22	.00000E+00	3.83259E-11	3.03604E-01	2.13487E-01	2.43719E-01	5.98741E-02	3.57357E-06	1.00002E+00
23	.00000E+00	3.66438E-11	7.12952E-01	1.07286E+00	5.75034E-01	1.37859E-01	-5.71100E-07	1.00006E+00
24	.00000E+00	9.97397E-12	7.38426E-01	8.92745E-01	5.95276E-01	1.43121E-01	-2.53733E-06	1.00004E+00
25	.00000E+00	2.91973E-12	4.81342E-01	3.57749E-01	4.01982E-01	7.93486E-02	-1.55391E-06	1.00003E+00
26	.00000E+00	2.04733E-12	3.71811E-01	3.57384E-01	2.99769E-01	7.20558E-02	7.83225E-06	9.99998E-01
27	.00000E+00	4.87889E-13	1.21985E-01	7.23509E-02	1.01512E-01	2.04720E-02	2.27438E-07	1.00001E+00
28	.00000E+00	1.00000E+00	1.00190E+01	1.61017E+01	1.00190E+01	1.00249E+00	-5.99568E-06	9.99985E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*db**2	total flux
1	1.64997E-01	2.10805E-09	1.72578E-01	.00000E+00	2.30590E-03	2.57414E-03	.00000E+00	3.47733E-01
2	1.23071E+00	-4.87721E-08	1.31441E+00	.00000E+00	1.75309E-05	1.17886E-02	.00000E+00	2.61089E+00
3	1.56413E+00	-3.94333E-09	1.67305E+00	.00000E+00	.00000E+00	1.45478E-02	.00000E+00	3.32164E+00
4	9.70670E-01	2.16520E-08	1.08912E+00	.00000E+00	.00000E+00	6.29661E-03	.00000E+00	2.06328E+00
5	1.46501E+00	-2.23687E-08	1.57395E+00	.00000E+00	.00000E+00	1.85640E-03	.00000E+00	3.11830E+00
6	2.81868E+00	2.37698E-07	3.02941E+00	.00000E+00	.00000E+00	1.67207E-03	.00000E+00	6.00150E+00
7	2.78100E+00	1.75371E-07	2.90442E+00	.00000E+00	.00000E+00	1.69873E-03	.00000E+00	5.86555E+00
8	2.06382E+00	-1.20098E-07	2.07939E+00	.00000E+00	.00000E+00	1.77522E-03	.00000E+00	4.30265E+00
9	1.60356E+00	-4.92143E-08	1.58549E+00	.00000E+00	.00000E+00	2.42091E-03	.00000E+00	3.32763E+00
10	1.46680E+00	-6.01523E-08	1.44347E+00	.00000E+00	.00000E+00	5.15569E-03	.00000E+00	3.03873E+00
11	1.35177E+00	-4.26168E-08	1.30199E+00	.00000E+00	.00000E+00	1.07150E-02	.00000E+00	2.78819E+00
12	8.51598E-01	-1.92106E-08	7.94341E-01	.00000E+00	.00000E+00	1.37916E-02	.00000E+00	1.75791E+00
13	7.20153E-01	-1.56201E-09	6.72804E-01	.00000E+00	.00000E+00	1.36260E-02	.00000E+00	1.47051E+00
14	6.65674E-01	1.05850E-08	5.95112E-01	.00000E+00	.00000E+00	9.17978E-03	.00000E+00	1.34296E+00
15	3.78673E-01	2.09122E-06	3.72168E-01	.00000E+00	.00000E+00	2.32477E-03	.00000E+00	7.84918E-01
16	2.10948E-01	1.64750E-06	2.07153E-01	.00000E+00	.00000E+00	1.56920E-03	.00000E+00	4.36996E-01
17	9.27525E-02	-3.35600E-06	8.87581E-02	.00000E+00	.00000E+00	2.20864E-03	.00000E+00	1.90646E-01
18	7.36155E-02	-3.21498E-06	6.42002E-02	.00000E+00	.00000E+00	2.54205E-03	.00000E+00	1.47443E-01
19	1.44266E-01	-5.37192E-06	1.37581E-01	.00000E+00	.00000E+00	3.54318E-03	.00000E+00	2.96270E-01
20	4.73085E-01	3.61124E-06	4.52738E-01	.00000E+00	.00000E+00	1.69539E-02	.00000E+00	9.72674E-01
21	1.43393E-01	-8.45319E-06	1.26547E-01	.00000E+00	.00000E+00	1.28783E-02	.00000E+00	2.88022E-01
22	2.82468E-01	3.57357E-06	2.32596E-01	.00000E+00	.00000E+00	3.65695E-02	.00000E+00	5.57494E-01
23	8.89289E-01	-5.71100E-07	7.74383E-01	.00000E+00	.00000E+00	8.32006E-02	.00000E+00	1.77813E+00
24	6.71217E-01	-2.53733E-06	5.52211E-01	.00000E+00	.00000E+00	8.61648E-02	.00000E+00	1.31936E+00
25	2.89473E-01	-1.55391E-06	2.26387E-01	.00000E+00	.00000E+00	4.96836E-02	.00000E+00	5.60524E-01
26	1.97859E-01	7.83225E-06	1.35701E-01	.00000E+00	.00000E+00	4.56895E-02	.00000E+00	3.68577E-01
27	3.65267E-02	2.27438E-07	1.74124E-02	.00000E+00	.00000E+00	1.27786E-02	.00000E+00	6.21699E-02
28	2.36019E+01	-5.99568E-06	2.35678E+01	.00000E+00	2.32343E-03	4.53203E-01	.00000E+00	4.90943E+01

- elapsed time .02 min.

Odirect access unit 9 requires 516 blocks of length 1456 for cross section weighting.

1 transport cross section weighting function

Ozone	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	2.32023E-03	2.46432E-02	3.14960E-02	1.91146E-02	2.92591E-02	5.58960E-02	3.18415E-02	4.61034E-03
2	3.63221E-03	3.82934E-02	4.86876E-02	2.94863E-02	4.49319E-02	8.46411E-02	4.80592E-02	6.95116E-03
3	2.95138E-03	3.26702E-02	4.29859E-02	2.71862E-02	4.25898E-02	8.04845E-02	4.60468E-02	5.53407E-03
4	1.01878E-03	1.20220E-02	1.64775E-02	1.09272E-02	1.74414E-02	3.33811E-02	1.95152E-02	1.98607E-03
5	1.69031E-03	1.87470E-02	2.46961E-02	1.56111E-02	2.43670E-02	4.65140E-02	2.66799E-02	3.29888E-03

Ozone	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	4.76323E-03	5.86906E-03	1.25367E-02	1.44708E-02	1.21700E-02	1.78675E-02	1.82534E-03	1.05963E-03
2	7.15452E-03	8.80490E-03	1.88576E-02	2.18491E-02	1.83631E-02	2.71110E-02	2.71215E-03	1.58962E-03
3	5.75377E-03	8.26024E-03	1.76352E-02	2.02020E-02	1.69731E-02	2.50551E-02	2.53800E-03	1.47790E-03
4	1.91944E-03	3.36057E-03	7.16180E-03	8.11418E-03	6.85335E-03	1.00771E-02	1.10575E-03	6.22081E-04
5	3.33909E-03	4.78343E-03	1.02084E-02	1.16847E-02	9.84101E-03	1.44731E-02	1.51758E-03	8.70663E-04

Ozone	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	1.05475E-03	2.33689E-03	1.76176E-03	5.37297E-03	4.22154E-03	1.20619E-02	2.84650E-02	2.83012E-02
2	1.59250E-03	3.58292E-03	2.63450E-03	8.07731E-03	6.43045E-03	1.85115E-02	4.32459E-02	4.33146E-02
3	1.47296E-03	3.29918E-03	2.44771E-03	7.46892E-03	5.97175E-03	1.71157E-02	4.01916E-02	4.01905E-02
4	5.96243E-04	1.30954E-03	9.99810E-04	3.03522E-03	2.40481E-03	6.86900E-03	1.65064E-02	1.64319E-02
5	8.54371E-04	1.89117E-03	1.42751E-03	4.34696E-03	3.43847E-03	9.83099E-03	2.33356E-02	2.32414E-02

Ozone	grp. 25	grp. 26	grp. 27	grp. 28
1	1.44409E-02	1.31470E-02	3.44384E-03	3.84351E-01
2	2.22285E-02	2.05503E-02	5.66049E-03	5.86934E-01

3	2.04903E-02	1.89825E-02	5.19966E-03	5.40975E-01
4	8.29796E-03	7.56765E-03	1.90505E-03	2.17707E-01
5	1.18116E-02	1.07995E-02	2.81431E-03	3.12114E-01

1 240 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0cell averaged fluxes

0zone	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	1.70692E-01	1.29416E+00	1.64749E+00	1.02366E+00	1.54938E+00	2.98152E+00	2.87557E+00	2.07444E+00
2	1.67548E-01	1.26141E+00	1.60707E+00	9.99721E-01	1.51239E+00	2.91177E+00	2.83454E+00	2.06721E+00
3	1.66402E-01	1.24956E+00	1.59208E+00	9.90752E-01	1.49870E+00	2.88529E+00	2.81946E+00	2.06494E+00
4	1.64993E-01	1.23114E+00	1.56617E+00	9.71662E-01	1.46683E+00	2.82225E+00	2.78268E+00	2.06318E+00
5	1.67064E-01	1.25437E+00	1.59584E+00	9.91275E-01	1.49815E+00	2.88286E+00	2.81802E+00	2.06715E+00

0zone	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	1.59046E+00	1.44919E+00	1.31426E+00	8.08612E-01	6.84621E-01	6.12646E-01	3.74037E-01	2.08164E-01
2	1.59784E+00	1.45723E+00	1.33160E+00	8.28980E-01	7.01506E-01	6.37861E-01	3.76594E-01	2.09588E-01
3	1.60013E+00	1.45986E+00	1.33719E+00	8.35452E-01	7.06969E-01	6.45905E-01	3.77442E-01	2.10065E-01
4	1.60343E+00	1.46646E+00	1.35106E+00	8.50869E-01	7.19688E-01	6.64860E-01	3.78898E-01	2.11010E-01
5	1.59871E+00	1.45992E+00	1.33714E+00	8.34953E-01	7.06488E-01	6.45205E-01	3.77103E-01	2.09949E-01

0zone	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	8.97398E-02	6.64960E-02	1.39255E-01	4.57807E-01	1.30620E-01	2.45133E-01	8.01802E-01	5.79882E-01
2	9.11561E-02	6.98580E-02	1.41621E-01	4.65042E-01	1.36517E-01	2.62748E-01	8.41092E-01	6.19751E-01
3	9.16263E-02	7.09144E-02	1.42394E-01	4.67401E-01	1.38376E-01	2.68071E-01	8.53064E-01	6.31378E-01
4	9.27138E-02	7.34609E-02	1.44203E-01	4.72895E-01	1.43093E-01	2.81597E-01	8.86436E-01	6.67204E-01
5	9.15952E-02	7.08572E-02	1.42339E-01	4.67212E-01	1.38376E-01	2.67841E-01	8.54277E-01	6.33868E-01

0zone	grp. 25	grp. 26	grp. 27
1	2.40893E-01	1.49332E-01	2.13871E-02
2	2.61856E-01	1.69242E-01	2.74920E-02
3	2.67666E-01	1.74396E-01	2.88879E-02
4	2.86895E-01	1.94317E-01	3.52220E-02
5	2.69296E-01	1.76982E-01	2.98687E-02

0flux disadvantage factors (zone average/cell average-flux)

0zone	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	1.02172E+00	1.03172E+00	1.03237E+00	1.03267E+00	1.03419E+00	1.03422E+00	1.02042E+00	1.00853E+00
2	1.00290E+00	1.00561E+00	1.00704E+00	1.00852E+00	1.00951E+00	1.01003E+00	1.00586E+00	1.00003E+00
3	9.96088E-01	9.96167E-01	9.97648E-01	9.99473E-01	1.00057E+00	1.00084E+00	1.00051E+00	9.98953E-01
4	9.87605E-01	9.81488E-01	9.80781E-01	9.80215E-01	9.79099E-01	9.78978E-01	9.87458E-01	9.98079E-01
5	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00

0zone	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	9.94857E-01	9.92650E-01	9.82885E-01	9.68452E-01	9.69049E-01	9.49537E-01	9.91858E-01	9.91502E-01
2	9.99455E-01	9.98161E-01	9.95854E-01	9.92846E-01	9.92948E-01	9.88618E-01	9.98650E-01	9.98285E-01
3	1.00089E+00	9.99961E-01	1.00003E+00	1.00060E+00	1.00068E+00	1.00109E+00	1.00090E+00	1.00056E+00
4	1.00295E+00	1.00448E+00	1.01040E+00	1.01906E+00	1.01868E+00	1.03046E+00	1.00476E+00	1.00505E+00
5	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00

0zone	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	9.79765E-01	9.38716E-01	9.78334E-01	9.79871E-01	9.43951E-01	9.15220E-01	9.38574E-01	9.14831E-01
2	9.95229E-01	9.86177E-01	9.94957E-01	9.95356E-01	9.86564E-01	9.80988E-01	9.84566E-01	9.77728E-01
3	1.00056E+00	1.00105E+00	1.00089E+00	1.00040E+00	9.99995E-01	1.00086E+00	9.98580E-01	9.96071E-01
4	1.01224E+00	1.03704E+00	1.01310E+00	1.01216E+00	1.03409E+00	1.05136E+00	1.03764E+00	1.05259E+00
5	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00

0zone	grp. 25	grp. 26	grp. 27
1	8.94530E-01	8.43769E-01	7.16037E-01
2	9.72373E-01	9.56267E-01	9.20431E-01
3	9.93948E-01	9.85393E-01	9.67165E-01
4	1.06535E+00	1.09795E+00	1.17923E+00
5	1.00000E+00	1.00000E+00	1.00000E+00

0cell averaged currents

0zone	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	2.32023E-03	2.46432E-02	3.14960E-02	1.91146E-02	2.92591E-02	5.58960E-02	3.18415E-02	4.61034E-03

```
     2 3.63221E-03 3.82934E-02 4.86876E-02 2.94863E-02 4.49319E-02 8.46411E-02 4.80592E-02 6.93116E-03
     3 2.95138E-03 3.26702E-02 4.29859E-02 2.71862E-02 4.23898E-02 8.04845E-02 4.60468E-02 5.53407E-03
     4 1.01878E-03 1.20220E-02 1.64775E-02 1.09272E-02 1.74414E-02 3.33811E-02 1.93152E-02 1.98607E-03
     5 1.69031E-03 1.87470E-02 2.46961E-02 1.56111E-02 2.43670E-02 4.65140E-02 2.66799E-02 3.29888E-03
Ozone  grp. 9      grp. 10     grp. 11     grp. 12     grp. 13     grp. 14     grp. 15     grp. 16
     1 4.76323E-03 5.86906E-03 1.25367E-02 1.44708E-02 1.21700E-02 1.78675E-02 1.82534E-03 1.05963E-03
     2 7.15452E-03 8.80490E-03 1.88576E-02 2.18491E-02 1.83631E-02 2.71110E-02 2.71215E-03 1.58962E-03
     3 5.75377E-03 8.26024E-03 1.76352E-02 2.02020E-02 1.69731E-02 2.50551E-02 2.53800E-03 1.47790E-03
     4 1.91944E-03 3.36057E-03 7.16180E-03 8.11418E-03 6.85335E-03 1.00771E-02 1.10575E-03 6.22081E-04
     5 3.33909E-03 4.78343E-03 1.02084E-02 1.16847E-02 9.84101E-03 1.44731E-02 1.51738E-03 8.70663E-04
Ozone  grp. 17     grp. 18     grp. 19     grp. 20     grp. 21     grp. 22     grp. 23     grp. 24
     1 1.05475E-03 2.33689E-03 1.76176E-03 5.37297E-03 4.22154E-03 1.20619E-02 2.84650E-02 2.83012E-02
     2 1.59250E-03 3.58292E-03 2.63450E-03 8.07731E-03 6.43045E-03 1.85115E-02 4.32459E-02 4.33146E-02
     3 1.47296E-03 3.29918E-03 2.44771E-03 7.46892E-03 5.97175E-03 1.71157E-02 4.01916E-02 4.01905E-02
     4 5.96243E-04 1.30954E-03 9.99810E-04 3.03522E-03 2.40481E-03 6.86900E-03 1.65064E-02 1.64319E-02
     5 8.54371E-04 1.89117E-03 1.42751E-03 4.34696E-03 3.43847E-03 9.83099E-03 2.33356E-02 2.32414E-02
Ozone  grp. 25     grp. 26     grp. 27
     1 1.44409E-02 1.31470E-02 3.44384E-03
     2 2.22285E-02 2.05508E-02 5.66049E-03
     3 2.04903E-02 1.89825E-02 5.19966E-03
     4 8.29796E-03 7.56765E-03 1.90505E-03
     5 1.18116E-02 1.07995E-02 2.81431E-03
Ozone      volume      vol. fraction

     1    6.88443E-01    3.30753E-01
     2    3.17352E-02    1.52468E-02
     3    2.16724E-01    1.04122E-01
     4    1.14454E+00    5.49878E-01
     5    2.08144E+00    1.00000E+00
 - elapsed time    .03 min.
Orequested parm=halt8,skipcellwt,skipshipdata
  pass= 2, exec halts after pass  8
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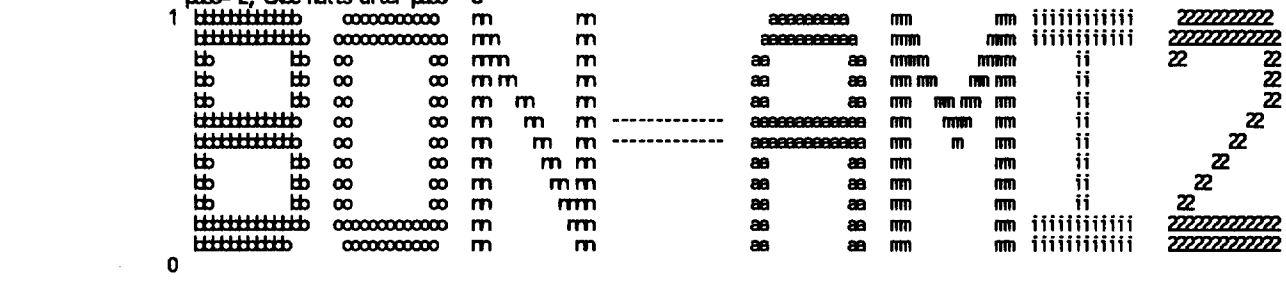

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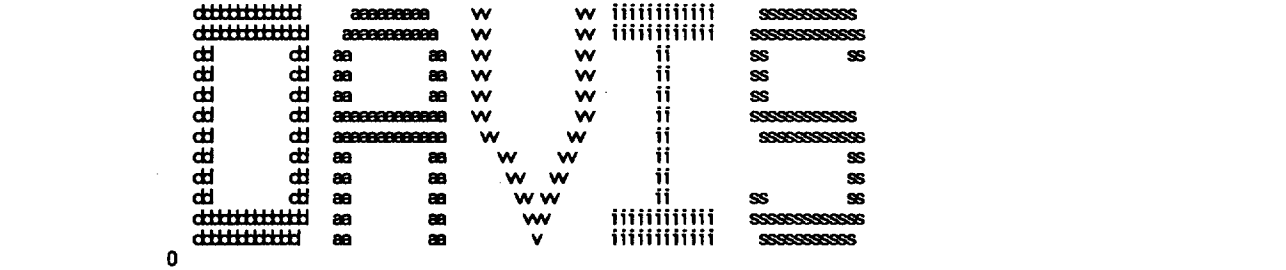

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  000000000   222222222222            //      111      666666666666         //   999999999999  666666666666
 00       00  22        22           //      1111      66                  //    99        99  66
00         00           22          //         11      66                 //     99        99  66
00         00           22         //          11      66                //      99        99  66
00         00          22         //           11      66666666666      //       999999999999  66666666666
00         00        22          //            11      666666666666    //         99999999999  666666666666
00         00      22           //             11      66        66   //                   99  66        66
00         00    22            //              11      66        66  //                    99  66        66
 00       00   22             //               11      66        66 //                     99  66        66
  000000000   222222222222   //          11111111      666666666666//        999999999999  666666666666
   0000000    222222222222  //           11111111       6666666666//          9999999999    6666666666
0
   0000000    9999999999          555555555555  8888888888              11        11
  000000000  999999999999         555555555555 888888888888            111       111
 00       00 99        99   :::   55           88        88    :::    1111      1111
00         00 99        99  :::   55           88        88    :::      11        11
00         00 99        99  :::   55           88        88    :::      11        11
00         00 999999999999        55555555555   8888888888              11        11
00         00  99999999999        555555555555  8888888888              11        11
00         00           99  :::             55 88        88    :::      11        11
00         00           99  :::             55 88        88    :::      11        11
 00       00            99  :::   55        55 88        88    :::      11        11
  000000000  999999999999         555555555555 888888888888         11111111  11111111
   0000000   9999999999            5555555555   8888888888          11111111  11111111
1
0                     ssssssssss    cccccccccc     aaaaaaaa    ll          eeeeeeeeeeee
                     ssssssssssss  cccccccccccc   aaaaaaaaaa   ll          eeeeeeeeeeee
                     ss        ss  cc        cc  aa        aa  ll          ee
                     ss            cc            aa        aa  ll          ee
                     ss            cc            aa        aa  ll          ee
                     sssssssssss   cc            aaaaaaaaaaaa  ll          eeeeeeee
                      sssssssssss  cc            aaaaaaaaaaaa  ll          eeeeeeee
                               ss  cc            aa        aa  ll          ee
                               ss  cc            aa        aa  ll          ee
                     ss        ss  cc        cc  aa        aa  ll          ee
                     ssssssssssss  cccccccccccc  aa        aa  llllllllllll eeeeeeeeeeee
                      ssssssssss    cccccccccc   aa        aa  llllllllllll eeeeeeeeeeee
```

```
***********************************************************************************
***********************************************************************************
***********************************************************************************
*****                                                                         *****
*****                    program verification information                     *****
*****                                                                         *****
*****                    code system:    scale  version:    4.2               *****
*****                                                                         *****
***********************************************************************************
***********************************************************************************
*****                                                                         *****
*****                                                                         *****
*****                 program:  c0c008                                        *****
*****                                                                         *****
*****           creation date:  04/27/95                                      *****
*****                                                                         *****
```

```
                    *****          library:  /neutronics/scale/exe                *****
                    *****                                                         *****
                    *****                                                         *****
                    *****  this is not a  scale  configuration controlled code    *****
                    *****                                                         *****
                    *****          jobname:  davis                                *****
                    *****                                                         *****
                    *****  date of execution:  02/16/96                           *****
                    *****                                                         *****
                    *****  time of execution:  09:58:11                           *****
                    *****                                                         *****
                    *****                                                         *****
                    ***************************************************************************
                    ***************************************************************************
                    ***************************************************************************
1
0      -1q array has     1 entries.
0       0q array has     4 entries.
0       1q array has     6 entries.
0       2q array has     2 entries.
1logical assignments
0master library   12
 working library  17
 scratch file     18
 new library       1
0p r o b l e m   d e s c r i p t i o n
0igr--geometry (0/1/2/3--inf med/slab/cyl/sphere            2
0izm--number of zones or material regions                   4
0ms--mixing table length                                   70
0ibl--shielded cross section edit option (0/1--no/yes)      0
0ibr--bondarenko factor edit option (0/1--no/yes)           0
0issopt--dancoff factor option                              0
0convergence criterion    1.00000E-03
0geometry correction factor for wigner rational approximation  1.350E+00
0       3q array has    70 entries.
0       4q array has    70 entries.
0       5q array has    70 entries.
0       6q array has     4 entries.
0       7q array has     4 entries.
0       8q array has     4 entries.
0       9q array has     4 entries.
0      10q array has    70 entries.
0      11q array has     4 entries.
0m i x i n g   t a b l e
0entry  mixture   isotope  number density   new identifier
   1      3        8016    2.09710E-02          201
   2      3        1001    4.19420E-02          202
   3      3        5010    3.81515E-06          203
   4      3        5011    1.54884E-05          204
   5      2       40302    4.25156E-02          205
   6      1       92235    1.97093E-04       200006
   7      1       92234    1.73586E-06       200007
   8      1       92236    6.85418E-06       200008
   9      1       92238    7.27846E-03       200009
  10      1        8016    1.50611E-02       200010
  11      1        8016    1.15315E-02       200011
  12      1       36083    1.49788E-07       200012
  13      1       36085    7.24877E-08       200013
  14      1       38090    1.62222E-06       200014
  15      1       39089    9.69799E-07       200015
```

16	1	42095	8.85395E-07	200016
17	1	40093	1.21166E-06	200017
18	1	40094	1.86811E-06	200018
19	1	40095	6.68494E-07	200019
20	1	41094	6.37185E-13	200020
21	1	43099	1.78738E-06	200021
22	1	45103	7.74208E-07	200022
23	1	45105	4.70797E-09	200023
24	1	44101	1.56517E-06	200024
25	1	44106	2.11021E-07	200025
26	1	46105	4.39806E-07	200026
27	1	46108	8.09598E-08	200027
28	1	47109	5.68571E-08	200028
29	1	51124	1.58536E-11	200029
30	1	54131	8.22327E-07	200030
31	1	54132	1.34631E-06	200031
32	1	54135	2.15375E-09	200032
33	1	54136	2.98490E-06	200033
34	1	55134	2.69282E-08	200034
35	1	55135	9.25459E-07	200035
36	1	55137	1.88777E-06	200036
37	1	56136	5.51117E-09	200037
38	1	57139	1.88760E-06	200038
39	1	59141	1.39034E-06	200039
40	1	59143	1.33567E-07	200040
41	1	58144	1.20205E-06	200041
42	1	60143	1.53714E-06	200042
43	1	60145	1.14105E-06	200043
44	1	61147	5.39173E-07	200044
45	1	61148	1.43795E-09	200045
46	1	60147	4.43675E-08	200046
47	1	62147	4.54726E-08	200047
48	1	62149	2.27445E-08	200048
49	1	62150	3.27241E-07	200049
50	1	62151	7.37387E-08	200050
51	1	62152	1.51696E-07	200051
52	1	64155	1.47720E-10	200052
53	1	63153	6.69315E-08	200053
54	1	63154	5.20859E-09	200054
55	1	63155	1.05382E-08	200055
56	1	40302	4.42681E-05	200056
57	1	1001	2.30630E-02	200057
58	1	5010	2.09787E-06	200058
59	1	5011	8.51673E-06	200059
60	1	55133	1.95560E-06	200060
61	1	95237	2.03586E-07	200061
62	1	94238	7.98213E-09	200062
63	1	94239	1.44467E-05	200063
64	1	94240	1.07622E-06	200064
65	1	94241	2.48362E-07	200065
66	1	94242	6.83419E-09	200066
67	1	95241	2.00094E-09	200067
68	1	95243	1.38633E-10	200068
69	1	96244	3.02219E-12	200069
70	1	999	3.30753E-21	200070

Ogeometry and material description

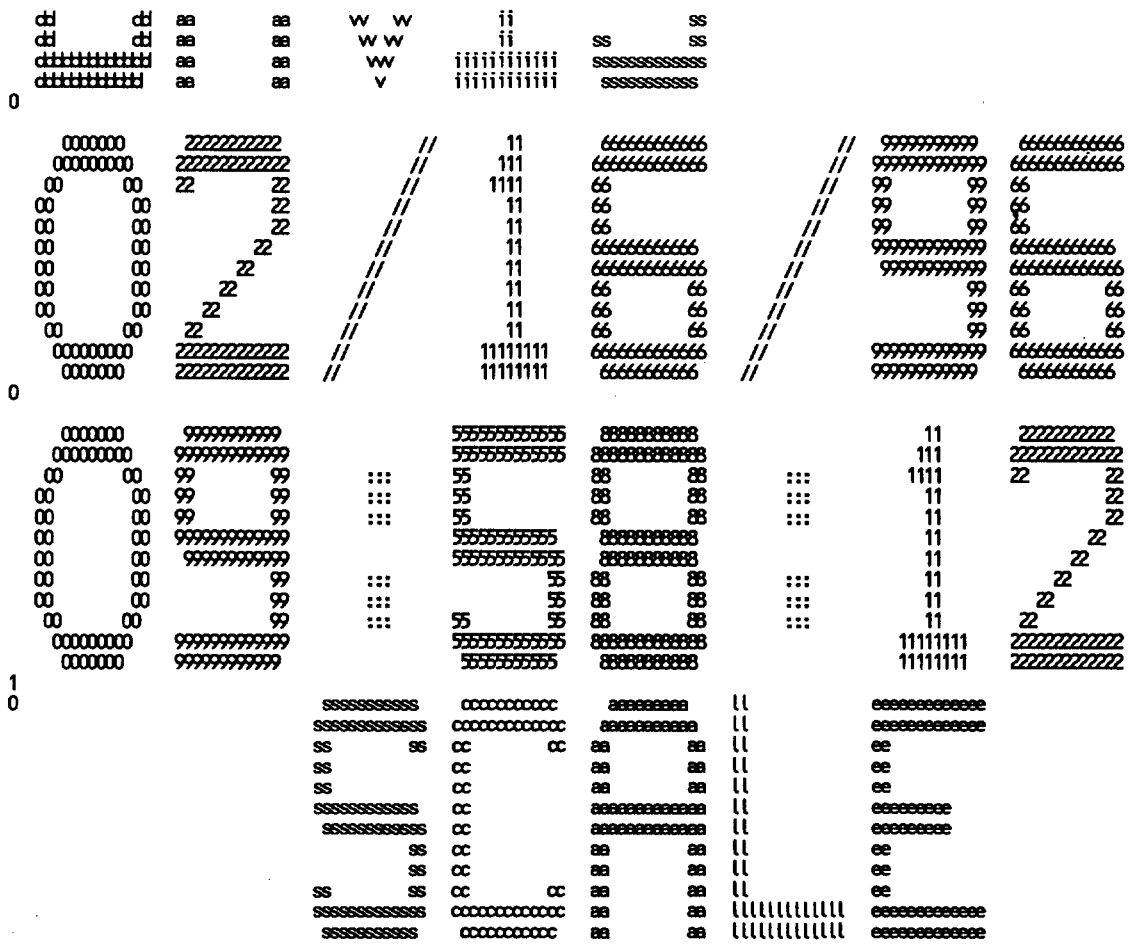
Ozone	mixture	outer dimension	temperature	extra xs	type (0/1--fuel/mod)
1	3	6.32460E-01	6.07600E+02	7.90564E-01	0
2	2	6.73100E-01	6.50000E+02	1.23052E+01	0
3	3	8.14000E-01	6.07600E+02	3.54862E+00	0

```
   4     1          2.96100E+00    9.75000E+02    2.32883E-01            0
     8067 locations of   200000 available are required to make a new master containing the self-shielded values
0no nuclides in your problem have bondarenko factor data**bonami will copy from logical 12 to logical  1
0copy       999  1/v cross sectio from log 12 to log  1   bondarenko trigger 0
0copy      1001  hydrogen        from log 12 to log 18   bondarenko trigger 0
0copy      1001  hydrogen        from log 18 to log  1   bondarenko trigger 0
0copy      1001  hydrogen        from log 18 to log  1   bondarenko trigger 0
0copy      5010  b-10 1273 218ngp from log 12 to log 18   bondarenko trigger 0
0copy      5010  b-10 1273 218ngp from log 18 to log  1   bondarenko trigger 0
0copy      5010  b-10 1273 218ngp from log 18 to log  1   bondarenko trigger 0
0copy      5011  boron-11        from log 12 to log 18   bondarenko trigger 0
0copy      5011  boron-11        from log 18 to log  1   bondarenko trigger 0
0copy      5011  boron-11        from log 18 to log  1   bondarenko trigger 0
0copy      8016  oxygen-16       from log 12 to log 18   bondarenko trigger 0
0copy      8016  oxygen-16       from log 18 to log  1   bondarenko trigger 0
0copy      8016  oxygen-16       from log 18 to log  1   bondarenko trigger 0
0copy      8016  oxygen-16       from log 18 to log  1   bondarenko trigger 0
0copy     36083  kr-83           from log 12 to log  1   bondarenko trigger 0
0copy     36085  kr-85           from log 12 to log  1   bondarenko trigger 0
0copy     38090  sr-90           from log 12 to log  1   bondarenko trigger 0
0copy     39089   y-89           from log 12 to log  1   bondarenko trigger 0
0copy     40093  zr-93           from log 12 to log  1   bondarenko trigger 0
0copy     40094  zr-94           from log 12 to log  1   bondarenko trigger 0
0copy     40095  zr-95           from log 12 to log  1   bondarenko trigger 0
0copy     40302  zircalloy       from log 12 to log 18   bondarenko trigger 0
0copy     40302  zircalloy       from log 18 to log  1   bondarenko trigger 0
0copy     40302  zircalloy       from log 18 to log  1   bondarenko trigger 0
0copy     41094  nb-94           from log 12 to log  1   bondarenko trigger 0
0copy     42095  mo-95           from log 12 to log  1   bondarenko trigger 0
0copy     43099  tc-99           from log 12 to log  1   bondarenko trigger 0
0copy     44101  ru-101          from log 12 to log  1   bondarenko trigger 0
0copy     44106  ru-106          from log 12 to log  1   bondarenko trigger 0
0copy     45103  rh-103          from log 12 to log  1   bondarenko trigger 0
0copy     45105  rh-105          from log 12 to log  1   bondarenko trigger 0
0copy     46105  pd-105          from log 12 to log  1   bondarenko trigger 0
0copy     46108  pd-108          from log 12 to log  1   bondarenko trigger 0
0copy     47109  silver-109      from log 12 to log  1   bondarenko trigger 0
0copy     51124  sb-124          from log 12 to log  1   bondarenko trigger 0
0copy     54131  xe-131          from log 12 to log  1   bondarenko trigger 0
0copy     54132  xe-132          from log 12 to log  1   bondarenko trigger 0
0copy     54135  xenon-135       from log 12 to log  1   bondarenko trigger 0
0copy     54136  xe-136          from log 12 to log  1   bondarenko trigger 0
0copy     55133  cesium-133      from log 12 to log  1   bondarenko trigger 0
0copy     55134  cs-134          from log 12 to log  1   bondarenko trigger 0
0copy     55135  cs-135          from log 12 to log  1   bondarenko trigger 0
0copy     55137  cs-137          from log 12 to log  1   bondarenko trigger 0
0copy     56136  ba-136          from log 12 to log  1   bondarenko trigger 0
0copy     57139  la-139          from log 12 to log  1   bondarenko trigger 0
0copy     58144  ce-144          from log 12 to log  1   bondarenko trigger 0
0copy     59141  pr-141          from log 12 to log  1   bondarenko trigger 0
0copy     59143  pr-143          from log 12 to log  1   bondarenko trigger 0
0copy     60143  nd-143          from log 12 to log  1   bondarenko trigger 0
0copy     60145  nd-145          from log 12 to log  1   bondarenko trigger 0
0copy     60147  nd-147          from log 12 to log  1   bondarenko trigger 0
0copy     61147  pm-147          from log 12 to log  1   bondarenko trigger 0
0copy     61148  pm-148          from log 12 to log  1   bondarenko trigger 0
0copy     62147  sm-147          from log 12 to log  1   bondarenko trigger 0
0copy     62149  sm-149          from log 12 to log  1   bondarenko trigger 0
0copy     62150  sm-150          from log 12 to log  1   bondarenko trigger 0
0copy     62151  sm-151          from log 12 to log  1   bondarenko trigger 0
```

```
0ocpy   62152  sm-152           from log 12 to log  1   bondarenko trigger 0
0ocpy   63153  eu-153           from log 12 to log  1   bondarenko trigger 0
0ocpy   63154  eu-154           from log 12 to log  1   bondarenko trigger 0
0ocpy   63155  eu-155           from log 12 to log  1   bondarenko trigger 0
0ocpy   64155  gd-155           from log 12 to log  1   bondarenko trigger 0
0ocpy   92234  u-234 1043 sigp= from log 12 to log  1   bondarenko trigger 0
0ocpy   92235   uranium-235     from log 12 to log  1   bondarenko trigger 0
0ocpy   92236  u-236 1163 sigp= from log 12 to log  1   bondarenko trigger 0
0ocpy   92238   uranium-238     from log 12 to log  1   bondarenko trigger 0
0ocpy   93237   neptunium-237   from log 12 to log  1   bondarenko trigger 0
0ocpy   94238  pu-238 1050 sigp from log 12 to log  1   bondarenko trigger 0
0ocpy   94239   plutonium-239   from log 12 to log  1   bondarenko trigger 0
0ocpy   94240   plutonium-240   from log 12 to log  1   bondarenko trigger 0
0ocpy   94241   plutonium-241   from log 12 to log  1   bondarenko trigger 0
0ocpy   94242   plutonium-242   from log 12 to log  1   bondarenko trigger 0
0ocpy   95241  am-241 1056 sigp from log 12 to log  1   bondarenko trigger 0
0ocpy   95243  am-243 1057 218  from log 12 to log  1   bondarenko trigger 0
0ocpy   96244   curium-244      from log 12 to log  1   bondarenko trigger 0
1    scale 4.2 - 27 group neutron burnup library
       based on endf-b version 4 data with endf-b version 5 fission products
          compiled for nrc      1/27/89
            last updated       9/16/93
               l.m.petrie   -   ornl
        tape id                            4321        number of nuclides                70
        number of neutron groups             27        number of gamma groups             0
        first thermal group                  15        logical unit                       1
                                     table of contents
      1/v cross sections normalized to 1.0 at 0.0253 ev                          id   200070
       hydrogen      endf/b-iv mat 1269/thrm1002    updated 10/13/89             id      202
       hydrogen      endf/b-iv mat 1269/thrm1002    updated 10/13/89             id   200057
      b-10 1273 218grp 042375 p-3 293k                                           id      203
      b-10 1273 218grp 042375 p-3 293k                                           id   200058
       boron-11      endf/b-iv mat 1160             updated 10/13/89             id      204
       boron-11      endf/b-iv mat 1160             updated 10/13/89             id   200059
       oxygen-16     endf/b-iv mat 1276             updated 10/13/89             id      201
       oxygen-16     endf/b-iv mat 1276             updated 10/13/89             id   200010
       oxygen-16     endf/b-iv mat 1276             updated 10/13/89             id   200011
       kr-83         mt=102,103,103,105,106,107     updated 10/13/89             id   200012
       kr-85            mt=  102                                                 id   200013
       sr-90         mt=102                         updated 10/13/89             id   200014
        y-89         mt=102                         updated 10/13/89             id   200015
       zr-93            mt=  102                                                 id   200017
       zr-94         mt=102                         updated 10/13/89             id   200018
       zr-95         mt=102                         updated 10/13/89             id   200019
       zircalloy     endf/b-iv mat 1284             updated 10/13/89             id      205
       zircalloy     endf/b-iv mat 1284             updated 10/13/89             id   200056
       nb-94         mt=102                         updated 10/13/89             id   200020
       mo-95         mt=102                         updated 10/13/89             id   200016
       tc-99         mt=102                         updated 10/13/89             id   200021
       ru-101        mt=102                         updated 10/13/89             id   200024
       ru-106        mt=102                         updated 10/13/89             id   200025
       rh-103        mt=102                         updated 10/13/89             id   200022
       rh-105           mt=  102                                                 id   200023
       pd-105        mt=102                         updated 10/13/89             id   200026
       pd-108        mt=102                         updated 10/13/89             id   200027
       silver-109    endf/b-iv mat 1139             updated 10/13/89             id   200028
       sb-124        mt=102                         updated 10/13/89             id   200029
       xe-131        mt=102,103,104,105,106         updated 10/13/89             id   200030
       xe-132        mt=102,103,104,105,106         updated 10/13/89             id   200031
       xenon-135     endf/b-iv mat 1294             updated 10/13/89             id   200032
```

```
        xe-136          mt=  102, 103, 104, 105, 107                          id   200033
        cesium-133      endf/b-iv mat 1141          updated 10/13/89          id   200060
        cs-134          mt=102                      updated 10/13/89          id   200034
        cs-135          mt=  102                                              id   200035
        cs-137          mt=102                      updated 10/13/89          id   200036
        ba-136          mt=102                      updated 10/13/89          id   200037
        la-139          mt=102                      updated 10/13/89          id   200038
        ce-144          mt=  102                                              id   200041
        pr-141          mt=102,103,104,105,106,107  updated 10/13/89          id   200039
        pr-143          mt=102                      updated 10/13/89          id   200040
        nd-143          mt=102                      updated 10/13/89          id   200042
        nd-145          mt=102                      updated 10/13/89          id   200043
        nd-147          mt=102                      updated 10/13/89          id   200046
        pm-147          mt=102                      updated 10/13/89          id   200044
        pm-148          mt=  102                                              id   200045
        sm-147          endf/b-v fission product    updated 10/13/89          id   200047
        sm-149          mt=102,103,107              updated 10/13/89          id   200048
        sm-150          mt=102                      updated 10/13/89          id   200049
        sm-151          mt=102,103,104,105,106,107  updated 10/13/89          id   200050
        sm-152          mt=102,103,104,105,106,107  updated 10/13/89          id   200051
        eu-153          mt=102,103,104,105,106,107  updated 10/13/89          id   200053
        eu-154          mt=102,103,104,105,106,107  updated 10/13/89          id   200054
        eu-155          mt=102,103,104,105,106,107  updated 10/13/89          id   200055
        gd-155          mt=102                      updated 10/13/89          id   200052
       u-234 1043 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                    id   200007
        uranium-235     endf/b-iv mat 1261          updated 10/13/89          id   200006
       u-236 1163 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                    id   200008
        uranium-238     endf/b-iv mat 1262          updated 10/13/89          id   200009
        neptunium-237   endf/b-iv mat 1263          updated 10/13/89          id   200061
       pu-238 1050 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                   id   200062
        plutonium-239   endf/b-iv mat 1264          updated 10/13/89          id   200063
        plutonium-240   endf/b-iv mat 1265          updated 10/13/89          id   200064
        plutonium-241   endf/b-iv mat 1266          updated 10/13/89          id   200065
        plutonium-242   endf/b-iv mat 1161          updated 10/13/89          id   200066
       am-241 1056 sigo=5+4 newklacs 218ngp p-3 293k                          id   200067
       am-243 1057 218 gp wt f-1/e-m 090376 p3 293k                           id   200068
        curium-244      endf/b-iv mat 1162          updated 10/13/89          id   200069
0        tape copy used      0 i/o's, and took     .00 seconds
1               m         m  iiiiiiiiiiii   ttttttttttt     aaaaaaaa    ww         ww  ll
                mm        m  iiiiiiiiiiii   ttttttttttt    aaaaaaaaaa   ww         ww  ll
                mmm       m      ii             tt        aa        aa  ww         ww  ll
                m m       m      ii             tt        aa        aa  ww         ww  ll
                m  m      m      ii             tt        aa        aa  ww         ww  ll
                m   m     m      ii             tt        aaaaaaaaaaaa  ww    w    ww  ll
                m    m    m      ii             tt        aaaaaaaaaaaa  ww   www   ww  ll
                m     m   m      ii             tt        aa        aa  ww  ww ww  ww  ll
                m      m  m      ii             tt        aa        aa  ww ww   ww ww  ll
                m       mm       ii             tt        aa        aa  wwww     wwww  ll
                m        m iiiiiiiiiii         tt        aa        aa  www       www  lllllllllll
                m        m iiiiiiiiiii         tt        aa        aa  ww        ww  lllllllllll
0

  ddddddddddd     aaaaaaaa    w         w iiiiiiiiiii    sssssssss
  ddddddddddd    aaaaaaaaaa   w         w iiiiiiiiiii   ssssssssssss
  dd        dd  aa        aa  w         w     ii       ss          ss
  dd        dd  aa        aa  w         w     ii       ss
  dd        dd  aa        aa  w         w     ii       ss
  dd        dd  aaaaaaaaaaaa  w         w     ii       ssssssssss
  dd        dd  aaaaaaaaaaaa   w       w      ii        ssssssssss
  dd        dd  aa        aa    w     w       ii                ss
```



program verification information

code system: scale version: 4.2

```
                      *****                                                           *****
                      *****                                                           *****
                      *****              program:  c0c002                             *****
                      *****                                                           *****
                      *****        creation date:  04/27/95                           *****
                      *****                                                           *****
                      *****              library:  /neutronics/scale/exe              *****
                      *****                                                           *****
                      *****                                                           *****
                      *****    this is not a   scale  configuration controlled code   *****
                      *****                                                           *****
                      *****              jobname:  davis                              *****
                      *****                                                           *****
                      *****    date of execution:  02/16/96                           *****
                      *****                                                           *****
                      *****    time of execution:  09:58:12                           *****
                      *****                                                           *****
                      *****                                                           *****
                      *************************************************************************
                      *************************************************************************
                      *************************************************************************
1
0       -1q array has      1 entries.
0        0q array has      4 entries.
0        1q array has     12 entries.
0select  5 nuclides from the master  library on logical  1
        65 nuclides from the working library on logical  3
         0 nuclides from the working library on logical  0
           to create the new working library on logical  4

         1 resonance calculations have been requested
         0 output option for ampx formatted cross section data
0the storage allocated for this case is 200000 words
0        2q array has     70 entries.
0        3q array has     15 entries.
0        4q array has      5 entries.
0 general  information concerning cross section library
    tape identification number              4349
    number of nuclides on tape                65
    number of neutron energy groups           27
    first thermal neutron energy group        15
    number of gamma energy groups              0
0  direct access unit number  9 requires  72 blocks of length  1484 words
- xsdrn tape   4321
                      scale 4.2 - 27 group neutron burnup library
                        based on endf-b version 4 data with endf-b version 5 fission products
                          compiled for nrc       1/27/89
                            last updated        9/16/93
                              l.m.petrie   -   ornl
-  work tape   4349

 xsdrn weighted tape--parent case entitled--  240 d, sas2h: babcock wilcox 15x15,
  3.00wt%, 20gwd/mtu burn high temp

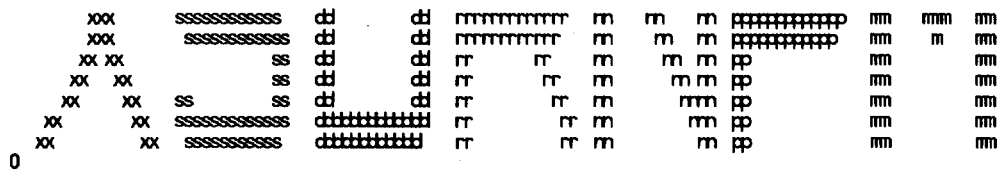

0 nuclides from xsdrn tape
     1     hydrogen      endf/b-iv mat 1269/thrm1002     updated 10/13/89            202
     2    b-10 1273 218ngp 042375 p-3 293k                                           203
     3     boron-11      endf/b-iv mat 1160               updated 10/13/89            204
```

4	oxygen-16	endf/b-iv mat 1276	updated 10/13/89	201
5	zircalloy	endf/b-iv mat 1284	updated 10/13/89	205
0 nuclides from work tape				
6	1/v cross sections normalized to 1.0 at 0.0253 ev			999
7	hydrogen	endf/b-iv mat 1269/thrml002	updated 10/13/89	1001
8	b-10 1273 218ngp 042375 p-3 293k			5010
9	boron-11	endf/b-iv mat 1160	updated 10/13/89	5011
10	oxygen-16	endf/b-iv mat 1276	updated 10/13/89	8016
11	oxygen-16	endf/b-iv mat 1276	updated 10/13/89	6
12	kr-83	mt=102,103,103,105,106,107	updated 10/13/89	36083
13	kr-85	mt= 102		36085
14	sr-90	mt=102	updated 10/13/89	38090
15	y-89	mt=102	updated 10/13/89	39089
16	zr-93	mt= 102		40093
17	zr-94	mt=102	updated 10/13/89	40094
18	zr-95	mt=102	updated 10/13/89	40095
19	zircalloy	endf/b-iv mat 1284	updated 10/13/89	40302
20	nb-94	mt=102	updated 10/13/89	41094
21	mo-95	mt=102	updated 10/13/89	42095
22	tc-99	mt=102	updated 10/13/89	43099
23	ru-101	mt=102	updated 10/13/89	44101
24	ru-106	mt=102	updated 10/13/89	44106
25	rh-103	mt=102	updated 10/13/89	45103
26	rh-105	mt= 102		45105
27	pd-105	mt=102	updated 10/13/89	46105
28	pd-108	mt=102	updated 10/13/89	46108
29	silver-109	endf/b-iv mat 1139	updated 10/13/89	47109
30	sb-124	mt=102	updated 10/13/89	51124
31	xe-131	mt=102,103,104,105,106	updated 10/13/89	54131
32	xe-132	mt=102,103,104,105,106	updated 10/13/89	54132
33	xenon-135	endf/b-iv mat 1294	updated 10/13/89	54135
34	xe-136	mt= 102, 103, 104, 105, 107		54136
35	cesium-133	endf/b-iv mat 1141	updated 10/13/89	55133
36	cs-134	mt=102	updated 10/13/89	55134
37	cs-135	mt= 102		55135
38	cs-137	mt=102	updated 10/13/89	55137
39	ba-136	mt=102	updated 10/13/89	56136
40	la-139	mt=102	updated 10/13/89	57139
41	ce-144	mt= 102		58144
42	pr-141	mt=102,103,104,105,106,107	updated 10/13/89	59141
43	pr-143	mt=102	updated 10/13/89	59143
44	nd-143	mt=102	updated 10/13/89	60143
45	nd-145	mt=102	updated 10/13/89	60145
46	nd-147	mt=102	updated 10/13/89	60147
47	pm-147	mt=102	updated 10/13/89	61147
48	pm-148	mt= 102		61148
49	sm-147	endf/b-v fission product	updated 10/13/89	62147
50	sm-149	mt=102,103,107	updated 10/13/89	62149
51	sm-150	mt=102	updated 10/13/89	62150
52	sm-151	mt=102,103,104,105,106,107	updated 10/13/89	62151
53	sm-152	mt=102,103,104,105,106,107	updated 10/13/89	62152
54	eu-153	mt=102,103,104,105,106,107	updated 10/13/89	63153
55	eu-154	mt=102,103,104,105,106,107	updated 10/13/89	63154
56	eu-155	mt=102,103,104,105,106,107	updated 10/13/89	63155
57	gd-155	mt=102	updated 10/13/89	64155
58	u-234 1043 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)			92234
59	uranium-235	endf/b-iv mat 1261	updated 10/13/89	92235
60	u-236 1163 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)			92236
61	uranium-238	endf/b-iv mat 1262	updated 10/13/89	92238
62	neptunium-237	endf/b-iv mat 1263	updated 10/13/89	93237

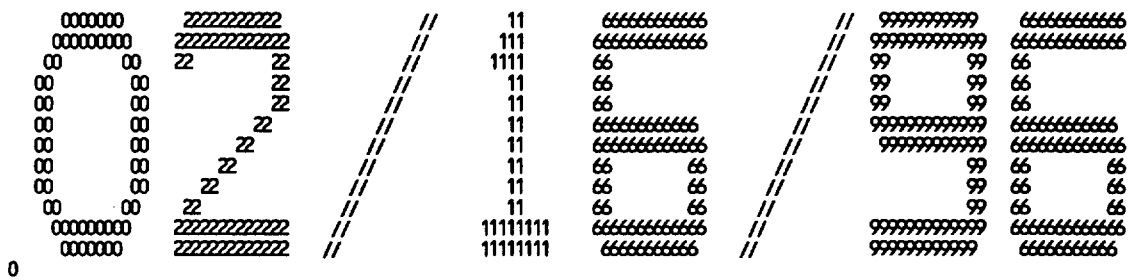
```
    63    pu-238 1050 sigp=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                    94238
    64     plutonium-239  endf/b-iv mat 1264            updated 10/13/89        94239
    65     plutonium-240  endf/b-iv mat 1265            updated 10/13/89        94240
    66     plutonium-241  endf/b-iv mat 1266            updated 10/13/89        94241
    67     plutonium-242  endf/b-iv mat 1161            updated 10/13/89        94242
    68    am-241 1056 sigp=5+4 newxlacs 218ngp p-3 293k                           95241
    69    am-243 1057 218 gp wt f-1/e-m 090576 p3 293k                            95243
    70     curium-244     endf/b-iv mat 1162            updated 10/13/89        96244
0 hydrogen        endf/b-iv mat 1269/thrm1002    updated 10/13/89          202    temperature=  607.60
                            thermal scattering matrix number   2 at a temperature of   550.00 was selected.
0b-10 1273 218ngp 042375 p-3 293k                                           203    temperature=  607.60
                            thermal scattering matrix number   2 at a temperature of   550.00 was selected.
0 boron-11        endf/b-iv mat 1160            updated 10/13/89          204    temperature=  607.60
                            thermal scattering matrix number   2 at a temperature of   550.00 was selected.
0 oxygen-16       endf/b-iv mat 1276            updated 10/13/89          201    temperature=  607.60
0 zircalloy       endf/b-iv mat 1284            updated 10/13/89          205    temperature=  650.00
0resonance data for this nuclide
0mass number (a)          =    90.436          temperature(kelvin)       =   650.000
0potential scatter sigma  =     6.385          lumped nuclear density    = 4.251602E-02
0spin factor (g)          =     1.079          lump dimension (a-bar)    = 6.730999E-01
0inner radius             = 6.324600E-01       dancoff correction (c)    = 1.680690E-01
0the absorber will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs          res fiss         res scat
   8     -1.156752E-03     .000000E+00    -7.806083E-01
   9     -4.625978E-02     .000000E+00    -2.075270E+00
  10     -5.962250E-02     .000000E+00    -1.351984E+00
  11     -1.761672E-01     .000000E+00    -7.350731E-01
0excess resonance integrals
0                 resolved
0absorption      2.92402E-01
 fission          .00000E+00
-  elapsed time    .00 min.
-  elapsed time    .02 min.
1     this xsdrn working tape was created 02/16/96 at 09:58:12
      the title of the parent case is as follows
      xsdrn weighted tape--parent case entitled--  240 d, sas2h: babcock wilcox 15x15,
       3.00wt%, 20gwd/mtu burn high temp

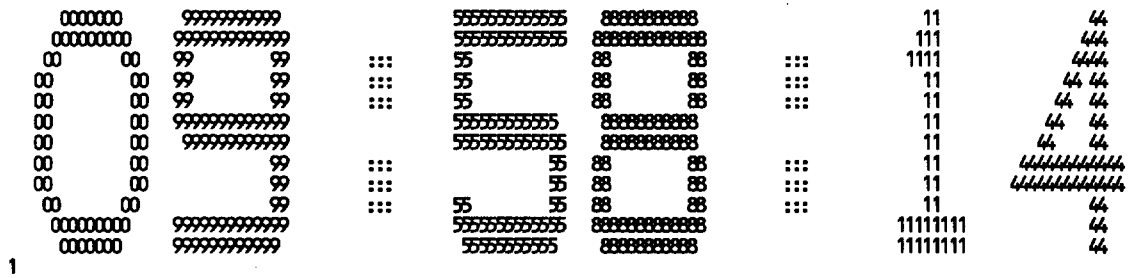
          tape id                          8670        number of nuclides              70
          number of neutron groups           27        number of gamma groups           0
          first thermal group                15        logical unit                     4
                                  table of contents
         hydrogen       endf/b-iv mat 1269/thrm1002    updated 10/13/89          id    202
        b-10 1273 218ngp 042375 p-3 293k                                         id    203
         boron-11       endf/b-iv mat 1160             updated 10/13/89          id    204
         oxygen-16      endf/b-iv mat 1276             updated 10/13/89          id    201
         zircalloy      endf/b-iv mat 1284             updated 10/13/89          id    205
        1/v cross sections normalized to 1.0 at 0.0253 ev                         id    999
         hydrogen       endf/b-iv mat 1269/thrm1002    updated 10/13/89          id   1001
        b-10 1273 218ngp 042375 p-3 293k                                         id   5010
         boron-11       endf/b-iv mat 1160             updated 10/13/89          id   5011
         oxygen-16      endf/b-iv mat 1276             updated 10/13/89          id   8016
         oxygen-16      endf/b-iv mat 1276             updated 10/13/89          id      6
         kr-83          mt=102,103,103,105,106,107     updated 10/13/89          id  36083
         kr-85            mt=  102                                                id  36085
         sr-90          mt=102                         updated 10/13/89          id  38090
          y-89          mt=102                         updated 10/13/89          id  39089
         zr-93            mt=  102                                                id  40093
```

```
      zr-94          mt=102                          updated 10/13/89          id   40094
      zr-95          mt=102                          updated 10/13/89          id   40095
      zircalloy      endf/b-iv mat 1284              updated 10/13/89          id   40302
      nb-94          mt=102                          updated 10/13/89          id   41094
      mo-95          mt=102                          updated 10/13/89          id   42095
      tc-99          mt=102                          updated 10/13/89          id   43099
      ru-101         mt=102                          updated 10/13/89          id   44101
      ru-106         mt=102                          updated 10/13/89          id   44106
      rh-103         mt=102                          updated 10/13/89          id   45103
      rh-105           mt=  102                                                id   45105
      pd-105         mt=102                          updated 10/13/89          id   46105
      pd-108         mt=102                          updated 10/13/89          id   46108
      silver-109     endf/b-iv mat 1139              updated 10/13/89          id   47109
      sb-124         mt=102                          updated 10/13/89          id   51124
      xe-131         mt=102,103,104,105,106          updated 10/13/89          id   54131
      xe-132         mt=102,103,104,105,106          updated 10/13/89          id   54132
      xenon-135      endf/b-iv mat 1294              updated 10/13/89          id   54135
      xe-136           mt=  102, 103, 104, 105, 107                            id   54136
      cesium-133     endf/b-iv mat 1141              updated 10/13/89          id   55133
      cs-134         mt=102                          updated 10/13/89          id   55134
      cs-135           mt=  102                                                id   55135
      cs-137         mt=102                          updated 10/13/89          id   55137
      ba-136         mt=102                          updated 10/13/89          id   56136
      la-139         mt=102                          updated 10/13/89          id   57139
      ce-144           mt=  102                                                id   58144
      pr-141         mt=102,103,104,105,106,107      updated 10/13/89          id   59141
      pr-143         mt=102                          updated 10/13/89          id   59143
      nd-143         mt=102                          updated 10/13/89          id   60143
      nd-145         mt=102                          updated 10/13/89          id   60145
      nd-147         mt=102                          updated 10/13/89          id   60147
      pm-147         mt=102                          updated 10/13/89          id   61147
      pm-148           mt=  102                                                id   61148
      sm-147         endf/b-v fission product        updated 10/13/89          id   62147
      sm-149         mt=102,103,107                  updated 10/13/89          id   62149
      sm-150         mt=102                          updated 10/13/89          id   62150
      sm-151         mt=102,103,104,105,106,107      updated 10/13/89          id   62151
      sm-152         mt=102,103,104,105,106,107      updated 10/13/89          id   62152
      eu-153         mt=102,103,104,105,106,107      updated 10/13/89          id   63153
      eu-154         mt=102,103,104,105,106,107      updated 10/13/89          id   63154
      eu-155         mt=102,103,104,105,106,107      updated 10/13/89          id   63155
      gd-155         mt=102                          updated 10/13/89          id   64155
     u-234 1043 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                        id   92234
      uranium-235    endf/b-iv mat 1261              updated 10/13/89          id   92235
     u-236 1163 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                        id   92236
      uranium-238    endf/b-iv mat 1262              updated 10/13/89          id   92238
      neptunium-237  endf/b-iv mat 1263              updated 10/13/89          id   93237
     pu-238 1050 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                       id   94238
      plutonium-239  endf/b-iv mat 1264              updated 10/13/89          id   94239
      plutonium-240  endf/b-iv mat 1265              updated 10/13/89          id   94240
      plutonium-241  endf/b-iv mat 1266              updated 10/13/89          id   94241
      plutonium-242  endf/b-iv mat 1161              updated 10/13/89          id   94242
     am-241 1056 sigo=5+4 newklacs 218grp p-3 293k                              id   95241
     am-243 1057 218 gp wt f-1/e-m 090576 p3 293k                               id   95243
      curium-244     endf/b-iv mat 1162              updated 10/13/89          id   96244
0       tape copy used      0 i/o's, and took     .00 seconds
1 xx        xx  ssssssssss   dddddddddd   rrrrrrrrrr   mm      mm pppppppppp   mm        mm
   xx      xx  ssssssssssss  ddddddddddd  rrrrrrrrrrr  mm      mm ppppppppppp  mmm      mmm
    xx    xx  ss      ss    dd      dd   rr      rr   mmm     mm pp      pp   mmmm    mmmm
     xx  xx   ss            dd      dd   rr      rr   mm mm   mm pp      pp   mm mm  mm mm
      xxxx    ss            dd      dd   rr      rr   mm  mm  mm pp      pp   mm  mmm  mm
```


0


0


0


1
0

```
                    ssssssssssss  cccccccccccc  aa        aa  llllllllllll  eeeeeeeeeeee
                     ssssssssss    cccccccccc   aa        aa  llllllllllll  eeeeeeeeeeee


               ***************************************************************************
               ***************************************************************************
               ***************************************************************************
               *****                                                                *****
               *****                program verification information                *****
               *****                                                                *****
               *****              code system:    scale  version:    4.2            *****
               *****                                                                *****
               ***************************************************************************
               ***************************************************************************
               *****                                                                *****
               *****                                                                *****
               *****              program:  c0c001                                  *****
               *****                                                                *****
               *****        creation date:  04/27/95                                *****
               *****                                                                *****
               *****              library:  /neutronics/scale/exe                   *****
               *****                                                                *****
               *****                                                                *****
               *****    this is not a   scale  configuration controlled code        *****
               *****                                                                *****
               *****              jobname:  davis                                   *****
               *****                                                                *****
               *****    date of execution:  02/16/96                                *****
               *****                                                                *****
               *****    time of execution:  09:58:14                                *****
               *****                                                                *****
               *****                                                                *****
               ***************************************************************************
               ***************************************************************************
               ***************************************************************************
1
               240 d, second part of sas2h pass to make library
0       -1q array has      1 entries.
0        0q array has     11 entries.
0        1q array has     15 entries.
0        2q array has     10 entries.
0        3q array has     12 entries.
0        4q array has      9 entries.
0        5q array has     12 entries.
0direct access unit  9 requires    12 blocks of length  704 for cross section mixing.
1              240 d, second part of sas2h pass to make library
0general problem description data block
0                         general problem data

 ige  1/2/3 = plane/cylinder/sphere      2       isn  quadrature order                8
 izm  number of zones                    4       isct order of scattering             3
 im   number of spacial intervals       28       ievt 0/1/2/3/4/5/6=q/k/alpha/c/z/r/h  1
 ibl  0/1/2/3 = vacuum/refl/per/white    1       iim  inner iteration maximum        20
 ibr  right boundary condition           3       iom  outer iteration maximum        25
 mxx  number of mixtures                 3       iclc -1/0/n--flat res/sn/cpt         0
 ms   mixing table length               70       ith  0/1 = forward/adjoint           0
 igm  number of energy groups           27       iflu not used(always wgtd)           0
```

```
 nng  number of neutron groups          27       iprt -2/-1/0/n=mixture xsec print        -2
 ngg  number of gamma groups             0       idl  0/1/2/3=no/prt nd/pch n/both        14
 iftg number of first thermal group     15       ipbt -1/0/1=none/fine/all bal. prt        0
0                              special options

 ifg  0/1 = none/weighting calculation   1       ipn  0/1/2 diff. coef. param              0
 iqm  volumetric sources (0/n=no/yes)    0       idfm 0/1 = none/density factors 38*       0
 ipm  boundary sources (0/n=no/yes)      0       iaz  0/n = none/n activities by zone      0
 ifn  0/1/2 = input 33*/34*/use last    14       iai  0/1=none/activities by interval      0
 itmx maximum time (minutes)            10       ifct 0/1=no/yes upscatter scaling         0
 idt1 0/1/2/3=no/xsect/srce/flux--out    0       ipvt 0/1/2=no/k/alpha parametric srch     0
 isx  broad group fluxes                 0       isen outer iteration acceleration         0
 ibln activity data unit                 0       nbnd band rebaln parameter                0
 jbkl 0/1/2 buckling geometry            0
0                              weighting data (ifg=1)

 icon -1/0/1=cell/zone/region weight    -1       ihtf total xsect psn in brd gp tables     3
 igmf number of broad groups             3       ndsf psn g-g or file number               4
 itp  0/10/20/30/40 0/c/e/ac/a           0       nusf table length or max order            6
 ipp  -2/-1/0/n=wgted xsect print       -2       mscm extra 1-d x-sect positions           0
 iap  -1/n anisn xsect print            -1
0                              floating point parameters

 eps  overall convergence        1.00000E-04     dy   cyl/pla ht for buckling     .00000E+00
 ptc  point convergence          1.00000E-04     dz   plane depth for buckling  2.00000E+02
 xnf  normalization factor       1.00000E+00     vsc  void streaming correction  .00000E+00
 ev   eigenvalue guess            .00000E+00     pv   ipvt=1/2--k/alpha         1.00000E+00
 evm  eigenvalue modifier         .00000E+00     eql  ev change eps for search  1.00000E-03
 bf   buckling factor=1.420892   1.42089E+00     xnpm new param mod for search  7.50000E-01
     this case will require      2611 locations for mixing
     this case has been allocated 200000 locations
1                       240 d, second part of sas2h pass to make library
0        13q array has     70 entries.
0        14q array has     70 entries.
0        15q array has     70 entries.
0                                 data block 2 (mixing table, etc.)
0     nuclides        cccc                                 mixing table                                    extra
       on tape    identification                 mixture    component    atom density                 xsect id's
      1     202                                     3          201      2.09710E-02
      2     203                                     3          202      4.19420E-02
      3     204                                     3          203      3.81515E-06
      4     201                                     3          204      1.54884E-05
      5     205                                     2          205      4.25156E-02
      6     999                                     1        92235      1.97093E-04
      7    1001                                     1        92234      1.73586E-06
      8    5010                                     1        92236      6.85418E-06
      9    5011                                     1        92238      7.27846E-03
     10    8016                                     1         8016      1.50611E-02
     11       6                                     1            6      1.15315E-02
     12   36083                                     1        36083      1.49788E-07
     13   36085                                     1        36085      7.24877E-08
     14   38090                                     1        38090      1.62222E-06
     15   39089                                     1        39089      9.69799E-07
     16   40093                                     1        42095      8.85393E-07
     17   40094                                     1        40093      1.21166E-06
     18   40095                                     1        40094      1.86811E-06
     19   40302                                     1        40095      6.68494E-07
     20   41094                                     1        41094      6.37186E-13
     21   42095                                     1        43099      1.78738E-06
     22   43099                                     1        45103      7.74208E-07
```

23	44101	1	45105	4.70797E-09
24	44106	1	44101	1.56517E-06
25	45103	1	44106	2.11021E-07
26	45105	1	46105	4.39806E-07
27	46105	1	46108	8.09598E-08
28	46108	1	47109	5.68571E-08
29	47109	1	51124	1.58536E-11
30	51124	1	54131	8.22527E-07
31	54131	1	54132	1.34631E-06
32	54132	1	54135	2.15375E-09
33	54135	1	54136	2.98490E-06
34	54136	1	55134	2.69282E-08
35	55133	1	55135	9.25459E-07
36	55134	1	55137	1.88777E-06
37	55135	1	56136	5.51117E-09
38	55137	1	57139	1.88760E-06
39	56136	1	59141	1.39034E-06
40	57139	1	59143	1.33567E-07
41	58144	1	58144	1.20205E-06
42	59141	1	60143	1.53714E-06
43	59143	1	60145	1.14105E-06
44	60143	1	61147	5.39173E-07
45	60145	1	61148	1.43795E-09
46	60147	1	60147	4.43675E-08
47	61147	1	62147	4.54726E-08
48	61148	1	62149	2.27445E-08
49	62147	1	62150	3.27241E-07
50	62149	1	62151	7.37387E-08
51	62150	1	62152	1.51696E-07
52	62151	1	64155	1.47720E-10
53	62152	1	63153	6.69315E-08
54	63153	1	63154	5.20359E-09
55	63154	1	63155	1.03382E-08
56	63155	1	40302	4.42681E-03
57	64155	1	1001	2.30630E-02
58	92234	1	5010	2.09787E-06
59	92235	1	5011	8.51673E-06
60	92236	1	55133	1.93560E-06
61	92238	1	95237	2.03586E-07
62	95237	1	94238	7.98213E-09
63	94238	1	94239	1.44467E-05
64	94239	1	94240	1.07622E-06
65	94240	1	94241	2.48362E-07
66	94241	1	94242	6.83419E-09
67	94242	1	95241	2.00094E-09
68	95241	1	95243	1.38633E-10
69	95243	1	96244	3.02219E-12
70	96244	1	999	3.30753E-21

- elapsed time .00 min.
0 24259 locations will be used
0 35q array has 29 entries.
0 36q array has 28 entries.
0 39q array has 4 entries.
0 40q array has 4 entries.
0 47q array has 27 entries.
0 51q array has 27 entries.
1 240 d, second part of sas2h pass to make library
neutron group parameters

0 gp	energy boundaries	lethargy boundaries	weighted velocities	broad gp numbers	calc type	group band	right albedo	left albedo

1	2.00000E+07	-6.93147E-01	4.60581E+09	1	0	1	1.00000E+00
2	6.43400E+06	4.40989E-01	2.88737E+09	1	0	2	1.00000E+00
3	3.00000E+06	1.20397E+00	2.12201E+09	1	0	3	1.00000E+00
4	1.85000E+06	1.68740E+00	1.75673E+09	1	0	4	1.00000E+00
5	1.40000E+06	1.96611E+00	1.46535E+09	1	0	5	1.00000E+00
6	9.00000E+05	2.40795E+00	1.06620E+09	2	0	6	1.00000E+00
7	4.00000E+05	3.21888E+00	6.07557E+08	2	0	7	1.00000E+00
8	1.00000E+05	4.60517E+00	2.72415E+08	2	0	8	1.00000E+00
9	1.70000E+04	6.37713E+00	1.13526E+08	2	0	9	1.00000E+00
10	3.00000E+03	8.11173E+00	4.82126E+07	2	0	10	1.00000E+00
11	5.50000E+02	9.80818E+00	2.05946E+07	2	0	11	1.00000E+00
12	1.00000E+02	1.15129E+01	1.01036E+07	2	0	12	1.00000E+00
13	3.00000E+01	1.27169E+01	5.69595E+06	2	0	13	1.00000E+00
14	1.00000E+01	1.38155E+01	3.20957E+06	2	0	14	1.00000E+00
15	3.04999E+00	1.50030E+01	2.10601E+06	2	0	15	1.00000E+00
16	1.77000E+00	1.55471E+01	1.70522E+06	2	0	16	1.00000E+00
17	1.29999E+00	1.58657E+01	1.52545E+06	2	0	17	1.00000E+00
18	1.12999E+00	1.59959E+01	1.42867E+06	2	0	18	1.00000E+00
19	1.00000E+00	1.61181E+01	1.31002E+06	2	0	19	1.00000E+00
20	8.00000E-01	1.63412E+01	9.05898E+05	2	0	20	1.00000E+00
21	4.00000E-01	1.70844E+01	8.17974E+05	3	0	21	1.00000E+00
22	3.25000E-01	1.72420E+01	6.90070E+05	3	0	22	1.00000E+00
23	2.25000E-01	1.76098E+01	4.86953E+05	3	0	23	1.00000E+00
24	9.99999E-02	1.84207E+01	3.57766E+05	3	0	24	1.00000E+00
25	5.00000E-02	1.91138E+01	2.71895E+05	3	0	25	1.00000E+00
26	3.00000E-02	1.96247E+01	1.87283E+05	3	0	26	1.00000E+00
27	1.00000E-02	2.07233E+01	8.88201E+04	3	0	27	1.00000E+00
28	1.00000E-05	2.76310E+01					

1 240 d, second part of sas2h pass to make library

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	mixture by zone	order p(l) by zone	activity table matl no.	activity table reaction	quadrature constants weights	quadrature constants directions	quadrature constants refl direc	quadrature constants wt x cos
1	3	3			0	-2.79004E-01	3	0
2	2	3			5.06143E-02	-1.97286E-01	3	-9.98548E-03
3	3	3			5.06143E-02	1.97286E-01	2	9.98548E-03
4	1	3			0	-6.04419E-01	8	0
5					5.55953E-02	-5.58410E-01	8	-3.10450E-02
6					5.55953E-02	-2.31301E-01	7	-1.28593E-02
7					5.55953E-02	2.31301E-01	6	1.28593E-02
8					5.55953E-02	5.58410E-01	5	3.10450E-02
9					0	-8.50774E-01	15	0
10					5.22844E-02	-8.21784E-01	15	-4.29665E-02
11					5.22844E-02	-6.01588E-01	14	-3.14537E-02
12					5.22844E-02	-2.20196E-01	13	-1.15128E-02
13					5.22844E-02	2.20196E-01	12	1.15128E-02
14					5.22844E-02	6.01588E-01	11	3.14537E-02
15					5.22844E-02	8.21784E-01	10	4.29665E-02
16					0	-9.83032E-01	24	0
17					4.53355E-02	-9.64143E-01	24	-4.37099E-02
18					4.53355E-02	-8.17361E-01	23	-3.70555E-02
19					4.53355E-02	-5.46143E-01	22	-2.47597E-02
20					4.53355E-02	-1.91780E-01	21	-8.69444E-03
21					4.53355E-02	1.91780E-01	20	8.69444E-03
22					4.53355E-02	5.46143E-01	19	2.47597E-02
23					4.53355E-02	8.17361E-01	18	3.70555E-02
24					4.53355E-02	9.64143E-01	17	4.37099E-02

0constants for p(3) scattering

0angl	set 1	set 2	set 3	set 4	set 5
1	-2.79004E-01	8.83235E-01	6.74143E-02	-6.16919E-01	-1.71701E-02
2	-1.97286E-01	8.83235E-01	.00000E+00	-4.36228E-01	1.21411E-02
3	1.97286E-01	8.83235E-01	.00000E+00	4.36228E-01	-1.21411E-02

4	-6.04419E-01	4.52016E-01	3.16379E-01	-8.04435E-01	-1.74564E-01
5	-5.58410E-01	4.52016E-01	2.23714E-01	-7.43201E-01	-6.68028E-02
6	-2.31301E-01	4.52016E-01	-2.23713E-01	-3.07844E-01	1.61276E-01
7	2.31301E-01	4.52016E-01	-2.23713E-01	3.07844E-01	-1.61276E-01
8	5.58410E-01	4.52016E-01	2.23713E-01	7.43201E-01	6.68028E-02
9	-8.50774E-01	-8.57235E-02	6.26843E-01	-1.98456E-01	-4.86835E-01
10	-8.21784E-01	-8.57235E-02	5.42862E-01	-1.91694E-01	-3.44245E-01
11	-6.01588E-01	-8.57235E-02	.00000E+00	-1.40330E-01	3.44244E-01
12	-2.20196E-01	-8.57235E-02	-5.42862E-01	-5.13643E-02	3.44245E-01
13	2.20196E-01	-8.57235E-02	-5.42862E-01	5.13643E-02	-3.44245E-01
14	6.01588E-01	-8.57235E-02	.00000E+00	1.40330E-01	-3.44245E-01
15	8.21784E-01	-8.57235E-02	5.42862E-01	1.91694E-01	3.44245E-01
16	-9.89032E-01	-4.49528E-01	8.36886E-01	5.00703E-01	-7.51005E-01
17	-9.64143E-01	-4.49528E-01	7.73181E-01	4.91083E-01	-6.24438E-01
18	-8.17361E-01	-4.49528E-01	3.20262E-01	4.16320E-01	1.46514E-01
19	-5.46143E-01	-4.49528E-01	-3.20262E-01	2.78176E-01	7.36575E-01
20	-1.91780E-01	-4.49528E-01	-7.73181E-01	9.76824E-02	4.17236E-01
21	1.91780E-01	-4.49528E-01	-7.73181E-01	-9.76824E-02	-4.17236E-01
22	5.46143E-01	-4.49528E-01	-3.20262E-01	-2.78176E-01	-7.36575E-01
23	8.17361E-01	-4.49528E-01	3.20262E-01	-4.16320E-01	-1.46514E-01
24	9.64143E-01	-4.49528E-01	7.73181E-01	-4.91083E-01	6.24438E-01

1 int	radii	mid pts	zone no.	areas	volumes	dens fact	radius mod	spec(int)
1	0	1.97644E-02	1	0	4.90881E-03		0	
2	3.95287E-02	5.92931E-02	1	2.48366E-01	1.47264E-02		0	
3	7.90575E-02	1.18586E-01	1	4.96733E-01	5.89057E-02		0	
4	1.58115E-01	1.97644E-01	1	9.93466E-01	9.81762E-02		0	
5	2.37172E-01	2.76701E-01	1	1.49020E+00	1.37447E-01			
6	3.16230E-01	3.55759E-01	1	1.98693E+00	1.76717E-01			
7	3.95288E-01	4.34816E-01	1	2.48366E+00	2.15988E-01			
8	4.74345E-01	5.13874E-01	1	2.98040E+00	2.55258E-01			
9	5.53403E-01	5.73167E-01	1	3.47713E+00	1.42355E-01			
10	5.92931E-01	6.12696E-01	1	3.72550E+00	1.52173E-01			
11	6.32460E-01	6.42620E-01	2	3.97386E+00	8.20460E-02			
12	6.52780E-01	6.62940E-01	2	4.10154E+00	8.46405E-02			
13	6.73100E-01	6.96583E-01	3	4.22921E+00	2.05562E-01			
14	7.20067E-01	7.43550E-01	3	4.52431E+00	2.19422E-01			
15	7.67033E-01	7.90517E-01	3	4.81941E+00	2.33282E-01			
16	8.14000E-01	8.62795E-01	4	5.11451E+00	5.29051E-01			
17	9.11591E-01	9.60886E-01	4	5.72769E+00	5.88891E-01			
18	1.00918E+00	1.10677E+00	4	6.34088E+00	1.35731E+00			
19	1.20436E+00	1.30195E+00	4	7.56724E+00	1.59667E+00			
20	1.39955E+00	1.49714E+00	4	8.79360E+00	1.83603E+00			
21	1.59473E+00	1.69232E+00	4	1.00200E+01	2.07540E+00			
22	1.78991E+00	1.88750E+00	4	1.12463E+01	2.31476E+00			
23	1.98509E+00	2.08268E+00	4	1.24727E+01	2.55412E+00			
24	2.18027E+00	2.27786E+00	4	1.36991E+01	2.79349E+00			
25	2.37545E+00	2.47305E+00	4	1.49254E+01	3.03285E+00			
26	2.57064E+00	2.66823E+00	4	1.61518E+01	3.27221E+00			
27	2.76582E+00	2.81461E+00	4	1.73781E+01	1.72587E+00			
28	2.86341E+00	2.91220E+00	4	1.79913E+01	1.78571E+00			
29	2.96100E+00			1.86045E+01				

- elapsed time .00 min.

1 outer iter	inner iters	1 - balance	eigenvalue	1 - source ratio	1 - scatter ratio	1 - upscat ratio	search parameter	time (min)
1	215	-1.84556E-06	1.12831E+00	-1.42524E-01	1.00000E+00	-4.10664E-02	.00000E+00	.0000
2	319	2.60041E-06	1.14215E+00	-1.25675E-03	-1.84449E-02	-4.28646E-03	.00000E+00	.0167
3	401	2.31725E-07	1.14359E+00	-1.27918E-04	-1.79126E-03	-8.35467E-04	.00000E+00	.0167
4	462	2.14825E-06	1.14384E+00	-2.02940E-05	-3.55786E-04	-1.62330E-04	.00000E+00	.0167
5	504	-4.31136E-07	1.14393E+00	-3.61934E-06	-7.01865E-05	-3.16620E-05	.00000E+00	.0167

grp to grp inner mfd max. flux msf max. scale coarse

		iters	int.	difference	int.	factor	mesh
1	1	1	17	2.49552E-06	28	1.00000E+00	1
2	2	1	17	3.03674E-06	28	1.00000E+00	1
3	3	1	17	2.81856E-06	28	1.00000E+00	1
4	4	1	17	2.75748E-06	28	1.00000E+00	1
5	5	1	17	2.89726E-06	28	1.00000E+00	1
6	6	1	17	1.98400E-06	28	1.00000E+00	1
7	7	1	24	1.11949E-06	28	1.00000E+00	2
8	8	1	3	2.11836E-07	20	1.00000E+00	2
9	9	1	27	6.98521E-06	28	9.99993E-01	3
10	10	1	26	1.04663E-06	28	1.00000E+00	3
11	11	1	26	2.28395E-06	28	1.00000E+00	3
12	12	1	26	1.14753E-06	28	9.99999E-01	3
13	13	1	26	1.47956E-06	28	1.00000E+00	3
14	14	1	25	4.36464E-07	28	1.00000E+00	3
15	15	1	2	3.39450E-05	28	9.99962E-01	2
16	16	1	2	4.18474E-05	28	9.99965E-01	2
17	17	1	27	9.47314E-05	28	1.00002E+00	3
18	18	1	2	5.36516E-05	28	9.99921E-01	3
19	19	1	26	7.43672E-05	26	9.99978E-01	3
20	20	1	2	4.05059E-05	28	9.99919E-01	3
21	21	1	3	6.15783E-05	28	9.99942E-01	3
22	22	1	24	2.89865E-05	28	9.99966E-01	3
23	23	1	27	3.44234E-05	28	1.00002E+00	4
24	24	1	1	3.42575E-05	9	1.00002E+00	4
25	25	1	1	3.91320E-05	8	1.00002E+00	5
26	26	1	1	3.23397E-05	6	1.00002E+00	6
27	27	1	1	3.00958E-05	5	1.00002E+00	8

6 531 -1.69257E-06 1.14395E+00 -5.47494E-07 -1.38940E-05 -6.78856E-06 .00000E+00 .0167

final monitor

lambda 1.14395E+00 production/absorption 1.15895E+00 angular flux on 16

- elapsed time .02 min.

1 240 d, second part of sas2h pass to make library

0 int.	zone	number	radius	int. midpoint	area	volume	prod density
1	1		.00000E+00	1.97644E-02	.00000E+00	4.90881E-03	.00000E+00
2	1		3.95287E-02	5.92951E-02	2.48366E-01	1.47264E-02	.00000E+00
3	1		7.90575E-02	1.18586E-01	4.96733E-01	5.89057E-02	.00000E+00
4	1		1.58115E-01	1.97644E-01	9.93466E-01	9.81762E-02	.00000E+00
5	1		2.37172E-01	2.76701E-01	1.49020E+00	1.37447E-01	.00000E+00
6	1		3.16230E-01	3.55759E-01	1.98693E+00	1.76717E-01	.00000E+00
7	1		3.95288E-01	4.34816E-01	2.48366E+00	2.15988E-01	.00000E+00
8	1		4.74345E-01	5.13874E-01	2.98040E+00	2.55258E-01	.00000E+00
9	1		5.53408E-01	5.73167E-01	3.47713E+00	1.42355E-01	.00000E+00
10	1		5.92931E-01	6.12696E-01	3.72550E+00	1.52173E-01	.00000E+00
11	2		6.32460E-01	6.42620E-01	3.97386E+00	8.20460E-02	.00000E+00
12	2		6.52780E-01	6.62940E-01	4.10154E+00	8.46405E-02	.00000E+00
13	3		6.73100E-01	6.96583E-01	4.22921E+00	2.05562E-01	.00000E+00
14	3		7.20067E-01	7.43550E-01	4.52431E+00	2.19422E-01	.00000E+00
15	3		7.67033E-01	7.90517E-01	4.81941E+00	2.33282E-01	.00000E+00
16	4		8.14000E-01	8.62795E-01	5.11451E+00	5.29051E-01	2.59973E-02
17	4		9.11591E-01	9.60388E-01	5.72769E+00	5.88891E-01	2.83198E-02
18	4		1.00918E+00	1.10677E+00	6.34088E+00	1.35731E+00	6.39825E-02
19	4		1.20436E+00	1.30195E+00	7.56724E+00	1.59667E+00	7.37806E-02
20	4		1.39955E+00	1.49714E+00	8.79360E+00	1.83603E+00	8.36686E-02
21	4		1.59473E+00	1.69232E+00	1.00200E+01	2.07540E+00	9.36102E-02
22	4		1.78991E+00	1.88750E+00	1.12463E+01	2.31476E+00	1.03609E-01
23	4		1.98509E+00	2.08268E+00	1.24727E+01	2.55412E+00	1.13674E-01
24	4		2.18027E+00	2.27786E+00	1.36991E+01	2.79349E+00	1.23819E-01
25	4		2.37545E+00	2.47305E+00	1.49254E+01	3.05285E+00	1.34061E-01
26	4		2.57064E+00	2.66823E+00	1.61518E+01	3.27221E+00	1.44431E-01

27	4	2.76582E+00	2.81461E+00	1.73781E+01	1.72587E+00	7.61524E-02
28	4	2.86341E+00	2.91220E+00	1.79913E+01	1.78571E+00	7.88275E-02
29		2.96100E+00		1.86045E+01		

1 240 d, second part of sas2h pass to make library

0 total flux

0 int.	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	1.22880E-02	8.89680E-02	1.11539E-01	6.86707E-02	1.02474E-01	1.92610E-01	1.92975E-01	1.46890E-01
2	1.22830E-02	8.89176E-02	1.11474E-01	6.86325E-02	1.02421E-01	1.92523E-01	1.92885E-01	1.46884E-01
3	1.22836E-02	8.89308E-02	1.11496E-01	6.86504E-02	1.02456E-01	1.92593E-01	1.92985E-01	1.46895E-01
4	1.22900E-02	8.90028E-02	1.11608E-01	6.87286E-02	1.02586E-01	1.92836E-01	1.93145E-01	1.46924E-01
5	1.23016E-02	8.91483E-02	1.11802E-01	6.88615E-02	1.02802E-01	1.93236E-01	1.93394E-01	1.46968E-01
6	1.23175E-02	8.93397E-02	1.12070E-01	6.90446E-02	1.03100E-01	1.93785E-01	1.93734E-01	1.47024E-01
7	1.23375E-02	8.95846E-02	1.12414E-01	6.92824E-02	1.03489E-01	1.94505E-01	1.94177E-01	1.47094E-01
8	1.23617E-02	8.98904E-02	1.12851E-01	6.95895E-02	1.03995E-01	1.95443E-01	1.94756E-01	1.47177E-01
9	1.23821E-02	9.01594E-02	1.13244E-01	6.98711E-02	1.04463E-01	1.96313E-01	1.95293E-01	1.47246E-01
10	1.23959E-02	9.03708E-02	1.13571E-01	7.01190E-02	1.04885E-01	1.97101E-01	1.95781E-01	1.47294E-01
11	1.24076E-02	9.05451E-02	1.13864E-01	7.03270E-02	1.05238E-01	1.97778E-01	1.96200E-01	1.47339E-01
12	1.24202E-02	9.06752E-02	1.14017E-01	7.04353E-02	1.05408E-01	1.98116E-01	1.96404E-01	1.47382E-01
13	1.24467E-02	9.09120E-02	1.14286E-01	7.05729E-02	1.05599E-01	1.98457E-01	1.96597E-01	1.47451E-01
14	1.24857E-02	9.12894E-02	1.14737E-01	7.08281E-02	1.05975E-01	1.99119E-01	1.96978E-01	1.47542E-01
15	1.25316E-02	9.17748E-02	1.15358E-01	7.12144E-02	1.06573E-01	2.00195E-01	1.97609E-01	1.47643E-01
16	1.26029E-02	9.25525E-02	1.16369E-01	7.18590E-02	1.07590E-01	2.02042E-01	1.98706E-01	1.47812E-01
17	1.26733E-02	9.33277E-02	1.17380E-01	7.25074E-02	1.08623E-01	2.03942E-01	1.99853E-01	1.48008E-01
18	1.27295E-02	9.39581E-02	1.18212E-01	7.30446E-02	1.09493E-01	2.05585E-01	2.00878E-01	1.48213E-01
19	1.27788E-02	9.45195E-02	1.18961E-01	7.35315E-02	1.10290E-01	2.07122E-01	2.01849E-01	1.48425E-01
20	1.28078E-02	9.48584E-02	1.19421E-01	7.38328E-02	1.10789E-01	2.08112E-01	2.02492E-01	1.48580E-01
21	1.28261E-02	9.50772E-02	1.19722E-01	7.40317E-02	1.11122E-01	2.08790E-01	2.02941E-01	1.48697E-01
22	1.28379E-02	9.52208E-02	1.19923E-01	7.41649E-02	1.11347E-01	2.09259E-01	2.03258E-01	1.48784E-01
23	1.28454E-02	9.53137E-02	1.20055E-01	7.42528E-02	1.11497E-01	2.09579E-01	2.03477E-01	1.48847E-01
24	1.28498E-02	9.53694E-02	1.20135E-01	7.43067E-02	1.11590E-01	2.09784E-01	2.03620E-01	1.48888E-01
25	1.28517E-02	9.53953E-02	1.20174E-01	7.43327E-02	1.11636E-01	2.09889E-01	2.03695E-01	1.48910E-01
26	1.28514E-02	9.53927E-02	1.20172E-01	7.43318E-02	1.11636E-01	2.09897E-01	2.03702E-01	1.48910E-01
27	1.28497E-02	9.53729E-02	1.20146E-01	7.43143E-02	1.11608E-01	2.09841E-01	2.03664E-01	1.48897E-01
28	1.28473E-02	9.53434E-02	1.20106E-01	7.42875E-02	1.11563E-01	2.09750E-01	2.03600E-01	1.48877E-01

0 int.	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	1.15817E-01	1.06965E-01	1.00658E-01	6.52725E-02	5.58591E-02	5.35811E-02	2.92296E-02	1.62611E-02
2	1.15817E-01	1.06966E-01	1.00662E-01	6.52774E-02	5.58639E-02	5.35878E-02	2.92318E-02	1.62620E-02
3	1.15815E-01	1.06957E-01	1.00641E-01	6.52536E-02	5.58419E-02	5.35563E-02	2.92256E-02	1.62589E-02
4	1.15810E-01	1.06935E-01	1.00591E-01	6.51962E-02	5.57891E-02	5.34805E-02	2.92104E-02	1.62514E-02
5	1.15803E-01	1.06901E-01	1.00515E-01	6.51087E-02	5.57089E-02	5.33654E-02	2.91877E-02	1.62401E-02
6	1.15793E-01	1.06855E-01	1.00411E-01	6.49898E-02	5.56005E-02	5.32092E-02	2.91578E-02	1.62252E-02
7	1.15780E-01	1.06794E-01	1.00274E-01	6.48339E-02	5.54590E-02	5.30050E-02	2.91201E-02	1.62061E-02
8	1.15765E-01	1.06713E-01	1.00093E-01	6.46285E-02	5.52739E-02	5.27367E-02	2.90726E-02	1.61819E-02
9	1.15755E-01	1.06636E-01	9.99221E-02	6.44369E-02	5.51021E-02	5.24868E-02	2.90299E-02	1.61599E-02
10	1.15754E-01	1.06565E-01	9.97645E-02	6.42625E-02	5.49467E-02	5.22598E-02	2.89926E-02	1.61403E-02
11	1.15759E-01	1.06508E-01	9.96398E-02	6.41257E-02	5.48232E-02	5.20806E-02	2.89599E-02	1.61236E-02
12	1.15754E-01	1.06488E-01	9.95981E-02	6.40721E-02	5.47724E-02	5.20086E-02	2.89418E-02	1.61153E-02
13	1.15709E-01	1.06460E-01	9.95294E-02	6.39901E-02	5.46998E-02	5.19019E-02	2.89268E-02	1.61074E-02
14	1.15637E-01	1.06395E-01	9.95842E-02	6.38126E-02	5.45467E-02	5.16737E-02	2.89022E-02	1.60927E-02
15	1.15560E-01	1.06287E-01	9.91465E-02	6.35332E-02	5.43074E-02	5.13153E-02	2.88649E-02	1.60699E-02
16	1.15452E-01	1.06109E-01	9.87528E-02	6.30733E-02	5.39124E-02	5.07225E-02	2.87965E-02	1.60302E-02
17	1.15365E-01	1.05953E-01	9.83594E-02	6.26135E-02	5.35123E-02	5.01268E-02	2.87147E-02	1.59859E-02
18	1.15286E-01	1.05784E-01	9.80228E-02	6.22208E-02	5.31615E-02	4.96156E-02	2.86263E-02	1.59410E-02
19	1.15231E-01	1.05647E-01	9.77089E-02	6.18547E-02	5.28290E-02	4.91376E-02	2.85325E-02	1.58946E-02
20	1.15205E-01	1.05560E-01	9.75058E-02	6.16188E-02	5.26094E-02	4.88273E-02	2.84618E-02	1.58603E-02
21	1.15192E-01	1.05501E-01	9.73644E-02	6.14540E-02	5.24543E-02	4.86106E-02	2.84079E-02	1.58344E-02
22	1.15185E-01	1.05459E-01	9.72641E-02	6.13369E-02	5.23425E-02	4.84557E-02	2.83668E-02	1.58148E-02
23	1.15182E-01	1.05429E-01	9.71927E-02	6.12537E-02	5.22625E-02	4.83455E-02	2.83365E-02	1.58003E-02
24	1.15179E-01	1.05409E-01	9.71440E-02	6.11971E-02	5.22079E-02	4.82704E-02	2.83157E-02	1.57905E-02
25	1.15177E-01	1.05397E-01	9.71150E-02	6.11633E-02	5.21757E-02	4.82260E-02	2.83041E-02	1.57850E-02

26	1.15174E-01	1.05393E-01	9.71056E-02	6.11526E-02	5.21665E-02	4.82127E-02	2.83024E-02	1.57842E-02
27	1.15172E-01	1.05395E-01	9.71114E-02	6.11593E-02	5.21744E-02	4.82228E-02	2.83075E-02	1.57867E-02
28	1.15170E-01	1.05401E-01	9.71271E-02	6.11779E-02	5.21936E-02	4.82485E-02	2.83170E-02	1.57912E-02

0 int.	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	7.25461E-03	6.03026E-03	1.13700E-02	3.74452E-02	1.21054E-02	2.57135E-02	8.61427E-02	7.02890E-02
2	7.25513E-03	6.03101E-03	1.13708E-02	3.74474E-02	1.21062E-02	2.57150E-02	8.61374E-02	7.02732E-02
3	7.25300E-03	6.02723E-03	1.13671E-02	3.74353E-02	1.20974E-02	2.56858E-02	8.60179E-02	7.01356E-02
4	7.24787E-03	6.01811E-03	1.13582E-02	3.74068E-02	1.20769E-02	2.56196E-02	8.57552E-02	6.98395E-02
5	7.24011E-03	6.00418E-03	1.13447E-02	3.73640E-02	1.20461E-02	2.55201E-02	8.53655E-02	6.94011E-02
6	7.22966E-03	5.98516E-03	1.13266E-02	3.73065E-02	1.20043E-02	2.53861E-02	8.48465E-02	6.88167E-02
7	7.21609E-03	5.96009E-03	1.13031E-02	3.72322E-02	1.19498E-02	2.52121E-02	8.41850E-02	6.80727E-02
8	7.19838E-03	5.92883E-03	1.12726E-02	3.71359E-02	1.18782E-02	2.49858E-02	8.33494E-02	6.71368E-02
9	7.18197E-03	5.89561E-03	1.12445E-02	3.70471E-02	1.18115E-02	2.47770E-02	8.25982E-02	6.62999E-02
10	7.16708E-03	5.86697E-03	1.12191E-02	3.69673E-02	1.17504E-02	2.45889E-02	8.19453E-02	6.55780E-02
11	7.15508E-03	5.84473E-03	1.11986E-02	3.69037E-02	1.17035E-02	2.44473E-02	8.14707E-02	6.50756E-02
12	7.14999E-03	5.83644E-03	1.11899E-02	3.68776E-02	1.16873E-02	2.43997E-02	8.13251E-02	6.49485E-02
13	7.14337E-03	5.82269E-03	1.11788E-02	3.68422E-02	1.16611E-02	2.43141E-02	8.10429E-02	6.46302E-02
14	7.12953E-03	5.79213E-03	1.11557E-02	3.67680E-02	1.16012E-02	2.41210E-02	8.04153E-02	6.39014E-02
15	7.10762E-03	5.74365E-03	1.11195E-02	3.66525E-02	1.15056E-02	2.38221E-02	7.94979E-02	6.28549E-02
16	7.07138E-03	5.66402E-03	1.10594E-02	3.64633E-02	1.13509E-02	2.33405E-02	7.80935E-02	6.12981E-02
17	7.03438E-03	5.58604E-03	1.09973E-02	3.62690E-02	1.11983E-02	2.28638E-02	7.66686E-02	5.97503E-02
18	7.00119E-03	5.52229E-03	1.09402E-02	3.60906E-02	1.10680E-02	2.24547E-02	7.53061E-02	5.82828E-02
19	6.98609E-03	5.46433E-03	1.08844E-02	3.59154E-02	1.09460E-02	2.20694E-02	7.39348E-02	5.68130E-02
20	6.94729E-03	5.42810E-03	1.08460E-02	3.57945E-02	1.08661E-02	2.18156E-02	7.29563E-02	5.57717E-02
21	6.93153E-03	5.40338E-03	1.08181E-02	3.57061E-02	1.08096E-02	2.16350E-02	7.22225E-02	5.49962E-02
22	6.91997E-03	5.38602E-03	1.07976E-02	3.56407E-02	1.07688E-02	2.15035E-02	7.16659E-02	5.44126E-02
23	6.91162E-03	5.37381E-03	1.07828E-02	3.55929E-02	1.07395E-02	2.14077E-02	7.12485E-02	5.39765E-02
24	6.90593E-03	5.36556E-03	1.07726E-02	3.55600E-02	1.07189E-02	2.13402E-02	7.09469E-02	5.36609E-02
25	6.90266E-03	5.36068E-03	1.07667E-02	3.55405E-02	1.07060E-02	2.12974E-02	7.07479E-02	5.34489E-02
26	6.90190E-03	5.35889E-03	1.07651E-02	3.55341E-02	1.07012E-02	2.12788E-02	7.06508E-02	5.33360E-02
27	6.90296E-03	5.35990E-03	1.07669E-02	3.55391E-02	1.07026E-02	2.12802E-02	7.06413E-02	5.33107E-02
28	6.90538E-03	5.36261E-03	1.07707E-02	3.55509E-02	1.07082E-02	2.12954E-02	7.06936E-02	5.33466E-02

0 int.	grp. 25	grp. 26	grp. 27
1	3.17211E-02	2.28527E-02	4.33841E-03
2	3.17091E-02	2.28395E-02	4.33517E-03
3	3.16342E-02	2.27732E-02	4.32162E-03
4	3.14747E-02	2.26333E-02	4.29288E-03
5	3.12384E-02	2.24247E-02	4.24956E-03
6	3.09229E-02	2.21437E-02	4.18968E-03
7	3.05213E-02	2.17829E-02	4.11143E-03
8	3.00181E-02	2.13273E-02	4.01022E-03
9	2.95708E-02	2.09204E-02	3.91846E-03
10	2.91905E-02	2.05718E-02	3.83928E-03
11	2.89360E-02	2.03471E-02	3.79132E-03
12	2.88818E-02	2.03134E-02	3.78818E-03
13	2.87007E-02	2.01454E-02	3.74307E-03
14	2.82861E-02	1.97449E-02	3.63380E-03
15	2.77053E-02	1.91757E-02	3.47025E-03
16	2.68613E-02	1.83587E-02	3.23001E-03
17	2.60360E-02	1.75901E-02	3.02405E-03
18	2.52608E-02	1.69073E-02	2.87147E-03
19	2.44902E-02	1.62510E-02	2.73535E-03
20	2.39514E-02	1.58131E-02	2.65395E-03
21	2.35550E-02	1.55031E-02	2.59984E-03
22	2.32604E-02	1.52802E-02	2.56276E-03
23	2.30423E-02	1.51194E-02	2.53666E-03
24	2.28864E-02	1.50059E-02	2.51862E-03
25	2.27797E-02	1.49299E-02	2.50670E-03
26	2.27206E-02	1.48862E-02	2.49985E-03
27	2.27052E-02	1.48707E-02	2.49727E-03

28 2.27147E-02 1.48739E-02 2.49715E-03
- elapsed time .02 min.
1fine group summary for zone 1 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	.00000E+00	.00000E+00	4.78609E-04	6.33478E-04	5.27473E-05	-6.86193E-04	9.99953E-01
2	.00000E+00	.00000E+00	3.63477E-04	6.03966E-03	7.95803E-03	1.72591E-04	-7.74685E-03	9.99964E-01
3	.00000E+00	.00000E+00	3.76711E-03	5.41786E-03	1.40962E-02	9.19848E-05	-1.04207E-02	9.99978E-01
4	.00000E+00	.00000E+00	5.52772E-03	3.58341E-03	1.23122E-02	4.18181E-05	-6.82619E-03	9.99989E-01
5	.00000E+00	.00000E+00	1.01847E-02	1.15008E-02	2.08350E-02	4.95595E-05	-1.06997E-02	9.99992E-01
6	.00000E+00	.00000E+00	2.14030E-02	3.44731E-02	4.09715E-02	8.42317E-05	-1.96527E-02	1.00000E+00
7	.00000E+00	.00000E+00	4.21606E-02	6.09446E-02	5.41143E-02	6.11957E-05	-1.20143E-02	9.99988E-01
8	.00000E+00	.00000E+00	5.63212E-02	7.83023E-02	5.87126E-02	3.63824E-05	-2.42262E-03	9.99912E-01
9	.00000E+00	.00000E+00	5.77525E-02	7.25507E-02	5.74534E-02	2.92511E-05	2.76213E-04	9.99889E-01
10	.00000E+00	.00000E+00	5.70358E-02	6.90680E-02	5.55064E-02	3.60089E-05	1.49945E-03	9.99895E-01
11	.00000E+00	.00000E+00	5.57952E-02	6.54509E-02	5.22535E-02	5.50866E-05	3.49016E-03	9.99938E-01
12	.00000E+00	.00000E+00	4.53160E-02	3.50229E-02	4.12088E-02	6.03238E-05	4.04784E-03	9.99979E-01
13	.00000E+00	.00000E+00	4.04793E-02	2.85696E-02	3.66386E-02	8.46325E-05	3.75730E-03	9.99968E-01
14	.00000E+00	.00000E+00	3.94366E-02	2.83864E-02	3.39096E-02	1.36998E-04	5.39045E-03	9.99988E-01
15	.00000E+00	.00000E+00	2.17603E-02	1.09527E-02	2.04813E-02	1.13435E-04	1.16563E-03	9.99999E-01
16	.00000E+00	.00000E+00	1.43052E-02	4.63237E-03	1.36474E-02	7.72528E-05	5.78567E-04	9.99999E-01
17	.00000E+00	.00000E+00	7.37300E-03	1.33708E-03	6.95650E-03	3.82740E-05	3.78279E-04	9.99994E-01
18	.00000E+00	.00000E+00	6.55987E-03	1.07568E-03	5.87771E-03	3.36583E-05	6.48474E-04	1.00000E+00
19	.00000E+00	.00000E+00	1.10239E-02	3.10681E-03	1.03112E-02	6.95832E-05	6.43075E-04	9.99999E-01
20	.00000E+00	.00000E+00	2.72076E-02	2.20461E-02	2.49261E-02	2.87528E-04	1.99575E-03	1.00001E+00
21	.00000E+00	.00000E+00	1.33346E-02	4.57299E-03	1.18965E-02	1.14689E-04	1.32340E-03	1.00000E+00
22	.00000E+00	.00000E+00	2.68219E-02	1.45137E-02	2.25864E-02	2.78769E-04	3.95628E-03	1.00002E+00
23	.00000E+00	.00000E+00	7.10181E-02	8.73366E-02	5.73516E-02	1.26782E-03	1.23956E-02	1.00004E+00
24	.00000E+00	.00000E+00	7.65800E-02	8.19825E-02	6.32830E-02	1.49151E-03	1.18026E-02	1.00004E+00
25	.00000E+00	.00000E+00	5.10189E-02	3.46880E-02	4.46262E-02	8.81621E-04	5.51002E-03	1.00002E+00
26	.00000E+00	.00000E+00	4.07276E-02	3.87085E-02	3.57524E-02	8.95196E-04	4.07927E-03	1.00002E+00
27	.00000E+00	.00000E+00	1.37997E-02	8.39691E-03	1.27918E-02	3.19619E-04	6.88214E-04	1.00000E+00
28	.00000E+00	.00000E+00	8.17072E-01	8.13118E-01	8.17072E-01	6.86171E-03	-6.84474E-03	9.99979E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*db**2	total flux
1	1.24026E-02	-6.86193E-04	1.22921E-02	.00000E+00	3.50331E-11	.00000E+00	1.89658E-05	1.55081E-02
2	9.04818E-02	-7.74685E-03	8.90107E-02	.00000E+00	.00000E+00	.00000E+00	8.75418E-05	1.12645E-01
3	1.13749E-01	-1.04207E-02	1.11595E-01	.00000E+00	.00000E+00	.00000E+00	9.15590E-05	1.41375E-01
4	7.02589E-02	-6.82619E-03	6.87048E-02	.00000E+00	.00000E+00	.00000E+00	4.15656E-05	8.71495E-02
5	1.05125E-01	-1.06997E-02	1.02523E-01	.00000E+00	.00000E+00	.00000E+00	4.92671E-05	1.30197E-01
6	1.97551E-01	-1.96527E-02	1.92694E-01	.00000E+00	.00000E+00	.00000E+00	8.33628E-05	2.44701E-01
7	1.96062E-01	-1.20143E-02	1.93018E-01	.00000E+00	.00000E+00	.00000E+00	5.92527E-05	2.44185E-01
8	1.47318E-01	-2.42262E-03	1.46897E-01	.00000E+00	.00000E+00	.00000E+00	3.27046E-05	1.84858E-01
9	1.15757E-01	2.76213E-04	1.15816E-01	.00000E+00	.00000E+00	.00000E+00	2.16555E-05	1.45495E-01
10	1.06523E-01	1.49945E-03	1.06661E-01	.00000E+00	.00000E+00	.00000E+00	1.91325E-05	1.34178E-01
11	9.96734E-02	3.49016E-03	1.00650E-01	.00000E+00	.00000E+00	.00000E+00	1.78688E-05	1.25953E-01
12	6.41626E-02	4.04784E-03	6.52636E-02	.00000E+00	.00000E+00	.00000E+00	1.04903E-05	8.14122E-02
13	5.48577E-02	3.75730E-03	5.58506E-02	.00000E+00	.00000E+00	.00000E+00	8.74495E-06	6.96391E-02
14	5.21298E-02	5.39045E-03	5.35691E-02	.00000E+00	.00000E+00	.00000E+00	8.52431E-06	6.65295E-02
15	2.89721E-02	1.16563E-03	2.92270E-02	.00000E+00	.00000E+00	.00000E+00	4.50400E-06	3.65828E-02
16	1.61293E-02	5.78567E-04	1.62599E-02	.00000E+00	.00000E+00	.00000E+00	2.26695E-06	2.03594E-02
17	7.15854E-03	3.78279E-04	7.25373E-03	.00000E+00	.00000E+00	.00000E+00	9.27623E-07	9.06306E-03
18	5.85054E-03	6.48474E-04	6.02892E-03	.00000E+00	.00000E+00	.00000E+00	7.46824E-07	7.47947E-03
19	1.12046E-02	6.43075E-04	1.13686E-02	.00000E+00	.00000E+00	.00000E+00	1.48534E-06	1.41956E-02
20	3.69229E-02	1.99375E-03	3.74423E-02	.00000E+00	.00000E+00	.00000E+00	5.48083E-06	4.67613E-02
21	1.17155E-02	1.32340E-03	1.21031E-02	.00000E+00	.00000E+00	.00000E+00	1.37497E-06	1.49956E-02
22	2.44815E-02	3.95628E-03	2.57066E-02	.00000E+00	.00000E+00	.00000E+00	2.89052E-06	3.16192E-02
23	8.15744E-02	1.23956E-02	8.61215E-02	.00000E+00	.00000E+00	.00000E+00	8.70913E-06	1.05591E-01
24	6.51699E-02	1.18026E-02	7.02734E-02	.00000E+00	.00000E+00	.00000E+00	5.23011E-06	8.53253E-02
25	2.89769E-02	5.51002E-03	3.17159E-02	.00000E+00	.00000E+00	.00000E+00	1.81083E-06	3.82406E-02
26	2.05753E-02	4.07927E-03	2.28509E-02	.00000E+00	.00000E+00	.00000E+00	9.53476E-07	2.72648E-02
27	3.79469E-03	6.88214E-04	4.33862E-03	.00000E+00	.00000E+00	.00000E+00	1.12286E-07	5.13932E-03

28	1.76838E+00	-6.84477E-03	1.77553E+00	.00000E+00	3.50331E-11	.00000E+00	5.87149E-04	2.22644E+00

1fine group summary for zone 2 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	.00000E+00	.00000E+00	2.11632E-04	1.58645E-04	2.37992E-06	-1.55367E-04	1.00001E+00
2	.00000E+00	.00000E+00	2.77070E-05	1.43126E-03	1.02700E-03	1.37854E-05	-1.01310E-03	1.00000E+00
3	.00000E+00	.00000E+00	1.46512E-04	2.74728E-03	8.68660E-04	2.01035E-05	-7.42206E-04	9.99996E-01
4	.00000E+00	.00000E+00	2.82531E-04	2.29473E-03	2.97118E-04	1.30402E-05	-2.76058E-05	9.99997E-01
5	.00000E+00	.00000E+00	6.08308E-04	4.40740E-03	2.78735E-04	1.68290E-05	3.12708E-04	1.00000E+00
6	.00000E+00	.00000E+00	1.01186E-03	1.23972E-02	1.69380E-04	2.70507E-05	8.15401E-04	1.00000E+00
7	.00000E+00	.00000E+00	6.67148E-04	1.25908E-02	6.32853E-05	2.68066E-05	5.77050E-04	1.00000E+00
8	.00000E+00	.00000E+00	1.16872E-04	9.20258E-03	4.43118E-04	2.20992E-05	-3.48375E-04	1.00001E+00
9	.00000E+00	.00000E+00	4.44942E-04	6.35391E-03	5.29668E-05	7.66408E-05	3.15340E-04	9.99993E-01
10	.00000E+00	.00000E+00	5.30313E-05	4.98040E-03	4.94142E-05	5.92497E-05	-5.56279E-05	9.99997E-01
11	.00000E+00	.00000E+00	4.94175E-05	4.44516E-03	5.02016E-05	8.98253E-05	-9.06093E-05	1.00000E+00
12	.00000E+00	.00000E+00	5.02019E-05	2.75609E-03	5.12762E-05	5.66238E-06	-6.74324E-06	1.00000E+00
13	.00000E+00	.00000E+00	5.12762E-05	2.35720E-03	4.80852E-05	6.31606E-06	-3.12645E-06	1.00000E+00
14	.00000E+00	.00000E+00	4.80853E-05	2.24437E-03	4.22955E-05	8.57116E-06	-2.78652E-06	1.00000E+00
15	.00000E+00	.00000E+00	4.49199E-05	1.22266E-03	5.00394E-05	6.33185E-06	-1.14143E-05	9.99969E-01
16	.00000E+00	.00000E+00	5.62555E-05	6.51788E-04	5.64653E-05	3.86304E-06	-4.04869E-06	9.99962E-01
17	.00000E+00	.00000E+00	6.27271E-05	2.52189E-04	6.20771E-05	1.87465E-06	-1.21095E-06	9.99969E-01
18	.00000E+00	.00000E+00	6.55613E-05	1.93985E-04	6.26370E-05	1.61502E-06	1.31881E-06	9.99987E-01
19	.00000E+00	.00000E+00	6.35760E-05	4.28613E-04	6.32380E-05	3.32595E-06	-2.96644E-06	9.99970E-01
20	.00000E+00	.00000E+00	7.79284E-05	1.55479E-03	6.61000E-05	1.33671E-05	-1.47877E-06	9.99971E-01
21	.00000E+00	.00000E+00	8.99546E-05	4.14786E-04	9.90781E-05	5.14164E-06	-1.42420E-05	9.99984E-01
22	.00000E+00	.00000E+00	1.31719E-04	9.46594E-04	1.26509E-04	1.22225E-05	-6.99355E-06	9.99997E-01
23	.00000E+00	.00000E+00	1.91860E-04	3.33163E-03	2.44597E-04	5.44158E-05	-1.07195E-04	1.00000E+00
24	.00000E+00	.00000E+00	3.13404E-04	2.51201E-03	3.44735E-04	6.16610E-05	-9.30531E-05	1.00001E+00
25	.00000E+00	.00000E+00	3.18690E-04	1.01014E-03	2.59997E-04	3.57476E-05	2.29138E-05	1.00001E+00
26	.00000E+00	.00000E+00	1.35291E-04	7.88964E-04	1.04264E-04	3.54189E-05	-4.40422E-06	1.00000E+00
27	.00000E+00	.00000E+00	3.02525E-05	1.66427E-04	8.57494E-08	1.23474E-05	1.77954E-05	1.00001E+00
28	.00000E+00	.00000E+00	5.14000E-03	8.18941E-02	5.14000E-03	6.35691E-04	-6.30030E-04	9.99995E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*dv**2	total flux
1	1.24278E-02	-8.41560E-04	1.24026E-02	-6.86195E-04	5.66822E-06	.00000E+00	1.56695E-06	2.06924E-03
2	9.07419E-02	-8.75994E-03	9.04818E-02	-7.74685E-03	.00000E+00	.00000E+00	1.09420E-05	1.51037E-02
3	1.14095E-01	-1.11629E-02	1.13749E-01	-1.04207E-02	.00000E+00	.00000E+00	1.25895E-05	1.89909E-02
4	7.04754E-02	-6.85380E-03	7.02586E-02	-6.82619E-03	.00000E+00	.00000E+00	7.40690E-06	1.17317E-02
5	1.05464E-01	-1.03870E-02	1.05125E-01	-1.06997E-02	.00000E+00	.00000E+00	8.61804E-06	1.75562E-02
6	1.98227E-01	-1.88373E-02	1.97551E-01	-1.96527E-02	.00000E+00	.00000E+00	1.01695E-05	3.29955E-02
7	1.96469E-01	-1.14372E-02	1.96062E-01	-1.20143E-02	.00000E+00	.00000E+00	8.35086E-06	3.27212E-02
8	1.47406E-01	-2.77099E-03	1.47318E-01	-2.42262E-03	.00000E+00	.00000E+00	5.27158E-06	2.45631E-02
9	1.15746E-01	5.91553E-04	1.15757E-01	2.76213E-04	.00000E+00	.00000E+00	4.57967E-06	1.92950E-02
10	1.06482E-01	1.44382E-03	1.06523E-01	1.49945E-03	.00000E+00	.00000E+00	4.90286E-06	1.77518E-02
11	9.95800E-02	3.39955E-03	9.96734E-02	3.49016E-03	.00000E+00	.00000E+00	4.75415E-06	1.66047E-02
12	6.40554E-02	4.04110E-03	6.41626E-02	4.04784E-03	.00000E+00	.00000E+00	3.20855E-06	1.06843E-02
13	5.47560E-02	3.75418E-03	5.48577E-02	3.75730E-03	.00000E+00	.00000E+00	2.73715E-06	9.13398E-03
14	5.19858E-02	5.38766E-03	5.21298E-02	5.39045E-03	.00000E+00	.00000E+00	2.59318E-06	8.67503E-03
15	2.89360E-02	1.15421E-03	2.89721E-02	1.16563E-03	.00000E+00	.00000E+00	1.42181E-06	4.82570E-03
16	1.61127E-02	5.74519E-04	1.61298E-02	5.78567E-04	.00000E+00	.00000E+00	7.91675E-07	2.68689E-03
17	7.14857E-03	3.77068E-04	7.15854E-03	3.78279E-04	.00000E+00	.00000E+00	3.51113E-07	1.19222E-03
18	5.83399E-03	6.49793E-04	5.85054E-03	6.48474E-04	.00000E+00	.00000E+00	2.86619E-07	9.73538E-04
19	1.11873E-02	6.40108E-04	1.12046E-02	6.43075E-04	.00000E+00	.00000E+00	5.49104E-07	1.86592E-03
20	3.68707E-02	1.99227E-03	3.69229E-02	1.99375E-03	.00000E+00	.00000E+00	1.80704E-06	6.14915E-03
21	1.16830E-02	1.30915E-03	1.17155E-02	1.32340E-03	.00000E+00	.00000E+00	5.71933E-07	1.94944E-03
22	2.43863E-02	3.94928E-03	2.44815E-02	3.95628E-03	.00000E+00	.00000E+00	1.19281E-06	4.07101E-03
23	8.12852E-02	1.22884E-02	8.15744E-02	1.23956E-02	.00000E+00	.00000E+00	3.96133E-06	1.35677E-02
24	6.49157E-02	1.17095E-02	6.51699E-02	1.18026E-02	.00000E+00	.00000E+00	3.14467E-06	1.08365E-02
25	2.88684E-02	5.53294E-03	2.89769E-02	5.51002E-03	.00000E+00	.00000E+00	1.39004E-06	4.81865E-03
26	2.03078E-02	4.07486E-03	2.03753E-02	4.07927E-03	.00000E+00	.00000E+00	9.67257E-07	3.38874E-03
27	3.78842E-03	7.06009E-04	3.79469E-03	6.88214E-04	.00000E+00	.00000E+00	1.74783E-07	6.31696E-04
28	1.76923E+00	-7.47473E-03	1.76838E+00	-6.84477E-03	5.66822E-06	.00000E+00	1.04301E-04	2.94833E-01

1fine group summary for zone 3 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	.00000E+00	.00000E+00	2.53734E-04	3.35839E-04	2.79640E-05	-3.63784E-04	9.99985E-01
2	.00000E+00	.00000E+00	1.92698E-04	3.22388E-03	4.23720E-03	9.21267E-05	-4.13646E-03	9.99987E-01
3	.00000E+00	.00000E+00	2.01047E-03	2.89639E-03	7.53584E-03	4.91752E-05	-5.57437E-03	9.99991E-01
4	.00000E+00	.00000E+00	2.95410E-03	1.91862E-03	6.59219E-03	2.23902E-05	-3.66041E-03	9.99995E-01
5	.00000E+00	.00000E+00	5.44811E-03	6.16735E-03	1.11734E-02	2.65777E-05	-5.75175E-03	9.99996E-01
6	.00000E+00	.00000E+00	1.14658E-02	1.84816E-02	2.19655E-02	4.51580E-05	-1.05449E-02	1.00000E+00
7	.00000E+00	.00000E+00	2.25974E-02	3.23794E-02	2.87506E-02	3.25129E-05	-6.18531E-03	9.99992E-01
8	.00000E+00	.00000E+00	2.99751E-02	4.11411E-02	3.08484E-02	1.91158E-05	-8.89669E-04	9.99919E-01
9	.00000E+00	.00000E+00	3.04068E-02	3.79552E-02	3.00570E-02	1.53029E-05	3.57880E-04	9.99892E-01
10	.00000E+00	.00000E+00	2.98719E-02	3.60450E-02	2.89675E-02	1.87922E-05	8.88763E-04	9.99900E-01
11	.00000E+00	.00000E+00	2.91375E-02	3.39824E-02	2.71302E-02	2.85752E-05	1.98047E-03	9.99945E-01
12	.00000E+00	.00000E+00	2.35542E-02	1.80582E-02	2.12477E-02	3.11036E-05	2.27593E-03	9.99981E-01
13	.00000E+00	.00000E+00	2.09249E-02	1.47206E-02	1.88782E-02	4.36072E-05	2.00576E-03	9.99973E-01
14	.00000E+00	.00000E+00	2.05434E-02	1.44976E-02	1.73185E-02	6.99657E-05	2.95516E-03	9.99990E-01
15	.00000E+00	.00000E+00	1.11508E-02	5.68458E-03	1.06495E-02	5.89818E-05	4.42308E-04	1.00000E+00
16	.00000E+00	.00000E+00	7.37853E-03	2.40976E-03	7.09388E-03	4.01869E-05	2.38960E-04	1.00000E+00
17	.00000E+00	.00000E+00	3.81181E-03	6.92019E-04	3.60054E-03	1.98099E-05	1.91479E-04	9.99995E-01
18	.00000E+00	.00000E+00	3.39183E-03	5.47617E-04	2.99229E-03	1.71352E-05	3.82387E-04	1.00000E+00
19	.00000E+00	.00000E+00	5.68615E-03	1.60635E-03	5.33134E-03	3.59775E-05	3.18838E-04	9.99999E-01
20	.00000E+00	.00000E+00	1.40287E-02	1.14053E-02	1.28952E-02	1.48749E-04	9.84574E-04	1.00001E+00
21	.00000E+00	.00000E+00	6.84749E-03	2.32580E-03	6.05050E-03	5.85274E-05	7.39661E-04	1.00000E+00
22	.00000E+00	.00000E+00	1.36463E-02	7.27446E-03	1.13206E-02	1.39723E-04	2.18581E-03	1.00001E+00
23	.00000E+00	.00000E+00	3.53407E-02	4.37130E-02	2.87052E-02	6.34560E-04	5.99388E-03	1.00002E+00
24	.00000E+00	.00000E+00	3.77600E-02	4.03256E-02	3.11278E-02	7.33642E-04	5.89755E-03	1.00002E+00
25	.00000E+00	.00000E+00	2.49493E-02	1.68444E-02	2.16703E-02	4.28112E-04	2.85049E-03	1.00001E+00
26	.00000E+00	.00000E+00	1.98217E-02	1.83811E-02	1.69773E-02	4.25092E-04	2.41917E-03	1.00001E+00
27	.00000E+00	.00000E+00	6.67666E-03	3.88256E-03	5.91467E-03	1.47785E-04	6.14197E-04	1.00000E+00
28	.00000E+00	.00000E+00	4.19572E-01	4.16813E-01	4.19572E-01	3.41045E-03	-3.40036E-03	9.99977E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*db**2	total flux
1	1.25573E-02	-1.20534E-03	1.24278E-02	-8.41560E-04	1.85728E-11	.00000E+00	1.00653E-05	8.22160E-03
2	9.20530E-02	-1.28964E-02	9.07419E-02	-8.75994E-03	.00000E+00	.00000E+00	4.67285E-05	6.01283E-02
3	1.15719E-01	-1.67373E-02	1.14095E-01	-1.11629E-02	.00000E+00	.00000E+00	4.89476E-05	7.55794E-02
4	7.14430E-02	-1.05142E-02	7.04754E-02	-6.85380E-03	.00000E+00	.00000E+00	2.22550E-05	4.66614E-02
5	1.06930E-01	-1.61387E-02	1.05464E-01	-1.03870E-02	.00000E+00	.00000E+00	2.64209E-05	6.98217E-02
6	2.00839E-01	-2.95822E-02	1.98227E-01	-1.88373E-02	.00000E+00	.00000E+00	4.46921E-05	1.31188E-01
7	1.97987E-01	-1.76225E-02	1.96469E-01	-1.14372E-02	.00000E+00	.00000E+00	3.14806E-05	1.29753E-01
8	1.47697E-01	-3.66066E-03	1.47406E-01	-2.77099E-03	.00000E+00	.00000E+00	1.71834E-05	9.71266E-02
9	1.15517E-01	9.29439E-04	1.15746E-01	5.91553E-04	.00000E+00	.00000E+00	1.13291E-05	7.61165E-02
10	1.06222E-01	2.33259E-03	1.06482E-01	1.44382E-03	.00000E+00	.00000E+00	9.98481E-06	7.00243E-02
11	9.90053E-02	5.38001E-03	9.95800E-02	3.39956E-03	.00000E+00	.00000E+00	9.27753E-06	6.53956E-02
12	6.33661E-02	6.31708E-03	6.40554E-02	4.04110E-03	.00000E+00	.00000E+00	5.40888E-06	4.19769E-02
13	5.41649E-02	5.75794E-03	5.47560E-02	3.75418E-03	.00000E+00	.00000E+00	4.50588E-06	3.58818E-02
14	5.11011E-02	8.34282E-03	5.19858E-02	5.38766E-03	.00000E+00	.00000E+00	4.35358E-06	3.39789E-02
15	2.88443E-02	1.59652E-03	2.89360E-02	1.15421E-03	.00000E+00	.00000E+00	2.34191E-06	1.90217E-02
16	1.60568E-02	8.13479E-04	1.61127E-02	5.74519E-04	.00000E+00	.00000E+00	1.17927E-06	1.05910E-02
17	7.09457E-03	5.68547E-04	7.14837E-03	3.77068E-04	.00000E+00	.00000E+00	4.80119E-07	4.69086E-03
18	5.71451E-03	1.03218E-03	5.85399E-03	6.49798E-04	.00000E+00	.00000E+00	3.80202E-07	3.80773E-03
19	1.10981E-02	9.58947E-04	1.11873E-02	6.40108E-04	.00000E+00	.00000E+00	7.67982E-07	7.33971E-03
20	3.65854E-02	2.97685E-03	3.68707E-02	1.99227E-03	.00000E+00	.00000E+00	2.83544E-06	2.41914E-02
21	1.14485E-02	2.04782E-03	1.16830E-02	1.30915E-03	.00000E+00	.00000E+00	6.99303E-07	7.62670E-03
22	2.36443E-02	6.13510E-03	2.43863E-02	3.94928E-03	.00000E+00	.00000E+00	1.44877E-06	1.58480E-02
23	7.89650E-02	1.82883E-02	8.12832E-02	1.22884E-02	.00000E+00	.00000E+00	4.35902E-06	5.28496E-02
24	6.22481E-02	1.76071E-02	6.49157E-02	1.17095E-02	.00000E+00	.00000E+00	2.57258E-06	4.19698E-02
25	2.73699E-02	8.38343E-03	2.88684E-02	5.53294E-03	.00000E+00	.00000E+00	8.79534E-07	1.85695E-02
26	1.88436E-02	6.49408E-03	2.08078E-02	4.07486E-03	.00000E+00	.00000E+00	4.52766E-07	1.29469E-02
27	3.37046E-03	1.32021E-03	3.78842E-03	7.06009E-04	.00000E+00	.00000E+00	5.19185E-08	2.37631E-03
28	1.76588E+00	-1.08750E-02	1.76923E+00	-7.47473E-03	1.85728E-11	.00000E+00	3.11082E-04	1.16366E+00

1fine group summary for zone 4 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	2.21135E-02	.00000E+00	2.05319E-02	1.94698E-02	3.63035E-03	1.20533E-03	9.98897E-01
2	.00000E+00	1.91371E-01	6.73317E-03	2.47194E-01	1.70070E-01	1.51509E-02	1.28963E-02	1.00002E+00
3	.00000E+00	2.15417E-01	7.01575E-02	2.56078E-01	2.52603E-01	1.62374E-02	1.67372E-02	9.99989E-01
4	.00000E+00	1.24145E-01	1.04566E-01	1.76088E-01	2.10417E-01	7.77983E-03	1.05141E-02	1.00000E+00
5	.00000E+00	1.65069E-01	1.90752E-01	4.43728E-01	3.34458E-01	5.22670E-03	1.61386E-02	9.99991E-01
6	.00000E+00	1.78657E-01	3.89452E-01	1.19091E+00	5.30402E-01	8.31671E-03	2.93820E-02	1.00001E+00
7	.00000E+00	8.85054E-02	5.92545E-01	1.56461E+00	6.55078E-01	8.35657E-03	1.76231E-02	9.99989E-01
8	.00000E+00	1.36510E-02	6.89167E-01	1.57532E+00	6.85762E-01	1.34511E-02	3.66075E-03	9.99922E-01
9	.00000E+00	9.91007E-04	6.77875E-01	1.37068E+00	6.57763E-01	2.21066E-02	-9.33803E-04	9.99898E-01
10	.00000E+00	7.36106E-05	6.54847E-01	1.24451E+00	6.23907E-01	3.34119E-02	-2.33196E-03	9.99899E-01
11	.00000E+00	5.79123E-06	6.28047E-01	1.15711E+00	5.79264E-01	5.42054E-02	-5.37864E-03	9.99940E-01
12	.00000E+00	4.06824E-07	5.04635E-01	6.32315E-01	4.52782E-01	5.81835E-02	-6.31742E-03	9.99975E-01
13	.00000E+00	6.46000E-08	4.47429E-01	5.02026E-01	3.99663E-01	5.35376E-02	-5.75748E-03	9.99970E-01
14	.00000E+00	1.28020E-08	4.30968E-01	4.72118E-01	3.66665E-01	7.46500E-02	-8.34267E-03	9.99988E-01
15	.00000E+00	1.44677E-09	2.38564E-01	2.17038E-01	2.32592E-01	7.53757E-03	-1.60098E-03	1.00007E+00
16	.00000E+00	4.24821E-10	1.63040E-01	1.00866E-01	1.59132E-01	4.71284E-03	-8.16557E-04	1.00007E+00
17	.00000E+00	1.36813E-10	8.79279E-02	3.24917E-02	8.35567E-02	4.93557E-03	-5.67262E-04	1.00003E+00
18	.00000E+00	9.79542E-11	7.87397E-02	2.46702E-02	6.85430E-02	1.12269E-02	-1.03496E-03	1.00006E+00
19	.00000E+00	1.38486E-10	1.27389E-01	6.45629E-02	1.21350E-01	6.99304E-03	-9.58357E-04	1.00003E+00
20	.00000E+00	2.25198E-10	3.08895E-01	3.63470E-01	2.80077E-01	2.67779E-02	-2.98742E-03	1.00009E+00
21	.00000E+00	3.29610E-11	1.52381E-01	7.71019E-02	1.34486E-01	1.99390E-02	-2.05092E-03	1.00004E+00
22	.00000E+00	3.82423E-11	2.93188E-01	2.10436E-01	2.40235E-01	5.90774E-02	-6.13913E-03	1.00005E+00
23	.00000E+00	3.65638E-11	7.15845E-01	1.10448E+00	5.91982E-01	1.42114E-01	-1.82787E-02	1.00004E+00
24	.00000E+00	9.95219E-12	7.61354E-01	9.41618E-01	6.27864E-01	1.51068E-01	-1.76074E-02	1.00004E+00
25	.00000E+00	2.91335E-12	5.03116E-01	3.80135E-01	4.27137E-01	8.43519E-02	-8.38349E-03	1.00002E+00
26	.00000E+00	2.04286E-12	3.89479E-01	3.80591E-01	3.19234E-01	7.67321E-02	-6.49428E-03	1.00002E+00
27	.00000E+00	4.86834E-13	1.28224E-01	7.68333E-02	1.07801E-01	2.17422E-02	-1.32026E-03	1.00001E+00
28	.00000E+00	1.00000E+00	9.33080E+00	1.48275E+01	9.33029E+00	9.91453E-01	1.08564E-02	9.99988E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*db**2	total flux
1	1.28458E-02	-9.97737E-09	1.25573E-02	-1.20534E-03	2.16520E-03	2.41708E-03	2.83477E-04	3.26516E-01
2	9.53250E-02	-9.01340E-08	9.20530E-02	-1.28964E-02	1.62522E-05	1.09287E-02	1.56700E-03	2.42065E+00
3	1.20081E-01	-1.07647E-07	1.15719E-01	-1.67373E-02	.00000E+00	1.33500E-02	1.81787E-03	3.04817E+00
4	7.42708E-02	-9.78123E-08	7.14430E-02	-1.05142E-02	.00000E+00	5.75240E-03	8.81579E-04	1.88495E+00
5	1.11534E-01	-1.84290E-07	1.06950E-01	-1.61387E-02	.00000E+00	1.68452E-03	1.03082E-03	2.82959E+00
6	2.09693E-01	-2.34811E-07	2.00839E-01	-2.95822E-02	.00000E+00	1.48188E-03	1.73113E-03	5.31797E+00
7	2.08560E-01	5.61110E-07	1.97987E-01	-1.76225E-02	.00000E+00	1.49704E-03	1.22593E-03	5.16913E+00
8	1.48864E-01	8.97995E-08	1.47697E-01	-3.66066E-03	.00000E+00	1.56076E-03	6.97367E-04	3.78712E+00
9	1.15171E-01	-4.37011E-06	1.15517E-01	9.29433E-04	.00000E+00	2.13399E-03	4.70672E-04	2.93326E+00
10	1.05405E-01	6.26909E-07	1.06222E-01	2.33259E-03	.00000E+00	4.55729E-03	4.28092E-04	2.68604E+00
11	9.71375E-02	1.37020E-06	9.90033E-02	5.38001E-03	.00000E+00	9.54164E-03	3.86377E-04	2.47840E+00
12	6.11904E-02	-3.91943E-07	6.33661E-02	6.31708E-03	.00000E+00	1.24109E-02	2.27570E-04	1.56392E+00
13	5.22063E-02	4.64490E-07	5.41649E-02	5.75794E-03	.00000E+00	1.23673E-02	1.96229E-04	1.33468E+00
14	4.82667E-02	1.48095E-07	5.11011E-02	8.34282E-03	.00000E+00	8.45267E-03	1.78236E-04	1.23658E+00
15	2.85257E-02	-4.46883E-06	2.88443E-02	1.59652E-03	.00000E+00	2.14073E-03	1.11784E-04	7.22782E-01
16	1.57945E-02	-3.07762E-06	1.60568E-02	8.13479E-04	.00000E+00	1.44688E-03	5.86730E-05	4.02934E-01
17	6.90660E-03	1.28506E-06	7.09457E-03	5.68547E-04	.00000E+00	2.04339E-03	2.34470E-05	1.76382E-01
18	5.36478E-03	-2.77755E-06	5.71451E-03	1.05218E-03	.00000E+00	2.37041E-03	1.62793E-05	1.37489E-01
19	1.07732E-02	5.89876E-07	1.10981E-02	9.58947E-04	.00000E+00	3.29172E-03	3.72986E-05	2.75244E-01
20	3.56610E-02	-1.05754E-05	3.66854E-02	2.97685E-03	.00000E+00	1.58574E-02	1.31723E-04	9.08433E-01
21	1.07126E-02	-3.10257E-06	1.14485E-02	2.04782E-03	.00000E+00	1.22900E-02	3.12957E-05	2.74863E-01
22	2.13068E-02	-4.03089E-06	2.36443E-02	6.13510E-03	.00000E+00	3.60467E-02	5.91360E-05	5.49526E-01
23	7.07259E-02	9.52730E-06	7.89650E-02	1.82883E-02	.00000E+00	8.56527E-02	1.91421E-04	1.83053E+00
24	5.33756E-02	-3.12395E-07	6.22481E-02	1.76071E-02	.00000E+00	9.08818E-02	1.12351E-04	1.39159E+00
25	2.27252E-02	-6.15187E-08	2.73699E-02	8.38343E-03	.00000E+00	5.27926E-02	3.80808E-05	5.95598E-01
26	1.48782E-02	-2.52953E-07	1.88434E-02	6.49408E-03	.00000E+00	4.86563E-02	1.86382E-05	3.92298E-01
27	2.49733E-03	-5.16804E-08	3.37046E-03	1.32021E-03	.00000E+00	1.35708E-02	1.90395E-06	6.60215E-02
28	1.75450E+00	-1.95233E-05	1.76588E+00	-1.08750E-02	2.18146E-03	4.55157E-01	1.19544E-02	4.47405E+01

1fine group summary for system

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance

1	.00000E+00	2.21135E-02	.00000E+00	2.14758E-02	2.05978E-02	3.71345E-03	-9.97737E-09	9.98896E-01
2	.00000E+00	1.91371E-01	7.31705E-03	2.57889E-01	1.85272E-01	1.54294E-02	-9.01340E-08	1.00001E+00
3	.00000E+00	2.15417E-01	7.60816E-02	2.67140E-01	2.75104E-01	1.63987E-02	-1.07647E-07	9.99987E-01
4	.00000E+00	1.24145E-01	1.13331E-01	1.83884E-01	2.29619E-01	7.85708E-03	-9.78123E-08	9.99999E-01
5	.00000E+00	1.65069E-01	2.06993E-01	4.65803E-01	3.66746E-01	5.31966E-03	-1.84290E-07	9.99990E-01
6	.00000E+00	1.78657E-01	4.23332E-01	1.25626E+00	5.98508E-01	8.47315E-03	-2.34811E-07	1.00001E+00
7	.00000E+00	8.85054E-02	6.57970E-01	1.67052E+00	7.38006E-01	8.47708E-03	5.61110E-07	9.99985E-01
8	.00000E+00	1.36510E-02	7.75581E-01	1.70897E+00	7.75766E-01	1.35287E-02	8.97995E-08	9.99920E-01
9	.00000E+00	9.91007E-04	7.66479E-01	1.48754E+00	7.45326E-01	2.22278E-02	-4.37011E-06	9.99897E-01
10	.00000E+00	7.36106E-05	7.41808E-01	1.35461E+00	7.08430E-01	3.35259E-02	6.26909E-07	9.99898E-01
11	.00000E+00	5.79123E-06	7.13029E-01	1.26099E+00	6.58698E-01	5.43788E-02	1.37020E-06	9.99935E-01
12	.00000E+00	4.06824E-07	5.73555E-01	6.88152E-01	5.15290E-01	5.82805E-02	-3.91943E-07	9.99975E-01
13	.00000E+00	6.46000E-08	5.08884E-01	5.47674E-01	4.55227E-01	5.36722E-02	4.64490E-07	9.99969E-01
14	.00000E+00	1.28020E-08	4.90796E-01	5.17246E-01	4.15936E-01	7.48656E-02	1.48095E-07	9.99988E-01
15	.00000E+00	1.44677E-09	2.71502E-01	2.34877E-01	2.65773E-01	7.71631E-03	-4.46383E-06	1.00006E+00
16	.00000E+00	4.24821E-10	1.84778E-01	1.08560E-01	1.79935E-01	4.83414E-03	-3.07762E-06	1.00006E+00
17	.00000E+00	1.36813E-10	9.91754E-02	3.47729E-02	9.41758E-02	4.99553E-03	1.28506E-06	1.00003E+00
18	.00000E+00	9.79542E-11	8.87569E-02	2.64875E-02	7.74756E-02	1.12795E-02	-2.77755E-06	1.00005E+00
19	.00000E+00	1.38486E-10	1.44163E-01	6.97047E-02	1.37056E-01	7.10192E-03	5.89876E-07	1.00003E+00
20	.00000E+00	2.25193E-10	3.45209E-01	3.98476E-01	3.17964E-01	2.72276E-02	-1.05754E-05	1.00008E+00
21	.00000E+00	3.29610E-11	1.72653E-01	8.44155E-02	1.52532E-01	2.01171E-02	-3.10237E-06	1.00004E+00
22	.00000E+00	3.82423E-11	3.33788E-01	2.33171E-01	2.74269E-01	5.95081E-02	-4.03089E-06	1.00004E+00
23	.00000E+00	3.65638E-11	8.22395E-01	1.23886E+00	6.78284E-01	1.44071E-01	9.52730E-06	1.00004E+00
24	.00000E+00	9.95219E-12	8.76008E-01	1.06644E+00	7.22619E-01	1.53355E-01	-3.12395E-07	1.00004E+00
25	.00000E+00	2.91336E-12	5.79402E-01	4.32678E-01	4.95693E-01	8.56973E-02	-6.15187E-08	1.00002E+00
26	.00000E+00	2.04286E-12	4.50164E-01	4.38470E-01	3.72068E-01	7.80878E-02	-2.52953E-07	1.00002E+00
27	.00000E+00	4.86824E-13	1.48731E-01	8.92792E-02	1.26508E-01	2.22220E-02	-5.16804E-08	1.00001E+00
28	.00000E+00	1.00000E+00	1.05719E+01	1.61395E+01	1.05719E+01	1.00236E+00	-1.95301E-05	9.99987E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*db**2	total flux
1	1.28458E-02	-9.97737E-09	1.22921E-02	.00000E+00	2.17087E-03	2.41708E-03	3.14095E-04	3.52315E-01
2	9.53250E-02	-9.01340E-08	8.90107E-02	.00000E+00	1.62522E-05	1.09287E-02	1.71221E-03	2.60833E+00
3	1.20081E-01	-1.07647E-07	1.11595E-01	.00000E+00	.00000E+00	1.33500E-02	1.97097E-03	3.28411E+00
4	7.42708E-02	-9.78123E-08	6.87048E-02	.00000E+00	.00000E+00	5.75240E-03	9.52807E-04	2.03049E+00
5	1.11534E-01	-1.84290E-07	1.02523E-01	.00000E+00	.00000E+00	1.68452E-03	1.11513E-03	3.04717E+00
6	2.09693E-01	-2.34811E-07	1.92694E-01	.00000E+00	.00000E+00	1.48188E-03	1.86985E-03	5.72685E+00
7	2.08560E-01	5.61110E-07	1.93018E-01	.00000E+00	.00000E+00	1.49704E-03	1.32501E-03	5.57576E+00
8	1.48864E-01	8.97995E-08	1.46897E-01	.00000E+00	.00000E+00	1.56076E-03	7.52527E-04	4.09367E+00
9	1.15171E-01	-4.37011E-06	1.15816E-01	.00000E+00	.00000E+00	2.13399E-03	5.08257E-04	3.17416E+00
10	1.05405E-01	6.26909E-07	1.06961E-01	.00000E+00	.00000E+00	4.55729E-03	4.62112E-04	2.90800E+00
11	9.71375E-02	1.37020E-06	1.00650E-01	.00000E+00	.00000E+00	9.54164E-03	4.18278E-04	2.68636E+00
12	6.11904E-02	-3.91943E-07	6.52634E-02	.00000E+00	.00000E+00	1.24109E-02	2.46678E-04	1.69799E+00
13	5.22063E-02	4.64490E-07	5.58506E-02	.00000E+00	.00000E+00	1.23673E-02	2.12217E-04	1.44933E+00
14	4.82667E-02	1.48095E-07	5.35691E-02	.00000E+00	.00000E+00	8.45267E-03	1.95707E-04	1.34577E+00
15	2.83257E-02	-4.46383E-06	2.92270E-02	.00000E+00	.00000E+00	2.14073E-03	1.20052E-04	7.83212E-01
16	1.57945E-02	-3.07762E-06	1.62599E-02	.00000E+00	.00000E+00	1.44688E-03	6.29109E-05	4.36571E-01
17	6.90660E-03	1.28506E-06	7.25373E-03	.00000E+00	.00000E+00	2.04339E-03	2.52059E-05	1.91328E-01
18	5.36478E-03	-2.77755E-06	6.02892E-03	.00000E+00	.00000E+00	2.37041E-03	1.76930E-05	1.49749E-01
19	1.07732E-02	5.89876E-07	1.13686E-02	.00000E+00	.00000E+00	3.29172E-03	4.01010E-05	2.98645E-01
20	3.55610E-02	-1.05754E-05	3.74423E-02	.00000E+00	.00000E+00	1.58374E-02	1.41846E-04	9.85535E-01
21	1.07126E-02	-3.10237E-06	1.21031E-02	.00000E+00	.00000E+00	1.22900E-02	3.39399E-05	2.99435E-01
22	2.13068E-02	-4.03089E-06	2.57066E-02	.00000E+00	.00000E+00	3.60467E-02	6.46681E-05	6.01064E-01
23	7.07299E-02	9.52730E-06	8.61215E-02	.00000E+00	.00000E+00	8.56527E-02	2.08450E-04	2.00254E+00
24	5.33756E-02	-3.12395E-07	7.02734E-02	.00000E+00	.00000E+00	9.08818E-02	1.23298E-04	1.52972E+00
25	2.27252E-02	-6.15187E-08	3.17159E-02	.00000E+00	.00000E+00	5.27926E-02	4.21610E-05	6.57227E-01
26	1.48782E-02	-2.52953E-07	2.28509E-02	.00000E+00	.00000E+00	4.88563E-02	2.10117E-05	4.35898E-01
27	2.49733E-03	-5.16804E-08	4.33862E-03	.00000E+00	.00000E+00	1.35703E-02	2.24294E-06	7.41689E-02
28	1.75450E+00	-1.95233E-05	1.77553E+00	.00000E+00	2.18713E-03	4.55157E-01	1.29569E-02	4.84254E+01

- elapsed time .02 min.
0direct access unit 9 requires 556 blocks of length 216 for cross section weighting.
1 transport cross section weighting function

Ozone	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	1.09993E-03	4.97152E-03	5.26014E-03	2.50249E-03	3.18158E-03	5.52947E-03	3.72049E-03	1.74274E-03
2	6.70103E-04	4.91019E-03	5.75661E-03	3.43497E-03	4.29880E-03	6.16395E-03	4.33987E-03	2.14746E-03
3	1.12768E-03	5.38921E-03	5.84306E-03	2.91018E-03	3.86563E-03	6.79211E-03	4.38629E-03	1.82315E-03
4	7.74881E-04	4.25266E-03	4.90758E-03	2.38326E-03	2.82784E-03	4.80332E-03	3.32751E-03	1.79648E-03
5	7.97509E-04	4.29811E-03	4.95116E-03	2.40766E-03	2.87768E-03	4.89222E-03	3.37687E-03	1.79679E-03

Ozone	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	1.11224E-03	1.01486E-03	1.09642E-03	8.72989E-04	7.85709E-04	1.00879E-03	3.13745E-04	1.56159E-04
2	1.78969E-03	1.95277E-03	2.04380E-03	1.59939E-03	1.41152E-03	1.66206E-03	6.25267E-04	3.40838E-04
3	1.12153E-03	1.05699E-03	1.30164E-03	1.21978E-03	1.10269E-03	1.51851E-03	3.73415E-04	1.87902E-04
4	1.19407E-03	1.09414E-03	1.03049E-03	6.77811E-04	6.01782E-04	6.38781E-04	3.11266E-04	1.61485E-04
5	1.19220E-03	1.09483E-03	1.04611E-03	7.05245E-04	6.26954E-04	6.82879E-04	3.14763E-04	1.62959E-04

Ozone	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	8.08819E-05	1.13772E-04	1.34905E-04	4.46709E-04	2.31664E-04	6.75516E-04	2.16474E-03	2.01510E-03
2	1.65665E-04	1.94151E-04	2.66191E-04	8.59307E-04	3.91615E-04	1.07147E-03	3.38727E-03	3.12103E-03
3	1.10969E-04	1.81898E-04	1.86016E-04	5.97253E-04	3.62520E-04	1.07915E-03	3.28500E-03	3.13057E-03
4	6.96203E-05	6.48574E-05	1.12953E-04	3.86197E-04	1.31387E-04	3.30358E-04	1.11594E-03	9.12768E-04
5	7.17085E-05	7.06686E-05	1.16610E-04	3.96865E-04	1.43061E-04	3.68486E-04	1.22957E-03	1.02943E-03

Ozone	grp. 25	grp. 26	grp. 27	grp. 28
1	9.28145E-04	6.61741E-04	1.00942E-04	4.19214E-02
2	1.45258E-03	1.06411E-03	1.85235E-04	5.53039E-02
3	1.48223E-03	1.11985E-03	2.09760E-04	5.17650E-02
4	3.84693E-04	2.34281E-04	2.90224E-05	3.45354E-02
5	4.42179E-04	2.79969E-04	3.75563E-05	3.54099E-02

1broad group parameters

grp	upper energy	mid energy	velocity	fiss spec
1	2.0000E+07	2.6391E+06	1.9647E+09	7.1812E-01
2	9.0000E+05	1.5069E+05	9.6512E+06	2.8188E-01
3	4.0000E-01	1.2716E-01	3.6830E+05	1.2316E-10
4	1.0000E-05			

1 240 d, second part of sas2h pass to make library

0cell averaged fluxes

Ozone	grp. 1	grp. 2	grp. 3
1	3.87437E-01	1.13905E+00	2.45235E-01
2	3.92664E-01	1.14057E+00	2.35554E-01
3	3.95604E-01	1.14097E+00	2.31194E-01
4	4.12753E-01	1.14406E+00	2.03512E-01
5	4.11067E-01	1.14373E+00	2.03313E-01

0flux disadvantage factors (zone average/cell average-flux)

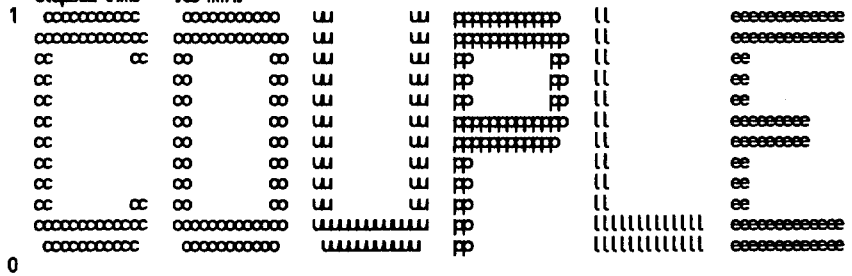
Ozone	grp. 1	grp. 2	grp. 3
1	9.42516E-01	9.95905E-01	1.20619E+00
2	9.55231E-01	9.97237E-01	1.15858E+00
3	9.62383E-01	9.97588E-01	1.13713E+00
4	1.00410E+00	1.00028E+00	9.85240E-01
5	1.00000E+00	1.00000E+00	1.00000E+00

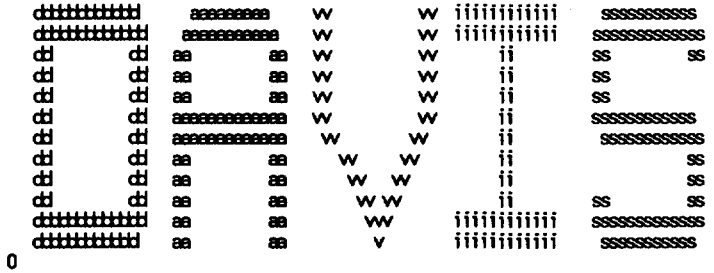
0cell averaged currents

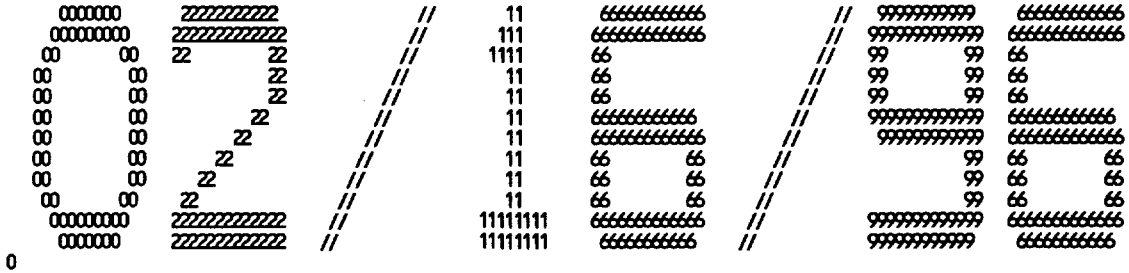
Ozone	grp. 1	grp. 2	grp. 3
1	1.70157E-02	1.81279E-02	6.77785E-03
2	1.90707E-02	2.55619E-02	1.05713E-02
3	1.91358E-02	2.19601E-02	1.06691E-02
4	1.51262E-02	1.62707E-02	3.13845E-03
5	1.53321E-02	1.65477E-02	3.53005E-03

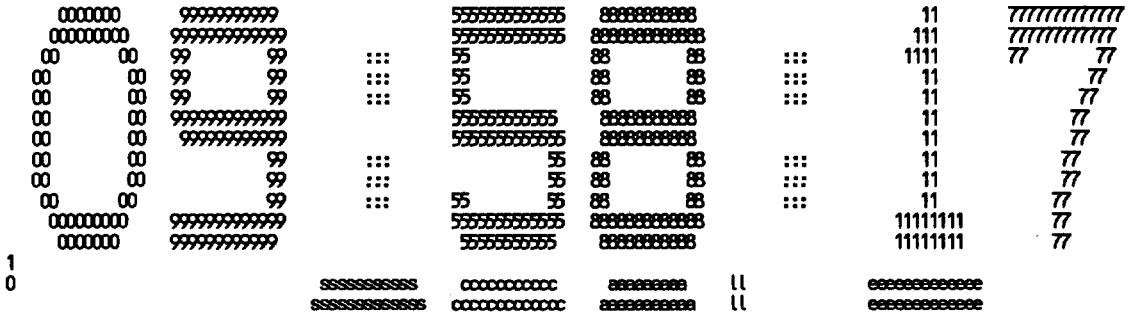
Ozone	volume	vol. fraction
1	1.2566E+00	4.5623E-02
2	1.6668E-01	6.0516E-03
3	6.5826E-01	2.3898E-02

```
   4    2.54624E+01    9.24426E-01
   5    2.75440E+01    1.00000E+00
-  elapsed time   .03 min.
```









```
ss       ss  cc       cc  aa       aa  ll          ee
ss           cc           aa       aa  ll          ee
ss           cc           aa       aa  ll          ee
ssssssssssss cc           aaaaaaaaaaaa ll          eeeeeeeee
 ssssssssssss cc          aaaaaaaaaaaa ll          eeeeeeeee
         ss   cc          aa       aa  ll          ee
         ss   cc          aa       aa  ll          ee
ss       ss  cc       cc  aa       aa  ll          ee
ssssssssssss cccccccccccc  aa       aa  llllllllllll eeeeeeeeeeee
 ssssssssss   cccccccccc   aa       aa  llllllllllll eeeeeeeeeeee
```

```
*********************************************************************
*********************************************************************
*********************************************************************
*****                                                           *****
*****              program verification information              *****
*****                                                           *****
*****              code system:   scale  version:   4.2         *****
*****                                                           *****
*********************************************************************
*********************************************************************
*****                                                           *****
*****                                                           *****
*****              program:  c0c005                             *****
*****                                                           *****
*****          creation date:  04/27/95                         *****
*****                                                           *****
*****              library:  /neutronics/scale/exe              *****
*****                                                           *****
*****                                                           *****
*****    this is not a  scale  configuration controlled code    *****
*****                                                           *****
*****              jobname:  davis                              *****
*****                                                           *****
*****    date of execution:  02/16/96                           *****
*****                                                           *****
*****    time of execution:  09:58:17                           *****
*****                                                           *****
*****                                                           *****
*********************************************************************
*********************************************************************
*********************************************************************
```

```
1
0      -1q array has      1 entries.
0       0q array has      1 entries.
0       0q array has      1 entries.
0       1q array has      1 entries.
0       1q array has      1 entries.
0       1q array has      1 entries.
0       1q array has      1 entries.
0       1q array has      1 entries.
0       2q array has      1 entries.
0        * core allocated to array-data (by -1$$ or default) was   200000 words. *
1        * broad 3-group flux weighting factors *
0
0               therm =    .5092
```

0 res = .3846
0 fast = 2.9317
0 user requested (see jaddl) that only the nuclide transitions presently included in
0 origen library be updated.
1cross sections, available from ampx (normalized to thermal flux), barns

10010	to 10020	2.75385E-01
10010	tot-cap	2.75385E-01
50100	to 40100	2.09013E-02
50100	to 10010	2.09013E-02
50100	to 40090	3.11769E-03
50100	to 10020	3.11769E-03
50100	to 30070	3.16715E+03
50100	to 20040	3.16730E+03
50100	to 10030	7.80945E-02
50100	tot-cap	3.16725E+03
50110	to 50100	8.88977E-06
50110	to 50120	4.18853E-03
50110	to 40110	1.13442E-06
50110	to 10010	1.13442E-06
50110	to 40090	1.01236E-05
50110	to 10030	1.01236E-05
50110	to 30080	1.32158E-04
50110	to 20040	1.32158E-04
50110	tot-cap	4.34084E-03
80160	to 80170	1.47104E-04
80160	to 70160	7.77840E-05
80160	to 10010	7.77840E-05
80160	to 70150	1.46700E-05
80160	to 10020	1.46700E-05
80160	to 60130	2.21441E-02
80160	to 20040	2.21441E-02
80160	to 80161	3.41133E-03
80160	tot-cap	2.23837E-02
360830	to 360820	1.76621E-02
360830	to 360810	1.86468E-09
360830	to 360840	1.48072E+02
360830	to 350830	7.33568E-04
360830	to 10010	7.33568E-04
360830	to 350820	5.83331E-06
360830	to 10020	5.83331E-06
360830	to 350810	2.03885E-06
360830	to 10030	2.03885E-06
360830	to 340810	3.29972E-08
360830	to 20030	3.29972E-08
360830	to 340800	3.87812E-05
360830	to 20040	3.87812E-05
360830	tot-cap	1.48091E+02
360850	to 360860	1.33283E+00
360850	tot-cap	1.33283E+00
380900	to 380910	6.11188E-01
380900	tot-cap	6.11188E-01
390890	to 390900	9.50305E-01
390890	tot-cap	9.50305E-01
400930	to 400940	1.18722E+01
400930	tot-cap	1.18722E+01
400940	to 400950	1.66352E-01
400940	tot-cap	1.66352E-01
400950	to 400960	1.97588E+00
400950	tot-cap	1.97588E+00

410940 to 410950 3.46661E+01
410940 tot-cap 3.46661E+01
420950 to 420960 3.52522E+01
420950 tot-cap 3.52522E+01
430990 to 430980 5.35894E-03
430990 to 431000 8.15638E+01
430990 tot-cap 8.15691E+01
441010 to 441020 2.50117E+01
441010 tot-cap 2.50117E+01
441060 to 441070 7.66631E-01
441060 tot-cap 7.66631E-01
451030 to 451020 1.94081E-03
451030 to 451040 3.40500E+02
451030 tot-cap 3.40502E+02
451050 to 451060 7.90428E+03
451050 tot-cap 7.90428E+03
461050 to 461060 3.05554E+01
461050 tot-cap 3.05554E+01
461080 to 461090 6.08972E+01
461080 tot-cap 6.08972E+01
471090 to 471080 4.51323E-03
471090 to 471100 3.36304E+02
471090 to 461090 2.57938E-04
471090 to 10010 2.57938E-04
471090 to 451060 2.12051E-04
471090 to 20040 2.12051E-04
471090 to 471091 5.55824E-01
471090 tot-cap 3.36309E+02
511240 to 511250 1.09642E+01
511240 tot-cap 1.09642E+01
541310 to 541300 5.47244E-02
541310 to 541290 1.14430E-05
541310 to 541320 2.40805E+02
541310 to 531310 3.33792E-05
541310 to 10010 3.33792E-05
541310 to 531300 4.58919E-07
541310 to 10020 4.58919E-07
541310 to 531290 4.70576E-07
541310 to 10030 4.70576E-07
541310 to 521280 1.55555E-05
541310 to 20040 1.55555E-05
541310 tot-cap 2.40860E+02
541320 to 541310 8.84048E-03
541320 to 541300 1.87500E-05
541320 to 541330 8.41305E-01
541320 to 531320 6.77785E-06
541320 to 10010 6.77785E-06
541320 to 531310 2.84930E-07
541320 to 10020 2.84930E-07
541320 to 531300 3.83659E-08
541320 to 10030 3.83659E-08
541320 to 521290 8.30858E-07
541320 to 20040 8.30858E-07
541320 tot-cap 8.50172E-01
541350 to 541360 1.44670E+06
541350 tot-cap 1.44670E+06
541360 to 541350 1.51222E-02
541360 to 541340 4.61869E-05
541360 to 541370 1.18642E-01
541360 to 531360 2.79290E-07

541360	to 10010	2.79290E-07
541360	to 531350	1.03961E-07
541360	to 10020	1.03961E-07
541360	to 531340	2.34866E-08
541360	to 10030	2.34866E-08
541360	to 521330	2.34241E-07
541360	to 20040	2.34241E-07
541360	tot-cap	1.33811E-01
551330	to 551320	7.08146E-03
551330	to 551340	9.32952E+01
551330	to 541330	7.78062E-04
551330	to 10010	7.78062E-04
551330	to 531300	1.21005E-05
551330	to 20040	1.21005E-05
551330	tot-cap	9.33011E+01
551340	to 551350	1.22130E+02
551340	tot-cap	1.22130E+02
551350	to 551360	1.93162E+01
551350	tot-cap	1.93162E+01
551370	to 551380	2.08031E-01
551370	tot-cap	2.08031E-01
561360	to 561370	8.14606E-01
561360	tot-cap	8.14606E-01
571390	to 571400	7.56554E+00
571390	tot-cap	7.56554E+00
581440	to 581450	1.14875E+00
581440	tot-cap	1.14875E+00
591410	to 591400	5.07440E-03
591410	to 591390	1.45800E-06
591410	to 571370	2.19084E-06
591410	to 20040	4.52882E-05
591410	to 581400	1.54905E-05
591410	to 10010	4.43067E-05
591410	to 591420	1.11551E+01
591410	to 581410	4.17447E-05
591410	to 10020	1.29286E-05
591410	to 581390	1.35585E-06
591410	to 10030	1.35585E-06
591410	to 571390	1.30942E-08
591410	to 20030	1.30942E-08
591410	to 571380	4.30973E-05
591410	tot-cap	1.11608E+01
591430	to 591440	9.16495E+01
591430	tot-cap	9.16495E+01
601430	to 601420	7.77088E-02
601430	to 601410	7.92624E-06
601430	to 581390	1.75011E-05
601430	to 20040	4.88975E-04
601430	to 591420	3.31708E-06
601430	to 10010	3.42954E-05
601430	to 601440	1.94951E+02
601430	to 591430	3.30457E-05
601430	to 10020	2.06737E-06
601430	to 591410	2.97908E-06
601430	to 10030	2.97908E-06
601430	to 581410	1.43133E-08
601430	to 20030	1.43133E-08
601430	to 581400	4.71414E-04
601430	tot-cap	1.95029E+02
601450	to 601440	9.97664E-02

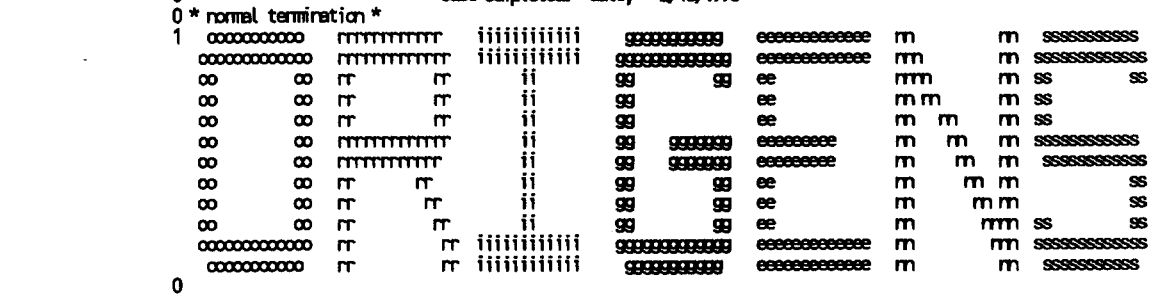
601450 to 601430 1.01175E-04
601450 to 581410 7.23125E-06
601450 to 20040 1.81711E-04
601450 to 591440 1.90050E-06
601450 to 10010 1.23862E-05
601450 to 601460 7.22582E+01
601450 to 591450 1.16281E-05
601450 to 10020 1.14244E-06
601450 to 591430 1.80107E-06
601450 to 10030 1.80107E-06
601450 to 581430 3.66699E-09
601450 to 20030 3.66699E-09
601450 to 581420 1.74479E-04
601450 tot-cap 7.23582E+01
601470 to 601480 1.69168E+02
601470 tot-cap 1.69168E+02
611470 to 611460 2.72616E-02
611470 to 611450 8.50608E-05
611470 to 591430 7.58435E-06
611470 to 20040 7.05508E-05
611470 to 601460 1.04371E-05
611470 to 10010 2.38494E-05
611470 to 611480 5.36551E+02
611470 to 601470 2.12576E-05
611470 to 10020 7.84523E-06
611470 to 601450 2.96207E-06
611470 to 10030 2.96207E-06
611470 to 591450 4.45355E-09
611470 to 20030 4.45355E-09
611470 to 591440 6.29665E-05
611470 tot-cap 5.36578E+02
611480 to 611490 1.15266E+04
611480 tot-cap 1.15266E+04
621470 to 621460 7.11243E-02
621470 to 621450 6.40362E-03
621470 to 601430 5.62185E-05
621470 to 20040 1.09573E-03
621470 to 611460 1.29063E-04
621470 to 10010 1.85403E-04
621470 to 621480 2.08808E+02
621470 to 611470 1.63646E-04
621470 to 10020 1.07306E-04
621470 to 611450 1.15222E-04
621470 to 10030 1.15222E-04
621470 to 601450 5.30158E-06
621470 to 20030 5.30158E-06
621470 to 601440 1.03752E-03
621470 to 621471 1.45472E+00
621470 tot-cap 2.08887E+02
621490 to 621480 4.02107E-02
621490 to 621470 3.19192E-05
621490 to 621500 4.47195E+04
621490 to 611490 4.15418E-04
621490 to 10010 4.15418E-04
621490 to 601460 4.15418E-04
621490 to 20040 4.15418E-04
621490 tot-cap 4.47195E+04
621500 to 621510 1.24848E+02
621500 tot-cap 1.24848E+02
621510 to 621500 1.34695E-01

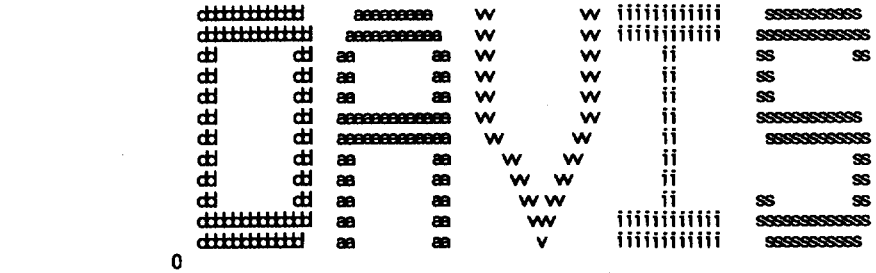
621510 to 621490 1.20109E-04
621510 to 601470 1.35716E-05
621510 to 20040 1.06235E-04
621510 to 611500 1.64465E-06
621510 to 10010 1.28376E-05
621510 to 621520 4.81862E+03
621510 to 611510 1.18528E-05
621510 to 10020 6.39831E-07
621510 to 611490 1.16285E-06
621510 to 10030 1.16285E-06
621510 to 601490 1.19796E-09
621510 to 20030 1.19796E-09
621510 to 601480 9.26637E-05
621510 tot-cap 4.81876E+03
621520 to 621510 1.60840E-02
621520 to 621500 1.08680E-04
621520 to 601480 2.42985E-06
621520 to 20040 1.00951E-05
621520 to 611510 6.96662E-07
621520 to 10010 2.05583E-06
621520 to 621530 6.81767E+02
621520 to 611520 1.82621E-06
621520 to 10020 4.67044E-07
621520 to 611500 1.21467E-07
621520 to 10030 1.21467E-07
621520 to 601500 3.68114E-10
621520 to 20030 3.68114E-10
621520 to 601490 7.66524E-06
621520 tot-cap 6.81788E+02
631530 to 631520 1.56213E-02
631530 to 631510 2.33275E-05
631530 to 611490 3.85358E-05
631530 to 20040 5.50264E-04
631530 to 621520 6.54189E-06
631530 to 10010 5.55667E-05
631530 to 631540 5.68632E+02
631530 to 621530 5.33315E-05
631530 to 10020 4.30669E-06
631530 to 621510 9.64501E-07
631530 to 10030 9.64501E-07
631530 to 611510 2.20463E-08
631530 to 20030 2.20463E-08
631530 to 611500 5.11728E-04
631530 tot-cap 5.68648E+02
631540 to 631530 2.49726E-02
631540 to 631520 8.97066E-06
631540 to 611500 8.72236E-11
631540 to 20040 6.56784E-04
631540 to 621530 1.96376E-06
631540 to 10010 1.05938E-05
631540 to 631550 1.02480E+03
631540 to 621540 1.05938E-05
631540 to 10020 1.96267E-06
631540 to 621520 3.32532E-06
631540 to 10030 3.32532E-06
631540 to 611520 1.40944E-08
631540 to 20030 1.40944E-08
631540 to 611510 6.56784E-04
631540 tot-cap 1.02483E+03
631550 to 631540 2.05034E-02

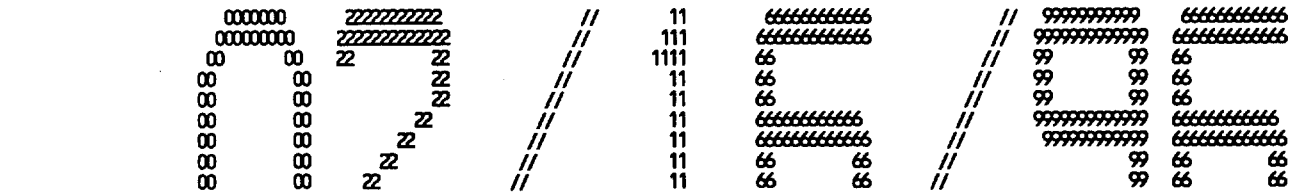
631550	to 631530	5.74142E-05
631550	to 611510	1.54638E-06
631550	to 20040	7.61090E-06
631550	to 621540	3.13069E-06
631550	to 10010	6.58607E-06
631550	to 631560	2.50523E+03
631550	to 621550	5.06278E-06
631550	to 10020	1.60740E-06
631550	to 621530	5.32104E-07
631550	to 10030	5.32104E-07
631550	to 611530	1.20604E-10
631550	to 20030	1.20604E-10
631550	to 611520	6.06452E-06
631550	tot-cap	2.50525E+03
641550	to 641560	1.68972E+04
641550	tot-cap	1.68972E+04
922340	to 922330	5.37161E-03
922340	fission	3.86763E+00
922340	nu-sigf	1.01609E+01
922340	to 922320	7.78853E-05
922340	to 922350	1.69442E+02
922340	to 922341	2.60942E+00
922340	tot-cap	1.73315E+02
922350	to 922340	2.46199E-02
922350	fission	3.51653E+02
922350	nu-sigf	8.51468E+02
922350	to 922330	2.34617E-05
922350	to 922360	8.13681E+01
922350	to 922351	7.42194E-02
922350	tot-cap	4.33045E+02
922360	to 922350	2.73641E-02
922360	fission	1.65349E+00
922360	nu-sigf	4.53531E+00
922360	to 922340	3.64673E-04
922360	to 922370	6.97858E+01
922360	to 922361	2.85478E+00
922360	tot-cap	7.14670E+01
922380	to 922370	5.46600E-02
922380	fission	8.27057E-01
922380	nu-sigf	2.32670E+00
922380	to 922360	3.53195E-04
922380	to 922390	7.61294E+00
922380	tot-cap	8.49501E+00
952370	to 952360	1.24589E-02
952370	fission	4.48514E+00
952370	nu-sigf	1.35001E+01
952370	to 952350	4.76640E-05
952370	to 952380	2.78086E+02
952370	to 952371	6.69106E-01
952370	tot-cap	2.82589E+02
942380	to 942370	2.00260E-03
942380	fission	2.02106E+01
942380	nu-sigf	5.72261E+01
942380	to 942360	1.12078E-05
942380	to 942390	2.57609E+02
942380	to 942381	2.60790E+00
942380	tot-cap	2.77822E+02
942390	to 942380	1.06246E-02
942390	fission	8.54735E+02
942390	nu-sigf	2.45731E+03

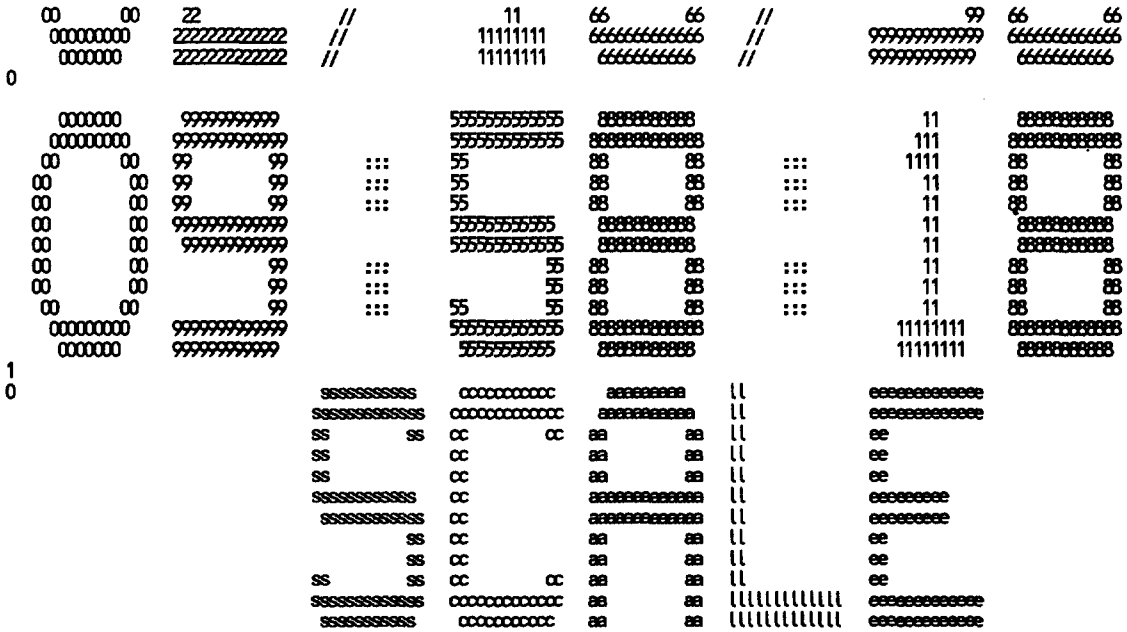
```
                    942390 to 942370  1.80436E-05
                    942390 to 942360  1.78869E-08
                    942390 to 942400  4.83359E+02
                    942390 tot-cap    1.33811E+03
                    942400 to 942390  4.98738E-03
                    942400 fission    5.21918E+00
                    942400 nu-sigf    1.63062E+01
                    942400 to 942380  4.86689E-05
                    942400 to 942410  1.91204E+03
                    942400 tot-cap    1.91727E+03
                    942410 to 942400  6.34184E-02
                    942410 fission    8.90576E+02
                    942410 nu-sigf    2.61233E+03
                    942410 to 942390  1.04138E-04
                    942410 to 942420  2.94405E+02
                    942410 tot-cap    1.18484E+03
                    942420 to 942410  2.03312E-02
                    942420 fission    3.88427E+00
                    942420 nu-sigf    1.21612E+01
                    942420 to 942400  2.47167E-04
                    942420 to 942430  2.96889E+02
                    942420 tot-cap    3.00795E+02
                    952410 fission    1.16252E+01
                    952410 nu-sigf    3.74443E+01
                    952410 to 952420  1.00417E+03
                    952410 tot-cap    1.01579E+03
                    952430 fission    2.99676E+00
                    952430 nu-sigf    1.00699E+01
                    952430 to 952440  3.82722E+02
                    952430 tot-cap    3.85718E+02
                    962440 to 962430  4.88608E-03
                    962440 fission    1.35709E+01
                    962440 nu-sigf    4.54429E+01
                    962440 to 962420  4.87258E-05
                    962440 to 962450  1.26267E+02
                    962440 to 962441  3.32706E+00
                    962440 tot-cap    1.39843E+02
0the reaction  50100 to  30070 was not used, because  50100 is not in library., (in subr pool)
                                    in the search of library number 3
0the reaction  50100 to  40090 was not used, because  50100 is not in library., (in subr pool)
                                    in the search of library number 3
0the reaction  50110 to  40090 was not used, because  50110 is not in library., (in subr pool)
                                    in the search of library number 3
0the reaction  50100 to  40100 was not used, because  50100 is not in library., (in subr pool)
                                    in the search of library number 3
0the reaction  80160 to  80161 was not used, because  80161 is not in library., (in subr pool)
0the reaction 621470 to 621471 was not used, because 621471 is not in library., (in subr pool)
0the fission product transitions for  922340 were not used.  library fissile nuclides are
   922330  922350  942410  922380  942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the reaction  922340 to 922341 was not used, because  922341 is not in library., (in subr pool)
0the reaction  922350 to 922351 was not used, because  922351 is not in library., (in subr pool)
0the fission product transitions for  922360 were not used.  library fissile nuclides are
   922330  922350  942410  922380  942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the reaction  922360 to 922361 was not used, because  922361 is not in library., (in subr pool)
0the fission product transitions for  952370 were not used.  library fissile nuclides are
   922330  922350  942410  922380  942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the reaction  952370 to 952371 was not used, because  952371 is not in library., (in subr pool)
```

```
0the fission product transitions for  942380 were not used.  library fissile nuclides are
   922330   922350   942410   922380   942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the reaction  942380 to 942381 was not used, because  942381 is not in library., (in subr pool)
0the fission product transitions for  942400 were not used.  library fissile nuclides are
   922330   922350   942410   922380   942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the fission product transitions for  942420 were not used.  library fissile nuclides are
   922330   922350   942410   922380   942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the fission product transitions for  952410 were not used.  library fissile nuclides are
   922330   922350   942410   922380   942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the fission product transitions for  952430 were not used.  library fissile nuclides are
   922330   922350   942410   922380   942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the fission product transitions for  962440 were not used.  library fissile nuclides are
   922330   922350   942410   922380   942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the reaction  962440 to 962441 was not used, because  962441 is not in library., (in subr pool)
1
0                          case completed.  date,   2/16/1996
0 * normal termination *
```










```
*****************************************************************
*****************************************************************
*****************************************************************
******                                                     ******
******              program verification information       ******
******                                                     ******
******              code system:   scale  version:  4.2    ******
******                                                     ******
*****************************************************************
*****************************************************************
******                                                     ******
******                                                     ******
******          program:  c0c004                           ******
******                                                     ******
******       creation date:  04/27/95                      ******
******                                                     ******
******          library:  /nautronics/scale/exe            ******
******                                                     ******
******                                                     ******
******  this is not a  scale  configuration controlled code******
******                                                     ******
******          jobname:  davis                            ******
******                                                     ******
******  date of execution:  02/16/96                       ******
******                                                     ******
```

```
                    *****    time of execution:  09:58:18                                    *****
                    *****                                                                    *****
                    *****                                                                    *****
                    ************************************************************************
                    ************************************************************************
                    ************************************************************************
1
0       -1q array has       1 entries.
0        0q array has       1 entries.
0        0q array has       1 entries.
0        0q array has       1 entries.
0        0q array has       1 entries.
0         dbl. prec. machine word applied has, at least, a 16 significant figure accuracy.
0             short-lived split test fraction, qxn =    9.1188E-04
0             half-norm of matrix used, axn =    7.0000E+00
0             4-place-accuracy-retention ratio, ratio4 =    6.4516E-13
0        1q array has      20 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        4q array has       1 entries.
0       54q array has      12 entries.
1library information...

          cross-section data taken from position number  1 of library on unit 15.

          pass  2
          pass  1
          pass  0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass  1
          pass  0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ************************************************************************
          *                                                                      *
          *           prelim lwr origen-s binary working library--id = 1143      *
          *         made from modified card-image origen-s libraries of scale 4.2*
          *       data from the light element, actinide, and fission product libraries*
          *         decay data, including gamma and total energy, are from endf/b-vi*
          *                                                                      *
          *      neutron flux spectrum factors and cross sections were produced from*
          *     the "presas2" case updating all nuclides on the scale "burnup" library*
          *                                                                      *
          *                  fission product yields are from endf/b-v            *
          *                                                                      *
          *              photon libraries use an 18-energy-group structure       *
          *             the photon data are from the master photon data base,    *
          *              produced to include bremsstrahlung from ua2 matrix      *
          *                                                                      *
          *        see information above this box (if present) for later updates *
          *                                                                      *
          ************************************************************************
```

```
0       ******************************************************************************
0                .other identification and sizes of library.
0                 data set name:  ft15f001
0               2/16/1996    date library was produced
0                  1697    total number of nuclides in library
                    689    number of light-element nuclides
                    129    number of actinide nuclides
                    879    number of fission product nuclides
0                  7935    number of nonzero off-diagonal matrix elements
0       ******************************************************************************
1
```

sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp actinides page 1
power= 8.466E-05mw, burnup=2.0318E-02mwd, flux= 1.64E+13n/cm**2-sec

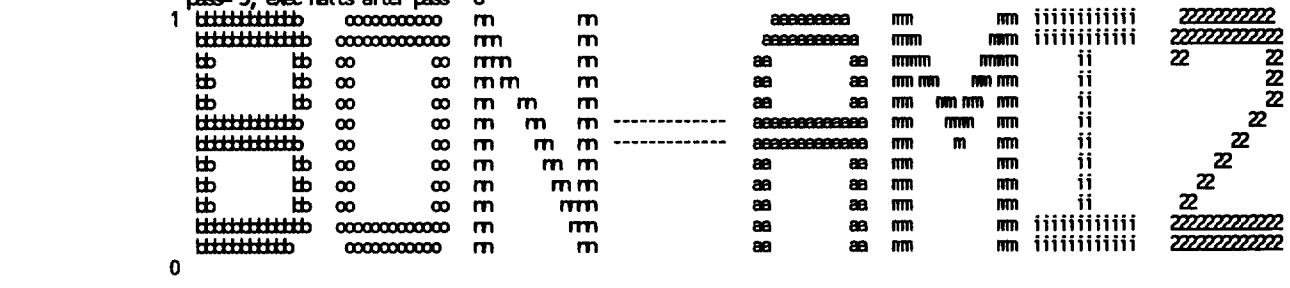
0 nuclide concentrations, gram atoms
basis = converted to atoms/(barn-cm)

	charge	200.0 d	240.0 d	280.0 d	320.0 d	320.0 d	360.0 d	400.0 d
u230	3.02E-22	4.37E-22	5.84E-22	7.51E-22	9.43E-22	9.43E-22	1.17E-21	1.42E-21
u231	8.18E-21	1.15E-20	1.44E-20	1.82E-20	2.23E-20	2.22E-20	2.69E-20	3.22E-20
u232	1.07E-13	1.44E-13	1.87E-13	2.36E-13	2.94E-13	2.94E-13	3.61E-13	4.37E-13
u233	9.03E-12	1.12E-11	1.33E-11	1.52E-11	1.71E-11	1.71E-11	1.89E-11	2.06E-11
u234	5.35E-06	5.30E-06	5.25E-06	5.19E-06	5.14E-06	5.14E-06	5.10E-06	5.05E-06
u235	6.26E-04	6.11E-04	5.96E-04	5.82E-04	5.67E-04	5.67E-04	5.54E-04	5.40E-04
u236	1.53E-05	1.81E-05	2.08E-05	2.34E-05	2.59E-05	2.59E-05	2.84E-05	3.08E-05
u237	2.96E-08	3.35E-08	3.61E-08	3.85E-08	4.09E-08	4.08E-08	4.32E-08	4.55E-08
u238	2.20E-02	2.20E-02	2.20E-02	2.20E-02	2.20E-02	2.20E-02	2.20E-02	2.20E-02
u239	4.13E-09	5.62E-09	5.59E-09	5.58E-09	5.57E-09	3.23E-09	5.56E-09	5.55E-09
u240	.00E+00	2.57E-39	1.87E-38	9.93E-38	4.17E-37	4.17E-37	1.47E-36	4.50E-36
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	1.51E-15	2.54E-15	3.82E-15	5.38E-15	7.21E-15	7.21E-15	9.31E-15	1.17E-14
np236m	6.04E-15	8.73E-15	1.11E-14	1.36E-14	1.62E-14	1.60E-14	1.89E-14	2.18E-14
np236	1.12E-13	1.91E-13	2.93E-13	4.21E-13	5.75E-13	5.75E-13	7.57E-13	9.68E-13
np237	3.67E-07	4.91E-07	6.25E-07	7.67E-07	9.16E-07	9.17E-07	1.07E-06	1.24E-06
np238	4.33E-10	5.93E-10	7.52E-10	9.21E-10	1.10E-09	1.09E-09	1.28E-09	1.48E-09
np239	7.84E-07	8.11E-07	8.08E-07	8.05E-07	8.04E-07	8.08E-07	8.02E-07	8.02E-07
np240m	.00E+00	2.19E-41	1.59E-40	8.48E-40	3.56E-39	3.56E-39	1.25E-38	3.84E-38
np240	1.15E-11	1.36E-11	1.35E-11	1.35E-11	1.34E-11	1.09E-11	1.34E-11	1.34E-11
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	1.46E-13	2.47E-13	3.77E-13	5.37E-13	7.27E-13	7.27E-13	9.49E-13	1.20E-12
pu237	3.28E-14	4.61E-14	5.89E-14	7.12E-14	8.31E-14	8.31E-14	9.46E-14	1.06E-13
pu238	9.70E-09	1.62E-08	2.46E-08	3.51E-08	4.76E-08	4.76E-08	6.24E-08	7.96E-08
pu239	3.13E-05	3.81E-05	4.45E-05	5.03E-05	5.57E-05	5.57E-05	6.08E-05	6.54E-05
pu240	1.65E-06	2.40E-06	3.25E-06	4.17E-06	5.13E-06	5.13E-06	6.13E-06	7.16E-06
pu241	2.56E-07	4.51E-07	7.16E-07	1.05E-06	1.47E-06	1.47E-06	1.95E-06	2.51E-06
pu242	4.63E-09	1.04E-08	1.98E-08	3.41E-08	5.43E-08	5.43E-08	8.17E-08	1.17E-07
pu243	5.47E-13	1.31E-12	2.49E-12	4.27E-12	6.80E-12	6.51E-12	1.02E-11	1.46E-11
pu244	1.12E-29	1.28E-28	9.32E-28	4.95E-27	2.08E-26	2.08E-26	7.32E-26	2.24E-25
pu245	.00E+00	9.35E-35	6.81E-34	3.60E-33	1.51E-32	1.48E-32	5.32E-32	1.63E-31
pu246	.00E+00	2.11E-37	1.75E-36	9.95E-36	4.40E-35	4.40E-35	1.61E-34	5.11E-34
am239	1.95E-20	4.62E-20	8.77E-20	1.50E-19	2.37E-19	2.33E-19	3.53E-19	5.03E-19
am240	8.34E-18	1.99E-17	3.78E-17	6.45E-17	1.02E-16	1.02E-16	1.52E-16	2.17E-16
am241	1.37E-09	3.09E-09	5.89E-09	1.01E-08	1.60E-08	1.60E-08	2.39E-08	3.40E-08
am242m	9.02E-12	2.46E-11	5.45E-11	1.05E-10	1.84E-10	1.84E-10	2.99E-10	4.59E-10
am242	1.59E-12	3.56E-12	6.77E-12	1.16E-11	1.83E-11	1.81E-11	2.73E-11	3.88E-11
am243	6.20E-11	1.82E-10	4.26E-10	8.61E-10	1.57E-09	1.57E-09	2.67E-09	4.26E-09
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	1.97E-14	6.03E-14	1.40E-13	2.83E-13	5.17E-13	5.06E-13	8.75E-13	1.40E-12
am245	.00E+00	8.66E-33	6.24E-32	3.26E-31	1.35E-30	1.35E-30	4.69E-30	1.42E-29
am246	.00E+00	5.25E-40	4.38E-39	2.49E-38	1.10E-37	1.10E-37	4.03E-37	1.28E-36
totals	2.27E-02	2.27E-02	2.27E-02	2.27E-02	2.26E-02	2.26E-02	2.26E-02	2.26E-02

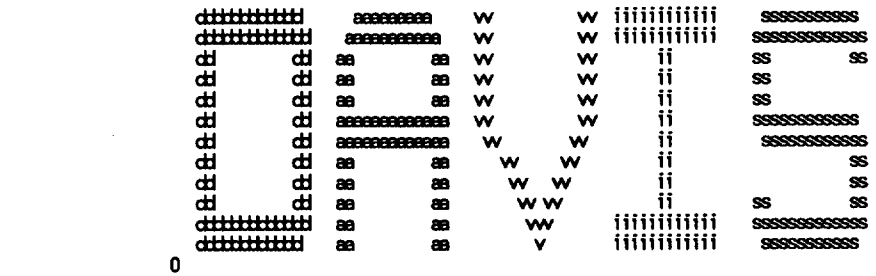
```
0   flux             1.65E+13  1.64E+13  1.64E+13  1.64E+13   .00E+00  1.64E+13  1.63E+13
0  .results on logical unit no. 71, position  1, for time step  7, subcase 1. (run position 1, case position 1)
   title: sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0  .results on logical unit no. 71, position  2, for time step  5, subcase 1. (run position 1, case position 1)
   title: sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0  .results on logical unit no. 71, position  3, for time step  4, subcase 1. (run position 1, case position 1)
   title: sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0     .terminated logical unit no. 71 with zero flag record.
1  * normal termination of execution *
0                                      table of contents for material tables
0                                        case or subcase printed      page

                                                     1                1
0ndset         33
           15          4          1         27          6          0          0          0          0          0
            0          0          0          0          0          0         -1       1698        690        130
          880       7935          0          5         99          2         16         96         18         18
           18          0         71
0        56q array has      2 entries.
0        56q array has      1 entries.
0        56q array has      1 entries.
0        56q array has      1 entries.
0        56q array has      1 entries.
0        56q array has      1 entries.
0        56q array has      1 entries.
0        57q array has      3 entries.
0          1q array has     20 entries.
0          1q array has     10 entries.
     l90   97376
     l116  60826
     l32   33663 nudata (library) storage size
     l44   33734
     l103  75953
0        58q array has      4 entries.
0        60q array has      7 entries.
0        58q array has      7 entries.
0        66q array has      1 entries.
0        73q array has   1697 entries.
0        74q array has   1697 entries.
0        75q array has   1697 entries.
     l140  66991
     used   101044 in size   200000
0jopt          12
            0          0          0          0          0          0          0          0          0          0
            0          0
0therm          4
  5.092282E-01 3.846097E-01 2.931669E+00 1.000000E-31
0non            5
         7935         20          6         18       1697
0mm            19
            7          7          0          0          1          1          0          0          0          0
           21        100       1697          4          3         74          4          1          0
0tconst         5
  8.640000E+04 1.600064E+02  .000000E+00  .000000E+00 1.000000E-08
0nzero          4
            0        689        129        879
0pow            3
   .000000E+00  .000000E+00  .000000E+00
0 lirp          9
            6          0         51         26          2       3000       1000       1697         94
```

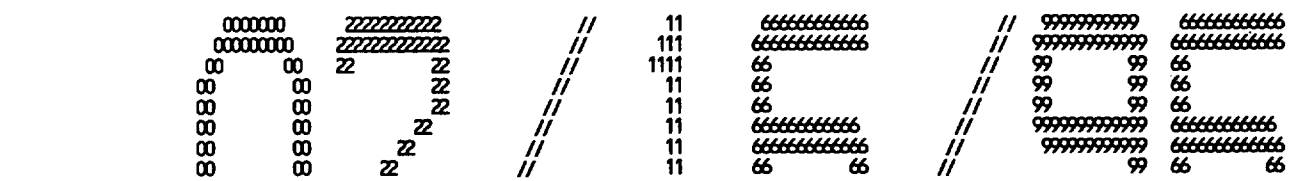
```
 n-gamma, fission and total mev/fission =          5.2408E+00     1.9492E+02     2.0016E+02
 start of interval flux =        1.65204E+13
 n-gamma, fission and total mev/fission =          5.3397E+00     1.9505E+02     2.0039E+02
 start of interval flux =        1.64592E+13
 n-gamma, fission and total mev/fission =          5.4422E+00     1.9518E+02     2.0062E+02
 start of interval flux =        1.64118E+13
 n-gamma, fission and total mev/fission =          5.5462E+00     1.9530E+02     2.0085E+02
 start of interval flux =        1.63779E+13
 start of interval flux =         .00000E+00
 n-gamma, fission and total mev/fission =          5.6579E+00     1.9542E+02     2.0107E+02
 start of interval flux =        1.63548E+13
 n-gamma, fission and total mev/fission =          5.7568E+00     1.9553E+02     2.0128E+02
 start of interval flux =        1.63432E+13
0 case or subcase    1  sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0       56q array has     20 entries.
0       56q array has      1 entries.
0       56q array has      1 entries.
0       56q array has     20 entries.
0       56q array has      1 entries.
0       56q array has      1 entries.
0       56q array has     20 entries.
0       56q array has     20 entries.
0requested parm=halt8,skipcellwt,skipshipdata
  pass= 3, exec halts after pass  8
```

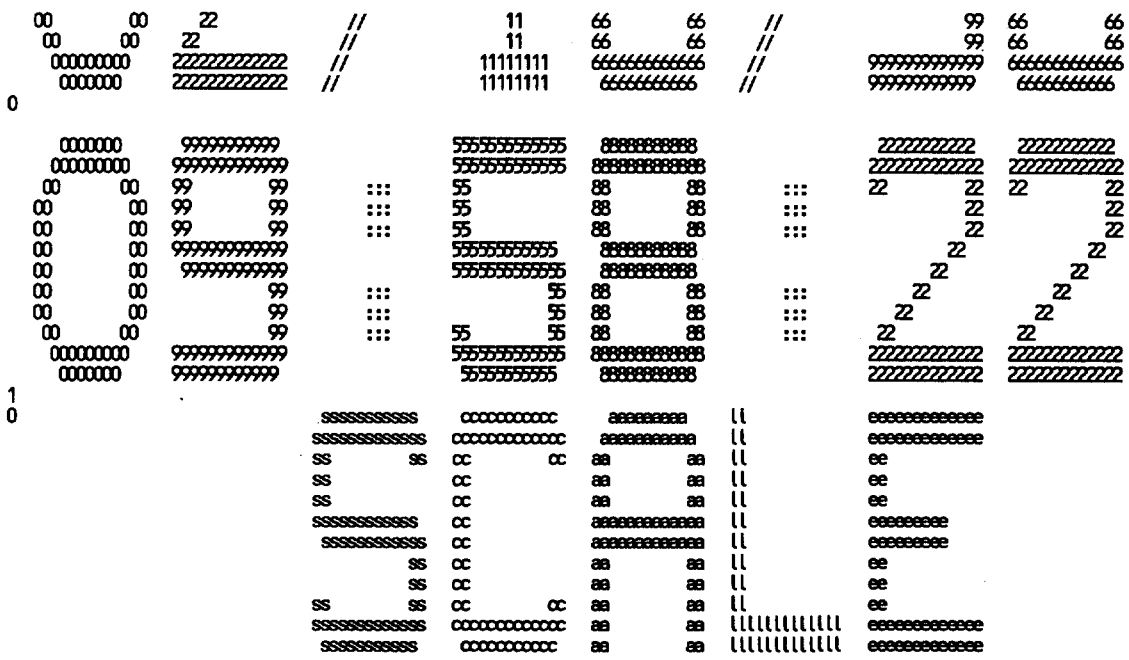


```
0
```



```
0
```






```
*****************************************************************
*****************************************************************
*****************************************************************
*****                                                       *****
*****                program verification information       *****
*****                                                       *****
*****                code system:   scale  version:   4.2   *****
*****                                                       *****
*****************************************************************
*****************************************************************
*****                                                       *****
*****                                                       *****
*****           program:  c0c008                            *****
*****                                                       *****
*****      creation date:  04/27/95                         *****
*****                                                       *****
*****           library:  /nautronics/scale/exe             *****
*****                                                       *****
*****                                                       *****
*****  this is not a  scale  configuration controlled code  *****
*****                                                       *****
*****           jobname:  davis                             *****
*****                                                       *****
*****  date of execution:  02/16/96                         *****
```

```
                    *****                                                  *****
                    *****   time of execution:  09:58:22                   *****
                    *****                                                  *****
                    *****                                                  *****
                    ********************************************************************
                    ********************************************************************
                    ********************************************************************

1
0      -1q array has      1 entries.
0       0q array has      4 entries.
0       1q array has      6 entries.
0       2q array has      2 entries.
1logical assignments
0master library   12
 working library   0
 scratch file     18
 new library       1
0p r o b l e m   d e s c r i p t i o n
0igr--geometry (0/1/2/3--inf med/slab/cyl/sphere              2
0izm--number of zones or material regions                     4
0ms--mixing table length                                     66
0ibl--shielded cross section edit option (0/1--no/yes)        0
0ibr--bondarenko factor edit option (0/1--no/yes)             0
0issopt--dancoff factor option                                0
0convergence criterion    1.00000E-03
0geometry correction factor for wigner rational approximation  1.350E+00
0       3q array has     66 entries.
0       4q array has     66 entries.
0       5q array has     66 entries.
0       6q array has      4 entries.
0       7q array has      4 entries.
0       8q array has      4 entries.
0       9q array has      4 entries.
0      10q array has     66 entries.
0      11q array has      4 entries.
0m i x i n g   t a b l e
0entry  mixture   isotope   number density   new identifier
    1        1     92235    5.40480E-04           92235
    2        1     92234    5.04673E-06           92234
    3        1     92236    3.08086E-05           92236
    4        1     92238    2.19627E-02           92238
    5        1      8016    4.55359E-02            8016
    6        3      8016    2.09710E-02               6
    7        1     36083    7.25090E-07           36083
    8        1     36085    3.50117E-07           36085
    9        1     38090    7.86170E-06           38090
   10        1     39089    5.47406E-06           39089
   11        1     42095    6.12150E-06           42095
   12        1     40093    5.98109E-06           40093
   13        1     40094    9.26342E-06           40094
   14        1     40095    2.10190E-06           40095
   15        1     41094    3.60192E-12           41094
   16        1     43099    8.96719E-06           43099
   17        1     45103    4.40586E-06           45103
   18        1     45105    1.67519E-08           45105
   19        1     44101    7.89901E-06           44101
   20        1     44106    1.14008E-06           44106
   21        1     46105    2.49116E-06           46105
   22        1     46108    5.44054E-07           46108
   23        1     47109    3.91284E-07           47109
```

```
   24      1       51124    1.00596E-10          51124
   25      1       54131    4.16287E-06          54131
   26      1       54132    7.00585E-06          54132
   27      1       54135    6.60408E-09          54135
   28      1       54136    1.50336E-05          54136
   29      1       55134    2.22576E-07          55134
   30      1       55135    4.71145E-06          55135
   31      1       55137    9.46756E-06          55137
   32      1       56136    4.32042E-08          56136
   33      1       57139    9.43297E-06          57139
   34      1       59141    7.61682E-06          59141
   35      1       59143    3.93553E-07          59143
   36      1       58144    5.00712E-06          58144
   37      1       60143    7.75909E-06          60143
   38      1       60145    5.63501E-06          60145
   39      1       61147    2.48433E-06          61147
   40      1       61148    6.82848E-09          61148
   41      1       60147    1.32716E-07          60147
   42      1       62147    3.65895E-07          62147
   43      1       62149    7.51956E-08          62149
   44      1       62150    1.75200E-06          62150
   45      1       62151    2.87244E-07          62151
   46      1       62152    8.48904E-07          62152
   47      1       64155    7.98151E-10          64155
   48      1       63153    3.95032E-07          63153
   49      1       63154    4.62875E-08          63154
   50      1       63155    5.11217E-08          63155
   51      2       40302    4.25156E-02          40302
   52      3        1001    4.19420E-02           1001
   53      3        5010    3.81515E-06           5010
   54      3        5011    1.54884E-05           5011
   55      1       55133    9.78898E-06          55133
   56      1       95237    1.23726E-06          95237
   57      1       94238    7.95918E-08          94238
   58      1       94239    6.54028E-05          94239
   59      1       94240    7.15776E-06          94240
   60      1       94241    2.50939E-06          94241
   61      1       94242    1.17254E-07          94242
   62      1       95241    3.39704E-08          95241
   63      1       95243    4.26479E-09          95243
   64      1       96244    1.64658E-10          96244
   65      1         999    1.00000E-20            999
   66      4         999    1.00000E-20             66
0geometry and material description
0zone   mixture   outer dimension   temperature      extra xs   type (0/1--fuel/mod)
    1         1      4.68122E-01    9.75000E+02   9.05844E-01              0
    2         4      4.78790E-01    2.93000E+02   5.49010E-01              0
    3         2      5.46100E-01    6.50000E+02    .00000E+00              0
    4         3      8.13968E-01    6.07600E+02    .00000E+00              0
     7711 locations of   200000 available are required to make a new master containing the self-shielded values
0no nuclides in your problem have bondarenko factor data**bonami will copy from logical 12 to logical  1
0copy       999  1/v cross sectio from log 12 to log 18    bondarenko trigger 0
0copy       999  1/v cross sectio from log 18 to log  1    bondarenko trigger 0
0copy       999  1/v cross sectio from log 18 to log  1    bondarenko trigger 0
0copy      1001   hydrogen        from log 12 to log  1    bondarenko trigger 0
0copy      5010  b-10 1273 218ngp from log 12 to log  1    bondarenko trigger 0
0copy      5011   boron-11        from log 12 to log  1    bondarenko trigger 0
0copy      8016   oxygen-16       from log 12 to log 18    bondarenko trigger 0
0copy      8016   oxygen-16       from log 18 to log  1    bondarenko trigger 0
0copy      8016   oxygen-16       from log 18 to log  1    bondarenko trigger 0
```

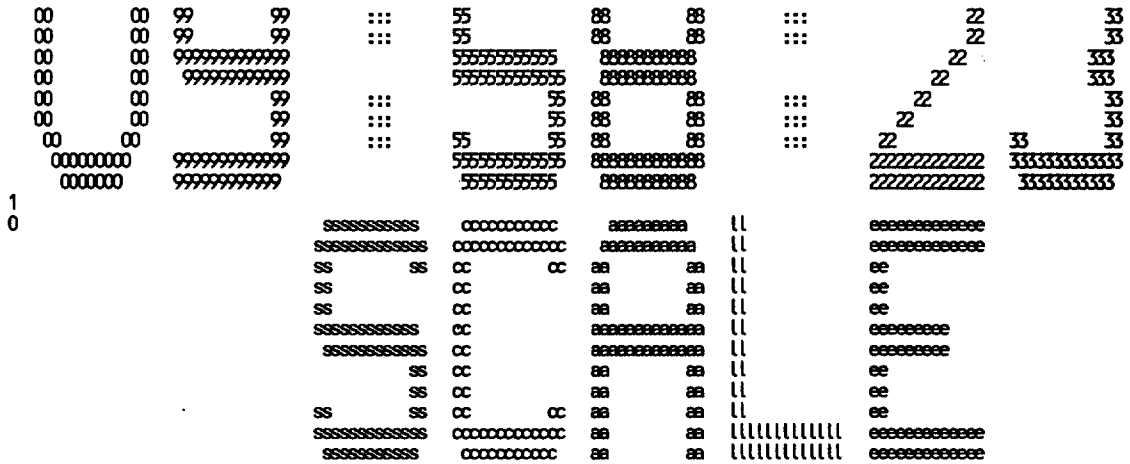
```
0copy    36083  kr-83          from log 12 to log  1   bondarenko trigger 0
0copy    36085  kr-85          from log 12 to log  1   bondarenko trigger 0
0copy    38090  sr-90          from log 12 to log  1   bondarenko trigger 0
0copy    39089   y-89          from log 12 to log  1   bondarenko trigger 0
0copy    40093  zr-93          from log 12 to log  1   bondarenko trigger 0
0copy    40094  zr-94          from log 12 to log  1   bondarenko trigger 0
0copy    40095  zr-95          from log 12 to log  1   bondarenko trigger 0
0copy    40302  zircalloy      from log 12 to log  1   bondarenko trigger 0
0copy    41094  rb-94          from log 12 to log  1   bondarenko trigger 0
0copy    42095  mo-95          from log 12 to log  1   bondarenko trigger 0
0copy    43099  tc-99          from log 12 to log  1   bondarenko trigger 0
0copy    44101  ru-101         from log 12 to log  1   bondarenko trigger 0
0copy    44106  ru-106         from log 12 to log  1   bondarenko trigger 0
0copy    45103  rh-103         from log 12 to log  1   bondarenko trigger 0
0copy    45105  rh-105         from log 12 to log  1   bondarenko trigger 0
0copy    46105  pd-105         from log 12 to log  1   bondarenko trigger 0
0copy    46108  pd-108         from log 12 to log  1   bondarenko trigger 0
0copy    47109  silver-109     from log 12 to log  1   bondarenko trigger 0
0copy    51124  sb-124         from log 12 to log  1   bondarenko trigger 0
0copy    54131  xe-131         from log 12 to log  1   bondarenko trigger 0
0copy    54132  xe-132         from log 12 to log  1   bondarenko trigger 0
0copy    54135  xenon-135      from log 12 to log  1   bondarenko trigger 0
0copy    54136  xe-136         from log 12 to log  1   bondarenko trigger 0
0copy    55133  cesium-133     from log 12 to log  1   bondarenko trigger 0
0copy    55134  cs-134         from log 12 to log  1   bondarenko trigger 0
0copy    55135  cs-135         from log 12 to log  1   bondarenko trigger 0
0copy    55137  cs-137         from log 12 to log  1   bondarenko trigger 0
0copy    56136  ba-136         from log 12 to log  1   bondarenko trigger 0
0copy    57139  la-139         from log 12 to log  1   bondarenko trigger 0
0copy    58144  ce-144         from log 12 to log  1   bondarenko trigger 0
0copy    59141  pr-141         from log 12 to log  1   bondarenko trigger 0
0copy    59143  pr-143         from log 12 to log  1   bondarenko trigger 0
0copy    60143  nd-143         from log 12 to log  1   bondarenko trigger 0
0copy    60145  nd-145         from log 12 to log  1   bondarenko trigger 0
0copy    60147  nd-147         from log 12 to log  1   bondarenko trigger 0
0copy    61147  pm-147         from log 12 to log  1   bondarenko trigger 0
0copy    61148  pm-148         from log 12 to log  1   bondarenko trigger 0
0copy    62147  sm-147         from log 12 to log  1   bondarenko trigger 0
0copy    62149  sm-149         from log 12 to log  1   bondarenko trigger 0
0copy    62150  sm-150         from log 12 to log  1   bondarenko trigger 0
0copy    62151  sm-151         from log 12 to log  1   bondarenko trigger 0
0copy    62152  sm-152         from log 12 to log  1   bondarenko trigger 0
0copy    63153  eu-153         from log 12 to log  1   bondarenko trigger 0
0copy    63154  eu-154         from log 12 to log  1   bondarenko trigger 0
0copy    63155  eu-155         from log 12 to log  1   bondarenko trigger 0
0copy    64155  gd-155         from log 12 to log  1   bondarenko trigger 0
0copy    92234  u-234 1043 sigo= from log 12 to log  1   bondarenko trigger 0
0copy    92235   uranium-235   from log 12 to log  1   bondarenko trigger 0
0copy    92236  u-236 1163 sigo= from log 12 to log  1   bondarenko trigger 0
0copy    92238   uranium-238   from log 12 to log  1   bondarenko trigger 0
0copy    93237   neptunium-237 from log 12 to log  1   bondarenko trigger 0
0copy    94238  pu-238 1050 sigo from log 12 to log  1   bondarenko trigger 0
0copy    94239   plutonium-239 from log 12 to log  1   bondarenko trigger 0
0copy    94240   plutonium-240 from log 12 to log  1   bondarenko trigger 0
0copy    94241   plutonium-241 from log 12 to log  1   bondarenko trigger 0
0copy    94242   plutonium-242 from log 12 to log  1   bondarenko trigger 0
0copy    95241  am-241 1056 sigo from log 12 to log  1   bondarenko trigger 0
0copy    95243  am-243 1057 218 from log 12 to log  1   bondarenko trigger 0
0copy    96244   curium-244    from log 12 to log  1   bondarenko trigger 0
1     scale 4.2 - 27 group neutron burnup library
```

based on endf-b version 4 data with endf-b version 5 fission products
compiled for nrc 1/27/89
last updated 9/16/93
l.m.petrie - ornl

tape id	4321	number of nuclides	66
number of neutron groups	27	number of gamma groups	0
first thermal group	15	logical unit	1

table of contents

```
       gd-155        mt=102                          updated 10/13/89             id    64155
     u-234 1043 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                          id    92234
       uranium-235    endf/b-iv mat 1261             updated 10/13/89             id    92235
     u-236 1163 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                          id    92236
       uranium-238    endf/b-iv mat 1262             updated 10/13/89             id    92238
       neptunium-237  endf/b-iv mat 1263             updated 10/13/89             id    93237
     pu-238 1050 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                         id    94238
       plutonium-239  endf/b-iv mat 1264             updated 10/13/89             id    94239
       plutonium-240  endf/b-iv mat 1265             updated 10/13/89             id    94240
       plutonium-241  endf/b-iv mat 1266             updated 10/13/89             id    94241
       plutonium-242  endf/b-iv mat 1161             updated 10/13/89             id    94242
     am-241 1056 sigo=5+4 newxlacs 218ngp p-3 293k                                id    95241
     am-243 1057 218 gp wt f-1/e-m 090376 p3 293k                                 id    95243
       curium-244     endf/b-iv mat 1162             updated 10/13/89             id    96244
0       tape copy used      0 i/o's, and took    .00 seconds
1              m         m iiiiiiiiiiii  tttttttttttt    aaaaaaaaaa   ww         ww ll
               mm        m iiiiiiiiiiii  tttttttttttt   aaaaaaaaaaaa  ww         ww ll
               mmm       m      ii            tt       aa        aa  ww         ww ll
               m m       m      ii            tt       aa        aa  ww         ww ll
               m  m      m      ii            tt       aa        aa  ww         ww ll
               m   m     m      ii            tt       aaaaaaaaaaaa  ww    w    ww ll
               m    m    m      ii            tt       aaaaaaaaaaaa  ww   www   ww ll
               m     m   m      ii            tt       aa        aa  ww  ww ww  ww ll
               m      m  m      ii            tt       aa        aa  ww ww   ww ww ll
               m       mmm      ii            tt       aa        aa  wwww     wwww ll
               m        mm iiiiiiiiiiii       tt       aa        aa  www       www llllllllllll
               m         m iiiiiiiiiiii       tt       aa        aa  ww         ww llllllllllll
0
   dddddddddddd    aaaaaaaaaa   w          w iiiiiiiiiiii   ssssssssss
   ddddddddddddd  aaaaaaaaaaaa  w          w iiiiiiiiiiii  ssssssssssss
   dd         dd aa        aa  w          w      ii       ss        ss
   dd         dd aa        aa  w          w      ii       ss
   dd         dd aa        aa  w          w      ii       ss
   dd         dd aaaaaaaaaaaa  w          w      ii       sssssssssss
   dd         dd aaaaaaaaaaaa   w        w       ii        sssssssssss
   dd         dd aa        aa    w      w        ii                 ss
   dd         dd aa        aa     w    w         ii                 ss
   dd         dd aa        aa      w  w          ii       ss        ss
   ddddddddddddd aa        aa       ww      iiiiiiiiiiii  ssssssssssss
   dddddddddddd  aa        aa        v      iiiiiiiiiiii   ssssssssss
0
     00000000    2222222222          //       11       666666666666        //  9999999999    666666666666
    0000000000  222222222222        //       111      6666666666666       //  999999999999  6666666666666
   00      00   22        22       //       1111      66                 //   99        99  66
   00      00             22      //          11      66                //    99        99  66
   00      00             22     //           11      66               //     99        99  66
   00      00            22     //            11      666666666666    //      999999999999  666666666666
   00      00           22     //             11      6666666666666  //        99999999999  6666666666666
   00      00          22     //              11      66        66  //                  99  66        66
   00      00         22     //               11      66        66 //                   99  66        66
   00      00        22     //                11      66        66 //                   99  66        66
    0000000000  222222222222 //           11111111    6666666666666 //      999999999999  6666666666666
     00000000   222222222222 //           11111111     666666666666 //       9999999999    666666666666
0
     00000000    9999999999             555555555555  8888888888           2222222222    3333333333
    0000000000  999999999999            555555555555 888888888888         222222222222  333333333333
   00      00   99        99     :::    55           88        88    :::  22        22  33        33
```



program verification information

code system: scale version: 4.2

program: c0c002

creation date: 04/27/95

library: /neutronics/scale/exe

this is not a scale configuration controlled code

jobname: davis

date of execution: 02/16/96

time of execution: 09:58:23

1
0 -1q array has 1 entries.

```
0        0q array has      9 entries.
0        1q array has     12 entries.
0select 65 nuclides from the master  library on logical  1
         0 nuclides from the working library on logical  2
         0 nuclides from the working library on logical  3
           to create the new working library on logical  4

        61 resonance calculations have been requested
         0 output option for ampx formatted cross section data
0the storage allocated for this case is 200000 words
0        2q array has     65 entries.
0        3q array has    915 entries.
0        4q array has     65 entries.
0 general information concerning cross section library
    tape identification number             4321
    number of nuclides on tape               66
    number of neutron energy groups          27
    first thermal neutron energy group       15
    number of gamma energy groups             0
0   direct access unit number  9 requires 117 blocks of length  1484 words
- xsdrn tape   4321
                          scale 4.2 - 27 group neutron burnup library
                            based on endf-b version 4 data with endf-b version 5 fission products
                              compiled for nrc      1/27/89
                                last updated        9/16/93
                                  l.m.petrie   -    ornl
0 nuclides from xsdrn tape
     1    1/v cross sections normalized to 1.0 at 0.0253 ev                                999
     2     hydrogen       endf/b-iv mat 1269/thrm1002     updated 10/13/89              1001
     3    b-10 1273 218ngp 042375 p-3 293k                                             5010
     4     boron-11       endf/b-iv mat 1160              updated 10/13/89              5011
     5     oxygen-16      endf/b-iv mat 1276              updated 10/13/89              8016
     6     oxygen-16      endf/b-iv mat 1276              updated 10/13/89                 6
     7     kr-83          mt=102,103,103,105,106,107      updated 10/13/89             36083
     8     kr-85              mt=  102                                                 36085
     9     sr-90          mt=102                          updated 10/13/89             38090
    10      y-89          mt=102                          updated 10/13/89             39089
    11     zr-93              mt=  102                                                 40093
    12     zr-94          mt=102                          updated 10/13/89             40094
    13     zr-95          mt=102                          updated 10/13/89             40095
    14     zircalloy      endf/b-iv mat 1284              updated 10/13/89             40302
    15     nb-94          mt=102                          updated 10/13/89             41094
    16     mo-95          mt=102                          updated 10/13/89             42095
    17     tc-99          mt=102                          updated 10/13/89             43099
    18     ru-101         mt=102                          updated 10/13/89             44101
    19     ru-106         mt=102                          updated 10/13/89             44106
    20     rh-103         mt=102                          updated 10/13/89             45103
    21     rh-105             mt=  102                                                 45105
    22     pd-105         mt=102                          updated 10/13/89             46105
    23     pd-108         mt=102                          updated 10/13/89             46108
    24     silver-109     endf/b-iv mat 1139              updated 10/13/89             47109
    25     sb-124         mt=102                          updated 10/13/89             51124
    26     xe-131         mt=102,103,104,105,106          updated 10/13/89             54131
    27     xe-132         mt=102,103,104,105,106          updated 10/13/89             54132
    28     xenon-135      endf/b-iv mat 1294              updated 10/13/89             54135
    29     xe-136             mt=  102, 103, 104, 105, 107                             54136
    30     cesium-133     endf/b-iv mat 1141              updated 10/13/89             55133
    31     cs-134         mt=102                          updated 10/13/89             55134
    32     cs-135             mt=  102                                                 55135
    33     cs-137         mt=102                          updated 10/13/89             55137
```

```
    34     ba-136          mt=102                          updated 10/13/89              56136
    35     la-139          mt=102                          updated 10/13/89              57139
    36     ce-144             mt=  102                                                   58144
    37     pr-141          mt=102,103,104,105,106,107      updated 10/13/89              59141
    38     pr-143          mt=102                          updated 10/13/89              59143
    39     nd-143          mt=102                          updated 10/13/89              60143
    40     nd-145          mt=102                          updated 10/13/89              60145
    41     nd-147          mt=102                          updated 10/13/89              60147
    42     pm-147          mt=102                          updated 10/13/89              61147
    43     pm-148             mt=  102                                                   61148
    44     sm-147          endf/b-v fission product        updated 10/13/89              62147
    45     sm-149          mt=102,103,107                  updated 10/13/89              62149
    46     sm-150          mt=102                          updated 10/13/89              62150
    47     sm-151          mt=102,103,104,105,106,107      updated 10/13/89              62151
    48     sm-152          mt=102,103,104,105,106,107      updated 10/13/89              62152
    49     eu-153          mt=102,103,104,105,106,107      updated 10/13/89              63153
    50     eu-154          mt=102,103,104,105,106,107      updated 10/13/89              63154
    51     eu-155          mt=102,103,104,105,106,107      updated 10/13/89              63155
    52     gd-155          mt=102                          updated 10/13/89              64155
    53    u-234 1043 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                            92234
    54     uranium-235     endf/b-iv mat 1261              updated 10/13/89              92235
    55    u-236 1163 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                            92236
    56     uranium-238     endf/b-iv mat 1262              updated 10/13/89              92238
    57     neptunium-237   endf/b-iv mat 1263              updated 10/13/89              93237
    58    pu-238 1050 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                           94238
    59     plutonium-239   endf/b-iv mat 1264              updated 10/13/89              94239
    60     plutonium-240   endf/b-iv mat 1265              updated 10/13/89              94240
    61     plutonium-241   endf/b-iv mat 1266              updated 10/13/89              94241
    62     plutonium-242   endf/b-iv mat 1161              updated 10/13/89              94242
    63    am-241 1056 sigo=5+4 newklacs 218ngp p-3 293k                                  95241
    64    am-243 1057 218 gp wt f-1/e-m 090576 p3 293k                                   95243
    65     curium-244      endf/b-iv mat 1162              updated 10/13/89              96244
01/v cross sections normalized to 1.0 at 0.0253 ev                          999    temperature=  975.00
0 hydrogen      endf/b-iv mat 1269/thrm1002    updated 10/13/89            1001    temperature=  607.60
                          thermal scattering matrix number  2 at a temperature of   550.00 was selected.
0b-10 1273 218ngp 042375 p-3 293k                                          5010    temperature=  607.60
                          thermal scattering matrix number  2 at a temperature of   550.00 was selected.
0 boron-11      endf/b-iv mat 1160             updated 10/13/89            5011    temperature=  607.60
                          thermal scattering matrix number  2 at a temperature of   550.00 was selected.
0 oxygen-16     endf/b-iv mat 1276             updated 10/13/89            8016    temperature=  975.00
0 oxygen-16     endf/b-iv mat 1276             updated 10/13/89               6    temperature=  607.60
0 kr-83         mt=102,103,103,105,106,107     updated 10/13/89           36083    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =    82.202          temperature(kelvin)      =   975.000
0potential scatter sigma  =     7.004          lumped nuclear density   = 7.250901E-07
0spin factor (g)          =  4988.190          lump dimension (a-bar)   = 4.681220E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.426926E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1   =    15.995            sigma(per absorber atom)= 2.355013E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2   =   237.933            sigma(per absorber atom)= 2.627460E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs          res fiss         res scat
  11     -9.819651E-04     .000000E+00    -1.251893E-03
  12      2.167537E-02     .000000E+00     9.906985E-03
  13     -2.399784E-01     .000000E+00    -7.504968E-02
  14      4.781998E-05     .000000E+00    -1.721927E-05
0excess resonance integrals
```

```
0                resolved
0absorption      1.45000E+02
 fission         .00000E+00
- elapsed time    .00 min.
0 kr-85           mt=  102                                          36085    temperature=  975.00
0 sr-90          mt=102                    updated 10/13/89       38090    temperature=  975.00
0 y-89           mt=102                    updated 10/13/89       39089    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   88.142          temperature(kelvin)      =   975.000
0potential scatter sigma  =    3.644          lumped nuclear density   = 5.4740635E-06
0spin factor (g)          =   78.664          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             = .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =   15.995              sigma(per absorber atom)= 3.1194320E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =  237.933              sigma(per absorber atom)= 3.4803137E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
   9     -7.380091E-07     .000000E+00   9.697895E-06
  10     -3.189627E-05     .000000E+00  -8.988161E-05
0excess resonance integrals
0                resolved
0absorption      1.46470E-01
 fission         .00000E+00
- elapsed time    .00 min.
0 zr-93           mt=  102                                          40093    temperature=  975.00
0 zr-94          mt=102                    updated 10/13/89       40094    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   93.100          temperature(kelvin)      =   975.000
0potential scatter sigma  =    3.779          lumped nuclear density   = 9.2634236E-06
0spin factor (g)          =  180.853          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             = .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =   15.995              sigma(per absorber atom)= 1.8433756E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =  237.933              sigma(per absorber atom)= 2.0566324E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
   8     -3.996329E-07     .000000E+00  -3.981763E-04
   9     -1.740391E-05     .000000E+00  -1.543847E-03
0excess resonance integrals
0                resolved
0absorption      3.44067E-02
 fission         .00000E+00
- elapsed time    .00 min.
0 zr-95          mt=102                    updated 10/13/89       40095    temperature=  975.00
0 zircalloy      endf/b-iv mat 1284        updated 10/13/89       40302    temperature=  650.00
0resonance data for this nuclide
0mass number (a)          =   90.436          temperature(kelvin)      =   650.000
0potential scatter sigma  =    6.385          lumped nuclear density   = 4.2515602E-02
0spin factor (g)          =    1.079          lump dimension (a-bar)   = 5.4610002E-01
0inner radius             = 4.7878999E-01     dancoff correction (c)   = 5.0364637E-01
0the absorber will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
```

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   8      -1.788594E-03     .000000E+00   -1.286987E+00
   9      -5.895375E-02     .000000E+00   -2.695259E+00
  10      -6.999955E-02     .000000E+00   -1.601321E+00
  11      -1.883957E-01     .000000E+00   -7.920912E-01
0excess resonance integrals
0                  resolved
0absorption       2.28539E-01
 fission           .00000E+00
- elapsed time     .02 min.
0 rb-94          mt=102                    updated 10/13/89          41094     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =    93.101          temperature(kelvin)      =   975.000
0potential scatter sigma  =     3.779          lumped nuclear density   = 3.6019208E-12
0spin factor (g)          = 43808.801          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 4.7407952E+10
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   257.953          sigma(per absorber atom)= 5.2892492E+10
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  13       1.042787E-02      .000000E+00    9.252072E-04
  14       9.836727E-03      .000000E+00   -4.064848E-04
0excess resonance integrals
0                  resolved
0absorption       9.15001E+01
 fission           .00000E+00
- elapsed time     .02 min.
0 mo-95          mt=102                    updated 10/13/89          42095     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =    94.091          temperature(kelvin)      =   975.000
0potential scatter sigma  =     3.806          lumped nuclear density   = 6.1215057E-06
0spin factor (g)          =   607.724          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 2.7895055E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   257.953          sigma(per absorber atom)= 3.1122184E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  10      -1.359311E-03      .000000E+00   -7.621617E-03
  11      -2.295119E-03      .000000E+00   -4.000108E-03
  12      -1.778539E+00      .000000E+00   -2.047869E+00
  13       1.600225E-04      .000000E+00   -2.533864E-05
0excess resonance integrals
0                  resolved
0absorption       1.01012E+02
 fission           .00000E+00
- elapsed time     .02 min.
0 tc-99          mt=102                    updated 10/13/89          43099     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =    98.150          temperature(kelvin)      =   975.000
0potential scatter sigma  =     6.000          lumped nuclear density   = 8.9671930E-06
0spin factor (g)          =  4527.940          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
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0mass of moderator-1    =    15.995              sigma(per absorber atom)= 1.9042715E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 2.1245732E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  11      -1.143065E-02     .000000E+00    -5.399383E-03
  12      -2.896091E-03     .000000E+00    -9.676807E-05
  13      -1.866455E-01     .000000E+00    -9.856686E-03
  14      -4.066176E+00     .000000E+00    -1.301287E-01
  15       1.071256E-02     .000000E+00    -5.402104E-04
  16       4.836075E-03     .000000E+00    -2.802230E-04
  17       2.074324E-04     .000000E+00    -1.191662E-05
0excess resonance integrals
0                 resolved
0absorption      3.2972BE+02
 fission          .00000E+00
-  elapsed time    .03 min.
0 ru-101        mt=102                  updated 10/13/89            44101     temperature=   975.00
0resonance data for this nuclide
0mass number (a)         =   100.039          temperature(kelvin)      =   975.000
0potential scatter sigma =     3.965          lumped nuclear density   = 7.8990079E-06
0spin factor (g)         =  8786.290          lump dimension (a-bar)   = 4.6812201E-01
0inner radius            = .0000000E+00       dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 2.1617867E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 2.4118799E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  11      -3.577315E-02     .000000E+00    -3.650390E-03
  12      -3.629454E-02     .000000E+00    -1.328239E-02
  13      -2.097446E-01     .000000E+00    -5.654530E-03
  14       2.376605E-04     .000000E+00    -4.179696E-05
0excess resonance integrals
0                 resolved
0absorption      7.9672DE+01
 fission          .00000E+00
-  elapsed time    .03 min.
0 ru-102        mt=102                  updated 10/13/89            44106     temperature=   975.00
0 rh-103        mt=102                  updated 10/13/89            45103     temperature=   975.00
0resonance data for this nuclide
0mass number (a)         =   102.021          temperature(kelvin)      =   975.000
0potential scatter sigma =     5.408          lumped nuclear density   = 4.4058538E-06
0spin factor (g)         =      .500          lump dimension (a-bar)   = 4.6812201E-01
0inner radius            = .0000000E+00       dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 3.8757457E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 4.3241238E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
   9       1.289190E-03     .000000E+00     2.051222E-03
  10      -2.437226E-03     .000000E+00    -3.482086E-03
  11      -8.577483E-03     .000000E+00    -7.675869E-03
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  12     -1.027692E-04    .000000E+00   -1.704071E-05
  13      .000000E+00     .000000E+00    .000000E+00
  14      .000000E+00     .000000E+00    .000000E+00
  15     2.306213E-01     .000000E+00   3.364654E-03
  16     3.688781E+01     .000000E+00  -4.548918E-02
  17    -1.831598E+02     .000000E+00  -1.432801E-01
  18     8.764003E+01     .000000E+00   2.615952E-01
  19     1.155327E+01     .000000E+00  -1.651123E-03
  20     1.092636E+00     .000000E+00  -2.517397E-03
  21     2.166005E-01     .000000E+00   1.924732E-03
  22     2.583945E-01     .000000E+00   2.928506E-03
  23    -9.880788E-02     .000000E+00   1.799112E-03
0excess resonance integrals
0                    resolved
0absorption        1.15654E+03
 fission            .00000E+00
- elapsed time      .05 min.
0 rh-105          mt= 102                                          45105     temperature=   975.00
0 pd-105        mt=102                    updated 10/13/89         46105     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   104.004            temperature(kelvin)     =   975.000
0potential scatter sigma  =     4.069            lumped nuclear density  = 2.4911647E-06
0spin factor (g)          = 15210.000            lump dimension (a-bar)  = 4.6812201E-01
0inner radius             =  .0000000E+00        dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1     =    15.995            sigma(per absorber atom)= 6.8546125E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2     =   237.933            sigma(per absorber atom)= 7.6476109E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs         res fiss        res scat
  12     -4.953295E-02    .000000E+00   -7.882353E-04
  13      2.276423E-02    .000000E+00   -5.572332E-05
  14      7.777355E-04    .000000E+00   -8.168058E-05
0excess resonance integrals
0                    resolved
0absorption        6.12945E+01
 fission            .00000E+00
- elapsed time      .07 min.
0 pd-108        mt=102                    updated 10/13/89         46108     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   106.977            temperature(kelvin)     =   975.000
0potential scatter sigma  =     4.146            lumped nuclear density  = 5.4405444E-07
0spin factor (g)          = 21175.100            lump dimension (a-bar)  = 4.6812201E-01
0inner radius             =  .0000000E+00        dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1     =    15.995            sigma(per absorber atom)= 3.1386509E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2     =   237.933            sigma(per absorber atom)= 3.5017556E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs         res fiss        res scat
  11      1.170557E-04    .000000E+00    3.532514E-04
  12     -4.881945E-01    .000000E+00   -3.598531E-01
  13      6.931076E-03    .000000E+00    1.824895E-03
  14      8.561452E-02    .000000E+00   -3.206503E-05
  15     -1.840304E-01    .000000E+00    8.083835E-05
  16      2.946594E-04    .000000E+00   -9.255707E-06
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0excess resonance integrals
0                resolved
0absorption      2.13516E+02
 fission          .0000E+00
- elapsed time    .07 min.
0 silver-109    endf/b-iv mat 1139          updated 10/13/89          47109    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   107.969          temperature(kelvin)     =   975.000
0potential scatter sigma  =     4.988          lumped nuclear density  = 3.9128443E-07
0spin factor (g)          =  1441.870          lump dimension (a-bar)  = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 4.3640809E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 4.8689538E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  10     -1.470666E-05     .000000E+00    1.632901E-05
  11     -1.383515E-03     .000000E+00   -1.091168E-03
  12     -7.052492E-01     .000000E+00   -3.163157E-02
  13      7.672281E-01     .000000E+00    3.380755E-02
  14     -3.453321E+00     .000000E+00   -3.333731E-01
0excess resonance integrals
0                resolved
0absorption      1.39897E+03
 fission          .0000E+00
- elapsed time    .07 min.
0 sb-124        mt=102                      updated 10/13/89          51124    temperature=  975.00
0 xe-131        mt=102,103,104,105,106      updated 10/13/89          54131    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   129.781          temperature(kelvin)     =   975.000
0potential scatter sigma  =     4.301          lumped nuclear density  = 4.1628664E-06
0spin factor (g)          =   246.825          lump dimension (a-bar)  = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 4.1019738E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 4.5765238E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
   9     -1.157132E-06     .000000E+00   -1.109606E-05
  10     -8.302818E-05     .000000E+00   -6.607881E-05
  11     -1.069897E-03     .000000E+00   -8.185382E-04
  12     -2.103276E-02     .000000E+00   -1.964439E-03
  13     -3.601871E+01     .000000E+00   -8.453455E+01
  14      1.100193E-02     .000000E+00    1.539452E-02
0excess resonance integrals
0                resolved
0absorption      7.98384E+02
 fission          .0000E+00
- elapsed time    .08 min.
0 xe-132        mt=102,103,104,105,106      updated 10/13/89          54132    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   130.771          temperature(kelvin)     =   975.000
0potential scatter sigma  =     4.301          lumped nuclear density  = 7.0058454E-06
0spin factor (g)          =   675.899          lump dimension (a-bar)  = 4.6812201E-01
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0inner radius          =  .0000000E+00        dancoff correction (c)    = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1   =   15.995             sigma(per absorber atom)= 2.4373887E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2   =  237.933             sigma(per absorber atom)= 2.7193658E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group      res abs        res fiss       res scat
  9     -1.056912E-05    .000000E+00   -4.704644E-05
 10     -3.331607E-03    .000000E+00   -4.241930E-02
 11      3.344413E-08    .000000E+00   -9.285239E-07
0excess resonance integrals
0                resolved
0absorption     9.78718E-01
 fission         .00000E+00
- elapsed time   .08 min.
0 xenon-135    endf/b-iv mat 1294          updated 10/13/89          54135    temperature=  975.00
0 xe-136         mt=  102, 103, 104, 105, 107                       54136    temperature=  975.00
0 cesium-133   endf/b-iv mat 1141          updated 10/13/89          55133    temperature=  975.00
0resonance data for this nuclide
0mass number (a)       =   131.764           temperature(kelvin)     =   975.000
0potential scatter sigma =   7.100           lumped nuclear density  = 9.7889797E-06
0spin factor (g)       =   374.437           lump dimension (a-bar)  = 4.6812201E-01
0inner radius          =  .0000000E+00       dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1   =   15.995             sigma(per absorber atom)= 1.7444074E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2   =  238.051             sigma(per absorber atom)= 1.8711057E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group      res abs        res fiss       res scat
  9     -2.907373E-05    .000000E+00   -1.570998E-04
 10     -1.314802E-03    .000000E+00   -2.538390E-03
 11     -5.049485E-02    .000000E+00   -8.853554E-02
 12     -7.794366E-02    .000000E+00   -1.087077E-02
 13     -1.295005E-01    .000000E+00   -7.041851E-03
 14     -5.816874E+00    .000000E+00   -2.551529E-01
 15      5.627014E-03    .000000E+00   -4.058210E-04
 16      2.777945E-03    .000000E+00   -2.215582E-04
 17      2.352170E-03    .000000E+00   -1.830856E-04
 18      2.214986E-03    .000000E+00   -1.679469E-04
 19      1.317094E-03    .000000E+00   -9.670768E-05
0excess resonance integrals
0                resolved
0absorption     3.59757E+02
 fission         .00000E+00
- elapsed time   .10 min.
0 cs-134       mt=102                      updated 10/13/89          55134    temperature=  975.00
0 cs-135         mt=  102                                            55135    temperature=  975.00
0 cs-137       mt=102                      updated 10/13/89          55137    temperature=  975.00
0 ba-136       mt=102                      updated 10/13/89          56136    temperature=  975.00
0resonance data for this nuclide
0mass number (a)       =   134.737           temperature(kelvin)     =   975.000
0potential scatter sigma =   4.835           lumped nuclear density  = 4.3204217E-08
0spin factor (g)       =  1247.690           lump dimension (a-bar)  = 4.6812201E-01
0inner radius          =  .0000000E+00       dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1   =   15.995             sigma(per absorber atom)= 3.9523850E+06
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0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 4.409629E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  10      1.325435E-06     .000000E+00    5.726989E-07
  11      1.778946E-05     .000000E+00    1.536195E-05
0excess resonance integrals
0                 resolved
0absorption      1.38476E+00
 fission          .0000E+00
-  elapsed time    .10 min.
0 la-139        mt=102                    updated 10/13/89            57139     temperature=  975.00
0resonance data for this nuclide
0mass number (a)         =   137.713          temperature(kelvin)      =   975.000
0potential scatter sigma =     4.906          lumped nuclear density   = 9.4329744E-06
0spin factor (g)         =   145.855          lump dimension (a-bar)   = 4.6812201E-01
0inner radius            =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 1.8102422E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 2.0196658E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
   9      2.513561E-05     .000000E+00    4.217379E-03
  10     -2.130884E-04     .000000E+00   -1.470223E-02
  11       .000000E+00     .000000E+00     .000000E+00
  12     -3.235367E-02     .000000E+00   -1.955698E-02
0excess resonance integrals
0                 resolved
0absorption      8.11172E+00
 fission          .0000E+00
-  elapsed time    .12 min.
0 ce-144         mt=  102                                                58144     temperature=  975.00
0 pr-141        mt=102,103,104,105,106,107    updated 10/13/89            59141     temperature=  975.00
0resonance data for this nuclide
0mass number (a)         =   139.697          temperature(kelvin)      =   975.000
0potential scatter sigma =     4.953          lumped nuclear density   = 7.6168221E-06
0spin factor (g)         =  1026.500          lump dimension (a-bar)   = 4.6812201E-01
0inner radius            =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 2.2418758E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 2.5012344E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  10     -2.990048E-03     .000000E+00   -1.015056E-01
  11     -4.969222E-02     .000000E+00   -6.609490E-01
  12     -1.083222E-03     .000000E+00   -1.048369E-04
0excess resonance integrals
0                 resolved
0absorption      1.22139E+01
 fission          .0000E+00
-  elapsed time    .12 min.
0 pr-143        mt=102                    updated 10/13/89            59143     temperature=  975.00
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0 nd-143        mt=102                    updated 10/13/89          60143     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   141.682          temperature(kelvin)      =   975.000
0potential scatter sigma  =     5.000          lumped nuclear density   = 7.7590876E-06
0spin factor (g)          =  1964.860          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 2.2007703E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 2.4553734E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
  10     -7.957541E-05     .000000E+00   -2.374323E-05
  11     -1.830864E-01     .000000E+00   -2.131639E+00
  12     -1.198135E-01     .000000E+00   -5.897775E-02
0excess resonance integrals
0                resolved
0absorption     5.12357E+01
 fission         .00000E+00
- elapsed time    .12 min.
0 nd-145        mt=102                    updated 10/13/89          60145     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   143.668          temperature(kelvin)      =   975.000
0potential scatter sigma  =     5.047          lumped nuclear density   = 5.6350132E-06
0spin factor (g)          =  1007.250          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 3.0303336E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 3.3809074E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
  10     -2.253398E-03     .000000E+00   -3.557378E-02
  11     -3.474493E-02     .000000E+00   -1.048051E-01
  12     -8.615515E-01     .000000E+00   -5.427825E+00
  13      9.626082E-05     .000000E+00    2.037469E-04
  14     -7.513707E-01     .000000E+00   -1.978675E-02
  15      5.908317E-03     .000000E+00   -4.625057E-04
  16      1.326683E-03     .000000E+00   -1.451354E-04
  17      9.642397E-04     .000000E+00   -1.063940E-04
  18      8.539907E-04     .000000E+00   -9.313782E-05
  19      7.634096E-04     .000000E+00   -8.069522E-05
  20      2.839427E-05     .000000E+00   -2.921005E-06
0excess resonance integrals
0                resolved
0absorption     2.08187E+02
 fission         .00000E+00
- elapsed time    .13 min.
0 nd-147        mt=102                    updated 10/13/89          60147     temperature=  975.00
0 pm-147        mt=102                    updated 10/13/89          61147     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   145.663          temperature(kelvin)      =   975.000
0potential scatter sigma  =     5.093          lumped nuclear density   = 2.4843284E-06
0spin factor (g)          = 21589.500          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
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0mass of moderator-1    =    15.995              sigma(per absorber atom)= 6.873475E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.953              sigma(per absorber atom)= 7.668654E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  12      -1.223039E-01     .000000E+00    -3.948635E-02
  13      -3.141409E-02     .000000E+00    -1.907241E-03
  14      -5.745860E+01     .000000E+00    -2.474550E+01
  15       4.132830E-02     .000000E+00     6.985857E-03
  16       1.697975E-02     .000000E+00     1.746748E-03
  17       1.369755E-02     .000000E+00     1.150447E-03
  18       1.253781E-02     .000000E+00     9.649050E-04
  19       6.998458E-04     .000000E+00     5.072522E-05
0excess resonance integrals
0                resolved
0absorption     2.04771E+03
 fission         .00000E+00
- elapsed time    .13 min.
0 pm-148          mt=  102                                          61148     temperature=   975.00
0 sm-147       endf/b-v fission product       updated 10/13/89      62147     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   145.653          temperature(kelvin)      =   975.000
0potential scatter sigma  =     5.093          lumped nuclear density   = 3.658958E-07
0spin factor (g)          =      .000          lump dimension (a-bar)   = 4.681220IE-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 4.666909E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.953              sigma(per absorber atom)= 5.206815E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  11       2.896982E-01     .000000E+00     1.129878E+00
  12       1.167188E+00     .000000E+00    -1.330838E+00
  13      -2.347516E+00     .000000E+00    -8.911353E-01
  14      -1.601623E-01     .000000E+00     1.549642E-04
  15       3.119469E-01     .000000E+00    -1.984454E-03
  16       7.287886E-03     .000000E+00    -3.738721E-04
  17       4.281512E-03     .000000E+00    -2.401627E-04
  18       3.510471E-03     .000000E+00    -1.997258E-04
  19       2.910642E-03     .000000E+00    -1.649535E-04
  20       8.435342E-04     .000000E+00    -4.627657E-05
0excess resonance integrals
0                resolved
0absorption     7.24261E+02
 fission         .00000E+00
- elapsed time    .15 min.
                          thermal scattering matrix number  3 at a temperature of    900.03 was selected.
0 sm-149       mt=102,103,107              updated 10/13/89      62149     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   147.638          temperature(kelvin)      =   975.000
0potential scatter sigma  =     3.260          lumped nuclear density   = 7.519558IE-08
0spin factor (g)          = 10407.900          lump dimension (a-bar)   = 4.681220IE-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 2.270874E+06
0moderator-1 will be treated by the nordheim integral method.
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0mass of moderator-2    =   237.933              sigma(per absorber atom)= 2.5335873E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  11      8.546639E-03     .000000E+00    3.071180E-02
  12     -5.302144E-02     .000000E+00   -1.779283E-01
  13      2.406209E-02     .000000E+00    2.974950E-03
  14      1.500835E-02     .000000E+00   -6.463817E-03
0excess resonance integrals
0                resolved
0absorption     8.04352E+02
 fission         .00000E+00
- elapsed time    .15 min.
0 sm-150        mt=102                   updated 10/13/89          62150     temperature=   975.00
0resonance data for this nuclide
0mass number (a)        =   148.629          temperature(kelvin)      =   975.000
0potential scatter sigma =    5.162          lumped nuclear density   = 1.7519981E-06
0spin factor (g)        =  4376.420          lump dimension (a-bar)   = 4.6812201E-01
0inner radius           =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995          sigma(per absorber atom)= 9.7465680E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933          sigma(per absorber atom)= 1.0874131E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  10     -6.375778E-04     .000000E+00   -5.756720E-03
  11     -1.304944E-02     .000000E+00   -1.490106E-01
  12     -4.227013E-02     .000000E+00   -1.278060E-02
  13     -3.095665E+00     .000000E+00   -2.440727E+00
  14      1.066137E-04     .000000E+00   -6.413570E-05
0excess resonance integrals
0                resolved
0absorption     2.91457E+02
 fission         .00000E+00
- elapsed time    .15 min.
0 sm-151        mt=102,103,104,105,106,107   updated 10/13/89          62151     temperature=   975.00
0resonance data for this nuclide
0mass number (a)        =   149.623          temperature(kelvin)      =   975.000
0potential scatter sigma =    5.185          lumped nuclear density   = 2.8724369E-07
0spin factor (g)        = 75574.703          lump dimension (a-bar)   = 4.6812201E-01
0inner radius           =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995          sigma(per absorber atom)= 5.9447675E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933          sigma(per absorber atom)= 6.6325069E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  14     -1.639244E-01     .000000E+00   -1.796795E-02
  15      1.491918E+01     .000000E+00    7.558513E-02
  16     -2.177298E+01     .000000E+00   -6.173761E-02
  17      1.739949E+02     .000000E+00    8.298581E-01
  18     -3.204102E+02     .000000E+00   -1.780888E+00
  19      6.256166E+01     .000000E+00    3.868497E-01
  20      1.141531E+00     .000000E+00   -1.417322E-04
  21     -7.117683E-02     .000000E+00    1.244102E-02
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  22      6.952534E-02     .000000E+00    3.838926E-03
  23     -1.091920E-02     .000000E+00    3.374054E-04
0excess resonance integrals
0                 resolved
0absorption      2.05685E+03
 fission          .00000E+00
-  elapsed time    .15 min.
0 sm-152        mt=102,103,104,105,106,107     updated 10/13/89              62152     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   150.615              temperature(kelvin)      =   975.000
0potential scatter sigma  =     5.208              lumped nuclear density   = 8.489045E-07
0spin factor (g)          =   863.594              lump dimension (a-bar)   = 4.681220E-01
0inner radius             =  .0000000E+00          dancoff correction (c)   = 3.426926E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995              sigma(per absorber atom)= 2.011530E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.953              sigma(per absorber atom)= 2.244240E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
   9      2.403006E-06     .000000E+00    1.158916E-04
  10     -6.300000E-04     .000000E+00   -1.018422E-02
  11     -9.556884E-03     .000000E+00   -3.651736E-02
  12     -6.599117E-02     .000000E+00   -2.088114E-01
  13      4.246605E-02     .000000E+00    1.033022E-01
  14     -6.047521E+01     .000000E+00   -1.170778E+02
0excess resonance integrals
0                 resolved
0absorption      2.83243E+03
 fission          .00000E+00
-  elapsed time    .17 min.
0 eu-153        mt=102,103,104,105,106,107     updated 10/13/89              63153     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   151.607              temperature(kelvin)      =   975.000
0potential scatter sigma  =     9.731              lumped nuclear density   = 3.950322E-07
0spin factor (g)          = 12265.900              lump dimension (a-bar)   = 4.681220E-01
0inner radius             =  .0000000E+00          dancoff correction (c)   = 3.426926E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995              sigma(per absorber atom)= 4.322677E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.953              sigma(per absorber atom)= 4.822760E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  12     -2.700846E-01     .000000E+00   -5.264485E-02
  13     -7.127646E-02     .000000E+00   -2.768018E-04
  14     -5.875798E-01     .000000E+00    3.188236E-03
  15      2.867073E+00     .000000E+00   -2.053510E-02
  16     -3.292299E+00     .000000E+00    8.159547E-03
  17      1.505616E-01     .000000E+00   -3.437751E-03
  18      7.726888E-02     .000000E+00   -2.231265E-03
  19      5.055488E-02     .000000E+00   -1.541107E-03
  20     -1.253801E-01     .000000E+00   -1.275081E-03
0excess resonance integrals
0                 resolved
0absorption      1.35573E+03
 fission          .00000E+00
-  elapsed time    .17 min.
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0 eu-154        mt=102,103,104,105,106,107     updated 10/13/89              63154     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   152.601              temperature(kelvin)      =   975.000
0potential scatter sigma  =     9.731              lumped nuclear density   = 4.6287475E-08
0spin factor (g)          = 19135.801              lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00          dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1   =   15.995                  sigma(per absorber atom)= 3.6891120E+06
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2   =  237.933                  sigma(per absorber atom)= 4.1158988E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs          res fiss         res scat
  12      -3.861222E-01     .000000E+00     -6.053471E-02
  13      -2.990322E-01     .000000E+00     -2.442458E-02
  14       3.518871E-01     .000000E+00      1.505895E-02
  15       2.104515E-01     .000000E+00      2.119006E-02
  16       7.291847E+00     .000000E+00      9.268108E-02
  17      -1.437307E+02     .000000E+00     -1.895209E+00
  18       1.138007E+02     .000000E+00      1.859608E+00
  19      -1.014582E+02     .000000E+00      1.187222E+00
0excess resonance integrals
0              resolved
0absorption     2.13713E+03
 fission         .00000E+00
-  elapsed time    .18 min.
0 eu-155        mt=102,103,104,105,106,107     updated 10/13/89              63155     temperature=  975.00
0 gd-155        mt=102                         updated 10/13/89              64155     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   153.592              temperature(kelvin)      =   975.000
0potential scatter sigma  =     5.277              lumped nuclear density   = 7.9815138E-10
0spin factor (g)          = 12700.100              lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00          dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1   =   15.995                  sigma(per absorber atom)= 2.1394400E+08
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2   =  237.933                  sigma(per absorber atom)= 2.3869478E+08
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs          res fiss         res scat
  12      -1.439277E+00     .000000E+00     -1.839441E-01
  13       1.541312E+00     .000000E+00      1.985276E-01
  14       2.191371E-01     .000000E+00      9.808348E-03
  15      -3.311029E-01     .000000E+00     -7.466390E-06
  16       1.477360E+00     .000000E+00     -4.148879E-03
  17       1.568661E-01     .000000E+00     -1.479119E-03
  18       9.605166E-02     .000000E+00     -1.078106E-03
  19       6.295341E-02     .000000E+00     -8.026528E-04
  20       1.670418E-02     .000000E+00      1.626651E-04
  21        .000000E+00     .000000E+00       .000000E+00
  22        .000000E+00     .000000E+00       .000000E+00
  23        .000000E+00     .000000E+00       .000000E+00
  24        .000000E+00     .000000E+00       .000000E+00
  25      -2.127720E+03     .000000E+00     -1.621942E+00
  26      -5.205629E+03     .000000E+00      1.961451E+00
  27      -1.699955E+03     .000000E+00      7.392510E-01
0excess resonance integrals
0              resolved
```

```
0absorption      3.97067E+04
 fission          .0000E+00
- elapsed time    .18 min.
0u-234 1043 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                    92234     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   232.029          temperature(kelvin)      =   975.000
0potential scatter sigma  =    10.021          lumped nuclear density   = 5.046729?E-06
0spin factor (g)          =  6948.450          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =   15.995           sigma(per absorber atom)= 3.3835711E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =  237.985           sigma(per absorber atom)= 3.7738547E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  11     -2.415318E-02     .000000E+00   -7.041884E-02
  12     -1.968077E-01     .000000E+00   -8.249157E-02
  13      7.759724E-04     .000000E+00   -6.471135E-04
  14     -1.924428E+01     .000000E+00   -3.151055E+00
0excess resonance integrals
0                resolved
0absorption      5.80961E+02
 fission          .0000E+00
- elapsed time    .20 min.
0 uranium-235   endf/b-iv mat 1261          updated 10/13/89            92235     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   233.025          temperature(kelvin)      =   975.000
0potential scatter sigma  =    11.500          lumped nuclear density   = 5.4047973E-04
0spin factor (g)          = 15171.100          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =   15.995           sigma(per absorber atom)= 3.1594098E+02
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =  238.049           sigma(per absorber atom)= 3.3905756E+02
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  12     -2.237724E+00   -1.393543E+00   -5.229959E-02
  13     -7.708092E+00   -3.834183E+00   -1.662088E-01
  14     -6.189115E+00   -3.789033E+00   -4.212886E-02
0excess resonance integrals
0                resolved
0absorption      2.09175E+02
 fission         1.24654E+02
- elapsed time    .22 min.
0u-236 1163 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                    92236     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   234.017          temperature(kelvin)      =   975.000
0potential scatter sigma  =    10.995          lumped nuclear density   = 3.0808562E-05
0spin factor (g)          =  6328.490          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =   15.995           sigma(per absorber atom)= 5.5426050E+03
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =  237.934           sigma(per absorber atom)= 6.1827402E+03
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
```

```
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs         res fiss        res scat
  11      -1.523668E-01     .000000E+00   -3.801088E-01
  12      -8.034678E-01     .000000E+00   -5.583938E-01
  13      -6.051546E-02     .000000E+00   -3.357721E-03
  14      -2.886298E+01     .000000E+00   -2.525290E+00
0excess resonance integrals
0                  resolved
0absorption       2.96393E+02
 fission           .00000E+00
- elapsed time     .22 min.
0 uranium-238   endf/b-iv mat 1262          updated 10/13/89          92238     temperature=   975.00
0resonance data for this nuclide
0mass number (a)        =   236.006          temperature(kelvin)      =   975.000
0potential scatter sigma =    10.599         lumped nuclear density   = 2.196266E-02
0spin factor (g)         =   656.527         lump dimension (a-bar)   = 4.681220E-01
0inner radius            =  .0000000E+00     dancoff correction (c)   = 3.426926E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995          sigma(per absorber atom)= 7.774999E+00
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   235.041          sigma(per absorber atom)= 3.347694E-01
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs         res fiss        res scat
   9      -3.944036E-02     .000000E+00   -4.050720E-01
  10      -1.026518E+00   -1.753316E-05   -6.484920E+00
  11      -9.709722E+00     .000000E+00   -2.690162E+01
  12      -4.305133E+01     .000000E+00   -4.999088E+01
  13      -5.401731E+01     .000000E+00   -1.769248E+01
  14      -1.045068E+02     .000000E+00   -6.060081E+00
0excess resonance integrals
0                  resolved
0absorption       1.79895E+01
 fission          5.03922E-04
- elapsed time     .23 min.
0 neptunium-237  endf/b-iv mat 1263          updated 10/13/89          93237     temperature=   975.00
0resonance data for this nuclide
0mass number (a)        =   235.012          temperature(kelvin)      =   975.000
0potential scatter sigma =    10.500         lumped nuclear density   = 1.257256E-06
0spin factor (g)         = 10100.800         lump dimension (a-bar)   = 4.681220E-01
0inner radius            =  .0000000E+00     dancoff correction (c)   = 3.426926E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995          sigma(per absorber atom)= 1.380148E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   238.051          sigma(per absorber atom)= 1.480389E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs         res fiss        res scat
  11      -6.323133E-02   -1.946361E-06   -7.388205E-03
  12       3.730817E-02   -9.091694E-05    8.668517E-03
  13       1.510195E-02    9.073738E-05    4.388553E-04
  14      -1.946115E-02   -2.886008E-06   -9.108837E-04
0excess resonance integrals
0                  resolved
0absorption       2.98165E+02
 fission          1.39589E-01
- elapsed time     .27 min.
0pu-238 1050 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                    94238     temperature=   975.00
```

```
0resonance data for this nuclide
0mass number (a)          =   236.167          temperature(kelvin)      =   975.000
0potential scatter sigma  =    10.890          lumped nuclear density   = 7.9591842E-08
0spin factor (g)          = 13130.600          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 2.1454420E+06
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   238.051          sigma(per absorber atom)= 2.3012678E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
  11     -1.284735E-04  -1.341992E-05  -1.980659E-04
  12     -4.303728E-05  -2.903865E-06  -5.489353E-05
  13      4.134514E-01   7.566257E-02  -9.305859E-03
  14     -3.822731E-01  -6.988454E-02   8.538994E-03
0excess resonance integrals
0                resolved
0absorption     8.25506E+01
 fission        9.08542E+00
- elapsed time    .27 min.
0 plutonium-239  endf/b-iv mat 1264          updated 10/13/89          9423?     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   236.999          temperature(kelvin)      =   975.000
0potential scatter sigma  =    10.200          lumped nuclear density   = 6.5402754E-05
0spin factor (g)          =  6435.710          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 2.6108943E+03
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   238.051          sigma(per absorber atom)= 2.8005264E+03
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
  11     -1.372717E-01  -5.512489E-02  -4.218680E-02
  12     -1.231102E+00  -4.618338E-01  -1.623044E-01
  13     -4.054652E+00  -2.387267E+00  -6.166678E-02
  14     -1.292015E+00  -6.866961E-01  -1.170952E-02
0excess resonance integrals
0                resolved
0absorption     3.11634E+02
 fission        1.74952E+02
- elapsed time    .28 min.
0 plutonium-240  endf/b-iv mat 1265          updated 10/13/89          9424?     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   237.992          temperature(kelvin)      =   975.000
0potential scatter sigma  =    10.599          lumped nuclear density   = 7.1577624E-06
0spin factor (g)          =   669.244          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 2.3856574E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   238.051          sigma(per absorber atom)= 2.5589308E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
   9     -2.527904E-05  -4.472240E-07  -4.415883E-05
```

```
   10    -1.671842E-03  -1.040354E-04  -7.659151E-03
   11    -5.483094E-02  -3.168331E-04  -7.304044E-02
   12    -7.702689E-01  -4.206388E-03  -7.416141E-01
   13    -9.330229E-02  -5.720981E-04  -6.802738E-03
   14     .000000E+00    .000000E+00    .000000E+00
   15     1.750853E-02   3.341580E-06   3.472721E-03
   16     3.193329E+00   6.094609E-04   4.049562E-01
   17     5.207403E+02   9.938658E-02   4.696471E+01
   18    -5.241542E+03  -1.000371E+00  -4.157560E+02
   19     8.658362E+02   1.652487E-01   6.655492E+01
   20    -9.297894E+01  -1.774544E-02   1.798328E+00
0excess resonance integrals
0                  resolved
0absorption      6.34075E+03
 fission         2.23112E+00
-  elapsed time    .30 min.
0 plutonium-241  endf/b-iv mat 1266          updated 10/13/89            94241     temperature=   975.00
0resonance data for this nuclide
0mass number (a)      .     =   238.978            temperature(kelvin)        =   975.000
0potential scatter sigma  =    10.939            lumped nuclear density     = 2.5098871E-06
0spin factor (g)          = 16402.100            lump dimension (a-bar)     = 4.6812201E-01
0inner radius             =  .0000000E+00        dancoff correction (c)     = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 6.8048359E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   238.051              sigma(per absorber atom)= 7.2990789E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs        res fiss       res scat
   12     9.910288E-03   8.743934E-03   6.553351E-04
   13    -1.870408E-01  -1.488423E-01  -6.361959E-03
   14    -1.075350E-01  -6.497218E-02   7.055812E-04
   15     1.797773E-02   1.611609E-02  -4.686306E-04
0excess resonance integrals
0                  resolved
0absorption      5.09079E+02
 fission         4.26759E+02
-  elapsed time    .32 min.
0 plutonium-242  endf/b-iv mat 1161          updated 10/13/89            94242     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   240.145            temperature(kelvin)        =   975.000
0potential scatter sigma  =    10.694            lumped nuclear density     = 1.1725373E-07
0spin factor (g)          =  6606.710            lump dimension (a-bar)     = 4.6812201E-01
0inner radius             =  .0000000E+00        dancoff correction (c)     = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 1.4563261E+06
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   238.051              sigma(per absorber atom)= 1.5621008E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs        res fiss       res scat
   11    -1.595395E-04   .000000E+00   -5.900082E-04
   12    -5.455536E-03   .000000E+00   -1.111986E-02
   13     1.023480E-04   .000000E+00    4.744354E-06
   14     8.148858E-02   .000000E+00    1.527138E-02
   15    -1.866679E+00   .000000E+00   -1.871458E-01
   16     4.033705E-02   .000000E+00   -3.458752E-03
   17     1.550415E-02   .000000E+00   -1.848246E-03
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```
  18      1.112550E-02     .000000E+00   -1.430672E-03
0excess resonance integrals
0                 resolved
0absorption       1.110866E+03
 fission           .000000E+00
- elapsed time     .32 min.
0am-241 1056 sigp-5+4 newklacs 218ngp p-3 293k                          95241     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   238.950          temperature(kelvin)      =   975.000
0potential scatter sigma  =     9.511          lumped nuclear density   = 3.397043E-08
0spin factor (g)          = 82058.203          lump dimension (a-bar)   = 4.681220E-01
0inner radius             =  .000000E+00       dancoff correction (c)   = 3.426926E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995            sigma(per absorber atom)= 5.026715E+06
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   238.051            sigma(per absorber atom)= 5.391811E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  13      4.919184E-01     1.212657E-02     4.934242E-03
  14     -4.313571E-01    -1.109051E-02    -4.482724E-03
0excess resonance integrals
0                 resolved
0absorption       1.954731E+02
 fission          1.076121E+00
- elapsed time     .32 min.
0am-243 1057 218 gp wt f-1/e-m 090376 p3 293k                           95243     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   240.940          temperature(kelvin)      =   975.000
0potential scatter sigma  =     9.511          lumped nuclear density   = 4.264787E-09
0spin factor (g)          = 82052.602          lump dimension (a-bar)   = 4.681220E-01
0inner radius             =  .000000E+00       dancoff correction (c)   = 3.426926E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995            sigma(per absorber atom)= 4.003943E+07
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   238.051            sigma(per absorber atom)= 4.294754E+07
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  13     -6.647073E-03     .000000E+00     4.374598E-04
  14      2.210911E-02     .000000E+00     2.339746E-04
0excess resonance integrals
0                 resolved
0absorption       1.601526E+02
 fission           .000000E+00
- elapsed time     .32 min.
0 curium-244     endf/b-iv mat 1162          updated 10/13/89           96244     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   242.133          temperature(kelvin)      =   975.000
0potential scatter sigma  =    10.320          lumped nuclear density   = 1.646575E-10
0spin factor (g)          =  5251.150          lump dimension (a-bar)   = 4.681220E-01
0inner radius             =  .000000E+00       dancoff correction (c)   = 3.426926E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995            sigma(per absorber atom)= 1.037059E+09
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   238.051            sigma(per absorber atom)= 1.112382E+09
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
```

0volume fraction of lump in cell used to account for spatial self-shielding=1.00000

0group	res abs	res fiss	res scat
11	2.577953E-04	7.054416E-06	3.049273E-04
12	6.927479E-04	3.252465E-05	1.367911E-04
13	2.717880E-03	1.335395E-04	7.127342E-04
14	8.386877E-02	5.017790E-03	1.583305E-02

0excess resonance integrals

0	resolved
0absorption	6.13903E+02
fission	3.54221E+01

- elapsed time .32 min.
- elapsed time .33 min.

1 this xsdrn working tape was created 02/16/96 at 09:58:23
the title of the parent case is as follows
scale 4.2 - 27 group neutron burnup library
based on endf-b version 4 data with endf-b version 5 fission products
compiled for nrc 1/27/89

tape id	4321	number of nuclides	65
number of neutron groups	27	number of gamma groups	0
first thermal group	15	logical unit	4

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hydrogen	endf/b-iv mat 1269/thrm1002	updated 10/13/89	id	1001
b-10 1273 218ngp 042375 p-3 293k				
boron-11	endf/b-iv mat 1160	updated 10/13/89	id	5011
oxygen-16	endf/b-iv mat 1276	updated 10/13/89	id	8016
oxygen-16	endf/b-iv mat 1276	updated 10/13/89	id	6
kr-83	mt=102,103,103,105,106,107	updated 10/13/89	id	36083
kr-85	mt= 102		id	36085
sr-90	mt=102	updated 10/13/89	id	38090
y-89	mt=102	updated 10/13/89	id	39089
zr-93	mt= 102		id	40093
zr-94	mt=102	updated 10/13/89	id	40094
zr-95	mt=102	updated 10/13/89	id	40095
zircalloy	endf/b-iv mat 1284	updated 10/13/89	id	40302
nb-94	mt=102	updated 10/13/89	id	41094
mo-95	mt=102	updated 10/13/89	id	42095
tc-99	mt=102	updated 10/13/89	id	43099
ru-101	mt=102	updated 10/13/89	id	44101
ru-106	mt=102	updated 10/13/89	id	44106
rh-103	mt=102	updated 10/13/89	id	45103
rh-105	mt= 102		id	45105
pd-105	mt=102	updated 10/13/89	id	46105
pd-108	mt=102	updated 10/13/89	id	46108
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sb-124	mt=102	updated 10/13/89	id	51124
xe-131	mt=102,103,104,105,106	updated 10/13/89	id	54131
xe-132	mt=102,103,104,105,106	updated 10/13/89	id	54132
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xe-136	mt= 102, 103, 104, 105, 107		id	54136
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cs-134	mt=102	updated 10/13/89	id	55134
cs-135	mt= 102		id	55135
cs-137	mt=102	updated 10/13/89	id	55137
ba-136	mt=102	updated 10/13/89	id	56136
la-139	mt=102	updated 10/13/89	id	57139
ce-144	mt= 102		id	58144
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pr-143	mt=102	updated 10/13/89	id	59143
nd-143	mt=102	updated 10/13/89	id	60143

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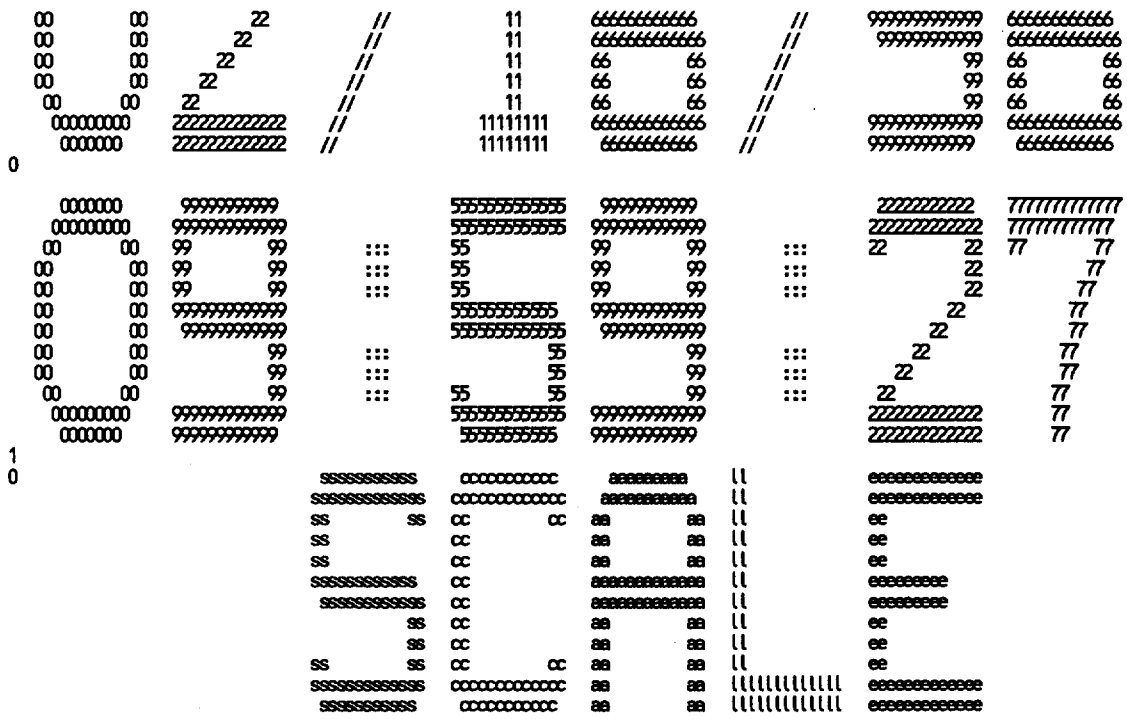
         nd-145       mt=102                       updated 10/13/89         id    60145
         nd-147       mt=102                       updated 10/13/89         id    60147
         pm-147       mt=102                       updated 10/13/89         id    61147
         pm-148          mt=  102                                           id    61148
         sm-147       endf/b-v fission product     updated 10/13/89         id    62147
         sm-149       mt=102,103,107               updated 10/13/89         id    62149
         sm-150       mt=102                       updated 10/13/89         id    62150
         sm-151       mt=102,103,104,105,106,107   updated 10/13/89         id    62151
         sm-152       mt=102,103,104,105,106,107   updated 10/13/89         id    62152
         eu-153       mt=102,103,104,105,106,107   updated 10/13/89         id    63153
         eu-154       mt=102,103,104,105,106,107   updated 10/13/89         id    63154
         eu-155       mt=102,103,104,105,106,107   updated 10/13/89         id    63155
         gd-155       mt=102                       updated 10/13/89         id    64155
        u-234 1043 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                 id    92234
         uranium-235   endf/b-iv mat 1261          updated 10/13/89         id    92235
        u-236 1163 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                 id    92236
         uranium-238   endf/b-iv mat 1262          updated 10/13/89         id    92238
         neptunium-237 endf/b-iv mat 1263          updated 10/13/89         id    93237
        pu-238 1050 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                id    94238
         plutonium-239 endf/b-iv mat 1264          updated 10/13/89         id    94239
         plutonium-240 endf/b-iv mat 1265          updated 10/13/89         id    94240
         plutonium-241 endf/b-iv mat 1266          updated 10/13/89         id    94241
         plutonium-242 endf/b-iv mat 1161          updated 10/13/89         id    94242
        am-241 1056 sigo=5+4 newxlacs 218ngp p-3 293k                       id    95241
        am-243 1057 218 gp wt f-1/e-m 090376 p3 293k                        id    95243
         curium-244    endf/b-iv mat 1162          updated 10/13/89         id    96244
0          tape copy used      0 i/o's, and took     .00 seconds
1 xx         xx   sssssssssss   ddddddddddd   rrrrrrrrrrr   m          m  ppppppppppp   mm         mm
   xx       xx   ssssssssssss   dddddddddddd  rrrrrrrrrrrr  mm         m  pppppppppppp  mmm       mmm
    xx     xx    ss        ss   dd        dd  rr        rr  mmm        m  pp        pp  mmmm     mmmm
     xx   xx     ss             dd        dd  rr        rr  m m m      m  pp        pp  mm mm   mm mm
      xx xx      ss             dd        dd  rr        rr  m   m      m  pp        pp  mm  mm mm  mm
       xxx       sssssssssss    dd        dd  rrrrrrrrrrrr  m    m     m  pppppppppppp  mm   mmm   mm
       xxx        sssssssssss   dd        dd  rrrrrrrrrrr   m     m    m  ppppppppppp   mm    m    mm
      xx xx                ss   dd        dd  rr    rr      m      m   m  pp            mm         mm
     xx   xx               ss   dd        dd  rr     rr     m       m  m  pp            mm         mm
    xx     xx    ss        ss   dd        dd  rr      rr    m        mmm  pp            mm         mm
   xx       xx   ssssssssssss   dddddddddddd  rr       rr   m         mm  pp            mm         mm
  xx         xx   sssssssssss   ddddddddddd   rr        rr  m          m  pp            mm         mm
0

  ddddddddddd     aaaaaaaaa    vv        vv  iiiiiiiiiii    ssssssssss
  dddddddddddd   aaaaaaaaaaa   vv        vv  iiiiiiiiiii   ssssssssssss
  dd        dd  aa        aa   vv        vv      ii        ss        ss
  dd        dd  aa        aa   vv        vv      ii        ss
  dd        dd  aa        aa   vv        vv      ii        ss
  dd        dd  aaaaaaaaaaaa   vv        vv      ii        sssssssssss
  dd        dd  aaaaaaaaaaaa    vv      vv       ii         sssssssssss
  dd        dd  aa        aa     vv    vv        ii                  ss
  dd        dd  aa        aa      vv  vv         ii                  ss
  dd        dd  aa        aa       vvvv          ii        ss        ss
  dddddddddddd  aa        aa        vv       iiiiiiiiiii   ssssssssssss
  ddddddddddd   aa        aa        v        iiiiiiiiiii    ssssssssss
0

     0000000      2222222222            //        11       6666666666          //   9999999999    6666666666
    000000000    222222222222          //        111      666666666666        //   999999999999  666666666666
   00       00   22        22         //        1111      66                 //    99        99  66
   00       00             22        //          11       66                //     99        99  66
   00       00             22       //           11       66               //      99        99  66
```



```
*****************************************************************
*****************************************************************
*****************************************************************
*****                                                       *****
*****              program verification information          *****
*****                                                       *****
*****              code system:   scale  version:   4.2     *****
*****                                                       *****
*****************************************************************
*****************************************************************
*****                                                       *****
*****                                                       *****
*****                                                       *****
*****          program:  c0c001                             *****
*****                                                       *****
*****       creation date:  04/27/95                        *****
*****                                                       *****
*****          library:  /neutronics/scale/exe              *****
*****                                                       *****
*****                                                       *****
*****                                                       *****
*****  this is not a  scale  configuration controlled code  *****
*****                                                       *****
```

```
                    *****              jobname:  davis                          *****
                    *****                                                       *****
                    *****   date of execution:  02/16/96                        *****
                    *****                                                       *****
                    *****   time of execution:  09:59:27                        *****
                    *****                                                       *****
                    *****                                                       *****
                    *******************************************************************
                    *******************************************************************
                    *******************************************************************
1
                    400 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0       -1q array has     1 entries.
0        1q array has    15 entries.
0        2q array has    10 entries.
0        3q array has    12 entries.
0        4q array has     9 entries.
0        5q array has    12 entries.
0direct access unit  9 requires    12 blocks of length  704 for cross section mixing.
1                   400 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0general problem description data block
0                            general problem data

 ige  1/2/3 = plane/cylinder/sphere       2      isn  quadrature order                  8
 izm  number of zones                     4      isct order of scattering               3
 im   number of spacial intervals        24      ievt 0/1/2/3/4/5/6=q/k/alpha/c/z/r/h   1
 ibl  0/1/2/3 = vacuum/refl/per/white     1      iim  inner iteration maximum          20
 ibr  right boundary condition            3      iom  outer iteration maximum          25
 mxx  number of mixtures                  3      iclc -1/0/n--flat res/sn/opt           0
 ms   mixing table length                65      ith  0/1 = forward/adjoint             0
 igm  number of energy groups            27      iflu not used(always wgtd)             0
 nng  number of neutron groups           27      iprt -2/-1/0/n=mixture xsec print     -2
 ngg  number of gamma groups              0      idl  0/1/2/3=no/prt nd/pch n/both     53
 iftg number of first thermal group      15      ipbt -1/0/1=none/fine/all bal. prt     0
0                            special options

 ifg  0/1 = none/weighting calculation    1      ipn  0/1/2 diff. coef. param           0
 iqm  volumetric sources (0/n=no/yes)     0      idfm 0/1 = none/density factors 38*    1
 ipm  boundary sources (0/n=no/yes)       0      iaz  0/n = none/n activities by zone   0
 ifn  0/1/2 = input 33*/34*/use last     53      iai  0/1=none/activities by interval   0
 itmx maximum time (minutes)             10      ifct 0/1=no/yes upscatter scaling      0
 idt1 0/1/2/3=no/xsect/srce/flux--out     0      ipvt 0/1/2=no/k/alpha parametric srch  0
 isx  broad group fluxes                  0      isen outer iteration acceleration      0
 ibln activity data unit                  0      nbnd band rebaln parameter             0
 jbkl 0/1/2 buckling geometry             0
0                            weighting data (ifg=1)

 icon -1/0/1=cell/zone/region weight     -1      ihtf total xsect psn in brd gp tables  3
 igmf number of broad groups             27      ndsf psn g-g or file number            4
 itp  0/10/20/30/40 0/c/e/ac/a            0      nusf table length or max order         4
 ipp  -2/-1/0/n=wgted xsect print        -2      msan extra 1-d x-sect positions        0
 iap  -1/n anisn xsect print             -1
0                            floating point parameters

 eps  overall convergence      1.00000E-04     dy   cyl/pla ht for buckling     .00000E+00
 ptc  point convergence        1.00000E-04     dz   plane depth for buckling    .00000E+00
 xnf  normalization factor     1.00000E+00     vsc  void streaming correction   .00000E+00
 ev   eigenvalue guess          .00000E+00     pv   ipvt=1/2--k/alpha          1.00000E+00
 evm  eigenvalue modifier       .00000E+00     eql  ev change eps for search   1.00000E-03
 bf   buckling factor=1.420892 1.42089E+00     xnpm new param mod for search   7.50000E-01
```

this case will require 2535 locations for mixing
this case has been allocated 200000 locations
1 400 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0 13q array has 65 entries.
0 14q array has 65 entries.
0 15q array has 65 entries.
0 data block 2 (mixing table, etc.)

	nuclides on tape	cccc identification	mixing table mixture	mixing table component	atom density	extra xsect id's
1	999		1	92235	5.40480E-04	
2	1001		1	92234	5.04673E-06	
3	5010		1	92236	3.08086E-05	
4	5011		1	92238	2.19627E-02	
5	8016		1	8016	4.55359E-02	
6	6		3	6	2.09710E-02	
7	36083		1	36083	7.25090E-07	
8	36085		1	36085	3.50117E-07	
9	38090		1	38090	7.86170E-06	
10	39089		1	39089	5.47406E-06	
11	40093		1	42095	6.12150E-06	
12	40094		1	40093	5.98109E-06	
13	40095		1	40094	9.26342E-06	
14	40802		1	40095	2.10190E-06	
15	41094		1	41094	3.60192E-12	
16	42095		1	43099	8.96719E-06	
17	43099		1	45103	4.40585E-06	
18	44101		1	45105	1.67519E-08	
19	44106		1	44101	7.89901E-06	
20	45103		1	44106	1.14008E-06	
21	45105		1	46105	2.49116E-06	
22	46105		1	46108	5.44054E-07	
23	46108		1	47109	3.91284E-07	
24	47109		1	51124	1.00598E-10	
25	51124		1	54131	4.16287E-06	
26	54131		1	54132	7.00585E-06	
27	54132		1	54135	6.60408E-09	
28	54135		1	54136	1.50336E-05	
29	54136		1	55134	2.22576E-07	
30	55133		1	55135	4.71145E-06	
31	55134		1	55137	9.46756E-06	
32	55135		1	56136	4.32042E-08	
33	55137		1	57139	9.43297E-06	
34	56136		1	59141	7.61682E-06	
35	57139		1	59143	3.95553E-07	
36	58144		1	58144	5.00712E-06	
37	59141		1	60143	7.75909E-06	
38	59143		1	60145	5.63501E-06	
39	60143		1	61147	2.48433E-06	
40	60145		1	61148	6.82848E-09	
41	60147		1	60147	1.32716E-07	
42	61147		1	62147	3.65895E-07	
43	61148		1	62149	7.51956E-08	
44	62147		1	62150	1.75200E-06	
45	62149		1	62151	2.87244E-07	
46	62150		1	62152	8.48904E-07	
47	62151		1	64155	7.98151E-10	
48	62152		1	63153	3.95032E-07	
49	63153		1	63154	4.62875E-08	
50	63154		1	63155	5.11217E-08	
51	63155		2	40802	4.25156E-02	

52	64155		3	1001	4.19420E-02
53	92234		3	5010	3.81515E-06
54	92235		3	5011	1.54884E-05
55	92236		1	55133	9.78898E-06
56	92238		1	95237	1.23726E-06
57	95237		1	94238	7.95918E-08
58	94238		1	94239	6.54028E-05
59	94239		1	94240	7.15776E-06
60	94240		1	94241	2.50939E-06
61	94241		1	94242	1.17254E-07
62	94242		1	95241	3.39704E-08
63	95241		1	95243	4.26479E-09
64	95243		1	96244	1.64658E-10
65	96244		1	999	1.00000E-20

- elapsed time .00 min.
0 21649 locations will be used
0 35q array has 25 entries.
0 36q array has 24 entries.
0 38q array has 24 entries.
0 39q array has 4 entries.
0 40q array has 4 entries.
0 47q array has 27 entries.
0 51q array has 27 entries.
1 400 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp

neutron group parameters

0 gp	energy boundaries	lethargy boundaries	weighted velocities	broad gp numbers	calc type	group band	right albedo	left albedo
1	2.00000E+07	-6.93147E-01	4.60581E+09	1	0	1	1.00000E+00	
2	6.43400E+06	4.40989E-01	2.88737E+09	2	0	2	1.00000E+00	
3	3.00000E+06	1.20397E+00	2.12201E+09	3	0	3	1.00000E+00	
4	1.85000E+06	1.68740E+00	1.75673E+09	4	0	4	1.00000E+00	
5	1.40000E+06	1.96611E+00	1.46535E+09	5	0	5	1.00000E+00	
6	9.00000E+05	2.40795E+00	1.06620E+09	6	0	6	1.00000E+00	
7	4.00000E+05	3.21888E+00	6.07557E+08	7	0	7	1.00000E+00	
8	1.00000E+05	4.60517E+00	2.72415E+08	8	0	8	1.00000E+00	
9	1.70000E+04	6.37713E+00	1.13526E+08	9	0	9	1.00000E+00	
10	3.00000E+03	8.11173E+00	4.82126E+07	10	0	10	1.00000E+00	
11	5.50000E+02	9.80818E+00	2.05946E+07	11	0	11	1.00000E+00	
12	1.00000E+02	1.15129E+01	1.01036E+07	12	0	12	1.00000E+00	
13	3.00000E+01	1.27169E+01	5.69595E+06	13	0	13	1.00000E+00	
14	1.00000E+01	1.38155E+01	3.20957E+06	14	0	14	1.00000E+00	
15	3.04999E+00	1.50030E+01	2.10601E+06	15	0	15	1.00000E+00	
16	1.77000E+00	1.55471E+01	1.70522E+06	16	0	16	1.00000E+00	
17	1.29999E+00	1.58557E+01	1.52545E+06	17	0	17	1.00000E+00	
18	1.12999E+00	1.59959E+01	1.42867E+06	18	0	18	1.00000E+00	
19	1.00000E+00	1.61181E+01	1.31002E+06	19	0	19	1.00000E+00	
20	8.00000E-01	1.63412E+01	9.05898E+05	20	0	20	1.00000E+00	
21	4.00000E-01	1.70344E+01	8.17974E+05	21	0	21	1.00000E+00	
22	3.25000E-01	1.72420E+01	6.90070E+05	22	0	22	1.00000E+00	
23	2.25000E-01	1.76098E+01	4.86953E+05	23	0	23	1.00000E+00	
24	9.99999E-02	1.84207E+01	3.57766E+05	24	0	24	1.00000E+00	
25	5.00000E-02	1.91138E+01	2.71895E+05	25	0	25	1.00000E+00	
26	3.00000E-02	1.96247E+01	1.87283E+05	26	0	26	1.00000E+00	
27	1.00000E-02	2.07233E+01	8.88201E+04	27	0	27	1.00000E+00	
28	1.00000E-05	2.76310E+01						

1 400 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp

0	mixture by zone	order p(l) by zone	activity table matl no.	reaction	quadrature constants weights	directions	refl direc	wt x cos
1	1	3			0	-2.79004E-01	3	0
2	1	3			5.06143E-02	-1.97286E-01	3	-9.98548E-05

3	2	3	5.06143E-02	1.97286E-01	2	9.98548E-03
4	3	3	0	-6.04419E-01	8	0
5			5.55953E-02	-5.58410E-01	8	-3.10450E-02
6			5.55953E-02	-2.31301E-01	7	-1.28593E-02
7			5.55953E-02	2.31301E-01	6	1.28593E-02
8			5.55953E-02	5.58410E-01	5	3.10450E-02
9			0	-8.50774E-01	15	0
10			5.22844E-02	-8.21784E-01	15	-4.29665E-02
11			5.22844E-02	-6.01588E-01	14	-3.14537E-02
12			5.22844E-02	-2.20196E-01	13	-1.15128E-02
13			5.22844E-02	2.20196E-01	12	1.15128E-02
14			5.22844E-02	6.01588E-01	11	3.14537E-02
15			5.22844E-02	8.21784E-01	10	4.29665E-02
16			0	-9.83052E-01	24	0
17			4.53355E-02	-9.64143E-01	24	-4.37099E-02
18			4.53355E-02	-8.17361E-01	23	-3.70555E-02
19			4.53355E-02	-5.46143E-01	22	-2.47597E-02
20			4.53355E-02	-1.91780E-01	21	-8.69444E-03
21			4.53355E-02	1.91780E-01	20	8.69444E-03
22			4.53355E-02	5.46143E-01	19	2.47597E-02
23			4.53355E-02	8.17361E-01	18	3.70555E-02
24			4.53355E-02	9.64143E-01	17	4.37099E-02

0constants for p(3) scattering

0angl	set 1	set 2	set 3	set 4	set 5
1	-2.79004E-01	8.85235E-01	6.74143E-02	-6.16919E-01	-1.71701E-02
2	-1.97286E-01	8.85235E-01	.00000E+00	-4.36228E-01	1.21411E-02
3	1.97286E-01	8.85235E-01	.00000E+00	4.36228E-01	-1.21411E-02
4	-6.04419E-01	4.52016E-01	3.16379E-01	-8.04435E-01	-1.74564E-01
5	-5.58410E-01	4.52016E-01	2.23714E-01	-7.43201E-01	-6.68028E-02
6	-2.31301E-01	4.52016E-01	-2.23713E-01	-3.07844E-01	1.61276E-01
7	2.31301E-01	4.52016E-01	-2.23713E-01	3.07844E-01	-1.61276E-01
8	5.58410E-01	4.52016E-01	2.23713E-01	7.43201E-01	6.68028E-02
9	-8.50774E-01	-8.57235E-02	6.26843E-01	-1.98456E-01	-4.86885E-01
10	-8.21784E-01	-8.57235E-02	5.42862E-01	-1.91694E-01	-3.44245E-01
11	-6.01588E-01	-8.57235E-02	.00000E+00	-1.40330E-01	3.44244E-01
12	-2.20196E-01	-8.57235E-02	-5.42862E-01	-5.13643E-02	3.44245E-01
13	2.20196E-01	-8.57235E-02	-5.42862E-01	5.13643E-02	-3.44245E-01
14	6.01588E-01	-8.57235E-02	.00000E+00	1.40330E-01	-3.44245E-01
15	8.21784E-01	-8.57235E-02	5.42862E-01	1.91694E-01	3.44245E-01
16	-9.83052E-01	-4.49528E-01	8.36885E-01	5.00703E-01	-7.51005E-01
17	-9.64143E-01	-4.49528E-01	7.73181E-01	4.91083E-01	-6.24438E-01
18	-8.17361E-01	-4.49528E-01	3.20862E-01	4.16320E-01	1.46514E-01
19	-5.46143E-01	-4.49528E-01	-3.20862E-01	2.78176E-01	7.36575E-01
20	-1.91780E-01	-4.49528E-01	-7.73181E-01	9.76824E-02	4.17236E-01
21	1.91780E-01	-4.49528E-01	-7.73181E-01	-9.76824E-02	-4.17236E-01
22	5.46143E-01	-4.49528E-01	-3.20862E-01	-2.78176E-01	-7.36575E-01
23	8.17361E-01	-4.49528E-01	3.20862E-01	-4.16320E-01	-1.46514E-01
24	9.64143E-01	-4.49528E-01	7.73181E-01	-4.91083E-01	6.24438E-01

1 int	radii	mid pts	zone no.	areas	volumes	dens fact	radius mod	spec(int)
1	0	1.29551E-02	1	0	2.10906E-03	1.00000E+00	0	
2	2.59102E-02	4.33406E-02	1	1.62798E-01	9.49518E-03	1.00000E+00	0	
3	6.07710E-02	8.75100E-02	1	3.81835E-01	2.94045E-02	1.00000E+00	0	
4	1.14249E-01	1.74155E-01	1	7.17848E-01	1.31104E-01	1.00000E+00	0	
5	2.34061E-01	2.93967E-01	1	1.47065E+00	2.21299E-01	1.00000E+00		
6	3.53873E-01	3.80612E-01	1	2.22345E+00	1.27890E-01	1.00000E+00		
7	4.07351E-01	4.24781E-01	1	2.55946E+00	9.30429E-02	1.00000E+00		
8	4.42212E-01	4.55167E-01	1	2.77850E+00	7.41004E-02	1.00000E+00		
9	4.68122E-01	4.68814E-01	2	2.94130E+00	4.07946E-03	0		
10	4.69507E-01	4.71481E-01	2	2.95000E+00	1.16988E-02	0		
11	4.73456E-01	4.75431E-01	2	2.97481E+00	1.17968E-02	0		

12	4.77405E-01	4.78098E-01	2	2.99962E+00	4.16023E-03	0
13	4.78790E-01	4.83159E-01	3	3.00833E+00	2.65268E-02	1.00000E+00
14	4.87528E-01	4.99987E-01	3	3.06323E+00	7.82768E-02	1.00000E+00
15	5.12445E-01	5.24908E-01	3	3.21979E+00	8.21777E-02	1.00000E+00
16	5.37362E-01	5.41731E-01	3	3.37634E+00	2.97427E-02	1.00000E+00
17	5.46100E-01	5.53513E-01	4	3.43125E+00	5.15631E-02	1.00000E+00
18	5.60926E-01	5.70900E-01	4	3.52440E+00	7.15548E-02	1.00000E+00
19	5.80874E-01	5.96175E-01	4	3.64974E+00	1.14628E-01	1.00000E+00
20	6.11475E-01	6.45755E-01	4	3.84201E+00	2.78169E-01	1.00000E+00
21	6.80084E-01	7.14313E-01	4	4.27278E+00	3.07702E-01	1.00000E+00
22	7.48592E-01	7.63898E-01	4	4.70854E+00	1.46875E-01	1.00000E+00
23	7.79193E-01	7.89167E-01	4	4.89588E+00	9.89116E-02	1.00000E+00
24	7.99141E-01	8.06554E-01	4	5.02115E+00	7.51357E-02	1.00000E+00
25	8.13968E-01			5.11431E+00		

- elapsed time .00 min.

1 outer iter	inner iters	1 - balance	eigenvalue	1 - source ratio	1 - scatter ratio	1 - upscat ratio	search parameter	time (min)
1	138	1.09566E-05	1.09759E+00	-1.07731E-01	1.00000E+00	-3.55729E-02	.00000E+00	.0000
2	213	-1.28319E-05	1.10826E+00	-1.48861E-03	-1.15081E-02	-4.26417E-03	.00000E+00	.0000
3	273	1.62299E-05	1.10914E+00	-1.97899E-04	-1.28292E-03	-8.84204E-04	.00000E+00	.0000
4	319	-1.04679E-05	1.10971E+00	-3.81491E-05	-2.70424E-04	-1.78398E-04	.00000E+00	.0167
5	350	-9.05080E-06	1.10975E+00	-8.04876E-06	-5.43973E-05	-3.29763E-05	.00000E+00	.0167

grp to grp	inner iters	mfd int.	max. flux difference	msf int.	max. scale factor	coarse mesh
1	1	1	3.80860E-08	24	1.00000E+00	1
2	1	1	4.46907E-08	24	1.00000E+00	1
3	1	1	4.10794E-08	24	1.00000E+00	1
4	1	1	3.97392E-08	24	1.00000E+00	1
5	1	1	4.12062E-08	24	1.00000E+00	1
6	1	1	2.63373E-08	24	1.00000E+00	1
7	1	1	1.85898E-08	24	1.00000E+00	1
8	1	1	4.40921E-09	24	1.00000E+00	1
9	1	2	2.34214E-09	24	1.00000E+00	1
10	1	1	2.37749E-09	24	1.00000E+00	1
11	1	1	2.43404E-09	24	1.00000E+00	1
12	1	24	4.39085E-09	24	1.00000E+00	1
13	1	24	5.87595E-09	24	1.00000E+00	1
14	1	24	5.61334E-09	24	1.00000E+00	1
15	1	24	4.08593E-05	24	9.99977E-01	1
16	1	24	5.07017E-05	24	9.99983E-01	1
17	1	18	1.82135E-05	24	9.99956E-01	1
18	1	18	2.09272E-05	24	9.99955E-01	1
19	1	18	1.73670E-05	24	9.99951E-01	1
20	1	24	5.16144E-05	24	9.99965E-01	1
21	1	18	2.68156E-05	24	9.99938E-01	1
22	1	24	4.66957E-05	24	9.99989E-01	1
23	1	24	2.32620E-06	24	1.00000E+00	1
24	1	24	1.39544E-05	24	1.00001E+00	1
25	1	24	1.72749E-05	24	1.00000E+00	1
26	1	1	1.01266E-05	24	9.99997E-01	2
27	1	2	4.45654E-06	24	1.00000E+00	2

6	377	-1.79461E-06	1.10967E+00	-1.60890E-06	-1.02061E-05	-6.57033E-06	.00000E+00	.0167

final monitor
lambda 1.10965E+00 production/absorption 1.10965E+00 angular flux on 16

- elapsed time .02 min.

1 400 d, sas2h: babcock wilcox 15x15, 3.00w%, 20gwd/mtu burn high temp

0 int.	zone number	radius	int. midpoint	area	volume	prod density
1	1	.00000E+00	1.29551E-02	.00000E+00	2.10906E-03	3.25096E-03
2	1	2.59102E-02	4.33406E-02	1.62798E-01	9.49318E-03	1.46265E-02
3	1	6.07710E-02	8.75100E-02	3.81835E-01	2.94045E-02	4.53863E-02

4	1	1.14249E-01	1.74155E-01	7.17848E-01	1.31104E-01	2.04251E-01
5	1	2.34061E-01	2.98967E-01	1.47065E+00	2.21299E-01	3.52723E-01
6	1	3.53873E-01	3.80612E-01	2.22345E+00	1.27890E-01	2.09002E-01
7	1	4.07351E-01	4.24781E-01	2.55946E+00	9.30429E-02	1.54907E-01
8	1	4.42212E-01	4.55167E-01	2.77850E+00	7.41004E-02	1.25505E-01
9	2	4.68122E-01	4.68814E-01	2.94130E+00	4.07946E-03	.00000E+00
10	2	4.69507E-01	4.71481E-01	2.95000E+00	1.16988E-02	.00000E+00
11	2	4.73456E-01	4.75431E-01	2.97481E+00	1.17968E-02	.00000E+00
12	2	4.77406E-01	4.78098E-01	2.99962E+00	4.16023E-03	.00000E+00
13	3	4.78790E-01	4.83159E-01	3.00833E+00	2.65268E-02	.00000E+00
14	3	4.87528E-01	4.99587E-01	3.06323E+00	7.82768E-02	.00000E+00
15	3	5.12445E-01	5.24903E-01	3.21979E+00	8.21777E-02	.00000E+00
16	3	5.37362E-01	5.41731E-01	3.37634E+00	2.97427E-02	.00000E+00
17	4	5.46100E-01	5.53513E-01	3.43125E+00	5.15631E-02	.00000E+00
18	4	5.60926E-01	5.70900E-01	3.52440E+00	7.15548E-02	.00000E+00
19	4	5.80874E-01	5.96175E-01	3.64974E+00	1.14628E-01	.00000E+00
20	4	6.11475E-01	6.45755E-01	3.84201E+00	2.78169E-01	.00000E+00
21	4	6.80034E-01	7.14313E-01	4.27278E+00	3.07702E-01	.00000E+00
22	4	7.48592E-01	7.63895E-01	4.70354E+00	1.46875E-01	.00000E+00
23	4	7.79198E-01	7.89167E-01	4.89582E+00	9.89116E-02	.00000E+00
24	4	7.99141E-01	8.06654E-01	5.02115E+00	7.51357E-02	.00000E+00
25		8.13968E-01		5.11431E+00		

1 400 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp

0 total flux

0 int.	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	1.75114E-01	1.32204E+00	1.67743E+00	1.04071E+00	1.57532E+00	3.03093E+00	2.90528E+00	2.08005E+00
2	1.75177E-01	1.32267E+00	1.67826E+00	1.04121E+00	1.57602E+00	3.03223E+00	2.90594E+00	2.08012E+00
3	1.75120E-01	1.32205E+00	1.67748E+00	1.04073E+00	1.57523E+00	3.03062E+00	2.90491E+00	2.07992E+00
4	1.74725E-01	1.31778E+00	1.67201E+00	1.03740E+00	1.56992E+00	3.02009E+00	2.89857E+00	2.07887E+00
5	1.73702E-01	1.30685E+00	1.65814E+00	1.02898E+00	1.55660E+00	2.99403E+00	2.88298E+00	2.07627E+00
6	1.72524E-01	1.29439E+00	1.64253E+00	1.01958E+00	1.54181E+00	2.96549E+00	2.86599E+00	2.07339E+00
7	1.71586E-01	1.28464E+00	1.63050E+00	1.01242E+00	1.53069E+00	2.94444E+00	2.85365E+00	2.07122E+00
8	1.70655E-01	1.27515E+00	1.61897E+00	1.00567E+00	1.52034E+00	2.92522E+00	2.84230E+00	2.06918E+00
9	1.70147E-01	1.27002E+00	1.61278E+00	1.00208E+00	1.51490E+00	2.91521E+00	2.83649E+00	2.06810E+00
10	1.70041E-01	1.26898E+00	1.61155E+00	1.00139E+00	1.51390E+00	2.91342E+00	2.83550E+00	2.06790E+00
11	1.69886E-01	1.26748E+00	1.60976E+00	1.00039E+00	1.51248E+00	2.91088E+00	2.83410E+00	2.06762E+00
12	1.69784E-01	1.26649E+00	1.60859E+00	9.99752E-01	1.51156E+00	2.90925E+00	2.83321E+00	2.06743E+00
13	1.69593E-01	1.26465E+00	1.60638E+00	9.98512E-01	1.50975E+00	2.90581E+00	2.83127E+00	2.06705E+00
14	1.69075E-01	1.25943E+00	1.59987E+00	9.94677E-01	1.50393E+00	2.89452E+00	2.82484E+00	2.06601E+00
15	1.68494E-01	1.25310E+00	1.59149E+00	9.89360E-01	1.49553E+00	2.87785E+00	2.81524E+00	2.06488E+00
16	1.68210E-01	1.24960E+00	1.58648E+00	9.85890E-01	1.48980E+00	2.86630E+00	2.80852E+00	2.06437E+00
17	1.68073E-01	1.24759E+00	1.58337E+00	9.83560E-01	1.48582E+00	2.85834E+00	2.80385E+00	2.06423E+00
18	1.67894E-01	1.24499E+00	1.57958E+00	9.80589E-01	1.48076E+00	2.84836E+00	2.79797E+00	2.06409E+00
19	1.67670E-01	1.24190E+00	1.57477E+00	9.77225E-01	1.47507E+00	2.83720E+00	2.79140E+00	2.06386E+00
20	1.67371E-01	1.23790E+00	1.56890E+00	9.73009E-01	1.46799E+00	2.82333E+00	2.78325E+00	2.06353E+00
21	1.67165E-01	1.23511E+00	1.56477E+00	9.70025E-01	1.46296E+00	2.81351E+00	2.77755E+00	2.06344E+00
22	1.67166E-01	1.23499E+00	1.56447E+00	9.69743E-01	1.46244E+00	2.81250E+00	2.77711E+00	2.06366E+00
23	1.67242E-01	1.23584E+00	1.56560E+00	9.70472E-01	1.46362E+00	2.81479E+00	2.77859E+00	2.06395E+00
24	1.67329E-01	1.23685E+00	1.56695E+00	9.71370E-01	1.46508E+00	2.81765E+00	2.78039E+00	2.06422E+00

0 int.	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	1.58622E+00	1.44471E+00	1.30346E+00	7.94800E-01	6.71758E-01	5.90936E-01	3.71152E-01	2.05765E-01
2	1.58614E+00	1.44461E+00	1.30325E+00	7.94568E-01	6.71548E-01	5.90650E-01	3.71122E-01	2.05744E-01
3	1.58633E+00	1.44482E+00	1.30372E+00	7.95115E-01	6.72001E-01	5.91332E-01	3.71198E-01	2.05786E-01
4	1.58737E+00	1.44606E+00	1.30637E+00	7.98190E-01	6.74585E-01	5.95154E-01	3.71615E-01	2.06025E-01
5	1.58997E+00	1.44909E+00	1.31289E+00	8.05783E-01	6.80963E-01	6.04634E-01	3.72622E-01	2.06610E-01
6	1.59287E+00	1.45239E+00	1.32002E+00	8.14143E-01	6.87975E-01	6.15124E-01	3.73706E-01	2.07248E-01
7	1.59507E+00	1.45481E+00	1.32527E+00	8.20340E-01	6.93165E-01	6.22949E-01	3.74486E-01	2.07713E-01
8	1.59715E+00	1.45701E+00	1.33006E+00	8.26030E-01	6.97922E-01	6.30163E-01	3.75181E-01	2.08136E-01
9	1.59826E+00	1.45815E+00	1.33253E+00	8.28986E-01	7.00395E-01	6.33914E-01	3.75538E-01	2.08355E-01
10	1.59845E+00	1.45833E+00	1.33293E+00	8.29462E-01	7.00799E-01	6.34514E-01	3.75598E-01	2.08392E-01

11	1.59874E+00	1.45860E+00	1.33350E+00	8.30141E-01	7.01377E-01	6.35372E-01	3.75684E-01	2.08446E-01
12	1.59893E+00	1.45877E+00	1.33387E+00	8.30581E-01	7.01752E-01	6.35927E-01	3.75740E-01	2.08481E-01
13	1.59931E+00	1.45912E+00	1.33462E+00	8.31478E-01	7.02516E-01	6.37061E-01	3.75854E-01	2.08552E-01
14	1.60034E+00	1.46024E+00	1.33702E+00	8.34283E-01	7.04909E-01	6.40612E-01	3.76221E-01	2.08775E-01
15	1.60148E+00	1.46183E+00	1.34040E+00	8.38154E-01	7.08209E-01	6.45508E-01	3.76742E-01	2.09084E-01
16	1.60202E+00	1.46289E+00	1.34263E+00	8.40651E-01	7.10337E-01	6.48651E-01	3.77087E-01	2.09283E-01
17	1.60252E+00	1.46368E+00	1.34429E+00	8.42487E-01	7.11869E-01	6.50945E-01	3.77273E-01	2.09409E-01
18	1.60278E+00	1.46478E+00	1.34656E+00	8.44993E-01	7.13943E-01	6.54072E-01	3.77479E-01	2.09570E-01
19	1.60331E+00	1.46598E+00	1.34915E+00	8.47883E-01	7.16336E-01	6.57676E-01	3.77722E-01	2.09757E-01
20	1.60408E+00	1.46753E+00	1.35244E+00	8.51563E-01	7.19386E-01	6.62270E-01	3.78017E-01	2.09992E-01
21	1.60466E+00	1.46864E+00	1.35479E+00	8.54186E-01	7.21531E-01	6.65525E-01	3.78162E-01	2.10135E-01
22	1.60472E+00	1.46875E+00	1.35501E+00	8.54416E-01	7.21674E-01	6.65778E-01	3.78073E-01	2.10110E-01
23	1.60456E+00	1.46847E+00	1.35442E+00	8.53735E-01	7.21067E-01	6.64901E-01	3.77928E-01	2.10034E-01
24	1.60437E+00	1.46813E+00	1.35369E+00	8.52894E-01	7.20334E-01	6.63829E-01	3.77782E-01	2.09954E-01

0 int.	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	8.66004E-02	5.31541E-02	1.31681E-01	4.41026E-01	1.17777E-01	2.07352E-01	7.27214E-01	5.24901E-01
2	8.65773E-02	5.31207E-02	1.31642E-01	4.40923E-01	1.17709E-01	2.07207E-01	7.26784E-01	5.24541E-01
3	8.66202E-02	5.32611E-02	1.31719E-01	4.41119E-01	1.17883E-01	2.07750E-01	7.27824E-01	5.25661E-01
4	8.68721E-02	5.39873E-02	1.32168E-01	4.42268E-01	1.18848E-01	2.10591E-01	7.33650E-01	5.31123E-01
5	8.74954E-02	5.58220E-02	1.33265E-01	4.45090E-01	1.21254E-01	2.17711E-01	7.48091E-01	5.44953E-01
6	8.81809E-02	5.79073E-02	1.34458E-01	4.48175E-01	1.23952E-01	2.25724E-01	7.64055E-01	5.60333E-01
7	8.86888E-02	5.95142E-02	1.35328E-01	4.50442E-01	1.25945E-01	2.31820E-01	7.75950E-01	5.71878E-01
8	8.91555E-02	6.10372E-02	1.36114E-01	4.52510E-01	1.27811E-01	2.37536E-01	7.86911E-01	5.82595E-01
9	8.93985E-02	6.18375E-02	1.36521E-01	4.53583E-01	1.28783E-01	2.40525E-01	7.92603E-01	5.88176E-01
10	8.94391E-02	6.19543E-02	1.36587E-01	4.53762E-01	1.28935E-01	2.40966E-01	7.93486E-01	5.89013E-01
11	8.94972E-02	6.21216E-02	1.36683E-01	4.54017E-01	1.29151E-01	2.41594E-01	7.94743E-01	5.90203E-01
12	8.95347E-02	6.22300E-02	1.36745E-01	4.54182E-01	1.29290E-01	2.42001E-01	7.95553E-01	5.90970E-01
13	8.96115E-02	6.24505E-02	1.36872E-01	4.54520E-01	1.29576E-01	2.42831E-01	7.97212E-01	5.92536E-01
14	8.98516E-02	6.31332E-02	1.37273E-01	4.55575E-01	1.30469E-01	2.45408E-01	8.02576E-01	5.97365E-01
15	9.01818E-02	6.40600E-02	1.37853E-01	4.57023E-01	1.31696E-01	2.48912E-01	8.09389E-01	6.03822E-01
16	9.03989E-02	6.46674E-02	1.38199E-01	4.57949E-01	1.32484E-01	2.51131E-01	8.13816E-01	6.07819E-01
17	9.05475E-02	6.50908E-02	1.38461E-01	4.58609E-01	1.33093E-01	2.52865E-01	8.17473E-01	6.11476E-01
18	9.07569E-02	6.57088E-02	1.38813E-01	4.59506E-01	1.33952E-01	2.55344E-01	8.22927E-01	6.17238E-01
19	9.09985E-02	6.64198E-02	1.39220E-01	4.60553E-01	1.34946E-01	2.58230E-01	8.29438E-01	6.24188E-01
20	9.13070E-02	6.73260E-02	1.39740E-01	4.61895E-01	1.36222E-01	2.61953E-01	8.38099E-01	6.33561E-01
21	9.15234E-02	6.79797E-02	1.40103E-01	4.62830E-01	1.37146E-01	2.64665E-01	8.44652E-01	6.40871E-01
22	9.15380E-02	6.80515E-02	1.40125E-01	4.62874E-01	1.37248E-01	2.64976E-01	8.45642E-01	6.42259E-01
23	9.14775E-02	6.78980E-02	1.40019E-01	4.62589E-01	1.37031E-01	2.64346E-01	8.44340E-01	6.41098E-01
24	9.14045E-02	6.77041E-02	1.39892E-01	4.62251E-01	1.36756E-01	2.63545E-01	8.42618E-01	6.39445E-01

0 int.	grp. 25	grp. 26	grp. 27
1	2.16177E-01	1.30156E-01	1.68247E-02
2	2.16028E-01	1.30066E-01	1.68266E-02
3	2.16572E-01	1.30593E-01	1.69881E-02
4	2.19435E-01	1.33224E-01	1.77167E-02
5	2.26562E-01	1.39805E-01	1.95694E-02
6	2.34528E-01	1.47246E-01	2.17378E-02
7	2.40548E-01	1.52954E-01	2.34877E-02
8	2.46178E-01	1.58368E-01	2.52294E-02
9	2.49120E-01	1.61213E-01	2.61617E-02
10	2.49546E-01	1.61596E-01	2.62683E-02
11	2.50151E-01	1.62140E-01	2.64199E-02
12	2.50542E-01	1.62490E-01	2.65176E-02
13	2.51336E-01	1.63202E-01	2.67159E-02
14	2.53747E-01	1.65345E-01	2.73022E-02
15	2.56885E-01	1.68091E-01	2.80273E-02
16	2.58764E-01	1.69699E-01	2.84318E-02
17	2.60644E-01	1.71616E-01	2.90585E-02
18	2.63760E-01	1.74960E-01	3.02029E-02
19	2.67558E-01	1.79023E-01	3.15437E-02
20	2.72740E-01	1.84599E-01	3.33080E-02

21	2.76874E-01	1.89076E-01	3.47586E-02
22	2.77773E-01	1.90231E-01	3.51897E-02
23	2.77252E-01	1.89831E-01	3.51395E-02
24	2.76401E-01	1.89098E-01	3.49777E-02

- elapsed time .02 min.

1fine group summary for zone 1 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	2.22774E-02	.00000E+00	1.25166E-02	1.04028E-02	3.17762E-03	1.09607E-02	9.98852E-01
2	.00000E+00	1.91850E-01	2.29592E-03	1.66186E-01	6.60876E-02	1.35819E-02	1.14487E-01	1.00004E+00
3	.00000E+00	2.15499E-01	2.60958E-02	1.60779E-01	8.10886E-02	1.55664E-02	1.44988E-01	1.00000E+00
4	.00000E+00	1.24085E-01	3.88498E-02	1.05171E-01	6.78165E-02	7.43247E-03	8.76831E-02	1.00001E+00
5	.00000E+00	1.64899E-01	6.78165E-02	2.59859E-01	9.47669E-02	4.44868E-03	1.33502E-01	9.99992E-01
6	.00000E+00	1.78574E-01	1.34568E-01	6.53782E-01	5.44055E-02	7.04578E-03	2.51482E-01	1.00003E+00
7	.00000E+00	8.85271E-02	9.84097E-02	7.45204E-01	3.63369E-02	7.63574E-03	1.42763E-01	1.00001E+00
8	.00000E+00	1.36205E-02	4.25737E-02	6.30972E-01	2.14889E-02	1.40324E-02	2.06706E-02	1.00004E+00
9	.00000E+00	9.88735E-04	2.17113E-02	5.35049E-01	2.06561E-02	2.31899E-02	-2.11456E-02	9.99991E-01
10	.00000E+00	7.34411E-05	2.06780E-02	4.59547E-01	1.06739E-02	3.60185E-02	-2.59414E-02	1.00001E+00
11	.00000E+00	5.77788E-06	1.06748E-02	4.20560E-01	8.12718E-03	5.84172E-02	-5.58644E-02	1.00001E+00
12	.00000E+00	4.05887E-07	8.12723E-03	2.37903E-01	9.35703E-03	6.38639E-02	-6.50903E-02	9.99959E-01
13	.00000E+00	6.44511E-08	9.35704E-03	1.76672E-01	6.15561E-03	5.84519E-02	-5.52509E-02	1.00001E+00
14	.00000E+00	1.27725E-08	6.15561E-03	1.51889E-01	7.45442E-03	8.08520E-02	-8.21511E-02	1.00000E+00
15	.00000E+00	1.44343E-09	7.54253E-03	8.50837E-02	8.92281E-03	6.68092E-03	-8.09078E-03	1.00190E+00
16	.00000E+00	4.23842E-10	9.09568E-03	4.31122E-02	9.67630E-03	4.51264E-03	-5.11392E-03	1.00146E+00
17	.00000E+00	1.36498E-10	7.83887E-03	1.49801E-02	7.67337E-03	5.73779E-03	-5.58201E-03	1.00072E+00
18	.00000E+00	9.77284E-11	7.29731E-03	1.02207E-02	5.54822E-03	1.75312E-02	-1.57871E-02	1.00022E+00
19	.00000E+00	1.38167E-10	7.70172E-03	2.52994E-02	9.31264E-03	7.78657E-03	-9.40703E-03	1.00062E+00
20	.00000E+00	2.24674E-10	1.07374E-02	1.05506E-01	9.96470E-03	2.54882E-02	-2.47475E-02	1.00091E+00
21	.00000E+00	3.28850E-11	9.51791E-03	2.29079E-02	8.87943E-03	2.18035E-02	-2.11760E-02	1.00036E+00
22	.00000E+00	3.81541E-11	1.27663E-02	4.69140E-02	1.05476E-02	6.34005E-02	-6.11984E-02	1.00025E+00
23	.00000E+00	3.64796E-11	1.57917E-02	1.77060E-01	1.94305E-02	1.23766E-01	-1.27465E-01	1.00042E+00
24	.00000E+00	9.92926E-12	2.34777E-02	1.20933E-01	2.33514E-02	1.22645E-01	-1.22564E-01	1.00030E+00
25	.00000E+00	2.90664E-12	1.99277E-02	4.55053E-02	1.49595E-02	6.73957E-02	-6.24438E-02	1.00022E+00
26	.00000E+00	2.03815E-12	9.74409E-03	3.14246E-02	6.67925E-03	6.06728E-02	-5.76195E-02	1.00017E+00
27	.00000E+00	4.85702E-13	2.09086E-03	4.65127E-03	1.12921E-03	1.68633E-02	-1.59088E-02	1.00009E+00
28	.00000E+00	1.00000E+00	6.30843E-01	5.44918E+00	6.30843E-01	9.37995E-01	6.39953E-02	1.00016E+00

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	r2n rate	fiss rate	flux*df**2	total flux
1	1.70174E-01	1.09607E-02	1.75054E-01	.00000E+00	2.23497E-03	2.60459E-03	.00000E+00	1.19203E-01
2	1.27029E+00	1.14487E-01	1.32142E+00	.00000E+00	1.73374E-05	1.18240E-02	.00000E+00	8.95746E-01
3	1.61311E+00	1.44988E-01	1.67662E+00	.00000E+00	.00000E+00	1.45423E-02	.00000E+00	1.13668E+00
4	1.00226E+00	8.76831E-02	1.04022E+00	.00000E+00	.00000E+00	6.28508E-03	.00000E+00	7.05515E-01
5	1.51516E+00	1.33502E-01	1.57460E+00	.00000E+00	.00000E+00	1.83944E-03	.00000E+00	1.06716E+00
6	2.91569E+00	2.51482E-01	3.02957E+00	.00000E+00	.00000E+00	1.62738E-03	.00000E+00	2.05279E+00
7	2.83678E+00	1.42763E-01	2.90454E+00	.00000E+00	.00000E+00	1.62640E-03	.00000E+00	1.97980E+00
8	2.06815E+00	2.06706E-02	2.07996E+00	.00000E+00	.00000E+00	1.67775E-03	.00000E+00	1.42852E+00
9	1.59821E+00	-2.11456E-02	1.58631E+00	.00000E+00	.00000E+00	2.26989E-03	.00000E+00	1.09549E+00
10	1.45810E+00	-2.59414E-02	1.44483E+00	.00000E+00	.00000E+00	4.83462E-03	.00000E+00	9.98583E-01
11	1.33243E+00	-5.58644E-02	1.30372E+00	.00000E+00	.00000E+00	1.01361E-02	.00000E+00	9.06949E-01
12	8.28860E-01	-6.50903E-02	7.95094E-01	.00000E+00	.00000E+00	1.31558E-02	.00000E+00	5.57221E-01
13	7.00288E-01	-5.52509E-02	6.72015E-01	.00000E+00	.00000E+00	1.35217E-02	.00000E+00	4.70885E-01
14	6.33755E-01	-8.21511E-02	5.91297E-01	.00000E+00	.00000E+00	8.78186E-03	.00000E+00	4.19398E-01
15	3.75527E-01	-8.09078E-03	3.71197E-01	.00000E+00	.00000E+00	2.20594E-03	.00000E+00	2.56839E-01
16	2.08346E-01	-5.11392E-03	2.05792E-01	.00000E+00	.00000E+00	1.50475E-03	.00000E+00	1.42426E-01
17	8.99308E-02	-5.58201E-03	8.66302E-02	.00000E+00	.00000E+00	2.00824E-03	.00000E+00	6.04359E-02
18	6.18088E-02	-1.57871E-02	5.32102E-02	.00000E+00	.00000E+00	2.00612E-03	.00000E+00	3.90798E-02
19	1.36508E-01	-9.40703E-03	1.31732E-01	.00000E+00	.00000E+00	3.19801E-03	.00000E+00	9.20951E-02
20	4.53547E-01	-2.47475E-02	4.41158E-01	.00000E+00	.00000E+00	1.65072E-02	.00000E+00	3.07527E-01
21	1.28750E-01	-2.11760E-02	1.17871E-01	.00000E+00	.00000E+00	1.39008E-02	.00000E+00	8.42857E-02
22	2.40409E-01	-6.11984E-02	2.07574E-01	.00000E+00	.00000E+00	3.96511E-02	.00000E+00	1.52340E-01
23	7.92361E-01	-1.27465E-01	7.27752E-01	.00000E+00	.00000E+00	8.00365E-02	.00000E+00	5.19798E-01
24	5.87945E-01	-1.22564E-01	5.25378E-01	.00000E+00	.00000E+00	7.97521E-02	.00000E+00	3.79811E-01

25	2.49004E-01	-6.24438E-02	2.16400E-01	.00000E+00	.00000E+00	4.57852E-02	.00000E+00	1.58999E-01
26	1.61109E-01	-5.76195E-02	1.30331E-01	.00000E+00	.00000E+00	4.20884E-02	.00000E+00	9.85518E-02
27	2.61330E-02	-1.59088E-02	1.68556E-02	.00000E+00	.00000E+00	1.18066E-02	.00000E+00	1.41831E-02
28	2.34541E+01	6.39931E-02	2.34271E+01	.00000E+00	2.25290E-03	4.35177E-01	.00000E+00	1.61385E+01

1fine group summary for zone 2 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-4.65661E-09	1.00000E+00
2	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	7.45058E-09	1.00000E+00
3	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-8.94070E-08	1.00000E+00
4	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-1.49012E-08	1.00000E+00
5	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	1.00000E+00
6	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-2.98023E-08	1.00000E+00
7	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-2.98023E-08	1.00000E+00
8	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-3.35276E-08	1.00000E+00
9	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	5.96046E-08	9.99997E-01
10	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	2.23517E-08	9.99999E-01
11	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-5.96046E-08	1.00000E+00
12	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-7.45058E-09	1.00000E+00
13	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	2.23517E-08	1.00000E+00
14	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	4.47035E-08	9.99999E-01
15	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-1.49012E-08	1.00000E+00
16	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-9.31323E-10	1.00000E+00
17	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-9.31323E-10	1.00000E+00
18	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-1.86265E-09	1.00000E+00
19	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-1.86265E-09	1.00000E+00
20	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-1.86265E-09	1.00000E+00
21	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	5.58794E-09	1.00000E+00
22	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	3.72529E-09	1.00000E+00
23	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	5.96046E-08	1.00000E+00
24	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-7.45058E-09	1.00000E+00
25	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	3.72529E-09	1.00000E+00
26	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-1.11759E-08	1.00000E+00
27	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-3.72529E-09	1.00000E+00
28	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-6.33259E-08	9.99999E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	r2n rate	fiss rate	flux*db**2	total flux
1	1.69758E-01	1.09606E-02	1.70174E-01	1.09607E-02	.00000E+00	.00000E+00	.00000E+00	5.39583E-03
2	1.26624E+00	1.14487E-01	1.27029E+00	1.14487E-01	.00000E+00	.00000E+00	.00000E+00	4.02478E-02
3	1.60830E+00	1.44988E-01	1.61311E+00	1.44988E-01	.00000E+00	.00000E+00	.00000E+00	5.11145E-02
4	9.99590E-01	8.76831E-02	1.00226E+00	8.76831E-02	.00000E+00	.00000E+00	.00000E+00	3.17635E-02
5	1.51133E+00	1.33502E-01	1.51516E+00	1.33502E-01	.00000E+00	.00000E+00	.00000E+00	4.80215E-02
6	2.90884E+00	2.51482E-01	2.91569E+00	2.51482E-01	.00000E+00	.00000E+00	.00000E+00	9.24181E-02
7	2.83299E+00	1.42763E-01	2.83676E+00	1.42763E-01	.00000E+00	.00000E+00	.00000E+00	8.99634E-02
8	2.06738E+00	2.06705E-02	2.06815E+00	2.06705E-02	.00000E+00	.00000E+00	.00000E+00	6.56209E-02
9	1.59898E+00	-2.11456E-02	1.59821E+00	-2.11456E-02	.00000E+00	.00000E+00	.00000E+00	5.07319E-02
10	1.45881E+00	-2.59414E-02	1.45810E+00	-2.59414E-02	.00000E+00	.00000E+00	.00000E+00	4.62847E-02
11	1.33396E+00	-5.58644E-02	1.33243E+00	-5.58644E-02	.00000E+00	.00000E+00	.00000E+00	4.23099E-02
12	8.30691E-01	-6.50904E-02	8.28860E-01	-6.50908E-02	.00000E+00	.00000E+00	.00000E+00	2.63339E-02
13	7.01845E-01	-5.52508E-02	7.00288E-01	-5.52509E-02	.00000E+00	.00000E+00	.00000E+00	2.22492E-02
14	6.36066E-01	-8.21510E-02	6.33755E-01	-8.21511E-02	.00000E+00	.00000E+00	.00000E+00	2.01500E-02
15	3.75758E-01	-8.09079E-03	3.75527E-01	-8.09078E-03	.00000E+00	.00000E+00	.00000E+00	1.19211E-02
16	2.08491E-01	-5.11392E-03	2.08346E-01	-5.11392E-03	.00000E+00	.00000E+00	.00000E+00	6.61429E-03
17	8.95471E-02	-5.58201E-03	8.93908E-02	-5.58201E-03	.00000E+00	.00000E+00	.00000E+00	2.83929E-03
18	6.22593E-02	-1.57871E-02	6.18088E-02	-1.57871E-02	.00000E+00	.00000E+00	.00000E+00	1.96878E-03
19	1.36766E-01	-9.40703E-03	1.36508E-01	-9.40703E-03	.00000E+00	.00000E+00	.00000E+00	4.33614E-03
20	4.54235E-01	-2.47475E-02	4.53547E-01	-2.47475E-02	.00000E+00	.00000E+00	.00000E+00	1.44043E-02
21	1.29332E-01	-2.11760E-02	1.28750E-01	-2.11760E-02	.00000E+00	.00000E+00	.00000E+00	4.09518E-03
22	2.42103E-01	-6.11984E-02	2.40409E-01	-6.11984E-02	.00000E+00	.00000E+00	.00000E+00	7.65703E-03
23	7.95748E-01	-1.27465E-01	7.92361E-01	-1.27465E-01	.00000E+00	.00000E+00	.00000E+00	2.52013E-02
24	5.91151E-01	-1.22564E-01	5.87945E-01	-1.22564E-01	.00000E+00	.00000E+00	.00000E+00	1.87112E-02
25	2.50636E-01	-6.24438E-02	2.49004E-01	-6.24438E-02	.00000E+00	.00000E+00	.00000E+00	7.92895E-03

26	1.62576E-01	-5.76195E-02	1.61109E-01	-5.76195E-02	.00000E+00	.00000E+00	.00000E+00	5.13686E-03
27	2.65416E-02	-1.59038E-02	2.61330E-02	-1.59038E-02	.00000E+00	.00000E+00	.00000E+00	8.36021E-04
28	2.34495E+01	6.39952E-02	2.34541E+01	6.39951E-02	.00000E+00	.00000E+00	.00000E+00	7.44253E-01

1fine group summary for zone 3 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	.00000E+00	.00000E+00	3.74152E-03	2.80474E-03	1.43732E-05	-2.71906E-03	1.00001E+00
2	.00000E+00	.00000E+00	4.89842E-04	2.58014E-02	1.85137E-02	5.12586E-05	-1.80754E-02	1.00000E+00
3	.00000E+00	.00000E+00	2.62885E-03	5.00266E-02	1.58179E-02	1.36826E-04	-1.33248E-02	9.99993E-01
4	.00000E+00	.00000E+00	5.11053E-03	4.20489E-02	5.44442E-03	1.05225E-04	-4.36708E-04	9.99996E-01
5	.00000E+00	.00000E+00	1.10180E-02	8.15850E-02	5.15964E-03	1.51991E-04	5.70606E-03	1.00000E+00
6	.00000E+00	.00000E+00	1.84231E-02	2.34979E-01	3.21046E-03	3.19974E-04	1.48927E-02	1.00000E+00
7	.00000E+00	.00000E+00	1.22704E-02	2.35139E-01	1.18193E-03	3.44682E-04	1.07440E-02	9.99999E-01
8	.00000E+00	.00000E+00	2.15752E-03	1.58516E-01	7.63277E-03	2.94795E-04	-5.77059E-03	1.00002E+00
9	.00000E+00	.00000E+00	7.66597E-03	1.05152E-01	8.76556E-04	1.10880E-03	5.68073E-03	9.99995E-01
10	.00000E+00	.00000E+00	8.77730E-04	8.55144E-02	8.48652E-04	8.35100E-04	-8.05790E-04	9.99999E-01
11	.00000E+00	.00000E+00	8.48513E-04	7.69778E-02	8.69351E-04	1.33568E-03	-1.35650E-03	1.00000E+00
12	.00000E+00	.00000E+00	8.69357E-04	4.67526E-02	8.69815E-04	4.16252E-05	-4.21554E-05	1.00000E+00
13	.00000E+00	.00000E+00	8.69817E-04	3.95207E-02	8.06194E-04	6.00388E-05	3.62098E-06	1.00000E+00
14	.00000E+00	.00000E+00	8.06195E-04	3.60606E-02	6.79566E-04	9.60489E-05	3.05027E-05	1.00000E+00
15	.00000E+00	.00000E+00	7.25794E-04	2.06732E-02	8.46087E-04	8.30211E-05	-2.04784E-04	9.99941E-01
16	.00000E+00	.00000E+00	9.47810E-04	1.09843E-02	9.51590E-04	5.17606E-05	-5.51790E-05	9.99941E-01
17	.00000E+00	.00000E+00	1.03311E-03	4.12690E-03	1.01588E-03	2.49315E-05	-7.62660E-06	9.99994E-01
18	.00000E+00	.00000E+00	1.06905E-03	2.74689E-03	8.86957E-04	1.88105E-05	1.63304E-04	9.99999E-01
19	.00000E+00	.00000E+00	9.19272E-04	6.84829E-03	1.01040E-03	4.43675E-05	-1.35426E-04	9.99995E-01
20	.00000E+00	.00000E+00	1.21060E-03	2.50055E-02	1.06307E-03	1.85918E-04	-3.75081E-05	9.99966E-01
21	.00000E+00	.00000E+00	1.34875E-03	6.04549E-03	1.44405E-03	6.66027E-05	-1.61819E-04	9.99997E-01
22	.00000E+00	.00000E+00	1.82261E-03	1.24574E-02	1.66489E-03	1.45151E-04	1.28821E-05	9.99995E-01
23	.00000E+00	.00000E+00	2.41147E-03	4.28920E-02	3.14899E-03	6.49560E-04	-1.38709E-03	1.00000E+00
24	.00000E+00	.00000E+00	3.85957E-03	3.01764E-02	4.14126E-03	7.02948E-04	-9.84915E-04	1.00000E+00
25	.00000E+00	.00000E+00	3.72885E-03	1.16002E-02	2.98574E-03	3.94554E-04	3.48464E-04	1.00000E+00
26	.00000E+00	.00000E+00	1.55394E-03	8.41237E-03	1.11172E-03	3.67335E-04	7.48336E-05	1.00000E+00
27	.00000E+00	.00000E+00	3.22360E-04	1.57956E-03	8.13744E-07	1.15516E-04	2.06027E-04	1.00000E+00
28	.00000E+00	.00000E+00	8.49869E-02	1.40536E+00	8.49869E-02	7.74487E-03	-7.64218E-03	9.99981E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	r2n rate	fiss rate	flux*dv**2	total flux
1	1.68154E-01	8.24158E-03	1.69758E-01	1.09606E-02	1.00211E-04	.00000E+00	.00000E+00	3.65829E-02
2	1.24880E+00	9.64112E-02	1.26624E+00	1.14487E-01	.00000E+00	.00000E+00	.00000E+00	2.72274E-01
3	1.58525E+00	1.31664E-01	1.60890E+00	1.44988E-01	.00000E+00	.00000E+00	.00000E+00	3.45816E-01
4	9.84981E-01	8.72464E-02	9.99590E-01	8.76831E-02	.00000E+00	.00000E+00	.00000E+00	2.14974E-01
5	1.48825E+00	1.39208E-01	1.51133E+00	1.33502E-01	.00000E+00	.00000E+00	.00000E+00	3.24981E-01
6	2.86315E+00	2.66375E-01	2.90884E+00	2.51482E-01	.00000E+00	.00000E+00	.00000E+00	6.25408E-01
7	2.80668E+00	1.53507E-01	2.85299E+00	1.42763E-01	.00000E+00	.00000E+00	.00000E+00	6.11107E-01
8	2.06427E+00	1.48999E-02	2.06758E+00	2.06705E-02	.00000E+00	.00000E+00	.00000E+00	4.47640E-01
9	1.60213E+00	-1.54648E-02	1.59898E+00	-2.11456E-02	.00000E+00	.00000E+00	.00000E+00	3.46948E-01
10	1.46317E+00	-2.67472E-02	1.45881E+00	-2.59414E-02	.00000E+00	.00000E+00	.00000E+00	3.16648E-01
11	1.34321E+00	-5.72209E-02	1.33396E+00	-5.58644E-02	.00000E+00	.00000E+00	.00000E+00	2.90144E-01
12	8.41297E-01	-6.51325E-02	8.30691E-01	-6.50904E-02	.00000E+00	.00000E+00	.00000E+00	1.81242E-01
13	7.10886E-01	-5.52472E-02	7.01845E-01	-5.52508E-02	.00000E+00	.00000E+00	.00000E+00	1.53140E-01
14	6.49463E-01	-8.21205E-02	6.36066E-01	-8.21510E-02	.00000E+00	.00000E+00	.00000E+00	1.39383E-01
15	3.77182E-01	-8.29558E-03	3.75758E-01	-8.09079E-03	.00000E+00	.00000E+00	.00000E+00	8.15949E-02
16	2.09336E-01	-5.16910E-03	2.08491E-01	-5.11398E-03	.00000E+00	.00000E+00	.00000E+00	4.52811E-02
17	9.04515E-02	-5.58964E-03	8.95471E-02	-5.58201E-03	.00000E+00	.00000E+00	.00000E+00	1.95099E-02
18	6.47998E-02	-1.56238E-02	6.22593E-02	-1.57871E-02	.00000E+00	.00000E+00	.00000E+00	1.37856E-02
19	1.38259E-01	-9.54265E-03	1.36766E-01	-9.40703E-03	.00000E+00	.00000E+00	.00000E+00	2.98133E-02
20	4.58198E-01	-2.47850E-02	4.54235E-01	-2.47475E-02	.00000E+00	.00000E+00	.00000E+00	9.88956E-02
21	1.32694E-01	-2.13378E-02	1.29352E-01	-2.11760E-02	.00000E+00	.00000E+00	.00000E+00	2.84128E-02
22	2.51697E-01	-6.11865E-02	2.42103E-01	-6.11984E-02	.00000E+00	.00000E+00	.00000E+00	5.35756E-02
23	8.14928E-01	-1.28852E-01	7.95748E-01	-1.27468E-01	.00000E+00	.00000E+00	.00000E+00	1.74674E-01
24	6.08804E-01	-1.23549E-01	5.91151E-01	-1.22564E-01	.00000E+00	.00000E+00	.00000E+00	1.30177E-01
25	2.59214E-01	-6.20953E-02	2.50636E-01	-6.24438E-02	.00000E+00	.00000E+00	.00000E+00	5.53362E-02
26	1.70078E-01	-5.75446E-02	1.62576E-01	-5.76195E-02	.00000E+00	.00000E+00	.00000E+00	3.61325E-02

27	2.85232E-02	-1.56978E-02	2.65416E-02	-1.59038E-02	.00000E+00	.00000E+00	.00000E+00	5.99467E-03
28	2.34239E+01	5.63513E-02	2.34499E+01	6.39932E-02	1.00211E-04	.00000E+00	.00000E+00	5.07947E+00

1fine group summary for zone 4 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	.00000E+00	.00000E+00	5.91195E-03	7.82496E-03	4.17035E-04	-8.24157E-03	9.99949E-01
2	.00000E+00	.00000E+00	4.48981E-03	7.59598E-02	9.98352E-02	1.06965E-03	-9.64112E-02	9.99962E-01
3	.00000E+00	.00000E+00	4.73567E-02	6.88057E-02	1.79019E-01	5.40804E-06	-1.31663E-01	9.99977E-01
4	.00000E+00	.00000E+00	7.00592E-02	4.57825E-02	1.57304E-01	3.22595E-06	-8.72463E-02	9.99987E-01
5	.00000E+00	.00000E+00	1.29608E-01	1.48377E-01	2.68814E-01	3.77207E-06	-1.39208E-01	9.99991E-01
6	.00000E+00	.00000E+00	2.74570E-01	4.55137E-01	5.40934E-01	1.14731E-05	-2.66375E-01	9.99998E-01
7	.00000E+00	.00000E+00	5.52406E-01	7.94995E-01	7.05897E-01	2.53458E-05	-1.53507E-01	9.99987E-01
8	.00000E+00	.00000E+00	7.35272E-01	1.00050E+00	7.50191E-01	4.69920E-05	-1.48998E-02	9.99912E-01
9	.00000E+00	.00000E+00	7.40482E-01	9.15515E-01	7.25003E-01	9.58498E-05	1.54650E-02	9.99889E-01
10	.00000E+00	.00000E+00	7.21750E-01	8.64640E-01	6.94867E-01	2.11270E-04	2.67473E-02	9.99896E-01
11	.00000E+00	.00000E+00	6.99883E-01	8.04457E-01	6.42247E-01	4.56830E-04	5.72210E-02	9.99940E-01
12	.00000E+00	.00000E+00	5.59151E-01	4.19864E-01	4.98433E-01	5.96706E-04	6.51325E-02	9.99979E-01
13	.00000E+00	.00000E+00	4.89577E-01	3.37852E-01	4.33247E-01	8.97357E-04	5.52472E-02	9.99970E-01
14	.00000E+00	.00000E+00	4.70024E-01	3.23500E-01	3.86444E-01	1.46407E-03	8.21205E-02	9.99988E-01
15	.00000E+00	.00000E+00	2.51764E-01	1.29273E-01	2.42180E-01	1.28804E-03	8.29675E-03	9.99996E-01
16	.00000E+00	.00000E+00	1.67146E-01	5.46799E-02	1.61092E-01	8.85122E-04	5.17011E-03	9.99995E-01
17	.00000E+00	.00000E+00	8.62418E-02	1.54186E-02	8.02224E-02	4.30679E-04	5.58595E-03	1.00003E+00
18	.00000E+00	.00000E+00	7.65626E-02	1.10905E-02	6.06006E-02	3.39526E-04	1.56203E-02	1.00003E+00
19	.00000E+00	.00000E+00	1.26494E-01	3.50070E-02	1.16185E-01	7.67316E-04	9.53673E-03	1.00004E+00
20	.00000E+00	.00000E+00	3.09794E-01	2.49256E-01	2.81818E-01	3.18886E-03	2.47872E-02	1.00000E+00
21	.00000E+00	.00000E+00	1.46271E-01	4.75720E-02	1.25757E-01	1.17872E-03	2.13296E-02	1.00004E+00
22	.00000E+00	.00000E+00	2.78161E-01	1.37742E-01	2.14356E-01	2.61822E-03	6.11882E-02	9.99996E-01
23	.00000E+00	.00000E+00	6.61823E-01	7.94182E-01	5.21518E-01	1.14496E-02	1.28651E-01	1.00001E+00
24	.00000E+00	.00000E+00	6.75005E-01	6.98008E-01	5.38798E-01	1.26543E-02	1.23547E-01	1.00001E+00
25	.00000E+00	.00000E+00	4.34602E-01	2.89951E-01	3.65304E-01	7.20201E-03	6.20944E-02	1.00000E+00
26	.00000E+00	.00000E+00	3.42940E-01	3.01452E-01	2.78431E-01	6.96414E-03	5.75428E-02	1.00001E+00
27	.00000E+00	.00000E+00	1.13959E-01	6.29167E-02	9.58472E-02	2.39401E-03	1.56979E-02	9.99999E-01
28	.00000E+00	.00000E+00	9.16517E+00	9.08132E+00	9.16517E+00	5.66653E-02	-5.63700E-02	9.99968E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*dv**2	total flux
1	1.67374E-01	9.51706E-09	1.68154E-01	8.24158E-03	4.32742E-10	.00000E+00	.00000E+00	1.91561E-01
2	1.25737E+00	-5.43483E-08	1.24880E+00	9.64112E-02	.00000E+00	.00000E+00	.00000E+00	1.41672E+00
3	1.56766E+00	3.61414E-08	1.58525E+00	1.31664E-01	.00000E+00	.00000E+00	.00000E+00	1.79544E+00
4	9.71839E-01	3.75537E-08	9.84981E-01	8.72464E-02	.00000E+00	.00000E+00	.00000E+00	1.11344E+00
5	1.46584E+00	5.84953E-08	1.48825E+00	1.39208E-01	.00000E+00	.00000E+00	.00000E+00	1.67980E+00
6	2.81914E+00	-1.89576E-08	2.86315E+00	2.66375E-01	.00000E+00	.00000E+00	.00000E+00	3.23071E+00
7	2.78133E+00	1.01438E-07	2.80668E+00	1.53507E-01	.00000E+00	.00000E+00	.00000E+00	3.18526E+00
8	2.06435E+00	4.74044E-08	2.06427E+00	1.48999E-02	.00000E+00	.00000E+00	.00000E+00	2.36199E+00
9	1.60426E+00	1.44233E-07	1.60213E+00	-1.54648E-02	.00000E+00	.00000E+00	.00000E+00	1.83600E+00
10	1.46795E+00	3.97199E-08	1.46317E+00	-2.67472E-02	.00000E+00	.00000E+00	.00000E+00	1.67973E+00
11	1.35330E+00	7.56448E-08	1.34321E+00	-5.72209E-02	.00000E+00	.00000E+00	.00000E+00	1.54809E+00
12	8.52453E-01	-4.70533E-08	8.41297E-01	-6.51325E-02	.00000E+00	.00000E+00	.00000E+00	9.74828E-01
13	7.19952E-01	-9.27500E-09	7.10886E-01	-5.52472E-02	.00000E+00	.00000E+00	.00000E+00	8.23472E-01
14	6.65269E-01	-2.58478E-08	6.49463E-01	-8.21205E-02	.00000E+00	.00000E+00	.00000E+00	7.58190E-01
15	3.77714E-01	1.17395E-06	3.77182E-01	-8.29558E-03	.00000E+00	.00000E+00	.00000E+00	4.32571E-01
16	2.09915E-01	1.01414E-06	2.09336E-01	-5.16910E-03	.00000E+00	.00000E+00	.00000E+00	2.40320E-01
17	9.13696E-02	-3.68692E-06	9.04515E-02	-5.58964E-03	.00000E+00	.00000E+00	.00000E+00	1.04515E-01
18	6.76043E-02	-3.45730E-06	6.47998E-02	-1.56238E-02	.00000E+00	.00000E+00	.00000E+00	7.71151E-02
19	1.39831E-01	-5.72888E-06	1.38259E-01	-9.54245E-03	.00000E+00	.00000E+00	.00000E+00	1.59953E-01
20	4.62087E-01	2.19781E-06	4.58198E-01	-2.47850E-02	.00000E+00	.00000E+00	.00000E+00	5.28690E-01
21	1.36618E-01	-8.18188E-06	1.32694E-01	-2.13378E-02	.00000E+00	.00000E+00	.00000E+00	1.55996E-01
22	2.63122E-01	2.64454E-06	2.51697E-01	-6.11855E-02	.00000E+00	.00000E+00	.00000E+00	3.00082E-01
23	8.41693E-01	-5.58053E-07	8.14928E-01	-1.28852E-01	.00000E+00	.00000E+00	.00000E+00	9.60176E-01
24	6.38542E-01	-2.05871E-06	6.08804E-01	-1.23549E-01	.00000E+00	.00000E+00	.00000E+00	7.26469E-01
25	2.75942E-01	-8.83522E-07	2.59214E-01	-6.20953E-02	.00000E+00	.00000E+00	.00000E+00	3.13052E-01
26	1.88682E-01	-2.05815E-06	1.70078E-01	-5.75446E-02	.00000E+00	.00000E+00	.00000E+00	2.12332E-01
27	3.48789E-02	1.46157E-07	2.85232E-02	-1.56978E-02	.00000E+00	.00000E+00	.00000E+00	3.85081E-02

28	2.34641E+01	-1.91602E-05	2.34239E+01	5.63513E-02	4.32742E-10	.00000E+00	.00000E+00	2.68450E+01

1fine group summary for system

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	2.22774E-02	.00000E+00	2.21701E-02	2.10325E-02	3.60903E-03	9.51706E-09	9.98826E-01
2	.00000E+00	1.91850E-01	7.27557E-03	2.67948E-01	1.84436E-01	1.47028E-02	-5.43483E-08	1.00002E+00
3	.00000E+00	2.15499E-01	7.60814E-02	2.79605E-01	2.75875E-01	1.57086E-02	3.61414E-08	9.99986E-01
4	.00000E+00	1.24085E-01	1.14020E-01	1.93002E-01	2.30565E-01	7.53892E-03	3.75537E-08	1.00000E+00
5	.00000E+00	1.64899E-01	2.08442E-01	4.89521E-01	3.68741E-01	4.60445E-03	5.84953E-08	9.99989E-01
6	.00000E+00	1.78374E-01	4.27561E-01	1.34390E+00	5.98550E-01	7.37721E-03	-1.89576E-08	1.00001E+00
7	.00000E+00	8.83271E-02	6.63086E-01	1.77534E+00	7.43416E-01	8.00577E-03	1.01438E-07	9.99989E-01
8	.00000E+00	1.36206E-02	7.80003E-01	1.78998E+00	7.79313E-01	1.43741E-02	4.74046E-08	9.99920E-01
9	.00000E+00	9.88735E-04	7.69859E-01	1.55572E+00	7.46535E-01	2.43945E-02	1.44233E-07	9.99878E-01
10	.00000E+00	7.34411E-05	7.43306E-01	1.40970E+00	7.06389E-01	3.70648E-02	3.97199E-08	9.99899E-01
11	.00000E+00	5.77788E-06	7.11406E-01	1.30199E+00	6.51244E-01	6.02097E-02	7.56448E-08	9.99942E-01
12	.00000E+00	4.05887E-07	5.68147E-01	7.04020E-01	5.03660E-01	6.45025E-02	-4.70533E-08	9.99974E-01
13	.00000E+00	6.44511E-08	4.99603E-01	5.54024E-01	4.40209E-01	5.94093E-02	-9.27500E-09	9.99971E-01
14	.00000E+00	1.27725E-08	4.76985E-01	5.11443E-01	3.94578E-01	8.24122E-02	-2.58478E-08	9.99989E-01
15	.00000E+00	1.44343E-09	2.60030E-01	2.35030E-01	2.51949E-01	8.05198E-03	1.17395E-06	1.00011E+00
16	.00000E+00	4.23842E-10	1.77189E-01	1.08776E-01	1.71720E-01	5.44952E-03	1.01414E-06	1.00011E+00
17	.00000E+00	1.36498E-10	9.51138E-02	3.45256E-02	8.89116E-02	6.19340E-03	-3.68692E-06	1.00013E+00
18	.00000E+00	9.77284E-11	8.49290E-02	2.40580E-02	6.70358E-02	1.78895E-02	-3.45730E-06	1.00009E+00
19	.00000E+00	1.38167E-10	1.35115E-01	6.71547E-02	1.26508E-01	8.59726E-03	-5.72888E-06	1.00011E+00
20	.00000E+00	2.24674E-10	3.21742E-01	3.79767E-01	2.92844E-01	2.88629E-02	2.19781E-06	1.00010E+00
21	.00000E+00	3.28850E-11	1.57138E-01	7.65254E-02	1.34080E-01	2.30489E-02	-8.18188E-06	1.00011E+00
22	.00000E+00	3.81541E-11	2.92750E-01	1.97113E-01	2.26569E-01	6.61639E-02	2.64454E-06	1.00005E+00
23	.00000E+00	3.64796E-11	6.80026E-01	1.01413E+00	5.44097E-01	1.35865E-01	-5.58053E-07	1.00010E+00
24	.00000E+00	9.92926E-12	7.02342E-01	8.49118E-01	5.66291E-01	1.36003E-01	-2.05871E-06	1.00007E+00
25	.00000E+00	2.90664E-12	4.58258E-01	3.41057E-01	3.85249E-01	7.49903E-02	-8.83522E-07	1.00004E+00
26	.00000E+00	2.03815E-12	3.54238E-01	3.41289E-01	2.86222E-01	6.80043E-02	-2.05815E-06	1.00004E+00
27	.00000E+00	4.85702E-13	1.16352E-01	6.91474E-02	9.69772E-02	1.95729E-02	1.46157E-07	1.00001E+00
28	.00000E+00	1.00000E+00	9.88100E+00	1.59359E+01	9.88100E+00	1.00241E+00	-1.90419E-05	9.99997E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	r2n rate	fiss rate	flux*adj**2	total flux
1	1.67374E-01	9.51706E-09	1.75054E-01	.00000E+00	2.33518E-03	2.60459E-03	.00000E+00	3.52741E-01
2	1.25737E+00	-5.43483E-08	1.32142E+00	.00000E+00	1.73374E-05	1.18240E-02	.00000E+00	2.62499E+00
3	1.56766E+00	3.61414E-08	1.67662E+00	.00000E+00	.00000E+00	1.45423E-02	.00000E+00	3.32905E+00
4	9.71859E-01	3.75537E-08	1.04022E+00	.00000E+00	.00000E+00	6.28508E-03	.00000E+00	2.06570E+00
5	1.46584E+00	5.84953E-08	1.57460E+00	.00000E+00	.00000E+00	1.83944E-03	.00000E+00	3.11997E+00
6	2.81914E+00	-1.89576E-08	3.02557E+00	.00000E+00	.00000E+00	1.62738E-03	.00000E+00	6.00132E+00
7	2.78133E+00	1.01438E-07	2.90454E+00	.00000E+00	.00000E+00	1.62640E-03	.00000E+00	5.86612E+00
8	2.06435E+00	4.74046E-08	2.07996E+00	.00000E+00	.00000E+00	1.67775E-03	.00000E+00	4.30877E+00
9	1.60426E+00	1.44233E-07	1.58631E+00	.00000E+00	.00000E+00	2.26989E-03	.00000E+00	3.32917E+00
10	1.46795E+00	3.97199E-08	1.44483E+00	.00000E+00	.00000E+00	4.83462E-03	.00000E+00	3.04124E+00
11	1.35330E+00	7.56448E-08	1.30572E+00	.00000E+00	.00000E+00	1.01361E-02	.00000E+00	2.78650E+00
12	8.52453E-01	-4.70533E-08	7.95094E-01	.00000E+00	.00000E+00	1.31558E-02	.00000E+00	1.73963E+00
13	7.19952E-01	-9.27500E-09	6.72015E-01	.00000E+00	.00000E+00	1.35217E-02	.00000E+00	1.46975E+00
14	6.65269E-01	-2.58478E-08	5.91297E-01	.00000E+00	.00000E+00	8.78186E-03	.00000E+00	1.33712E+00
15	3.77714E-01	1.17395E-06	3.71197E-01	.00000E+00	.00000E+00	2.20594E-03	.00000E+00	7.82927E-01
16	2.09915E-01	1.01414E-06	2.05792E-01	.00000E+00	.00000E+00	1.50475E-03	.00000E+00	4.34640E-01
17	9.13694E-02	-3.68692E-06	8.66302E-02	.00000E+00	.00000E+00	2.00824E-03	.00000E+00	1.87304E-01
18	6.76043E-02	-3.45730E-06	5.32102E-02	.00000E+00	.00000E+00	2.00612E-03	.00000E+00	1.31949E-01
19	1.39831E-01	-5.72888E-06	1.31732E-01	.00000E+00	.00000E+00	3.19801E-03	.00000E+00	2.86196E-01
20	4.62087E-01	2.19781E-06	4.41158E-01	.00000E+00	.00000E+00	1.65072E-02	.00000E+00	9.49516E-01
21	1.36618E-01	-8.18188E-06	1.17871E-01	.00000E+00	.00000E+00	1.39008E-02	.00000E+00	2.72790E-01
22	2.63122E-01	2.64454E-06	2.07574E-01	.00000E+00	.00000E+00	3.96511E-02	.00000E+00	5.13655E-01
23	8.41693E-01	-5.58053E-07	7.27752E-01	.00000E+00	.00000E+00	8.00865E-02	.00000E+00	1.67984E+00
24	6.38542E-01	-2.05871E-06	5.25378E-01	.00000E+00	.00000E+00	7.97521E-02	.00000E+00	1.25517E+00
25	2.75942E-01	-8.83522E-07	2.16400E-01	.00000E+00	.00000E+00	4.57852E-02	.00000E+00	5.34696E-01
26	1.88682E-01	-2.05815E-06	1.30331E-01	.00000E+00	.00000E+00	4.20884E-02	.00000E+00	3.52153E-01
27	3.48789E-02	1.46157E-07	1.68556E-02	.00000E+00	.00000E+00	1.18066E-02	.00000E+00	5.95219E-02
28	2.34641E+01	-1.91602E-05	2.34271E+01	.00000E+00	2.35251E-03	4.35177E-01	.00000E+00	4.88072E+01

- elapsed time .02 min.
0direct access unit 9 requires 516 blocks of length 1456 for cross section weighting.
1 transport cross section weighting function

0zone	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	2.35140E-03	2.47475E-02	3.15079E-02	1.90954E-02	2.92078E-02	5.58110E-02	3.17882E-02	4.62073E-03
2	3.68453E-03	3.84858E-02	4.87395E-02	2.94756E-02	4.48780E-02	8.45382E-02	4.79912E-02	6.94858E-03
3	2.99390E-03	3.28340E-02	4.30313E-02	2.71787E-02	4.23465E-02	8.03980E-02	4.59882E-02	5.55052E-03
4	1.03346E-03	1.20820E-02	1.64948E-02	1.09253E-02	1.74268E-02	3.33499E-02	1.92934E-02	1.99253E-03
5	1.71392E-03	1.88345E-02	2.47151E-02	1.56028E-02	2.43366E-02	4.64582E-02	2.66432E-02	3.30782E-03

0zone	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	4.73259E-03	5.81299E-03	1.26849E-02	1.44916E-02	1.23077E-02	1.81939E-02	1.83083E-03	1.14541E-03
2	7.10853E-03	8.72049E-03	1.87794E-02	2.18808E-02	1.85732E-02	2.76159E-02	2.71977E-03	1.71908E-03
3	5.71089E-03	8.18237E-03	1.75632E-02	2.02312E-02	1.71671E-02	2.55214E-02	2.54517E-03	1.59734E-03
4	1.90219E-03	3.32937E-03	7.13284E-03	8.12556E-03	6.93056E-03	1.02636E-02	1.11012E-03	6.69829E-04
5	3.31430E-03	4.73831E-03	1.01667E-02	1.17014E-02	9.95242E-03	1.47398E-02	1.52246E-03	9.39700E-04

0zone	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	1.24160E-03	3.40662E-03	2.11873E-03	5.53585E-03	4.65845E-03	1.33223E-02	2.81858E-02	2.69236E-02
2	1.87639E-03	5.30680E-03	3.16215E-03	8.31895E-03	7.11816E-03	2.05725E-02	4.28491E-02	4.12017E-02
3	1.73551E-03	4.87994E-03	2.94379E-03	7.69526E-03	6.60366E-03	1.90131E-02	3.98161E-02	3.82520E-02
4	7.00612E-04	1.92966E-03	1.20433E-03	3.13711E-03	2.65565E-03	7.62001E-03	1.63514E-02	1.56410E-02
5	1.00523E-03	2.77685E-03	1.71774E-03	4.48411E-03	3.79719E-03	1.08898E-02	2.31129E-02	2.21147E-02

0zone	grp. 25	grp. 26	grp. 27	grp. 28
1	1.36428E-02	1.24020E-02	3.25945E-03	3.84827E-01
2	2.09914E-02	1.93696E-02	5.34630E-03	5.87971E-01
3	1.93504E-02	1.78922E-02	4.91070E-03	5.41912E-01
4	7.84082E-03	7.13736E-03	1.79954E-03	2.18080E-01
5	1.11587E-02	1.01850E-02	2.66043E-03	3.12590E-01

1 400 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0cell averaged fluxes

0zone	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	1.73149E-01	1.30112E+00	1.65109E+00	1.02480E+00	1.55011E+00	2.98179E+00	2.87576E+00	2.07500E+00
2	1.69963E-01	1.26825E+00	1.61065E+00	1.00089E+00	1.51319E+00	2.91216E+00	2.83481E+00	2.06778E+00
3	1.68800E-01	1.25632E+00	1.59565E+00	9.91924E-01	1.49952E+00	2.88571E+00	2.81975E+00	2.06548E+00
4	1.67370E-01	1.23781E+00	1.56870E+00	9.72852E-01	1.46767E+00	2.82272E+00	2.78300E+00	2.06570E+00
5	1.69470E-01	1.26114E+00	1.59940E+00	9.92436E-01	1.49894E+00	2.88525E+00	2.81830E+00	2.06769E+00

0zone	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	1.59126E+00	1.45049E+00	1.31594E+00	8.09393E-01	6.89985E-01	6.09198E-01	3.73073E-01	2.08881E-01
2	1.59860E+00	1.45846E+00	1.33321E+00	8.29800E-01	7.01087E-01	6.34941E-01	3.75641E-01	2.08419E-01
3	1.60088E+00	1.46107E+00	1.33877E+00	8.36282E-01	7.06612E-01	6.43135E-01	3.76492E-01	2.08934E-01
4	1.60414E+00	1.46760E+00	1.35259E+00	8.51721E-01	7.19479E-01	6.62442E-01	3.77944E-01	2.09971E-01
5	1.59945E+00	1.46112E+00	1.33873E+00	8.35779E-01	7.06119E-01	6.42401E-01	3.76146E-01	2.08817E-01

0zone	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	8.77912E-02	5.67655E-02	1.33770E-01	4.46408E-01	1.22429E-01	2.21282E-01	7.55026E-01	5.51696E-01
2	8.94680E-02	6.20578E-02	1.36635E-01	4.53889E-01	1.29042E-01	2.41279E-01	7.94111E-01	5.89604E-01
3	9.00218E-02	6.36089E-02	1.37564E-01	4.56521E-01	1.31102E-01	2.47207E-01	8.05973E-01	6.00657E-01
4	9.13165E-02	6.73765E-02	1.39753E-01	4.61924E-01	1.36296E-01	2.62186E-01	8.38920E-01	6.34726E-01
5	8.99875E-02	6.33952E-02	1.37499E-01	4.56086E-01	1.31058E-01	2.46779E-01	8.07058E-01	6.03028E-01

0zone	grp. 25	grp. 26	grp. 27
1	2.30083E-01	1.43152E-01	2.06017E-02
2	2.49847E-01	1.61866E-01	2.63436E-02
3	2.55330E-01	1.66721E-01	2.76604E-02
4	2.73501E-01	1.85517E-01	3.36451E-02
5	2.56887E-01	1.69187E-01	2.85965E-02

0flux disadvantage factors (zone average/cell average-flux)

0zone	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	1.02171E+00	1.03170E+00	1.03252E+00	1.03261E+00	1.03413E+00	1.03417E+00	1.02089E+00	1.00854E+00
2	1.00291E+00	1.00562E+00	1.00704E+00	1.00852E+00	1.00950E+00	1.01003E+00	1.00586E+00	1.00003E+00
3	9.96045E-01	9.96177E-01	9.97657E-01	9.99484E-01	1.00038E+00	1.00085E+00	1.00051E+00	9.98934E-01

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     4 9.87609E-01 9.81500E-01 9.80807E-01 9.80247E-01 9.79134E-01 9.79005E-01 9.87477E-01 9.98073E-01
     5 1.00000E+00 1.00000E+00 1.00000E+00 1.00000E+00 1.00000E+00 1.00000E+00 1.00000E+00 1.00000E+00
Ozone   grp. 9      grp. 10     grp. 11     grp. 12     grp. 13     grp. 14     grp. 15     grp. 16
     1 9.94874E-01 9.92725E-01 9.82973E-01 9.68429E-01 9.68653E-01 9.48313E-01 9.91829E-01 9.90727E-01
     2 9.99464E-01 9.98179E-01 9.95877E-01 9.92846E-01 9.92873E-01 9.88386E-01 9.98656E-01 9.98094E-01
     3 1.00089E+00 9.99960E-01 1.00003E+00 1.00060E+00 1.00070E+00 1.00114E+00 1.00092E+00 1.00056E+00
     4 1.00293E+00 1.00443E+00 1.01035E+00 1.01907E+00 1.01892E+00 1.03120E+00 1.00478E+00 1.00552E+00
     5 1.00000E+00 1.00000E+00 1.00000E+00 1.00000E+00 1.00000E+00 1.00000E+00 1.00000E+00 1.00000E+00
Ozone   grp. 17     grp. 18     grp. 19     grp. 20     grp. 21     grp. 22     grp. 23     grp. 24
     1 9.75594E-01 8.95451E-01 9.72881E-01 9.78781E-01 9.34160E-01 8.96684E-01 9.35529E-01 9.14875E-01
     2 9.94227E-01 9.78616E-01 9.93718E-01 9.95182E-01 9.84616E-01 9.77713E-01 9.83957E-01 9.77739E-01
     3 1.00038E+00 1.00340E+00 1.00047E+00 1.00051E+00 1.00033E+00 1.00173E+00 9.98656E-01 9.96068E-01
     4 1.01477E+00 1.06284E+00 1.01640E+00 1.01280E+00 1.03997E+00 1.06243E+00 1.03948E+00 1.05256E+00
     5 1.00000E+00 1.00000E+00 1.00000E+00 1.00000E+00 1.00000E+00 1.00000E+00 1.00000E+00 1.00000E+00
Ozone   grp. 25     grp. 26     grp. 27
     1 8.95655E-01 8.46115E-01 7.20428E-01
     2 9.72593E-01 9.56730E-01 9.21219E-01
     3 9.93939E-01 9.85427E-01 9.67266E-01
     4 1.06467E+00 1.09652E+00 1.17655E+00
     5 1.00000E+00 1.00000E+00 1.00000E+00
0cell averaged currents

Ozone   grp. 1      grp. 2      grp. 3      grp. 4      grp. 5      grp. 6      grp. 7      grp. 8
     1 2.35140E-03 2.47475E-02 3.15079E-02 1.90954E-02 2.92078E-02 5.58110E-02 3.17882E-02 4.62073E-03
     2 3.68453E-03 3.84858E-02 4.87393E-02 2.94756E-02 4.48780E-02 8.45382E-02 4.79912E-02 6.94858E-03
     3 2.99390E-03 3.28340E-02 4.30313E-02 2.71787E-02 4.23465E-02 8.03980E-02 4.59882E-02 5.55032E-03
     4 1.03346E-03 1.20820E-02 1.64948E-02 1.09253E-02 1.74268E-02 3.33499E-02 1.92934E-02 1.99253E-03
     5 1.71392E-03 1.88345E-02 2.47151E-02 1.56028E-02 2.43366E-02 4.64582E-02 2.66432E-02 3.30782E-03
Ozone   grp. 9      grp. 10     grp. 11     grp. 12     grp. 13     grp. 14     grp. 15     grp. 16
     1 4.73259E-03 5.81293E-03 1.24849E-02 1.44916E-02 1.23077E-02 1.81939E-02 1.83083E-03 1.14541E-03
     2 7.10833E-03 8.72049E-03 1.87794E-02 2.18808E-02 1.85732E-02 2.76159E-02 2.71977E-03 1.71908E-03
     3 5.71089E-03 8.18237E-03 1.75632E-02 2.02312E-02 1.71671E-02 2.55214E-02 2.54517E-03 1.59734E-03
     4 1.90219E-03 3.32937E-03 7.13284E-03 8.12556E-03 6.98056E-03 1.02636E-02 1.11012E-03 6.69828E-04
     5 3.31430E-03 4.73831E-03 1.01667E-02 1.17014E-02 9.95242E-03 1.47398E-02 1.52246E-03 9.39700E-04
Ozone   grp. 17     grp. 18     grp. 19     grp. 20     grp. 21     grp. 22     grp. 23     grp. 24
     1 1.24160E-03 3.40662E-03 2.11873E-03 5.53585E-03 4.65845E-03 1.33223E-02 2.81858E-02 2.69236E-02
     2 1.87639E-03 5.30680E-03 3.16215E-03 8.31895E-03 7.11816E-03 2.05725E-02 4.28491E-02 4.12017E-02
     3 1.73551E-03 4.87994E-03 2.94379E-03 7.69526E-03 6.60366E-03 1.90131E-02 3.98161E-02 3.82320E-02
     4 7.00612E-04 1.92966E-03 1.20433E-03 3.13711E-03 2.65565E-03 7.62001E-03 1.63514E-02 1.56410E-02
     5 1.00523E-03 2.77685E-03 1.71774E-03 4.48411E-03 3.79719E-03 1.08898E-02 2.31129E-02 2.21147E-02
Ozone   grp. 25     grp. 26     grp. 27
     1 1.36428E-02 1.24020E-02 3.25945E-03
     2 2.09914E-02 1.93696E-02 5.34630E-03
     3 1.93504E-02 1.78922E-02 4.91070E-03
     4 7.84082E-03 7.13736E-03 1.79954E-03
     5 1.11587E-02 1.01850E-02 2.66043E-03
Ozone       volume       vol. fraction

     1      6.88443E-01    3.30753E-01
     2      3.17352E-02    1.52468E-02
     3      2.16724E-01    1.04122E-01
     4      1.14454E+00    5.49878E-01
     5      2.08144E+00    1.00000E+00
- elapsed time     .03 min.
0requested parm=halt8,skipcellwt,skipshipdata
  pass= 3, exec halts after pass   8
1 bbbbbbbbbbbb     ooooooooooo    m         m                     aaaaaaaaa    mm        mm iiiiiiiiiiii     2222222222
  bbbbbbbbbbbbb   oooooooooooo    mm        m                   aaaaaaaaaaa    mmm      mmm iiiiiiiiiiii   222222222222
  bb         bb   oo         oo   mmm       m                   aa        aa   mmmm    mmmm      ii        22          22
  bb         bb   oo         oo   m m       m                   aa        aa   mm mm  mm mm      ii                    22
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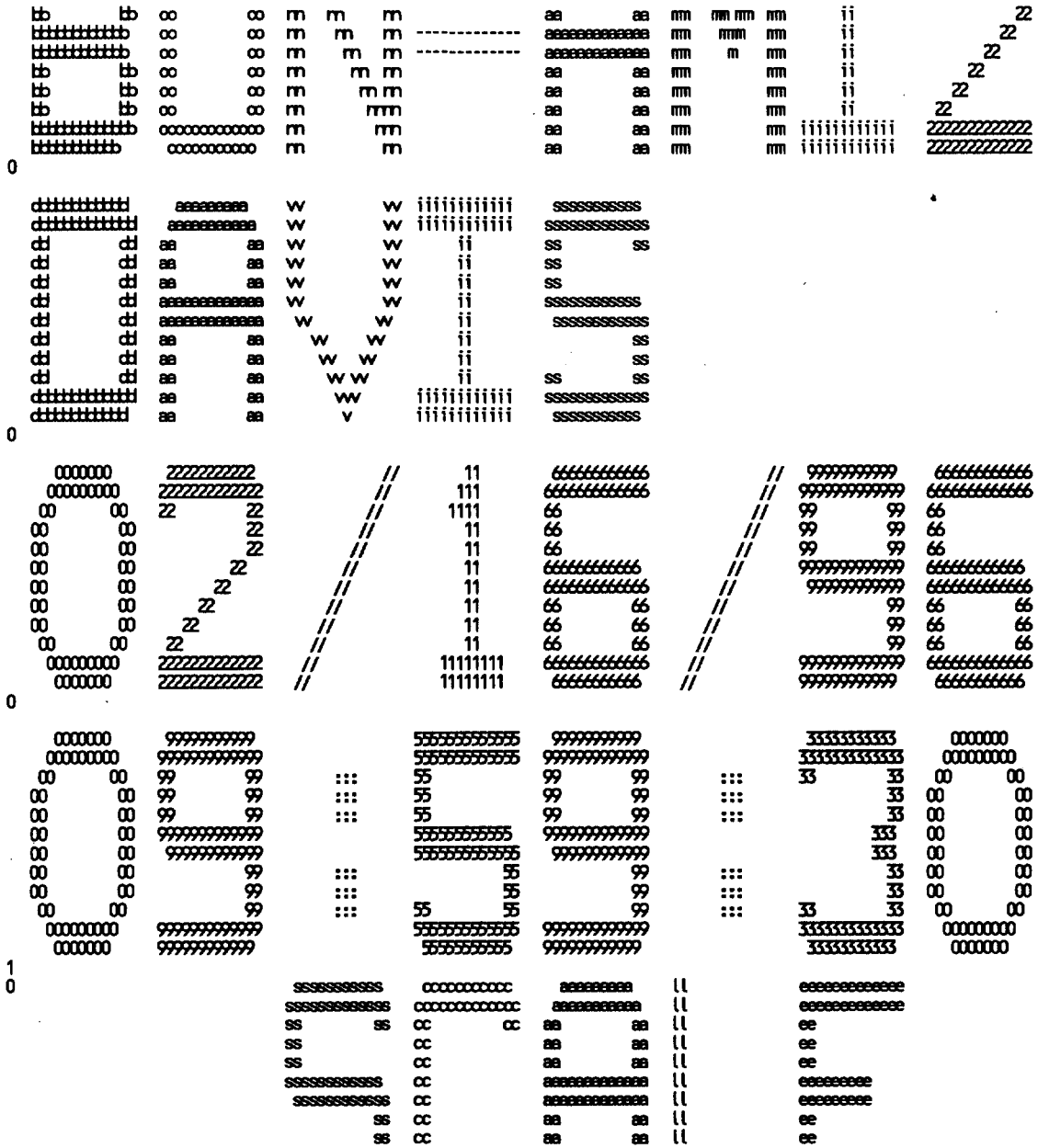

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      ss       ss  cc        cc  aa       aa  ll           ee
      sssssssssss  ccccccccccc  aa       aa  lllllllllll  eeeeeeeeeee
       sssssssss    cccccccccc  aa       aa  lllllllllll  eeeeeeeeeee
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*********************************************************************
*********************************************************************
*********************************************************************
*****                                                           *****
*****                 program verification information           *****
*****                                                           *****
*****                 code system:   scale  version:   4.2      *****
*****                                                           *****
*********************************************************************
*********************************************************************
*****                                                           *****
*****                                                           *****
*****              program:  c0c008                             *****
*****                                                           *****
*****         creation date:  04/27/95                          *****
*****                                                           *****
*****              library:  /neutronics/scale/exe              *****
*****                                                           *****
*****                                                           *****
*****    this is not a   scale  configuration controlled code   *****
*****                                                           *****
*****              jobname:  davis                              *****
*****                                                           *****
*****    date of execution:  02/16/96                           *****
*****                                                           *****
*****    time of execution:  09:59:30                           *****
*****                                                           *****
*****                                                           *****
*********************************************************************
*********************************************************************
*********************************************************************
```

```
1
0      -1q array has      1 entries.
0       0q array has      4 entries.
0       1q array has      6 entries.
0       2q array has      2 entries.
1logical assignments
0master library   12
 working library  17
 scratch file     18
 new library       1
0p r o b l e m   d e s c r i p t i o n
0igr--geometry (0/1/2/3--inf med/slab/cyl/sphere              2
0izm--number of zones or material regions                     4
0ms--mixing table length                                     70
0ibl--shielded cross section edit option (0/1--no/yes)        0
0ibr--bondarenko factor edit option (0/1--no/yes)             0
0issqpt--dancoff factor option                                0
0convergence criterion    1.00000E-03
0geometry correction factor for wigner rational approximation  1.350E+00
0       3q array has     70 entries.
0       4q array has     70 entries.
```

0 5q array has 70 entries.
0 6q array has 4 entries.
0 7q array has 4 entries.
0 8q array has 4 entries.
0 9q array has 4 entries.
0 10q array has 70 entries.
0 11q array has 4 entries.
0 m i x i n g t a b l e

0entry	mixture	isotope	number density	new identifier
1	3	8016	2.09710E-02	201
2	3	1001	4.19420E-02	202
3	3	5010	3.81515E-06	203
4	3	5011	1.54884E-05	204
5	2	40302	4.25156E-02	205
6	1	92235	1.78765E-04	200006
7	1	92234	1.66922E-06	200007
8	1	92236	1.01900E-05	200008
9	1	92238	7.26421E-03	200009
10	1	8016	1.50611E-02	200010
11	1	8016	1.15315E-02	200011
12	1	36083	2.39826E-07	200012
13	1	36085	1.15802E-07	200013
14	1	38090	2.60028E-06	200014
15	1	39089	1.81056E-06	200015
16	1	42095	2.02470E-06	200016
17	1	40093	1.97826E-06	200017
18	1	40094	3.06390E-06	200018
19	1	40095	6.95210E-07	200019
20	1	41094	1.19135E-12	200020
21	1	43099	2.96592E-06	200021
22	1	45103	1.45725E-06	200022
23	1	45105	5.54075E-09	200023
24	1	44101	2.61262E-06	200024
25	1	44106	3.77085E-07	200025
26	1	46105	8.23960E-07	200026
27	1	46108	1.79948E-07	200027
28	1	47109	1.29418E-07	200028
29	1	51124	3.32722E-11	200029
30	1	54131	1.37688E-06	200030
31	1	54132	2.31720E-06	200031
32	1	54135	2.18432E-09	200032
33	1	54136	4.97240E-06	200033
34	1	55134	7.36175E-08	200034
35	1	55135	1.55832E-06	200035
36	1	55137	3.13142E-06	200036
37	1	56136	1.42899E-08	200037
38	1	57139	3.11998E-06	200038
39	1	59141	2.51929E-06	200039
40	1	59143	1.30169E-07	200040
41	1	58144	1.65612E-06	200041
42	1	60143	2.56634E-06	200042
43	1	60145	1.86380E-06	200043
44	1	61147	8.21699E-07	200044
45	1	61148	2.25854E-09	200045
46	1	60147	4.38963E-08	200046
47	1	62147	1.21021E-07	200047
48	1	62149	2.48712E-08	200048
49	1	62150	5.79478E-07	200049
50	1	62151	9.50067E-08	200050
51	1	62152	2.80778E-07	200051

52	1	64155	2.63991E-10	200052
53	1	63153	1.30658E-07	200053
54	1	63154	1.53097E-08	200054
55	1	63155	1.69086E-08	200055
56	1	40302	4.42681E-03	200056
57	1	1001	2.30630E-02	200057
58	1	5010	2.09787E-06	200058
59	1	5011	8.51673E-06	200059
60	1	55133	3.23773E-06	200060
61	1	95237	4.09226E-07	200061
62	1	94238	2.63252E-08	200062
63	1	94239	2.16321E-05	200063
64	1	94240	2.36745E-06	200064
65	1	94241	8.29987E-07	200065
66	1	94242	3.87820E-08	200066
67	1	95241	1.12358E-08	200067
68	1	95243	1.41059E-09	200068
69	1	96244	5.44610E-11	200069
70	1	999	3.30753E-21	200070

Ogeometry and material description

Ozone	mixture	outer dimension	temperature	extra xs	type (0/1--fuel/mod)
1	3	6.32460E-01	6.07600E+02	7.90564E-01	0
2	2	6.73100E-01	6.50000E+02	1.23052E+01	0
3	3	8.14000E-01	6.07600E+02	3.54852E+00	0
4	1	2.96100E+00	9.75000E+02	2.32883E-01	0

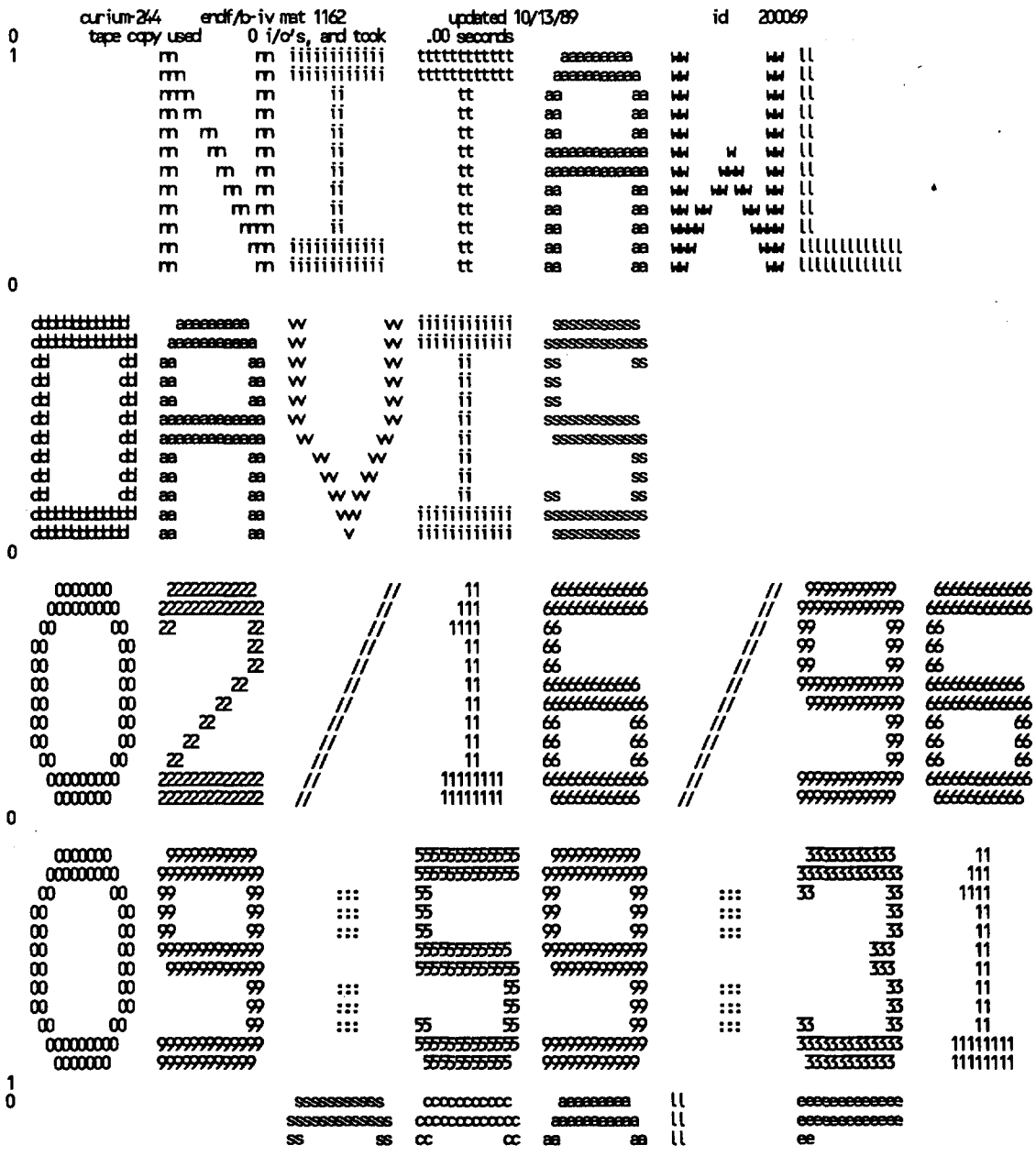
8057 locations of 200000 available are required to make a new master containing the self-shielded values

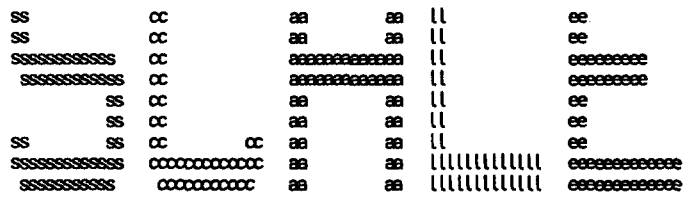
Ono nuclides in your problem have bondarenko factor data**bonami will copy from logical 12 to logical 1

Ocopy	999	1/v cross sectio	from log 12	to log 1	bondarenko	trigger 0
Ocopy	1001	hydrogen	from log 12	to log 18	bondarenko	trigger 0
Ocopy	1001	hydrogen	from log 18	to log 1	bondarenko	trigger 0
Ocopy	1001	hydrogen	from log 18	to log 1	bondarenko	trigger 0
Ocopy	5010	b-10 1273 218ngp	from log 12	to log 18	bondarenko	trigger 0
Ocopy	5010	b-10 1273 218ngp	from log 18	to log 1	bondarenko	trigger 0
Ocopy	5010	b-10 1273 218ngp	from log 18	to log 1	bondarenko	trigger 0
Ocopy	5011	boron-11	from log 12	to log 18	bondarenko	trigger 0
Ocopy	5011	boron-11	from log 18	to log 1	bondarenko	trigger 0
Ocopy	5011	boron-11	from log 18	to log 1	bondarenko	trigger 0
Ocopy	8016	oxygen-16	from log 12	to log 18	bondarenko	trigger 0
Ocopy	8016	oxygen-16	from log 18	to log 1	bondarenko	trigger 0
Ocopy	8016	oxygen-16	from log 18	to log 1	bondarenko	trigger 0
Ocopy	8016	oxygen-16	from log 18	to log 1	bondarenko	trigger 0
Ocopy	36083	kr-83	from log 12	to log 1	bondarenko	trigger 0
Ocopy	36085	kr-85	from log 12	to log 1	bondarenko	trigger 0
Ocopy	38090	sr-90	from log 12	to log 1	bondarenko	trigger 0
Ocopy	39089	y-89	from log 12	to log 1	bondarenko	trigger 0
Ocopy	40093	zr-93	from log 12	to log 1	bondarenko	trigger 0
Ocopy	40094	zr-94	from log 12	to log 1	bondarenko	trigger 0
Ocopy	40095	zr-95	from log 12	to log 1	bondarenko	trigger 0
Ocopy	40302	zircalloy	from log 12	to log 18	bondarenko	trigger 0
Ocopy	40302	zircalloy	from log 18	to log 1	bondarenko	trigger 0
Ocopy	40302	zircalloy	from log 18	to log 1	bondarenko	trigger 0
Ocopy	41094	nb-94	from log 12	to log 1	bondarenko	trigger 0
Ocopy	42095	mo-95	from log 12	to log 1	bondarenko	trigger 0
Ocopy	43099	tc-99	from log 12	to log 1	bondarenko	trigger 0
Ocopy	44101	ru-101	from log 12	to log 1	bondarenko	trigger 0
Ocopy	44106	ru-106	from log 12	to log 1	bondarenko	trigger 0
Ocopy	45103	rh-103	from log 12	to log 1	bondarenko	trigger 0
Ocopy	45105	rh-105	from log 12	to log 1	bondarenko	trigger 0
Ocopy	46105	pd-105	from log 12	to log 1	bondarenko	trigger 0
Ocopy	46108	pd-108	from log 12	to log 1	bondarenko	trigger 0

```
0copy    47109  silver-109       from log 12 to log  1    bondarenko trigger 0
0copy    51124  sb-124           from log 12 to log  1    bondarenko trigger 0
0copy    54131  xe-131           from log 12 to log  1    bondarenko trigger 0
0copy    54132  xe-132           from log 12 to log  1    bondarenko trigger 0
0copy    54135  xenon-135        from log 12 to log  1    bondarenko trigger 0
0copy    54136  xe-136           from log 12 to log  1    bondarenko trigger 0
0copy    55133  cesium-133       from log 12 to log  1    bondarenko trigger 0
0copy    55134  cs-134           from log 12 to log  1    bondarenko trigger 0
0copy    55135  cs-135           from log 12 to log  1    bondarenko trigger 0
0copy    55137  cs-137           from log 12 to log  1    bondarenko trigger 0
0copy    56136  ba-136           from log 12 to log  1    bondarenko trigger 0
0copy    57139  la-139           from log 12 to log  1    bondarenko trigger 0
0copy    58144  ce-144           from log 12 to log  1    bondarenko trigger 0
0copy    59141  pr-141           from log 12 to log  1    bondarenko trigger 0
0copy    59143  pr-143           from log 12 to log  1    bondarenko trigger 0
0copy    60143  nd-143           from log 12 to log  1    bondarenko trigger 0
0copy    60145  nd-145           from log 12 to log  1    bondarenko trigger 0
0copy    60147  nd-147           from log 12 to log  1    bondarenko trigger 0
0copy    61147  pm-147           from log 12 to log  1    bondarenko trigger 0
0copy    61148  pm-148           from log 12 to log  1    bondarenko trigger 0
0copy    62147  sm-147           from log 12 to log  1    bondarenko trigger 0
0copy    62149  sm-149           from log 12 to log  1    bondarenko trigger 0
0copy    62150  sm-150           from log 12 to log  1    bondarenko trigger 0
0copy    62151  sm-151           from log 12 to log  1    bondarenko trigger 0
0copy    62152  sm-152           from log 12 to log  1    bondarenko trigger 0
0copy    63153  eu-153           from log 12 to log  1    bondarenko trigger 0
0copy    63154  eu-154           from log 12 to log  1    bondarenko trigger 0
0copy    63155  eu-155           from log 12 to log  1    bondarenko trigger 0
0copy    64155  gd-155           from log 12 to log  1    bondarenko trigger 0
0copy    92234  u-234 1043 sigo= from log 12 to log  1    bondarenko trigger 0
0copy    92235  uranium-235      from log 12 to log  1    bondarenko trigger 0
0copy    92236  u-236 1163 sigo= from log 12 to log  1    bondarenko trigger 0
0copy    92238  uranium-238      from log 12 to log  1    bondarenko trigger 0
0copy    93237  neptunium-237    from log 12 to log  1    bondarenko trigger 0
0copy    94238  pu-238 1050 sigo from log 12 to log  1    bondarenko trigger 0
0copy    94239  plutonium-239    from log 12 to log  1    bondarenko trigger 0
0copy    94240  plutonium-240    from log 12 to log  1    bondarenko trigger 0
0copy    94241  plutonium-241    from log 12 to log  1    bondarenko trigger 0
0copy    94242  plutonium-242    from log 12 to log  1    bondarenko trigger 0
0copy    95241  am-241 1056 sigp from log 12 to log  1    bondarenko trigger 0
0copy    95243  am-243 1057 218  from log 12 to log  1    bondarenko trigger 0
0copy    96244  curium-244       from log 12 to log  1    bondarenko trigger 0
1     scale 4.2 - 27 group neutron burnup library
        based on endf-b version 4 data with endf-b version 5 fission products
           compiled for nrc      1/27/89
              last updated       9/16/93
                 l.m.petrie  -   ornl
         tape id                             4321       number of nuclides                 70
         number of neutron groups              27       number of gamma groups              0
         first thermal group                   15       logical unit                        1
                                      table of contents
        1/v cross sections normalized to 1.0 at 0.0253 ev                          id    200070
         hydrogen      endf/b-iv mat 1269/thrm1002   updated 10/13/89              id       202
         hydrogen      endf/b-iv mat 1269/thrm1002   updated 10/13/89              id    200057
        b-10 1273 218ngp 042375 p-3 293k                                           id       203
        b-10 1273 218ngp 042375 p-3 293k                                           id    200058
         boron-11      endf/b-iv mat 1160            updated 10/13/89              id       204
         boron-11      endf/b-iv mat 1160            updated 10/13/89              id    200059
         oxygen-16     endf/b-iv mat 1276            updated 10/13/89              id       201
         oxygen-16     endf/b-iv mat 1276            updated 10/13/89              id    200010
```

```
 oxygen-16      endf/b-iv mat 1276          updated 10/13/89          id   200011
 kr-83          mt=102,103,105,105,106,107  updated 10/13/89          id   200012
 kr-85            mt=  102                                           id   200013
 sr-90          mt=102                      updated 10/13/89          id   200014
  y-89          mt=102                      updated 10/13/89          id   200015
 zr-93            mt=  102                                           id   200017
 zr-94          mt=102                      updated 10/13/89          id   200018
 zr-95          mt=102                      updated 10/13/89          id   200019
 zircalloy      endf/b-iv mat 1284          updated 10/13/89          id     205
 zircalloy      endf/b-iv mat 1284          updated 10/13/89          id   200056
 nb-94          mt=102                      updated 10/13/89          id   200020
 mo-95          mt=102                      updated 10/13/89          id   200016
 tc-99          mt=102                      updated 10/13/89          id   200021
 ru-101         mt=102                      updated 10/13/89          id   200024
 ru-106         mt=102                      updated 10/13/89          id   200025
 rh-103         mt=102                      updated 10/13/89          id   200022
 rh-105           mt=  102                                           id   200023
 pd-105         mt=102                      updated 10/13/89          id   200026
 pd-108         mt=102                      updated 10/13/89          id   200027
 silver-109     endf/b-iv mat 1139          updated 10/13/89          id   200028
 sb-124         mt=102                      updated 10/13/89          id   200029
 xe-131         mt=102,103,104,105,106      updated 10/13/89          id   200030
 xe-132         mt=102,103,104,105,106      updated 10/13/89          id   200031
 xenon-135      endf/b-iv mat 1294          updated 10/13/89          id   200032
 xe-136           mt=  102, 103, 104, 105, 107                       id   200033
 cesium-133     endf/b-iv mat 1141          updated 10/13/89          id   200060
 cs-134         mt=102                      updated 10/13/89          id   200034
 cs-135           mt=  102                                           id   200035
 cs-137         mt=102                      updated 10/13/89          id   200036
 ba-136         mt=102                      updated 10/13/89          id   200037
 la-139         mt=102                      updated 10/13/89          id   200038
 ce-144           mt=  102                                           id   200041
 pr-141         mt=102,103,104,105,106,107  updated 10/13/89          id   200039
 pr-143         mt=102                      updated 10/13/89          id   200040
 nd-143         mt=102                      updated 10/13/89          id   200042
 nd-145         mt=102                      updated 10/13/89          id   200043
 nd-147         mt=102                      updated 10/13/89          id   200046
 pm-147         mt=102                      updated 10/13/89          id   200044
 pm-148           mt=  102                                           id   200045
 sm-147         endf/b-v fission product    updated 10/13/89          id   200047
 sm-149         mt=102,103,107              updated 10/13/89          id   200048
 sm-150         mt=102                      updated 10/13/89          id   200049
 sm-151         mt=102,103,104,105,106,107  updated 10/13/89          id   200050
 sm-152         mt=102,103,104,105,106,107  updated 10/13/89          id   200051
 eu-153         mt=102,103,104,105,106,107  updated 10/13/89          id   200053
 eu-154         mt=102,103,104,105,106,107  updated 10/13/89          id   200054
 eu-155         mt=102,103,104,105,106,107  updated 10/13/89          id   200055
 gd-155         mt=102                      updated 10/13/89          id   200052
u-234 1043 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                   id   200007
 uranium-235    endf/b-iv mat 1261          updated 10/13/89          id   200006
u-236 1163 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                   id   200008
 uranium-238    endf/b-iv mat 1262          updated 10/13/89          id   200009
 neptunium-237  endf/b-iv mat 1263          updated 10/13/89          id   200061
pu-238 1050 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                  id   200062
 plutonium-239  endf/b-iv mat 1264          updated 10/13/89          id   200063
 plutonium-240  endf/b-iv mat 1265          updated 10/13/89          id   200064
 plutonium-241  endf/b-iv mat 1266          updated 10/13/89          id   200065
 plutonium-242  endf/b-iv mat 1161          updated 10/13/89          id   200066
am-241 1056 sigo=5+4 newklacs 218ngp p-3 293k                         id   200067
am-243 1057 218 gp wt f-1/e-m 090376 p3 293k                          id   200068
```


curium-244 endf/b-iv mat 1162 updated 10/13/89 id 200069
tape copy used 0 i/o's, and took .00 seconds



program verification information

code system: scale version: 4.2

program: c0c002

creation date: 04/27/95

library: /neutronics/scale/exe

this is not a scale configuration controlled code

jobname: davis

date of execution: 02/16/96

time of execution: 09:59:31

```
1
0      -1q array has      1 entries.
0       0q array has      4 entries.
0       1q array has     12 entries.
0select  5 nuclides from the master  library on logical  1
        65 nuclides from the working library on logical  3
         0 nuclides from the working library on logical  0
           to create the new working library on logical  4

         1 resonance calculations have been requested
         0 output option for ampx formatted cross section data
0the storage allocated for this case is 200000 words
0       2q array has     70 entries.
0       3q array has     15 entries.
0       4q array has      5 entries.
```

```
0 general information concerning cross section library
    tape identification number                4349
    number of nuclides on tape                  65
    number of neutron energy groups             27
    first thermal neutron energy group          15
    number of gamma energy groups                0
0   direct access unit number  9 requires  72 blocks of length  1484 words
- xsdrn tape   4321
                        scale 4.2 - 27 group neutron burnup library
                          based on endf-b version 4 data with endf-b version 5 fission products
                            compiled for nrc      1/27/89
                              last updated        9/16/93
                                l.m.petrie   -    ornl
- work tape   4349

 xsdrn weighted tape--parent case entitled--  400 d, sas2h: babcock wilcox 15x15,
  3.00wt%, 20gwd/mtu burn high temp



0 nuclides from xsdrn tape
     1     hydrogen          endf/b-iv mat 1269/thrm1002    updated 10/13/89          202
     2   b-10 1273 218ngp 042375 p-3 293k                                             203
     3     boron-11          endf/b-iv mat 1160             updated 10/13/89          204
     4     oxygen-16         endf/b-iv mat 1276             updated 10/13/89          201
     5     zircalloy         endf/b-iv mat 1284             updated 10/13/89          205
0 nuclides from work tape
     6   1/v cross sections normalized to 1.0 at 0.0253 ev                             999
     7     hydrogen          endf/b-iv mat 1269/thrm1002    updated 10/13/89         1001
     8   b-10 1273 218ngp 042375 p-3 293k                                            5010
     9     boron-11          endf/b-iv mat 1160             updated 10/13/89         5011
    10     oxygen-16         endf/b-iv mat 1276             updated 10/13/89         8016
    11     oxygen-16         endf/b-iv mat 1276             updated 10/13/89            6
    12     kr-83             mt=102,103,103,105,106,107     updated 10/13/89        36083
    13     kr-85               mt=  102                                              36085
    14     sr-90             mt=102                         updated 10/13/89        38090
    15      y-89             mt=102                         updated 10/13/89        39089
    16     zr-93               mt=  102                                            40093
    17     zr-94             mt=102                         updated 10/13/89        40094
    18     zr-95             mt=102                         updated 10/13/89        40095
    19     zircalloy         endf/b-iv mat 1284             updated 10/13/89        40302
    20     nb-94             mt=102                         updated 10/13/89        41094
    21     mo-95             mt=102                         updated 10/13/89        42095
    22     tc-99             mt=102                         updated 10/13/89        43099
    23     ru-101            mt=102                         updated 10/13/89        44101
    24     ru-106            mt=102                         updated 10/13/89        44106
    25     rh-103            mt=102                         updated 10/13/89        45103
    26     rh-105              mt=  102                                            45105
    27     pd-105            mt=102                         updated 10/13/89        46105
    28     pd-108            mt=102                         updated 10/13/89        46108
    29     silver-109        endf/b-iv mat 1139             updated 10/13/89        47109
    30     sb-124            mt=102                         updated 10/13/89        51124
    31     xe-131            mt=102,103,104,105,106         updated 10/13/89        54131
    32     xe-132            mt=102,103,104,105,106         updated 10/13/89        54132
    33     xenon-135         endf/b-iv mat 1294             updated 10/13/89        54135
    34     xe-136              mt=  102,  103,  104,  105,  107                      54136
    35     cesium-133        endf/b-iv mat 1141             updated 10/13/89        55133
    36     cs-134            mt=102                         updated 10/13/89        55134
    37     cs-135              mt=  102                                            55135
    38     cs-137            mt=102                         updated 10/13/89        55137
```

```
     39    ba-136       mt=102                           updated 10/13/89               56136
     40    la-139       mt=102                           updated 10/13/89               57139
     41    ce-144          mt=  102                                                     58144
     42    pr-141       mt=102,103,104,105,106,107       updated 10/13/89               59141
     43    pr-143       mt=102                           updated 10/13/89               59143
     44    nd-143       mt=102                           updated 10/13/89               60143
     45    nd-145       mt=102                           updated 10/13/89               60145
     46    nd-147       mt=102                           updated 10/13/89               60147
     47    pm-147       mt=102                           updated 10/13/89               61147
     48    pm-148          mt=  102                                                     61148
     49    sm-147       endf/b-v fission product         updated 10/13/89               62147
     50    sm-149       mt=102,103,107                   updated 10/13/89               62149
     51    sm-150       mt=102                           updated 10/13/89               62150
     52    sm-151       mt=102,103,104,105,106,107       updated 10/13/89               62151
     53    sm-152       mt=102,103,104,105,106,107       updated 10/13/89               62152
     54    eu-153       mt=102,103,104,105,106,107       updated 10/13/89               63153
     55    eu-154       mt=102,103,104,105,106,107       updated 10/13/89               63154
     56    eu-155       mt=102,103,104,105,106,107       updated 10/13/89               63155
     57    gd-155       mt=102                           updated 10/13/89               64155
     58    u-234 1043 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                          92234
     59     uranium-235    endf/b-iv mat 1261            updated 10/13/89               92235
     60    u-236 1163 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                          92236
     61     uranium-238    endf/b-iv mat 1262            updated 10/13/89               92238
     62     neptunium-237  endf/b-iv mat 1263            updated 10/13/89               93237
     63    pu-238 1050 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                         94238
     64     plutonium-239  endf/b-iv mat 1264            updated 10/13/89               94239
     65     plutonium-240  endf/b-iv mat 1265            updated 10/13/89               94240
     66     plutonium-241  endf/b-iv mat 1266            updated 10/13/89               94241
     67     plutonium-242  endf/b-iv mat 1161            updated 10/13/89               94242
     68    am-241 1056 sigo=5+4 newxlacs 218ngp p-3 293k                                95241
     69    am-243 1057 218 gp wt f-1/e-m 090376 p3 293k                                 95243
     70     curium-244     endf/b-iv mat 1162            updated 10/13/89               96244
0 hydrogen     endf/b-iv mat 1269/thrm1002   updated 10/13/89           202      temperature=   607.60
                              thermal scattering matrix number   2 at a temperature of    550.00 was selected.
0b-10 1273 218ngp 042375 p-3 293k                                       203      temperature=   607.60
                              thermal scattering matrix number   2 at a temperature of    550.00 was selected.
0 boron-11     endf/b-iv mat 1160            updated 10/13/89           204      temperature=   607.60
                              thermal scattering matrix number   2 at a temperature of    550.00 was selected.
0 oxygen-16    endf/b-iv mat 1276            updated 10/13/89           201      temperature=   607.60
0 zircalloy    endf/b-iv mat 1284            updated 10/13/89           205      temperature=   650.00
0resonance data for this nuclide
0mass number (a)           =    90.436          temperature(kelvin)      =   650.000
0potential scatter sigma   =     6.385          lumped nuclear density   = 4.2515602E-02
0spin factor (g)           =     1.079          lump dimension (a-bar)   = 6.7309999E-01
0inner radius              = 6.3246000E-01      dancoff correction (c)   = 1.6805907E-01
0the absorber will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss        res scat
   8     -1.156752E-03     .000000E+00    -7.806053E-01
   9     -4.625978E-02     .000000E+00    -2.073270E+00
  10     -5.962230E-02     .000000E+00    -1.351984E+00
  11     -1.761672E-01     .000000E+00    -7.350731E-01
0excess resonance integrals
0                 resolved
0absorption      2.92402E-01
 fission          .00000E+00
 -  elapsed time    .00 min.
 -  elapsed time    .02 min.
1       this xsdrn working tape was created 02/16/96 at 09:59:31
```

the title of the parent case is as follows
xsdrn weighted tape--parent case entitled-- 400 d, sas2h: babcock wilcox 15x15,
3.00wt%, 20gwd/mtu burn high temp

tape id	8670	number of nuclides	70
number of neutron groups	27	number of gamma groups	0
first thermal group	15	logical unit	4

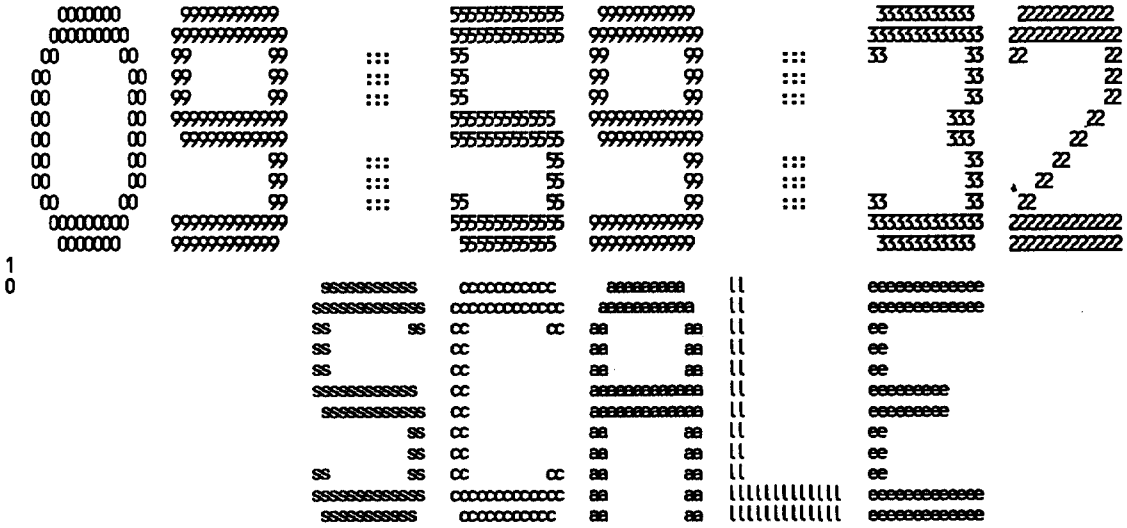
table of contents

hydrogen	endf/b-iv mat 1269/thrml002	updated 10/13/89	id	202
b-10 1273 218grp 042375 p-3 293k			id	203
boron-11	endf/b-iv mat 1160	updated 10/13/89	id	204
oxygen-16	endf/b-iv mat 1276	updated 10/13/89	id	201
zircalloy	endf/b-iv mat 1284	updated 10/13/89	id	205
1/v cross sections normalized to 1.0 at 0.0253 ev			id	999
hydrogen	endf/b-iv mat 1269/thrml002	updated 10/13/89	id	1001
b-10 1273 218grp 042375 p-3 293k			id	5010
boron-11	endf/b-iv mat 1160	updated 10/13/89	id	5011
oxygen-16	endf/b-iv mat 1276	updated 10/13/89	id	8016
oxygen-16	endf/b-iv mat 1276	updated 10/13/89	id	6
kr-83	mt=102,103,103,105,106,107	updated 10/13/89	id	36083
kr-85	mt= 102		id	36085
sr-90	mt=102	updated 10/13/89	id	38090
y-89	mt=102	updated 10/13/89	id	39089
zr-93	mt= 102		id	40093
zr-94	mt=102	updated 10/13/89	id	40094
zr-95	mt=102	updated 10/13/89	id	40095
zircalloy	endf/b-iv mat 1284	updated 10/13/89	id	40302
nb-94	mt=102	updated 10/13/89	id	41094
mo-95	mt=102	updated 10/13/89	id	42095
tc-99	mt=102	updated 10/13/89	id	43099
ru-101	mt=102	updated 10/13/89	id	44101
ru-106	mt=102	updated 10/13/89	id	44106
rh-103	mt=102	updated 10/13/89	id	45103
rh-105	mt= 102		id	45105
pd-105	mt=102	updated 10/13/89	id	46105
pd-108	mt=102	updated 10/13/89	id	46108
silver-109	endf/b-iv mat 1139	updated 10/13/89	id	47109
sb-124	mt=102	updated 10/13/89	id	51124
xe-131	mt=102,103,104,105,106	updated 10/13/89	id	54131
xe-132	mt=102,103,104,105,106	updated 10/13/89	id	54132
xenon-135	endf/b-iv mat 1294	updated 10/13/89	id	54135
xe-136	mt= 102, 103, 104, 105, 107		id	54136
cesium-133	endf/b-iv mat 1141	updated 10/13/89	id	55133
cs-134	mt=102	updated 10/13/89	id	55134
cs-135	mt= 102		id	55135
cs-137	mt=102	updated 10/13/89	id	55137
ba-136	mt=102	updated 10/13/89	id	56136
la-139	mt=102	updated 10/13/89	id	57139
ce-144	mt= 102		id	58144
pr-141	mt=102,103,104,105,106,107	updated 10/13/89	id	59141
pr-143	mt=102	updated 10/13/89	id	59143
nd-143	mt=102	updated 10/13/89	id	60143
nd-145	mt=102	updated 10/13/89	id	60145
nd-147	mt=102	updated 10/13/89	id	60147
pm-147	mt=102	updated 10/13/89	id	61147
pm-148	mt= 102		id	61148
sm-147	endf/b-v fission product	updated 10/13/89	id	62147
sm-149	mt=102,103,107	updated 10/13/89	id	62149
sm-150	mt=102	updated 10/13/89	id	62150
sm-151	mt=102,103,104,105,106,107	updated 10/13/89	id	62151

```
          sm-152         mt=102,103,104,105,106,107    updated 10/13/89             id    62152
          eu-153         mt=102,103,104,105,106,107    updated 10/13/89             id    63153
          eu-154         mt=102,103,104,105,106,107    updated 10/13/89             id    63154
          eu-155         mt=102,103,104,105,106,107    updated 10/13/89             id    63155
          gd-155         mt=102                        updated 10/13/89             id    64155
         u-234 1043 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                        id    92234
          uranium-235    endf/b-iv mat 1261            updated 10/13/89             id    92235
         u-236 1163 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                        id    92236
          uranium-238    endf/b-iv mat 1262            updated 10/13/89             id    92238
          neptunium-237  endf/b-iv mat 1263            updated 10/13/89             id    93237
         pu-238 1050 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                       id    94238
          plutonium-239  endf/b-iv mat 1264            updated 10/13/89             id    94239
          plutonium-240  endf/b-iv mat 1265            updated 10/13/89             id    94240
          plutonium-241  endf/b-iv mat 1266            updated 10/13/89             id    94241
          plutonium-242  endf/b-iv mat 1161            updated 10/13/89             id    94242
         am-241 1056 sigo=5+4 newxlacs 218ngp p-3 293k                              id    95241
         am-243 1057 218 gp wt f-1/e-m 090376 p3 293k                               id    95243
          curium-244     endf/b-iv mat 1162            updated 10/13/89             id    96244
0          tape copy used      0 i/o's, and took      .00 seconds
1 xx          xx  ssssssssss   dddddddddd   rrrrrrrrrr   mm        mm  pppppppppp   mm        mm
   xx        xx  ssssssssssss  dddddddddddd rrrrrrrrrrr  mmm       mm  ppppppppppp  mmm      mmm
    xx      xx   ss        ss  dd        dd rr       rr  mmmm      mm  pp       pp  mmmm    mmmm
     xx    xx    ss            dd        dd rr       rr  mm mm     mm  pp       pp  mm mm  mm mm
      xx  xx     ss            dd        dd rr       rr  mm  mm    mm  pp       pp  mm  mmmm  mm
       xxxx      sssssssssss   dd        dd rrrrrrrrrrr  mm   mm   mm  ppppppppppp  mm   mm   mm
       xxxx       sssssssssss  dd        dd rrrrrrrrrr   mm    mm  mm  pppppppppp   mm    m   mm
      xx  xx               ss  dd        dd rr    rr     mm     mm mm  pp           mm        mm
     xx    xx              ss  dd        dd rr     rr    mm      mmmm  pp           mm        mm
    xx      xx   ss        ss  dd        dd rr      rr   mm       mmm  pp           mm        mm
   xx        xx  ssssssssssss  dddddddddddd rr       rr  mm        mm  pp           mm        mm
  xx          xx  ssssssssss   dddddddddd   rr       rr  mm        mm  pp           mm        mm
0

  dddddddddd     aaaaaaaaaa   vv        vv  iiiiiiiiiiii   ssssssssss
  dddddddddddd  aaaaaaaaaaaa  vv        vv  iiiiiiiiiiii  ssssssssssss
  dd        dd  aa        aa  vv        vv       ii       ss        ss
  dd        dd  aa        aa  vv        vv       ii       ss
  dd        dd  aa        aa  vv        vv       ii       ss
  dd        dd  aaaaaaaaaaaa  vv        vv       ii       sssssssssss
  dd        dd  aaaaaaaaaaaa   vv      vv        ii        sssssssssss
  dd        dd  aa        aa    vv    vv         ii                 ss
  dd        dd  aa        aa     vv  vv          ii                 ss
  dd        dd  aa        aa      vvvv           ii       ss        ss
  dddddddddddd  aa        aa       vv       iiiiiiiiiiii  ssssssssssss
  dddddddddd    aa        aa       v        iiiiiiiiiiii   ssssssssss
0

    00000000    2222222222           //     11       6666666666          //  9999999999   6666666666
   0000000000  222222222222         //     111      666666666666        //  999999999999 666666666666
  00      00   22        22        //     1111      66                 //   99        99 66
  00      00             22       //        11      66                //    99        99 66
  00      00             22      //         11      66               //     99        99 66
  00      00            22      //          11      66666666666     //      999999999999 66666666666
  00      00           22      //           11      666666666666   //        99999999999 666666666666
  00      00         22       //            11      66        66  //                  99 66        66
  00      00       22        //             11      66        66 //                   99 66        66
  00      00     22         //              11      66        66//                    99 66        66
   0000000000  222222222222 //          11111111    666666666666//          999999999999 666666666666
    00000000   222222222222//           11111111     6666666666//           9999999999    6666666666
0
```




```
**********************************************************************
**********************************************************************
**********************************************************************
******                                                          ******
******                program verification information          ******
******                                                          ******
******                code system:    scale  version:   4.2     ******
******                                                          ******
**********************************************************************
**********************************************************************
******                                                          ******
******                                                          ******
******           program:  c0c001                               ******
******                                                          ******
******      creation date:  04/27/95                            ******
******                                                          ******
******           library:  /neutronics/scale/exe                ******
******                                                          ******
******                                                          ******
******   this is not a   scale  configuration controlled code   ******
******                                                          ******
******           jobname:  davis                                ******
******                                                          ******
******  date of execution:  02/16/96                            ******
******                                                          ******
******  time of execution:  09:59:32                            ******
******                                                          ******
******                                                          ******
**********************************************************************
```

```
                    ********************************************************************************
                    ********************************************************************************
1
                    400 d, second part of sas2h pass to make library
0       -1q array has      1 entries.
0        0q array has     11 entries.
0        1q array has     15 entries.
0        2q array has     10 entries.
0        3q array has     12 entries.
0        4q array has      9 entries.
0        5q array has     12 entries.
0direct access unit   9 requires    12 blocks of length  704 for cross section mixing.
1                    400 d, second part of sas2h pass to make library
0general problem description data block
0                              general problem data

 ige  1/2/3 = plane/cylinder/sphere      2       isn  quadrature order                 8
 izm  number of zones                    4       isct order of scattering              3
 im   number of special intervals       28       ievt 0/1/2/3/4/5/6=q/k/alpha/c/z/r/h  1
 ibl  0/1/2/3 = vacuum/refl/per/white    1       iim  inner iteration maximum         20
 ibr  right boundary condition           3       iom  outer iteration maximum         25
 mx   number of mixtures                 3       iclc -1/0/n--flat res/sn/cpt          0
 ms   mixing table length               70       ith  0/1 = forward/adjoint          0
 igm  number of energy groups           27       iflu not used(always wgtd)            0
 nrg  number of neutron groups          27       iprt -2/-1/0/n=mixture xsec print    -2
 ngg  number of gamma groups             0       idl  0/1/2/3=no/prt nd/pch n/both   14
 iftg number of first thermal group     15       ipbt -1/0/1=none/fine/all bal. prt    0
0                            special options

 ifg  0/1 = none/weighting calculation   1       ipn  0/1/2 diff. coef. param          0
 iqm  volumetric sources (0/n=no/yes)    0       idfm 0/1 = none/density factors 39*   0
 ipn  boundary sources (0/n=no/yes)      0       iaz  0/n = none/n activities by zone  0
 ifn  0/1/2 = input 39*/34*/use last    14       iai  0/1=none/activities by interval  0
 itmx maximum time (minutes)            10       ifct 0/1=no/yes upscatter scaling     0
 idt1 0/1/2/3=no/xsect/srce/flux--out    0       ipvt 0/1/2=no/k/alpha parametric srch 0
 isx  broad group fluxes                 0       isen outer iteration acceleration     0
 ibln activity data unit                 0       ntnd band rebaln parameter            0
 jbkl 0/1/2 buckling geometry            0
0                          weighting data (ifg=1)

 icon -1/0/1=cell/zone/region weight    -1       ihtf total xsect psn in brd gp tables 3
 igmf number of broad groups             3       ndsf psn g-g or file number           4
 itp  0/10/20/30/40 0/c/e/ac/a           0       nusf table length or max order        6
 ipp  -2/-1/0/n=wgted xsect print       -2       msm extra 1-d x-sect positions        0
 iap  -1/n anisn xsect print            -1
0                          floating point parameters

 eps  overall convergence      1.00000E-04       dy   cyl/pla ht for buckling    .00000E+00
 ptc  point convergence        1.00000E-04       dz   plane depth for buckling 2.00000E+02
 xnf  normalization factor     1.00000E+00       vsc  void streaming correction  .00000E+00
 ev   eigenvalue guess          .00000E+00       pv   ipvt=1/2--k/alpha         1.00000E+00
 evm  eigenvalue modifier       .00000E+00       eql  ev change eps for search  1.00000E-03
 bf   buckling factor=1.420892 1.42089E+00       xnpm new param mod for search  7.50000E-01
     this case will require      2611 locations for mixing
     this case has been allocated 200000 locations
1                    400 d, second part of sas2h pass to make library
0       13q array has     70 entries.
0       14q array has     70 entries.
0       15q array has     70 entries.
0                              data block 2 (mixing table, etc.)
```

0	nuclides on tape	cccc identification	mixing table mixture	mixing table component	atom density	extra xsect id's
1	202		3	201	2.09710E-02	
2	203		3	202	4.19420E-02	
3	204		3	203	3.81515E-06	
4	201		3	204	1.54884E-05	
5	205		2	205	4.25156E-02	
6	999		1	92235	1.78765E-04	
7	1001		1	92234	1.66922E-06	
8	5010		1	92236	1.01900E-05	
9	5011		1	92238	7.26421E-03	
10	8016		1	8016	1.50611E-02	
11	6		1	6	1.15315E-02	
12	36083		1	36083	2.39826E-07	
13	36085		1	36085	1.15802E-07	
14	38090		1	38090	2.60028E-06	
15	39089		1	39089	1.81056E-06	
16	40093		1	42095	2.02470E-06	
17	40094		1	40093	1.97826E-06	
18	40095		1	40094	3.06390E-06	
19	40802		1	40095	6.95210E-07	
20	41094		1	41094	1.19135E-12	
21	42095		1	43099	2.96592E-06	
22	43099		1	45103	1.45725E-06	
23	44101		1	45105	5.54075E-09	
24	44106		1	44101	2.61262E-06	
25	45103		1	44106	3.77085E-07	
26	45105		1	46105	8.23960E-07	
27	46105		1	46108	1.79948E-07	
28	46108		1	47109	1.29418E-07	
29	47109		1	51124	3.32722E-11	
30	51124		1	54131	1.37688E-06	
31	54131		1	54132	2.31720E-06	
32	54132		1	54135	2.18432E-09	
33	54135		1	54136	4.97240E-06	
34	54136		1	55134	7.36175E-08	
35	55133		1	55135	1.55832E-06	
36	55134		1	55137	3.13142E-06	
37	55135		1	56136	1.42859E-08	
38	55137		1	57139	3.11998E-06	
39	56136		1	59141	2.51925E-06	
40	57139		1	59143	1.30169E-07	
41	58144		1	58144	1.65612E-06	
42	59141		1	60143	2.56634E-06	
43	59143		1	60145	1.86380E-06	
44	60143		1	61147	8.21699E-07	
45	60145		1	61148	2.25854E-09	
46	60147		1	60147	4.38963E-08	
47	61147		1	62147	1.21021E-07	
48	61148		1	62149	2.48712E-08	
49	62147		1	62150	5.79478E-07	
50	62149		1	62151	9.50067E-08	
51	62150		1	62152	2.80778E-07	
52	62151		1	64155	2.63991E-10	
53	62152		1	63153	1.30658E-07	
54	63153		1	63154	1.53097E-08	
55	63154		1	63155	1.69086E-08	
56	63155		1	40802	4.42681E-05	
57	64155		1	1001	2.30630E-02	
58	92234		1	5010	2.09787E-06	

59	92235	1	5011	8.51673E-06	
60	92236	1	55133	3.23773E-06	
61	92238	1	95237	4.09226E-07	
62	95237	1	94238	2.63252E-08	
63	94238	1	94239	2.16321E-05	
64	94239	1	94240	2.36745E-06	
65	94240	1	94241	8.29987E-07	
66	94241	1	94242	3.87820E-08	
67	94242	1	95241	1.12358E-08	
68	95241	1	95243	1.41059E-09	
69	95243	1	96244	5.44610E-11	
70	96244	1	999	3.30753E-21	

- elapsed time .00 min.
0 24259 locations will be used
0 35q array has 29 entries.
0 36q array has 28 entries.
0 39q array has 4 entries.
0 40q array has 4 entries.
0 47q array has 27 entries.
0 51q array has 27 entries.
1 400 d, second part of ses2h pass to make library
neutron group parameters

0 gp	energy boundaries	lethargy boundaries	weighted velocities	broad gp numbers	calc type	group band	right albedo	left albedo
1	2.00000E+07	-6.93147E-01	4.60581E+09	1	0	1	1.00000E+00	
2	6.43400E+06	4.40989E-01	2.88737E+09	1	0	2	1.00000E+00	
3	3.00000E+06	1.20397E+00	2.12201E+09	1	0	3	1.00000E+00	
4	1.85000E+06	1.68740E+00	1.75673E+09	1	0	4	1.00000E+00	
5	1.40000E+06	1.96611E+00	1.46535E+09	1	0	5	1.00000E+00	
6	9.00000E+05	2.40795E+00	1.06620E+09	2	0	6	1.00000E+00	
7	4.00000E+05	3.21888E+00	6.07557E+08	2	0	7	1.00000E+00	
8	1.00000E+05	4.60517E+00	2.72415E+08	2	0	8	1.00000E+00	
9	1.70000E+04	6.37713E+00	1.13526E+08	2	0	9	1.00000E+00	
10	3.00000E+03	8.11173E+00	4.82126E+07	2	0	10	1.00000E+00	
11	5.50000E+02	9.80818E+00	2.05946E+07	2	0	11	1.00000E+00	
12	1.00000E+02	1.15129E+01	1.01036E+07	2	0	12	1.00000E+00	
13	3.00000E+01	1.27169E+01	5.69595E+06	2	0	13	1.00000E+00	
14	1.00000E+01	1.38155E+01	3.20957E+06	2	0	14	1.00000E+00	
15	3.04999E+00	1.50030E+01	2.10601E+06	2	0	15	1.00000E+00	
16	1.77000E+00	1.55471E+01	1.70522E+06	2	0	16	1.00000E+00	
17	1.29999E+00	1.58657E+01	1.52545E+06	2	0	17	1.00000E+00	
18	1.12999E+00	1.59959E+01	1.42867E+06	2	0	18	1.00000E+00	
19	1.00000E+00	1.61181E+01	1.31002E+06	2	0	19	1.00000E+00	
20	8.00000E-01	1.63412E+01	9.05898E+05	2	0	20	1.00000E+00	
21	4.00000E-01	1.70344E+01	8.17974E+05	3	0	21	1.00000E+00	
22	3.25000E-01	1.72420E+01	6.90070E+05	3	0	22	1.00000E+00	
23	2.25000E-01	1.76098E+01	4.86953E+05	3	0	23	1.00000E+00	
24	9.99999E-02	1.84207E+01	3.57766E+05	3	0	24	1.00000E+00	
25	5.00000E-02	1.91138E+01	2.71895E+05	3	0	25	1.00000E+00	
26	3.00000E-02	1.96247E+01	1.87283E+05	3	0	26	1.00000E+00	
27	1.00000E-02	2.07233E+01	8.88201E+04	3	0	27	1.00000E+00	
28	1.00000E-05	2.76310E+01						

1 400 d, second part of ses2h pass to make library

0	mixture by zone	order p(l) by zone	activity table matl no.	activity table reaction	quadrature constants weights	quadrature constants directions	quadrature constants refl direc	quadrature constants wt x cos
1	3	3			0	-2.79004E-01	3	0
2	2	3			5.06143E-02	-1.97286E-01	3	-9.98548E-03
3	3	3			5.06143E-02	1.97286E-01	2	9.98548E-03
4	1	3			0	-6.04419E-01	8	0
5					5.55953E-02	-5.58410E-01	8	-3.10450E-02

6				5.55953E-02	-2.31301E-01	7	-1.28593E-02
7				5.55953E-02	2.31301E-01	6	1.28593E-02
8				5.55953E-02	5.58410E-01	5	3.10450E-02
9				0	-8.50774E-01	15	0
10				5.22844E-02	-8.21784E-01	15	-4.29665E-02
11				5.22844E-02	-6.01588E-01	14	-3.14537E-02
12				5.22844E-02	-2.20196E-01	13	-1.15128E-02
13				5.22844E-02	2.20196E-01	12	1.15128E-02
14				5.22844E-02	6.01588E-01	11	3.14537E-02
15				5.22844E-02	8.21784E-01	10	4.29665E-02
16				0	-9.83052E-01	24	0
17				4.53355E-02	-9.64143E-01	24	-4.37099E-02
18				4.53355E-02	-8.17361E-01	23	-3.70555E-02
19				4.53355E-02	-5.46143E-01	22	-2.47597E-02
20				4.53355E-02	-1.91780E-01	21	-8.69444E-03
21				4.53355E-02	1.91780E-01	20	8.69444E-03
22				4.53355E-02	5.46143E-01	19	2.47597E-02
23				4.53355E-02	8.17361E-01	18	3.70555E-02
24				4.53355E-02	9.64143E-01	17	4.37099E-02

0constants for p(3) scattering

0angl	set 1	set 2	set 3	set 4	set 5
1	-2.79004E-01	8.83235E-01	6.74143E-02	-6.16919E-01	-1.71701E-02
2	-1.97286E-01	8.83235E-01	.00000E+00	-4.36228E-01	1.21411E-02
3	1.97286E-01	8.83235E-01	.00000E+00	4.36228E-01	-1.21411E-02
4	-6.04419E-01	4.52016E-01	3.16379E-01	-8.04435E-01	-1.74564E-01
5	-5.58410E-01	4.52016E-01	2.25714E-01	-7.43201E-01	-6.68028E-02
6	-2.31301E-01	4.52016E-01	-2.25713E-01	-3.07844E-01	1.61276E-01
7	2.31301E-01	4.52016E-01	-2.25713E-01	3.07844E-01	-1.61276E-01
8	5.58410E-01	4.52016E-01	2.25713E-01	7.43201E-01	6.68028E-02
9	-8.50774E-01	-8.57235E-02	6.26843E-01	-1.98456E-01	-4.86835E-01
10	-8.21784E-01	-8.57235E-02	5.42862E-01	-1.91694E-01	-3.44245E-01
11	-6.01588E-01	-8.57235E-02	.00000E+00	-1.40830E-01	3.44244E-01
12	-2.20196E-01	-8.57235E-02	-5.42862E-01	-5.13643E-02	3.44245E-01
13	2.20196E-01	-8.57235E-02	-5.42862E-01	5.13643E-02	-3.44245E-01
14	6.01588E-01	-8.57235E-02	.00000E+00	1.40830E-01	-3.44245E-01
15	8.21784E-01	-8.57235E-02	5.42862E-01	1.91694E-01	3.44245E-01
16	-9.83052E-01	-4.49528E-01	8.36865E-01	5.00703E-01	-7.51005E-01
17	-9.64143E-01	-4.49528E-01	7.73181E-01	4.91083E-01	-6.24438E-01
18	-8.17361E-01	-4.49528E-01	3.20262E-01	4.16320E-01	1.46514E-01
19	-5.46143E-01	-4.49528E-01	-3.20262E-01	2.78176E-01	7.36575E-01
20	-1.91780E-01	-4.49528E-01	-7.73181E-01	9.76824E-02	4.17236E-01
21	1.91780E-01	-4.49528E-01	-7.73181E-01	-9.76824E-02	-4.17236E-01
22	5.46143E-01	-4.49528E-01	-3.20262E-01	-2.78176E-01	-7.36575E-01
23	8.17361E-01	-4.49528E-01	3.20262E-01	-4.16320E-01	-1.46514E-01
24	9.64143E-01	-4.49528E-01	7.73181E-01	-4.91083E-01	6.24438E-01

1 int	radii	mid pts	zone no.	areas	volumes	dens fact	radius mod	spec(int)
1	0	1.97644E-02	1	0	4.90881E-03		0	
2	3.95287E-02	5.92931E-02	1	2.48366E-01	1.47264E-02		0	
3	7.90575E-02	1.18586E-01	1	4.96733E-01	5.89057E-02		0	
4	1.58115E-01	1.97644E-01	1	9.93466E-01	9.81762E-02		0	
5	2.37172E-01	2.76701E-01	1	1.49020E+00	1.37447E-01			
6	3.16230E-01	3.55759E-01	1	1.98695E+00	1.76717E-01			
7	3.95288E-01	4.34816E-01	1	2.48366E+00	2.15988E-01			
8	4.74345E-01	5.13874E-01	1	2.98040E+00	2.55258E-01			
9	5.53403E-01	5.73167E-01	1	3.47713E+00	1.42355E-01			
10	5.92931E-01	6.12696E-01	1	3.72550E+00	1.52173E-01			
11	6.32460E-01	6.42620E-01	2	3.97386E+00	8.20460E-02			
12	6.52780E-01	6.62940E-01	2	4.10154E+00	8.46405E-02			
13	6.73100E-01	6.96589E-01	3	4.22921E+00	2.05562E-01			
14	7.20067E-01	7.43550E-01	3	4.52431E+00	2.19422E-01			

15	7.67033E-01	7.90517E-01	3	4.81941E+00	2.33282E-01
16	8.14000E-01	8.62795E-01	4	5.11451E+00	5.29051E-01
17	9.11591E-01	9.60886E-01	4	5.72769E+00	5.88891E-01
18	1.00918E+00	1.10677E+00	4	6.34088E+00	1.35731E+00
19	1.20436E+00	1.30195E+00	4	7.56724E+00	1.59667E+00
20	1.39955E+00	1.49714E+00	4	8.79360E+00	1.83603E+00
21	1.59473E+00	1.69232E+00	4	1.00200E+01	2.07540E+00
22	1.78991E+00	1.88750E+00	4	1.12463E+01	2.31476E+00
23	1.98509E+00	2.08268E+00	4	1.24727E+01	2.55412E+00
24	2.18027E+00	2.27786E+00	4	1.36991E+01	2.79349E+00
25	2.37545E+00	2.47305E+00	4	1.49254E+01	3.03285E+00
26	2.57064E+00	2.66823E+00	4	1.61518E+01	3.27221E+00
27	2.76582E+00	2.81461E+00	4	1.73781E+01	1.72587E+00
28	2.86341E+00	2.91220E+00	4	1.79913E+01	1.78571E+00
29	2.96100E+00			1.86045E+01	

- elapsed time .00 min.

outer iter	inner iters	1 - balance	eigenvalue	1 - source ratio	1 - scatter ratio	1 - upscat ratio	search parameter	time (min)
1	209	-6.79447E-06	1.10245E+00	-1.13242E-01	1.00000E+00	-3.37148E-02	.00000E+00	.0000
2	310	9.83679E-06	1.11343E+00	-1.52187E-03	-1.43890E-02	-4.02258E-03	.00000E+00	.0167
3	391	-1.79683E-07	1.11486E+00	-1.88561E-04	-1.61512E-03	-8.38010E-04	.00000E+00	.0167
4	450	3.41931E-07	1.11512E+00	-3.48739E-05	-3.42568E-04	-1.73054E-04	.00000E+00	.0167
5	490	-3.09952E-07	1.11519E+00	-7.12395E-06	-7.15464E-05	-3.53365E-05	.00000E+00	.0167

grp to grp	inner iters	mfd int.	max. flux difference	msf int.	max. scale factor	coarse mesh
1	1	17	1.87323E-06	28	1.00000E+00	1
2	1	17	2.27993E-06	28	1.00000E+00	1
3	1	17	2.11385E-06	28	1.00000E+00	1
4	1	17	2.05738E-06	28	1.00000E+00	1
5	1	17	2.17286E-06	28	1.00000E+00	1
6	1	17	1.48735E-06	28	1.00000E+00	1
7	1	24	8.67078E-07	28	1.00000E+00	2
8	1	3	1.58248E-07	20	1.00000E+00	2
9	1	27	9.38686E-06	28	1.00001E+00	3
10	1	26	2.98893E-06	28	1.00000E+00	3
11	1	26	2.40434E-06	28	1.00000E+00	3
12	1	26	6.88131E-07	28	1.00000E+00	3
13	1	26	3.40379E-06	28	9.99997E-01	3
14	1	25	1.09215E-06	28	9.99999E-01	3
15	1	2	3.61842E-05	28	9.99959E-01	2
16	1	2	4.45262E-05	28	9.99963E-01	2
17	1	27	9.69786E-05	28	1.00002E+00	3
18	1	2	5.90621E-05	28	9.99926E-01	3
19	1	2	5.16568E-05	28	9.99895E-01	3
20	1	2	4.13515E-05	28	9.99919E-01	3
21	1	2	6.33971E-05	28	9.99945E-01	3
22	1	23	2.90040E-05	28	9.99968E-01	3
23	1	27	2.77437E-05	28	1.00001E+00	4
24	1	1	3.29003E-05	9	1.00002E+00	4
25	1	1	3.33667E-05	8	1.00002E+00	5
26	1	1	2.69977E-05	6	1.00002E+00	6
27	1	1	2.52230E-05	5	1.00001E+00	8

6	517	-1.47045E-06	1.11521E+00	-1.32887E-06	-1.47463E-05	-7.75286E-06	.00000E+00	.0167

final monitor lambda 1.11520E+00 production/absorption 1.12981E+00 angular flux on 16

- elapsed time .02 min.

1 400 d, second part of sas2h pass to make library

0 int. zone number radius int. midpoint area volume prod density

int.	zone number	radius	int. midpoint	area	volume	prod density
1	1	.00000E+00	1.97644E-02	.00000E+00	4.90881E-03	.00000E+00
2	1	3.95287E-02	5.92931E-02	2.48366E-01	1.47264E-02	.00000E+00

3	1	7.90575E-02	1.18586E-01	4.96733E-01	5.89057E-02	.00000E+00
4	1	1.58115E-01	1.97644E-01	9.93466E-01	9.81762E-02	.00000E+00
5	1	2.37172E-01	2.76701E-01	1.49020E+00	1.37447E-01	.00000E+00
6	1	3.16230E-01	3.55759E-01	1.98693E+00	1.76717E-01	.00000E+00
7	1	3.95288E-01	4.34816E-01	2.48366E+00	2.15988E-01	.00000E+00
8	1	4.74345E-01	5.13874E-01	2.98040E+00	2.55258E-01	.00000E+00
9	1	5.53403E-01	5.73167E-01	3.47713E+00	1.42355E-01	.00000E+00
10	1	5.92931E-01	6.12696E-01	3.72550E+00	1.52173E-01	.00000E+00
11	2	6.32460E-01	6.42620E-01	3.97386E+00	8.20460E-02	.00000E+00
12	2	6.52780E-01	6.62940E-01	4.10154E+00	8.46405E-02	.00000E+00
13	3	6.73100E-01	6.96883E-01	4.22921E+00	2.05562E-01	.00000E+00
14	3	7.20067E-01	7.43550E-01	4.52431E+00	2.19422E-01	.00000E+00
15	3	7.67033E-01	7.90517E-01	4.81941E+00	2.33282E-01	.00000E+00
16	4	8.14000E-01	8.62795E-01	5.11451E+00	5.29051E-01	2.53798E-02
17	4	9.11591E-01	9.60386E-01	5.72769E+00	5.88891E-01	2.76386E-02
18	4	1.00918E+00	1.10677E+00	6.34088E+00	1.35731E+00	6.24247E-02
19	4	1.20436E+00	1.30195E+00	7.56724E+00	1.59667E+00	7.19621E-02
20	4	1.39956E+00	1.49714E+00	8.79360E+00	1.83603E+00	8.15879E-02
21	4	1.59473E+00	1.69232E+00	1.00200E+01	2.07540E+00	9.12662E-02
22	4	1.78991E+00	1.88750E+00	1.12463E+01	2.31478E+00	1.01001E-01
23	4	1.98509E+00	2.08268E+00	1.24727E+01	2.55412E+00	1.10800E-01
24	4	2.18027E+00	2.27786E+00	1.36991E+01	2.79349E+00	1.20679E-01
25	4	2.37545E+00	2.47305E+00	1.49254E+01	3.03285E+00	1.30656E-01
26	4	2.57064E+00	2.66823E+00	1.61518E+01	3.27221E+00	1.40759E-01
27	4	2.76582E+00	2.81461E+00	1.73781E+01	1.72587E+00	7.42165E-02
28	4	2.86341E+00	2.91220E+00	1.79913E+01	1.78571E+00	7.68256E-02
29		2.96100E+00		1.86045E+01		

1 400 d, second part of search pass to make library

0 total flux

0 int.	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	1.25057E-02	8.95631E-02	1.11854E-01	6.87739E-02	1.02549E-01	1.92650E-01	1.92996E-01	1.46916E-01
2	1.25006E-02	8.95125E-02	1.11789E-01	6.87356E-02	1.02496E-01	1.92564E-01	1.92956E-01	1.46910E-01
3	1.25013E-02	8.95252E-02	1.11810E-01	6.87536E-02	1.02531E-01	1.92634E-01	1.93010E-01	1.46921E-01
4	1.25078E-02	8.96048E-02	1.11923E-01	6.88318E-02	1.02660E-01	1.92877E-01	1.93166E-01	1.46950E-01
5	1.25196E-02	8.97448E-02	1.12117E-01	6.89647E-02	1.02877E-01	1.93276E-01	1.93415E-01	1.46995E-01
6	1.25358E-02	8.99374E-02	1.12385E-01	6.91479E-02	1.03174E-01	1.93826E-01	1.93754E-01	1.47050E-01
7	1.25562E-02	9.01839E-02	1.12730E-01	6.93857E-02	1.03563E-01	1.94544E-01	1.94197E-01	1.47120E-01
8	1.25808E-02	9.04917E-02	1.13168E-01	6.96928E-02	1.04069E-01	1.95481E-01	1.94774E-01	1.47203E-01
9	1.26015E-02	9.07625E-02	1.13561E-01	6.99745E-02	1.04537E-01	1.96350E-01	1.95311E-01	1.47272E-01
10	1.26156E-02	9.09748E-02	1.13889E-01	7.02224E-02	1.04958E-01	1.97137E-01	1.95799E-01	1.47320E-01
11	1.26275E-02	9.11508E-02	1.14163E-01	7.04305E-02	1.05312E-01	1.97814E-01	1.96217E-01	1.47365E-01
12	1.26404E-02	9.12817E-02	1.14336E-01	7.05388E-02	1.05481E-01	1.98151E-01	1.96420E-01	1.47408E-01
13	1.26674E-02	9.15202E-02	1.14605E-01	7.06764E-02	1.05671E-01	1.98492E-01	1.96613E-01	1.47477E-01
14	1.27071E-02	9.19001E-02	1.15057E-01	7.09315E-02	1.06047E-01	1.99153E-01	1.96993E-01	1.47568E-01
15	1.27538E-02	9.23889E-02	1.15679E-01	7.13178E-02	1.06644E-01	2.00227E-01	1.97623E-01	1.47669E-01
16	1.28264E-02	9.31720E-02	1.16692E-01	7.19625E-02	1.07660E-01	2.02071E-01	1.98718E-01	1.47838E-01
17	1.28981E-02	9.39521E-02	1.17705E-01	7.26107E-02	1.08693E-01	2.03969E-01	1.99864E-01	1.48035E-01
18	1.29553E-02	9.45857E-02	1.18537E-01	7.31472E-02	1.09561E-01	2.05610E-01	2.00884E-01	1.48239E-01
19	1.30052E-02	9.51495E-02	1.19286E-01	7.36332E-02	1.10355E-01	2.07143E-01	2.01854E-01	1.48451E-01
20	1.30346E-02	9.54890E-02	1.19744E-01	7.39336E-02	1.10853E-01	2.08131E-01	2.02496E-01	1.48606E-01
21	1.30531E-02	9.57079E-02	1.20045E-01	7.41316E-02	1.11184E-01	2.08806E-01	2.02943E-01	1.48722E-01
22	1.30650E-02	9.58513E-02	1.20245E-01	7.42641E-02	1.11408E-01	2.09273E-01	2.03259E-01	1.48809E-01
23	1.30725E-02	9.59439E-02	1.20376E-01	7.43514E-02	1.11557E-01	2.09592E-01	2.03478E-01	1.48872E-01
24	1.30769E-02	9.59993E-02	1.20456E-01	7.44048E-02	1.11650E-01	2.09796E-01	2.03620E-01	1.48914E-01
25	1.30788E-02	9.60249E-02	1.20494E-01	7.44305E-02	1.11695E-01	2.09900E-01	2.03694E-01	1.48935E-01
26	1.30785E-02	9.60221E-02	1.20492E-01	7.44295E-02	1.11695E-01	2.09908E-01	2.03701E-01	1.48936E-01
27	1.30768E-02	9.60022E-02	1.20466E-01	7.44120E-02	1.11666E-01	2.09853E-01	2.03664E-01	1.48922E-01
28	1.30743E-02	9.59726E-02	1.20426E-01	7.43853E-02	1.11622E-01	2.09762E-01	2.03600E-01	1.48902E-01

0 int.	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	1.15851E-01	1.07023E-01	1.00742E-01	6.53261E-02	5.58631E-02	5.34703E-02	2.91697E-02	1.62050E-02

2	1.15851E-01	1.07025E-01	1.00746E-01	6.53311E-02	5.58679E-02	5.34771E-02	2.91719E-02	1.62060E-02
3	1.15849E-01	1.07015E-01	1.00725E-01	6.53072E-02	5.58457E-02	5.34451E-02	2.91656E-02	1.62027E-02
4	1.15845E-01	1.06994E-01	1.00675E-01	6.52498E-02	5.57924E-02	5.33681E-02	2.91503E-02	1.61949E-02
5	1.15838E-01	1.06960E-01	1.00599E-01	6.51622E-02	5.57115E-02	5.32510E-02	2.91274E-02	1.61831E-02
6	1.15828E-01	1.06915E-01	1.00496E-01	6.50432E-02	5.56021E-02	5.30922E-02	2.90972E-02	1.61674E-02
7	1.15815E-01	1.06854E-01	1.00359E-01	6.48873E-02	5.54593E-02	5.28844E-02	2.90591E-02	1.61475E-02
8	1.15801E-01	1.06774E-01	1.00179E-01	6.46818E-02	5.52724E-02	5.26115E-02	2.90112E-02	1.61220E-02
9	1.15790E-01	1.06698E-01	1.00009E-01	6.44900E-02	5.50988E-02	5.23572E-02	2.89682E-02	1.60988E-02
10	1.15790E-01	1.06627E-01	9.98521E-02	6.43155E-02	5.49420E-02	5.21263E-02	2.89306E-02	1.60782E-02
11	1.15795E-01	1.06571E-01	9.97279E-02	6.41785E-02	5.48174E-02	5.19440E-02	2.88976E-02	1.60607E-02
12	1.15790E-01	1.06550E-01	9.96815E-02	6.41249E-02	5.47661E-02	5.18708E-02	2.88794E-02	1.60521E-02
13	1.15745E-01	1.06523E-01	9.96181E-02	6.40429E-02	5.46928E-02	5.17622E-02	2.88642E-02	1.60436E-02
14	1.15674E-01	1.06459E-01	9.94736E-02	6.38652E-02	5.45380E-02	5.15298E-02	2.88395E-02	1.60279E-02
15	1.15597E-01	1.06352E-01	9.92370E-02	6.35855E-02	5.42961E-02	5.11648E-02	2.88021E-02	1.60034E-02
16	1.15490E-01	1.06178E-01	9.88450E-02	6.31250E-02	5.38967E-02	5.05607E-02	2.87335E-02	1.59609E-02
17	1.15395E-01	1.06001E-01	9.84532E-02	6.26647E-02	5.34921E-02	4.99536E-02	2.86511E-02	1.59139E-02
18	1.15326E-01	1.05854E-01	9.81182E-02	6.22715E-02	5.31377E-02	4.94330E-02	2.85619E-02	1.58667E-02
19	1.15272E-01	1.05718E-01	9.78056E-02	6.19052E-02	5.28019E-02	4.89466E-02	2.84672E-02	1.58180E-02
20	1.15246E-01	1.05632E-01	9.76034E-02	6.16686E-02	5.25803E-02	4.86311E-02	2.83957E-02	1.57823E-02
21	1.15233E-01	1.05573E-01	9.74629E-02	6.15042E-02	5.24238E-02	4.84108E-02	2.83411E-02	1.57555E-02
22	1.15227E-01	1.05532E-01	9.73628E-02	6.13871E-02	5.23111E-02	4.82535E-02	2.82996E-02	1.57351E-02
23	1.15223E-01	1.05508E-01	9.72917E-02	6.13088E-02	5.22305E-02	4.81415E-02	2.82689E-02	1.57202E-02
24	1.15221E-01	1.05483E-01	9.72433E-02	6.12472E-02	5.21755E-02	4.80653E-02	2.82479E-02	1.57100E-02
25	1.15218E-01	1.05471E-01	9.72144E-02	6.12134E-02	5.21430E-02	4.80202E-02	2.82361E-02	1.57043E-02
26	1.15216E-01	1.05467E-01	9.72050E-02	6.12026E-02	5.21336E-02	4.80065E-02	2.82344E-02	1.57034E-02
27	1.15213E-01	1.05469E-01	9.72108E-02	6.12094E-02	5.21414E-02	4.80166E-02	2.82396E-02	1.57060E-02
28	1.15212E-01	1.05475E-01	9.72264E-02	6.12279E-02	5.21608E-02	4.80427E-02	2.82492E-02	1.57106E-02

0 int.	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	7.18856E-03	5.77404E-03	1.11361E-02	3.67568E-02	1.17026E-02	2.45114E-02	8.23524E-02	6.72903E-02
2	7.18914E-03	5.77505E-03	1.11370E-02	3.67591E-02	1.17085E-02	2.45130E-02	8.23472E-02	6.72749E-02
3	7.18674E-03	5.76971E-03	1.11326E-02	3.67463E-02	1.16938E-02	2.44814E-02	8.22286E-02	6.71417E-02
4	7.18094E-03	5.75685E-03	1.11221E-02	3.67161E-02	1.16714E-02	2.44096E-02	8.19679E-02	6.68551E-02
5	7.17216E-03	5.73712E-03	1.11061E-02	3.66707E-02	1.16377E-02	2.43017E-02	8.15812E-02	6.64307E-02
6	7.16051E-03	5.71012E-03	1.10846E-02	3.66099E-02	1.15919E-02	2.41561E-02	8.10650E-02	6.58652E-02
7	7.14487E-03	5.67441E-03	1.10567E-02	3.65314E-02	1.15322E-02	2.39668E-02	8.04095E-02	6.51457E-02
8	7.12469E-03	5.62688E-03	1.10205E-02	3.64299E-02	1.14537E-02	2.37201E-02	7.95802E-02	6.42412E-02
9	7.10594E-03	5.58210E-03	1.09870E-02	3.63366E-02	1.13805E-02	2.34919E-02	7.88345E-02	6.34329E-02
10	7.08890E-03	5.54098E-03	1.09567E-02	3.62528E-02	1.13135E-02	2.32861E-02	7.81864E-02	6.27366E-02
11	7.07524E-03	5.50932E-03	1.09324E-02	3.61859E-02	1.12621E-02	2.31311E-02	7.77151E-02	6.22517E-02
12	7.06955E-03	5.49785E-03	1.09222E-02	3.61580E-02	1.12443E-02	2.30792E-02	7.75701E-02	6.21288E-02
13	7.06188E-03	5.47757E-03	1.09090E-02	3.61211E-02	1.12153E-02	2.29849E-02	7.72897E-02	6.18219E-02
14	7.04569E-03	5.43221E-03	1.08814E-02	3.60443E-02	1.11489E-02	2.27717E-02	7.66667E-02	6.11202E-02
15	7.02004E-03	5.36034E-03	1.08383E-02	3.59251E-02	1.10431E-02	2.24408E-02	7.57563E-02	6.01143E-02
16	6.97771E-03	5.24045E-03	1.07667E-02	3.57294E-02	1.08713E-02	2.19052E-02	7.43599E-02	5.86188E-02
17	6.93481E-03	5.12525E-03	1.06925E-02	3.55267E-02	1.07018E-02	2.13714E-02	7.29415E-02	5.71296E-02
18	6.89685E-03	5.03059E-03	1.06245E-02	3.53387E-02	1.05580E-02	2.09211E-02	7.15856E-02	5.57125E-02
19	6.86046E-03	4.94801E-03	1.05580E-02	3.51531E-02	1.04257E-02	2.05008E-02	7.02214E-02	5.42902E-02
20	6.83605E-03	4.89816E-03	1.05126E-02	3.50242E-02	1.03364E-02	2.02273E-02	6.92483E-02	5.32798E-02
21	6.81853E-03	4.86498E-03	1.04798E-02	3.49297E-02	1.02749E-02	2.00342E-02	6.85188E-02	5.25261E-02
22	6.80577E-03	4.84202E-03	1.04558E-02	3.48596E-02	1.02306E-02	1.98945E-02	6.79658E-02	5.19580E-02
23	6.79658E-03	4.82608E-03	1.04386E-02	3.48083E-02	1.01987E-02	1.97930E-02	6.75511E-02	5.15330E-02
24	6.79052E-03	4.81535E-03	1.04266E-02	3.47728E-02	1.01764E-02	1.97221E-02	6.72513E-02	5.12251E-02
25	6.78670E-03	4.80890E-03	1.04197E-02	3.47518E-02	1.01627E-02	1.96769E-02	6.70536E-02	5.10182E-02
26	6.78581E-03	4.80639E-03	1.04178E-02	3.47450E-02	1.01574E-02	1.96571E-02	6.69571E-02	5.09080E-02
27	6.78691E-03	4.80730E-03	1.04192E-02	3.47508E-02	1.01588E-02	1.96581E-02	6.69476E-02	5.08833E-02
28	6.78947E-03	4.81043E-03	1.04236E-02	3.47628E-02	1.01648E-02	1.96738E-02	6.69992E-02	5.09185E-02

0 int.	grp. 25	grp. 26	grp. 27
1	3.05898E-02	2.19068E-02	4.15995E-03
2	3.05783E-02	2.18929E-02	4.15685E-03
3	3.05061E-02	2.18294E-02	4.14383E-03

4	3.01527E-02	2.16951E-02	4.11622E-03
5	2.99252E-02	2.14949E-02	4.07445E-03
6	2.96217E-02	2.12253E-02	4.01718E-03
7	2.92355E-02	2.08794E-02	3.94217E-03
8	2.87521E-02	2.04428E-02	3.84524E-03
9	2.85226E-02	2.00533E-02	3.75744E-03
10	2.79580E-02	1.97200E-02	3.68178E-03
11	2.77139E-02	1.95052E-02	3.63597E-03
12	2.76618E-02	1.94729E-02	3.63295E-03
13	2.74883E-02	1.93123E-02	3.59886E-03
14	2.70915E-02	1.89301E-02	3.48563E-03
15	2.65368E-02	1.83881E-02	3.32999E-03
16	2.57315E-02	1.76111E-02	3.10172E-03
17	2.49430E-02	1.68792E-02	2.90579E-03
18	2.41993E-02	1.62261E-02	2.75982E-03
19	2.34580E-02	1.55963E-02	2.62914E-03
20	2.29381E-02	1.51746E-02	2.55060E-03
21	2.25547E-02	1.48750E-02	2.49817E-03
22	2.22691E-02	1.46591E-02	2.46212E-03
23	2.20574E-02	1.45029E-02	2.43669E-03
24	2.19050E-02	1.43925E-02	2.41907E-03
25	2.18021E-02	1.43186E-02	2.40741E-03
26	2.17446E-02	1.42760E-02	2.40071E-03
27	2.17277E-02	1.42609E-02	2.39818E-03
28	2.17389E-02	1.42640E-02	2.39807E-03

- elapsed time .02 min.

1fine group summary for zone 1 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	.00000E+00	.00000E+00	4.87090E-04	6.44704E-04	5.36821E-05	-6.98354E-04	9.99954E-01
2	.00000E+00	.00000E+00	3.69919E-04	6.08007E-03	7.99113E-03	1.73746E-04	-7.79466E-03	9.99963E-01
3	.00000E+00	.00000E+00	3.79336E-03	5.43308E-03	1.41358E-02	9.22434E-05	-1.04344E-02	9.99978E-01
4	.00000E+00	.00000E+00	5.54790E-03	3.58874E-03	1.23306E-02	4.18804E-05	-6.82441E-03	9.99988E-01
5	.00000E+00	.00000E+00	1.02112E-02	1.15085E-02	2.08499E-02	4.95949E-05	-1.06881E-02	9.99992E-01
6	.00000E+00	.00000E+00	2.14361E-02	3.44799E-02	4.09796E-02	8.42484E-05	-1.96277E-02	9.99999E-01
7	.00000E+00	.00000E+00	4.21852E-02	6.09506E-02	5.41196E-02	6.12018E-05	-1.19949E-02	9.99988E-01
8	.00000E+00	.00000E+00	5.63523E-02	7.83160E-02	5.87228E-02	3.63888E-05	-2.42176E-03	9.99912E-01
9	.00000E+00	.00000E+00	5.77629E-02	7.25727E-02	5.74705E-02	2.92600E-05	2.69312E-04	9.99886E-01
10	.00000E+00	.00000E+00	5.70519E-02	6.91057E-02	5.55375E-02	3.60291E-05	1.48434E-03	9.99895E-01
11	.00000E+00	.00000E+00	5.58237E-02	6.55068E-02	5.22981E-02	5.50836E-05	3.47392E-03	9.99935E-01
12	.00000E+00	.00000E+00	4.53517E-02	3.50518E-02	4.12427E-02	6.03735E-05	4.04963E-03	9.99979E-01
13	.00000E+00	.00000E+00	4.05122E-02	2.85695E-02	3.66385E-02	8.46320E-05	3.79026E-03	9.99969E-01
14	.00000E+00	.00000E+00	3.94478E-02	2.83211E-02	3.38317E-02	1.36678E-04	5.47987E-03	9.99888E-01
15	.00000E+00	.00000E+00	2.17288E-02	1.09097E-02	2.04384E-02	1.13197E-04	1.17730E-03	9.99999E-01
16	.00000E+00	.00000E+00	1.42777E-02	4.61551E-03	1.35977E-02	7.69716E-05	6.02984E-04	1.00000E+00
17	.00000E+00	.00000E+00	7.35010E-03	1.32371E-03	6.88720E-03	3.78928E-05	4.25050E-04	9.99994E-01
18	.00000E+00	.00000E+00	6.53283E-03	1.02337E-03	5.59193E-03	3.20218E-05	9.08861E-04	1.00000E+00
19	.00000E+00	.00000E+00	1.09093E-02	3.03867E-03	1.00851E-02	6.80572E-05	7.56118E-04	1.00001E+00
20	.00000E+00	.00000E+00	2.68510E-02	2.16304E-02	2.44561E-02	2.82106E-04	2.11265E-03	1.00001E+00
21	.00000E+00	.00000E+00	1.30419E-02	4.41230E-03	1.14784E-02	1.10653E-04	1.45278E-03	1.00000E+00
22	.00000E+00	.00000E+00	2.60528E-02	1.37924E-02	2.14639E-02	2.64914E-04	4.32368E-03	1.00001E+00
23	.00000E+00	.00000E+00	6.85292E-02	8.34136E-02	5.47754E-02	1.21087E-03	1.23403E-02	1.00004E+00
24	.00000E+00	.00000E+00	7.33842E-02	7.84564E-02	6.05612E-02	1.42736E-03	1.13952E-02	1.00003E+00
25	.00000E+00	.00000E+00	4.88734E-02	3.32269E-02	4.27465E-02	8.44487E-04	5.28160E-03	1.00002E+00
26	.00000E+00	.00000E+00	3.90251E-02	3.71037E-02	3.42702E-02	8.58082E-04	3.89628E-03	1.00001E+00
27	.00000E+00	.00000E+00	1.32287E-02	8.05151E-03	1.22656E-02	3.06472E-04	6.56609E-04	1.00000E+00
28	.00000E+00	.00000E+00	8.05411E-01	8.00971E-01	8.05411E-01	6.62813E-03	-6.60952E-03	9.99977E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*db**2	total flux
1	1.26224E-02	-6.98354E-04	1.25098E-02	.00000E+00	3.56540E-11	.00000E+00	1.95222E-05	1.57825E-02
2	9.10870E-02	-7.79466E-03	8.96050E-02	.00000E+00	.00000E+00	.00000E+00	8.81274E-05	1.13399E-01
3	1.14068E-01	-1.04344E-02	1.11909E-01	.00000E+00	.00000E+00	.00000E+00	9.18164E-05	1.41773E-01

4	7.03623E-02	-6.82441E-03	6.88079E-02	.00000E+00	.00000E+00	.00000E+00	4.16276E-05	8.72793E-02
5	1.05198E-01	-1.06881E-02	1.02598E-01	.00000E+00	.00000E+00	.00000E+00	4.93024E-05	1.30290E-01
6	1.97587E-01	-1.96277E-02	1.92734E-01	.00000E+00	.00000E+00	.00000E+00	8.33793E-05	2.44749E-01
7	1.96079E-01	-1.19949E-02	1.95089E-01	.00000E+00	.00000E+00	.00000E+00	5.92586E-05	2.44207E-01
8	1.47344E-01	-2.42176E-03	1.46923E-01	.00000E+00	.00000E+00	.00000E+00	3.27104E-05	1.84890E-01
9	1.15793E-01	2.69312E-04	1.15550E-01	.00000E+00	.00000E+00	.00000E+00	2.16620E-05	1.45540E-01
10	1.06585E-01	1.48434E-03	1.07020E-01	.00000E+00	.00000E+00	.00000E+00	1.91432E-05	1.34253E-01
11	9.97614E-02	3.47392E-03	1.00734E-01	.00000E+00	.00000E+00	.00000E+00	1.78840E-05	1.26061E-01
12	6.42154E-02	4.04963E-03	6.53172E-02	.00000E+00	.00000E+00	.00000E+00	1.04989E-05	8.14793E-02
13	5.48522E-02	3.79026E-03	5.58544E-02	.00000E+00	.00000E+00	.00000E+00	8.74493E-06	6.96388E-02
14	5.19940E-02	5.47987E-03	5.34581E-02	.00000E+00	.00000E+00	.00000E+00	8.50472E-06	6.63766E-02
15	2.89100E-02	1.17730E-03	2.91671E-02	.00000E+00	.00000E+00	.00000E+00	4.49456E-06	3.65061E-02
16	1.60667E-02	6.02984E-04	1.62038E-02	.00000E+00	.00000E+00	.00000E+00	2.25869E-06	2.02853E-02
17	7.07912E-03	4.25050E-04	7.18759E-03	.00000E+00	.00000E+00	.00000E+00	9.18383E-07	8.97278E-03
18	5.51736E-03	9.08861E-04	5.77216E-03	.00000E+00	.00000E+00	.00000E+00	7.10512E-07	7.11580E-03
19	1.09396E-02	7.56118E-04	1.11345E-02	.00000E+00	.00000E+00	.00000E+00	1.45276E-06	1.38842E-02
20	3.62062E-02	2.11265E-03	3.67535E-02	.00000E+00	.00000E+00	.00000E+00	5.37749E-06	4.58796E-02
21	1.12751E-02	1.45278E-03	1.17000E-02	.00000E+00	.00000E+00	.00000E+00	1.32665E-06	1.44687E-02
22	2.31684E-02	4.32368E-03	2.45039E-02	.00000E+00	.00000E+00	.00000E+00	2.76687E-06	3.00478E-02
23	7.78185E-02	1.23408E-02	8.23315E-02	.00000E+00	.00000E+00	.00000E+00	8.31792E-06	1.00848E-01
24	6.23427E-02	1.13952E-02	6.72752E-02	.00000E+00	.00000E+00	.00000E+00	5.00516E-06	8.16554E-02
25	2.77532E-02	5.28160E-03	3.03848E-02	.00000E+00	.00000E+00	.00000E+00	1.73456E-06	3.66298E-02
26	1.95322E-02	3.89626E-03	2.19042E-02	.00000E+00	.00000E+00	.00000E+00	9.13946E-07	2.61344E-02
27	3.63920E-03	6.56606E-04	4.16017E-03	.00000E+00	.00000E+00	.00000E+00	1.07667E-07	4.92792E-03
28	1.75780E+00	-6.60954E-03	1.76484E+00	.00000E+00	3.56540E-11	.00000E+00	5.87347E-04	2.21307E+00

1fine group summary for zone 2 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	.00000E+00	.00000E+00	2.15385E-04	1.61457E-04	2.42210E-06	-1.58120E-04	1.00001E+00
2	.00000E+00	.00000E+00	2.81981E-05	1.44083E-03	1.05387E-03	1.38776E-05	-1.01956E-03	1.00000E+00
3	.00000E+00	.00000E+00	1.47884E-04	2.75496E-03	8.71089E-04	2.01597E-05	-7.43311E-04	9.99995E-01
4	.00000E+00	.00000E+00	2.84131E-04	2.29810E-03	2.97554E-04	1.30594E-05	-2.64714E-05	9.99998E-01
5	.00000E+00	.00000E+00	6.11481E-04	4.41046E-03	2.78928E-04	1.68406E-05	3.15690E-04	1.00000E+00
6	.00000E+00	.00000E+00	1.01580E-03	1.23994E-02	1.69411E-04	2.70556E-05	8.19316E-04	1.00000E+00
7	.00000E+00	.00000E+00	6.69131E-04	1.25914E-02	6.32907E-05	2.68088E-05	5.79052E-04	1.00000E+00
8	.00000E+00	.00000E+00	1.17079E-04	9.20419E-03	4.43196E-04	2.21031E-05	-3.48250E-04	1.00001E+00
9	.00000E+00	.00000E+00	4.45026E-04	6.35590E-03	5.29835E-05	7.66649E-05	3.15394E-04	9.99977E-01
10	.00000E+00	.00000E+00	5.30482E-05	4.98332E-03	4.94432E-05	5.92845E-05	-5.56846E-05	1.00000E+00
11	.00000E+00	.00000E+00	4.94466E-05	4.44910E-03	5.02461E-05	8.99049E-05	-9.07094E-05	1.00000E+00
12	.00000E+00	.00000E+00	5.02464E-05	2.75837E-03	5.13184E-05	5.66705E-06	-6.74324E-06	1.00000E+00
13	.00000E+00	.00000E+00	5.13185E-05	2.35694E-03	4.80799E-05	6.31536E-06	-3.07290E-06	9.99999E-01
14	.00000E+00	.00000E+00	4.80800E-05	2.23846E-03	4.21840E-05	8.54857E-06	-2.65427E-06	1.00000E+00
15	.00000E+00	.00000E+00	4.47981E-05	1.22002E-03	4.99316E-05	6.31821E-06	-1.14141E-05	9.99969E-01
16	.00000E+00	.00000E+00	5.60781E-05	6.49237E-04	5.62444E-05	3.84795E-06	-3.98967E-06	9.99963E-01
17	.00000E+00	.00000E+00	6.20020E-05	2.49863E-04	6.13815E-05	1.85364E-06	-1.21919E-06	9.99971E-01
18	.00000E+00	.00000E+00	6.47016E-05	1.82791E-04	5.90224E-05	1.52182E-06	4.16752E-06	9.99990E-01
19	.00000E+00	.00000E+00	6.02860E-05	4.18990E-04	6.17296E-05	3.24660E-06	-4.67128E-06	9.99977E-01
20	.00000E+00	.00000E+00	7.57261E-05	1.52450E-03	6.48122E-05	1.31067E-05	-2.13273E-06	9.99973E-01
21	.00000E+00	.00000E+00	8.70456E-05	3.99105E-04	9.53318E-05	4.94723E-06	-1.32096E-05	9.99985E-01
22	.00000E+00	.00000E+00	1.26263E-04	8.95497E-04	1.19680E-04	1.15625E-05	-4.96162E-06	9.99994E-01
23	.00000E+00	.00000E+00	1.82549E-04	3.17792E-03	2.33312E-04	5.19052E-05	-1.02700E-04	1.00000E+00
24	.00000E+00	.00000E+00	2.99436E-04	2.40298E-03	3.29773E-04	5.89847E-05	-8.98902E-05	1.00001E+00
25	.00000E+00	.00000E+00	3.05008E-04	9.67478E-04	2.49016E-04	3.42578E-05	2.17282E-05	1.00000E+00
26	.00000E+00	.00000E+00	1.29576E-04	7.56319E-04	9.99495E-05	3.39527E-05	-4.33787E-06	1.00000E+00
27	.00000E+00	.00000E+00	2.89815E-05	1.59608E-04	8.22357E-08	1.18415E-05	1.70544E-05	1.00001E+00
28	.00000E+00	.00000E+00	5.09332E-03	8.14601E-02	5.09332E-03	6.26039E-04	-6.20222E-04	9.99994E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*db**2	total flux
1	1.26481E-02	-8.56474E-04	1.26224E-02	-6.98354E-04	5.76869E-06	.00000E+00	1.59470E-06	2.10592E-03
2	9.13489E-02	-8.81422E-03	9.10870E-02	-7.79466E-03	.00000E+00	.00000E+00	1.10152E-05	1.52047E-02
3	1.14414E-01	-1.11777E-02	1.14068E-01	-1.04344E-02	.00000E+00	.00000E+00	1.26247E-05	1.90441E-02
4	7.05785E-02	-6.85088E-03	7.03623E-02	-6.82441E-03	.00000E+00	.00000E+00	7.41779E-06	1.17490E-02

5	1.05537E-01	-1.03724E-02	1.05198E-01	-1.06881E-02	.00000E+00	.00000E+00	8.62403E-06	1.75684E-02
6	1.98262E-01	-1.88084E-02	1.97587E-01	-1.96277E-02	.00000E+00	.00000E+00	1.01711E-05	3.30015E-02
7	1.96485E-01	-1.14159E-02	1.96079E-01	-1.19949E-02	.00000E+00	.00000E+00	8.35158E-06	3.27240E-02
8	1.47432E-01	-2.77001E-03	1.47344E-01	-2.42176E-03	.00000E+00	.00000E+00	5.27251E-06	2.45674E-02
9	1.15782E-01	5.84706E-04	1.15795E-01	2.69312E-04	.00000E+00	.00000E+00	4.58111E-06	1.93011E-02
10	1.06545E-01	1.42866E-03	1.06588E-01	1.48434E-03	.00000E+00	.00000E+00	4.90574E-06	1.77622E-02
11	9.96685E-02	3.38521E-03	9.97614E-02	3.47392E-03	.00000E+00	.00000E+00	4.75836E-06	1.66194E-02
12	6.41083E-02	4.04289E-03	6.42154E-02	4.04963E-03	.00000E+00	.00000E+00	3.21119E-06	1.06952E-02
13	5.47497E-02	3.78719E-03	5.48522E-02	3.79026E-03	.00000E+00	.00000E+00	2.73684E-06	9.13298E-03
14	5.18477E-02	5.47721E-03	5.19940E-02	5.47987E-03	.00000E+00	.00000E+00	2.58635E-06	8.65217E-03
15	2.88734E-02	1.16589E-03	2.89100E-02	1.17730E-03	.00000E+00	.00000E+00	1.41874E-06	4.81530E-03
16	1.60494E-02	5.98994E-04	1.60667E-02	6.02984E-04	.00000E+00	.00000E+00	7.88577E-07	2.67637E-03
17	7.06775E-03	4.23830E-04	7.07912E-03	4.25050E-04	.00000E+00	.00000E+00	3.47178E-07	1.17887E-03
18	5.49442E-03	9.13028E-04	5.51736E-03	9.08861E-04	.00000E+00	.00000E+00	2.70079E-07	9.17358E-04
19	1.09191E-02	7.51447E-04	1.09396E-02	7.56118E-04	.00000E+00	.00000E+00	5.36007E-07	1.82142E-03
20	3.61504E-02	2.11051E-03	3.62062E-02	2.11265E-03	.00000E+00	.00000E+00	1.77184E-06	6.02934E-03
21	1.12395E-02	1.43957E-03	1.12751E-02	1.45278E-03	.00000E+00	.00000E+00	5.50308E-07	1.87573E-03
22	2.30646E-02	4.31871E-03	2.31684E-02	4.32368E-03	.00000E+00	.00000E+00	1.12842E-06	3.85126E-03
23	7.75288E-02	1.22576E-02	7.78188E-02	1.23403E-02	.00000E+00	.00000E+00	3.77857E-06	1.29418E-02
24	6.20970E-02	1.13038E-02	6.23427E-02	1.13932E-02	.00000E+00	.00000E+00	3.00818E-06	1.03661E-02
25	2.76489E-02	5.30333E-03	2.77532E-02	5.28160E-03	.00000E+00	.00000E+00	1.33133E-06	4.61513E-03
26	1.94675E-02	3.89192E-03	1.95322E-02	3.89626E-03	.00000E+00	.00000E+00	9.27235E-07	3.24852E-03
27	3.63316E-03	6.73660E-04	3.63920E-03	6.56606E-04	.00000E+00	.00000E+00	1.67621E-07	6.05812E-04
28	1.75864E+00	-7.22974E-03	1.75780E+00	-6.60954E-03	5.76869E-06	.00000E+00	1.08875E-04	2.93069E-01

1fine group summary for zone 3 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	.00000E+00	.00000E+00	2.58233E-04	3.41795E-04	2.84598E-05	-3.70235E-04	9.99985E-01
2	.00000E+00	.00000E+00	1.96114E-04	3.24545E-03	4.26555E-03	9.27431E-05	-4.16202E-03	9.99888E-01
3	.00000E+00	.00000E+00	2.02449E-03	2.90447E-03	7.55686E-03	4.93124E-05	-5.58153E-03	9.99991E-01
4	.00000E+00	.00000E+00	2.96483E-03	1.92142E-03	6.60181E-03	2.24228E-05	-3.65952E-03	9.99994E-01
5	.00000E+00	.00000E+00	5.46216E-03	6.17154E-03	1.11810E-02	2.65958E-05	-5.74531E-03	9.99996E-01
6	.00000E+00	.00000E+00	1.14852E-02	1.84847E-02	2.19692E-02	4.51656E-05	-1.05312E-02	9.99999E-01
7	.00000E+00	.00000E+00	2.26100E-02	3.23819E-02	2.87528E-02	3.25154E-05	-6.17498E-03	9.99991E-01
8	.00000E+00	.00000E+00	2.99803E-02	4.11489E-02	3.08538E-02	1.91192E-05	-8.89860E-04	9.99919E-01
9	.00000E+00	.00000E+00	3.04122E-02	3.79673E-02	3.00666E-02	1.53077E-05	3.33720E-04	9.99885E-01
10	.00000E+00	.00000E+00	2.98807E-02	3.60666E-02	2.89849E-02	1.88035E-05	8.80193E-04	9.99900E-01
11	.00000E+00	.00000E+00	2.91533E-02	3.40130E-02	2.71547E-02	2.86010E-05	1.97182E-03	9.99945E-01
12	.00000E+00	.00000E+00	2.35738E-02	1.80730E-02	2.12652E-02	3.11292E-05	2.27803E-03	9.99982E-01
13	.00000E+00	.00000E+00	2.09422E-02	1.47188E-02	1.88751E-02	4.35999E-05	2.02418E-03	9.99974E-01
14	.00000E+00	.00000E+00	2.08471E-02	1.44569E-02	1.72699E-02	6.97695E-05	3.00769E-03	9.99991E-01
15	.00000E+00	.00000E+00	1.11306E-02	5.67224E-03	1.06264E-02	5.88538E-05	4.45320E-04	1.00000E+00
16	.00000E+00	.00000E+00	7.36354E-03	2.40001E-03	7.07066E-03	4.00243E-05	2.52856E-04	1.00000E+00
17	.00000E+00	.00000E+00	3.79802E-03	6.83820E-04	3.55788E-03	1.95752E-05	2.20581E-04	9.99995E-01
18	.00000E+00	.00000E+00	3.37567E-03	5.13196E-04	2.80421E-03	1.60581E-05	5.55392E-04	1.00000E+00
19	.00000E+00	.00000E+00	5.61321E-03	1.56669E-03	5.19969E-03	3.50891E-05	3.78374E-04	1.00001E+00
20	.00000E+00	.00000E+00	1.38132E-02	1.11805E-02	1.26411E-02	1.45818E-04	1.02620E-03	1.00001E+00
21	.00000E+00	.00000E+00	6.68412E-03	2.23468E-03	5.81345E-03	5.60422E-05	8.14637E-04	1.00000E+00
22	.00000E+00	.00000E+00	1.32522E-02	6.86523E-03	1.06838E-02	1.31863E-04	2.41643E-03	1.00001E+00
23	.00000E+00	.00000E+00	3.39578E-02	4.16726E-02	2.73653E-02	6.04941E-04	5.96659E-03	1.00002E+00
24	.00000E+00	.00000E+00	3.61386E-02	3.85702E-02	2.97727E-02	7.01708E-04	5.66290E-03	1.00003E+00
25	.00000E+00	.00000E+00	2.38828E-02	1.61333E-02	2.07555E-02	4.10039E-04	2.71696E-03	1.00001E+00
26	.00000E+00	.00000E+00	1.89825E-02	1.76252E-02	1.62774E-02	4.07566E-04	2.29739E-03	1.00001E+00
27	.00000E+00	.00000E+00	6.39842E-03	3.72451E-03	5.67391E-03	1.41769E-04	5.82721E-04	1.00000E+00
28	.00000E+00	.00000E+00	4.13381E-01	4.10651E-01	4.13381E-01	3.29289E-03	-3.28245E-03	9.99975E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*dv**2	total flux
1	1.27800E-02	-1.22671E-03	1.26481E-02	-8.56474E-04	1.89021E-11	.00000E+00	1.02438E-05	8.36737E-03
2	9.26692E-02	-1.29762E-02	9.13489E-02	-8.81422E-03	.00000E+00	.00000E+00	4.70411E-05	6.05306E-02
3	1.16041E-01	-1.67592E-02	1.14414E-01	-1.11777E-02	.00000E+00	.00000E+00	4.90841E-05	7.57903E-02
4	7.15465E-02	-1.05102E-02	7.05786E-02	-6.85088E-03	.00000E+00	.00000E+00	2.22874E-05	4.67294E-02
5	1.07001E-01	-1.61177E-02	1.05537E-01	-1.03724E-02	.00000E+00	.00000E+00	2.64389E-05	6.98691E-02

6	2.00871E-01	-2.95395E-02	1.98262E-01	-1.88084E-02	.00000E+00	.00000E+00	4.46996E-05	1.31210E-01
7	1.98001E-01	-1.75909E-02	1.96485E-01	-1.14159E-02	.00000E+00	.00000E+00	3.14830E-05	1.29743E-01
8	1.47723E-01	-3.65987E-03	1.47432E-01	-2.77001E-03	.00000E+00	.00000E+00	1.71865E-05	9.71437E-02
9	1.15554E-01	9.18426E-04	1.15782E-01	5.84706E-04	.00000E+00	.00000E+00	1.13328E-05	7.61409E-02
10	1.06287E-01	2.30885E-03	1.06545E-01	1.42866E-03	.00000E+00	.00000E+00	9.99080E-06	7.00663E-02
11	9.90944E-02	5.35503E-03	9.96685E-02	3.38321E-03	.00000E+00	.00000E+00	9.28590E-06	6.54545E-02
12	6.34182E-02	6.32092E-03	6.41083E-02	4.04289E-03	.00000E+00	.00000E+00	5.41334E-06	4.20115E-02
13	5.41521E-02	5.81137E-03	5.47497E-02	3.78719E-03	.00000E+00	.00000E+00	4.50513E-06	3.58759E-02
14	5.09467E-02	8.48490E-03	5.18477E-02	5.47721E-03	.00000E+00	.00000E+00	4.34136E-06	3.38825E-02
15	2.87815E-02	1.61121E-03	2.88734E-02	1.16589E-03	.00000E+00	.00000E+00	2.33683E-06	1.89804E-02
16	1.59893E-02	8.51850E-04	1.60494E-02	5.98994E-04	.00000E+00	.00000E+00	1.17450E-06	1.05481E-02
17	7.00473E-03	6.44412E-04	7.06775E-03	4.23830E-04	.00000E+00	.00000E+00	4.74431E-07	4.63528E-03
18	5.31703E-03	1.46842E-03	5.49442E-03	9.13028E-04	.00000E+00	.00000E+00	3.56304E-07	3.56840E-03
19	1.08129E-02	1.12982E-03	1.09191E-02	7.51447E-04	.00000E+00	.00000E+00	7.49018E-07	7.15846E-03
20	3.58560E-02	3.13671E-03	3.61504E-02	2.11051E-03	.00000E+00	.00000E+00	2.77957E-06	2.37147E-02
21	1.09799E-02	2.25421E-03	1.12395E-02	1.43957E-03	.00000E+00	.00000E+00	6.71905E-07	7.32790E-03
22	2.22435E-02	6.73514E-03	2.30646E-02	4.31871E-03	.00000E+00	.00000E+00	1.36727E-06	1.49565E-02
23	7.52274E-02	1.82042E-02	7.75285E-02	1.22576E-02	.00000E+00	.00000E+00	4.15556E-06	5.03827E-02
24	5.95316E-02	1.69667E-02	6.20970E-02	1.13098E-02	.00000E+00	.00000E+00	2.46060E-06	4.01429E-02
25	2.62168E-02	8.02028E-03	2.76489E-02	5.30333E-03	.00000E+00	.00000E+00	8.42212E-07	1.77865E-02
26	1.80720E-02	6.18951E-03	1.94675E-02	3.89192E-03	.00000E+00	.00000E+00	4.34099E-07	1.24131E-02
27	3.23510E-03	1.25638E-03	3.63316E-03	6.73660E-04	.00000E+00	.00000E+00	4.98052E-08	2.27959E-03
28	1.75535E+00	-1.05122E-02	1.75864E+00	-7.22974E-03	1.89021E-11	.00000E+00	3.11186E-04	1.15671E+00

1fine group summary for zone 4 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	2.25011E-02	.00000E+00	2.08848E-02	1.98131E-02	3.68826E-03	1.22670E-03	9.98900E-01
2	.00000E+00	1.92525E-01	6.85378E-03	2.48705E-01	1.71191E-01	1.52242E-02	1.29761E-02	1.00002E+00
3	.00000E+00	2.15618E-01	7.06590E-02	2.56701E-01	2.53277E-01	1.62444E-02	1.67591E-02	9.99888E-01
4	.00000E+00	1.24001E-01	1.04953E-01	1.76351E-01	2.10673E-01	7.77117E-03	1.05101E-02	1.00000E+00
5	.00000E+00	1.64661E-01	1.91269E-01	4.44024E-01	3.34607E-01	5.20950E-03	1.61178E-02	9.99990E-01
6	.00000E+00	1.77976E-01	3.90072E-01	1.19096E+00	5.30432E-01	8.26884E-03	2.95394E-02	1.00001E+00
7	.00000E+00	8.80747E-02	5.92882E-01	1.56441E+00	6.55091E-01	8.28064E-03	1.75914E-02	9.99990E-01
8	.00000E+00	1.35773E-02	6.89252E-01	1.57537E+00	6.85878E-01	1.33484E-02	3.65991E-03	9.99920E-01
9	.00000E+00	9.85518E-04	6.77986E-01	1.37120E+00	6.57991E-01	2.19720E-02	-9.12558E-04	9.99865E-01
10	.00000E+00	7.32011E-05	6.55054E-01	1.24591E+00	6.24316E-01	3.31867E-02	-2.30688E-03	9.99896E-01
11	.00000E+00	5.75899E-06	6.28420E-01	1.15921E+00	5.79823E-01	5.39932E-02	-5.35353E-03	9.99940E-01
12	.00000E+00	4.04599E-07	5.05087E-01	6.33429E-01	4.53159E-01	5.82623E-02	-6.32114E-03	9.99975E-01
13	.00000E+00	6.42403E-08	4.47809E-01	5.02815E-01	3.99520E-01	5.41136E-02	-5.81247E-03	9.99974E-01
14	.00000E+00	1.27307E-08	4.30994E-01	4.71038E-01	3.63406E-01	7.60782E-02	-8.48526E-03	9.99990E-01
15	.00000E+00	1.43871E-09	2.37987E-01	2.16462E-01	2.32045E-01	7.52740E-03	-1.61600E-03	1.00013E+00
16	.00000E+00	4.22456E-10	1.62648E-01	1.00337E-01	1.58397E-01	5.08498E-03	-8.55121E-04	1.00013E+00
17	.00000E+00	1.36051E-10	8.74822E-02	3.19811E-02	8.23589E-02	5.75978E-03	-6.43208E-04	1.00008E+00
18	.00000E+00	9.74088E-11	7.82237E-02	2.25708E-02	6.28919E-02	1.67968E-02	-1.47086E-03	1.00007E+00
19	.00000E+00	1.37715E-10	1.24769E-01	6.25568E-02	1.17846E-01	8.04437E-03	-1.13503E-03	1.00011E+00
20	.00000E+00	2.23939E-10	2.98152E-01	3.55475E-01	2.74113E-01	2.71452E-02	-3.14665E-03	1.00014E+00
21	.00000E+00	3.27775E-11	1.48254E-01	7.32826E-02	1.28399E-01	2.21013E-02	-2.25739E-03	1.00007E+00
22	.00000E+00	3.80293E-11	2.85287E-01	1.95241E-01	2.24417E-01	6.55865E-02	-6.73878E-03	1.00007E+00
23	.00000E+00	3.63602E-11	6.84853E-01	1.04821E+00	5.62382E-01	1.40611E-01	-1.81967E-02	1.00008E+00
24	.00000E+00	9.89678E-12	7.26704E-01	8.98956E-01	5.99529E-01	1.44093E-01	-1.69675E-02	1.00007E+00
25	.00000E+00	2.89713E-12	4.80701E-01	3.63702E-01	4.08696E-01	8.00060E-02	-8.01983E-03	1.00004E+00
26	.00000E+00	2.03149E-12	3.72577E-01	3.64711E-01	3.05864E-01	7.26891E-02	-6.18951E-03	1.00003E+00
27	.00000E+00	4.84114E-13	1.22721E-01	7.36785E-02	1.03332E-01	2.06441E-02	-1.25642E-03	1.00001E+00
28	.00000E+00	1.00000E+00	9.19945E+00	1.46682E+01	9.19945E+00	9.91732E-01	1.04954E-02	9.99999E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	r2n rate	fiss rate	flux*db**2	total flux
1	1.30728E-02	-8.23645E-09	1.27800E-02	-1.22671E-03	2.19980E-03	2.45359E-03	2.88454E-04	3.32292E-01
2	9.59542E-02	-9.29967E-08	9.26692E-02	-1.29762E-02	1.60923E-05	1.09749E-02	1.57752E-03	2.43648E+00
3	1.20401E-01	-8.61707E-08	1.16041E-01	-1.67592E-02	.00000E+00	1.33511E-02	1.82264E-03	3.05635E+00
4	7.43687E-02	-7.46999E-08	7.15465E-02	-1.05102E-02	.00000E+00	5.74283E-03	8.82679E-04	1.88748E+00
5	1.11593E-01	-1.30847E-07	1.07001E-01	-1.61177E-02	.00000E+00	1.66916E-03	1.03129E-03	2.83115E+00
6	2.09705E-01	-1.39526E-07	2.00871E-01	-2.95395E-02	.00000E+00	1.44218E-03	1.73119E-03	5.31835E+00

7	2.08560E-01	4.72277E-07	1.98001E-01	-1.75909E-02	.00000E+00	1.43317E-03	1.22604E-03	5.16917E+00
8	1.48889E-01	3.86691E-08	1.47723E-01	-3.65987E-03	.00000E+00	1.47659E-03	6.97612E-04	3.78777E+00
9	1.15211E-01	5.86745E-06	1.15554E-01	9.18426E-04	.00000E+00	2.00066E-03	4.70875E-04	2.93430E+00
10	1.05478E-01	1.96873E-06	1.06287E-01	2.30885E-03	.00000E+00	4.27290E-03	4.28297E-04	2.68789E+00
11	9.72367E-02	1.50113E-06	9.90944E-02	5.35503E-03	.00000E+00	9.02446E-03	3.86574E-04	2.48091E+00
12	6.12403E-02	-2.23212E-07	6.34182E-02	6.32092E-03	.00000E+00	1.18367E-02	2.27595E-04	1.56520E+00
13	5.21738E-02	-1.09516E-06	5.41521E-02	5.81137E-03	.00000E+00	1.22719E-02	1.95662E-04	1.33390E+00
14	4.80601E-02	-3.63766E-07	5.09467E-02	8.48490E-03	.00000E+00	8.08807E-03	1.76823E-04	1.23149E+00
15	2.82560E-02	-4.78584E-06	2.87815E-02	1.61121E-03	.00000E+00	2.03167E-03	1.11532E-04	7.21075E-01
16	1.57140E-02	-3.27042E-06	1.59893E-02	8.51850E-04	.00000E+00	1.38800E-03	5.82700E-05	4.00918E-01
17	6.79082E-03	1.20404E-06	7.00473E-03	6.44412E-04	.00000E+00	1.86023E-03	2.28359E-05	1.73500E-01
18	4.81286E-03	-2.43980E-06	5.31703E-03	1.46842E-03	.00000E+00	1.88211E-03	1.34026E-05	1.23795E-01
19	1.04274E-02	-5.21187E-06	1.08129E-02	1.12982E-03	.00000E+00	2.97904E-03	3.57887E-05	2.66599E-01
20	3.47734E-02	-9.93118E-06	3.58660E-02	3.13671E-03	.00000E+00	1.54512E-02	1.28599E-04	8.88591E-01
21	1.01693E-02	-3.17838E-06	1.09799E-02	2.25421E-03	.00000E+00	1.33112E-02	2.91887E-05	2.61231E-01
22	1.96854E-02	-3.64302E-06	2.22435E-02	6.75514E-03	.00000E+00	3.92745E-02	5.30524E-05	5.08776E-01
23	6.70355E-02	7.43641E-06	7.52274E-02	1.82042E-02	.00000E+00	8.27260E-02	1.80689E-04	1.73629E+00
24	5.09464E-02	-7.86148E-07	5.95316E-02	1.69667E-02	.00000E+00	8.44330E-02	1.07313E-04	1.32884E+00
25	2.17490E-02	4.55754E-07	2.62168E-02	8.02028E-03	.00000E+00	4.88251E-02	3.65120E-05	5.70198E-01
26	1.42682E-02	-2.01242E-07	1.80720E-02	6.18931E-03	.00000E+00	4.49767E-02	1.79214E-05	3.76320E-01
27	2.39824E-03	-3.56412E-08	3.23510E-03	1.25638E-03	.00000E+00	1.25803E-02	1.83465E-06	6.34222E-02
28	1.74397E+00	-1.67794E-05	1.75535E+00	-1.05122E-02	2.21589E-03	4.37757E-01	1.19400E-02	4.44723E+01

1fine group summary for system

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	2.25011E-02	.00000E+00	2.18455E-02	2.09611E-02	3.77282E-03	-8.23645E-09	9.98858E-01
2	.00000E+00	1.92525E-01	7.44801E-03	2.59471E-01	1.84482E-01	1.55046E-02	-9.29967E-08	1.00001E+00
3	.00000E+00	2.15618E-01	7.66247E-02	2.67798E-01	2.75841E-01	1.64062E-02	-8.61707E-08	9.99987E-01
4	.00000E+00	1.24001E-01	1.13750E-01	1.84159E-01	2.29903E-01	7.84853E-03	-7.46999E-08	9.99999E-01
5	.00000E+00	1.64661E-01	2.07554E-01	4.66115E-01	3.66916E-01	5.30253E-03	-1.30847E-07	9.99990E-01
6	.00000E+00	1.77976E-01	4.24007E-01	1.25632E+00	5.98550E-01	8.42531E-03	-1.39526E-07	1.00001E+00
7	.00000E+00	8.80747E-02	6.58346E-01	1.67033E+00	7.38026E-01	8.40117E-03	4.72277E-07	9.99990E-01
8	.00000E+00	1.35773E-02	7.75682E-01	1.70404E+00	7.75897E-01	1.34260E-02	3.86691E-08	9.99919E-01
9	.00000E+00	9.85518E-04	7.66606E-01	1.48809E+00	7.45581E-01	2.20952E-02	5.86745E-06	9.99885E-01
10	.00000E+00	7.32011E-05	7.42040E-01	1.35607E+00	7.08888E-01	3.33008E-02	1.96873E-06	9.99895E-01
11	.00000E+00	5.75899E-06	7.13446E-01	1.26318E+00	6.97526E-01	5.41668E-02	1.50113E-06	9.99940E-01
12	.00000E+00	4.04559E-07	5.74063E-01	6.89312E-01	5.15718E-01	5.83694E-02	-2.23212E-07	9.99975E-01
13	.00000E+00	6.42403E-08	5.09315E-01	5.48460E-01	4.55082E-01	5.42482E-02	-1.09516E-06	9.99973E-01
14	.00000E+00	1.27307E-08	4.90837E-01	5.16054E-01	4.14550E-01	7.62932E-02	-3.63766E-07	9.99989E-01
15	.00000E+00	1.43871E-09	2.70891E-01	2.34264E-01	2.63160E-01	7.70577E-03	-4.78584E-06	1.00011E+00
16	.00000E+00	4.22456E-10	1.84345E-01	1.08002E-01	1.79121E-01	5.20583E-03	-3.27042E-06	1.00011E+00
17	.00000E+00	1.36051E-10	9.86924E-02	3.42380E-02	9.28654E-02	5.81911E-03	1.20404E-06	1.00007E+00
18	.00000E+00	9.74088E-11	8.81969E-02	2.42902E-02	7.13471E-02	1.68464E-02	-2.43980E-06	1.00007E+00
19	.00000E+00	1.37715E-10	1.41352E-01	6.75802E-02	1.33192E-01	8.15076E-03	-5.21187E-06	1.00010E+00
20	.00000E+00	2.23939E-10	3.38892E-01	3.89810E-01	3.11275E-01	2.75863E-02	-9.93118E-06	1.00012E+00
21	.00000E+00	3.27775E-11	1.68067E-01	8.05287E-02	1.45786E-01	2.22730E-02	-3.17838E-06	1.00006E+00
22	.00000E+00	3.80293E-11	3.22695E-01	2.16794E-01	2.56684E-01	6.59968E-02	-3.64302E-06	1.00007E+00
23	.00000E+00	3.63602E-11	7.87302E-01	1.17648E+00	6.44756E-01	1.42479E-01	7.43641E-06	1.00008E+00
24	.00000E+00	9.89678E-12	8.36524E-01	1.01839E+00	6.90195E-01	1.46281E-01	-7.86148E-07	1.00006E+00
25	.00000E+00	2.89713E-12	5.53762E-01	4.14030E-01	4.72447E-01	8.12947E-02	4.55754E-07	1.00004E+00
26	.00000E+00	2.03149E-12	4.30514E-01	4.20194E-01	3.56512E-01	7.39887E-02	-2.01242E-07	1.00003E+00
27	.00000E+00	4.84114E-13	1.42578E-01	8.56141E-02	1.21272E-01	2.11042E-02	-3.56412E-08	1.00001E+00
28	.00000E+00	1.00000E+00	1.04233E+01	1.59613E+01	1.04233E+01	1.00228E+00	-1.67535E-05	9.99997E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*adj**2	total flux
1	1.30728E-02	-8.23645E-09	1.25098E-02	.00000E+00	2.20557E-03	2.45359E-03	3.19615E-04	3.58548E-01
2	9.59542E-02	-9.29967E-08	8.96060E-02	.00000E+00	1.60923E-05	1.09749E-02	1.72350E-03	2.62561E+00
3	1.20401E-01	-8.61707E-08	1.11909E-01	.00000E+00	.00000E+00	1.33511E-02	1.97616E-03	3.29296E+00
4	7.43687E-02	-7.46999E-08	6.88079E-02	.00000E+00	.00000E+00	5.74289E-03	9.54011E-04	2.03324E+00
5	1.11593E-01	-1.30847E-07	1.02598E-01	.00000E+00	.00000E+00	1.66916E-03	1.11566E-03	3.04888E+00
6	2.09705E-01	-1.39526E-07	1.92734E-01	.00000E+00	.00000E+00	1.44218E-03	1.86944E-03	5.72731E+00
7	2.08560E-01	4.72277E-07	1.98089E-01	.00000E+00	.00000E+00	1.43317E-03	1.32514E-03	5.57585E+00

8	1.48889E-01	3.86691E-08	1.46923E-01	.00000E+00	.00000E+00	1.47659E-03	7.52782E-04	4.09437E+00
9	1.15211E-01	5.86745E-06	1.15850E-01	.00000E+00	.00000E+00	2.00066E-03	5.08451E-04	3.17528E+00
10	1.05478E-01	1.96873E-06	1.07020E-01	.00000E+00	.00000E+00	4.27290E-03	4.62337E-04	2.90997E+00
11	9.72367E-02	1.50113E-06	1.00734E-01	.00000E+00	.00000E+00	9.02446E-03	4.18502E-04	2.68904E+00
12	6.12403E-02	-2.25212E-07	6.53172E-02	.00000E+00	.00000E+00	1.18367E-02	2.46718E-04	1.69958E+00
13	5.21738E-02	-1.09516E-06	5.58544E-02	.00000E+00	.00000E+00	1.22719E-02	2.11649E-04	1.44854E+00
14	4.80601E-02	-3.63766E-07	5.34581E-02	.00000E+00	.00000E+00	8.08807E-03	1.92255E-04	1.34040E+00
15	2.82560E-02	-4.78584E-06	2.91671E-02	.00000E+00	.00000E+00	2.03167E-03	1.19782E-04	7.81377E-01
16	1.57140E-02	-3.27042E-06	1.62088E-02	.00000E+00	.00000E+00	1.38800E-03	6.24918E-05	4.34428E-01
17	6.79082E-03	1.20404E-06	7.18759E-03	.00000E+00	.00000E+00	1.86023E-03	2.45759E-05	1.88286E-01
18	4.81286E-03	-2.43980E-06	5.77216E-03	.00000E+00	.00000E+00	1.88211E-03	1.47395E-05	1.35394E-01
19	1.04274E-02	-5.21187E-06	1.11345E-02	.00000E+00	.00000E+00	2.97904E-03	3.85265E-05	2.89463E-01
20	3.47734E-02	-9.93118E-06	3.67535E-02	.00000E+00	.00000E+00	1.54512E-02	1.38627E-04	9.64214E-01
21	1.01693E-02	-3.17838E-06	1.17000E-02	.00000E+00	.00000E+00	1.33112E-02	3.17376E-05	2.84903E-01
22	1.96854E-02	-3.64302E-06	2.45089E-02	.00000E+00	.00000E+00	3.92745E-02	5.82949E-05	5.57632E-01
23	6.70355E-02	7.43641E-06	8.23315E-02	.00000E+00	.00000E+00	8.27260E-02	1.96941E-04	1.90047E+00
24	5.09464E-02	-7.86148E-07	6.72752E-02	.00000E+00	.00000E+00	8.44330E-02	1.17787E-04	1.46100E+00
25	2.17490E-02	4.55754E-07	3.03848E-02	.00000E+00	.00000E+00	4.88251E-02	4.04201E-05	6.29229E-01
26	1.42682E-02	-2.01242E-07	2.19042E-02	.00000E+00	.00000E+00	4.49767E-02	2.01967E-05	4.18116E-01
27	2.39824E-03	-3.56412E-08	4.16017E-03	.00000E+00	.00000E+00	1.25803E-02	2.15974E-06	7.12356E-02
28	1.74397E+00	-1.67794E-05	1.76484E+00	.00000E+00	2.22166E-03	4.37757E-01	1.29424E-02	4.81351E+01

- elapsed time .02 min.
0direct access unit 9 requires 556 blocks of length 216 for cross section weighting.
1 transport cross section weighting function

Ozone	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	1.11943E-03	5.00459E-03	5.27398E-03	2.50524E-03	3.18195E-03	5.52755E-03	3.71888E-03	1.74298E-03
2	6.81981E-04	4.94262E-03	5.77095E-03	3.43856E-03	4.29882E-03	6.15941E-03	4.33682E-03	2.14774E-03
3	1.14767E-03	5.42478E-03	5.85714E-03	2.91225E-03	3.86410E-03	6.78687E-03	4.38250E-03	1.82335E-03
4	7.88463E-04	4.26023E-03	4.91988E-03	2.38575E-03	2.82822E-03	4.80213E-03	3.32695E-03	1.79705E-03
5	8.11503E-04	4.32615E-03	4.96356E-03	2.41016E-03	2.87801E-03	4.89087E-03	3.37616E-03	1.79733E-03

Ozone	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	1.11254E-03	1.01473E-03	1.09556E-03	8.73455E-04	7.88082E-04	1.02144E-03	3.14856E-04	1.58611E-04
2	1.79015E-03	1.95321E-03	2.04368E-03	1.60047E-03	1.41666E-03	1.67774E-03	6.25492E-04	3.42242E-04
3	1.12161E-03	1.05598E-03	1.29507E-03	1.22050E-03	1.11105E-03	1.54174E-03	3.75369E-04	1.92953E-04
4	1.19457E-03	1.09447E-03	1.03050E-03	6.77876E-04	6.01821E-04	6.40114E-04	3.11243E-04	1.61381E-04
5	1.19269E-03	1.09511E-03	1.04602E-03	7.05350E-04	6.27420E-04	6.85339E-04	3.14842E-04	1.63104E-04

Ozone	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	8.68412E-05	1.52564E-04	1.49957E-04	4.60023E-04	2.50989E-04	7.31279E-04	2.15102E-03	1.94683E-03
2	1.71057E-04	2.46103E-04	2.79257E-04	8.64857E-04	4.13486E-04	1.14295E-03	3.34340E-03	3.00861E-03
3	1.22631E-04	2.54226E-04	2.13178E-04	6.21447E-04	3.97153E-04	1.17985E-03	3.26831E-03	3.01913E-03
4	7.01335E-05	7.06929E-05	1.14890E-04	3.85285E-04	1.34023E-04	3.36726E-04	1.09503E-03	8.83210E-04
5	7.27610E-05	7.98759E-05	1.19833E-04	3.97241E-04	1.47339E-04	3.79755E-04	1.20876E-03	9.95644E-04

Ozone	grp. 25	grp. 26	grp. 27	grp. 28
1	8.90710E-04	6.32943E-04	9.64889E-05	4.20035E-02
2	1.39218E-03	1.01683E-03	1.74955E-04	5.52802E-02
3	1.41951E-03	1.06838E-03	1.99854E-04	5.18804E-02
4	3.70880E-04	2.25540E-04	2.79488E-05	3.45350E-02
5	4.25833E-04	2.69059E-04	3.60738E-05	3.54158E-02

1broad group parameters

grp	upper energy	mid energy	velocity	fiss spec
1	2.0000E+07	2.6459E+06	1.9663E+09	7.1931E-01
2	9.0000E+05	1.5094E+05	9.7744E+06	2.8069E-01
3	4.0000E-01	1.2654E-01	3.6728E+05	1.2248E-10
4	1.0000E-05			

1 400 d, second part of sas2h pass to make library
0cell averaged fluxes

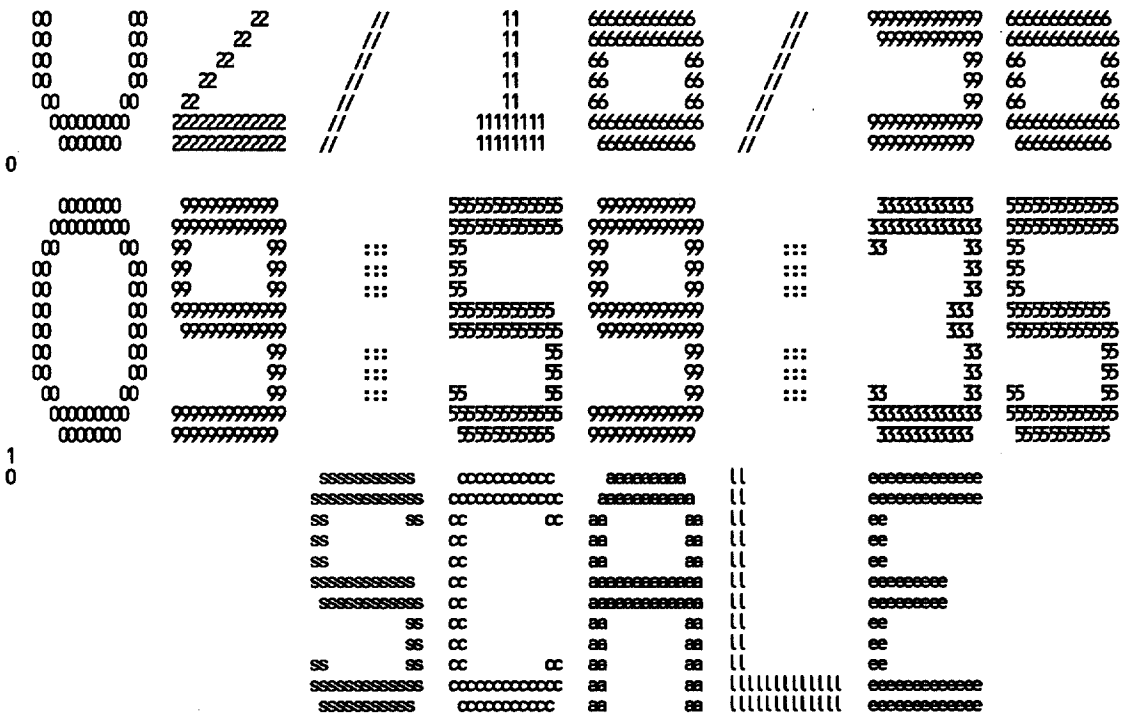
Ozone	grp. 1	grp. 2	grp. 3
1	3.88749E-01	1.13781E+00	2.34521E-01
2	3.95985E-01	1.13922E+00	2.24999E-01

```
    3 3.96952E-01 1.13956E+00 2.20714E-01
    4 4.14091E-01 1.14221E+00 1.90284E-01
    5 4.12403E-01 1.14198E+00 1.95240E-01
Oflux disadvantage factors (zone average/cell average-flux)

Ozone   grp. 1      grp. 2      grp. 3
    1 9.42642E-01 9.96394E-01 1.21363E+00
    2 9.55339E-01 9.97625E-01 1.16435E+00
    3 9.62485E-01 9.97925E-01 1.14218E+00
    4 1.00409E+00 1.00025E+00 9.84705E-01
    5 1.00000E+00 1.00000E+00 1.00000E+00
Ocell averaged currents

Ozone   grp. 1      grp. 2      grp. 3
    1 1.70852E-02 1.82180E-02 6.70026E-03
    2 1.91329E-02 2.56549E-02 1.04924E-02
    3 1.92059E-02 2.21225E-02 1.05520E-02
    4 1.51825E-02 1.62791E-02 3.07336E-03
    5 1.53894E-02 1.65639E-02 3.46246E-03
Ozone       volume      vol. fraction

   1     1.2566E+00     4.5623E-02
   2     1.6668E-01     6.0516E-03
   3     6.5826E-01     2.3898E-02
   4     2.5462E+01     9.2442E-01
   5     2.7544E+01     1.0000E+00
-  elapsed time    .03 min.
1
0
0
0
```



```
**********************************************************************
**********************************************************************
**********************************************************************
*****                                                            *****
*****                program verification information             *****
*****                                                            *****
*****              code system:   scale  version:   4.2          *****
*****                                                            *****
**********************************************************************
**********************************************************************
*****                                                            *****
*****                                                            *****
*****                                                            *****
*****          program:  c0c005                                  *****
*****                                                            *****
*****       creation date:  04/27/95                             *****
*****                                                            *****
*****          library:  /neutronics/scale/exe                   *****
*****                                                            *****
*****                                                            *****
*****                                                            *****
*****  this is not a  scale  configuration controlled code       *****
*****                                                            *****
```

```
                    *****            jobname:  davis                         *****
                    *****                                                    *****
                    *****   date of execution:  02/16/96                     *****
                    *****                                                    *****
                    *****   time of execution:  09:59:36                     *****
                    *****                                                    *****
                    *****                                                    *****
                    ******************************************************************
                    ******************************************************************
                    ******************************************************************
1
0      -1q array has     1 entries.
0       0q array has     1 entries.
0       0q array has     1 entries.
0       1q array has     1 entries.
0       1q array has     1 entries.
0       1q array has     1 entries.
0       1q array has     1 entries.
0       1q array has     1 entries.
0       2q array has     1 entries.
0       * core allocated to array-data (by -1$$ or default) was   200000 words. *
1         * broad 3-group flux weighting factors *
0
0               therm =    .5096
0               res   =    .4040
0               fast  =   3.0945
0 user requested (see jadd) that only the nuclide transitions presently included in
0 origen library be updated.
1cross sections, available from ampx (normalized to thermal flux), barns

                  10010 to  10020  2.78615E-01
                  10010 tot-cap    2.78615E-01
                  50100 to  40100  2.20952E-02
                  50100 to  10010  2.20952E-02
                  50100 to  40090  3.32705E-03
                  50100 to  10020  3.32705E-03
                  50100 to  30070  3.20410E+03
                  50100 to  20040  3.20427E+03
                  50100 to  10030  8.26806E-02
                  50100 tot-cap    3.20421E+03
                  50110 to  50100  9.51898E-06
                  50110 to  50120  4.23931E-03
                  50110 to  40110  1.21472E-06
                  50110 to  10010  1.21472E-06
                  50110 to  40090  1.08401E-05
                  50110 to  10030  1.08401E-05
                  50110 to  30080  1.41512E-04
                  50110 to  20040  1.41512E-04
                  50110 tot-cap    4.40240E-03
                  80160 to  80170  1.48835E-04
                  80160 to  70160  8.32895E-05
                  80160 to  10010  8.32895E-05
                  80160 to  70150  1.57083E-05
                  80160 to  10020  1.57083E-05
                  80160 to  60130  2.35267E-02
                  80160 to  20040  2.35267E-02
                  80160 to  80161  3.65278E-03
                  80160 tot-cap    2.37745E-02
                 360830 to 360820  1.89114E-02
                 360830 to 360810  1.99657E-09
```

360830 to 360840 1.50852E+02
360830 to 350830 7.81413E-04
360830 to 10010 7.81413E-04
360830 to 350820 6.24591E-06
360830 to 10020 6.24591E-06
360830 to 350810 2.18306E-06
360830 to 10030 2.18306E-06
360830 to 340810 3.53311E-08
360830 to 20030 3.53311E-08
360830 to 340800 4.15132E-05
360830 to 20040 4.15132E-05
360830 tot-cap 1.50871E+02
360850 to 360860 1.35661E+00
360850 tot-cap 1.35661E+00
380900 to 380910 6.18195E-01
380900 tot-cap 6.18195E-01
390890 to 390900 9.64542E-01
390890 tot-cap 9.64542E-01
400930 to 400940 1.24328E+01
400930 tot-cap 1.24328E+01
400940 to 400950 1.73545E-01
400940 tot-cap 1.73545E-01
400950 to 400960 2.06668E+00
400950 tot-cap 2.06668E+00
410940 to 410950 3.60758E+01
410940 tot-cap 3.60758E+01
420950 to 420960 3.64035E+01
420950 tot-cap 3.64035E+01
430990 to 430980 5.75799E-03
430990 to 431000 8.45551E+01
430990 tot-cap 8.45608E+01
441010 to 441020 2.61938E+01
441010 tot-cap 2.61938E+01
441060 to 441070 8.02991E-01
441060 tot-cap 8.02991E-01
451030 to 451020 2.07809E-03
451030 to 451040 3.46027E+02
451030 tot-cap 3.46029E+02
451050 to 451060 8.01728E+03
451050 tot-cap 8.01728E+03
461050 to 461060 3.17534E+01
461050 tot-cap 3.17534E+01
461080 to 461090 6.36886E+01
461080 tot-cap 6.36886E+01
471090 to 471080 4.83245E-03
471090 to 471100 3.49156E+02
471090 to 461090 2.75182E-04
471090 to 10010 2.75182E-04
471090 to 451060 2.26861E-04
471090 to 20040 2.26861E-04
471090 to 471091 5.85322E-01
471090 tot-cap 3.49162E+02
511240 to 511250 1.13599E+01
511240 tot-cap 1.13599E+01
541310 to 541300 5.85952E-02
541310 to 541290 1.22524E-05
541310 to 541320 2.46987E+02
541310 to 531310 3.55357E-05
541310 to 10010 3.55357E-05
541310 to 531300 4.91379E-07

541310	to 10020	4.91379E-07
541310	to 531290	5.03860E-07
541310	to 10030	5.03860E-07
541310	to 521280	1.65901E-05
541310	to 20040	1.65901E-05
541310	tot-cap	2.47045E+02
541320	to 541310	9.46579E-03
541320	to 541300	2.00762E-05
541320	to 541330	8.72308E-01
541320	to 531320	7.24232E-06
541320	to 10010	7.24232E-06
541320	to 531310	3.05084E-07
541320	to 10020	3.05084E-07
541320	to 531300	4.10795E-08
541320	to 10030	4.10795E-08
541320	to 521290	8.89626E-07
541320	to 20040	8.89626E-07
541320	tot-cap	8.81797E-01
541350	to 541360	1.45326E+06
541350	tot-cap	1.45326E+06
541360	to 541350	1.61918E-02
541360	to 541340	4.94538E-05
541360	to 541370	1.20415E-01
541360	to 531360	2.99028E-07
541360	to 10010	2.99028E-07
541360	to 531350	1.11314E-07
541360	to 10020	1.11314E-07
541360	to 531340	2.51478E-08
541360	to 10030	2.51478E-08
541360	to 521330	2.50809E-07
541360	to 20040	2.50809E-07
541360	tot-cap	1.36657E-01
551330	to 551320	7.58235E-03
551330	to 551340	9.64131E+01
551330	to 541330	8.28029E-04
551330	to 10010	8.28029E-04
551330	to 531300	1.29558E-05
551330	to 20040	1.29558E-05
551330	tot-cap	9.64215E+01
551340	to 551350	1.24610E+02
551340	tot-cap	1.24610E+02
551350	to 551360	2.00841E+01
551350	tot-cap	2.00841E+01
551370	to 551380	2.15936E-01
551370	tot-cap	2.15936E-01
561360	to 561370	8.46268E-01
561360	tot-cap	8.46268E-01
571390	to 571400	7.70902E+00
571390	tot-cap	7.70902E+00
581440	to 581450	1.18140E+00
581440	tot-cap	1.18140E+00
591410	to 591400	5.43332E-03
591410	to 591390	1.56113E-06
591410	to 571370	2.34117E-06
591410	to 20040	4.83729E-05
591410	to 581400	1.65777E-05
591410	to 10010	4.73127E-05
591410	to 591420	1.14107E+01
591410	to 581410	4.45780E-05
591410	to 10020	1.38430E-05

591410 to 581390 1.45175E-06
591410 to 10030 1.45175E-06
591410 to 571390 1.40204E-08
591410 to 20030 1.40204E-08
591410 to 571380 4.60317E-05
591410 tot-cap 1.14163E+01
591430 to 591440 9.39733E+01
591430 tot-cap 9.39733E+01
601430 to 601420 8.31713E-02
601430 to 601410 8.48474E-06
601430 to 581390 1.85769E-05
601430 to 20040 5.19258E-04
601430 to 591420 3.55170E-06
601430 to 10010 3.66370E-05
601430 to 601440 1.96475E+02
601430 to 591430 3.52989E-05
601430 to 10020 2.21360E-06
601430 to 591410 3.18980E-06
601430 to 10030 3.18980E-06
601430 to 581410 1.53257E-08
601430 to 20030 1.53257E-08
601430 to 581400 5.00721E-04
601430 tot-cap 1.96559E+02
601450 to 601440 1.06753E-01
601450 to 601430 1.08331E-04
601450 to 581410 7.70777E-06
601450 to 20040 1.93360E-04
601450 to 591440 2.03493E-06
601450 to 10010 1.32486E-05
601450 to 601460 7.45570E+01
601450 to 591450 1.24369E-05
601450 to 10020 1.22324E-06
601450 to 591430 1.92846E-06
601450 to 10030 1.92846E-06
601450 to 581430 3.92636E-09
601450 to 20030 3.92636E-09
601450 to 581420 1.85652E-04
601450 tot-cap 7.46641E+01
601470 to 601480 1.76354E+02
601470 tot-cap 1.76354E+02
611470 to 611460 2.91898E-02
611470 to 611450 9.10767E-05
611470 to 591430 8.10318E-06
611470 to 20040 7.52552E-05
611470 to 601460 1.11681E-05
611470 to 10010 2.54828E-05
611470 to 611480 5.53018E+02
611470 to 601470 2.27148E-05
611470 to 10020 8.40014E-06
611470 to 601450 3.17158E-06
611470 to 10030 3.17158E-06
611470 to 591450 4.76856E-09
611470 to 20030 4.76856E-09
611470 to 591440 6.71520E-05
611470 tot-cap 5.53047E+02
611480 to 611490 1.17726E+04
611480 tot-cap 1.17726E+04
621470 to 621460 7.61521E-02
621470 to 621450 6.85665E-03
621470 to 601430 5.97975E-05

621470	to 20040	1.15630E-03
621470	to 611460	1.38191E-04
621470	to 10010	1.97999E-04
621470	to 621480	2.17637E+02
621470	to 611470	1.74704E-04
621470	to 10020	1.14896E-04
621470	to 611450	1.23372E-04
621470	to 10030	1.23372E-04
621470	to 601450	5.67657E-06
621470	to 20030	5.67657E-06
621470	to 601440	1.09651E-03
621470	to 621471	1.53107E+00
621470	tot-cap	2.17722E+02
621490	to 621480	4.30478E-02
621490	to 621470	3.41769E-05
621490	to 621500	4.48465E+04
621490	to 611490	4.42693E-04
621490	to 10010	4.42693E-04
621490	to 601460	4.42693E-04
621490	to 20040	4.42693E-04
621490	tot-cap	4.48465E+04
621500	to 621510	1.28523E+02
621500	tot-cap	1.28523E+02
621510	to 621500	1.43962E-01
621510	to 621490	1.28605E-04
621510	to 601470	1.44849E-05
621510	to 20040	1.13153E-04
621510	to 611500	1.76098E-06
621510	to 10010	1.37227E-05
621510	to 621520	4.86412E+03
621510	to 611510	1.26468E-05
621510	to 10020	6.85087E-07
621510	to 611490	1.24510E-06
621510	to 10030	1.24510E-06
621510	to 601490	1.28269E-09
621510	to 20030	1.28269E-09
621510	to 601480	9.86677E-05
621510	tot-cap	4.86427E+03
621520	to 621510	1.72216E-02
621520	to 621500	1.16367E-04
621520	to 601480	2.60120E-06
621520	to 20040	1.08056E-05
621520	to 611510	7.45938E-07
621520	to 10010	2.20124E-06
621520	to 621530	7.01828E+02
621520	to 611520	1.95538E-06
621520	to 10020	5.00079E-07
621520	to 611500	1.30059E-07
621520	to 10030	1.30059E-07
621520	to 601500	3.94152E-10
621520	to 20030	3.94152E-10
621520	to 601490	8.20436E-06
621520	tot-cap	7.01846E+02
631530	to 631520	1.67262E-02
631530	to 631510	2.49775E-05
631530	to 611490	4.05235E-05
631530	to 20040	5.82415E-04
631530	to 621520	7.00077E-06
631530	to 10010	5.92402E-05
631530	to 631540	5.87260E+02

631530 to 621530 5.68491E-05
631530 to 10020 4.60967E-06
631530 to 621510 1.03267E-06
631530 to 10030 1.03267E-06
631530 to 611510 2.36057E-08
631530 to 20030 2.36057E-08
631530 to 611500 5.41891E-04
631530 tot-cap 5.87278E+02
631540 to 631530 2.67389E-02
631540 to 631520 9.60517E-06
631540 to 611500 9.33931E-11
631540 to 20040 6.96791E-04
631540 to 621530 2.10257E-06
631540 to 10010 1.12821E-03
631540 to 631550 1.04373E+03
631540 to 621540 1.12821E-03
631540 to 10020 2.10140E-06
631540 to 621520 3.55999E-06
631540 to 10030 3.55999E-06
631540 to 611520 1.50913E-08
631540 to 20030 1.50913E-08
631540 to 611510 6.96791E-04
631540 tot-cap 1.04376E+03
631550 to 631540 2.19537E-02
631550 to 631530 6.14752E-05
631550 to 611510 1.65527E-06
631550 to 20040 8.14666E-06
631550 to 621540 3.35213E-06
631550 to 10010 7.04497E-06
631550 to 631560 2.52414E+03
631550 to 621550 5.41393E-06
631550 to 10020 1.72109E-06
631550 to 621530 5.69740E-07
631550 to 10030 5.69740E-07
631550 to 611530 1.29134E-10
631550 to 20030 1.29134E-10
631550 to 611520 6.49139E-06
631550 tot-cap 2.52417E+03
641550 to 641560 1.67300E+04
641550 tot-cap 1.67300E+04
922340 to 922330 5.75156E-03
922340 fission 4.07947E+00
922340 nu-sigf 1.07202E+01
922340 to 922320 8.33942E-05
922340 to 922350 1.75502E+02
922340 to 922341 2.74562E+00
922340 tot-cap 1.79587E+02
922350 to 922340 2.63156E-02
922350 fission 3.55154E+02
922350 nu-sigf 8.59993E+02
922350 to 922330 2.51212E-05
922350 to 922360 8.29762E+01
922350 to 922351 7.80918E-02
922350 tot-cap 4.38156E+02
922360 to 922350 2.92996E-02
922360 fission 1.74637E+00
922360 nu-sigf 4.79174E+00
922360 to 922340 3.90467E-04
922360 to 922370 7.08938E+01
922360 to 922361 3.00376E+00

922360	tot-cap	7.26699E+01
922380	to 922370	5.85224E-02
922380	fission	8.74312E-01
922380	nu-sigf	2.46057E+00
922380	to 922360	3.78177E-04
922380	to 922390	7.93024E+00
922380	tot-cap	8.86345E+00
932370	to 932360	1.33402E-02
932370	fission	4.73060E+00
932370	nu-sigf	1.42424E+01
932370	to 932350	5.10554E-05
932370	to 932380	2.86381E+02
932370	to 932371	7.04022E-01
932370	tot-cap	2.91125E+02
942380	to 942370	2.14425E-03
942380	fission	2.09637E+01
942380	nu-sigf	5.93916E+01
942380	to 942360	1.20008E-05
942380	to 942390	2.60244E+02
942380	to 942381	2.74889E+00
942380	tot-cap	2.81210E+02
942390	to 942380	1.13665E-02
942390	fission	8.48173E+02
942390	nu-sigf	2.43855E+03
942390	to 942370	1.95198E-05
942390	to 942360	1.91520E-08
942390	to 942400	4.78014E+02
942390	tot-cap	1.32620E+03
942400	to 942390	5.34014E-03
942400	fission	5.45402E+00
942400	nu-sigf	1.70563E+01
942400	to 942380	5.21113E-05
942400	to 942410	1.75951E+03
942400	tot-cap	1.76497E+03
942410	to 942400	6.76750E-02
942410	fission	8.92208E+02
942410	nu-sigf	2.61778E+03
942410	to 942390	1.11504E-04
942410	to 942420	2.95726E+02
942410	tot-cap	1.18600E+03
942420	to 942410	2.17690E-02
942420	fission	4.09857E+00
942420	nu-sigf	1.28355E+01
942420	to 942400	2.64650E-04
942420	to 942430	3.10808E+02
942420	tot-cap	3.14929E+02
952410	fission	1.19256E+01
952410	nu-sigf	3.84612E+01
952410	to 952420	1.00850E+03
952410	tot-cap	1.02042E+03
952430	fission	3.16277E+00
952430	nu-sigf	1.05299E+01
952430	to 952440	3.97104E+02
952430	tot-cap	4.00267E+02
962440	to 962430	5.23168E-03
962440	fission	1.42353E+01
962440	nu-sigf	4.76814E+01
962440	to 962420	5.21725E-05
962440	to 962450	1.31908E+02
962440	to 962441	3.50653E+00

```
                962440 tot-cap   1.46148E+02
0the reaction  50100 to  30070 was not used, because  50100 is not in library., (in subr pool)
                                    in the search of library number 3
0the reaction  50100 to  40090 was not used, because  50100 is not in library., (in subr pool)
                                    in the search of library number 3
0the reaction  50110 to  40090 was not used, because  50110 is not in library., (in subr pool)
                                    in the search of library number 3
0the reaction  50100 to  40100 was not used, because  50100 is not in library., (in subr pool)
                                    in the search of library number 3
0the reaction  80160 to  80161 was not used, because  80161 is not in library., (in subr pool)
0the reaction 621470 to 621471 was not used, because 621471 is not in library., (in subr pool)
0the fission product transitions for 922340 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the reaction 922340 to 922341 was not used, because 922341 is not in library., (in subr pool)
0the reaction 922350 to 922351 was not used, because 922351 is not in library., (in subr pool)
0the fission product transitions for 922360 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the reaction 922360 to 922361 was not used, because 922361 is not in library., (in subr pool)
0the fission product transitions for 932370 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the reaction 932370 to 932371 was not used, because 932371 is not in library., (in subr pool)
0the fission product transitions for 942380 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the reaction 942380 to 942381 was not used, because 942381 is not in library., (in subr pool)
0the fission product transitions for 942400 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the fission product transitions for 942420 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the fission product transitions for 952410 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the fission product transitions for 952430 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the fission product transitions for 962440 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the reaction 962440 to 962441 was not used, because 962441 is not in library., (in subr pool)
1
0                          case completed.  date,  2/16/1996
0 * normal termination *
1   ooooooooo    rrrrrrrrrr    iiiiiiiiiii     ggggggggg    eeeeeeeeeee   m         m   sssssssss
   ooooooooooo   rrrrrrrrrrr   iiiiiiiiiii    ggggggggggg   eeeeeeeeeee   mm        m  sssssssssss
   oo       oo   rr       rr       ii       gg       gg   ee            mmm       m  ss       ss
   oo       oo   rr       rr       ii       gg            ee            m mm      m  ss
   oo       oo   rr       rr       ii       gg            ee            m  m      m   ss
   oo       oo   rrrrrrrrrrr         ii       gg  ggggggg   eeeeeeeee     m   m    m    sssssssss
   oo       oo   rrrrrrrrrrr         ii       gg  ggggggg   eeeeeeeee     m    m   m     sssssssss
   oo       oo   rr      rr         ii       gg       gg   ee            m     m m m          ss
   oo       oo   rr       rr        ii       gg       gg   ee            m      mmm      ss       ss
   oo       oo   rr        rr       ii       gg       gg   ee            m       m    sssssssssss
   ooooooooooo   rr         rr  iiiiiiiiiii  ggggggggggg   eeeeeeeeeee   m         m  sssssssssss
    ooooooooo    rr         rr  iiiiiiiiiii   ggggggggg    eeeeeeeeeee   m         m   sssssssss
0
```

```
  ddddddddddd     aaaaaaaa    w          w  iiiiiiiiiiii   ssssssssss
  dddddddddddd   aaaaaaaaaa   w          w  iiiiiiiiiiii  ssssssssssss
  dd        dd  aa        aa  w          w       ii       ss        ss
  dd        dd  aa        aa  w          w       ii       ss
  dd        dd  aa        aa  w          w       ii       ss
  dd        dd  aaaaaaaaaaaa  w          w       ii       sssssssssss
  dd        dd  aaaaaaaaaaaa   w        w        ii        sssssssssss
  dd        dd  aa        aa    w      w         ii                 ss
  dd        dd  aa        aa     w    w          ii                 ss
  dd        dd  aa        aa      w  w           ii       ss        ss
  dddddddddddd  aa        aa       ww       iiiiiiiiiiii  ssssssssssss
  ddddddddddd   aa        aa        v       iiiiiiiiiiii   ssssssssss
0
    0000000      2222222222             //       11        6666666666             //   9999999999    6666666666
   000000000    222222222222           //       111       666666666666           //   999999999999  666666666666
  00       00   22        22          //       1111       66                    //    99        99  66
  00       00             22         //          11       66                   //     99        99  66
  00       00             22        //           11       66                  //      99        99  66
  00       00            22        //            11       66666666666        //       999999999999  66666666666
  00       00          22         //             11       666666666666      //         99999999999  666666666666
  00       00        22          //              11       66        66     //                   99  66        66
  00       00      22           //               11       66        66    //                    99  66        66
  00       00    22            //                11       66        66   //                     99  66        66
   000000000    222222222222  //            11111111      666666666666  //            999999999999  666666666666
    0000000     222222222222 //             11111111       6666666666  //             99999999999    6666666666
0
    0000000      9999999999                 55555555555    9999999999                  3333333333    6666666666
   000000000    999999999999                555555555555  999999999999                333333333333  666666666666
  00       00   99        99      :::       55            99        99      :::       33        33  66
  00       00   99        99      :::       55            99        99      :::                 33  66
  00       00   99        99      :::       55            99        99      :::                 33  66
  00       00   999999999999                55555555555   999999999999                         333  66666666666
  00       00    99999999999                555555555555   99999999999                         333  666666666666
  00       00             99      :::                 55            99      :::                 33  66        66
  00       00             99      :::                 55            99      :::                 33  66        66
  00       00             99      :::       55        55            99      :::       33        33  66        66
   000000000    999999999999                555555555555  999999999999                333333333333  666666666666
    0000000     99999999999                  5555555555   99999999999                  3333333333    6666666666
1
0                              ssssssssss     cccccccccc      aaaaaaaa    ll            eeeeeeeeeeee
                              ssssssssssss   cccccccccccc    aaaaaaaaaa   ll            eeeeeeeeeeee
                              ss        ss   cc        cc   aa        aa  ll            ee
                              ss             cc             aa        aa  ll            ee
                              ss             cc             aa        aa  ll            ee
                              sssssssssss    cc             aaaaaaaaaaaa  ll            eeeeeeee
                               sssssssssss   cc             aaaaaaaaaaaa  ll            eeeeeeee
                                        ss   cc             aa        aa  ll            ee
                                        ss   cc             aa        aa  ll            ee
                              ss        ss   cc        cc   aa        aa  ll            ee
                              ssssssssssss   cccccccccccc   aa        aa  llllllllllll  eeeeeeeeeeee
                               ssssssssss     cccccccccc    aa        aa  llllllllllll  eeeeeeeeeeee


                   ********************************************************************************
```

```
**********************************************************************
**********************************************************************
*****                                                            *****
*****                program verification information             *****
*****                                                            *****
*****                code system:   scale  version:   4.2        *****
*****                                                            *****
**********************************************************************
**********************************************************************
*****                                                            *****
*****                                                            *****
*****             program:  c0c004                               *****
*****                                                            *****
*****        creation date:  04/27/95                            *****
*****                                                            *****
*****             library:  /neutronics/scale/exe                *****
*****                                                            *****
*****                                                            *****
*****   this is not a  scale  configuration controlled code      *****
*****                                                            *****
*****             jobname:  davis                                *****
*****                                                            *****
*****   date of execution:  02/16/96                             *****
*****                                                            *****
*****   time of execution:  09:59:36                             *****
*****                                                            *****
*****                                                            *****
**********************************************************************
**********************************************************************
**********************************************************************
```

```
1
0      -1q array has      1 entries.
0       0q array has      1 entries.
0       0q array has      1 entries.
0       0q array has      1 entries.
0       0q array has      1 entries.
0        dbl. prec. machine word applied has, at least, a 16 significant figure accuracy.
0            short-lived split test fraction, qm =    9.1188E-04
0            half-norm of matrix used, amn =    7.0000E+00
0            4-place-accuracy-retention ratio, ratio4 =    6.4516E-13
0       1q array has     20 entries.
0       3q array has      1 entries.
0       3q array has      1 entries.
0       3q array has      1 entries.
0       4q array has      1 entries.
0      54q array has     12 entries.
1library information...

         cross-section data taken from position number  1 of library on unit 15.

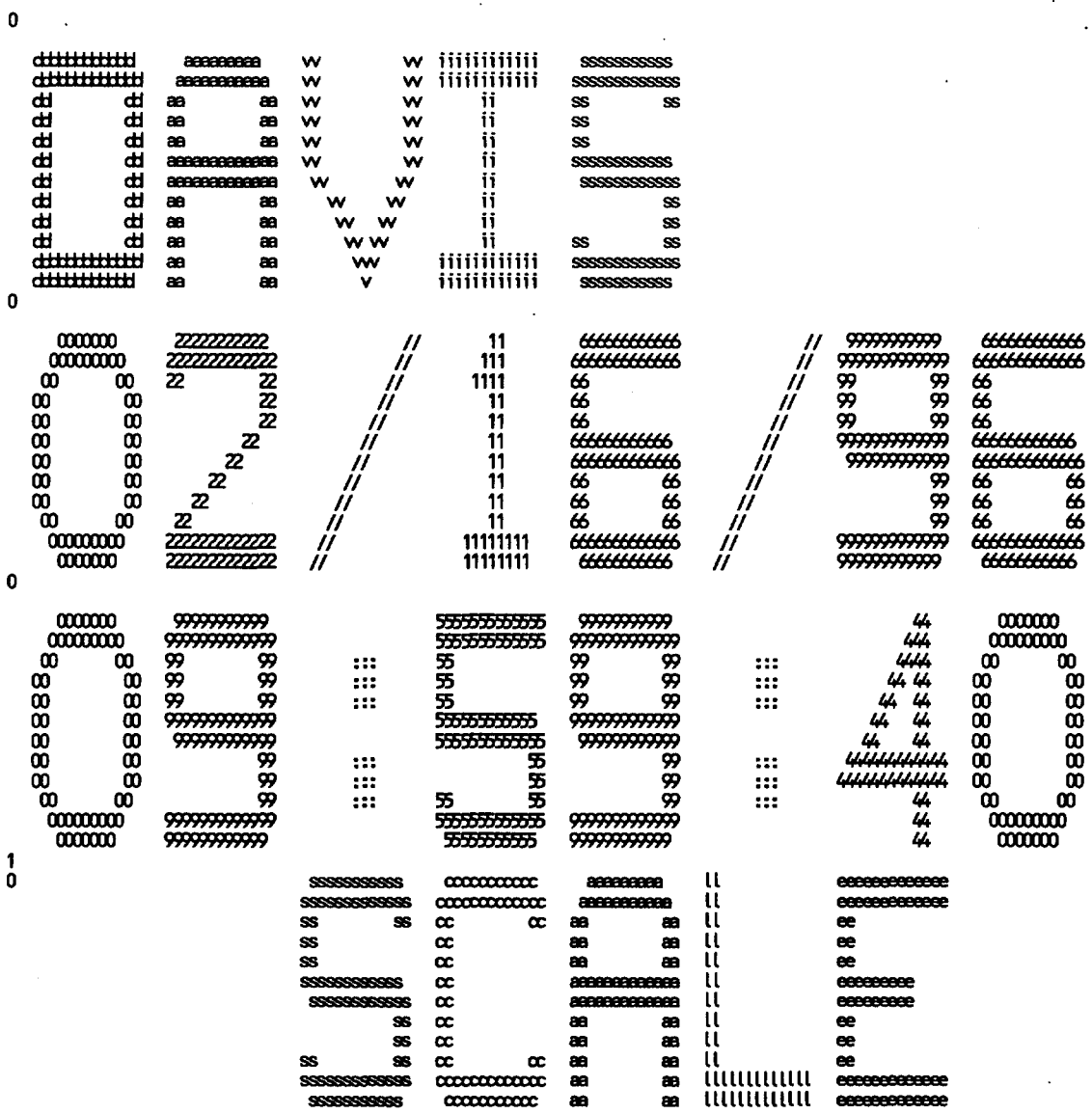
         pass  3
         pass  1
         pass  0
         *scale-system control module sas2 library*
         used a time-dependent neutron spectrum, for each of the above passes
           pass 0 applies start-up fuel densiities
           pass n applies mid time densities of nth library interval
         first library updated was...
         pass  1
         pass  0
```

```
      *scale-system control module sas2 library*
      used a time-dependent neutron spectrum, for each of the above passes
        pass 0 applies start-up fuel densities
        pass n applies mid time densities of nth library interval
      first library updated was...
      ************************************************************************
      *                                                                      *
      *          prelim lwr origen-s binary working library--id = 1143       *
      *        made from modified card-image origen-s libraries of scale 4.2 *
      *      data from the light element, actinide, and fission product libraries *
      *       decay data, including gamma and total energy, are from endf/b-vi *
      *                                                                      *
      *      neutron flux spectrum factors and cross sections were produced from *
      *     the "presas2" case updating all nuclides on the scale "burnup" library *
      *                                                                      *
      *                  fission product yields are from endf/b-v            *
      *                                                                      *
      *             photon libraries use an 18-energy-group structure        *
      *            the photon data are from the master photon data base,     *
      *             produced to include bremsstrahlung from uo2 matrix       *
      *                                                                      *
      *        see information above this box (if present) for later updates *
      *                                                                      *
      ************************************************************************
      *                                                                      *
0     ************************************************************************
0               .other identification and sizes of library.
0                data set name:  ft15f001
0              2/16/1996    date library was produced
0                  1697     total number of nuclides in library
                    689     number of light-element nuclides
                    129     number of actinide nuclides
                    879     number of fission product nuclides
0                  7935     number of nonzero off-diagonal matrix elements
0     ************************************************************************
0
1
   sas2h: babcock wilcox 15x15, 3.00w%, 20gwd/mtu burn high temp                actinides       page   1
     power= 8.466E-05mw, burnup=2.0318E-02mwd, flux= 1.62E+13n/cm**2-sec
0                                        nuclide concentrations, gram atoms
                                         basis = converted to atoms/(barn-cm)
          charge   360.0 d   400.0 d   440.0 d   480.0 d   480.0 d   520.0 d   560.0 d
   u230 9.43E-22  1.21E-21  1.49E-21  1.82E-21  2.18E-21  2.18E-21  2.60E-21  3.08E-21
   u231 2.22E-20  2.82E-20  3.39E-20  4.04E-20  4.77E-20  4.75E-20  5.59E-20  6.51E-20
   u232 2.94E-13  3.63E-13  4.42E-13  5.32E-13  6.36E-13  6.36E-13  7.53E-13  8.86E-13
   u233 1.71E-11  1.90E-11  2.09E-11  2.26E-11  2.43E-11  2.43E-11  2.59E-11  2.74E-11
   u234 5.14E-06  5.09E-06  5.04E-06  4.99E-06  4.95E-06  4.95E-06  4.90E-06  4.85E-06
   u235 5.67E-04  5.54E-04  5.40E-04  5.27E-04  5.15E-04  5.15E-04  5.02E-04  4.90E-04
   u236 2.59E-05  2.84E-05  3.09E-05  3.32E-05  3.55E-05  3.55E-05  3.77E-05  3.98E-05
   u237 4.08E-08  4.44E-08  4.67E-08  4.89E-08  5.11E-08  5.10E-08  5.32E-08  5.54E-08
   u238 2.20E-02  2.20E-02  2.20E-02  2.20E-02  2.19E-02  2.19E-02  2.19E-02  2.19E-02
   u239 3.23E-09  5.73E-09  5.72E-09  5.71E-09  5.71E-09  2.52E-09  5.71E-09  5.71E-09
   u240 .00E+00  1.49E-36  4.66E-36  1.30E-35  3.28E-35  3.28E-35  7.67E-35  1.68E-34
   u241 .00E+00  .00E+00  .00E+00  .00E+00  .00E+00  .00E+00  .00E+00  .00E+00
  np235 7.21E-15  9.47E-15  1.20E-14  1.49E-14  1.80E-14  1.80E-14  2.15E-14  2.52E-14
 np236m 1.60E-14  2.01E-14  2.32E-14  2.66E-14  2.98E-14  2.94E-14  3.33E-14  3.69E-14
  np236 5.75E-13  7.68E-13  9.98E-13  1.25E-12  1.54E-12  1.54E-12  1.87E-12  2.23E-12
  np237 9.17E-07  1.08E-06  1.24E-06  1.42E-06  1.60E-06  1.60E-06  1.79E-06  1.98E-06
  np238 1.09E-09  1.31E-09  1.52E-09  1.73E-09  1.95E-09  1.94E-09  2.18E-09  2.41E-09
  np239 8.03E-07  8.27E-07  8.26E-07  8.25E-07  8.24E-07  8.23E-07  8.24E-07  8.24E-07
 np240m .00E+00  1.27E-38  3.98E-38  1.11E-37  2.80E-37  2.80E-37  6.55E-37  1.43E-36
```

```
      np240   1.09E-11  1.42E-11  1.42E-11  1.42E-11  1.41E-11  1.04E-11  1.41E-11  1.42E-11
      np241    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
      pu236   7.27E-13  9.64E-13  1.24E-12  1.54E-12  1.89E-12  1.89E-12  2.27E-12  2.69E-12
      pu237   8.31E-14  9.77E-14  1.11E-13  1.24E-13  1.37E-13  1.37E-13  1.49E-13  1.61E-13
      pu238   4.76E-08  6.27E-08  8.03E-08  1.00E-07  1.23E-07  1.23E-07  1.49E-07  1.77E-07
      pu239   5.57E-05  6.11E-05  6.61E-05  7.07E-05  7.50E-05  7.50E-05  7.90E-05  8.27E-05
      pu240   5.13E-06  6.16E-06  7.22E-06  8.30E-06  9.39E-06  9.39E-06  1.05E-05  1.16E-05
      pu241   1.47E-06  1.90E-06  2.41E-06  2.98E-06  3.61E-06  3.61E-06  4.30E-06  5.05E-06
      pu242   5.43E-08  8.09E-08  1.15E-07  1.57E-07  2.08E-07  2.08E-07  2.69E-07  3.41E-07
      pu243   6.51E-12  1.05E-11  1.48E-11  2.02E-11  2.69E-11  2.52E-11  3.48E-11  4.41E-11
      pu244   2.08E-26  7.43E-26  2.32E-25  6.46E-25  1.63E-24  1.64E-24  3.82E-24  8.35E-24
      pu245    .00E+00  5.35E-32  1.67E-31  4.64E-31  1.17E-30  1.14E-30  2.74E-30  6.00E-30
      pu246    .00E+00  1.58E-34  5.23E-34  1.50E-33  3.90E-33  3.89E-33  9.31E-33  2.08E-32
      am239   2.33E-19  3.67E-19  5.17E-19  7.02E-19  9.24E-19  8.99E-19  1.19E-18  1.49E-18
      am240   1.02E-16  1.58E-16  2.23E-16  3.03E-16  3.99E-16  3.96E-16  5.13E-16  6.46E-16
      am241   1.60E-08  2.37E-08  3.35E-08  4.54E-08  5.98E-08  5.98E-08  7.69E-08  9.66E-08
      am242m  1.84E-10  2.98E-10  4.54E-10  6.59E-10  9.19E-10  9.19E-10  1.24E-09  1.63E-09
      am242   1.81E-11  2.70E-11  3.80E-11  5.16E-11  6.79E-11  6.65E-11  8.72E-11  1.10E-10
      am243   1.57E-09  2.70E-09  4.32E-09  6.57E-09  9.57E-09  9.57E-09  1.35E-08  1.85E-08
      am244m   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
      am244   5.06E-13  9.10E-13  1.46E-12  2.21E-12  3.22E-12  3.12E-12  4.53E-12  6.22E-12
      am245   1.35E-30  4.91E-30  1.52E-29  4.19E-29  1.05E-28  1.05E-28  2.42E-28  5.23E-28
      am246    .00E+00  3.95E-37  1.31E-36  3.75E-36  9.74E-36  9.73E-36  2.33E-35  5.19E-35
    totals    2.26E-02  2.26E-02  2.26E-02  2.26E-02  2.26E-02  2.26E-02  2.26E-02  2.26E-02
0     flux              1.62E+13  1.62E+13  1.62E+13  1.62E+13   .00E+00  1.62E+13  1.62E+13
0  .results on logical unit no. 71, position  1, for time step  7, subcase 1. (run position 1, case position 1)
   title: sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0  .results on logical unit no. 71, position  2, for time step  5, subcase 1. (run position 1, case position 1)
   title: sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0  .results on logical unit no. 71, position  3, for time step  4, subcase 1. (run position 1, case position 1)
   title: sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0     .terminated logical unit no. 71 with zero flag record.
1  * normal termination of execution *
0                                   table of contents for material tables
0                                     case or subcase printed       page

                                                 1                    1
0ndset       33
          15         4         1        27         6         0         0         0         0         0
           0         0         0         0         0         0        -1      1698       690       130
         880      7935         0         5        99         2        16        96        18        18
          18         0        71
0       56q array has      2 entries.
0       56q array has      1 entries.
0       56q array has      1 entries.
0       56q array has      1 entries.
0       56q array has      1 entries.
0       56q array has      1 entries.
0       56q array has      1 entries.
0       57q array has      3 entries.
0        1q array has     20 entries.
0        1q array has     10 entries.
      l90    97376
      l116   60826
      l32    33663 rudata (library) storage size
      l44    33734
      l103   75953
0       58q array has      4 entries.
0       60q array has      7 entries.
0       58q array has      7 entries.
```

```
0       66q array has      1 entries.
0       73q array has   1697 entries.
0       74q array has   1697 entries.
0       75q array has   1697 entries.
    l140  66991
   used   101044 in size   200000
0jcpt           12
           0          0          0          0          0          0          0          0          0          0
           0          0
0therm          4
  5.096365E-01 4.040221E-01 3.094528E+00 1.000000E-31
0non            5
        7935         20          6         18       1697
0mm            19
           7          7          0          0          1          1          0          0          0          0
          21        100       1697          4          3         74          4          1          0
0tconst         5
  8.640000E+04 3.200192E+02  .000000E+00  .000000E+00 1.000000E-08
0mzero          4
           0        689        129        879
0pow            3
   .000000E+00  .000000E+00  .000000E+00
0 lirp          9
           6          0         51         26          2       3000       1000       1697         94
 n-gamma, fission and total mev/fission =           5.7355E+00      1.9541E+02      2.0115E+02
 start of interval flux =          1.61872E+13
 n-gamma, fission and total mev/fission =           5.8325E+00      1.9552E+02      2.0136E+02
 start of interval flux =          1.61661E+13
 n-gamma, fission and total mev/fission =           5.9353E+00      1.9563E+02      2.0157E+02
 start of interval flux =          1.61526E+13
 n-gamma, fission and total mev/fission =           6.0383E+00      1.9574E+02      2.0178E+02
 start of interval flux =          1.61473E+13
 start of interval flux =           .00000E+00
 n-gamma, fission and total mev/fission =           6.1508E+00      1.9584E+02      2.0199E+02
 start of interval flux =          1.61482E+13
 n-gamma, fission and total mev/fission =           6.2440E+00      1.9593E+02      2.0218E+02
 start of interval flux =          1.61575E+13
0 case or subcase    1  sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0       56q array has     20 entries.
0       56q array has      1 entries.
0       56q array has      1 entries.
0       56q array has     20 entries.
0       56q array has      1 entries.
0       56q array has      1 entries.
0       56q array has     20 entries.
0       56q array has     20 entries.
0requested parm=halt8,skipcellwt,skipshipdata
  pass= 4, exec halts after pass   8
1 bbbbbbbbbbb     ccccccccccc    m          m                aaaaaaaaa    mm        mm  iiiiiiiiiii    2222222222
  bbbbbbbbbbbb   cccccccccccc    mm         m               aaaaaaaaaaa   mmm      mmm  iiiiiiiiiii   222222222222
  bb        bb   cc         cc   mmm        m              aa         aa  mmmm    mmmm      ii        22         22
  bb        bb   cc         cc   mm m       m              aa         aa  mm mm  mm mm      ii                   22
  bb        bb   cc         cc   m   m      m              aa         aa  mm  mm mm  mm     ii                   22
  bbbbbbbbbbb    cc         cc   m    m     m  ----------  aaaaaaaaaaaaa  mm   mmm   mm     ii                  22
  bbbbbbbbbbb    cc         cc   m     m    m  ----------  aaaaaaaaaaaaa  mm    m    mm     ii                22
  bb        bb   cc         cc   m      m   m              aa         aa  mm         mm     ii              22
  bb        bb   cc         cc   m       m  m              aa         aa  mm         mm     ii            22
  bb        bb   cc         cc   m        mmm              aa         aa  mm         mm     ii          22
  bbbbbbbbbbbb   cccccccccccc    m         mm              aa         aa  mm         mm  iiiiiiiiiii   222222222222
  bbbbbbbbbbb     ccccccccccc    m          m              aa         aa  mm         mm  iiiiiiiiiii   222222222222
```



```
                    ********************************************************************************
                    ********************************************************************************
                    ********************************************************************************
                    *****                                                                      *****
                    *****                  program verification information                   *****
                    *****                                                                      *****
                    *****                  code system:    scale  version:    4.2             *****
                    *****                                                                      *****
                    ********************************************************************************
                    ********************************************************************************
                    *****                                                                      *****
                    *****                                                                      *****
                    *****              program:  c0c008                                        *****
                    *****                                                                      *****
                    *****         creation date:  04/27/95                                     *****
                    *****                                                                      *****
                    *****              library:  /neutronics/scale/exe                         *****
                    *****                                                                      *****
                    *****                                                                      *****
                    *****     this is not a  scale  configuration controlled code              *****
                    *****                                                                      *****
                    *****              jobname:  davis                                         *****
                    *****                                                                      *****
                    *****     date of execution:  02/16/96                                     *****
                    *****                                                                      *****
                    *****     time of execution:  09:59:41                                     *****
                    *****                                                                      *****
                    *****                                                                      *****
                    ********************************************************************************
                    ********************************************************************************
                    ********************************************************************************
1
0       -1q array has      1 entries.
0        0q array has      4 entries.
0        1q array has      6 entries.
0        2q array has      2 entries.
1logical assignments
0master library   12
 working library   0
 scratch file     18
 new library       1
0p r o b l e m   d e s c r i p t i o n
0igr--geometry (0/1/2/3--inf med/slab/cyl/sphere              2
0izm--number of zones or material regions                     4
0ms--mixing table length                                     66
0ibl--shielded cross section edit option (0/1--no/yes)        0
0ibr--bondarenko factor edit option (0/1--no/yes)             0
0issopt--dancoff factor option                                0
0convergence criterion    1.00000E-03
0geometry correction factor for wigner rational approximation  1.350E+00
0        3q array has     66 entries.
0        4q array has     66 entries.
0        5q array has     66 entries.
0        6q array has      4 entries.
0        7q array has      4 entries.
0        8q array has      4 entries.
0        9q array has      4 entries.
0       10q array has     66 entries.
0       11q array has      4 entries.
0m i x i n g   t a b l e
```

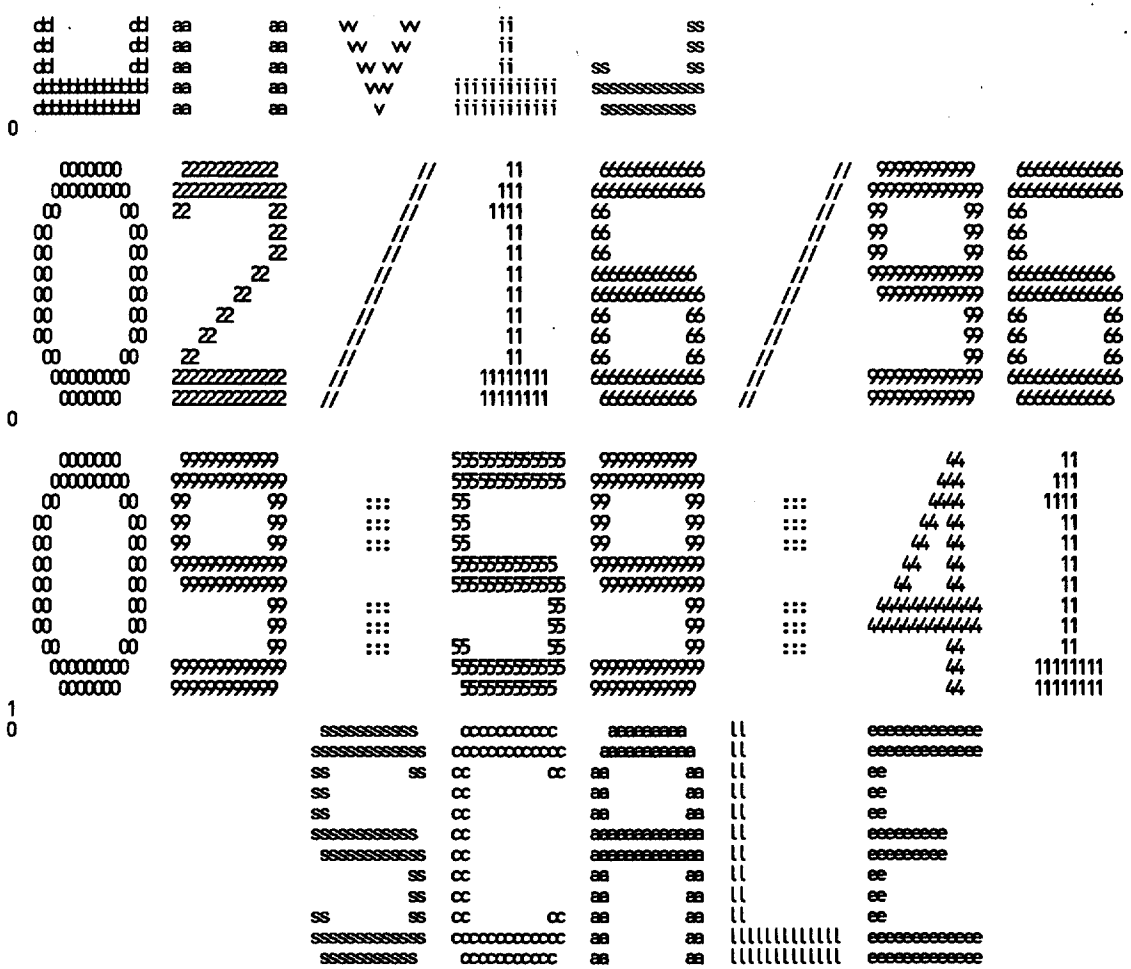
Oentry	mixture	isotope	number density	new identifier
1	1	92235	4.90251E-04	92235
2	1	92234	4.84938E-06	92234
3	1	92236	3.98238E-05	92236
4	1	92238	2.19185E-02	92238
5	1	8016	4.55359E-02	8016
6	3	8016	2.09710E-02	6
7	1	36083	9.77039E-07	36083
8	1	36085	4.70956E-07	36085
9	1	38090	1.06191E-05	38090
10	1	39089	7.90165E-06	39089
11	1	42095	9.68029E-06	42095
12	1	40093	8.21428E-06	40093
13	1	40094	1.27843E-05	40094
14	1	40095	2.07596E-06	40095
15	1	41094	5.48977E-12	41094
16	1	43099	1.24470E-05	43099
17	1	45103	6.47551E-06	45103
18	1	45105	1.88698E-08	45105
19	1	44101	1.10665E-05	44101
20	1	44106	1.65007E-06	44106
21	1	46105	3.81543E-06	46105
22	1	46108	9.30327E-07	46108
23	1	47109	6.68336E-07	47109
24	1	51124	1.62036E-10	51124
25	1	54131	5.77241E-06	54131
26	1	54132	1.00606E-05	54132
27	1	54135	6.65420E-09	54135
28	1	54136	2.10435E-05	54136
29	1	55134	4.21443E-07	55134
30	1	55135	6.63814E-06	55135
31	1	55137	1.31904E-05	55137
32	1	56136	8.15114E-08	56136
33	1	57139	1.31073E-05	57139
34	1	59141	1.09870E-05	59141
35	1	59143	3.85024E-07	59143
36	1	58144	5.87019E-06	58144
37	1	60143	1.06631E-05	60143
38	1	60145	7.73967E-06	60145
39	1	61147	3.14142E-06	61147
40	1	61148	8.83978E-09	61148
41	1	60147	1.31597E-07	60147
42	1	62147	6.67818E-07	62147
43	1	62149	8.02025E-08	62149
44	1	62150	2.54419E-06	62150
45	1	62151	3.32006E-07	62151
46	1	62152	1.24460E-06	62152
47	1	64155	1.18371E-09	64155
48	1	63153	6.30790E-07	63153
49	1	63154	9.52980E-08	63154
50	1	63155	7.31344E-08	63155
51	2	40302	4.25156E-02	40302
52	3	1001	4.19420E-02	1001
53	3	5010	3.81515E-06	5010
54	3	5011	1.54884E-05	5011
55	1	55133	1.36295E-05	55133
56	1	93237	1.97949E-06	93237
57	1	94238	1.77348E-07	94238
58	1	94239	8.26635E-05	94239
59	1	94240	1.15796E-05	94240

```
   60     1      94241   5.05481E-06          94241
   61     1      94242   3.41071E-07          94242
   62     1      95241   9.66355E-08          95241
   63     1      95243   1.84683E-08          95243
   64     1      96244   1.04617E-09          96244
   65     1        999   1.00000E-20            999
   66     4        999   1.00000E-20             66
0geometry and material description
0zone  mixture  outer dimension  temperature    extra xs   type (0/1--fuel/mod)
   1     1        4.68122E-01   9.75000E+02  9.05844E-01         0
   2     4        4.78790E-01   2.93000E+02  5.49010E-01         0
   3     2        5.46100E-01   6.50000E+02   .00000E+00         0
   4     3        8.13968E-01   6.07600E+02   .00000E+00         0
      7711 locations of   200000 available are required to make a new master containing the self-shielded values
0no nuclides in your problem have bondarenko factor data**bonami will copy from logical 12 to logical  1
0copy       999  1/v cross sectio from log 12 to log 18    bondarenko trigger 0
0copy       999  1/v cross sectio from log 18 to log  1    bondarenko trigger 0
0copy       999  1/v cross sectio from log 18 to log  1    bondarenko trigger 0
0copy      1001  hydrogen         from log 12 to log  1    bondarenko trigger 0
0copy      5010  b-10 1273 218ngp from log 12 to log  1    bondarenko trigger 0
0copy      5011  boron-11         from log 12 to log  1    bondarenko trigger 0
0copy      8016  oxygen-16        from log 12 to log 18    bondarenko trigger 0
0copy      8016  oxygen-16        from log 18 to log  1    bondarenko trigger 0
0copy      8016  oxygen-16        from log 18 to log  1    bondarenko trigger 0
0copy     36083  kr-83            from log 12 to log  1    bondarenko trigger 0
0copy     36085  kr-85            from log 12 to log  1    bondarenko trigger 0
0copy     38090  sr-90            from log 12 to log  1    bondarenko trigger 0
0copy     39089   y-89            from log 12 to log  1    bondarenko trigger 0
0copy     40093  zr-93            from log 12 to log  1    bondarenko trigger 0
0copy     40094  zr-94            from log 12 to log  1    bondarenko trigger 0
0copy     40095  zr-95            from log 12 to log  1    bondarenko trigger 0
0copy     40302  zircalloy        from log 12 to log  1    bondarenko trigger 0
0copy     41094  nb-94            from log 12 to log  1    bondarenko trigger 0
0copy     42095  mo-95            from log 12 to log  1    bondarenko trigger 0
0copy     43099  tc-99            from log 12 to log  1    bondarenko trigger 0
0copy     44101  ru-101           from log 12 to log  1    bondarenko trigger 0
0copy     44106  ru-106           from log 12 to log  1    bondarenko trigger 0
0copy     45103  rh-103           from log 12 to log  1    bondarenko trigger 0
0copy     45105  rh-105           from log 12 to log  1    bondarenko trigger 0
0copy     46105  pd-105           from log 12 to log  1    bondarenko trigger 0
0copy     46108  pd-108           from log 12 to log  1    bondarenko trigger 0
0copy     47109  silver-109       from log 12 to log  1    bondarenko trigger 0
0copy     51124  sb-124           from log 12 to log  1    bondarenko trigger 0
0copy     54131  xe-131           from log 12 to log  1    bondarenko trigger 0
0copy     54132  xe-132           from log 12 to log  1    bondarenko trigger 0
0copy     54135  xenon-135        from log 12 to log  1    bondarenko trigger 0
0copy     54136  xe-136           from log 12 to log  1    bondarenko trigger 0
0copy     55133  cesium-133       from log 12 to log  1    bondarenko trigger 0
0copy     55134  cs-134           from log 12 to log  1    bondarenko trigger 0
0copy     55135  cs-135           from log 12 to log  1    bondarenko trigger 0
0copy     55137  cs-137           from log 12 to log  1    bondarenko trigger 0
0copy     56136  ba-136           from log 12 to log  1    bondarenko trigger 0
0copy     57139  la-139           from log 12 to log  1    bondarenko trigger 0
0copy     58144  ce-144           from log 12 to log  1    bondarenko trigger 0
0copy     59141  pr-141           from log 12 to log  1    bondarenko trigger 0
0copy     59143  pr-143           from log 12 to log  1    bondarenko trigger 0
0copy     60143  nd-143           from log 12 to log  1    bondarenko trigger 0
0copy     60145  nd-145           from log 12 to log  1    bondarenko trigger 0
0copy     60147  nd-147           from log 12 to log  1    bondarenko trigger 0
0copy     61147  pm-147           from log 12 to log  1    bondarenko trigger 0
```

```
0copy    61148  pm-148           from log 12 to log  1   bondarenko trigger 0
0copy    62147  sm-147           from log 12 to log  1   bondarenko trigger 0
0copy    62149  sm-149           from log 12 to log  1   bondarenko trigger 0
0copy    62150  sm-150           from log 12 to log  1   bondarenko trigger 0
0copy    62151  sm-151           from log 12 to log  1   bondarenko trigger 0
0copy    62152  sm-152           from log 12 to log  1   bondarenko trigger 0
0copy    63153  eu-153           from log 12 to log  1   bondarenko trigger 0
0copy    63154  eu-154           from log 12 to log  1   bondarenko trigger 0
0copy    63155  eu-155           from log 12 to log  1   bondarenko trigger 0
0copy    64155  gd-155           from log 12 to log  1   bondarenko trigger 0
0copy    92234  u-234 1043 sigo= from log 12 to log  1   bondarenko trigger 0
0copy    92235   uranium-235     from log 12 to log  1   bondarenko trigger 0
0copy    92236  u-236 1163 sigo= from log 12 to log  1   bondarenko trigger 0
0copy    92238   uranium-238     from log 12 to log  1   bondarenko trigger 0
0copy    93237   neptunium-237   from log 12 to log  1   bondarenko trigger 0
0copy    94238  pu-238 1050 sigo from log 12 to log  1   bondarenko trigger 0
0copy    94239   plutonium-239   from log 12 to log  1   bondarenko trigger 0
0copy    94240   plutonium-240   from log 12 to log  1   bondarenko trigger 0
0copy    94241   plutonium-241   from log 12 to log  1   bondarenko trigger 0
0copy    94242   plutonium-242   from log 12 to log  1   bondarenko trigger 0
0copy    95241  am-241 1056 sigp from log 12 to log  1   bondarenko trigger 0
0copy    95243  am-243 1057 218  from log 12 to log  1   bondarenko trigger 0
0copy    96244   curium-244      from log 12 to log  1   bondarenko trigger 0
1     scale 4.2 - 27 group neutron burnup library
        based on endf-b version 4 data with endf-b version 5 fission products
          compiled for nrc      1/27/89
            last updated       9/16/93
              l.m.petrie   -   ornl
        tape id                          4321        number of nuclides              66
        number of neutron groups           27        number of gamma groups           0
        first thermal group                15        logical unit                     1
                                   table of contents
       1/v cross sections normalized to 1.0 at 0.0253 ev                       id     999
       1/v cross sections normalized to 1.0 at 0.0253 ev                       id      66
        hydrogen     endf/b-iv mat 1269/thrm1002   updated 10/13/89            id    1001
       b-10 1273 218ngp 042375 p-3 293k                                        id    5010
        boron-11     endf/b-iv mat 1160            updated 10/13/89            id    5011
        oxygen-16    endf/b-iv mat 1276            updated 10/13/89            id    8016
        oxygen-16    endf/b-iv mat 1276            updated 10/13/89            id       6
        kr-83        mt=102,103,103,105,106,107    updated 10/13/89            id   36083
        kr-85           mt=  102                                               id   36085
        sr-90        mt=102                        updated 10/13/89            id   38090
         y-89        mt=102                        updated 10/13/89            id   39089
        zr-93           mt=  102                                               id   40093
        zr-94        mt=102                        updated 10/13/89            id   40094
        zr-95        mt=102                        updated 10/13/89            id   40095
        zircalloy    endf/b-iv mat 1284            updated 10/13/89            id   40302
        nb-94        mt=102                        updated 10/13/89            id   41094
        mo-95        mt=102                        updated 10/13/89            id   42095
        tc-99        mt=102                        updated 10/13/89            id   43099
        ru-101       mt=102                        updated 10/13/89            id   44101
        ru-106       mt=102                        updated 10/13/89            id   44106
        rh-103       mt=102                        updated 10/13/89            id   45103
        rh-105          mt=  102                                               id   45105
        pd-105       mt=102                        updated 10/13/89            id   46105
        pd-108       mt=102                        updated 10/13/89            id   46108
        silver-109   endf/b-iv mat 1139            updated 10/13/89            id   47109
        sb-124       mt=102                        updated 10/13/89            id   51124
        xe-131       mt=102,103,104,105,106        updated 10/13/89            id   54131
        xe-132       mt=102,103,104,105,106        updated 10/13/89            id   54132
```

```
        xenon-135      endf/b-iv mat 1294            updated 10/13/89              id    54135
        xe-136           mt=  102, 103, 104, 105, 107                              id    54136
        cesium-133     endf/b-iv mat 1141            updated 10/13/89              id    55133
        cs-134         mt=102                        updated 10/13/89              id    55134
        cs-135           mt=  102                                                  id    55135
        cs-137         mt=102                        updated 10/13/89              id    55137
        ba-136         mt=102                        updated 10/13/89              id    56136
        la-139         mt=102                        updated 10/13/89              id    57139
        ce-144           mt=  102                                                  id    58144
        pr-141         mt=102,103,104,105,106,107    updated 10/13/89              id    59141
        pr-143         mt=102                        updated 10/13/89              id    59143
        nd-143         mt=102                        updated 10/13/89              id    60143
        nd-145         mt=102                        updated 10/13/89              id    60145
        nd-147         mt=102                        updated 10/13/89              id    60147
        pm-147         mt=102                        updated 10/13/89              id    61147
        pm-148           mt=  102                                                  id    61148
        sm-147         endf/b-v fission product      updated 10/13/89              id    62147
        sm-149         mt=102,103,107                updated 10/13/89              id    62149
        sm-150         mt=102                        updated 10/13/89              id    62150
        sm-151         mt=102,103,104,105,106,107    updated 10/13/89              id    62151
        sm-152         mt=102,103,104,105,106,107    updated 10/13/89              id    62152
        eu-153         mt=102,103,104,105,106,107    updated 10/13/89              id    63153
        eu-154         mt=102,103,104,105,106,107    updated 10/13/89              id    63154
        eu-155         mt=102,103,104,105,106,107    updated 10/13/89              id    63155
        gd-155         mt=102                        updated 10/13/89              id    64155
       u-234 1043 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                         id    92234
        uranium-235    endf/b-iv mat 1261            updated 10/13/89              id    92235
       u-236 1163 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                         id    92236
        uranium-238    endf/b-iv mat 1262            updated 10/13/89              id    92238
        neptunium-237  endf/b-iv mat 1263            updated 10/13/89              id    93237
       pu-238 1050 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                        id    94238
        plutonium-239  endf/b-iv mat 1264            updated 10/13/89              id    94239
        plutonium-240  endf/b-iv mat 1265            updated 10/13/89              id    94240
        plutonium-241  endf/b-iv mat 1266            updated 10/13/89              id    94241
        plutonium-242  endf/b-iv mat 1161            updated 10/13/89              id    94242
       am-241 1056 sigo=5+4 newklacs 218grp p-3 293k                               id    95241
       am-243 1057 218 gp wt f-1/e-m 090376 p3 293k                                id    95243
        curium-244     endf/b-iv mat 1162            updated 10/13/89              id    96244
0        tape copy used      0 i/o's, and took      .00 seconds
1                m          m  iiiiiiiiiiii    ttttttttttttt      aaaaaaaaa     ww          ww  ll
                 mm         m  iiiiiiiiiiii    ttttttttttttt     aaaaaaaaaaa    ww          ww  ll
                 mmm        m       ii              tt         aa         aa     ww          ww  ll
                 m m m      m       ii              tt         aa         aa     ww          ww  ll
                 m  m       m       ii              tt         aa         aa     ww          ww  ll
                 m   m      m       ii              tt         aaaaaaaaaaaa      ww    w     ww  ll
                 m    m     m       ii              tt         aaaaaaaaaaaa      ww   www    ww  ll
                 m     m    m       ii              tt         aa         aa     ww  ww ww  ww  ll
                 m      m   m       ii              tt         aa         aa     ww ww   ww ww  ll
                 m       m  m       ii              tt         aa         aa     wwww     wwww  ll
                 m          m  iiiiiiiiiiii        tt         aa         aa     www        www  lllllllllll
                 m          m  iiiiiiiiiiii        tt         aa         aa     ww         ww   lllllllllll
0

   ddddddddddd      aaaaaaaaa     w         w  iiiiiiiiiii     sssssssssss
   ddddddddddddd   aaaaaaaaaaa    w         w  iiiiiiiiiii    sssssssssssss
   dd         dd  aa         aa   w         w      ii        ss         ss
   dd         dd  aa         aa   w         w      ii        ss
   dd         dd  aa         aa   w         w      ii        ss
   dd         dd  aaaaaaaaaaaaa   w         w      ii        sssssssssss
   dd         dd  aaaaaaaaaaaaa    w       w      ii         sssssssssss
```



```
**********************************************************************
**********************************************************************
**********************************************************************
******                                                          ******
******              program verification information            ******
******                                                          ******
******              code system:   scale  version:  4.2         ******
******                                                          ******
**********************************************************************
```

```
                    ********************************************************************************
                    *****                                                                      *****
                    *****                                                                      *****
                    *****              program:  c0c002                                        *****
                    *****                                                                      *****
                    *****         creation date:  04/27/95                                     *****
                    *****                                                                      *****
                    *****              library:  /neutronics/scale/exe                         *****
                    *****                                                                      *****
                    *****                                                                      *****
                    *****    this is not a   scale  configuration controlled code             *****
                    *****                                                                      *****
                    *****              jobname:  davis                                         *****
                    *****                                                                      *****
                    *****    date of execution:  02/16/96                                      *****
                    *****                                                                      *****
                    *****    time of execution:  09:59:41                                      *****
                    *****                                                                      *****
                    *****                                                                      *****
                    ********************************************************************************
                    ********************************************************************************
                    ********************************************************************************

1
0       -1q array has       1 entries.
0        0q array has       9 entries.
0        1q array has      12 entries.
0select 65 nuclides from the master  library on logical  1
        0 nuclides from the working library on logical  2
        0 nuclides from the working library on logical  3
          to create the new working library on logical  4

       61 resonance calculations have been requested
        0 output option for ampx formatted cross section data
0the storage allocated for this case is 200000 words
0        2q array has      65 entries.
0        3q array has     915 entries.
0        4q array has      65 entries.
0 general information concerning cross section library
    tape identification number                4321
    number of nuclides on tape                  66
    number of neutron energy groups             27
    first thermal neutron energy group          15
    number of gamma energy groups                0
0   direct access unit number  9 requires 117 blocks of length  1484 words
- xsdrn tape   4321
                        scale 4.2 - 27 group neutron burnup library
                          based on endf-b version 4 data with endf-b version 5 fission products
                            compiled for nrc      1/27/89
                              last updated       9/16/93
                                l.m.petrie   -   ornl
0 nuclides from xsdrn tape
     1    1/v cross sections normalized to 1.0 at 0.0253 ev                              999
     2    hydrogen       endf/b-iv mat 1269/thrm1002    updated 10/13/89               1001
     3   b-10 1273 218ngp 042375 p-3 295k                                              5010
     4    boron-11       endf/b-iv mat 1160             updated 10/13/89               5011
     5    oxygen-16      endf/b-iv mat 1276             updated 10/13/89               8016
     6    oxygen-16      endf/b-iv mat 1276             updated 10/13/89                  6
     7    kr-83          mt=102,103,103,105,106,107     updated 10/13/89              36083
     8    kr-85            mt=  102                                                    36085
     9    sr-90          mt=102                         updated 10/13/89              38090
```

```
    10     y-89          mt=102                          updated 10/13/89              39089
    11     zr-93           mt=  102                                                    40093
    12     zr-94         mt=102                          updated 10/13/89              40094
    13     zr-95         mt=102                          updated 10/13/89              40095
    14     zircalloy     endf/b-iv mat 1284              updated 10/13/89              40302
    15     nb-94         mt=102                          updated 10/13/89              41094
    16     mo-95         mt=102                          updated 10/13/89              42095
    17     tc-99         mt=102                          updated 10/13/89              43099
    18     ru-101        mt=102                          updated 10/13/89              44101
    19     ru-106        mt=102                          updated 10/13/89              44106
    20     rh-103        mt=102                          updated 10/13/89              45103
    21     rh-105          mt=  102                                                    45105
    22     pd-105        mt=102                          updated 10/13/89              46105
    23     pd-108        mt=102                          updated 10/13/89              46108
    24     silver-109    endf/b-iv mat 1139              updated 10/13/89              47109
    25     sb-124        mt=102                          updated 10/13/89              51124
    26     xe-131        mt=102,103,104,105,106          updated 10/13/89              54131
    27     xe-132        mt=102,103,104,105,106          updated 10/13/89              54132
    28     xenon-135     endf/b-iv mat 1294              updated 10/13/89              54135
    29     xe-136          mt=  102, 103, 104, 105, 107                                54136
    30     cesium-133    endf/b-iv mat 1141              updated 10/13/89              55133
    31     cs-134        mt=102                          updated 10/13/89              55134
    32     cs-135          mt=  102                                                    55135
    33     cs-137        mt=102                          updated 10/13/89              55137
    34     ba-136        mt=102                          updated 10/13/89              56136
    35     la-139        mt=102                          updated 10/13/89              57139
    36     ce-144          mt=  102                                                    58144
    37     pr-141        mt=102,103,104,105,106,107      updated 10/13/89              59141
    38     pr-143        mt=102                          updated 10/13/89              59143
    39     nd-143        mt=102                          updated 10/13/89              60143
    40     nd-145        mt=102                          updated 10/13/89              60145
    41     nd-147        mt=102                          updated 10/13/89              60147
    42     pm-147        mt=102                          updated 10/13/89              61147
    43     pm-148          mt=  102                                                    61148
    44     sm-147        endf/b-v fission product        updated 10/13/89              62147
    45     sm-149        mt=102,103,107                  updated 10/13/89              62149
    46     sm-150        mt=102                          updated 10/13/89              62150
    47     sm-151        mt=102,103,104,105,106,107      updated 10/13/89              62151
    48     sm-152        mt=102,103,104,105,106,107      updated 10/13/89              62152
    49     eu-153        mt=102,103,104,105,106,107      updated 10/13/89              63153
    50     eu-154        mt=102,103,104,105,106,107      updated 10/13/89              63154
    51     eu-155        mt=102,103,104,105,106,107      updated 10/13/89              63155
    52     gd-155        mt=102                          updated 10/13/89              64155
    53    u-234 1043 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                           92234
    54     uranium-235   endf/b-iv mat 1261              updated 10/13/89              92235
    55    u-236 1163 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                           92236
    56     uranium-238   endf/b-iv mat 1262              updated 10/13/89              92238
    57     neptunium-237 endf/b-iv mat 1263              updated 10/13/89              93237
    58    pu-238 1060 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                          94238
    59     plutonium-239 endf/b-iv mat 1264              updated 10/13/89              94239
    60     plutonium-240 endf/b-iv mat 1265              updated 10/13/89              94240
    61     plutonium-241 endf/b-iv mat 1266              updated 10/13/89              94241
    62     plutonium-242 endf/b-iv mat 1161              updated 10/13/89              94242
    63    am-241 1056 sigo=5+4 newklacs 218ngp p-3 293k                                 95241
    64    am-243 1057 218 gp wt f-1/e-m 090376 p3 293k                                  95243
    65     curium-244    endf/b-iv mat 1162              updated 10/13/89              96244
01/v cross sections normalized to 1.0 at 0.0253 ev                          999   temperature=   975.00
0 hydrogen       endf/b-iv mat 1269/thrm1002    updated 10/13/89            1001   temperature=   607.60
                          thermal scattering matrix number   2 at a temperature of   550.00 was selected.
0b-10 1273 218ngp 042375 p-3 293k                                          5010   temperature=   607.60
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                          thermal scattering matrix number   2 at a temperature of    550.00 was selected.
0 boron-11       endf/b-iv mat 1160          updated 10/13/89              5011     temperature=   607.60
                          thermal scattering matrix number   2 at a temperature of    550.00 was selected.
0 oxygen-16      endf/b-iv mat 1276          updated 10/13/89              8016     temperature=   975.00
0 oxygen-16      endf/b-iv mat 1276          updated 10/13/89                 6     temperature=   607.60
0 kr-83          mt=102,103,103,105,106,107  updated 10/13/89             36083     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   82.202              temperature(kelvin)      =   975.000
0potential scatter sigma  =    7.004              lumped nuclear density   = 9.7708955E-07
0spin factor (g)          =  4988.190              lump dimension (a-bar)   = 4.6812201E-01
0inner radius             = .0000000E+00           dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =   15.995              sigma(per absorber atom)= 1.7477258E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =  237.933              sigma(per absorber atom)= 1.9499170E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs         res fiss        res scat
  11      -1.385983E-03     .000000E+00   -1.759590E-03
  12       2.166790E-02     .000000E+00    9.901676E-03
  13      -3.216016E-01     .000000E+00   -9.862398E-02
  14       4.782765E-05     .000000E+00   -1.722850E-05
0excess resonance integrals
0                 resolved
0absorption      1.4490SE+02
 fission          .00000E+00
- elapsed time    .00 min.
0 kr-85           mt=  102                                                36085     temperature=   975.00
0 sr-90          mt=102                      updated 10/13/89             38090     temperature=   975.00
0  y-89          mt=102                      updated 10/13/89             39089     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   88.142              temperature(kelvin)      =   975.000
0potential scatter sigma  =    3.644              lumped nuclear density   = 7.9016527E-06
0spin factor (g)          =   78.664              lump dimension (a-bar)   = 4.6812201E-01
0inner radius             = .0000000E+00           dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =   15.995              sigma(per absorber atom)= 2.1610631E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =  237.933              sigma(per absorber atom)= 2.4110725E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs         res fiss        res scat
   9      -1.668715E-06     .000000E+00   -8.242978E-05
  10      -4.720001E-05     .000000E+00   -1.330676E-04
0excess resonance integrals
0                 resolved
0absorption      1.4644E-01
 fission          .00000E+00
- elapsed time    .00 min.
0 zr-93           mt=  102                                                40093     temperature=   975.00
0 zr-94          mt=102                      updated 10/13/89             40094     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   93.100              temperature(kelvin)      =   975.000
0potential scatter sigma  =    3.779              lumped nuclear density   = 1.2784308E-05
0spin factor (g)          =  180.853              lump dimension (a-bar)   = 4.6812201E-01
0inner radius             = .0000000E+00           dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =   15.995              sigma(per absorber atom)= 1.3356976E+04
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0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 1.4902220E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
   8     -6.747734E-07     .000000E+00   -6.500250E-04
   9     -2.446607E-05     .000000E+00   -2.167085E-03
0excess resonance integrals
0                resolved
0absorption     3.4394OE-02
 fission          .00000E+00
- elapsed time    .00 min.
0 zr-95          mt=102                   updated 10/13/89            40095     temperature=   975.00
0 zircalloy      endf/b-iv mat 1284       updated 10/13/89            40302     temperature=   650.00
0resonance data for this nuclide
0mass number (a)          =    90.436          temperature(kelvin)      =   650.000
0potential scatter sigma  =     6.385          lumped nuclear density   = 4.2515602E-02
0spin factor (g)          =     1.079          lump dimension (a-bar)   = 5.4610002E-01
0inner radius             = 4.7878999E-01      dancoff correction (c)   = 5.0364637E-01
0the absorber will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
   8     -1.780596E-03     .000000E+00   -1.286907E+00
   9     -5.895373E-02     .000000E+00   -2.695297E+00
  10     -6.959985E-02     .000000E+00   -1.601321E+00
  11     -1.883957E-01     .000000E+00   -7.920912E-01
0excess resonance integrals
0                resolved
0absorption     2.28539E-01
 fission          .00000E+00
- elapsed time    .02 min.
0 rb-94          mt=102                   updated 10/13/89            41094     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =    93.101          temperature(kelvin)      =   975.000
0potential scatter sigma  =     3.779          lumped nuclear density   = 5.4897688E-12
0spin factor (g)          = 43808.801          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =   15.995              sigma(per absorber atom)= 3.1105079E+10
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933             sigma(per absorber atom)= 3.4703569E+10
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  13      1.043419E-02     .000000E+00    9.253895E-04
  14      9.836701E-03     .000000E+00   -4.064784E-04
0excess resonance integrals
0                resolved
0absorption     9.15001E+01
 fission          .00000E+00
- elapsed time    .02 min.
0 mo-95          mt=102                   updated 10/13/89            42095     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =    94.091          temperature(kelvin)      =   975.000
0potential scatter sigma  =     3.806          lumped nuclear density   = 9.6802851E-06
0spin factor (g)          =   607.724          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
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0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 1.763994E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 1.968067E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  10     -2.101411E-03     .000000E+00   -1.219284E-02
  11     -3.741213E-03     .000000E+00   -6.328940E-03
  12     -2.768862E+00     .000000E+00   -3.186731E+00
  13      1.591845E-04     .000000E+00   -2.397025E-05
0excess resonance integrals
0                resolved
0absorption     9.97889E+01
 fission         .00000E+00
- elapsed time    .02 min.
0 tc-99         mt=102                  updated 10/13/89          43099     temperature=   975.00
0resonance data for this nuclide
0mass number (a)        =   98.150          temperature(kelvin)     =   975.000
0potential scatter sigma =    6.000         lumped nuclear density  = 1.2446981E-05
0spin factor (g)        =  4527.940         lump dimension (a-bar)  = 4.6812201E-01
0inner radius           =  .0000000E+00     dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =   15.995          sigma(per absorber atom)= 1.3718964E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =  237.933          sigma(per absorber atom)= 1.5306087E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  11     -1.596682E-02     .000000E+00   -7.532893E-03
  12     -4.130031E-03     .000000E+00   -1.416189E-04
  13     -2.602912E-01     .000000E+00   -1.372298E-02
  14     -5.629467E+00     .000000E+00   -1.798383E-01
  15      1.070845E-02     .000000E+00   -5.397120E-04
  16      4.836022E-03     .000000E+00   -2.802316E-04
  17      2.074402E-04     .000000E+00   -1.192082E-05
0excess resonance integrals
0                resolved
0absorption     3.27549E+02
 fission         .00000E+00
- elapsed time    .03 min.
0 ru-101        mt=102                  updated 10/13/89          44101     temperature=   975.00
0resonance data for this nuclide
0mass number (a)        =  100.039          temperature(kelvin)     =   975.000
0potential scatter sigma =    3.965         lumped nuclear density  = 1.1066534E-05
0spin factor (g)        =  8785.290         lump dimension (a-bar)  = 4.6812201E-01
0inner radius           =  .0000000E+00     dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =   15.995          sigma(per absorber atom)= 1.5430277E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =  237.933          sigma(per absorber atom)= 1.7215379E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  11     -3.600798E-02     .000000E+00   -3.661688E-03
  12     -7.148226E-02     .000000E+00   -2.072644E-02
  13     -2.960912E-01     .000000E+00   -7.977196E-03
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  14     2.374839E-04     .000000E+00   -4.170895E-05
0excess resonance integrals
0                resolved
0absorption      7.95266E+01
 fission          .00000E+00
- elapsed time    .03 min.
0 ru-106        mt=102                    updated 10/13/89            44106    temperature=  975.00
0 rh-103        mt=102                    updated 10/13/89            45103    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   102.021          temperature(kelvin)      =   975.000
0potential scatter sigma  =     5.408          lumped nuclear density   = 6.4755109E-06
0spin factor (g)          =      .500          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 2.6370074E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 2.9420779E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs          res fiss         res scat
   9      1.271471E-03     .000000E+00    1.996385E-03
  10     -2.977085E-03     .000000E+00   -4.186531E-03
  11     -1.281989E-02     .000000E+00   -1.136710E-02
  12     -1.833917E-04     .000000E+00   -1.934018E-05
  13      .000000E+00      .000000E+00    .000000E+00
  14      .000000E+00      .000000E+00    .000000E+00
  15      2.295552E-01     .000000E+00    3.324061E-03
  16      3.506692E+01     .000000E+00   -5.387979E-02
  17     -1.842000E+02     .000000E+00   -1.504310E-01
  18      8.739133E+01     .000000E+00    2.613078E-01
  19      1.151897E+01     .000000E+00   -1.560780E-03
  20      1.089838E+00     .000000E+00   -2.495795E-03
  21      2.165939E-01     .000000E+00    1.934895E-03
  22      2.583943E-01     .000000E+00    2.928526E-03
  23     -9.880321E-02     .000000E+00    1.799034E-03
0excess resonance integrals
0                resolved
0absorption      1.15157E+03
 fission          .00000E+00
- elapsed time    .07 min.
0 rh-105         mt=  102                                                45105    temperature=  975.00
0 pd-105        mt=102                    updated 10/13/89            46105    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   104.004          temperature(kelvin)      =   975.000
0potential scatter sigma  =     4.069          lumped nuclear density   = 3.8154349E-06
0spin factor (g)          = 15210.000          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 4.4754977E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 4.9932598E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs          res fiss         res scat
  12     -5.267409E-02     .000000E+00   -1.049825E-03
  13      5.370175E-03     .000000E+00   -3.614218E-04
  14      7.773445E-04     .000000E+00   -8.157203E-05
0excess resonance integrals
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0                resolved
0absorption      6.12702E+01
 fission         .00000E+00
- elapsed time   .07 min.
0 pd-108       mt=102                    updated 10/13/89          46108    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =  106.977          temperature(kelvin)     =  975.000
0potential scatter sigma  =    4.146          lumped nuclear density  = 9.3032725E-07
0spin factor (g)          = 21175.100          lump dimension (a-bar)  = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1   =   15.995              sigma(per absorber atom)= 1.8354798E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2   =  237.933              sigma(per absorber atom)= 2.0478233E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  11      1.170385E-04     .000000E+00    3.531856E-04
  12     -8.421333E-01     .000000E+00   -6.202699E-01
  13      6.898835E-03     .000000E+00    1.834003E-03
  14      8.561365E-02     .000000E+00   -3.207094E-05
  15     -1.840486E-01     .000000E+00    8.083802E-05
  16      2.946586E-04     .000000E+00   -9.255640E-06
0excess resonance integrals
0                resolved
0absorption      2.13080E+02
 fission         .00000E+00
- elapsed time   .07 min.
0 silver-109   endf/b-iv mat 1139          updated 10/13/89          47109    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =  107.969          temperature(kelvin)     =  975.000
0potential scatter sigma  =    4.988          lumped nuclear density  = 6.6833451E-07
0spin factor (g)          = 1441.870          lump dimension (a-bar)  = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1   =   15.995              sigma(per absorber atom)= 2.5550053E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2   =  237.933              sigma(per absorber atom)= 2.8505872E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  10     -5.320484E-05     .000000E+00   -3.392181E-05
  11     -2.755409E-03     .000000E+00   -2.078532E-03
  12     -7.117940E-01     .000000E+00   -3.246696E-02
  13      7.671432E-01     .000000E+00    3.380747E-02
  14     -6.185493E+00     .000000E+00   -5.847073E-01
0excess resonance integrals
0                resolved
0absorption      1.39527E+03
 fission         .00000E+00
- elapsed time   .07 min.
0 sb-124       mt=102                    updated 10/13/89          51124    temperature=  975.00
0 xe-131       mt=102,103,104,105,106    updated 10/13/89          54131    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =  129.781          temperature(kelvin)     =  975.000
0potential scatter sigma  =    4.301          lumped nuclear density  = 5.7724055E-06
0spin factor (g)          =  246.825          lump dimension (a-bar)  = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)  = 3.4269261E-01
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0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 2.9582066E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 3.3004363E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  9      -1.746571E-06     .000000E+00   -1.644019E-05
 10      -1.217086E-04     .000000E+00   -1.011729E-04
 11      -1.522097E-03     .000000E+00   -1.149261E-03
 12      -2.946790E-02     .000000E+00   -2.748222E-03
 13      -4.860811E+01     .000000E+00   -1.140201E+02
 14       1.086607E-02     .000000E+00    1.520949E-02
0excess resonance integrals
0                resolved
0absorption     7.83722E+02
 fission         .00000E+00
- elapsed time    .08 min.
0 xe-132       mt=102,103,104,105,106        updated 10/13/89          54132    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   130.771          temperature(kelvin)     =   975.000
0potential scatter sigma  =     4.301          lumped nuclear density  = 1.0060623E-05
0spin factor (g)          =   675.899          lump dimension (a-bar)  = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 1.6973074E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 1.8936658E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  9      -1.536122E-05     .000000E+00   -6.967560E-05
 10      -4.775116E-03     .000000E+00   -6.079132E-02
 11       3.338609E-08     .000000E+00   -9.216575E-07
0excess resonance integrals
0                resolved
0absorption     9.76256E-01
 fission         .00000E+00
- elapsed time    .08 min.
0 xenon-135    endf/b-iv mat 1294          updated 10/13/89          54135    temperature=  975.00
0 xe-136         mt= 102, 103, 104, 105, 107                        54136    temperature=  975.00
0 cesium-133   endf/b-iv mat 1141          updated 10/13/89          55133    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   131.764          temperature(kelvin)     =   975.000
0potential scatter sigma  =     7.100          lumped nuclear density  = 1.3629538E-05
0spin factor (g)          =   374.437          lump dimension (a-bar)  = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 1.2528647E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   238.051              sigma(per absorber atom)= 1.3438617E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  9      -3.902142E-05     .000000E+00   -2.371830E-04
 10      -1.855911E-03     .000000E+00   -3.566480E-03
 11      -7.030141E-02     .000000E+00   -1.231307E-01
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  12      -1.087364E-01     .000000E+00   -1.514590E-02
  13      -1.806647E-01     .000000E+00   -9.834943E-03
  14      -8.027154E+00     .000000E+00   -3.517231E-01
  15       5.625014E-03     .000000E+00   -4.054422E-04
  16       2.777885E-03     .000000E+00   -2.215274E-04
  17       2.352273E-03     .000000E+00   -1.830700E-04
  18       2.215057E-03     .000000E+00   -1.679488E-04
  19       1.317054E-03     .000000E+00   -9.671629E-05
0excess resonance integrals
0                 resolved
0absorption      3.56736E+02
 fission          .00000E+00
-  elapsed time    .10 min.
0 cs-134        mt=102                    updated 10/13/89          55134    temperature=  975.00
0 cs-135          mt=  102                                          55135    temperature=  975.00
0 cs-137        mt=102                    updated 10/13/89          55137    temperature=  975.00
0 ba-136        mt=102                    updated 10/13/89          56136    temperature=  975.00
0resonance data for this nuclide
0mass number (a)         =   134.737          temperature(kelvin)     =   975.000
0potential scatter sigma =     4.835          lumped nuclear density  = 8.1511402E-08
0spin factor (g)         =  1247.690          lump dimension (a-bar)  = 4.6812201E-01
0inner radius            = .0000000E+00       dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1     =    15.995          sigma(per absorber atom)= 2.0949178E+06
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2     =   237.933          sigma(per absorber atom)= 2.3372750E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  10       1.264037E-06     .000000E+00    5.433292E-07
  11       1.019501E-05     .000000E+00    8.952431E-06
0excess resonance integrals
0                 resolved
0absorption      1.38475E+00
 fission          .00000E+00
-  elapsed time    .10 min.
0 la-139        mt=102                    updated 10/13/89          57139    temperature=  975.00
0resonance data for this nuclide
0mass number (a)         =   137.713          temperature(kelvin)     =   975.000
0potential scatter sigma =     4.906          lumped nuclear density  = 1.3107317E-05
0spin factor (g)         =   145.855          lump dimension (a-bar)  = 4.6812201E-01
0inner radius            = .0000000E+00       dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1     =    15.995          sigma(per absorber atom)= 1.3027813E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2     =   237.933          sigma(per absorber atom)= 1.4534978E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
   9       1.241050E-05     .000000E+00    2.717702E-03
  10      -2.747689E-04     .000000E+00   -1.731751E-02
  11        .000000E+00     .000000E+00     .000000E+00
  12      -4.498419E-02     .000000E+00   -2.717459E-02
0excess resonance integrals
0                 resolved
0absorption      8.09612E+00
 fission          .00000E+00
-  elapsed time    .12 min.
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0 ce-144          mt= 102                                          58144    temperature=  975.00
0 pr-141       mt=102,103,104,105,106,107    updated 10/13/89      59141    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   139.697          temperature(kelvin)     =   975.000
0potential scatter sigma  =     4.953          lumped nuclear density  = 1.0987054E-05
0spin factor (g)          =  1026.500          lump dimension (a-bar)  = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 1.5541928E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 1.7339945E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  10      -4.312013E-03      .000000E+00     -1.464163E-01
  11      -7.124887E-02      .000000E+00     -9.475036E-01
  12      -1.590714E-03      .000000E+00     -1.548419E-04
0excess resonance integrals
0                  resolved
0absorption       1.21742E+01
 fission           .00000E+00
- elapsed time     .12 min.
0 pr-143       mt=102                       updated 10/13/89      59143    temperature=  975.00
0 nd-143       mt=102                       updated 10/13/89      60143    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   141.682          temperature(kelvin)     =   975.000
0potential scatter sigma  =     5.000          lumped nuclear density  = 1.0663101E-05
0spin factor (g)          =  1964.860          lump dimension (a-bar)  = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 1.6014073E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 1.7866713E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  10      -1.073421E-04      .000000E+00     -4.672364E-05
  11      -2.502638E-01      .000000E+00     -2.911259E+00
  12      -1.644718E-01      .000000E+00     -8.092445E-02
0excess resonance integrals
0                  resolved
0absorption       5.10661E+01
 fission           .00000E+00
- elapsed time     .12 min.
0 nd-145       mt=102                       updated 10/13/89      60145    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   143.668          temperature(kelvin)     =   975.000
0potential scatter sigma  =     5.047          lumped nuclear density  = 7.7396689E-06
0spin factor (g)          =  1007.250          lump dimension (a-bar)  = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 2.2062920E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 2.4615338E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
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  10      -3.127119E-03     .000000E+00   -4.923112E-02
  11      -4.765503E-02     .000000E+00   -1.440322E-01
  12      -1.169613E+00     .000000E+00   -7.364430E+00
  13       9.609872E-05     .000000E+00    2.040021E-04
  14      -1.043070E+00     .000000E+00   -2.743980E-02
  15       5.904857E-03     .000000E+00   -4.619551E-04
  16       1.326684E-03     .000000E+00   -1.451367E-04
  17       9.642499E-04     .000000E+00   -1.063983E-04
  18       8.539784E-04     .000000E+00   -9.314087E-05
  19       7.634346E-04     .000000E+00   -8.070501E-05
  20       2.838992E-05     .000000E+00   -2.919078E-06
0excess resonance integrals
0                 resolved
0absorption      2.07412E+02
 fission          .00000E+00
- elapsed time    .13 min.
0 rd-147        mt=102                    updated 10/13/89            60147    temperature=  975.00
0 pm-147        mt=102                    updated 10/13/89            61147    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   145.653          temperature(kelvin)     =   975.000
0potential scatter sigma  =     5.093          lumped nuclear density  = 3.1414177E-06
0spin factor (g)          = 21589.500          lump dimension (a-bar)  = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 5.4357527E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 6.0646055E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs         res fiss        res scat
  12      -1.563805E-01     .000000E+00   -5.028190E-02
  13      -4.012225E-02     .000000E+00   -2.350455E-03
  14      -7.182008E+01     .000000E+00   -3.089703E+01
  15       4.130403E-02     .000000E+00    6.981774E-03
  16       1.697950E-02     .000000E+00    1.746737E-03
  17       1.369752E-02     .000000E+00    1.150408E-03
  18       1.253762E-02     .000000E+00    9.649074E-04
  19       6.999463E-04     .000000E+00    5.069173E-05
0excess resonance integrals
0                 resolved
0absorption      2.02910E+03
 fission          .00000E+00
- elapsed time    .13 min.
0 pm-148         mt= 102                                              61148    temperature=  975.00
0 sm-147        endf/b-v fission product   updated 10/13/89            62147    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   145.653          temperature(kelvin)     =   975.000
0potential scatter sigma  =     5.093          lumped nuclear density  = 6.6781757E-07
0spin factor (g)          =      .000          lump dimension (a-bar)  = 4.6812201E-01
0inner radius             = .0000000E+00       dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 2.5569811E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 2.8527958E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs         res fiss        res scat
  11       2.836913E-01     .000000E+00    1.112904E+00
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```
  12      1.088846E+00     .000000E+00   -1.408553E+00
  13     -2.806831E+00     .000000E+00   -1.302609E+00
  14     -2.406620E-01     .000000E+00   -1.391501E-03
  15      3.117676E-01     .000000E+00   -1.918673E-03
  16      7.287842E-03     .000000E+00   -3.798702E-04
  17      4.281479E-03     .000000E+00   -2.401535E-04
  18      3.510398E-03     .000000E+00   -1.997058E-04
  19      2.910600E-03     .000000E+00   -1.649439E-04
  20      8.434993E-04     .000000E+00   -4.626885E-05
0excess resonance integrals
0                resolved
0absorption      7.23525E+02
 fission          .00000E+00
- elapsed time    .15 min.
                          thermal scattering matrix number  3 at a temperature of    900.03 was selected.
0 sm-149        mt=102,103,107              updated 10/13/89            62149    temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   147.638          temperature(kelvin)      =   975.000
0potential scatter sigma  =     3.260          lumped nuclear density   = 8.0202490E-08
0spin factor (g)          = 10407.900          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 2.1291073E+06
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 2.3754198E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs          res fiss        res scat
  11      8.546618E-03     .000000E+00    3.071172E-02
  12     -5.400369E-02     .000000E+00   -1.796964E-01
  13      2.356363E-02     .000000E+00    2.899016E-03
  14      9.786990E-03     .000000E+00   -7.090896E-03
0excess resonance integrals
0                resolved
0absorption      8.04343E+02
 fission          .00000E+00
- elapsed time    .15 min.
0 sm-150        mt=102                      updated 10/13/89            62150    temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   148.629          temperature(kelvin)      =   975.000
0potential scatter sigma  =     5.162          lumped nuclear density   = 2.5441905E-06
0spin factor (g)          = 4376.420           lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 6.7117500E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 7.4882203E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs          res fiss        res scat
  10     -8.860412E-04     .000000E+00   -8.258277E-03
  11     -1.909252E-02     .000000E+00   -2.169535E-01
  12     -6.202067E-02     .000000E+00   -1.874718E-02
  13     -4.471614E+00     .000000E+00   -3.522457E+00
  14      1.065973E-04     .000000E+00   -6.409712E-05
0excess resonance integrals
0                resolved
0absorption      2.89862E+02
```

```
 fission          .00000E+00
- elapsed time    .15 min.
0 sm-151        mt=102,103,104,105,106,107     updated 10/13/89            62151     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   149.623              temperature(kelvin)      =   975.000
0potential scatter sigma  =     5.185              lumped nuclear density   = 3.3200570E-07
0spin factor (g)          = 75574.703              lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00          dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =   15.995               sigma(per absorber atom)= 5.1432759E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =  237.933               sigma(per absorber atom)= 5.7382925E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  14      -1.902656E-01     .000000E+00   -1.953556E-02
  15       1.489455E+01     .000000E+00    7.541747E-02
  16      -2.179166E+01     .000000E+00   -6.184455E-02
  17       1.737730E+02     .000000E+00    8.287368E-01
  18      -3.205274E+02     .000000E+00   -1.782191E+00
  19       6.255297E+01     .000000E+00    3.868173E-01
  20       1.141397E+00     .000000E+00   -1.408118E-04
  21      -7.117594E-02     .000000E+00    1.244059E-02
  22       6.952561E-02     .000000E+00    3.838921E-03
  23      -1.091915E-02     .000000E+00    3.374035E-04
0excess resonance integrals
0                 resolved
0absorption      2.0565BE+03
 fission          .00000E+00
- elapsed time    .15 min.
0 sm-152        mt=102,103,104,105,106,107     updated 10/13/89            62152     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   150.615              temperature(kelvin)      =   975.000
0potential scatter sigma  =     5.208              lumped nuclear density   = 1.2446013E-06
0spin factor (g)          =   863.594              lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00          dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =   15.995               sigma(per absorber atom)= 1.3720031E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =  237.933               sigma(per absorber atom)= 1.5307278E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
   9       2.402917E-06     .000000E+00    1.158824E-04
  10      -9.668040E-04     .000000E+00   -1.527281E-02
  11      -1.426155E-02     .000000E+00   -5.438628E-02
  12      -9.672706E-02     .000000E+00   -3.073028E-01
  13       4.225402E-02     .000000E+00    1.027737E-01
  14      -8.745422E+01     .000000E+00   -1.690672E+02
0excess resonance integrals
0                 resolved
0absorption      2.7977BE+03
 fission          .00000E+00
- elapsed time    .17 min.
0 eu-153        mt=102,103,104,105,106,107     updated 10/13/89            63153     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   151.607              temperature(kelvin)      =   975.000
0potential scatter sigma  =     9.731              lumped nuclear density   = 6.3078977E-07
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0spin factor (g)          = 12265.900              lump dimension (a-bar)    = 4.6812201E-01
0inner radius             = .0000000E+00           dancoff correction (c)    = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 2.7070775E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 3.0202547E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs          res fiss         res scat
  12      -2.772846E-01     .000000E+00   -5.409002E-02
  13      -1.013753E-01     .000000E+00   -2.071329E-03
  14      -6.824808E-01     .000000E+00    1.708121E-03
  15       2.409770E+00     .000000E+00   -2.694528E-02
  16      -3.294738E+00     .000000E+00    8.158251E-03
  17       1.505605E-01     .000000E+00   -3.437719E-03
  18       7.726888E-02     .000000E+00   -2.231196E-03
  19       5.055466E-02     .000000E+00   -1.541131E-03
  20      -1.253801E-01     .000000E+00   -1.275065E-03
0excess resonance integrals
0                  resolved
0absorption       1.35519E+03
 fission          .0000E+00
- elapsed time    .17 min.
0 eu-154        mt=102,103,104,105,106,107     updated 10/13/89          63154     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   152.601              temperature(kelvin)       =   975.000
0potential scatter sigma  =     9.731              lumped nuclear density    = 9.5298013E-08
0spin factor (g)          = 19135.801              lump dimension (a-bar)    = 4.6812201E-01
0inner radius             = .0000000E+00           dancoff correction (c)    = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 1.7918495E+06
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 1.9991453E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs          res fiss         res scat
  12      -3.879111E-01     .000000E+00   -6.058321E-02
  13      -3.050694E-01     .000000E+00   -2.464727E-02
  14       3.428014E-01     .000000E+00    1.488880E-02
  15       1.893024E-01     .000000E+00    2.110245E-02
  16       7.259678E+00     .000000E+00    9.253874E-02
  17      -1.438728E+02     .000000E+00   -1.895837E+00
  18       1.137163E+02     .000000E+00    1.859022E+00
  19      -1.014623E+02     .000000E+00    1.187256E+00
0excess resonance integrals
0                  resolved
0absorption       2.13692E+03
 fission          .0000E+00
- elapsed time    .18 min.
0 eu-155        mt=102,103,104,105,106,107     updated 10/13/89          63155     temperature=   975.00
0 gd-155        mt=102                         updated 10/13/89          64155     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   153.592              temperature(kelvin)       =   975.000
0potential scatter sigma  =     5.277              lumped nuclear density    = 1.1837075E-09
0spin factor (g)          = 12700.100              lump dimension (a-bar)    = 4.6812201E-01
0inner radius             = .0000000E+00           dancoff correction (c)    = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 1.4425835E+08
```

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0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 1.6094734E+08
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  12      -1.439291E+00     .000000E+00    -1.839456E-01
  13       1.541241E+00     .000000E+00     1.985186E-01
  14       2.190766E-01     .000000E+00     9.807291E-03
  15      -3.322711E-01     .000000E+00    -3.651623E-05
  16       1.477359E+00     .000000E+00    -4.148859E-03
  17       1.568654E-01     .000000E+00    -1.479120E-03
  18       9.605173E-02     .000000E+00    -1.078083E-03
  19       6.295319E-02     .000000E+00    -8.026669E-04
  20       1.670382E-02     .000000E+00     1.627042E-04
  21       .000000E+00      .000000E+00      .000000E+00
  22       .000000E+00      .000000E+00      .000000E+00
  23       .000000E+00      .000000E+00      .000000E+00
  24       .000000E+00      .000000E+00      .000000E+00
  25      -2.127761E+03     .000000E+00    -1.621977E+00
  26      -5.205660E+03     .000000E+00     1.961465E+00
  27      -1.659969E+03     .000000E+00     7.392578E-01
0excess resonance integrals
0                  resolved
0absorption      3.97057E+04
 fission          .00000E+00
-  elapsed time    .18 min.
0u-234 1043 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                    92234     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   232.029          temperature(kelvin)      =   975.000
0potential scatter sigma  =    10.021          lumped nuclear density   = 4.8493789E-06
0spin factor (g)          =  6948.450          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995          sigma(per absorber atom)= 3.5212695E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.955          sigma(per absorber atom)= 3.9274359E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  11      -2.320080E-02     .000000E+00    -6.766317E-02
  12      -1.891160E-01     .000000E+00    -7.924187E-02
  13       7.759874E-04     .000000E+00    -6.471546E-04
  14      -1.852598E+01     .000000E+00    -3.033657E+00
0excess resonance integrals
0                  resolved
0absorption      5.81870E+02
 fission          .00000E+00
-  elapsed time    .20 min.
0 uranium-235    endf/b-iv mat 1261          updated 10/13/89            92235     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   233.025          temperature(kelvin)      =   975.000
0potential scatter sigma  =    11.500          lumped nuclear density   = 4.9025129E-04
0spin factor (g)          = 15171.100          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995          sigma(per absorber atom)= 3.4831055E+02
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   238.049          sigma(per absorber atom)= 3.7379553E+02
```

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0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  12      -2.044447E+00    -1.275228E+00    -4.783008E-02
  13      -7.108612E+00    -3.537716E+00    -1.535470E-01
  14      -5.710854E+00    -3.502140E+00    -3.893792E-02
0excess resonance integrals
0                  resolved
0absorption       2.10693E+02
 fission          1.25499E+02
- elapsed time     .22 min.
0u-236 1163 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                    92236     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   234.017          temperature(kelvin)      =   975.000
0potential scatter sigma  =    10.995          lumped nuclear density   = 3.9825801E-05
0spin factor (g)          =  6328.490          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 4.2878804E+03
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.934          sigma(per absorber atom)= 4.7831025E+03
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  11      -1.949282E-01     .000000E+00    -4.880892E-01
  12      -1.041916E+00     .000000E+00    -7.155065E-01
  13      -6.303462E-02     .000000E+00    -3.415031E-03
  14      -3.580088E+01     .000000E+00    -3.132152E+00
0excess resonance integrals
0                  resolved
0absorption       2.87438E+02
 fission           .00000E+00
- elapsed time     .22 min.
0 uranium-238    endf/b-iv mat 1262          updated 10/13/89          92238     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   236.006          temperature(kelvin)      =   975.000
0potential scatter sigma  =    10.599          lumped nuclear density   = 2.1918545E-02
0spin factor (g)          =   656.527          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 7.7906489E+00
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   235.041          sigma(per absorber atom)= 3.3544329E-01
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
   9      -3.939976E-02     .000000E+00    -4.046975E-01
  10      -1.025897E+00    -1.750593E-05    -6.481733E+00
  11      -9.708024E+00     .000000E+00    -2.689807E+01
  12      -4.304811E+01     .000000E+00    -4.998776E+01
  13      -5.401412E+01     .000000E+00    -1.769151E+01
  14      -1.045006E+02     .000000E+00    -6.059761E+00
0excess resonance integrals
0                  resolved
0absorption       1.80080E+01
 fission          5.03969E-04
- elapsed time     .23 min.
```

```
0 neptunium-237  endf/b-iv mat 1263              updated 10/13/89              93237     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   235.012              temperature(kelvin)       =   975.000
0potential scatter sigma  =    10.500              lumped nuclear density    = 1.9794916E-06
0spin factor (g)          = 10100.800              lump dimension (a-bar)    = 4.6812201E-01
0inner radius             =  .0000000E+00          dancoff correction (c)    = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =   15.995               sigma(per absorber atom)= 8.6264414E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =  238.051               sigma(per absorber atom)= 9.2529891E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  11      -6.338531E-02    -2.012413E-06    -7.400325E-03
  12       3.148665E-02    -9.852385E-05     7.995239E-03
  13      -4.917675E-03     8.985276E-05    -4.406471E-04
  14      -4.483762E-02    -5.801127E-06    -1.160987E-03
0excess resonance integrals
0                 resolved
0absorption      2.93103E+02
 fission         1.38574E-01
- elapsed time     .27 min.
0pu-238 1050 sigo=5+4 newklacs p-3 295k f-1/e-m(1.+5)                          94238     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   236.167              temperature(kelvin)       =   975.000
0potential scatter sigma  =    10.890              lumped nuclear density    = 1.7734772E-07
0spin factor (g)          = 13130.600              lump dimension (a-bar)    = 4.6812201E-01
0inner radius             =  .0000000E+00          dancoff correction (c)    = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =   15.995               sigma(per absorber atom)= 9.6285250E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =  238.051               sigma(per absorber atom)= 1.0327856E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  11      -8.062604E-04    -1.198829E-04    -8.325950E-04
  12      -5.152005E-04    -5.715002E-05    -2.714376E-04
  13       4.091211E-01     7.547670E-02    -9.684728E-03
  14      -3.823655E-01    -6.990144E-02     8.539011E-03
0excess resonance integrals
0                 resolved
0absorption      8.25438E+01
 fission         9.08494E+00
- elapsed time     .27 min.
0 plutonium-239  endf/b-iv mat 1264              updated 10/13/89              94239     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   236.999              temperature(kelvin)       =   975.000
0potential scatter sigma  =    10.200              lumped nuclear density    = 8.2663486E-05
0spin factor (g)          =  6435.710              lump dimension (a-bar)    = 4.6812201E-01
0inner radius             =  .0000000E+00          dancoff correction (c)    = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =   15.995               sigma(per absorber atom)= 2.0657207E+03
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =  238.051               sigma(per absorber atom)= 2.2157563E+03
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
```

```
  11     -1.731143E-01   -6.962558E-02   -5.309264E-02
  12     -1.543933E+00   -5.794014E-01   -2.033134E-01
  13     -5.069869E+00   -2.983939E+00   -7.734127E-02
  14     -1.616615E+00   -8.598655E-01   -1.447852E-02
0excess resonance integrals
0                resolved
0absorption     3.09609E+02
 fission        1.73873E+02
-  elapsed time    .28 min.
0 plutonium-240  endf/b-iv mat 1265          updated 10/13/89          9424O     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   237.992          temperature(kelvin)      =   975.000
0potential scatter sigma  =    10.599          lumped nuclear density   = 1.1579618E-05
0spin factor (g)          =   669.244          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 1.4746573E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   238.051              sigma(per absorber atom)= 1.5817633E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
   9     -3.527370E-05   -8.454460E-07   -1.122160E-04
  10     -2.741197E-03   -1.699441E-04   -1.253630E-02
  11     -8.856678E-02   -5.120134E-04   -1.178721E-01
  12     -1.236512E+00   -6.752137E-03   -1.188553E+00
  13     -1.511770E-01   -9.269665E-04   -1.101984E-02
  14      .000000E+00     .000000E+00     .000000E+00
  15      1.744944E-02    3.330303E-06    3.451913E-03
  16      3.075249E+00    5.869248E-04    3.877850E-01
  17      4.904770E+02    9.360970E-02    4.406704E+01
  18     -6.409365E+03   -1.225256E+00   -5.070545E+02
  19      7.663346E+02    1.462583E-01    5.942957E+01
  20     -9.327890E+01   -1.780269E-02    1.798134E+00
0excess resonance integrals
0                resolved
0absorption     5.56424E+03
 fission        2.07910E+00
-  elapsed time    .30 min.
0 plutonium-241  endf/b-iv mat 1266          updated 10/13/89          9424l     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   238.978          temperature(kelvin)      =   975.000
0potential scatter sigma  =    10.939          lumped nuclear density   = 5.0548110E-06
0spin factor (g)          = 16402.100          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 3.3781617E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   238.051              sigma(per absorber atom)= 3.6235211E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  12      5.990875E-03    5.138614E-03    6.303210E-04
  13     -3.513053E-01   -2.733082E-01   -1.098470E-02
  14     -2.874569E-01   -1.940983E-01   -1.548980E-05
  15      1.794422E-02    1.608441E-02   -4.675214E-04
0excess resonance integrals
0                resolved
```

```
0absorption       5.08611E+02
 fission          4.26404E+02
- elapsed time     .32 min.
0 plutonium-242  endf/b-iv mat 1161            updated 10/13/89              94242     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   240.145          temperature(kelvin)       =   975.000
0potential scatter sigma  =    10.694          lumped nuclear density    = 3.4107089E-07
0spin factor (g)          =  6606.710          lump dimension (a-bar)    = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)    = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =   15.995           sigma(per absorber atom)= 5.0065744E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =  238.051           sigma(per absorber atom)= 5.3702075E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
  11     -7.845986E-04    .000000E+00   -2.272786E-03
  12     -1.841652E-02    .000000E+00   -3.615677E-02
  13      5.776821E-05    .000000E+00    4.300362E-06
  14      8.144961E-02    .000000E+00    1.525802E-02
  15     -6.458304E+00    .000000E+00   -5.533113E-01
  16      4.032914E-02    .000000E+00   -3.457235E-03
  17      1.550392E-02    .000000E+00   -1.848240E-03
  18      1.112569E-02    .000000E+00   -1.430698E-03
0excess resonance integrals
0                 resolved
0absorption       1.10788E+03
 fission          .00000E+00
- elapsed time     .32 min.
0am-241 1056 sigp=5+4 newklacs 218ngp p-3 293k                                  95241     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   238.950          temperature(kelvin)       =   975.000
0potential scatter sigma  =     9.511          lumped nuclear density    = 9.6635489E-08
0spin factor (g)          = 82058.203          lump dimension (a-bar)    = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)    = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =   15.995           sigma(per absorber atom)= 1.7670494E+06
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =  238.051           sigma(per absorber atom)= 1.8953921E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
  13      4.908578E-01    1.212019E-02    4.871396E-03
  14     -4.369514E-01   -1.113387E-02   -4.603611E-03
0excess resonance integrals
0                 resolved
0absorption       1.93465E+02
 fission          1.07605E+00
- elapsed time     .32 min.
0am-243 1057 218 gp wt f-1/e-m 090376 p3 293k                                   95243     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   240.940          temperature(kelvin)       =   975.000
0potential scatter sigma  =     9.511          lumped nuclear density    = 1.8468327E-08
0spin factor (g)          = 82052.602          lump dimension (a-bar)    = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)    = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =   15.995           sigma(per absorber atom)= 9.2460830E+06
0moderator-1 will be treated by the nordheim integral method.
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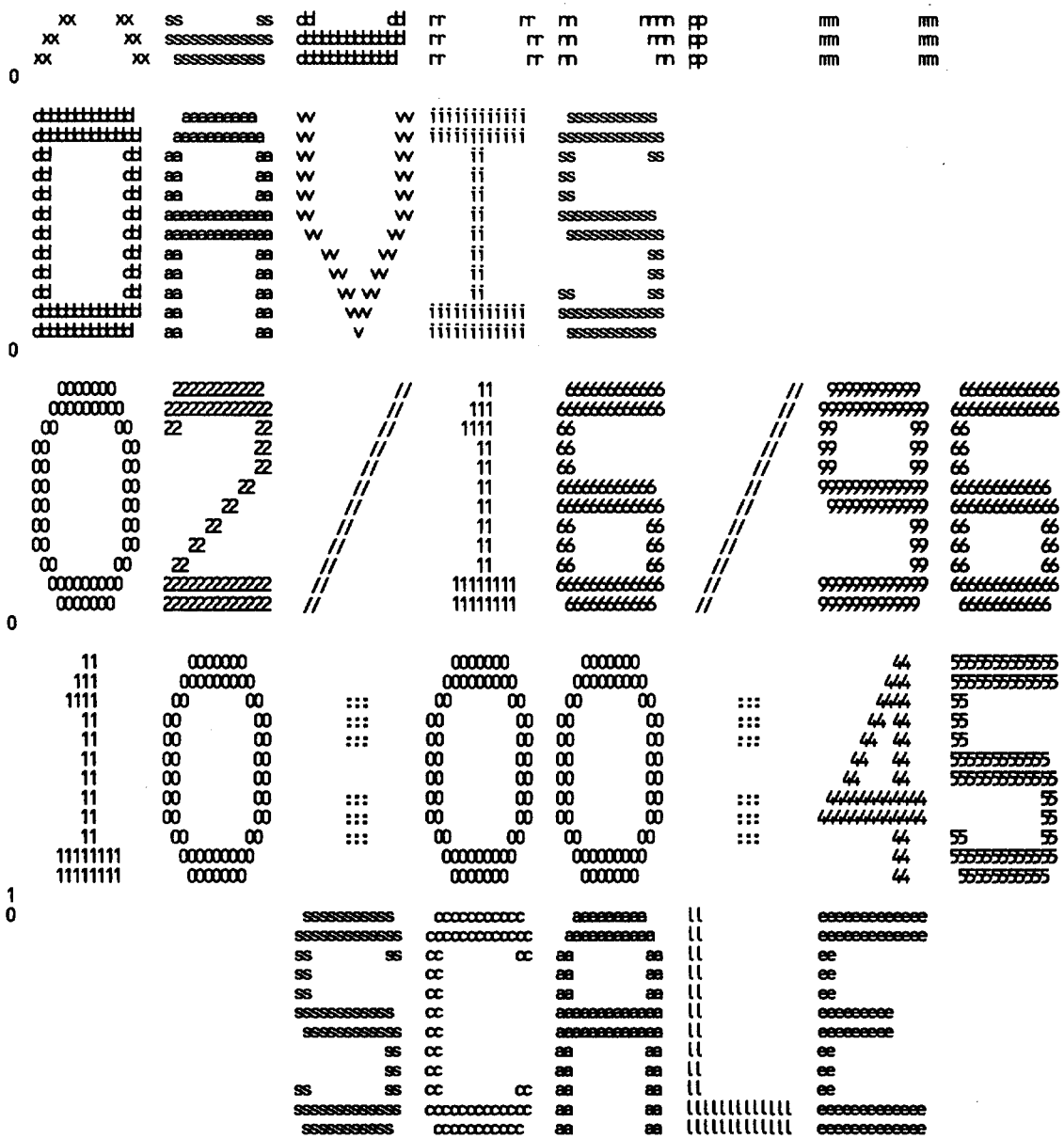
0mass of moderator-2    =   238.051              sigma(per absorber atom)= 9.9176360E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
  13     -6.806792E-03   .000000E+00   4.328656E-04
  14      2.134225E-02   .000000E+00   2.224311E-04
0excess resonance integrals
0                 resolved
0absorption     1.60150E+02
 fission         .00000E+00
- elapsed time     .32 min.
0 curium-244    endf/b-iv mat 1162          updated 10/13/89          96244    temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =  242.133           temperature(kelvin)      =   975.000
0potential scatter sigma  =   10.320           lumped nuclear density   = 1.0461749E-09
0spin factor (g)          = 5251.150           lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 1.6322288E+08
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   238.051              sigma(per absorber atom)= 1.7507795E+08
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
  11      2.553260E-04   6.986240E-06   3.015316E-04
  12      6.831913E-04   3.211379E-05   1.340608E-04
  13      2.708539E-03   1.329417E-04   7.121908E-04
  14      7.958634E-02   4.761576E-03   1.462926E-02
0excess resonance integrals
0                 resolved
0absorption     6.13898E+02
 fission        3.54218E+01
- elapsed time     .33 min.
- elapsed time     .33 min.
1      this xsdrn working tape was created 02/16/96 at 09:59:42
       the title of the parent case is as follows
       scale 4.2 - 27 group neutron burnup library
         based on endf-b version 4 data with endf-b version 5 fission products
           compiled for nrc      1/27/89
           tape id                         4321        number of nuclides                65
           number of neutron groups          27        number of gamma groups             0
           first thermal group               15        logical unit                       4
                                      table of contents
        1/v cross sections normalized to 1.0 at 0.0253 ev                         id        999
         hydrogen     endf/b-iv mat 1269/thrm1002    updated 10/13/89           id       1001
       b-10 1273 218grp 042375 p-3 293k                                          id       5010
         boron-11     endf/b-iv mat 1160             updated 10/13/89           id       5011
         oxygen-16    endf/b-iv mat 1276             updated 10/13/89           id       8016
         oxygen-16    endf/b-iv mat 1276             updated 10/13/89           id          6
         kr-83        mt=102,103,103,105,106,107     updated 10/13/89           id      36083
         kr-85           mt=  102                                               id      36085
         sr-90        mt=102                         updated 10/13/89           id      38090
          y-89        mt=102                         updated 10/13/89           id      39089
         zr-93           mt=  102                                               id      40093
         zr-94        mt=102                         updated 10/13/89           id      40094
         zr-95        mt=102                         updated 10/13/89           id      40095
         zircalloy    endf/b-iv mat 1284             updated 10/13/89           id      40302
         nb-94        mt=102                         updated 10/13/89           id      41094
```

```
      mo-95         mt=102                          updated 10/13/89          id    42095
      tc-99         mt=102                          updated 10/13/89          id    43099
      ru-101        mt=102                          updated 10/13/89          id    44101
      ru-106        mt=102                          updated 10/13/89          id    44106
      rh-103        mt=102                          updated 10/13/89          id    45103
      rh-105           mt=  102                                               id    45105
      pd-105        mt=102                          updated 10/13/89          id    46105
      pd-108        mt=102                          updated 10/13/89          id    46108
      silver-109    endf/b-iv mat 1139              updated 10/13/89          id    47109
      sb-124        mt=102                          updated 10/13/89          id    51124
      xe-131        mt=102,103,104,105,106          updated 10/13/89          id    54131
      xe-132        mt=102,103,104,105,106          updated 10/13/89          id    54132
      xenon-135     endf/b-iv mat 1294              updated 10/13/89          id    54135
      xe-136           mt=  102, 103, 104, 105, 107                           id    54136
      cesium-133    endf/b-iv mat 1141              updated 10/13/89          id    55133
      cs-134        mt=102                          updated 10/13/89          id    55134
      cs-135           mt=  102                                               id    55135
      cs-137        mt=102                          updated 10/13/89          id    55137
      ba-136        mt=102                          updated 10/13/89          id    56136
      la-139        mt=102                          updated 10/13/89          id    57139
      ce-144           mt=  102                                               id    58144
      pr-141        mt=102,103,104,105,106,107      updated 10/13/89          id    59141
      pr-143        mt=102                          updated 10/13/89          id    59143
      nd-143        mt=102                          updated 10/13/89          id    60143
      nd-145        mt=102                          updated 10/13/89          id    60145
      nd-147        mt=102                          updated 10/13/89          id    60147
      pm-147        mt=102                          updated 10/13/89          id    61147
      pm-148           mt=  102                                               id    61148
      sm-147        endf/b-v fission product        updated 10/13/89          id    62147
      sm-149        mt=102,103,107                  updated 10/13/89          id    62149
      sm-150        mt=102                          updated 10/13/89          id    62150
      sm-151        mt=102,103,104,105,106,107      updated 10/13/89          id    62151
      sm-152        mt=102,103,104,105,106,107      updated 10/13/89          id    62152
      eu-153        mt=102,103,104,105,106,107      updated 10/13/89          id    63153
      eu-154        mt=102,103,104,105,106,107      updated 10/13/89          id    63154
      eu-155        mt=102,103,104,105,106,107      updated 10/13/89          id    63155
      gd-155        mt=102                          updated 10/13/89          id    64155
     u-234 1043 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                      id    92234
      uranium-235   endf/b-iv mat 1261              updated 10/13/89          id    92235
     u-236 1163 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                      id    92236
      uranium-238   endf/b-iv mat 1262              updated 10/13/89          id    92238
      neptunium-237 endf/b-iv mat 1263              updated 10/13/89          id    93237
     pu-238 1050 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                     id    94238
      plutonium-239 endf/b-iv mat 1264              updated 10/13/89          id    94239
      plutonium-240 endf/b-iv mat 1265              updated 10/13/89          id    94240
      plutonium-241 endf/b-iv mat 1266              updated 10/13/89          id    94241
      plutonium-242 endf/b-iv mat 1161              updated 10/13/89          id    94242
     am-241 1056 sigo=5+4 newxlacs 218ngp p-3 293k                            id    95241
     am-243 1057 218 gp wt f-1/e-m 090376 p3 293k                             id    95243
      curium-244    endf/b-iv mat 1162              updated 10/13/89          id    96244
0       tape copy used     0 i/o's, and took     .00 seconds
1 xx       xx  ssssssssss   dddddddddd   rrrrrrrrrr    m        m  pppppppppp   mm        mm
   xx     xx   ssssssssssss dddddddddddd rrrrrrrrrrr   mm       m  ppppppppppp  mmm      mmm
    xx   xx    ss        ss dd        dd rr        rr  mmm      m  pp        pp mmmm    mmmm
     xx xx     ss           dd        dd rr        rr  m m      m  pp        pp mm mm  mm mm
      xxx      ss           dd        dd rr        rr  m  m     m  pp        pp mm  mmmm  mm
      xxx      ssssssssss   dd        dd rrrrrrrrrrr   m   m    m  ppppppppppp  mm   mm   mm
      xxx       ssssssssss  dd        dd rrrrrrrrrr    m    m   m  pppppppppp   mm    m   mm
     xx xx              ss  dd        dd rr    rr      m     m  m  pp           mm        mm
    xx   xx             ss  dd        dd rr     rr     m      m m  pp           mm        mm
```



```
*****************************************************************************
*****************************************************************************
*****************************************************************************
*****                                                                   *****
*****                 program verification information                  *****
*****                                                                   *****
*****              code system:    scale  version:    4.2               *****
*****                                                                   *****
*****************************************************************************
*****************************************************************************
*****                                                                   *****
*****                                                                   *****
*****              program:  c0c001                                     *****
*****                                                                   *****
*****        creation date:  04/27/95                                   *****
*****                                                                   *****
*****              library:  /neutronics/scale/exe                      *****
*****                                                                   *****
*****                                                                   *****
*****     this is not a   scale  configuration controlled code          *****
*****                                                                   *****
*****              jobname:  davis                                      *****
*****                                                                   *****
*****    date of execution:  02/16/96                                   *****
*****                                                                   *****
*****    time of execution:  10:00:45                                   *****
*****                                                                   *****
*****                                                                   *****
*****************************************************************************
*****************************************************************************
*****************************************************************************
1
                  560 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0      -1q array has      1 entries.
0       1q array has     15 entries.
0       2q array has     10 entries.
0       3q array has     12 entries.
0       4q array has      9 entries.
0       5q array has     12 entries.
0direct access unit  9 requires    12 blocks of length  704 for cross section mixing.
1                 560 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0general problem description data block
0                              general problem data

 ige  1/2/3 = plane/cylinder/sphere       2      isn  quadrature order               8
 izm  number of zones                     4      isct order of scattering            3
 im   number of spacial intervals        24      ievt 0/1/2/3/4/5/6=q/k/alpha/c/z/r/h  1
 ibl  0/1/2/3 = vacuum/refl/per/white     1      iim  inner iteration maximum       20
 ibr  right boundary condition            3      icm  outer iteration maximum       25
 mxx  number of mixtures                  3      iclc -1/0/n--flat res/sn/opt        0
 ms   mixing table length                65      ith  0/1 = forward/adjoint          0
 igm  number of energy groups            27      iflu not used(always wgtd)          0
 nng  number of neutron groups           27      iprt -2/-1/0/n=mixture xsec print  -2
 ngg  number of gamma groups              0      id1  0/1/2/3=no/prt nd/pch n/both  53
 iftg number of first thermal group      15      ipbt -1/0/1=none/fine/all bal. prt  0
0                              special options
```

```
 ifg  0/1 = none/weighting calculation   1        ipn  0/1/2 diff. coef. param          0
 iqm  volumetric sources (0/n=no/yes)    0        idfm 0/1 = none/density factors 38*   1
 ipm  boundary sources (0/n=no/yes)      0        iaz  0/n = none/n activities by zone  0
 ifn  0/1/2 = input 33*/34*/use last    53        iai  0/1=none/activities by interval  0
 itmx maximum time (minutes)            10        ifct 0/1=no/yes upscatter scaling     0
 idt1 0/1/2/3=no/xsect/srce/flux--out    0        ipvt 0/1/2=no/k/alpha parametric srch 0
 isx  broad group fluxes                 0        isen outer iteration acceleration     0
 ibln activity data unit                 0        nbnd band rebaln parameter            0
 jbkl 0/1/2 buckling geometry            0
0                                weighting data (ifg=1)

 icon -1/0/1=cell/zone/region weight    -1        ihtf total xsect psn in brd gp tables 3
 igmf number of broad groups            27        ndsf psn g-g or file number           4
 itp  0/10/20/30/40 0/c/e/ac/a           0        nusf table length or max order        4
 ipp  -2/-1/0/n=wgted xsect print       -2        mscm extra 1-d x-sect positions       0
 iap  -1/n anisn xsect print            -1
0                              floating point parameters

 eps  overall convergence       1.00000E-04    dy   cyl/pla ht for buckling     .00000E+00
 ptc  point convergence         1.00000E-04    dz   plane depth for buckling    .00000E+00
 xnf  normalization factor      1.00000E+00    vsc  void streaming correction   .00000E+00
 ev   eigenvalue guess           .00000E+00    pv   ipvt=1/2--k/alpha           1.00000E+00
 evm  eigenvalue modifier        .00000E+00    eql  ev change eps for search    1.00000E-03
 bf   buckling factor=1.420892  1.42089E+00    xnpm new param mod for search    7.50000E-01
    this case will require       2535 locations for mixing
    this case has been allocated 200000 locations
1                    560 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0        13q array has      65 entries.
0        14q array has      65 entries.
0        15q array has      65 entries.
0                                data block 2 (mixing table, etc.)
```

	nuclides on tape	cccc identification	mixture	mixing table component	atom density	extra xsect id's
1	999		1	92235	4.90251E-04	
2	1001		1	92234	4.84938E-06	
3	5010		1	92236	3.98238E-05	
4	5011		1	92238	2.19185E-02	
5	8016		1	8016	4.55359E-02	
6	6		3	6	2.09710E-02	
7	36083		1	36083	9.77039E-07	
8	36085		1	36085	4.70956E-07	
9	38090		1	38090	1.06191E-05	
10	39089		1	39089	7.90165E-06	
11	40093		1	42095	9.68029E-06	
12	40094		1	40093	8.21428E-06	
13	40095		1	40094	1.27843E-05	
14	40302		1	40095	2.07596E-06	
15	41094		1	41094	5.48977E-12	
16	42095		1	43099	1.24470E-05	
17	43099		1	45103	6.47551E-06	
18	44101		1	45105	1.88693E-08	
19	44106		1	44101	1.10665E-05	
20	45103		1	44106	1.65007E-06	
21	45105		1	46105	3.81543E-06	
22	46105		1	46108	9.30327E-07	
23	46108		1	47109	6.68335E-07	
24	47109		1	51124	1.62036E-10	
25	51124		1	54131	5.77241E-06	
26	54131		1	54132	1.00606E-05	
27	54132		1	54135	6.65420E-09	

28	54135	1	54136	2.10435E-05
29	54136	1	55134	4.21443E-07
30	55133	1	55135	6.63814E-06
31	55134	1	55137	1.31904E-05
32	55135	1	56136	8.15114E-08
33	55137	1	57139	1.31073E-05
34	56136	1	59141	1.09870E-05
35	57139	1	59143	3.85024E-07
36	58144	1	58144	5.87019E-06
37	59141	1	60143	1.06631E-05
38	59143	1	60145	7.73967E-06
39	60143	1	61147	3.14142E-06
40	60145	1	61148	8.83978E-09
41	60147	1	60147	1.31597E-07
42	61147	1	62147	6.67818E-07
43	61148	1	62149	8.02025E-08
44	62147	1	62150	2.54419E-06
45	62149	1	62151	3.32006E-07
46	62150	1	62152	1.24460E-06
47	62151	1	64155	1.18371E-09
48	62152	1	63153	6.30790E-07
49	63153	1	63154	9.52980E-08
50	63154	1	63155	7.31344E-08
51	63155	2	40302	4.25156E-02
52	64155	3	1001	4.19420E-02
53	92234	3	5010	3.81515E-06
54	92235	3	5011	1.54884E-05
55	92236	1	55133	1.36295E-05
56	92238	1	95237	1.97949E-06
57	95237	1	94238	1.77348E-07
58	94238	1	94239	8.26635E-05
59	94239	1	94240	1.15796E-05
60	94240	1	94241	5.05481E-06
61	94241	1	94242	3.41071E-07
62	94242	1	95241	9.66355E-08
63	95241	1	95243	1.84683E-08
64	95243	1	96244	1.04617E-09
65	96244	1	999	1.00000E-20

- elapsed time .00 min.
0 21649 locations will be used
0 35q array has 25 entries.
0 36q array has 24 entries.
0 38q array has 24 entries.
0 39q array has 4 entries.
0 40q array has 4 entries.
0 47q array has 27 entries.
0 51q array has 27 entries.
1 560 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp

neutron group parameters

0 gp	energy boundaries	lethargy boundaries	weighted velocities	broad gp numbers	calc type	group band	right albedo	left albedo
1	2.00000E+07	-6.93147E-01	4.60581E+09	1	0	1	1.00000E+00	
2	6.43400E+06	4.40989E-01	2.88737E+09	2	0	2	1.00000E+00	
3	3.00000E+06	1.20397E+00	2.12201E+09	3	0	3	1.00000E+00	
4	1.85000E+06	1.68740E+00	1.75673E+09	4	0	4	1.00000E+00	
5	1.40000E+06	1.96611E+00	1.46535E+09	5	0	5	1.00000E+00	
6	9.00000E+05	2.40795E+00	1.06620E+09	6	0	6	1.00000E+00	
7	4.00000E+05	3.21888E+00	6.07557E+08	7	0	7	1.00000E+00	
8	1.00000E+05	4.60517E+00	2.72415E+08	8	0	8	1.00000E+00	
9	1.70000E+04	6.37713E+00	1.13526E+08	9	0	9	1.00000E+00	

10	3.00000E+03	8.11173E+00	4.82126E+07	10	0	10	1.00000E+00
11	5.50000E+02	9.80818E+00	2.05946E+07	11	0	11	1.00000E+00
12	1.00000E+02	1.15129E+01	1.01036E+07	12	0	12	1.00000E+00
13	3.00000E+01	1.27169E+01	5.69595E+06	13	0	13	1.00000E+00
14	1.00000E+01	1.38155E+01	3.20957E+06	14	0	14	1.00000E+00
15	3.04999E+00	1.50030E+01	2.10601E+06	15	0	15	1.00000E+00
16	1.77000E+00	1.55471E+01	1.70522E+06	16	0	16	1.00000E+00
17	1.29999E+00	1.58657E+01	1.52545E+06	17	0	17	1.00000E+00
18	1.12999E+00	1.59959E+01	1.42867E+06	18	0	18	1.00000E+00
19	1.00000E+00	1.61181E+01	1.31002E+06	19	0	19	1.00000E+00
20	8.00000E-01	1.63412E+01	9.05898E+05	20	0	20	1.00000E+00
21	4.00000E-01	1.70344E+01	8.17974E+05	21	0	21	1.00000E+00
22	3.25000E-01	1.72420E+01	6.90070E+05	22	0	22	1.00000E+00
23	2.25000E-01	1.76098E+01	4.86933E+05	23	0	23	1.00000E+00
24	9.99999E-02	1.84207E+01	3.57766E+05	24	0	24	1.00000E+00
25	5.00000E-02	1.91138E+01	2.71895E+05	25	0	25	1.00000E+00
26	3.00000E-02	1.96247E+01	1.87283E+05	26	0	26	1.00000E+00
27	1.00000E-02	2.07233E+01	8.88201E+04	27	0	27	1.00000E+00
28	1.00000E-05	2.76310E+01					

1 560 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp

0

	mixture by zone	order p(l) by zone	activity table matl no.	reaction	quadrature constants weights	directions	refl direc	wt x cos
1	1	3			0	-2.79004E-01	3	0
2	1	3			5.06143E-02	-1.97286E-01	3	-9.98548E-03
3	2	3			5.06143E-02	1.97286E-01	2	9.98548E-03
4	3	3			0	-6.04419E-01	8	0
5					5.55953E-02	-5.58410E-01	8	-3.10450E-02
6					5.55953E-02	-2.31301E-01	7	-1.28593E-02
7					5.55953E-02	2.31301E-01	6	1.28593E-02
8					5.55953E-02	5.58410E-01	5	3.10450E-02
9					0	-8.50774E-01	15	0
10					5.22844E-02	-8.21784E-01	15	-4.29665E-02
11					5.22844E-02	-6.01588E-01	14	-3.14537E-02
12					5.22844E-02	-2.20196E-01	13	-1.15128E-02
13					5.22844E-02	2.20196E-01	12	1.15128E-02
14					5.22844E-02	6.01588E-01	11	3.14537E-02
15					5.22844E-02	8.21784E-01	10	4.29665E-02
16					0	-9.83052E-01	24	0
17					4.53355E-02	-9.64143E-01	24	-4.37099E-02
18					4.53355E-02	-8.17361E-01	23	-3.70655E-02
19					4.53355E-02	-5.46143E-01	22	-2.47597E-02
20					4.53355E-02	-1.91780E-01	21	-8.69444E-03
21					4.53355E-02	1.91780E-01	20	8.69444E-03
22					4.53355E-02	5.46143E-01	19	2.47597E-02
23					4.53355E-02	8.17361E-01	18	3.70655E-02
24					4.53355E-02	9.64143E-01	17	4.37099E-02

0constants for p(3) scattering

0angl	set 1	set 2	set 3	set 4	set 5
1	-2.79004E-01	8.83236E-01	6.74143E-02	-6.16919E-01	-1.71701E-02
2	-1.97286E-01	8.83236E-01	.00000E+00	-4.36228E-01	1.21411E-02
3	1.97286E-01	8.83236E-01	.00000E+00	4.36228E-01	-1.21411E-02
4	-6.04419E-01	4.52016E-01	3.16379E-01	-8.04435E-01	-1.74564E-01
5	-5.58410E-01	4.52016E-01	2.23714E-01	-7.43201E-01	-6.68028E-02
6	-2.31301E-01	4.52016E-01	-2.23713E-01	-3.07844E-01	1.61276E-01
7	2.31301E-01	4.52016E-01	-2.23713E-01	3.07844E-01	-1.61276E-01
8	5.58410E-01	4.52016E-01	2.23713E-01	7.43201E-01	6.68028E-02
9	-8.50774E-01	-8.57235E-02	6.26843E-01	-1.98456E-01	-4.86835E-01
10	-8.21784E-01	-8.57235E-02	5.42862E-01	-1.91694E-01	-3.44245E-01
11	-6.01588E-01	-8.57235E-02	.00000E+00	-1.40830E-01	3.44244E-01
12	-2.20196E-01	-8.57235E-02	-5.42862E-01	-5.13643E-02	3.44245E-01

13	2.20196E-01	-8.57235E-02	-5.42852E-01	5.13643E-02	-3.44245E-01
14	6.01588E-01	-8.57235E-02	.00000E+00	1.40330E-01	-3.44245E-01
15	8.21784E-01	-8.57235E-02	5.42852E-01	1.91694E-01	3.44245E-01
16	-9.83032E-01	-4.49528E-01	8.36885E-01	5.00703E-01	-7.51005E-01
17	-9.64143E-01	-4.49528E-01	7.73181E-01	4.91083E-01	-6.24438E-01
18	-8.17361E-01	-4.49528E-01	3.20262E-01	4.16320E-01	1.46514E-01
19	-5.46143E-01	-4.49528E-01	-3.20262E-01	2.78176E-01	7.36575E-01
20	-1.91780E-01	-4.49528E-01	-7.73181E-01	9.76824E-02	4.17236E-01
21	1.91780E-01	-4.49528E-01	-7.73181E-01	-9.76824E-02	-4.17236E-01
22	5.46143E-01	-4.49528E-01	-3.20262E-01	-2.78176E-01	-7.36575E-01
23	8.17361E-01	-4.49528E-01	3.20262E-01	-4.16320E-01	-1.46514E-01
24	9.64143E-01	-4.49528E-01	7.73181E-01	-4.91083E-01	6.24438E-01

1 int	radii	mid pts	zone no.	areas	volumes	dens fact	radius mod	spec(int)
1	0	1.29551E-02	1	0	2.10906E-03	1.00000E+00	0	
2	2.59102E-02	4.33406E-02	1	1.62798E-01	9.49318E-03	1.00000E+00	0	
3	6.07710E-02	8.75100E-02	1	3.81835E-01	2.94045E-02	1.00000E+00	0	
4	1.14249E-01	1.74155E-01	1	7.17848E-01	1.31104E-01	1.00000E+00	0	
5	2.34061E-01	2.93967E-01	1	1.47065E+00	2.21299E-01	1.00000E+00		
6	3.53873E-01	3.80612E-01	1	2.22345E+00	1.27890E-01	1.00000E+00		
7	4.07351E-01	4.24781E-01	1	2.55946E+00	9.30429E-02	1.00000E+00		
8	4.42212E-01	4.55167E-01	1	2.77850E+00	7.41004E-02	1.00000E+00		
9	4.68122E-01	4.68814E-01	2	2.94130E+00	4.07946E-03	0		
10	4.69507E-01	4.71481E-01	2	2.95000E+00	1.16988E-02	0		
11	4.73456E-01	4.75431E-01	2	2.97481E+00	1.17968E-02	0		
12	4.77405E-01	4.78098E-01	2	2.99962E+00	4.16023E-03	0		
13	4.78790E-01	4.83159E-01	3	3.00833E+00	2.65268E-02	1.00000E+00		
14	4.87528E-01	4.99987E-01	3	3.06323E+00	7.82768E-02	1.00000E+00		
15	5.12445E-01	5.24903E-01	3	3.21979E+00	8.21777E-02	1.00000E+00		
16	5.37362E-01	5.41731E-01	3	3.37634E+00	2.97427E-02	1.00000E+00		
17	5.46100E-01	5.53513E-01	4	3.43125E+00	5.15631E-02	1.00000E+00		
18	5.60926E-01	5.70900E-01	4	3.52440E+00	7.15548E-02	1.00000E+00		
19	5.80874E-01	5.96175E-01	4	3.64974E+00	1.14628E-01	1.00000E+00		
20	6.11475E-01	6.45755E-01	4	3.84201E+00	2.78169E-01	1.00000E+00		
21	6.80034E-01	7.14313E-01	4	4.27278E+00	3.07702E-01	1.00000E+00		
22	7.48592E-01	7.63893E-01	4	4.70354E+00	1.46875E-01	1.00000E+00		
23	7.79193E-01	7.89167E-01	4	4.89582E+00	9.89116E-02	1.00000E+00		
24	7.99141E-01	8.06554E-01	4	5.02115E+00	7.51357E-02	1.00000E+00		
25	8.13968E-01			5.11431E+00				

- elapsed time .00 min.

1 outer iter	inner iters	1 - balance	eigenvalue	1 - source ratio	1 - scatter ratio	1 - upscat ratio	search parameter	time (min)
1	134	1.17436E-05	1.07271E+00	-8.01027E-02	1.00000E+00	-2.70213E-02	.00000E+00	.0000
2	209	-9.52064E-06	1.08075E+00	-1.44108E-03	-8.42885E-03	-3.60698E-03	.00000E+00	.0000
3	269	1.26496E-05	1.08152E+00	-2.11928E-04	-1.04968E-03	-7.90523E-04	.00000E+00	.0000
4	314	3.15023E-06	1.08186E+00	-4.38725E-05	-2.33586E-04	-1.69522E-04	.00000E+00	.0167
5	343	-1.49547E-05	1.08211E+00	-9.74334E-06	-4.97663E-05	-3.29620E-05	.00000E+00	.0167

grp to grp	inner iters	mfd int.	max. flux difference	msf int.	max. scale factor	coarse mesh
1	1	1	1.84055E-08	24	1.00000E+00	1
2	1	1	1.97450E-08	24	1.00000E+00	1
3	1	1	1.70296E-08	24	1.00000E+00	1
4	1	1	1.49748E-08	24	1.00000E+00	1
5	1	1	8.71266E-09	24	1.00000E+00	1
6	1	1	3.09274E-09	24	1.00000E+00	1
7	1	2	1.84924E-09	24	1.00000E+00	1
8	1	24	1.01951E-09	24	1.00000E+00	1
9	1	1	1.96840E-09	24	1.00000E+00	1
10	1	1	1.75084E-09	24	1.00000E+00	1
11	1	1	1.78588E-09	24	1.00000E+00	1
12	1	24	3.26841E-09	24	1.00000E+00	1

13	13	1	24	4.40522E-09	24	1.00000E+00	1	
14	14	1	24	4.21909E-09	24	1.00000E+00	1	
15	15	1	24	3.79112E-05	24	9.99977E-01	1	
16	16	1	24	4.69885E-05	24	9.99982E-01	1	
17	17	1	24	6.01809E-05	24	9.99989E-01	1	
18	18	1	18	2.16487E-05	24	9.99959E-01	1	
19	19	1	24	5.91300E-05	24	9.99984E-01	1	
20	20	1	24	4.62845E-05	24	9.99967E-01	1	
21	21	1	18	2.49877E-05	24	9.99945E-01	1	
22	22	1	24	4.22500E-05	24	9.99989E-01	1	
23	23	1	24	1.98220E-06	24	1.00000E+00	1	
24	24	1	2	9.31992E-06	24	1.00001E+00	1	
25	25	1	24	1.63619E-05	24	1.00000E+00	1	
26	26	1	1	1.06731E-05	24	9.99996E-01	2	
27	27	1	2	4.91808E-06	24	1.00000E+00	2	

6 370 -3.35889E-07 1.08195E+00 -2.18376E-06 -9.78602E-06 -6.60634E-06 .00000E+00 .0167

final monitor

lambda 1.08195E+00 production/absorption 1.08195E+00 angular flux on 16

- elapsed time .02 min.

1 560 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp

0 int. zone number radius int. midpoint area volume prod density

1	1	.00000E+00	1.29551E-02	.00000E+00	2.10906E-03	3.16633E-03
2	1	2.59102E-02	4.33406E-02	1.62798E-01	9.49318E-03	1.42456E-02
3	1	6.07710E-02	8.75100E-02	3.81835E-01	2.94045E-02	4.42066E-02
4	1	1.14249E-01	1.74155E-01	7.17848E-01	1.31104E-01	1.98987E-01
5	1	2.34061E-01	2.95967E-01	1.47065E+00	2.21299E-01	3.43822E-01
6	1	3.53873E-01	3.80612E-01	2.22345E+00	1.27890E-01	2.03851E-01
7	1	4.07351E-01	4.24781E-01	2.55946E+00	9.30429E-02	1.51156E-01
8	1	4.42212E-01	4.55167E-01	2.77850E+00	7.41004E-02	1.22515E-01
9	2	4.68122E-01	4.68814E-01	2.94130E+00	4.07946E-03	.00000E+00
10	2	4.69507E-01	4.71481E-01	2.95000E+00	1.16988E-02	.00000E+00
11	2	4.73456E-01	4.75431E-01	2.97481E+00	1.17968E-02	.00000E+00
12	2	4.77405E-01	4.78098E-01	2.99962E+00	4.16023E-03	.00000E+00
13	3	4.78790E-01	4.83159E-01	3.00833E+00	2.65268E-02	.00000E+00
14	3	4.87528E-01	4.99387E-01	3.06323E+00	7.82768E-02	.00000E+00
15	3	5.12445E-01	5.24903E-01	3.21979E+00	8.21777E-02	.00000E+00
16	3	5.37362E-01	5.41731E-01	3.37634E+00	2.97427E-02	.00000E+00
17	4	5.46100E-01	5.53513E-01	3.43125E+00	5.15631E-02	.00000E+00
18	4	5.60926E-01	5.70900E-01	3.52440E+00	7.15548E-02	.00000E+00
19	4	5.80874E-01	5.98175E-01	3.69974E+00	1.14628E-01	.00000E+00
20	4	6.11475E-01	6.45755E-01	3.84201E+00	2.78169E-01	.00000E+00
21	4	6.80034E-01	7.14313E-01	4.27278E+00	3.07702E-01	.00000E+00
22	4	7.48592E-01	7.63893E-01	4.70854E+00	1.46875E-01	.00000E+00
23	4	7.79195E-01	7.89167E-01	4.89582E+00	9.89116E-02	.00000E+00
24	4	7.99141E-01	8.06554E-01	5.02115E+00	7.51357E-02	.00000E+00
25		8.13968E-01		5.11431E+00		

1 560 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp

0 total flux

0 int.	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	1.77256E-01	1.32813E+00	1.68059E+00	1.04172E+00	1.57595E+00	3.03114E+00	2.90546E+00	2.08063E+00
2	1.77319E-01	1.32876E+00	1.68142E+00	1.04222E+00	1.57665E+00	3.03244E+00	2.90613E+00	2.08069E+00
3	1.77263E-01	1.32814E+00	1.68064E+00	1.04174E+00	1.57586E+00	3.03083E+00	2.90510E+00	2.08050E+00
4	1.76865E-01	1.32388E+00	1.67519E+00	1.03842E+00	1.57058E+00	3.02033E+00	2.89878E+00	2.07944E+00
5	1.75833E-01	1.31295E+00	1.66134E+00	1.03008E+00	1.55730E+00	2.99433E+00	2.88322E+00	2.07684E+00
6	1.74643E-01	1.30044E+00	1.64574E+00	1.02064E+00	1.54254E+00	2.96584E+00	2.86626E+00	2.07395E+00
7	1.73694E-01	1.29066E+00	1.63371E+00	1.01349E+00	1.53144E+00	2.94482E+00	2.85385E+00	2.07178E+00
8	1.72753E-01	1.28113E+00	1.62217E+00	1.00674E+00	1.52110E+00	2.92562E+00	2.84261E+00	2.06973E+00
9	1.72238E-01	1.27597E+00	1.61597E+00	1.00315E+00	1.51567E+00	2.91563E+00	2.83681E+00	2.06865E+00
10	1.72131E-01	1.27498E+00	1.61473E+00	1.00246E+00	1.51467E+00	2.91384E+00	2.83582E+00	2.06846E+00
11	1.71973E-01	1.27342E+00	1.61295E+00	1.00147E+00	1.51325E+00	2.91130E+00	2.83442E+00	2.06817E+00

12	1.71870E-01	1.27243E+00	1.61178E+00	1.00083E+00	1.51233E+00	2.90967E+00	2.83353E+00	2.06798E+00
13	1.71677E-01	1.27058E+00	1.60956E+00	9.99585E-01	1.51052E+00	2.90623E+00	2.83160E+00	2.06760E+00
14	1.71152E-01	1.26533E+00	1.60304E+00	9.95751E-01	1.50471E+00	2.89496E+00	2.82517E+00	2.06656E+00
15	1.70564E-01	1.25897E+00	1.59465E+00	9.90433E-01	1.49631E+00	2.87831E+00	2.81558E+00	2.06543E+00
16	1.70276E-01	1.25545E+00	1.58963E+00	9.86962E-01	1.49058E+00	2.86676E+00	2.80887E+00	2.06491E+00
17	1.70138E-01	1.25343E+00	1.58652E+00	9.84632E-01	1.48661E+00	2.85880E+00	2.80420E+00	2.06477E+00
18	1.69956E-01	1.25082E+00	1.58253E+00	9.81660E-01	1.48154E+00	2.84882E+00	2.79833E+00	2.06463E+00
19	1.69730E-01	1.24772E+00	1.57791E+00	9.78296E-01	1.47586E+00	2.83767E+00	2.79178E+00	2.06440E+00
20	1.69426E-01	1.24370E+00	1.57203E+00	9.74080E-01	1.46878E+00	2.82382E+00	2.78361E+00	2.06407E+00
21	1.69218E-01	1.24090E+00	1.56790E+00	9.71095E-01	1.46376E+00	2.81400E+00	2.77792E+00	2.06397E+00
22	1.69219E-01	1.24077E+00	1.56760E+00	9.70813E-01	1.46324E+00	2.81298E+00	2.77748E+00	2.06420E+00
23	1.69296E-01	1.24163E+00	1.56873E+00	9.71542E-01	1.46441E+00	2.81528E+00	2.77896E+00	2.06448E+00
24	1.69384E-01	1.24264E+00	1.57009E+00	9.72439E-01	1.46587E+00	2.81813E+00	2.78078E+00	2.06475E+00

0 int.	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	1.58702E+00	1.44599E+00	1.30507E+00	7.95512E-01	6.71182E-01	5.87528E-01	3.70105E-01	2.04382E-01
2	1.58694E+00	1.44589E+00	1.30487E+00	7.95281E-01	6.70971E-01	5.87241E-01	3.70074E-01	2.04359E-01
3	1.58713E+00	1.44610E+00	1.30533E+00	7.95829E-01	6.71429E-01	5.87957E-01	3.70151E-01	2.04404E-01
4	1.58816E+00	1.44733E+00	1.30797E+00	7.98909E-01	6.74040E-01	5.91827E-01	3.70574E-01	2.04662E-01
5	1.59075E+00	1.45033E+00	1.31447E+00	8.06515E-01	6.80486E-01	6.01479E-01	3.71595E-01	2.05292E-01
6	1.59363E+00	1.45361E+00	1.32158E+00	8.14890E-01	6.87572E-01	6.12163E-01	3.72694E-01	2.05975E-01
7	1.59582E+00	1.45601E+00	1.32681E+00	8.21098E-01	6.92817E-01	6.20137E-01	3.73485E-01	2.06482E-01
8	1.59789E+00	1.45819E+00	1.33158E+00	8.26798E-01	6.97627E-01	6.27489E-01	3.74189E-01	2.06939E-01
9	1.59899E+00	1.45931E+00	1.33404E+00	8.29760E-01	7.00126E-01	6.31313E-01	3.74551E-01	2.07175E-01
10	1.59919E+00	1.45950E+00	1.33444E+00	8.30236E-01	7.00535E-01	6.31923E-01	3.74612E-01	2.07216E-01
11	1.59947E+00	1.45976E+00	1.33501E+00	8.30917E-01	7.01118E-01	6.32795E-01	3.74695E-01	2.07274E-01
12	1.59966E+00	1.45998E+00	1.33537E+00	8.31357E-01	7.01496E-01	6.33360E-01	3.74755E-01	2.07312E-01
13	1.60008E+00	1.46027E+00	1.33612E+00	8.32255E-01	7.02268E-01	6.34513E-01	3.74871E-01	2.07388E-01
14	1.60106E+00	1.46138E+00	1.33851E+00	8.35064E-01	7.04683E-01	6.38123E-01	3.75243E-01	2.07629E-01
15	1.60220E+00	1.46296E+00	1.34188E+00	8.38940E-01	7.08014E-01	6.43096E-01	3.75771E-01	2.07962E-01
16	1.60273E+00	1.46401E+00	1.34410E+00	8.41440E-01	7.10162E-01	6.46296E-01	3.76120E-01	2.08177E-01
17	1.60308E+00	1.46480E+00	1.34576E+00	8.43278E-01	7.11708E-01	6.48629E-01	3.76309E-01	2.08315E-01
18	1.60346E+00	1.46587E+00	1.34802E+00	8.45791E-01	7.13803E-01	6.51808E-01	3.76518E-01	2.08491E-01
19	1.60401E+00	1.46708E+00	1.35060E+00	8.48682E-01	7.16220E-01	6.55472E-01	3.76763E-01	2.08698E-01
20	1.60477E+00	1.46862E+00	1.35388E+00	8.52367E-01	7.19299E-01	6.60142E-01	3.77061E-01	2.08956E-01
21	1.60534E+00	1.46972E+00	1.35622E+00	8.54994E-01	7.21465E-01	6.63449E-01	3.77208E-01	2.09115E-01
22	1.60540E+00	1.46982E+00	1.35644E+00	8.55225E-01	7.21609E-01	6.63707E-01	3.77117E-01	2.09092E-01
23	1.60525E+00	1.46955E+00	1.35585E+00	8.54542E-01	7.20998E-01	6.62816E-01	3.76970E-01	2.09013E-01
24	1.60506E+00	1.46921E+00	1.35512E+00	8.53700E-01	7.20258E-01	6.61726E-01	3.76822E-01	2.08927E-01

0 int.	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	8.44235E-02	4.40822E-02	1.26326E-01	4.31233E-01	1.11295E-01	1.89316E-01	6.92956E-01	5.05696E-01
2	8.43974E-02	4.40589E-02	1.26282E-01	4.31129E-01	1.11225E-01	1.89182E-01	6.92536E-01	5.05349E-01
3	8.44475E-02	4.42477E-02	1.26374E-01	4.31332E-01	1.11413E-01	1.89773E-01	6.93574E-01	5.06328E-01
4	8.47397E-02	4.51692E-02	1.26900E-01	4.32512E-01	1.12444E-01	1.92806E-01	6.99364E-01	5.11670E-01
5	8.54635E-02	4.75197E-02	1.28186E-01	4.35412E-01	1.15019E-01	2.00427E-01	7.13720E-01	5.24952E-01
6	8.62611E-02	5.02350E-02	1.29583E-01	4.38580E-01	1.17893E-01	2.09044E-01	7.29600E-01	5.39721E-01
7	8.68531E-02	5.23698E-02	1.30602E-01	4.40906E-01	1.20059E-01	2.15638E-01	7.41441E-01	5.50804E-01
8	8.73979E-02	5.44291E-02	1.31522E-01	4.43027E-01	1.22073E-01	2.21852E-01	7.52356E-01	5.61089E-01
9	8.76817E-02	5.55185E-02	1.31996E-01	4.44127E-01	1.23122E-01	2.25109E-01	7.58025E-01	5.66447E-01
10	8.77287E-02	5.56665E-02	1.32074E-01	4.44309E-01	1.23284E-01	2.25578E-01	7.58902E-01	5.67250E-01
11	8.77959E-02	5.58786E-02	1.32185E-01	4.44571E-01	1.23514E-01	2.26249E-01	7.60149E-01	5.68392E-01
12	8.78394E-02	5.60162E-02	1.32256E-01	4.44739E-01	1.23664E-01	2.26685E-01	7.60954E-01	5.69128E-01
13	8.79284E-02	5.62956E-02	1.32403E-01	4.45085E-01	1.23968E-01	2.27568E-01	7.62600E-01	5.70632E-01
14	8.82064E-02	5.71589E-02	1.32869E-01	4.46165E-01	1.24921E-01	2.30314E-01	7.67724E-01	5.75269E-01
15	8.85891E-02	5.83268E-02	1.33521E-01	4.47648E-01	1.26228E-01	2.34044E-01	7.74681E-01	5.81468E-01
16	8.88349E-02	5.90644E-02	1.33947E-01	4.48697E-01	1.27066E-01	2.36404E-01	7.79071E-01	5.85305E-01
17	8.90140E-02	5.96209E-02	1.34253E-01	4.49267E-01	1.27712E-01	2.38245E-01	7.82691E-01	5.88816E-01
18	8.92589E-02	6.03961E-02	1.34668E-01	4.50175E-01	1.28623E-01	2.40875E-01	7.88086E-01	5.94347E-01
19	8.95415E-02	6.12874E-02	1.35141E-01	4.51235E-01	1.29677E-01	2.43936E-01	7.94526E-01	6.01029E-01
20	8.99014E-02	6.24211E-02	1.35747E-01	4.52592E-01	1.31050E-01	2.47880E-01	8.03091E-01	6.10031E-01
21	9.01556E-02	6.32356E-02	1.36172E-01	4.53533E-01	1.32009E-01	2.50746E-01	8.09564E-01	6.17057E-01

22	9.01746E-02	6.33218E-02	1.36197E-01	4.53566E-01	1.32115E-01	2.51067E-01	8.10532E-01	6.18391E-01
23	9.01057E-02	6.31275E-02	1.36075E-01	4.53270E-01	1.31882E-01	2.50393E-01	8.09236E-01	6.17274E-01
24	9.00219E-02	6.28831E-02	1.35927E-01	4.52920E-01	1.31588E-01	2.49540E-01	8.07525E-01	6.15685E-01

0 int. grp. 25 grp. 26 grp. 27

1	2.09171E-01	1.26496E-01	1.64760E-02
2	2.09027E-01	1.26407E-01	1.64770E-02
3	2.09545E-01	1.26908E-01	1.66308E-02
4	2.12277E-01	1.29414E-01	1.73268E-02
5	2.19075E-01	1.35680E-01	1.90952E-02
6	2.26671E-01	1.42760E-01	2.11622E-02
7	2.32408E-01	1.48185E-01	2.28270E-02
8	2.37771E-01	1.53328E-01	2.44812E-02
9	2.40573E-01	1.56030E-01	2.53661E-02
10	2.40980E-01	1.56395E-01	2.54678E-02
11	2.41557E-01	1.56913E-01	2.56125E-02
12	2.41930E-01	1.57247E-01	2.57058E-02
13	2.42688E-01	1.57924E-01	2.58950E-02
14	2.44988E-01	1.59966E-01	2.64544E-02
15	2.47983E-01	1.62589E-01	2.71464E-02
16	2.49775E-01	1.64114E-01	2.75324E-02
17	2.51572E-01	1.65943E-01	2.81312E-02
18	2.54545E-01	1.69133E-01	2.92247E-02
19	2.58174E-01	1.73011E-01	3.05063E-02
20	2.63128E-01	1.78296E-01	3.21929E-02
21	2.67081E-01	1.82611E-01	3.35798E-02
22	2.67942E-01	1.83714E-01	3.39921E-02
23	2.67426E-01	1.83334E-01	3.39442E-02
24	2.66632E-01	1.82635E-01	3.37898E-02

- elapsed time .02 min.

1fine group summary for zone 1 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	2.25466E-02	.00000E+00	1.26592E-02	1.05285E-02	3.20981E-03	1.10953E-02	9.98834E-01
2	.00000E+00	1.92653E-01	2.32567E-03	1.66826E-01	6.63876E-02	1.36156E-02	1.14985E-01	1.00004E+00
3	.00000E+00	2.15639E-01	2.62332E-02	1.61016E-01	8.11843E-02	1.55567E-02	1.45130E-01	1.00001E+00
4	.00000E+00	1.23985E-01	3.89532E-02	1.05308E-01	6.78544E-02	7.41953E-03	8.76617E-02	1.00001E+00
5	.00000E+00	1.64616E-01	6.79468E-02	2.59536E-01	9.47660E-02	4.42974E-03	1.33369E-01	9.99992E-01
6	.00000E+00	1.77901E-01	1.34714E-01	6.53812E-01	5.43928E-02	6.99367E-03	2.51218E-01	1.00003E+00
7	.00000E+00	8.80271E-02	9.84539E-02	7.45017E-01	3.63365E-02	7.55446E-03	1.42590E-01	1.00001E+00
8	.00000E+00	1.35691E-02	4.25773E-02	6.30878E-01	2.14972E-02	1.39252E-02	2.07217E-02	1.00004E+00
9	.00000E+00	9.84911E-04	2.17199E-02	5.35315E-01	2.06733E-02	2.30617E-02	-2.10198E-02	9.99991E-01
10	.00000E+00	7.31557E-05	2.06952E-02	4.60613E-01	1.06902E-02	3.57908E-02	-2.57133E-02	1.00001E+00
11	.00000E+00	5.75541E-06	1.06912E-02	4.22014E-01	8.14066E-03	5.82081E-02	-5.56523E-02	1.00001E+00
12	.00000E+00	4.04308E-07	8.14071E-03	2.38761E-01	9.36720E-03	6.39537E-02	-6.51767E-02	9.99958E-01
13	.00000E+00	6.42004E-08	9.36721E-03	1.77659E-01	6.15371E-03	5.89860E-02	-5.57729E-02	1.00001E+00
14	.00000E+00	1.27228E-08	6.15371E-03	1.51950E-01	7.41755E-03	8.22587E-02	-8.35227E-02	1.00000E+00
15	.00000E+00	1.43782E-09	7.50496E-03	8.47901E-02	8.89666E-03	6.76067E-03	-8.19649E-03	1.00282E+00
16	.00000E+00	4.22195E-10	9.06421E-03	4.28271E-02	9.61462E-03	4.94331E-03	-5.52444E-03	1.00211E+00
17	.00000E+00	1.35967E-10	7.74308E-03	1.46958E-02	7.51474E-03	6.68130E-03	-6.46574E-03	1.00090E+00
18	.00000E+00	9.73489E-11	7.17519E-03	9.31984E-03	4.81169E-03	2.21906E-02	-1.98332E-02	1.00022E+00
19	.00000E+00	1.37630E-10	7.02763E-03	2.44088E-02	8.96946E-03	8.96632E-03	-1.09213E-02	1.00073E+00
20	.00000E+00	2.23800E-10	1.02650E-02	1.03125E-01	9.74676E-03	2.57831E-02	-2.53119E-02	1.00132E+00
21	.00000E+00	3.27571E-11	9.21705E-03	2.17326E-02	8.43469E-03	2.33262E-02	-2.25584E-02	1.00046E+00
22	.00000E+00	3.80057E-11	1.21888E-02	4.32563E-02	9.73527E-03	6.75239E-02	-6.50953E-02	1.00030E+00
23	.00000E+00	3.63377E-11	1.48498E-02	1.68759E-01	1.85363E-02	1.22697E-01	-1.26468E-01	1.00060E+00
24	.00000E+00	9.89064E-12	2.25067E-02	1.16323E-01	2.26844E-02	1.17694E-01	-1.17733E-01	1.00044E+00
25	.00000E+00	2.89533E-12	1.92130E-02	4.39146E-02	1.44653E-02	6.43358E-02	-5.96142E-02	1.00033E+00
26	.00000E+00	2.03022E-12	9.42339E-03	3.04365E-02	6.47936E-03	5.78554E-02	-5.49278E-02	1.00025E+00
27	.00000E+00	4.83813E-13	2.02860E-03	4.52622E-03	1.10064E-03	1.61192E-02	-1.51936E-02	1.00014E+00
28	.00000E+00	1.00000E+00	6.26179E-01	5.42938E+00	6.26179E-01	9.39831E-01	6.20714E-02	1.00023E+00

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*bdy**2	total flux

1	1.72266E-01	1.10953E-02	1.77195E-01	.00000E+00	2.25841E-03	2.62977E-03	.00000E+00	1.20666E-01
2	1.27624E+00	1.14985E-01	1.32751E+00	.00000E+00	1.71854E-05	1.18502E-02	.00000E+00	8.99916E-01
3	1.61630E+00	1.45130E-01	1.67978E+00	.00000E+00	.00000E+00	1.45322E-02	.00000E+00	1.13888E+00
4	1.00333E+00	8.76617E-02	1.04123E+00	.00000E+00	.00000E+00	6.27267E-03	.00000E+00	7.06237E-01
5	1.51593E+00	1.33369E-01	1.57523E+00	.00000E+00	.00000E+00	1.82307E-03	.00000E+00	1.06764E+00
6	2.91611E+00	2.51218E-01	3.02978E+00	.00000E+00	.00000E+00	1.58370E-03	.00000E+00	2.05301E+00
7	2.85707E+00	1.42590E-01	2.90473E+00	.00000E+00	.00000E+00	1.55715E-03	.00000E+00	1.97997E+00
8	2.06870E+00	2.07217E-02	2.08053E+00	.00000E+00	.00000E+00	1.58895E-03	.00000E+00	1.42891E+00
9	1.59894E+00	-2.10198E-02	1.58711E+00	.00000E+00	.00000E+00	2.13181E-03	.00000E+00	1.09602E+00
10	1.45926E+00	-2.57133E-02	1.44611E+00	.00000E+00	.00000E+00	4.54090E-03	.00000E+00	9.99431E-01
11	1.33394E+00	-5.56523E-02	1.30533E+00	.00000E+00	.00000E+00	9.59878E-03	.00000E+00	9.07030E-01
12	8.29634E-01	-6.51767E-02	7.95806E-01	.00000E+00	.00000E+00	1.25419E-02	.00000E+00	5.57729E-01
13	7.00018E-01	-5.57729E-02	6.71440E-01	.00000E+00	.00000E+00	1.33683E-02	.00000E+00	4.70578E-01
14	6.31151E-01	-8.35227E-02	5.87894E-01	.00000E+00	.00000E+00	8.47353E-03	.00000E+00	4.17286E-01
15	3.74539E-01	-8.19649E-03	3.70150E-01	.00000E+00	.00000E+00	2.09234E-03	.00000E+00	2.56137E-01
16	2.07166E-01	-5.52444E-03	2.04111E-01	.00000E+00	.00000E+00	1.44179E-03	.00000E+00	1.41533E-01
17	8.76693E-02	-6.46574E-03	8.44542E-02	.00000E+00	.00000E+00	1.82542E-03	.00000E+00	5.90743E-02
18	5.54811E-02	-1.98332E-02	4.41396E-02	.00000E+00	.00000E+00	1.59461E-03	.00000E+00	3.35806E-02
19	1.31977E-01	-1.09213E-02	1.26380E-01	.00000E+00	.00000E+00	2.89268E-03	.00000E+00	8.86552E-02
20	4.44088E-01	-2.53119E-02	4.31366E-01	.00000E+00	.00000E+00	1.60106E-02	.00000E+00	3.00687E-01
21	1.23085E-01	-2.25584E-02	1.11389E-01	.00000E+00	.00000E+00	1.45424E-02	.00000E+00	8.00556E-02
22	2.24985E-01	-6.50953E-02	1.89539E-01	.00000E+00	.00000E+00	4.15271E-02	.00000E+00	1.40645E-01
23	7.57785E-01	-1.26468E-01	6.95485E-01	.00000E+00	.00000E+00	7.74830E-02	.00000E+00	4.96109E-01
24	5.66222E-01	-1.17733E-01	5.06153E-01	.00000E+00	.00000E+00	7.46668E-02	.00000E+00	3.65856E-01
25	2.40462E-01	-5.96142E-02	2.07886E-01	.00000E+00	.00000E+00	4.26923E-02	.00000E+00	1.53130E-01
26	1.55931E-01	-5.49278E-02	1.26664E-01	.00000E+00	.00000E+00	3.92310E-02	.00000E+00	9.55977E-02
27	2.53388E-02	-1.51956E-02	1.65059E-02	.00000E+00	.00000E+00	1.10868E-02	.00000E+00	1.38219E-02
28	2.33536E+01	6.20715E-02	2.33257E+01	.00000E+00	2.27559E-03	4.19530E-01	.00000E+00	1.60682E+01

1fine group summary for zone 2 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	4.65661E-09	1.00000E+00
2	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	2.98023E-08	1.00000E+00
3	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	1.00000E+00
4	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-1.49012E-08	1.00000E+00
5	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	1.49012E-08	1.00000E+00
6	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-5.96046E-08	1.00000E+00
7	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	2.98023E-08	1.00000E+00
8	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	6.89179E-08	9.99997E-01
9	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-6.70552E-08	1.00000E+00
10	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	3.72529E-09	1.00000E+00
11	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	8.56817E-08	9.99998E-01
12	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	2.23517E-08	1.00000E+00
13	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	1.00000E+00
14	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	1.49012E-08	1.00000E+00
15	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	1.00000E+00
16	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-9.77889E-09	1.00000E+00
17	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	4.65661E-09	9.99999E-01
18	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-5.58794E-09	1.00000E+00
19	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-2.79397E-09	1.00000E+00
20	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-1.11759E-08	1.00000E+00
21	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	1.00000E+00
22	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	1.00000E+00
23	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	5.96046E-08	1.00000E+00
24	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-2.98023E-08	1.00000E+00
25	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-1.49012E-08	1.00000E+00
26	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-3.72529E-09	1.00000E+00
27	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-9.31323E-10	1.00000E+00
28	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	1.14553E-07	9.99997E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*bdy**2	total flux
1	1.71843E-01	1.10953E-02	1.72266E-01	1.10953E-02	.00000E+00	.00000E+00	.00000E+00	5.46010E-03

2	1.27218E+00	1.14985E-01	1.27624E+00	1.14985E-01	.00000E+00	.00000E+00	.00000E+00	4.04362E-02
3	1.61148E+00	1.45130E-01	1.61630E+00	1.45130E-01	.00000E+00	.00000E+00	.00000E+00	5.12156E-02
4	1.00066E+00	8.76617E-02	1.00333E+00	8.76617E-02	.00000E+00	.00000E+00	.00000E+00	3.17976E-02
5	1.51210E+00	1.33369E-01	1.51593E+00	1.33369E-01	.00000E+00	.00000E+00	.00000E+00	4.80460E-02
6	2.90926E+00	2.51218E-01	2.91611E+00	2.51218E-01	.00000E+00	.00000E+00	.00000E+00	9.24314E-02
7	2.83331E+00	1.42590E-01	2.83707E+00	1.42590E-01	.00000E+00	.00000E+00	.00000E+00	8.99735E-02
8	2.06794E+00	2.07218E-02	2.06870E+00	2.07217E-02	.00000E+00	.00000E+00	.00000E+00	6.56385E-02
9	1.59971E+00	-2.10199E-02	1.59824E+00	-2.10198E-02	.00000E+00	.00000E+00	.00000E+00	5.07551E-02
10	1.45997E+00	-2.57133E-02	1.45926E+00	-2.57133E-02	.00000E+00	.00000E+00	.00000E+00	4.63216E-02
11	1.33546E+00	-5.56522E-02	1.33394E+00	-5.56523E-02	.00000E+00	.00000E+00	.00000E+00	4.23578E-02
12	8.31467E-01	-6.51767E-02	8.29634E-01	-6.51767E-02	.00000E+00	.00000E+00	.00000E+00	2.63585E-02
13	7.01591E-01	-5.57729E-02	7.00018E-01	-5.57729E-02	.00000E+00	.00000E+00	.00000E+00	2.22409E-02
14	6.33502E-01	-8.35227E-02	6.31151E-01	-8.35227E-02	.00000E+00	.00000E+00	.00000E+00	2.00680E-02
15	3.74774E-01	-8.19649E-03	3.74539E-01	-8.19649E-03	.00000E+00	.00000E+00	.00000E+00	1.18898E-02
16	2.07323E-01	-5.52445E-03	2.07166E-01	-5.52444E-03	.00000E+00	.00000E+00	.00000E+00	6.57697E-03
17	8.78504E-02	-6.46573E-03	8.76693E-02	-6.46574E-03	.00000E+00	.00000E+00	.00000E+00	2.78515E-03
18	5.60524E-02	-1.98332E-02	5.54811E-02	-1.98332E-02	.00000E+00	.00000E+00	.00000E+00	1.76994E-03
19	1.32275E-01	-1.09213E-02	1.31977E-01	-1.09213E-02	.00000E+00	.00000E+00	.00000E+00	4.19314E-03
20	4.44792E-01	-2.53119E-02	4.44088E-01	-2.53119E-02	.00000E+00	.00000E+00	.00000E+00	1.41044E-02
21	1.23706E-01	-2.25584E-02	1.23085E-01	-2.25584E-02	.00000E+00	.00000E+00	.00000E+00	3.91608E-03
22	2.26792E-01	-6.50933E-02	2.26985E-01	-6.50933E-02	.00000E+00	.00000E+00	.00000E+00	7.16938E-03
23	7.61147E-01	-1.26468E-01	7.57786E-01	-1.26468E-01	.00000E+00	.00000E+00	.00000E+00	2.41036E-02
24	5.69301E-01	-1.17733E-01	5.66222E-01	-1.17733E-01	.00000E+00	.00000E+00	.00000E+00	1.80198E-02
25	2.42020E-01	-5.96142E-02	2.40462E-01	-5.96142E-02	.00000E+00	.00000E+00	.00000E+00	7.65666E-03
26	1.57328E-01	-5.49278E-02	1.55981E-01	-5.49278E-02	.00000E+00	.00000E+00	.00000E+00	4.97139E-03
27	2.57287E-02	-1.51936E-02	2.53388E-02	-1.51936E-02	.00000E+00	.00000E+00	.00000E+00	8.10510E-04
28	2.33496E+01	6.20716E-02	2.33536E+01	6.20715E-02	.00000E+00	.00000E+00	.00000E+00	7.41067E-01

1fine group summary for zone 3 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	.00000E+00	.00000E+00	3.78748E-03	2.85920E-03	1.45497E-05	-2.75248E-03	1.00002E+00
2	.00000E+00	.00000E+00	4.95850E-04	2.59223E-02	1.86005E-02	5.14987E-05	-1.81564E-02	1.00000E+00
3	.00000E+00	.00000E+00	2.64593E-03	5.01259E-02	1.58473E-02	1.37098E-04	-1.33394E-02	9.99993E-01
4	.00000E+00	.00000E+00	5.13070E-03	4.20944E-02	5.45031E-03	1.03337E-04	-4.22552E-04	9.99996E-01
5	.00000E+00	.00000E+00	1.10582E-02	8.16275E-02	5.16232E-03	1.52070E-04	5.74346E-03	1.00000E+00
6	.00000E+00	.00000E+00	1.84734E-02	2.35015E-01	3.21096E-03	3.20023E-04	1.49424E-02	1.00000E+00
7	.00000E+00	.00000E+00	1.22958E-02	2.35167E-01	1.18207E-03	3.44723E-04	1.07690E-02	1.00000E+00
8	.00000E+00	.00000E+00	2.16023E-03	1.58658E-01	7.65480E-03	2.94873E-04	-5.76991E-03	1.00002E+00
9	.00000E+00	.00000E+00	7.66809E-03	1.05199E-01	8.76950E-04	1.10930E-03	5.68217E-03	9.99986E-01
10	.00000E+00	.00000E+00	8.78127E-04	8.55812E-02	8.49114E-04	8.35752E-04	-8.06695E-04	9.99998E-01
11	.00000E+00	.00000E+00	8.49175E-04	7.70634E-02	8.70317E-04	1.33717E-03	-1.35857E-03	1.00000E+00
12	.00000E+00	.00000E+00	8.70525E-04	4.67963E-02	8.70630E-04	4.16641E-05	-4.20883E-05	1.00000E+00
13	.00000E+00	.00000E+00	8.70631E-04	3.95089E-02	8.05955E-04	5.99859E-05	4.71622E-06	1.00000E+00
14	.00000E+00	.00000E+00	8.05956E-04	3.59234E-02	6.76981E-04	9.56835E-05	3.32668E-05	1.00000E+00
15	.00000E+00	.00000E+00	7.20989E-04	2.06197E-02	8.43898E-04	8.28063E-05	-2.05243E-04	9.99946E-01
16	.00000E+00	.00000E+00	9.43792E-04	1.09248E-02	9.46425E-04	5.14799E-05	-5.37680E-05	9.99947E-01
17	.00000E+00	.00000E+00	1.01657E-03	4.05272E-03	9.97588E-04	2.44834E-05	-5.33655E-06	9.99979E-01
18	.00000E+00	.00000E+00	1.04767E-03	2.49420E-03	8.05368E-04	1.70802E-05	2.25250E-04	9.99999E-01
19	.00000E+00	.00000E+00	8.46045E-04	6.63142E-03	9.78406E-04	4.29625E-05	-1.75057E-04	9.99978E-01
20	.00000E+00	.00000E+00	1.16855E-03	2.44908E-02	1.04119E-03	1.82091E-04	-5.39571E-05	9.99971E-01
21	.00000E+00	.00000E+00	1.30334E-03	5.79153E-03	1.38339E-03	6.38049E-05	-1.43766E-04	9.99996E-01
22	.00000E+00	.00000E+00	1.74531E-03	1.17026E-02	1.56402E-03	1.36356E-04	4.52399E-05	9.99996E-01
23	.00000E+00	.00000E+00	2.29337E-03	4.10463E-02	3.01349E-03	6.21609E-04	-1.34172E-03	1.00000E+00
24	.00000E+00	.00000E+00	3.70552E-03	2.90597E-02	3.98800E-03	6.76935E-04	-9.59478E-04	1.00000E+00
25	.00000E+00	.00000E+00	3.59428E-03	1.11990E-02	2.88248E-03	3.80907E-04	3.30836E-04	1.00000E+00
26	.00000E+00	.00000E+00	1.50017E-03	8.13769E-03	1.07542E-03	3.55341E-04	6.98463E-05	1.00000E+00
27	.00000E+00	.00000E+00	3.11835E-04	1.53002E-03	7.88522E-07	1.11907E-04	1.99131E-04	1.00000E+00
28	.00000E+00	.00000E+00	8.43998E-02	1.40005E+00	8.43998E-02	7.64549E-03	-7.54130E-03	9.99984E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*db**2	total flux
1	1.70219E-01	8.34280E-03	1.71843E-01	1.10953E-02	1.01442E-04	.00000E+00	.00000E+00	3.70823E-02
2	1.25465E+00	9.68289E-02	1.27218E+00	1.14985E-01	.00000E+00	.00000E+00	.00000E+00	2.73550E-01

3	1.58841E+00	1.31790E-01	1.61148E+00	1.45130E-01	.00000E+00	.00000E+00	.00000E+00	3.46502E-01
4	9.86054E-01	8.72391E-02	1.00066E+00	8.76617E-02	.00000E+00	.00000E+00	.00000E+00	2.15206E-01
5	1.48904E+00	1.39112E-01	1.51210E+00	1.33369E-01	.00000E+00	.00000E+00	.00000E+00	3.25150E-01
6	2.86361E+00	2.66161E-01	2.90926E+00	2.51218E-01	.00000E+00	.00000E+00	.00000E+00	6.25499E-01
7	2.80702E+00	1.53359E-01	2.83331E+00	1.42590E-01	.00000E+00	.00000E+00	.00000E+00	6.11180E-01
8	2.06482E+00	1.49519E-02	2.06794E+00	2.07218E-02	.00000E+00	.00000E+00	.00000E+00	4.47759E-01
9	1.60284E+00	-1.53377E-02	1.59971E+00	-2.10199E-02	.00000E+00	.00000E+00	.00000E+00	3.47104E-01
10	1.46429E+00	-2.65200E-02	1.45997E+00	-2.57133E-02	.00000E+00	.00000E+00	.00000E+00	3.16895E-01
11	1.34468E+00	-5.70106E-02	1.33546E+00	-5.56522E-02	.00000E+00	.00000E+00	.00000E+00	2.90467E-01
12	8.42086E-01	-6.52188E-02	8.31467E-01	-6.51767E-02	.00000E+00	.00000E+00	.00000E+00	1.81412E-01
13	7.10714E-01	-5.57682E-02	7.01591E-01	-5.57725E-02	.00000E+00	.00000E+00	.00000E+00	1.53094E-01
14	6.47122E-01	-8.34894E-02	6.33502E-01	-8.35227E-02	.00000E+00	.00000E+00	.00000E+00	1.38853E-01
15	3.76217E-01	-8.40173E-03	3.74774E-01	-8.19649E-03	.00000E+00	.00000E+00	.00000E+00	8.13838E-02
16	2.08234E-01	-5.57822E-03	2.07323E-01	-5.52445E-03	.00000E+00	.00000E+00	.00000E+00	4.50355E-02
17	8.88982E-02	-6.47107E-03	8.78504E-02	-6.46673E-03	.00000E+00	.00000E+00	.00000E+00	1.91592E-02
18	5.92547E-02	-1.96079E-02	5.60524E-02	-1.98332E-02	.00000E+00	.00000E+00	.00000E+00	1.25175E-02
19	1.34059E-01	-1.10963E-02	1.32275E-01	-1.09213E-02	.00000E+00	.00000E+00	.00000E+00	2.88692E-02
20	4.48850E-01	-2.53659E-02	4.44792E-01	-2.53119E-02	.00000E+00	.00000E+00	.00000E+00	9.68602E-02
21	1.27287E-01	-2.27022E-02	1.25706E-01	-2.25684E-02	.00000E+00	.00000E+00	.00000E+00	2.72193E-02
22	2.37005E-01	-6.50481E-02	2.26792E-01	-6.50953E-02	.00000E+00	.00000E+00	.00000E+00	5.03294E-02
23	7.80174E-01	-1.27809E-01	7.61147E-01	-1.26468E-01	.00000E+00	.00000E+00	.00000E+00	1.67158E-01
24	5.86248E-01	-1.18698E-01	5.69301E-01	-1.17733E-01	.00000E+00	.00000E+00	.00000E+00	1.25360E-01
25	2.50204E-01	-5.92833E-02	2.42020E-01	-5.96142E-02	.00000E+00	.00000E+00	.00000E+00	5.34229E-02
26	1.64475E-01	-5.48584E-02	1.57328E-01	-5.49278E-02	.00000E+00	.00000E+00	.00000E+00	3.49527E-02
27	2.76198E-02	-1.49945E-02	2.57287E-02	-1.51936E-02	.00000E+00	.00000E+00	.00000E+00	5.80739E-03
28	2.33241E+01	5.45300E-02	2.33496E+01	6.20716E-02	1.01442E-04	.00000E+00	.00000E+00	5.05778E+00

1fine group summary for zone 4 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	.00000E+00	.00000E+00	5.98456E-03	7.92106E-03	4.22157E-04	-8.34281E-03	9.99951E-01
2	.00000E+00	.00000E+00	4.54495E-03	7.63158E-02	1.00303E-01	1.07467E-03	-9.68289E-02	9.99961E-01
3	.00000E+00	.00000E+00	4.75877E-02	6.89432E-02	1.79577E-01	5.41885E-06	-1.31790E-01	9.99977E-01
4	.00000E+00	.00000E+00	7.02395E-02	4.58529E-02	1.57477E-01	3.22950E-06	-8.72391E-02	9.99987E-01
5	.00000E+00	.00000E+00	1.29849E-01	1.48457E-01	2.68960E-01	3.77411E-06	-1.39112E-01	9.99991E-01
6	.00000E+00	.00000E+00	2.74878E-01	4.55215E-01	5.41027E-01	1.14751E-05	-2.66161E-01	9.99998E-01
7	.00000E+00	.00000E+00	5.52647E-01	7.95099E-01	7.05989E-01	2.53491E-05	-1.53359E-01	9.99987E-01
8	.00000E+00	.00000E+00	7.35415E-01	1.00075E+00	7.50386E-01	4.70041E-05	-1.49520E-02	9.99912E-01
9	.00000E+00	.00000E+00	7.40666E-01	9.15908E-01	7.25314E-01	9.58909E-05	1.53377E-02	9.99889E-01
10	.00000E+00	.00000E+00	7.22037E-01	8.65279E-01	6.95380E-01	2.11426E-04	2.65199E-02	9.99896E-01
11	.00000E+00	.00000E+00	7.00356E-01	8.05312E-01	6.42930E-01	4.57316E-04	5.70105E-02	9.99940E-01
12	.00000E+00	.00000E+00	5.59704E-01	4.19760E-01	4.95859E-01	5.97270E-04	6.52188E-02	9.99979E-01
13	.00000E+00	.00000E+00	4.89846E-01	3.37792E-01	4.33195E-01	8.97250E-04	5.57682E-02	9.99969E-01
14	.00000E+00	.00000E+00	4.70148E-01	3.22462E-01	3.85204E-01	1.45957E-03	8.34894E-02	9.99989E-01
15	.00000E+00	.00000E+00	2.51253E-01	1.28945E-01	2.41567E-01	1.28478E-03	8.40238E-03	9.99998E-01
16	.00000E+00	.00000E+00	1.66756E-01	5.44108E-02	1.60298E-01	8.80758E-04	5.57890E-03	9.99994E-01
17	.00000E+00	.00000E+00	8.58857E-02	1.51818E-02	7.89905E-02	4.24066E-04	6.47153E-03	9.99996E-01
18	.00000E+00	.00000E+00	7.61187E-02	1.02846E-02	5.61972E-02	3.14669E-04	1.96048E-02	1.00003E+00
19	.00000E+00	.00000E+00	1.24710E-01	3.40075E-02	1.12868E-01	7.45409E-04	1.10970E-02	9.99998E-01
20	.00000E+00	.00000E+00	3.04630E-01	2.44232E-01	2.76137E-01	3.12458E-03	2.53677E-02	1.00000E+00
21	.00000E+00	.00000E+00	1.42879E-01	4.57608E-02	1.19045E-01	1.13385E-03	2.26651E-02	1.00003E+00
22	.00000E+00	.00000E+00	2.70382E-01	1.30851E-01	2.02855E-01	2.47774E-03	6.50501E-02	9.99996E-01
23	.00000E+00	.00000E+00	6.38528E-01	7.61024E-01	4.99744E-01	1.09715E-02	1.27809E-01	1.00001E+00
24	.00000E+00	.00000E+00	6.49668E-01	6.72083E-01	5.18787E-01	1.21843E-02	1.18696E-01	1.00000E+00
25	.00000E+00	.00000E+00	4.18654E-01	2.73939E-01	3.52423E-01	6.94805E-03	5.92826E-02	1.00000E+00
26	.00000E+00	.00000E+00	3.30556E-01	2.91208E-01	2.68969E-01	6.72748E-03	5.48562E-02	1.00001E+00
27	.00000E+00	.00000E+00	1.09857E-01	6.08041E-02	9.26287E-02	2.31363E-03	1.49946E-02	9.99999E-01
28	.00000E+00	.00000E+00	9.06787E+00	8.98535E+00	9.06787E+00	5.48425E-02	-5.45342E-02	9.99966E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*adj**2	total flux
1	1.69430E-01	-6.09055E-09	1.70219E-01	8.34280E-03	4.38057E-10	.00000E+00	.00000E+00	1.93914E-01
2	1.24317E+00	-1.05055E-08	1.25465E+00	9.68289E-02	.00000E+00	.00000E+00	.00000E+00	1.42536E+00
3	1.57079E+00	1.33290E-08	1.58841E+00	1.31790E-01	.00000E+00	.00000E+00	.00000E+00	1.79003E+00

4	9.72908E-01	-1.06295E-08	9.86054E-01	8.72391E-02	.00000E+00	.00000E+00	.00000E+00	1.11467E+00
5	1.46663E+00	-4.71665E-08	1.48904E+00	1.39112E-01	.00000E+00	.00000E+00	.00000E+00	1.68071E+00
6	2.81963E+00	4.11372E-08	2.86361E+00	2.66161E-01	.00000E+00	.00000E+00	.00000E+00	3.23127E+00
7	2.78169E+00	1.78610E-08	2.80702E+00	1.53359E-01	.00000E+00	.00000E+00	.00000E+00	3.18568E+00
8	2.06488E+00	-1.28764E-07	2.06482E+00	1.49519E-02	.00000E+00	.00000E+00	.00000E+00	2.36260E+00
9	1.60495E+00	-4.49942E-08	1.60284E+00	-1.53377E-02	.00000E+00	.00000E+00	.00000E+00	1.83679E+00
10	1.46908E+00	-6.20540E-08	1.46429E+00	-2.65200E-02	.00000E+00	.00000E+00	.00000E+00	1.68097E+00
11	1.35474E+00	-7.11370E-08	1.34468E+00	-5.70106E-02	.00000E+00	.00000E+00	.00000E+00	1.54974E+00
12	8.53259E-01	-1.05156E-08	8.42086E-01	-6.52188E-02	.00000E+00	.00000E+00	.00000E+00	9.75749E-01
13	7.19872E-01	-1.09998E-08	7.10716E-01	-5.57682E-02	.00000E+00	.00000E+00	.00000E+00	8.23374E-01
14	6.61157E-01	-1.69050E-09	6.47122E-01	-8.34894E-02	.00000E+00	.00000E+00	.00000E+00	7.55758E-01
15	3.76753E-01	6.47627E-07	3.76217E-01	-8.40173E-03	.00000E+00	.00000E+00	.00000E+00	4.31476E-01
16	2.08886E-01	6.75455E-07	2.08234E-01	-5.57822E-03	.00000E+00	.00000E+00	.00000E+00	2.39135E-01
17	8.99783E-02	4.58511E-07	8.88982E-02	-6.47107E-03	.00000E+00	.00000E+00	.00000E+00	1.02910E-01
18	6.27563E-02	-3.11249E-06	5.92547E-02	-1.96079E-02	.00000E+00	.00000E+00	.00000E+00	7.15116E-02
19	1.35851E-01	6.49765E-07	1.34059E-01	-1.10963E-02	.00000E+00	.00000E+00	.00000E+00	1.55387E-01
20	4.52750E-01	1.84102E-06	4.48850E-01	-2.53659E-02	.00000E+00	.00000E+00	.00000E+00	5.18034E-01
21	1.31440E-01	-7.10584E-06	1.27287E-01	-2.27022E-02	.00000E+00	.00000E+00	.00000E+00	1.50057E-01
22	2.49090E-01	2.05832E-06	2.37005E-01	-6.50481E-02	.00000E+00	.00000E+00	.00000E+00	2.83981E-01
23	8.06606E-01	-3.86636E-07	7.80174E-01	-1.27809E-01	.00000E+00	.00000E+00	.00000E+00	9.20088E-01
24	6.14815E-01	3.47787E-06	5.86248E-01	-1.18693E-01	.00000E+00	.00000E+00	.00000E+00	6.99487E-01
25	2.66193E-01	-7.20197E-07	2.50204E-01	-5.92833E-02	.00000E+00	.00000E+00	.00000E+00	3.01994E-01
26	1.82238E-01	-2.24975E-06	1.64475E-01	-5.48584E-02	.00000E+00	.00000E+00	.00000E+00	2.05116E-01
27	3.36952E-02	1.04078E-07	2.76198E-02	-1.49945E-02	.00000E+00	.00000E+00	.00000E+00	3.72151E-02
28	2.33632E+01	-3.95649E-06	2.33241E+01	5.45300E-02	4.38057E-10	.00000E+00	.00000E+00	2.67300E+01

1fine group summary for system

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	2.25466E-02	.00000E+00	2.24312E-02	2.12892E-02	3.64651E-03	-6.09055E-09	9.98829E-01
2	.00000E+00	1.92653E-01	7.36648E-03	2.69064E-01	1.85291E-01	1.47418E-02	-1.05055E-08	1.00002E+00
3	.00000E+00	2.15639E-01	7.64668E-02	2.80085E-01	2.78410E-01	1.56992E-02	1.33290E-08	9.99987E-01
4	.00000E+00	1.23985E-01	1.14323E-01	1.95235E-01	2.30782E-01	7.52609E-03	-1.06295E-08	1.00000E+00
5	.00000E+00	1.66166E-01	2.08654E-01	4.89620E-01	3.68888E-01	4.58659E-03	-4.71665E-08	9.99989E-01
6	.00000E+00	1.77901E-01	4.28063E-01	1.34404E+00	5.98630E-01	7.32517E-03	4.11372E-08	1.00001E+00
7	.00000E+00	8.80271E-02	6.63396E-01	1.77528E+00	7.43507E-01	7.92453E-03	1.78610E-08	9.99989E-01
8	.00000E+00	1.35691E-02	7.80152E-01	1.79019E+00	7.79518E-01	1.42670E-02	-1.28764E-07	9.99920E-01
9	.00000E+00	9.84911E-04	7.70054E-01	1.55642E+00	7.46865E-01	2.42569E-02	-4.49942E-08	9.99895E-01
10	.00000E+00	7.31557E-05	7.43610E-01	1.41137E+00	7.06920E-01	3.68380E-02	-6.20540E-08	9.99900E-01
11	.00000E+00	5.75541E-06	7.11896E-01	1.30439E+00	6.51941E-01	6.00026E-02	-7.11370E-08	9.99942E-01
12	.00000E+00	4.04308E-07	5.68715E-01	7.05317E-01	5.04137E-01	6.45927E-02	-1.05156E-08	9.99974E-01
13	.00000E+00	6.42004E-08	5.00084E-01	5.54959E-01	4.40155E-01	5.99433E-02	-1.09993E-08	9.99971E-01
14	.00000E+00	1.27228E-08	4.77108E-01	5.10635E-01	3.98259E-01	8.38137E-02	-1.69050E-09	9.99990E-01
15	.00000E+00	1.43782E-09	2.59479E-01	2.34355E-01	2.51307E-01	8.12826E-03	6.47627E-07	1.00017E+00
16	.00000E+00	4.22198E-10	1.76764E-01	1.08162E-01	1.70859E-01	5.87555E-03	6.75455E-07	1.00017E+00
17	.00000E+00	1.35967E-10	9.46454E-02	3.39304E-02	8.75028E-02	7.12985E-03	4.58511E-07	1.00013E+00
18	.00000E+00	9.73488E-11	8.43415E-02	2.20986E-02	6.18142E-02	2.25224E-02	-3.11249E-06	1.00010E+00
19	.00000E+00	1.37630E-10	1.32584E-01	6.50477E-02	1.22816E-01	9.75470E-03	6.49765E-07	1.00010E+00
20	.00000E+00	2.23800E-10	3.16054E-01	3.71848E-01	2.86925E-01	2.90858E-02	1.84102E-06	1.00015E+00
21	.00000E+00	3.27571E-11	1.53399E-01	7.32849E-02	1.28853E-01	2.45239E-02	-7.10584E-06	1.00013E+00
22	.00000E+00	3.80057E-11	2.84316E-01	1.85310E-01	2.14154E-01	7.01380E-02	2.05852E-06	1.00008E+00
23	.00000E+00	3.63377E-11	6.55671E-01	9.70830E-01	5.21293E-01	1.34290E-01	-3.86636E-07	1.00013E+00
24	.00000E+00	9.89064E-12	6.75880E-01	8.17465E-01	5.45259E-01	1.30655E-01	3.47787E-06	1.00009E+00
25	.00000E+00	2.89538E-12	4.41462E-01	3.29052E-01	3.69770E-01	7.16648E-02	-7.20197E-07	1.00006E+00
26	.00000E+00	2.03022E-12	3.41479E-01	3.29782E-01	2.76524E-01	6.49583E-02	-2.24975E-06	1.00006E+00
27	.00000E+00	4.83813E-13	1.12277E-01	6.68603E-02	9.37302E-02	1.85447E-02	1.04078E-07	1.00002E+00
28	.00000E+00	1.00000E+00	9.77845E+00	1.58148E+01	9.77845E+00	1.00232E+00	-3.99449E-06	1.00001E+00

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*dv**2	total flux
1	1.69430E-01	-6.09055E-09	1.77195E-01	.00000E+00	2.35985E-03	2.62977E-03	.00000E+00	3.57072E-01
2	1.24317E+00	-1.05055E-08	1.32751E+00	.00000E+00	1.71854E-05	1.18502E-02	.00000E+00	2.63726E+00
3	1.57079E+00	1.33290E-08	1.67978E+00	.00000E+00	.00000E+00	1.45522E-02	.00000E+00	3.33563E+00
4	9.72908E-01	-1.06295E-08	1.04123E+00	.00000E+00	.00000E+00	6.27267E-03	.00000E+00	2.06791E+00

5	1.46663E+00	-4.71665E-08	1.57523E+00	.00000E+00	.00000E+00	1.82307E-03	.00000E+00	3.12155E+00
6	2.81963E+00	4.11372E-08	3.02978E+00	.00000E+00	.00000E+00	1.58570E-03	.00000E+00	6.00220E+00
7	2.78169E+00	1.78610E-08	2.90473E+00	.00000E+00	.00000E+00	1.55715E-03	.00000E+00	5.86680E+00
8	2.06488E+00	-1.28764E-07	2.08053E+00	.00000E+00	.00000E+00	1.58895E-03	.00000E+00	4.30491E+00
9	1.60495E+00	-4.49942E-08	1.58711E+00	.00000E+00	.00000E+00	2.13181E-03	.00000E+00	3.33067E+00
10	1.46903E+00	-6.20540E-08	1.44611E+00	.00000E+00	.00000E+00	4.54090E-03	.00000E+00	3.04362E+00
11	1.35474E+00	-7.11370E-08	1.30533E+00	.00000E+00	.00000E+00	9.59878E-03	.00000E+00	2.78959E+00
12	8.53259E-01	-1.05156E-08	7.95806E-01	.00000E+00	.00000E+00	1.25419E-02	.00000E+00	1.74125E+00
13	7.19872E-01	-1.09993E-08	6.71440E-01	.00000E+00	.00000E+00	1.33683E-02	.00000E+00	1.46929E+00
14	6.61157E-01	-1.69050E-09	5.87894E-01	.00000E+00	.00000E+00	8.47353E-03	.00000E+00	1.33196E+00
15	3.76753E-01	6.47627E-07	3.70150E-01	.00000E+00	.00000E+00	2.09234E-03	.00000E+00	7.80886E-01
16	2.08885E-01	6.75455E-07	2.04111E-01	.00000E+00	.00000E+00	1.44179E-03	.00000E+00	4.32280E-01
17	8.99783E-02	4.58511E-07	8.44542E-02	.00000E+00	.00000E+00	1.82542E-03	.00000E+00	1.83929E-01
18	6.27563E-02	-3.11249E-06	4.41396E-02	.00000E+00	.00000E+00	1.59461E-03	.00000E+00	1.19580E-01
19	1.35851E-01	6.49766E-07	1.26380E-01	.00000E+00	.00000E+00	2.89268E-03	.00000E+00	2.77104E-01
20	4.52750E-01	1.84102E-06	4.31366E-01	.00000E+00	.00000E+00	1.60106E-02	.00000E+00	9.29685E-01
21	1.31440E-01	-7.10584E-06	1.11389E-01	.00000E+00	.00000E+00	1.45424E-02	.00000E+00	2.61248E-01
22	2.49090E-01	2.05852E-06	1.89539E-01	.00000E+00	.00000E+00	4.15271E-02	.00000E+00	4.82125E-01
23	8.06606E-01	-3.86636E-07	6.98486E-01	.00000E+00	.00000E+00	7.74830E-02	.00000E+00	1.60746E+00
24	6.14815E-01	3.47787E-06	5.06153E-01	.00000E+00	.00000E+00	7.46668E-02	.00000E+00	1.20872E+00
25	2.66193E-01	-7.20197E-07	2.09386E-01	.00000E+00	.00000E+00	4.26923E-02	.00000E+00	5.16208E-01
26	1.82238E-01	-2.24975E-06	1.26664E-01	.00000E+00	.00000E+00	3.92310E-02	.00000E+00	3.40638E-01
27	3.36952E-02	1.04078E-07	1.65059E-02	.00000E+00	.00000E+00	1.10868E-02	.00000E+00	5.78549E-02
28	2.33632E+01	-3.95649E-06	2.33257E+01	.00000E+00	2.37703E-03	4.19530E-01	.00000E+00	4.85970E+01

- elapsed time .02 min.

0direct access unit 9 requires 516 blocks of length 1456 for cross section weighting.

1 transport cross section weighting function

0zone	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	2.37800E-03	2.48358E-02	3.15170E-02	1.90785E-02	2.91626E-02	5.57354E-02	3.17414E-02	4.63097E-03
2	3.72979E-03	3.86536E-02	4.87869E-02	2.94684E-02	4.48333E-02	8.44496E-02	4.79530E-02	6.96581E-03
3	3.08067E-03	3.29767E-02	4.30731E-02	2.71742E-02	4.23109E-02	8.03236E-02	4.59382E-02	5.56634E-03
4	1.04615E-03	1.21344E-02	1.65107E-02	1.09244E-02	1.74148E-02	3.33252E-02	1.92749E-02	1.99890E-03
5	1.73421E-03	1.89099E-02	2.47319E-02	1.55961E-02	2.43107E-02	4.64094E-02	2.66114E-02	3.31664E-03
0zone	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	4.70455E-03	5.76194E-03	1.24377E-02	1.45107E-02	1.24227E-02	1.84916E-02	1.85482E-03	1.23684E-03
2	7.06606E-03	8.64380E-03	1.87081E-02	2.19098E-02	1.87486E-02	2.80770E-02	2.75530E-03	1.85708E-03
3	5.67164E-03	8.11162E-03	1.74975E-02	2.02581E-02	1.73291E-02	2.59472E-02	2.57808E-03	1.72469E-03
4	1.88639E-03	3.30102E-03	7.10645E-03	8.13598E-03	6.99506E-03	1.04338E-02	1.12452E-03	7.20699E-04
5	3.29160E-03	4.69733E-03	1.01286E-02	1.17166E-02	1.00455E-02	1.49832E-02	1.54228E-03	1.01328E-03
0zone	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	1.43647E-03	4.20291E-03	2.46130E-03	5.66414E-03	4.95029E-03	1.40983E-02	2.79502E-02	2.58665E-02
2	2.17352E-03	6.66691E-03	3.67127E-03	8.50867E-03	7.58290E-03	2.18818E-02	4.25139E-02	3.95780E-02
3	2.00981E-03	6.12758E-03	3.42052E-03	7.87317E-03	7.03047E-03	2.02184E-02	3.94995E-02	3.67274E-02
4	8.08923E-04	2.41974E-03	1.39868E-03	3.21777E-03	2.82516E-03	8.09754E-03	1.62196E-02	1.50528E-02
5	1.16233E-03	3.46035E-03	1.99532E-03	4.59231E-03	4.03846E-03	1.15545E-02	2.29244E-02	2.12492E-02
0zone	grp. 25	grp. 26	grp. 27	grp. 28				
1	1.30301E-02	1.18326E-02	3.12027E-03	3.85114E-01				
2	2.00402E-02	1.84648E-02	5.10756E-03	5.88778E-01				
3	1.84738E-02	1.70567E-02	4.69107E-03	5.42640E-01				
4	7.48920E-03	6.80681E-03	1.71927E-03	2.18367E-01				
5	1.06570E-02	9.71408E-03	2.54374E-03	3.12931E-01				

1 560 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp

0cell averaged fluxes

0zone	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	1.75274E-01	1.30718E+00	1.65429E+00	1.02585E+00	1.55081E+00	2.98210E+00	2.87601E+00	2.07557E+00
2	1.72052E-01	1.27417E+00	1.61384E+00	1.00197E+00	1.51396E+00	2.91258E+00	2.80513E+00	2.06831E+00
3	1.70873E-01	1.26220E+00	1.59882E+00	9.92998E-01	1.50030E+00	2.88616E+00	2.78009E+00	2.06603E+00
4	1.69425E-01	1.24361E+00	1.57184E+00	9.73903E-01	1.46846E+00	2.82520E+00	2.72337E+00	2.06424E+00
5	1.71550E-01	1.26704E+00	1.60256E+00	9.93499E-01	1.49971E+00	2.88368E+00	2.81862E+00	2.06824E+00

Ozone	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	1.59203E+00	1.45173E+00	1.31751E+00	8.10131E-01	6.83540E-01	6.06130E-01	3.72052E-01	2.05584E-01
2	1.59353E+00	1.45963E+00	1.33472E+00	8.30675E-01	7.00825E-01	6.32357E-01	3.74655E-01	2.07245E-01
3	1.60160E+00	1.46221E+00	1.34026E+00	8.37065E-01	7.06403E-01	6.40689E-01	3.75518E-01	2.07801E-01
4	1.60483E+00	1.46869E+00	1.35403E+00	8.52526E-01	7.19394E-01	6.60316E-01	3.76986E-01	2.08935E-01
5	1.60017E+00	1.46227E+00	1.34022E+00	8.36559E-01	7.05899E-01	6.39924E-01	3.75166E-01	2.07683E-01
Ozone	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	8.58086E-02	4.87777E-02	1.28776E-01	4.36764E-01	1.16285E-01	2.04294E-01	7.20625E-01	5.31425E-01
2	8.77622E-02	5.57722E-02	1.32129E-01	4.44439E-01	1.23399E-01	2.25912E-01	7.59522E-01	5.67817E-01
3	8.84088E-02	5.77576E-02	1.33207E-01	4.46929E-01	1.25994E-01	2.32228E-01	7.71292E-01	5.78429E-01
4	8.99142E-02	6.24807E-02	1.35763E-01	4.52613E-01	1.31107E-01	2.48118E-01	8.03894E-01	6.11151E-01
5	8.83662E-02	5.73543E-02	1.33131E-01	4.46655E-01	1.25513E-01	2.31630E-01	7.72281E-01	5.80714E-01
Ozone	grp. 25	grp. 26	grp. 27					
1	2.22430E-01	1.38861E-01	2.00771E-02					
2	2.41267E-01	1.56652E-01	2.55397E-02					
3	2.46499E-01	1.61278E-01	2.67963E-02					
4	2.63856E-01	1.79213E-01	3.25153E-02					
5	2.48003E-01	1.63655E-01	2.76995E-02					

Oflux disadvantage factors (zone average/cell average-flux)

Ozone	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	1.02170E+00	1.03168E+00	1.03228E+00	1.03256E+00	1.03408E+00	1.03413E+00	1.02086E+00	1.00355E+00
2	1.00292E+00	1.00563E+00	1.00704E+00	1.00852E+00	1.00951E+00	1.01002E+00	1.00586E+00	1.00004E+00
3	9.96052E-01	9.96186E-01	9.97667E-01	9.99495E-01	1.00089E+00	1.00086E+00	1.00052E+00	9.98935E-01
4	9.87612E-01	9.81511E-01	9.80830E-01	9.80275E-01	9.79166E-01	9.79029E-01	9.87493E-01	9.98067E-01
5	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
Ozone	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	9.94909E-01	9.92795E-01	9.83053E-01	9.68409E-01	9.68325E-01	9.47190E-01	9.91700E-01	9.85894E-01
2	9.99472E-01	9.98195E-01	9.95897E-01	9.92846E-01	9.92812E-01	9.88176E-01	9.98638E-01	9.97890E-01
3	1.00089E+00	9.99959E-01	1.00003E+00	1.00060E+00	1.00071E+00	1.00119E+00	1.00094E+00	1.00057E+00
4	1.00291E+00	1.00439E+00	1.01030E+00	1.01909E+00	1.01912E+00	1.03187E+00	1.00485E+00	1.00603E+00
5	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
Ozone	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	9.71057E-01	8.50462E-01	9.67291E-01	9.77856E-01	9.26477E-01	8.81983E-01	9.33112E-01	9.15123E-01
2	9.93165E-01	9.72414E-01	9.92474E-01	9.95040E-01	9.83153E-01	9.75314E-01	9.85478E-01	9.77792E-01
3	1.00043E+00	1.00708E+00	1.00057E+00	1.00061E+00	1.00065E+00	1.00258E+00	9.98720E-01	9.96066E-01
4	1.01752E+00	1.08938E+00	1.01977E+00	1.01334E+00	1.04457E+00	1.07118E+00	1.04093E+00	1.05241E+00
5	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
Ozone	grp. 25	grp. 26	grp. 27					
1	8.96885E-01	8.48498E-01	7.24817E-01					
2	9.72839E-01	9.57210E-01	9.22029E-01					
3	9.93957E-01	9.85475E-01	9.67391E-01					
4	1.06393E+00	1.09507E+00	1.17386E+00					
5	1.00000E+00	1.00000E+00	1.00000E+00					

Ocell averaged currents

Ozone	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	2.37800E-03	2.48358E-02	3.15170E-02	1.90785E-02	2.91626E-02	5.57354E-02	3.17414E-02	4.63097E-03
2	3.72979E-03	3.86535E-02	4.87869E-02	2.94684E-02	4.48333E-02	8.44496E-02	4.79330E-02	6.96581E-03
3	3.03067E-03	3.29767E-02	4.30731E-02	2.71742E-02	4.23109E-02	8.03236E-02	4.59382E-02	5.56634E-03
4	1.04615E-03	1.21344E-02	1.65107E-02	1.09244E-02	1.74148E-02	3.33252E-02	1.92749E-02	1.99890E-03
5	1.73421E-03	1.86099E-02	2.47319E-02	1.55961E-02	2.43107E-02	4.64094E-02	2.66114E-02	3.31664E-03
Ozone	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	4.70455E-03	5.76194E-03	1.26377E-02	1.45107E-02	1.24227E-02	1.84916E-02	1.85482E-03	1.23684E-03
2	7.06606E-03	8.64380E-03	1.87081E-02	2.19098E-02	1.87486E-02	2.80770E-02	2.75530E-03	1.85708E-03
3	5.67164E-03	8.11162E-03	1.74975E-02	2.02581E-02	1.73291E-02	2.59472E-02	2.57808E-03	1.72469E-03
4	1.88639E-03	3.30102E-03	7.10645E-03	8.13598E-03	6.99506E-03	1.04338E-02	1.12452E-03	7.20699E-04
5	3.29160E-03	4.69733E-03	1.01286E-02	1.17166E-02	1.00455E-02	1.49832E-02	1.54228E-03	1.01328E-03
Ozone	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	1.43647E-03	4.20291E-03	2.46130E-03	5.66414E-03	4.95029E-03	1.40983E-02	2.79502E-02	2.58665E-02

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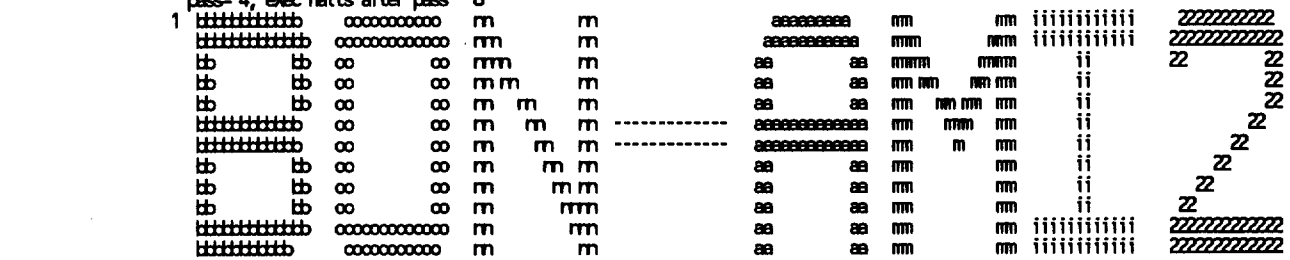
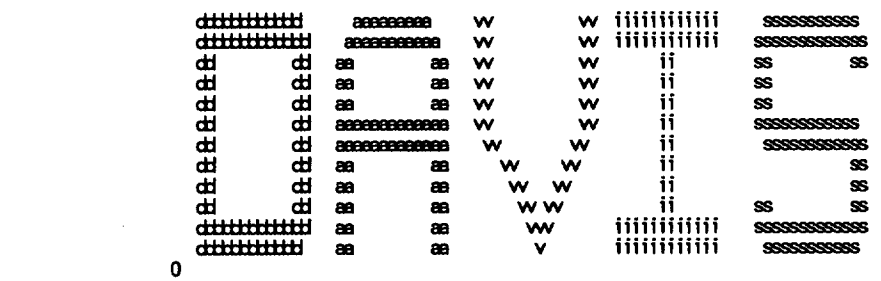
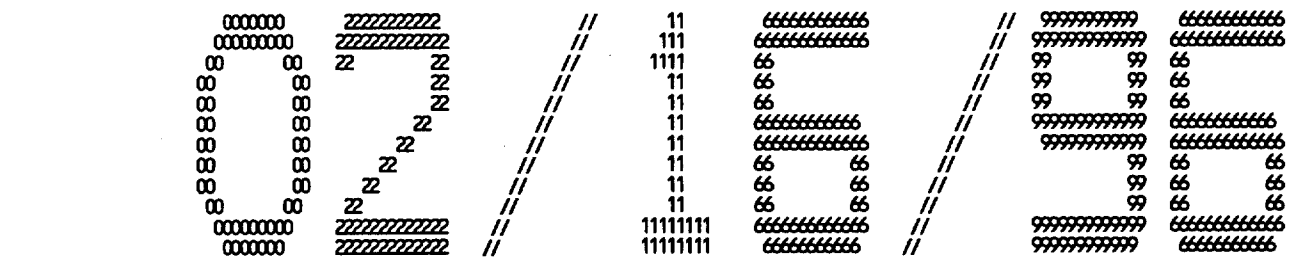
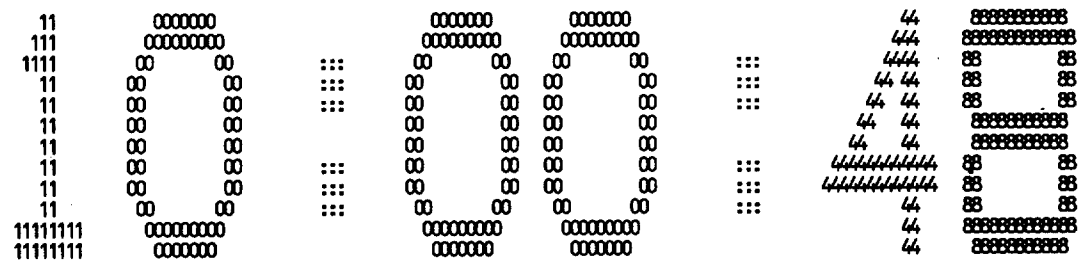
    2 2.17352E-03 6.66691E-03 3.67127E-03 8.50867E-03 7.58290E-03 2.18818E-02 4.25139E-02 3.95780E-02
    3 2.00981E-03 6.12758E-03 3.42052E-03 7.87317E-03 7.03047E-03 2.02184E-02 3.94995E-02 3.67274E-02
    4 8.08923E-04 2.41974E-03 1.39868E-03 3.21777E-03 2.82516E-03 8.09754E-03 1.62196E-02 1.50528E-02
    5 1.16233E-03 3.46035E-03 1.99532E-03 4.59231E-03 4.03846E-03 1.15545E-02 2.29244E-02 2.12492E-02
Ozone   grp. 25      grp. 26      grp. 27
    1 1.30301E-02 1.18326E-02 3.12027E-03
    2 2.00402E-02 1.84648E-02 5.10756E-03
    3 1.84738E-02 1.70567E-02 4.69107E-03
    4 7.48920E-03 6.80681E-03 1.71927E-03
    5 1.06570E-02 9.71408E-03 2.54374E-03
Ozone       volume      vol. fraction

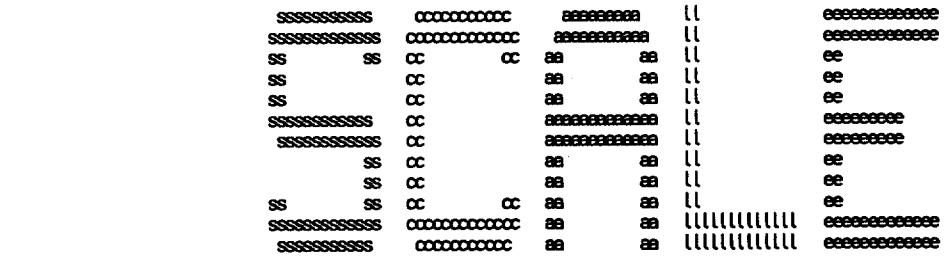
    1     6.88443E-01     3.30753E-01
    2     3.17352E-02     1.52468E-02
    3     2.16724E-01     1.04122E-01
    4     1.14454E+00     5.49878E-01
    5     2.08144E+00     1.00000E+00
 - elapsed time    .03 min.
 Orequested parm=halt8,skipcellwt,skipshipdata
   pass= 4, exec halts after pass  8
```

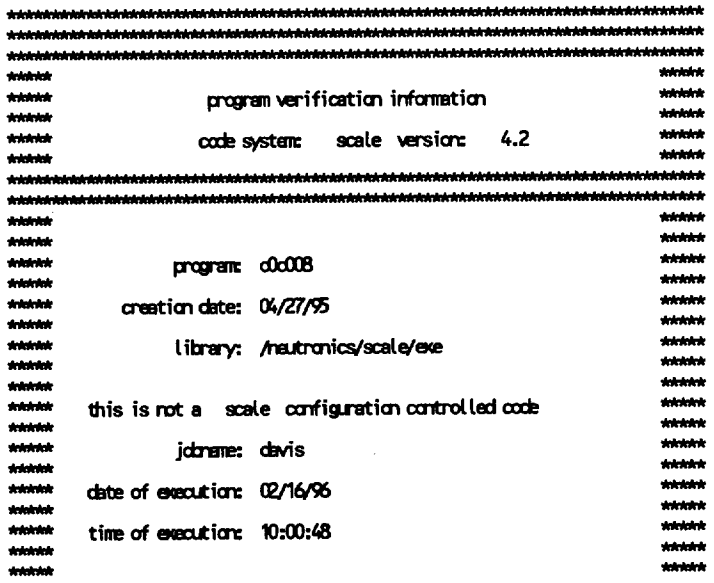











program verification information
code system: scale version: 4.2
program: c0c008
creation date: 04/27/95
library: /neutronics/scale/exe
this is not a scale configuration controlled code
jobname: davis
date of execution: 02/16/96
time of execution: 10:00:48

```
                    ********************************************************************************
                    ********************************************************************************
                    ********************************************************************************
1
0       -1q array has       1 entries.
0        0q array has       4 entries.
0        1q array has       6 entries.
0        2q array has       2 entries.
1logical assignments
0master library   12
 working library  17
 scratch file     18
 new library       1
0p r o b l e m   d e s c r i p t i o n
0igr--geometry (0/1/2/3--inf med/slab/cyl/sphere                2
0izm--number of zones or material regions                       4
0ms--mixing table length                                       70
0ibl--shielded cross section edit option (0/1--no/yes)          0
0ibr--bondarenko factor edit option (0/1--no/yes)               0
0issqpt--dancoff factor option                                  0
0convergence criterion    1.00000E-03
0geometry correction factor for wigner rational approximation  1.350E+00
0       3q array has      70 entries.
0       4q array has      70 entries.
0       5q array has      70 entries.
0       6q array has       4 entries.
0       7q array has       4 entries.
0       8q array has       4 entries.
0       9q array has       4 entries.
0      10q array has      70 entries.
0      11q array has       4 entries.
0m i x i n g   t a b l e
0entry  mixture   isotope  number density  new identifier
    1        3      8016    2.09710E-02             201
    2        3      1001    4.19420E-02             202
    3        3      5010    3.81515E-06             203
    4        3      5011    1.54884E-05             204
    5        2     40302    4.25156E-02             205
    6        1     92235    1.62152E-04          200006
    7        1     92234    1.60895E-06          200007
    8        1     92236    1.31718E-05          200008
    9        1     92238    7.24962E-03          200009
   10        1      8016    1.50611E-02          200010
   11        1      8016    1.15315E-02          200011
   12        1     36083    3.23159E-07          200012
   13        1     36085    1.55770E-07          200013
   14        1     38090    3.51229E-06          200014
   15        1     39089    2.61349E-06          200015
   16        1     42095    3.20178E-06          200016
   17        1     40093    2.71690E-06          200017
   18        1     40094    4.22845E-06          200018
   19        1     40095    6.86629E-07          200019
   20        1     41094    1.81576E-12          200020
   21        1     43099    4.11687E-06          200021
   22        1     45103    2.14179E-06          200022
   23        1     45105    6.24106E-09          200023
   24        1     44101    3.66029E-06          200024
   25        1     44106    5.45766E-07          200025
   26        1     46105    1.26197E-06          200026
   27        1     46108    3.07708E-07          200027
```

28	1	47109	2.21053E-07	200028
29	1	51124	5.35940E-11	200029
30	1	54131	1.90924E-06	200030
31	1	54132	3.32758E-06	200031
32	1	54135	2.20090E-09	200032
33	1	54136	6.96021E-06	200033
34	1	55134	1.39893E-07	200034
35	1	55135	2.19558E-06	200035
36	1	55137	4.36275E-06	200036
37	1	56136	2.69601E-08	200037
38	1	57139	4.33528E-06	200038
39	1	59141	3.63399E-06	200039
40	1	59143	1.27348E-07	200040
41	1	58144	1.94158E-06	200041
42	1	60143	3.52685E-06	200042
43	1	60145	2.55992E-06	200043
44	1	61147	1.03903E-06	200044
45	1	61148	2.92578E-09	200045
46	1	60147	4.35262E-08	200046
47	1	62147	2.20883E-07	200047
48	1	62149	2.65272E-08	200048
49	1	62150	8.41498E-07	200049
50	1	62151	1.09812E-07	200050
51	1	62152	4.11655E-07	200051
52	1	64155	3.91515E-10	200052
53	1	63153	2.08635E-07	200053
54	1	63154	3.15201E-08	200054
55	1	63155	2.41894E-08	200055
56	1	40302	4.42681E-03	200056
57	1	1001	2.30630E-02	200057
58	1	5010	2.09787E-06	200058
59	1	5011	8.51673E-06	200059
60	1	55133	4.50801E-06	200060
61	1	95237	6.54722E-07	200061
62	1	94238	5.86583E-08	200062
63	1	94239	2.73412E-05	200063
64	1	94240	3.82999E-06	200064
65	1	94241	1.67189E-06	200065
66	1	94242	1.12810E-07	200066
67	1	95241	3.19625E-08	200067
68	1	95243	6.10845E-09	200068
69	1	96244	3.46025E-10	200069
70	1	999	3.30753E-21	200070

0geometry and material description

0zone	mixture	outer dimension	temperature	extra xs	type (0/1--fuel/mod)
1	3	6.32460E-01	6.07600E+02	7.90564E-01	0
2	2	6.73100E-01	6.50000E+02	1.23032E+01	0
3	3	8.14000E-01	6.07600E+02	3.54862E+00	0
4	1	2.96100E+00	9.75000E+02	2.32883E-01	0

8067 locations of 20000 available are required to make a new master containing the self-shielded values

0no nuclides in your problem have bondarenko factor data**bonami will copy from logical 12 to logical 1

0copy	999	1/v cross sectio	from lag 12	to lag 1	bondarenko	trigger 0
0copy	1001	hydrogen	from lag 12	to lag 18	bondarenko	trigger 0
0copy	1001	hydrogen	from lag 18	to lag 1	bondarenko	trigger 0
0copy	1001	hydrogen	from lag 18	to lag 1	bondarenko	trigger 0
0copy	5010	b-10 1273 218ngp	from lag 12	to lag 18	bondarenko	trigger 0
0copy	5010	b-10 1273 218ngp	from lag 18	to lag 1	bondarenko	trigger 0
0copy	5010	b-10 1273 218ngp	from lag 18	to lag 1	bondarenko	trigger 0
0copy	5011	boron-11	from lag 12	to lag 18	bondarenko	trigger 0
0copy	5011	boron-11	from lag 18	to lag 1	bondarenko	trigger 0

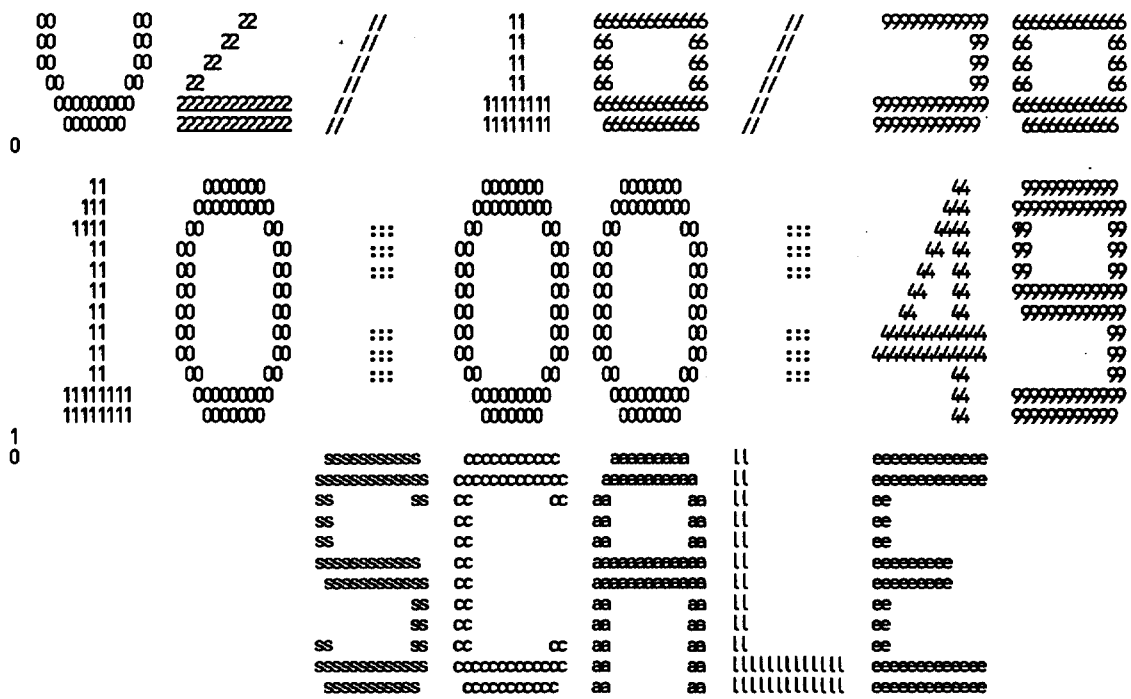
```
0copy    5011  boron-11          from lag 18 to lag  1   bondarenko trigger 0
0copy    8016  oxygen-16         from lag 12 to lag 18   bondarenko trigger 0
0copy    8016  oxygen-16         from lag 18 to lag  1   bondarenko trigger 0
0copy    8016  oxygen-16         from lag 18 to lag  1   bondarenko trigger 0
0copy    8016  oxygen-16         from lag 18 to lag  1   bondarenko trigger 0
0copy   36083  kr-83             from lag 12 to lag  1   bondarenko trigger 0
0copy   36085  kr-85             from lag 12 to lag  1   bondarenko trigger 0
0copy   38090  sr-90             from lag 12 to lag  1   bondarenko trigger 0
0copy   39089   y-89             from lag 12 to lag  1   bondarenko trigger 0
0copy   40093  zr-93             from lag 12 to lag  1   bondarenko trigger 0
0copy   40094  zr-94             from lag 12 to lag  1   bondarenko trigger 0
0copy   40095  zr-95             from lag 12 to lag  1   bondarenko trigger 0
0copy   40302  zircalloy         from lag 12 to lag 18   bondarenko trigger 0
0copy   40302  zircalloy         from lag 18 to lag  1   bondarenko trigger 0
0copy   40302  zircalloy         from lag 18 to lag  1   bondarenko trigger 0
0copy   41094  nb-94             from lag 12 to lag  1   bondarenko trigger 0
0copy   42095  mo-95             from lag 12 to lag  1   bondarenko trigger 0
0copy   43099  tc-99             from lag 12 to lag  1   bondarenko trigger 0
0copy   44101  ru-101            from lag 12 to lag  1   bondarenko trigger 0
0copy   44106  ru-106            from lag 12 to lag  1   bondarenko trigger 0
0copy   45103  rh-103            from lag 12 to lag  1   bondarenko trigger 0
0copy   45105  rh-105            from lag 12 to lag  1   bondarenko trigger 0
0copy   46105  pd-105            from lag 12 to lag  1   bondarenko trigger 0
0copy   46108  pd-108            from lag 12 to lag  1   bondarenko trigger 0
0copy   47109  silver-109        from lag 12 to lag  1   bondarenko trigger 0
0copy   51124  sb-124            from lag 12 to lag  1   bondarenko trigger 0
0copy   54131  xe-131            from lag 12 to lag  1   bondarenko trigger 0
0copy   54132  xe-132            from lag 12 to lag  1   bondarenko trigger 0
0copy   54135  xenon-135         from lag 12 to lag  1   bondarenko trigger 0
0copy   54136  xe-136            from lag 12 to lag  1   bondarenko trigger 0
0copy   55133  cesium-133        from lag 12 to lag  1   bondarenko trigger 0
0copy   55134  cs-134            from lag 12 to lag  1   bondarenko trigger 0
0copy   55135  cs-135            from lag 12 to lag  1   bondarenko trigger 0
0copy   55137  cs-137            from lag 12 to lag  1   bondarenko trigger 0
0copy   56136  ba-136            from lag 12 to lag  1   bondarenko trigger 0
0copy   57139  la-139            from lag 12 to lag  1   bondarenko trigger 0
0copy   58144  ce-144            from lag 12 to lag  1   bondarenko trigger 0
0copy   59141  pr-141            from lag 12 to lag  1   bondarenko trigger 0
0copy   59143  pr-143            from lag 12 to lag  1   bondarenko trigger 0
0copy   60143  nd-143            from lag 12 to lag  1   bondarenko trigger 0
0copy   60145  nd-145            from lag 12 to lag  1   bondarenko trigger 0
0copy   60147  nd-147            from lag 12 to lag  1   bondarenko trigger 0
0copy   61147  pm-147            from lag 12 to lag  1   bondarenko trigger 0
0copy   61148  pm-148            from lag 12 to lag  1   bondarenko trigger 0
0copy   62147  sm-147            from lag 12 to lag  1   bondarenko trigger 0
0copy   62149  sm-149            from lag 12 to lag  1   bondarenko trigger 0
0copy   62150  sm-150            from lag 12 to lag  1   bondarenko trigger 0
0copy   62151  sm-151            from lag 12 to lag  1   bondarenko trigger 0
0copy   62152  sm-152            from lag 12 to lag  1   bondarenko trigger 0
0copy   63153  eu-153            from lag 12 to lag  1   bondarenko trigger 0
0copy   63154  eu-154            from lag 12 to lag  1   bondarenko trigger 0
0copy   63155  eu-155            from lag 12 to lag  1   bondarenko trigger 0
0copy   64155  gd-155            from lag 12 to lag  1   bondarenko trigger 0
0copy   92234  u-234 1043 sigc=  from lag 12 to lag  1   bondarenko trigger 0
0copy   92235  uranium-235       from lag 12 to lag  1   bondarenko trigger 0
0copy   92236  u-236 1163 sigc=  from lag 12 to lag  1   bondarenko trigger 0
0copy   92238  uranium-238       from lag 12 to lag  1   bondarenko trigger 0
0copy   93237  neptunium-237     from lag 12 to lag  1   bondarenko trigger 0
0copy   94238  pu-238 1050 sigc  from lag 12 to lag  1   bondarenko trigger 0
0copy   94239  plutonium-239     from lag 12 to lag  1   bondarenko trigger 0
```

```
0copy   94240   plutonium-240   from log 12 to log  1   bondarenko trigger 0
0copy   94241   plutonium-241   from log 12 to log  1   bondarenko trigger 0
0copy   94242   plutonium-242   from log 12 to log  1   bondarenko trigger 0
0copy   95241  am-241 1056 sigp from log 12 to log  1   bondarenko trigger 0
0copy   95243  am-243 1057 218  from log 12 to log  1   bondarenko trigger 0
0copy   96244   curium-244     from log 12 to log  1   bondarenko trigger 0
1     scale 4.2 - 27 group neutron burnup library
      based on endf-b version 4 data with endf-b version 5 fission products
         compiled for nrc     1/27/89
            last updated      9/16/93
               l.m.petrie  -  ornl
       tape id                          4321        number of nuclides          70
       number of neutron groups           27        number of gamma groups       0
       first thermal group                15        logical unit                 1
                              table of contents
     1/v cross sections normalized to 1.0 at 0.0253 ev                      id  200070
      hydrogen       endf/b-iv mat 1269/thrml002   updated 10/13/89         id     202
      hydrogen       endf/b-iv mat 1269/thrml002   updated 10/13/89         id  200057
     b-10 1273 218ngp 042375 p-3 293k                                       id     203
     b-10 1273 218ngp 042375 p-3 293k                                       id  200058
      boron-11       endf/b-iv mat 1160            updated 10/13/89         id     204
      boron-11       endf/b-iv mat 1160            updated 10/13/89         id  200059
      oxygen-16      endf/b-iv mat 1276            updated 10/13/89         id     201
      oxygen-16      endf/b-iv mat 1276            updated 10/13/89         id  200010
      oxygen-16      endf/b-iv mat 1276            updated 10/13/89         id  200011
      kr-83          mt=102,103,103,105,106,107    updated 10/13/89         id  200012
      kr-85            mt=  102                                             id  200013
      sr-90          mt=102                        updated 10/13/89         id  200014
       y-89          mt=102                        updated 10/13/89         id  200015
      zr-93            mt=  102                                             id  200017
      zr-94          mt=102                        updated 10/13/89         id  200018
      zr-95          mt=102                        updated 10/13/89         id  200019
      zircalloy      endf/b-iv mat 1284            updated 10/13/89         id     205
      zircalloy      endf/b-iv mat 1284            updated 10/13/89         id  200056
      nb-94          mt=102                        updated 10/13/89         id  200020
      mo-95          mt=102                        updated 10/13/89         id  200016
      tc-99          mt=102                        updated 10/13/89         id  200021
      ru-101         mt=102                        updated 10/13/89         id  200024
      ru-106         mt=102                        updated 10/13/89         id  200025
      rh-103         mt=102                        updated 10/13/89         id  200022
      rh-105           mt=  102                                             id  200023
      pd-105         mt=102                        updated 10/13/89         id  200026
      pd-108         mt=102                        updated 10/13/89         id  200027
      silver-109     endf/b-iv mat 1139            updated 10/13/89         id  200028
      sb-124         mt=102                        updated 10/13/89         id  200029
      xe-131         mt=102,103,104,105,106        updated 10/13/89         id  200030
      xe-132         mt=102,103,104,105,106        updated 10/13/89         id  200031
      xenon-135      endf/b-iv mat 1294            updated 10/13/89         id  200032
      xe-136           mt=  102,  103,  104,  105,  107                     id  200033
      cesium-133     endf/b-iv mat 1141            updated 10/13/89         id  200060
      cs-134         mt=102                        updated 10/13/89         id  200034
      cs-135           mt=  102                                             id  200035
      cs-137         mt=102                        updated 10/13/89         id  200036
      ba-136         mt=102                        updated 10/13/89         id  200037
      la-139         mt=102                        updated 10/13/89         id  200038
      ce-144           mt=  102                                             id  200041
      pr-141         mt=102,103,104,105,106,107    updated 10/13/89         id  200039
      pr-143         mt=102                        updated 10/13/89         id  200040
      nd-143         mt=102                        updated 10/13/89         id  200042
      nd-145         mt=102                        updated 10/13/89         id  200043
```

```
        nd-147        mt=102                       updated 10/13/89          id    200046
        pm-147        mt=102                       updated 10/13/89          id    200044
        pm-148           mt= 102                                             id    200045
        sm-147        endf/b-v fission product     updated 10/13/89          id    200047
        sm-149        mt=102,103,107               updated 10/13/89          id    200048
        sm-150        mt=102                       updated 10/13/89          id    200049
        sm-151        mt=102,103,104,105,106,107   updated 10/13/89          id    200050
        sm-152        mt=102,103,104,105,106,107   updated 10/13/89          id    200051
        eu-153        mt=102,103,104,105,106,107   updated 10/13/89          id    200053
        eu-154        mt=102,103,104,105,106,107   updated 10/13/89          id    200054
        eu-155        mt=102,103,104,105,106,107   updated 10/13/89          id    200055
        gd-155        mt=102                       updated 10/13/89          id    200052
       u-234 1043 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                   id    200007
        uranium-235   endf/b-iv mat 1261           updated 10/13/89          id    200006
       u-236 1163 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                   id    200008
        uranium-238   endf/b-iv mat 1262           updated 10/13/89          id    200009
        neptunium-237 endf/b-iv mat 1263           updated 10/13/89          id    200061
       pu-238 1050 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                  id    200062
        plutonium-239 endf/b-iv mat 1264           updated 10/13/89          id    200063
        plutonium-240 endf/b-iv mat 1265           updated 10/13/89          id    200064
        plutonium-241 endf/b-iv mat 1266           updated 10/13/89          id    200065
        plutonium-242 endf/b-iv mat 1161           updated 10/13/89          id    200066
       am-241 1056 sigo=5+4 newxlacs 218ngp p-3 293k                         id    200067
       am-243 1057 218 gp wt f-1/e-m 090376 p3 293k                          id    200068
        curium-244    endf/b-iv mat 1162           updated 10/13/89          id    200069
0        tape copy used       0 i/o's, and took     .00 seconds
1              m       m iiiiiiiiiiii   tttttttttttt    aaaaaaaaaa    ww        ww ll
               mm      m iiiiiiiiiiii   tttttttttttt   aaaaaaaaaaaa   ww        ww ll
               mmm     m      ii             tt       aa        aa   ww        ww ll
               mm m    m      ii             tt       aa        aa   ww        ww ll
               m  m    m      ii             tt       aa        aa   ww        ww ll
               m   m   m      ii             tt       aaaaaaaaaaaaaa ww    w   ww ll
               m    m  m      ii             tt       aaaaaaaaaaaaaa ww   www  ww ll
               m     m m      ii             tt       aa        aa   ww  ww ww ww ll
               m      mm      ii             tt       aa        aa   ww ww   ww ww ll
               m      mmm     ii             tt       aa        aa   wwww     wwww ll
               m       mm iiiiiiiiiiii       tt       aa        aa   www       www llllllllllll
               m        m iiiiiiiiiiii       tt       aa        aa   ww         ww llllllllllll
0

   ddddddddddd    aaaaaaaaaa   w          w iiiiiiiiiiii   ssssssssss
   dddddddddddd  aaaaaaaaaaaa  w          w iiiiiiiiiiii  ssssssssssss
   dd        dd aa        aa   w          w      ii       ss        ss
   dd        dd aa        aa   w          w      ii       ss
   dd        dd aa        aa   w          w      ii       ss
   dd        dd aaaaaaaaaaaaa  w          w      ii       sssssssssss
   dd        dd aaaaaaaaaaaaa   w        w       ii        sssssssssss
   dd        dd aa        aa     w      w        ii                 ss
   dd        dd aa        aa      w    w         ii                 ss
   dd        dd aa        aa       w  w          ii       ss        ss
   dddddddddddd aa        aa        ww      iiiiiiiiiiii  ssssssssssss
   ddddddddddd  aa        aa         v      iiiiiiiiiiii   ssssssssss
0

     0000000     2222222222          //       11    666666666666        //  9999999999   666666666666
    000000000   222222222222        //       111   6666666666666       //  999999999999 6666666666666
   00      00   22        22       //       1111   66                 //   99        99 66
   00      00             22      //          11   66                //    99        99 66
   00      00             22     //           11   66               //     99        99 66
   00      00           22      //            11   666666666666    //      999999999999 666666666666
```


SCALE 4.2
program verification information
code system: scale version: 4.2
program: c0c002
creation date: 04/27/95
library: /nautronics/scale/exe
this is not a scale configuration controlled code
jobname: davis

```
                    *****                                                  *****
                    *****   date of execution:  02/16/96                   *****
                    *****                                                  *****
                    *****   time of execution:  10:00:49                   *****
                    *****                                                  *****
                    *****                                                  *****
                    ********************************************************************
                    ********************************************************************
                    ********************************************************************
1
0       -1q array has       1 entries.
0        0q array has       4 entries.
0        1q array has      12 entries.
0select  5 nuclides from the master  library on logical  1
        65 nuclides from the working library on logical  3
         0 nuclides from the working library on logical  0
           to create the new working library on logical  4

         1 resonance calculations have been requested
         0 output option for ampx formatted cross section data
0the storage allocated for this case is 200000 words
0        2q array has      70 entries.
0        3q array has      15 entries.
0        4q array has       5 entries.
0 general information concerning cross section library
    tape identification number                4349
    number of nuclides on tape                  65
    number of neutron energy groups             27
    first thermal neutron energy group          15
    number of gamma energy groups                0
0   direct access unit number  9 requires  72 blocks of length  1484 words
- xsdrn tape   4321
                        scale 4.2 - 27 group neutron burnup library
                           based on endf-b version 4 data with endf-b version 5 fission products
                              compiled for nrc      1/27/89
                                 last updated       9/16/93
                                    l.m.petrie   -   ornl
-  work tape   4349

 xsdrn weighted tape--parent case entitled--  560 d, sas2h: babcock wilcox 15x15,
  3.00wt%, 20gwd/mtu burn high temp



0 nuclides from xsdrn tape
     1     hydrogen        endf/b-iv mat 1269/thrm1002     updated 10/13/89          202
     2    b-10 1273 218ngp 042375 p-3 293k                                           203
     3     boron-11        endf/b-iv mat 1160              updated 10/13/89          204
     4     oxygen-16       endf/b-iv mat 1276              updated 10/13/89          201
     5     zircalloy       endf/b-iv mat 1284              updated 10/13/89          205
0 nuclides from  work tape
     6    1/v cross sections normalized to 1.0 at 0.0253 ev                           999
     7     hydrogen        endf/b-iv mat 1269/thrm1002     updated 10/13/89         1001
     8    b-10 1273 218ngp 042375 p-3 293k                                          5010
     9     boron-11        endf/b-iv mat 1160              updated 10/13/89         5011
    10     oxygen-16       endf/b-iv mat 1276              updated 10/13/89         8016
    11     oxygen-16       endf/b-iv mat 1276              updated 10/13/89            6
    12     kr-83           mt=102,103,103,105,106,107      updated 10/13/89        36083
    13     kr-85             mt=  102                                              36085
    14     sr-90           mt=102                          updated 10/13/89        38090
```

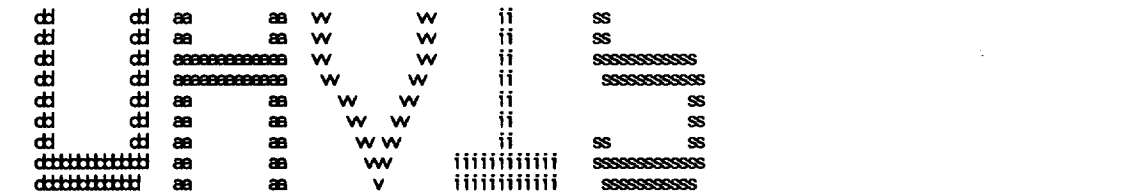
```
 15    y-89          mt=102                          updated 10/13/89          39089
 16    zr-93            mt=  102                                               40093
 17    zr-94         mt=102                          updated 10/13/89          40094
 18    zr-95         mt=102                          updated 10/13/89          40095
 19    zircalloy     endf/b-iv mat 1284              updated 10/13/89          40502
 20    rb-94         mt=102                          updated 10/13/89          41094
 21    mo-95         mt=102                          updated 10/13/89          42095
 22    tc-99         mt=102                          updated 10/13/89          43099
 23    ru-101        mt=102                          updated 10/13/89          44101
 24    ru-106        mt=102                          updated 10/13/89          44106
 25    rh-103        mt=102                          updated 10/13/89          45103
 26    rh-105           mt=  102                                               45105
 27    pd-105        mt=102                          updated 10/13/89          46105
 28    pd-108        mt=102                          updated 10/13/89          46108
 29    silver-109    endf/b-iv mat 1139              updated 10/13/89          47109
 30    sb-124        mt=102                          updated 10/13/89          51124
 31    xe-131        mt=102,103,104,105,106          updated 10/13/89          54131
 32    xe-132        mt=102,103,104,105,106          updated 10/13/89          54132
 33    xenon-135     endf/b-iv mat 1294              updated 10/13/89          54135
 34    xe-136           mt=  102,  103,  104,  105,  107                       54136
 35    cesium-133    endf/b-iv mat 1141              updated 10/13/89          55133
 36    cs-134        mt=102                          updated 10/13/89          55134
 37    cs-135           mt=  102                                               55135
 38    cs-137        mt=102                          updated 10/13/89          55137
 39    ba-136        mt=102                          updated 10/13/89          56136
 40    la-139        mt=102                          updated 10/13/89          57139
 41    ce-144           mt=  102                                               58144
 42    pr-141        mt=102,103,104,105,106,107      updated 10/13/89          59141
 43    pr-143        mt=102                          updated 10/13/89          59143
 44    nd-143        mt=102                          updated 10/13/89          60143
 45    nd-145        mt=102                          updated 10/13/89          60145
 46    nd-147        mt=102                          updated 10/13/89          60147
 47    pm-147        mt=102                          updated 10/13/89          61147
 48    pm-148           mt=  102                                               61148
 49    sm-147        endf/b-v fission product        updated 10/13/89          62147
 50    sm-149        mt=102,103,107                  updated 10/13/89          62149
 51    sm-150        mt=102                          updated 10/13/89          62150
 52    sm-151        mt=102,103,104,105,106,107      updated 10/13/89          62151
 53    sm-152        mt=102,103,104,105,106,107      updated 10/13/89          62152
 54    eu-153        mt=102,103,104,105,106,107      updated 10/13/89          63153
 55    eu-154        mt=102,103,104,105,106,107      updated 10/13/89          63154
 56    eu-155        mt=102,103,104,105,106,107      updated 10/13/89          63155
 57    gd-155        mt=102                          updated 10/13/89          64155
 58   u-234 1043 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                       92234
 59    uranium-235   endf/b-iv mat 1261              updated 10/13/89          92235
 60   u-236 1163 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                       92236
 61    uranium-238   endf/b-iv mat 1262              updated 10/13/89          92238
 62    neptunium-237 endf/b-iv mat 1263              updated 10/13/89          93237
 63   pu-238 1050 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                       94238
 64    plutonium-239 endf/b-iv mat 1264              updated 10/13/89          94239
 65    plutonium-240 endf/b-iv mat 1265              updated 10/13/89          94240
 66    plutonium-241 endf/b-iv mat 1266              updated 10/13/89          94241
 67    plutonium-242 endf/b-iv mat 1161              updated 10/13/89          94242
 68   am-241 1056 sigo=5+4 newklacs 218ngp p-3 293k                             95241
 69   am-243 1057 218 gp wt f-1/e-m 090576 p3 293k                              95243
 70    curium-244    endf/b-iv mat 1162              updated 10/13/89          96244
0 hydrogen       endf/b-iv mat 1269/thrm1002    updated 10/13/89          202    temperature=  607.60
                          thermal scattering matrix number  2 at a temperature of   550.00 was selected.
0b-10 1273 218ngp 042375 p-3 293k                                          203    temperature=  607.60
                          thermal scattering matrix number  2 at a temperature of   550.00 was selected.
```

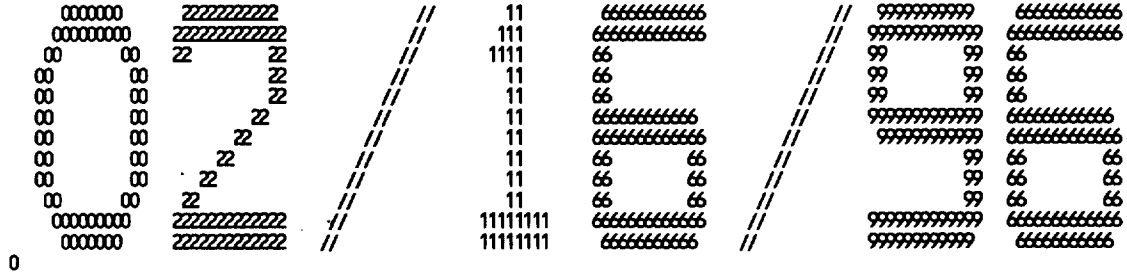
```
0 boron-11      endf/b-iv mat 1160          updated 10/13/89          204    temperature=  607.60
                          thermal scattering matrix number  2 at a temperature of   550.00 was selected.
0 oxygen-16     endf/b-iv mat 1276          updated 10/13/89          201    temperature=  607.60
0 zircalloy     endf/b-iv mat 1284          updated 10/13/89          205    temperature=  650.00
0resonance data for this nuclide
0mass number (a)          =   90.436          temperature(kelvin)      =   650.000
0potential scatter sigma  =    6.385          lumped nuclear density   = 4.2515602E-02
0spin factor (g)          =    1.079          lump dimension (a-bar)   = 6.7309999E-01
0inner radius             = 6.3246000E-01     dancoff correction (c)   = 1.6805907E-01
0the absorber will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs          res fiss         res scat
   8     -1.156752E-03     .000000E+00    -7.806033E-01
   9     -4.625978E-02     .000000E+00    -2.073270E+00
  10     -5.962230E-02     .000000E+00    -1.351984E+00
  11     -1.761672E-01     .000000E+00    -7.350731E-01
0excess resonance integrals
0                resolved
0absorption     2.92402E-01
 fission         .00000E+00
-  elapsed time    .00 min.
-  elapsed time    .02 min.
1     this xsdrn working tape was created 02/16/96 at 10:00:49
      the title of the parent case is as follows
      xsdrn weighted tape--parent case entitled--  560 d, sas2h: babcock wilcox 15x15,
       3.00wt%, 20gwd/mtu burn high temp

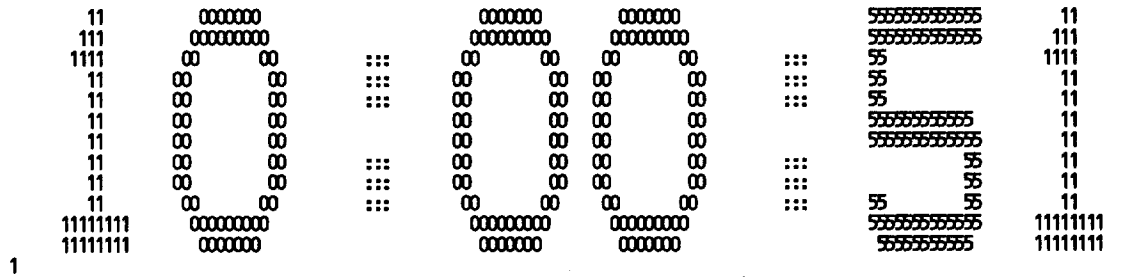
        tape id                          8670        number of nuclides              70
        number of neutron groups           27        number of gamma groups           0
        first thermal group                15        logical unit                     4
                                  table of contents
       hydrogen       endf/b-iv mat 1269/thrm1002   updated 10/13/89          id    202
      b-10 1273 218ngp 042375 p-3 293k                                         id    203
       boron-11       endf/b-iv mat 1160            updated 10/13/89          id    204
       oxygen-16      endf/b-iv mat 1276            updated 10/13/89          id    201
       zircalloy      endf/b-iv mat 1284            updated 10/13/89          id    205
      1/v cross sections normalized to 1.0 at 0.0253 ev                         id    999
       hydrogen       endf/b-iv mat 1269/thrm1002   updated 10/13/89          id   1001
      b-10 1273 218ngp 042375 p-3 293k                                         id   5010
       boron-11       endf/b-iv mat 1160            updated 10/13/89          id   5011
       oxygen-16      endf/b-iv mat 1276            updated 10/13/89          id   8016
       oxygen-16      endf/b-iv mat 1276            updated 10/13/89          id      6
       kr-83          mt=102,103,103,105,106,107    updated 10/13/89          id  36083
       kr-85            mt=  102                                               id  36085
       sr-90          mt=102                        updated 10/13/89          id  38090
        y-89          mt=102                        updated 10/13/89          id  39089
       zr-93            mt=  102                                               id  40093
       zr-94          mt=102                        updated 10/13/89          id  40094
       zr-95          mt=102                        updated 10/13/89          id  40095
       zircalloy      endf/b-iv mat 1284            updated 10/13/89          id  40302
       nb-94          mt=102                        updated 10/13/89          id  41094
       mo-95          mt=102                        updated 10/13/89          id  42095
       tc-99          mt=102                        updated 10/13/89          id  43099
       ru-101         mt=102                        updated 10/13/89          id  44101
       ru-106         mt=102                        updated 10/13/89          id  44106
       rh-103         mt=102                        updated 10/13/89          id  45103
       rh-105           mt=  102                                               id  45105
       pd-105         mt=102                        updated 10/13/89          id  46105
       pd-108         mt=102                        updated 10/13/89          id  46108
```

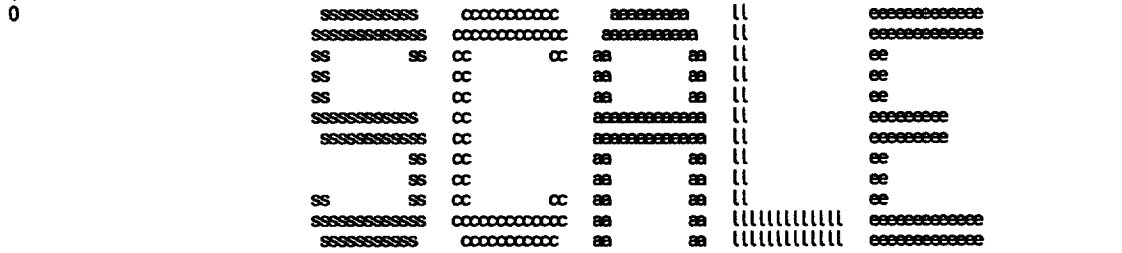
```
      silver-109     endf/b-iv mat 1139            updated 10/13/89          id    47109
      sb-124         mt=102                        updated 10/13/89          id    51124
      xe-131         mt=102,103,104,105,106        updated 10/13/89          id    54131
      xe-132         mt=102,103,104,105,106        updated 10/13/89          id    54132
      xenon-135      endf/b-iv mat 1294            updated 10/13/89          id    54135
      xe-136           mt=  102, 103,  104,  105,  107                       id    54136
      cesium-133     endf/b-iv mat 1141            updated 10/13/89          id    55133
      cs-134         mt=102                        updated 10/13/89          id    55134
      cs-135           mt=  102                                              id    55135
      cs-137         mt=102                        updated 10/13/89          id    55137
      ba-136         mt=102                        updated 10/13/89          id    56136
      la-139         mt=102                        updated 10/13/89          id    57139
      ce-144           mt=  102                                              id    58144
      pr-141         mt=102,103,104,105,106,107    updated 10/13/89          id    59141
      pr-143         mt=102                        updated 10/13/89          id    59143
      nd-143         mt=102                        updated 10/13/89          id    60143
      nd-145         mt=102                        updated 10/13/89          id    60145
      nd-147         mt=102                        updated 10/13/89          id    60147
      pm-147         mt=102                        updated 10/13/89          id    61147
      pm-148           mt=  102                                              id    61148
      sm-147         endf/b-v fission product      updated 10/13/89          id    62147
      sm-149         mt=102,103,107                updated 10/13/89          id    62149
      sm-150         mt=102                        updated 10/13/89          id    62150
      sm-151         mt=102,103,104,105,106,107    updated 10/13/89          id    62151
      sm-152         mt=102,103,104,105,106,107    updated 10/13/89          id    62152
      eu-153         mt=102,103,104,105,106,107    updated 10/13/89          id    63153
      eu-154         mt=102,103,104,105,106,107    updated 10/13/89          id    63154
      eu-155         mt=102,103,104,105,106,107    updated 10/13/89          id    63155
      gd-155         mt=102                        updated 10/13/89          id    64155
     u-234 1043 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                      id    92234
      uranium-235    endf/b-iv mat 1261            updated 10/13/89          id    92235
     u-236 1163 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                      id    92236
      uranium-238    endf/b-iv mat 1262            updated 10/13/89          id    92238
      neptunium-237  endf/b-iv mat 1263            updated 10/13/89          id    93237
     pu-238 1050 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                     id    94238
      plutonium-239  endf/b-iv mat 1264            updated 10/13/89          id    94239
      plutonium-240  endf/b-iv mat 1265            updated 10/13/89          id    94240
      plutonium-241  endf/b-iv mat 1266            updated 10/13/89          id    94241
      plutonium-242  endf/b-iv mat 1161            updated 10/13/89          id    94242
     am-241 1056 sigo=5+4 newklacs 218ngp p-3 293k                            id    95241
     am-243 1057 218 gp wt f-1/e-m 090576 p3 293k                             id    95243
      curium-244     endf/b-iv mat 1162            updated 10/13/89          id    96244
0       tape copy used      0 i/o's, and took      .00 seconds
1 xx        xx  ssssssssss   dddddddddd   rrrrrrrrrr   m        m  pppppppppp   mm        mm
   xx      xx  ssssssssssss  ddddddddddd  rrrrrrrrrrr  mm       m  ppppppppppp  mmm      mmm
    xx    xx  ss        ss  dd       dd  rr       rr  mmm      m  pp       pp  mmmm    mmmm
     xx  xx   ss            dd       dd  rr       rr  m m      m  pp       pp  mm mm   mm mm
      xxxx    ssssssssss    dd       dd  rrrrrrrrrr   m  m     m  pppppppppp  mm  mmm  mm
      xxx       ssssssssss  dd       dd  rrrrrrrrrr   m   m    m  pppppppppp  mm   m   mm
     xx xx            ss   dd       dd  rr  rr       m    m m  m  pp           mm       mm
    xx  xx            ss   dd       dd  rr   rr      m     mm  m  pp           mm       mm
   xx    xx  ss      ss   dd       dd  rr    rr     m      m   m  pp           mm       mm
  xx      xx  ssssssssss   ddddddddddd  rr     rr    m      m   m  pp           mm       mm
 xx        xx  ssssssssss   ddddddddd   rr      rr   m      m   m  pp           mm       mm
0

  ddddddddddd     aaaaaaaa    w        w  iiiiiiiiiii    ssssssssss
  ddddddddddd    aaaaaaaaaa   w        w  iiiiiiiiiii   ssssssssssss
  dd       dd   aa        aa  w        w      ii       ss        ss
```









****
****
****
***** *****
***** program verification information *****

```
*****                                                                    *****
*****              code system:    scale  version:    4.2                *****
*****                                                                    *****
******************************************************************************
******************************************************************************
*****                                                                    *****
*****                                                                    *****
*****                  program:  c0c001                                  *****
*****                                                                    *****
*****            creation date:  04/27/95                                *****
*****                                                                    *****
*****                  library:  /neutronics/scale/exe                   *****
*****                                                                    *****
*****                                                                    *****
*****   this is not a   scale  configuration controlled code             *****
*****                                                                    *****
*****                  jobname:  davis                                   *****
*****                                                                    *****
*****        date of execution:  02/16/96                                *****
*****                                                                    *****
*****        time of execution:  10:00:51                                *****
*****                                                                    *****
*****                                                                    *****
******************************************************************************
******************************************************************************
******************************************************************************
1
                         560 d, second part of sas2h pass to make library
0      -1q array has      1 entries.
0       0q array has     11 entries.
0       1q array has     15 entries.
0       2q array has     10 entries.
0       3q array has     12 entries.
0       4q array has      9 entries.
0       5q array has     12 entries.
0direct access unit   9 requires    12 blocks of length  704 for cross section mixing.
1                        560 d, second part of sas2h pass to make library
0general problem description data block
0                                   general problem data

 ige  1/2/3 = plane/cylinder/sphere        2      isn  quadrature order                  8
 izm  number of zones                      4      isct order of scattering               3
 im   number of spacial intervals         28      ievt 0/1/2/3/4/5/6=q/k/alpha/c/z/r/h   1
 ibl  0/1/2/3 = vacuum/refl/per/white      1      iim  inner iteration maximum          20
 ibr  right boundary condition             3      iom  outer iteration maximum          25
 mxx  number of mixtures                   3      iclc -1/0/n--flat res/sn/opt           0
 ms   mixing table length                 70      ith  0/1 = forward/adjoint             0
 igm  number of energy groups             27      iflu not used(always wgtd)             0
 nng  number of neutron groups            27      iprt -2/-1/0/n=mixture xsec print     -2
 ngg  number of gamma groups               0      idl  0/1/2/3=no/prt nd/pch n/both     14
 iftg number of first thermal group       15      ipbt -1/0/1=none/fine/all bal. prt     0
0                                   special options

 ifg  0/1 = none/weighting calculation     1      ipn  0/1/2 diff. coef. param           0
 iqm  volumetric sources (0/n=no/yes)      0      idfm 0/1 = none/density factors 38*    0
 ipm  boundary sources (0/n=no/yes)        0      iaz  0/n = none/n activities by zone   0
 ifn  0/1/2 = input 33*/34*/use last      14      iai  0/1=none/activities by interval   0
 itmx maximum time (minutes)              10      ifct 0/1=no/yes upscatter scaling      0
 idt1 0/1/2/3=no/xsect/srce/flux--out      0      ipvt 0/1/2=no/k/alpha parametric srch  0
 isx  broad group fluxes                   0      isen outer iteration acceleration      0
```

```
 ibln activity data unit              0      nbnd band rebaln parameter          0
 jbkl 0/1/2 buckling geometry         0
0                               weighting data (ifg=1)

 icon -1/0/1=cell/zone/region weight  -1     ihtf total xsect psn in brd gp tables   3
 igmf number of broad groups           3     ndsf psn g-g or file number            4
 itp  0/10/20/30/40 0/c/e/ac/a         0     nusf table length or max order         6
 ipp  -2/-1/0/n=wgted xsect print     -2     msom extra 1-d x-sect positions        0
 iap  -1/n anisn xsect print          -1
0                              floating point parameters

 eps  overall convergence      1.00000E-04    dy  cyl/pla ht for buckling    .00000E+00
 ptc  point convergence        1.00000E-04    dz  plane depth for buckling 2.00000E+02
 xnf  normalization factor     1.00000E+00    vsc void streaming correction .00000E+00
 ev   eigenvalue guess          .00000E+00    pv  ipvt=1/2--k/alpha        1.00000E+00
 evm  eigenvalue modifier       .00000E+00    eql ev change eps for search 1.00000E-03
 bf   buckling factor=1.420892 1.42089E+00    xnpm new param mod for search 7.50000E-01
     this case will require       2611 locations for mixing
     this case has been allocated 200000 locations
1                         560 d, second part of sas2h pass to make library
0        13q array has      70 entries.
0        14q array has      70 entries.
0        15q array has      70 entries.
0                                   data block 2 (mixing table, etc.)
```

0	nuclides on tape	cccc identification	mixture	mixing table component	atom density	extra xsect id's
1	202		3	201	2.09710E-02	
2	203		3	202	4.19420E-02	
3	204		3	203	3.81515E-06	
4	201		3	204	1.54884E-05	
5	205		2	205	4.25156E-02	
6	999		1	92235	1.62152E-04	
7	1001		1	92234	1.60395E-06	
8	5010		1	92236	1.31718E-05	
9	5011		1	92238	7.24962E-03	
10	8016		1	8016	1.50611E-02	
11	6		1	6	1.15315E-02	
12	36083		1	36083	3.23159E-07	
13	36085		1	36085	1.55770E-07	
14	38090		1	38090	3.51229E-06	
15	39089		1	39089	2.61349E-06	
16	40093		1	42095	3.20178E-06	
17	40094		1	40093	2.71690E-06	
18	40095		1	40094	4.22845E-06	
19	40302		1	40095	6.86629E-07	
20	41094		1	41094	1.81576E-12	
21	42095		1	43099	4.11687E-06	
22	43099		1	45103	2.14179E-06	
23	44101		1	45105	6.24106E-09	
24	44106		1	44101	3.66029E-06	
25	45103		1	44106	5.45766E-07	
26	45105		1	46105	1.26197E-06	
27	46105		1	46108	3.07708E-07	
28	46108		1	47109	2.21053E-07	
29	47109		1	51124	5.35940E-11	
30	51124		1	54131	1.90924E-06	
31	54131		1	54132	3.32758E-06	
32	54132		1	54135	2.20090E-09	
33	54135		1	54136	6.96021E-06	
34	54136		1	55134	1.39393E-07	

35	55133	1	55135	2.19558E-06
36	55134	1	55137	4.36275E-06
37	55135	1	56136	2.69601E-08
38	55137	1	57139	4.33528E-06
39	56136	1	59141	3.63399E-06
40	57139	1	59143	1.27348E-07
41	58144	1	58144	1.94158E-06
42	59141	1	60143	3.52685E-06
43	59143	1	60145	2.55992E-06
44	60143	1	61147	1.03903E-06
45	60145	1	61148	2.92378E-09
46	60147	1	60147	4.35262E-08
47	61147	1	62147	2.20883E-07
48	61148	1	62149	2.65272E-08
49	62147	1	62150	8.41498E-07
50	62149	1	62151	1.09812E-07
51	62150	1	62152	4.11655E-07
52	62151	1	64155	3.91515E-10
53	62152	1	63153	2.08635E-07
54	63153	1	63154	3.15201E-08
55	63154	1	63155	2.41894E-08
56	63155	1	40302	4.42681E-03
57	64155	1	1001	2.30630E-02
58	92234	1	5010	2.09787E-06
59	92235	1	5011	8.51673E-06
60	92236	1	55133	4.50801E-06
61	92238	1	95237	6.54722E-07
62	95237	1	94238	5.86583E-08
63	94238	1	94239	2.73412E-05
64	94239	1	94240	3.82999E-06
65	94240	1	94241	1.67189E-06
66	94241	1	94242	1.12810E-07
67	94242	1	95241	3.19625E-08
68	95241	1	95243	6.10845E-09
69	95243	1	96244	3.46025E-10
70	96244	1	999	3.30753E-21

- elapsed time .00 min.
0 24259 locations will be used
0 35q array has 29 entries.
0 36q array has 28 entries.
0 39q array has 4 entries.
0 40q array has 4 entries.
0 47q array has 27 entries.
0 51q array has 27 entries.
1 560 d, second part of sas2h pass to make library

neutron group parameters

0

gp	energy boundaries	lethargy boundaries	weighted velocities	broad gp numbers	calc type	group band	right albedo	left albedo
1	2.00000E+07	-6.93147E-01	4.60581E+09	1	0	1	1.00000E+00	
2	6.43400E+06	4.40989E-01	2.88737E+09	1	0	2	1.00000E+00	
3	3.00000E+06	1.20397E+00	2.12201E+09	1	0	3	1.00000E+00	
4	1.85000E+06	1.68740E+00	1.75673E+09	1	0	4	1.00000E+00	
5	1.40000E+06	1.96611E+00	1.46535E+09	1	0	5	1.00000E+00	
6	9.00000E+05	2.40795E+00	1.06620E+09	2	0	6	1.00000E+00	
7	4.00000E+05	3.21888E+00	6.07557E+08	2	0	7	1.00000E+00	
8	1.00000E+05	4.60517E+00	2.72415E+08	2	0	8	1.00000E+00	
9	1.70000E+04	6.37713E+00	1.13526E+08	2	0	9	1.00000E+00	
10	3.00000E+03	8.11173E+00	4.82126E+07	2	0	10	1.00000E+00	
11	5.50000E+02	9.80818E+00	2.05946E+07	2	0	11	1.00000E+00	
12	1.00000E+02	1.15129E+01	1.01086E+07	2	0	12	1.00000E+00	

13	3.00000E+01	1.27169E+01	5.69595E+06	2	0	13	1.00000E+00
14	1.00000E+01	1.38155E+01	3.20957E+06	2	0	14	1.00000E+00
15	3.04999E+00	1.50030E+01	2.10601E+06	2	0	15	1.00000E+00
16	1.77000E+00	1.55471E+01	1.70522E+06	2	0	16	1.00000E+00
17	1.29999E+00	1.58557E+01	1.52545E+06	2	0	17	1.00000E+00
18	1.12999E+00	1.59959E+01	1.42867E+06	2	0	18	1.00000E+00
19	1.00000E+00	1.61181E+01	1.31002E+06	2	0	19	1.00000E+00
20	8.00000E-01	1.63412E+01	9.05898E+05	2	0	20	1.00000E+00
21	4.00000E-01	1.70844E+01	8.17974E+05	3	0	21	1.00000E+00
22	3.25000E-01	1.72420E+01	6.90070E+05	3	0	22	1.00000E+00
23	2.25000E-01	1.76098E+01	4.86953E+05	3	0	23	1.00000E+00
24	9.99999E-02	1.84207E+01	3.57766E+05	3	0	24	1.00000E+00
25	5.00000E-02	1.91138E+01	2.71895E+05	3	0	25	1.00000E+00
26	3.00000E-02	1.96247E+01	1.87283E+05	3	0	26	1.00000E+00
27	1.00000E-02	2.07239E+01	8.88201E+04	3	0	27	1.00000E+00
28	1.00000E-05	2.76310E+01					

1 560 d, second part of sas2h pass to make library

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	mixture by zone	order p(l) by zone	activity table matl no.	activity table reaction	quadrature constants weights	quadrature constants directions	quadrature constants refl direc	quadrature constants wt x cos
1	3	3			0	-2.79004E-01	3	0
2	2	3			5.06143E-02	-1.97286E-01	3	-9.98548E-03
3	3	3			5.06143E-02	1.97286E-01	2	9.98548E-03
4	1	3			0	-6.04419E-01	8	0
5					5.55953E-02	-5.58410E-01	8	-3.10450E-02
6					5.55953E-02	-2.31301E-01	7	-1.28593E-02
7					5.55953E-02	2.31301E-01	6	1.28593E-02
8					5.55953E-02	5.58410E-01	5	3.10450E-02
9					0	-8.50774E-01	15	0
10					5.22844E-02	-8.21784E-01	15	-4.29665E-02
11					5.22844E-02	-6.01588E-01	14	-3.14537E-02
12					5.22844E-02	-2.20196E-01	13	-1.15128E-02
13					5.22844E-02	2.20196E-01	12	1.15128E-02
14					5.22844E-02	6.01588E-01	11	3.14537E-02
15					5.22844E-02	8.21784E-01	10	4.29665E-02
16					0	-9.83032E-01	24	0
17					4.53355E-02	-9.64143E-01	24	-4.37099E-02
18					4.53355E-02	-8.17361E-01	23	-3.70555E-02
19					4.53355E-02	-5.46143E-01	22	-2.47597E-02
20					4.53355E-02	-1.91780E-01	21	-8.69444E-03
21					4.53355E-02	1.91780E-01	20	8.69444E-03
22					4.53355E-02	5.46143E-01	19	2.47597E-02
23					4.53355E-02	8.17361E-01	18	3.70555E-02
24					4.53355E-02	9.64143E-01	17	4.37099E-02

0constants for p(3) scattering

0angl	set 1	set 2	set 3	set 4	set 5
1	-2.79004E-01	8.83235E-01	6.74143E-02	-6.16919E-01	-1.71701E-02
2	-1.97286E-01	8.83235E-01	.00000E+00	-4.36228E-01	1.21411E-02
3	1.97286E-01	8.83235E-01	.00000E+00	4.36228E-01	-1.21411E-02
4	-6.04419E-01	4.52016E-01	3.16379E-01	-8.04435E-01	-1.74564E-01
5	-5.58410E-01	4.52016E-01	2.23714E-01	-7.43201E-01	-6.68028E-02
6	-2.31301E-01	4.52016E-01	-2.23713E-01	-3.07844E-01	1.61278E-01
7	2.31301E-01	4.52016E-01	-2.23713E-01	3.07844E-01	-1.61278E-01
8	5.58410E-01	4.52016E-01	2.23713E-01	7.43201E-01	6.68028E-02
9	-8.50774E-01	-8.57235E-02	6.26843E-01	-1.98456E-01	-4.86835E-01
10	-8.21784E-01	-8.57235E-02	5.42862E-01	-1.91694E-01	-3.44245E-01
11	-6.01588E-01	-8.57235E-02	.00000E+00	-1.40330E-01	3.44244E-01
12	-2.20196E-01	-8.57235E-02	-5.42862E-01	-5.13643E-02	3.44245E-01
13	2.20196E-01	-8.57235E-02	-5.42862E-01	5.13643E-02	-3.44245E-01
14	6.01588E-01	-8.57235E-02	.00000E+00	1.40330E-01	-3.44245E-01
15	8.21784E-01	-8.57235E-02	5.42862E-01	1.91694E-01	3.44245E-01

16	-9.83032E-01	-4.49528E-01	8.36886E-01	5.00703E-01	-7.51005E-01
17	-9.64143E-01	-4.49528E-01	7.73181E-01	4.91083E-01	-6.24438E-01
18	-8.17361E-01	-4.49528E-01	3.20262E-01	4.16320E-01	1.46514E-01
19	-5.46143E-01	-4.49528E-01	-3.20262E-01	2.78176E-01	7.36575E-01
20	-1.91780E-01	-4.49528E-01	-7.73181E-01	9.76824E-02	4.17236E-01
21	1.91780E-01	-4.49528E-01	-7.73181E-01	-9.76824E-02	-4.17236E-01
22	5.46143E-01	-4.49528E-01	-3.20262E-01	-2.78176E-01	-7.36575E-01
23	8.17361E-01	-4.49528E-01	3.20262E-01	-4.16320E-01	-1.46514E-01
24	9.64143E-01	-4.49528E-01	7.73181E-01	-4.91083E-01	6.24438E-01

1

int	radii	mid pts	zone no.	areas	volumes	dens fact	radius mod	spec(int)
1	0	1.97644E-02	1	0	4.90881E-03		0	
2	3.95287E-02	5.92931E-02	1	2.48366E-01	1.47264E-02		0	
3	7.90575E-02	1.18586E-01	1	4.96733E-01	5.89057E-02		0	
4	1.58115E-01	1.97644E-01	1	9.93466E-01	9.81762E-02		0	
5	2.37172E-01	2.76701E-01	1	1.49020E+00	1.37447E-01			
6	3.16230E-01	3.55759E-01	1	1.98693E+00	1.76717E-01			
7	3.95288E-01	4.34816E-01	1	2.48366E+00	2.15988E-01			
8	4.74345E-01	5.13874E-01	1	2.98040E+00	2.55258E-01			
9	5.53403E-01	5.73167E-01	1	3.47713E+00	1.42355E-01			
10	5.92931E-01	6.12698E-01	1	3.72550E+00	1.52173E-01			
11	6.32460E-01	6.42620E-01	2	3.97386E+00	8.20460E-02			
12	6.52780E-01	6.62940E-01	2	4.10154E+00	8.46405E-02			
13	6.73100E-01	6.96588E-01	3	4.22921E+00	2.05562E-01			
14	7.20067E-01	7.43550E-01	3	4.52431E+00	2.19422E-01			
15	7.67033E-01	7.90517E-01	3	4.81941E+00	2.33282E-01			
16	8.14000E-01	8.62795E-01	4	5.11451E+00	5.29051E-01			
17	9.11591E-01	9.60386E-01	4	5.72769E+00	5.88891E-01			
18	1.00918E+00	1.10677E+00	4	6.34088E+00	1.35731E+00			
19	1.20436E+00	1.30195E+00	4	7.56724E+00	1.59667E+00			
20	1.39955E+00	1.49714E+00	4	8.79360E+00	1.85603E+00			
21	1.59473E+00	1.69232E+00	4	1.00200E+01	2.07540E+00			
22	1.78991E+00	1.88750E+00	4	1.12463E+01	2.31476E+00			
23	1.98509E+00	2.08268E+00	4	1.24727E+01	2.55412E+00			
24	2.18027E+00	2.27786E+00	4	1.36991E+01	2.79349E+00			
25	2.37545E+00	2.47305E+00	4	1.49254E+01	3.03285E+00			
26	2.57064E+00	2.66823E+00	4	1.61518E+01	3.27221E+00			
27	2.76582E+00	2.81461E+00	4	1.73781E+01	1.72587E+00			
28	2.86341E+00	2.91220E+00	4	1.79913E+01	1.78571E+00			
29	2.96100E+00			1.86045E+01				

- elapsed time .00 min.

1

outer iter	inner iters	1 - balance	eigenvalue	1 - source ratio	1 - scatter ratio	1 - upscat ratio	search parameter	time (min)
1	197	1.88423E-05	1.07849E+00	-8.68900E-02	1.00000E+00	-2.64515E-02	.00000E+00	.0000
2	295	-3.96240E-06	1.08746E+00	-1.52593E-03	-1.09213E-02	-3.49812E-03	.00000E+00	.0000
3	371	-1.38464E-06	1.08855E+00	-2.11298E-04	-1.36124E-03	-7.65849E-04	.00000E+00	.0167
4	428	-3.55400E-06	1.08881E+00	-4.25534E-05	-3.02777E-04	-1.65471E-04	.00000E+00	.0167
5	463	2.75520E-06	1.08879E+00	-9.24429E-06	-6.60568E-05	-3.53099E-05	.00000E+00	.0167

grp to grp	grp inner iters	mfd int.	max. flux difference	msf int.	max. scale factor	coarse mesh
1	1	17	1.52991E-06	28	1.00000E+00	1
2	1	17	1.85022E-06	28	1.00000E+00	1
3	1	17	1.70944E-06	28	1.00000E+00	1
4	1	17	1.66246E-06	28	1.00000E+00	1
5	1	17	1.71501E-06	28	1.00000E+00	1
6	1	17	1.15781E-06	28	1.00000E+00	1
7	1	17	7.13494E-07	28	9.99999E-01	2
8	1	15	1.39889E-07	28	1.00000E+00	2
9	1	27	6.91892E-06	28	1.00001E+00	3
10	1	26	1.58965E-06	28	9.99999E-01	3
11	1	26	2.98429E-06	28	9.99997E-01	3

12	12	1	26	1.25872E-06	28	1.00000E+00	3
13	13	1	26	1.74334E-06	28	9.99998E-01	3
14	14	1	25	5.97175E-07	28	9.99999E-01	3
15	15	1	2	3.50575E-05	28	9.99961E-01	2
16	16	1	2	4.30869E-05	28	9.99964E-01	2
17	17	1	2	4.92700E-05	28	9.99866E-01	3
18	18	1	2	5.74201E-05	28	9.99952E-01	3
19	19	1	2	4.95027E-05	28	9.99902E-01	3
20	20	1	2	3.87405E-05	28	9.99925E-01	3
21	21	1	2	5.99319E-05	28	9.99944E-01	3
22	22	1	23	2.70179E-05	28	9.99971E-01	3
23	23	1	1	1.82895E-05	14	1.00001E+00	4
24	24	1	1	2.60803E-05	9	1.00002E+00	4
25	25	1	1	2.91879E-05	8	1.00001E+00	5
26	26	1	1	2.18458E-05	6	1.00002E+00	6
27	27	1	1	2.02591E-05	5	1.00001E+00	8

6 490 -2.85836E-06 1.08887E+00 -1.88610E-06 -1.41942E-05 -7.87108E-06 .00000E+00 .0167

final monitor

lambda 1.08884E+00 productionyabsorption 1.10310E+00 angular flux on 16

- elapsed time .02 min.

1 560 d, second part of sas2h pass to make library

0 int. zone number radius int. midpoint area volume prod density

1	1	.00000E+00	1.97644E-02	.00000E+00	4.90881E-03	.00000E+00
2	1	3.95287E-02	5.92931E-02	2.48366E-01	1.47264E-02	.00000E+00
3	1	7.90575E-02	1.18586E-01	4.96733E-01	5.89057E-02	.00000E+00
4	1	1.58115E-01	1.97644E-01	9.93466E-01	9.81762E-02	.00000E+00
5	1	2.37172E-01	2.76701E-01	1.49020E+00	1.37447E-01	.00000E+00
6	1	3.16230E-01	3.55759E-01	1.98693E+00	1.76717E-01	.00000E+00
7	1	3.95288E-01	4.34816E-01	2.48366E+00	2.15988E-01	.00000E+00
8	1	4.74345E-01	5.13874E-01	2.98040E+00	2.55258E-01	.00000E+00
9	1	5.53408E-01	5.73167E-01	3.47713E+00	1.42355E-01	.00000E+00
10	1	5.92931E-01	6.12698E-01	3.72550E+00	1.52173E-01	.00000E+00
11	2	6.32460E-01	6.42620E-01	3.97386E+00	8.20460E-02	.00000E+00
12	2	6.52780E-01	6.62940E-01	4.10154E+00	8.46405E-02	.00000E+00
13	3	6.73100E-01	6.96583E-01	4.22921E+00	2.05562E-01	.00000E+00
14	3	7.20067E-01	7.43550E-01	4.52431E+00	2.19422E-01	.00000E+00
15	3	7.67033E-01	7.90517E-01	4.81941E+00	2.33282E-01	.00000E+00
16	4	8.14000E-01	8.62795E-01	5.11451E+00	5.29051E-01	2.48105E-02
17	4	9.11591E-01	9.60386E-01	5.72769E+00	5.88891E-01	2.70109E-02
18	4	1.00918E+00	1.10677E+00	6.34088E+00	1.35731E+00	6.09905E-02
19	4	1.20436E+00	1.30195E+00	7.56724E+00	1.59667E+00	7.02898E-02
20	4	1.39955E+00	1.49714E+00	8.79360E+00	1.83603E+00	7.96766E-02
21	4	1.59473E+00	1.69232E+00	1.00200E+01	2.07540E+00	8.91149E-02
22	4	1.78991E+00	1.88750E+00	1.12463E+01	2.31478E+00	9.86087E-02
23	4	1.98509E+00	2.08268E+00	1.24727E+01	2.55412E+00	1.08166E-01
24	4	2.18027E+00	2.27786E+00	1.36991E+01	2.79349E+00	1.17803E-01
25	4	2.37545E+00	2.47305E+00	1.49254E+01	3.03286E+00	1.27535E-01
26	4	2.57064E+00	2.66823E+00	1.61518E+01	3.27221E+00	1.37396E-01
27	4	2.76582E+00	2.81461E+00	1.73781E+01	1.72587E+00	7.24436E-02
28	4	2.86341E+00	2.91220E+00	1.79913E+01	1.78571E+00	7.49917E-02
29		2.96100E+00		1.86045E+01		

1 560 d, second part of sas2h pass to make library

0 total flux

0 int.	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	1.26807E-02	9.00449E-02	1.12113E-01	6.88618E-02	1.02615E-01	1.92691E-01	1.93021E-01	1.46944E-01
2	1.26756E-02	8.99940E-02	1.12048E-01	6.88236E-02	1.02562E-01	1.92604E-01	1.92982E-01	1.46958E-01
3	1.26762E-02	9.00069E-02	1.12070E-01	6.88415E-02	1.02597E-01	1.92674E-01	1.93085E-01	1.46950E-01
4	1.26829E-02	9.00869E-02	1.12182E-01	6.89198E-02	1.02726E-01	1.92916E-01	1.93191E-01	1.46978E-01
5	1.26948E-02	9.02276E-02	1.12377E-01	6.90527E-02	1.02943E-01	1.93316E-01	1.93439E-01	1.47022E-01
6	1.27113E-02	9.04213E-02	1.12646E-01	6.92359E-02	1.03240E-01	1.93865E-01	1.93778E-01	1.47079E-01

7	1.27319E-02	9.06691E-02	1.12991E-01	6.94738E-02	1.03628E-01	1.94582E-01	1.94220E-01	1.47148E-01
8	1.27569E-02	9.09786E-02	1.13430E-01	6.97810E-02	1.04134E-01	1.95519E-01	1.94798E-01	1.47231E-01
9	1.27780E-02	9.12509E-02	1.13823E-01	7.00627E-02	1.04602E-01	1.96387E-01	1.95334E-01	1.47300E-01
10	1.27923E-02	9.14643E-02	1.14151E-01	7.03107E-02	1.05023E-01	1.97174E-01	1.95821E-01	1.47349E-01
11	1.28043E-02	9.16412E-02	1.14426E-01	7.05189E-02	1.05377E-01	1.97850E-01	1.96239E-01	1.47393E-01
12	1.28174E-02	9.17728E-02	1.14599E-01	7.06272E-02	1.05546E-01	1.98187E-01	1.96442E-01	1.47437E-01
13	1.28448E-02	9.20127E-02	1.14869E-01	7.07648E-02	1.05736E-01	1.98527E-01	1.96634E-01	1.47505E-01
14	1.28851E-02	9.23947E-02	1.15321E-01	7.10199E-02	1.06111E-01	1.99187E-01	1.97014E-01	1.47597E-01
15	1.29325E-02	9.28863E-02	1.15945E-01	7.14063E-02	1.06708E-01	2.00261E-01	1.97643E-01	1.47698E-01
16	1.30062E-02	9.36736E-02	1.16959E-01	7.20511E-02	1.07723E-01	2.02103E-01	1.98737E-01	1.47868E-01
17	1.30789E-02	9.44577E-02	1.17973E-01	7.26992E-02	1.08755E-01	2.03999E-01	1.99881E-01	1.48064E-01
18	1.31368E-02	9.50958E-02	1.18805E-01	7.32352E-02	1.09622E-01	2.05637E-01	2.00899E-01	1.48268E-01
19	1.31873E-02	9.56592E-02	1.19554E-01	7.37204E-02	1.10415E-01	2.07167E-01	2.01868E-01	1.48480E-01
20	1.32170E-02	9.59994E-02	1.20012E-01	7.40200E-02	1.10910E-01	2.08153E-01	2.02508E-01	1.48635E-01
21	1.32356E-02	9.62184E-02	1.20311E-01	7.42173E-02	1.11241E-01	2.08826E-01	2.02954E-01	1.48751E-01
22	1.32478E-02	9.63616E-02	1.20511E-01	7.43492E-02	1.11464E-01	2.09295E-01	2.03269E-01	1.48839E-01
23	1.32551E-02	9.64539E-02	1.20641E-01	7.44360E-02	1.11612E-01	2.09610E-01	2.03487E-01	1.48901E-01
24	1.32594E-02	9.65090E-02	1.20720E-01	7.44891E-02	1.11704E-01	2.09813E-01	2.03629E-01	1.48942E-01
25	1.32614E-02	9.65344E-02	1.20758E-01	7.45146E-02	1.11749E-01	2.09917E-01	2.03703E-01	1.48964E-01
26	1.32610E-02	9.65315E-02	1.20756E-01	7.45134E-02	1.11749E-01	2.09925E-01	2.03709E-01	1.48964E-01
27	1.32593E-02	9.65114E-02	1.20730E-01	7.44959E-02	1.11720E-01	2.09870E-01	2.03672E-01	1.48951E-01
28	1.32568E-02	9.64818E-02	1.20690E-01	7.44695E-02	1.11675E-01	2.09779E-01	2.03609E-01	1.48930E-01

0 int.	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	1.15886E-01	1.07080E-01	1.00822E-01	6.53777E-02	5.58727E-02	5.33752E-02	2.91124E-02	1.61503E-02
2	1.15887E-01	1.07081E-01	1.00826E-01	6.53827E-02	5.58776E-02	5.33821E-02	2.91147E-02	1.61514E-02
3	1.15885E-01	1.07072E-01	1.00805E-01	6.53588E-02	5.58553E-02	5.33496E-02	2.91083E-02	1.61479E-02
4	1.15880E-01	1.07051E-01	1.00756E-01	6.53013E-02	5.58016E-02	5.32715E-02	2.90928E-02	1.61397E-02
5	1.15873E-01	1.07018E-01	1.00680E-01	6.52137E-02	5.57200E-02	5.31525E-02	2.90696E-02	1.61274E-02
6	1.15864E-01	1.06972E-01	1.00577E-01	6.50947E-02	5.56097E-02	5.29913E-02	2.90390E-02	1.61110E-02
7	1.15851E-01	1.06913E-01	1.00441E-01	6.49386E-02	5.54659E-02	5.27804E-02	2.90004E-02	1.60900E-02
8	1.15837E-01	1.06833E-01	1.00261E-01	6.47330E-02	5.52776E-02	5.25032E-02	2.89519E-02	1.60633E-02
9	1.15827E-01	1.06758E-01	1.00092E-01	6.45410E-02	5.51027E-02	5.22450E-02	2.89083E-02	1.60389E-02
10	1.15827E-01	1.06687E-01	9.99359E-02	6.43664E-02	5.49445E-02	5.20105E-02	2.88703E-02	1.60171E-02
11	1.15833E-01	1.06632E-01	9.98123E-02	6.42294E-02	5.48188E-02	5.18254E-02	2.88369E-02	1.59988E-02
12	1.15828E-01	1.06611E-01	9.97660E-02	6.41758E-02	5.47672E-02	5.17511E-02	2.88184E-02	1.59898E-02
13	1.15783E-01	1.06584E-01	9.97029E-02	6.40957E-02	5.46953E-02	5.16408E-02	2.88031E-02	1.59808E-02
14	1.15712E-01	1.06521E-01	9.95590E-02	6.39158E-02	5.45372E-02	5.14046E-02	2.87780E-02	1.59639E-02
15	1.15636E-01	1.06415E-01	9.95234E-02	6.36858E-02	5.42981E-02	5.10535E-02	2.87402E-02	1.59576E-02
16	1.15530E-01	1.06240E-01	9.89529E-02	6.31748E-02	5.38900E-02	5.04191E-02	2.86707E-02	1.58922E-02
17	1.15435E-01	1.06067E-01	9.85427E-02	6.27140E-02	5.34816E-02	4.98016E-02	2.85873E-02	1.58422E-02
18	1.15367E-01	1.05921E-01	9.82090E-02	6.23204E-02	5.31241E-02	4.92724E-02	2.84969E-02	1.57925E-02
19	1.15313E-01	1.05787E-01	9.78976E-02	6.19538E-02	5.27856E-02	4.87783E-02	2.84008E-02	1.57416E-02
20	1.15288E-01	1.05701E-01	9.76963E-02	6.17171E-02	5.25623E-02	4.84580E-02	2.83284E-02	1.57045E-02
21	1.15279E-01	1.05643E-01	9.75564E-02	6.15526E-02	5.24047E-02	4.82346E-02	2.82731E-02	1.56766E-02
22	1.15269E-01	1.05602E-01	9.74567E-02	6.14354E-02	5.22912E-02	4.80751E-02	2.82310E-02	1.56555E-02
23	1.15266E-01	1.05573E-01	9.73859E-02	6.13521E-02	5.22100E-02	4.79615E-02	2.81999E-02	1.56400E-02
24	1.15263E-01	1.05554E-01	9.73377E-02	6.12955E-02	5.21546E-02	4.78842E-02	2.81786E-02	1.56295E-02
25	1.15261E-01	1.05542E-01	9.73090E-02	6.12617E-02	5.21219E-02	4.78384E-02	2.81666E-02	1.56234E-02
26	1.15258E-01	1.05538E-01	9.72997E-02	6.12508E-02	5.21124E-02	4.78244E-02	2.81648E-02	1.56226E-02
27	1.15256E-01	1.05540E-01	9.73052E-02	6.12578E-02	5.21202E-02	4.78346E-02	2.81701E-02	1.56252E-02
28	1.15255E-01	1.05546E-01	9.73208E-02	6.12761E-02	5.21397E-02	4.78609E-02	2.81798E-02	1.56300E-02

0 int.	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	7.12314E-03	5.56306E-03	1.09272E-02	3.61687E-02	1.13884E-02	2.36176E-02	7.95371E-02	6.50857E-02
2	7.12377E-03	5.56429E-03	1.09283E-02	3.61712E-02	1.13894E-02	2.36195E-02	7.95321E-02	6.50707E-02
3	7.12109E-03	5.55769E-03	1.09232E-02	3.61577E-02	1.13791E-02	2.35861E-02	7.94143E-02	6.49410E-02
4	7.11461E-03	5.54180E-03	1.09111E-02	3.61261E-02	1.13554E-02	2.35105E-02	7.91554E-02	6.46618E-02
5	7.10477E-03	5.51740E-03	1.08928E-02	3.60786E-02	1.13195E-02	2.33972E-02	7.87713E-02	6.42485E-02
6	7.09146E-03	5.48396E-03	1.08681E-02	3.60151E-02	1.12710E-02	2.32440E-02	7.82597E-02	6.36979E-02
7	7.07410E-03	5.43967E-03	1.08361E-02	3.59331E-02	1.12076E-02	2.30446E-02	7.76078E-02	6.29976E-02
8	7.05134E-03	5.38059E-03	1.07945E-02	3.58273E-02	1.11243E-02	2.27845E-02	7.67841E-02	6.21178E-02

9	7.03017E-03	5.32492E-03	1.07560E-02	3.57302E-02	1.10466E-02	2.25437E-02	7.60435E-02	6.13319E-02
10	7.01090E-03	5.27375E-03	1.07212E-02	3.56432E-02	1.09755E-02	2.25263E-02	7.53998E-02	6.06554E-02
11	6.99551E-03	5.23448E-03	1.06953E-02	3.55735E-02	1.09210E-02	2.21626E-02	7.49314E-02	6.01845E-02
12	6.98921E-03	5.22042E-03	1.06816E-02	3.55442E-02	1.09021E-02	2.21078E-02	7.47870E-02	6.00649E-02
13	6.98044E-03	5.19491E-03	1.06664E-02	3.55059E-02	1.08710E-02	2.20079E-02	7.45084E-02	5.97669E-02
14	6.96177E-03	5.13767E-03	1.06346E-02	3.54271E-02	1.08002E-02	2.17815E-02	7.38895E-02	5.90864E-02
15	6.95221E-03	5.04700E-03	1.05847E-02	3.53052E-02	1.06875E-02	2.14297E-02	7.29852E-02	5.81122E-02
16	6.88347E-03	4.89307E-03	1.05019E-02	3.51042E-02	1.05088E-02	2.08548E-02	7.15960E-02	5.66645E-02
17	6.83435E-03	4.74214E-03	1.04162E-02	3.48948E-02	1.03224E-02	2.02858E-02	7.01838E-02	5.52211E-02
18	6.79141E-03	4.62511E-03	1.03377E-02	3.46988E-02	1.01685E-02	1.98079E-02	6.88343E-02	5.38436E-02
19	6.75059E-03	4.52304E-03	1.02614E-02	3.45044E-02	1.00261E-02	1.93647E-02	6.74769E-02	5.24585E-02
20	6.72335E-03	4.46267E-03	1.02095E-02	3.43687E-02	9.93348E-03	1.90784E-02	6.65092E-02	5.14726E-02
21	6.70406E-03	4.42307E-03	1.01723E-02	3.42690E-02	9.85850E-03	1.88774E-02	6.57838E-02	5.07360E-02
22	6.69010E-03	4.39611E-03	1.01451E-02	3.41948E-02	9.82172E-03	1.87325E-02	6.52342E-02	5.01800E-02
23	6.68008E-03	4.37752E-03	1.01255E-02	3.41405E-02	9.78806E-03	1.86278E-02	6.48220E-02	4.97637E-02
24	6.67328E-03	4.36506E-03	1.01120E-02	3.41029E-02	9.76454E-03	1.85546E-02	6.45241E-02	4.94620E-02
25	6.66957E-03	4.35738E-03	1.01041E-02	3.40806E-02	9.75008E-03	1.85080E-02	6.43276E-02	4.92591E-02
26	6.66843E-03	4.35445E-03	1.01019E-02	3.40734E-02	9.74444E-03	1.84873E-02	6.42516E-02	4.91510E-02
27	6.66967E-03	4.35517E-03	1.01034E-02	3.40789E-02	9.74583E-03	1.84880E-02	6.42222E-02	4.91267E-02
28	6.67172E-03	4.35847E-03	1.01082E-02	3.40921E-02	9.75208E-03	1.85039E-02	6.42730E-02	4.91610E-02

0 int.

	grp. 25	grp. 26	grp. 27
1	2.94143E-02	2.12121E-02	4.02897E-03
2	2.94031E-02	2.11996E-02	4.02596E-03
3	2.95332E-02	2.11382E-02	4.01336E-03
4	2.91844E-02	2.10082E-02	3.98664E-03
5	2.89639E-02	2.08145E-02	3.94622E-03
6	2.86697E-02	2.05538E-02	3.89084E-03
7	2.82957E-02	2.02195E-02	3.81839E-03
8	2.78276E-02	1.97978E-02	3.72474E-03
9	2.74122E-02	1.94217E-02	3.64001E-03
10	2.70597E-02	1.91008E-02	3.56709E-03
11	2.68238E-02	1.88933E-02	3.52295E-03
12	2.67734E-02	1.88520E-02	3.52003E-03
13	2.66057E-02	1.87072E-02	3.47849E-03
14	2.62228E-02	1.83592E-02	3.37816E-03
15	2.56884E-02	1.78182E-02	3.22861E-03
16	2.49135E-02	1.70725E-02	3.00962E-03
17	2.41557E-02	1.63692E-02	2.82145E-03
18	2.34346E-02	1.57391E-02	2.68068E-03
19	2.27163E-02	1.51300E-02	2.55410E-03
20	2.22110E-02	1.47207E-02	2.47773E-03
21	2.18577E-02	1.44292E-02	2.42659E-03
22	2.15592E-02	1.42186E-02	2.39132E-03
23	2.13524E-02	1.40661E-02	2.36638E-03
24	2.12084E-02	1.39581E-02	2.34908E-03
25	2.11028E-02	1.38856E-02	2.33762E-03
26	2.10466E-02	1.38439E-02	2.33103E-03
27	2.10259E-02	1.38291E-02	2.32855E-03
28	2.10409E-02	1.38322E-02	2.32844E-03

- elapsed time .02 min.

1fine group summary for zone 1 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	.00000E+00	.00000E+00	4.95909E-04	6.55730E-04	5.44336E-05	-7.08129E-04	9.99952E-01
2	.00000E+00	.00000E+00	3.75097E-04	6.11278E-03	8.03413E-03	1.74681E-04	-7.83340E-03	9.99962E-01
3	.00000E+00	.00000E+00	3.81462E-03	5.44566E-03	1.41685E-02	9.24568E-05	-1.04460E-02	9.99978E-01
4	.00000E+00	.00000E+00	5.56442E-03	3.59530E-03	1.23462E-02	4.19536E-05	-6.82359E-03	9.99988E-01
5	.00000E+00	.00000E+00	1.02332E-02	1.15158E-02	2.08631E-02	4.96263E-05	-1.06793E-02	9.99991E-01
6	.00000E+00	.00000E+00	2.14641E-02	3.44857E-02	4.09877E-02	8.42651E-05	-1.96078E-02	9.99995E-01
7	.00000E+00	.00000E+00	4.22059E-02	6.09580E-02	5.41262E-02	6.12093E-05	-1.19799E-02	9.99989E-01
8	.00000E+00	.00000E+00	5.63437E-02	7.83312E-02	5.87342E-02	3.63958E-05	-2.42175E-03	9.99912E-01

9	.00000E+00	.00000E+00	5.77742E-02	7.25955E-02	5.74889E-02	2.92692E-05	2.62572E-04	9.99887E-01
10	.00000E+00	.00000E+00	5.70686E-02	6.91447E-02	5.55680E-02	3.60489E-05	1.47054E-03	9.99896E-01
11	.00000E+00	.00000E+00	5.58517E-02	6.55604E-02	5.23408E-02	5.51286E-05	3.45910E-03	9.99940E-01
12	.00000E+00	.00000E+00	4.53861E-02	3.50795E-02	4.12754E-02	6.04213E-05	4.05131E-03	9.99978E-01
13	.00000E+00	.00000E+00	4.05438E-02	2.85727E-02	3.66426E-02	8.46415E-05	3.81776E-03	9.99969E-01
14	.00000E+00	.00000E+00	3.94615E-02	2.82648E-02	3.57644E-02	1.36406E-04	5.56112E-03	9.99988E-01
15	.00000E+00	.00000E+00	2.17024E-02	1.08877E-02	2.03970E-02	1.12968E-04	1.19245E-03	9.99999E-01
16	.00000E+00	.00000E+00	1.42544E-02	4.59900E-03	1.35491E-02	7.66962E-05	6.28674E-04	9.99999E-01
17	.00000E+00	.00000E+00	7.32923E-03	1.31047E-03	6.81851E-03	3.75137E-05	4.73347E-04	1.00001E+00
18	.00000E+00	.00000E+00	6.50694E-03	9.80409E-04	5.35716E-03	3.06774E-05	1.11910E-03	1.00000E+00
19	.00000E+00	.00000E+00	1.08108E-02	2.97767E-03	9.88262E-03	6.66909E-05	8.61393E-04	1.00001E+00
20	.00000E+00	.00000E+00	2.65444E-02	2.12755E-02	2.40548E-02	2.77477E-04	2.21191E-03	1.00001E+00
21	.00000E+00	.00000E+00	1.28049E-02	4.28748E-03	1.11537E-02	1.07525E-04	1.54372E-03	9.99999E-01
22	.00000E+00	.00000E+00	2.54533E-02	1.32586E-02	2.06331E-02	2.54660E-04	4.56535E-03	1.00001E+00
23	.00000E+00	.00000E+00	6.63183E-02	8.05025E-02	5.28638E-02	1.16862E-03	1.22839E-02	1.00003E+00
24	.00000E+00	.00000E+00	7.10189E-02	7.58689E-02	5.85639E-02	1.38028E-03	1.10728E-02	1.00003E+00
25	.00000E+00	.00000E+00	4.72941E-02	3.21591E-02	4.13727E-02	8.17348E-04	5.10337E-03	1.00001E+00
26	.00000E+00	.00000E+00	3.77734E-02	3.59319E-02	3.31879E-02	8.30984E-04	3.75412E-03	1.00001E+00
27	.00000E+00	.00000E+00	1.28099E-02	7.79891E-03	1.18808E-02	2.96857E-04	6.32156E-04	1.00000E+00
28	.00000E+00	.00000E+00	7.96709E-01	7.91998E-01	7.96709E-01	6.45521E-03	-6.43520E-03	9.99975E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*db**2	total flux
1	1.27992E-02	-7.08129E-04	1.26849E-02	.00000E+00	3.61531E-11	.00000E+00	1.95927E-05	1.60038E-02
2	9.15771E-02	-7.83540E-03	9.00880E-02	.00000E+00	.00000E+00	.00000E+00	8.86016E-05	1.14009E-01
3	1.14330E-01	-1.04460E-02	1.12169E-01	.00000E+00	.00000E+00	.00000E+00	9.20288E-05	1.42101E-01
4	7.04507E-02	-6.82359E-03	6.88958E-02	.00000E+00	.00000E+00	.00000E+00	4.16804E-05	8.73901E-02
5	1.05263E-01	-1.06798E-02	1.02664E-01	.00000E+00	.00000E+00	.00000E+00	4.98336E-05	1.30872E-01
6	1.97624E-01	-1.98078E-02	1.92774E-01	.00000E+00	.00000E+00	.00000E+00	8.33957E-05	2.44798E-01
7	1.96101E-01	-1.19799E-02	1.93054E-01	.00000E+00	.00000E+00	.00000E+00	5.92658E-05	2.44237E-01
8	1.47373E-01	-2.42175E-03	1.46951E-01	.00000E+00	.00000E+00	.00000E+00	3.27167E-05	1.84926E-01
9	1.15830E-01	2.62572E-04	1.15886E-01	.00000E+00	.00000E+00	.00000E+00	2.16688E-05	1.45585E-01
10	1.06646E-01	1.47054E-03	1.07077E-01	.00000E+00	.00000E+00	.00000E+00	1.91537E-05	1.34327E-01
11	9.98456E-02	3.45910E-03	1.00814E-01	.00000E+00	.00000E+00	.00000E+00	1.78986E-05	1.26164E-01
12	6.42663E-02	4.05131E-03	6.53688E-02	.00000E+00	.00000E+00	.00000E+00	1.05072E-05	8.15437E-02
13	5.48539E-02	3.81776E-03	5.58641E-02	.00000E+00	.00000E+00	.00000E+00	8.74591E-06	6.96466E-02
14	5.18761E-02	5.56112E-03	5.33628E-02	.00000E+00	.00000E+00	.00000E+00	8.48780E-06	6.62446E-02
15	2.88493E-02	1.19245E-03	2.91097E-02	.00000E+00	.00000E+00	.00000E+00	4.48547E-06	3.64322E-02
16	1.60049E-02	6.28674E-04	1.61490E-02	.00000E+00	.00000E+00	.00000E+00	2.25061E-06	2.02127E-02
17	6.99993E-03	4.73347E-04	7.12217E-03	.00000E+00	.00000E+00	.00000E+00	9.09197E-07	8.88502E-03
18	5.24432E-03	1.11910E-03	5.56075E-03	.00000E+00	.00000E+00	.00000E+00	6.80682E-07	6.81706E-03
19	1.07014E-02	8.61393E-04	1.09254E-02	.00000E+00	.00000E+00	.00000E+00	1.42360E-06	1.36055E-02
20	3.55944E-02	2.21191E-03	3.61650E-02	.00000E+00	.00000E+00	.00000E+00	5.28925E-06	4.51268E-02
21	1.09348E-02	1.54372E-03	1.13856E-02	.00000E+00	.00000E+00	.00000E+00	1.28912E-06	1.40594E-02
22	2.22018E-02	4.56536E-03	2.36094E-02	.00000E+00	.00000E+00	.00000E+00	2.64054E-06	2.88847E-02
23	7.50345E-02	1.22839E-02	7.95166E-02	.00000E+00	.00000E+00	.00000E+00	8.02763E-06	9.73286E-02
24	6.02731E-02	1.10728E-02	6.50713E-02	.00000E+00	.00000E+00	.00000E+00	4.84009E-06	7.89625E-02
25	2.68618E-02	5.10337E-03	2.94096E-02	.00000E+00	.00000E+00	.00000E+00	1.67882E-06	3.54527E-02
26	1.89193E-02	3.75412E-03	2.12106E-02	.00000E+00	.00000E+00	.00000E+00	8.85084E-07	2.53091E-02
27	3.52607E-03	6.32156E-04	4.02919E-03	.00000E+00	.00000E+00	.00000E+00	1.04289E-07	4.77332E-03
28	1.74998E+00	-6.43513E-03	1.75693E+00	.00000E+00	3.61531E-11	.00000E+00	5.87582E-04	2.20819E+00

1fine group summary for zone 2 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	.00000E+00	.00000E+00	2.18399E-04	1.63718E-04	2.45602E-06	-1.60335E-04	1.00001E+00
2	.00000E+00	.00000E+00	2.85980E-05	1.44859E-03	1.08943E-03	1.39523E-05	-1.02481E-03	1.00000E+00
3	.00000E+00	.00000E+00	1.48991E-04	2.76130E-03	8.73095E-04	2.02061E-05	-7.44257E-04	9.99995E-01
4	.00000E+00	.00000E+00	2.85430E-04	2.30098E-03	2.97928E-04	1.30757E-05	-2.55494E-05	9.99997E-01
5	.00000E+00	.00000E+00	6.14061E-04	4.41319E-03	2.79101E-04	1.68510E-05	3.18081E-04	1.00000E+00
6	.00000E+00	.00000E+00	1.01902E-03	1.24017E-02	1.69442E-04	2.70606E-05	8.22512E-04	1.00000E+00
7	.00000E+00	.00000E+00	6.70758E-04	1.25928E-02	6.32978E-05	2.68118E-05	5.80656E-04	9.99999E-01
8	.00000E+00	.00000E+00	1.17251E-04	9.20599E-03	4.43283E-04	2.21074E-05	-3.48166E-04	1.00001E+00
9	.00000E+00	.00000E+00	4.45118E-04	6.35797E-03	5.30007E-05	7.66898E-05	3.15442E-04	9.99980E-01

10	.00000E+00	.00000E+00	5.30655E-05	4.98617E-03	4.94715E-05	5.93184E-05	-5.57248E-06	1.00000E+00
11	.00000E+00	.00000E+00	4.94749E-05	4.45287E-03	5.02886E-05	8.99811E-05	-9.07890E-05	9.99998E-01
12	.00000E+00	.00000E+00	5.02889E-05	2.76055E-03	5.13591E-05	5.67154E-06	-6.74790E-06	1.00000E+00
13	.00000E+00	.00000E+00	5.13592E-05	2.35700E-03	4.80811E-05	6.31551E-06	-3.03565E-06	1.00000E+00
14	.00000E+00	.00000E+00	4.80811E-05	2.23332E-03	4.20872E-05	8.52895E-06	-2.53599E-06	1.00000E+00
15	.00000E+00	.00000E+00	4.46912E-05	1.21745E-03	4.98264E-05	6.30490E-06	-1.14019E-05	9.99969E-01
16	.00000E+00	.00000E+00	5.59083E-05	6.46727E-04	5.60269E-05	3.83305E-06	-3.95204E-06	9.99964E-01
17	.00000E+00	.00000E+00	6.13731E-05	2.46642E-04	6.06868E-05	1.85266E-06	-1.13642E-06	9.99981E-01
18	.00000E+00	.00000E+00	6.38667E-05	1.73619E-04	5.60608E-05	1.44546E-06	6.36990E-06	9.99992E-01
19	.00000E+00	.00000E+00	5.75836E-05	4.09206E-04	6.05747E-05	3.17534E-06	-5.94876E-06	9.99981E-01
20	.00000E+00	.00000E+00	7.38647E-05	1.49866E-03	6.37135E-05	1.28845E-05	-2.67895E-06	9.99976E-01
21	.00000E+00	.00000E+00	8.47763E-05	3.86987E-04	9.24372E-05	4.79701E-06	-1.24370E-05	9.99987E-01
22	.00000E+00	.00000E+00	1.22131E-04	8.57902E-04	1.14656E-04	1.10771E-05	-3.58606E-06	9.99997E-01
23	.00000E+00	.00000E+00	1.75714E-04	3.06399E-03	2.24948E-04	5.00445E-05	-9.92985E-05	1.00000E+00
24	.00000E+00	.00000E+00	2.89152E-04	2.32317E-03	3.18820E-04	5.70256E-05	-8.67415E-05	1.00000E+00
25	.00000E+00	.00000E+00	2.95007E-04	9.36405E-04	2.41018E-04	3.31381E-05	2.08272E-05	1.00000E+00
26	.00000E+00	.00000E+00	1.25413E-04	7.32592E-04	9.68139E-05	3.28876E-05	-4.29805E-06	1.00000E+00
27	.00000E+00	.00000E+00	2.80723E-05	1.54646E-04	7.96795E-08	1.14734E-05	1.65162E-05	1.00000E+00
28	.00000E+00	.00000E+00	5.05904E-03	8.11387E-02	5.05904E-03	6.18946E-04	-6.13004E-04	9.99996E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*dv**2	total flux
1	1.28253E-02	-8.68464E-04	1.27992E-02	-7.08129E-04	5.84947E-06	.00000E+00	1.61703E-06	2.13541E-03
2	9.18404E-02	-8.85821E-03	9.15771E-02	-7.83340E-03	.00000E+00	.00000E+00	1.10744E-05	1.52865E-02
3	1.14677E-01	-1.11908E-02	1.14330E-01	-1.04460E-02	.00000E+00	.00000E+00	1.26538E-05	1.90879E-02
4	7.06673E-02	-6.84913E-03	7.04507E-02	-6.82359E-03	.00000E+00	.00000E+00	7.42710E-06	1.17637E-02
5	1.06602E-01	-1.03612E-02	1.06263E-01	-1.06795E-02	.00000E+00	.00000E+00	8.62985E-06	1.75792E-02
6	1.98298E-01	-1.87853E-02	1.97624E-01	-1.96078E-02	.00000E+00	.00000E+00	1.01730E-05	3.30075E-02
7	1.96507E-01	-1.13998E-02	1.96101E-01	-1.19799E-02	.00000E+00	.00000E+00	8.35251E-06	3.27276E-02
8	1.47460E-01	-2.76991E-03	1.47373E-01	-2.42175E-03	.00000E+00	.00000E+00	5.27354E-06	2.45722E-02
9	1.15820E-01	5.78015E-04	1.15830E-01	2.62572E-04	.00000E+00	.00000E+00	4.58260E-06	1.93073E-02
10	1.06606E-01	1.41481E-03	1.06644E-01	1.47054E-03	.00000E+00	.00000E+00	4.90854E-06	1.77723E-02
11	9.97532E-02	3.36831E-03	9.98456E-02	3.45910E-03	.00000E+00	.00000E+00	4.76239E-06	1.66534E-02
12	6.41991E-02	4.04457E-03	6.42663E-02	4.05131E-03	.00000E+00	.00000E+00	3.21374E-06	1.07016E-02
13	5.47507E-02	3.81473E-03	5.48539E-02	3.81776E-03	.00000E+00	.00000E+00	2.73691E-06	9.13520E-03
14	5.17277E-02	5.55858E-03	5.18761E-02	5.56112E-03	.00000E+00	.00000E+00	2.58041E-06	8.63231E-03
15	2.88123E-02	1.18105E-03	2.88493E-02	1.19245E-03	.00000E+00	.00000E+00	1.41575E-06	4.80516E-03
16	1.59870E-02	6.24742E-04	1.60049E-02	6.28674E-04	.00000E+00	.00000E+00	7.85528E-07	2.66602E-03
17	6.98752E-03	4.72211E-04	6.99993E-03	4.73347E-04	.00000E+00	.00000E+00	3.43249E-07	1.16652E-03
18	5.21621E-03	1.12547E-03	5.24432E-03	1.11910E-03	.00000E+00	.00000E+00	2.56527E-07	8.71328E-04
19	1.06781E-02	8.55444E-04	1.07014E-02	8.61398E-04	.00000E+00	.00000E+00	5.24242E-07	1.78144E-03
20	3.55359E-02	2.20925E-03	3.55946E-02	2.21191E-03	.00000E+00	.00000E+00	1.74180E-06	5.92714E-03
21	1.08969E-02	1.53129E-03	1.09348E-02	1.54372E-03	.00000E+00	.00000E+00	5.33599E-07	1.81878E-03
22	2.20924E-02	4.56178E-03	2.22018E-02	4.56535E-03	.00000E+00	.00000E+00	1.08105E-06	3.68957E-03
23	7.47658E-02	1.21846E-02	7.50345E-02	1.22839E-02	.00000E+00	.00000E+00	3.64311E-06	1.24778E-02
24	6.00340E-02	1.09861E-02	6.02731E-02	1.10728E-02	.00000E+00	.00000E+00	2.90827E-06	1.00218E-02
25	2.67609E-02	5.12420E-03	2.68618E-02	5.10337E-03	.00000E+00	.00000E+00	1.28657E-06	4.46690E-03
26	1.88568E-02	3.74982E-03	1.89195E-02	3.75412E-03	.00000E+00	.00000E+00	8.98146E-07	3.14661E-03
27	3.52022E-03	6.48572E-04	3.52607E-03	6.32156E-04	.00000E+00	.00000E+00	1.62411E-07	5.86981E-04
28	1.75082E+00	-7.04818E-03	1.74998E+00	-6.43513E-03	5.84947E-06	.00000E+00	1.03568E-04	2.91765E-01

1fine group summary for zone 3 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	.00000E+00	.00000E+00	2.61850E-04	3.46581E-04	2.88585E-05	-3.75421E-04	9.99985E-01
2	.00000E+00	.00000E+00	1.98861E-04	3.26292E-03	4.28851E-03	9.32422E-05	-4.18273E-03	9.99889E-01
3	.00000E+00	.00000E+00	2.05583E-03	2.91114E-03	7.57422E-03	4.94257E-05	-5.58765E-03	9.99991E-01
4	.00000E+00	.00000E+00	2.97362E-03	1.92381E-03	6.61003E-03	2.24508E-05	-3.65880E-03	9.99995E-01
5	.00000E+00	.00000E+00	5.47381E-03	6.17528E-03	1.11877E-02	2.66119E-05	-5.74043E-03	9.99995E-01
6	.00000E+00	.00000E+00	1.14978E-02	1.84879E-02	2.19730E-02	4.51734E-05	-1.05203E-02	9.99999E-01
7	.00000E+00	.00000E+00	2.26210E-02	3.23853E-02	2.87558E-02	3.25188E-05	-6.16695E-03	9.99992E-01
8	.00000E+00	.00000E+00	2.99859E-02	4.11564E-02	3.08599E-02	1.91229E-05	-8.90382E-04	9.99919E-01
9	.00000E+00	.00000E+00	3.04181E-02	3.79799E-02	3.00765E-02	1.53128E-05	3.29698E-04	9.99885E-01
10	.00000E+00	.00000E+00	2.98899E-02	3.60876E-02	2.90018E-02	1.88145E-05	8.72389E-04	9.99900E-01

11	.00000E+00	.00000E+00	2.91688E-02	3.40423E-02	2.71781E-02	2.86256E-05	1.96391E-03	9.99946E-01
12	.00000E+00	.00000E+00	2.35926E-02	1.80874E-02	2.12820E-02	3.11538E-05	2.27999E-03	9.99981E-01
13	.00000E+00	.00000E+00	2.09586E-02	1.47179E-02	1.88747E-02	4.35990E-05	2.04124E-03	9.99974E-01
14	.00000E+00	.00000E+00	2.03525E-02	1.44215E-02	1.72276E-02	6.95982E-05	3.05559E-03	9.99991E-01
15	.00000E+00	.00000E+00	1.11134E-02	5.66013E-03	1.06057E-02	5.87281E-05	4.50913E-04	1.00000E+00
16	.00000E+00	.00000E+00	7.34976E-03	2.39039E-03	7.04231E-03	3.98639E-05	2.67583E-04	1.00000E+00
17	.00000E+00	.00000E+00	3.78542E-03	6.75611E-04	3.51517E-03	1.93402E-05	2.50871E-04	1.00001E+00
18	.00000E+00	.00000E+00	3.36007E-03	4.85033E-04	2.65082E-03	1.51769E-05	6.94574E-04	1.00000E+00
19	.00000E+00	.00000E+00	5.55062E-03	1.53097E-03	5.08117E-03	3.42893E-05	4.35114E-04	1.00001E+00
20	.00000E+00	.00000E+00	1.36278E-02	1.09889E-02	1.24244E-02	1.43318E-04	1.05996E-03	1.00001E+00
21	.00000E+00	.00000E+00	6.55215E-03	2.16447E-03	5.63079E-03	5.42814E-05	8.67080E-04	9.99999E-01
22	.00000E+00	.00000E+00	1.29094E-02	6.56504E-03	1.02166E-02	1.26097E-04	2.56663E-03	1.00001E+00
23	.00000E+00	.00000E+00	3.28926E-02	4.01610E-02	2.63726E-02	5.82997E-04	5.93616E-03	1.00002E+00
24	.00000E+00	.00000E+00	3.49421E-02	3.72868E-02	2.87820E-02	6.78359E-04	5.48083E-03	1.00002E+00
25	.00000E+00	.00000E+00	2.31007E-02	1.56163E-02	2.00904E-02	3.96899E-04	2.61320E-03	1.00001E+00
26	.00000E+00	.00000E+00	1.83681E-02	1.70738E-02	1.57700E-02	3.94860E-04	2.20319E-03	1.00000E+00
27	.00000E+00	.00000E+00	6.19530E-03	3.60994E-03	5.49987E-03	1.37408E-04	5.58514E-04	1.00000E+00
28	.00000E+00	.00000E+00	4.08915E-01	4.06110E-01	4.08915E-01	3.20613E-03	-3.19520E-03	9.99974E-01

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*db**2	total flux
1	1.29591E-02	-1.24388E-03	1.28253E-02	-8.68464E-04	1.91669E-11	.00000E+00	1.03872E-05	8.48457E-03
2	9.31681E-02	-1.30409E-02	9.18404E-02	-8.85821E-03	.00000E+00	.00000E+00	4.72943E-05	6.08564E-02
3	1.16307E-01	-1.67779E-02	1.14677E-01	-1.11903E-02	.00000E+00	.00000E+00	4.91969E-05	7.59644E-02
4	7.16350E-02	-1.05079E-02	7.06673E-02	-6.84913E-03	.00000E+00	.00000E+00	2.23152E-05	4.67876E-02
5	1.07066E-01	-1.61017E-02	1.05602E-01	-1.03612E-02	.00000E+00	.00000E+00	2.64549E-05	6.99114E-02
6	2.00904E-01	-2.93056E-02	1.98298E-01	-1.87853E-02	.00000E+00	.00000E+00	4.47074E-05	1.31233E-01
7	1.98020E-01	-1.75662E-02	1.96507E-01	-1.13993E-02	.00000E+00	.00000E+00	3.14863E-05	1.29756E-01
8	1.47752E-01	-3.66029E-03	1.47460E-01	-2.76991E-03	.00000E+00	.00000E+00	1.71898E-05	9.71628E-02
9	1.15593E-01	9.07712E-04	1.15820E-01	5.78015E-04	.00000E+00	.00000E+00	1.13365E-05	7.61660E-02
10	1.06351E-01	2.28720E-03	1.06606E-01	1.41481E-03	.00000E+00	.00000E+00	9.99663E-06	7.01072E-02
11	9.91815E-02	5.33222E-03	9.97532E-02	3.36831E-03	.00000E+00	.00000E+00	9.29389E-06	6.55109E-02
12	6.34683E-02	6.32456E-03	6.41591E-02	4.04457E-03	.00000E+00	.00000E+00	5.41763E-06	4.20448E-02
13	5.41477E-02	5.85596E-03	5.47507E-02	3.81473E-03	.00000E+00	.00000E+00	4.50503E-06	3.58751E-02
14	5.08119E-02	8.61418E-03	5.17277E-02	5.55858E-03	.00000E+00	.00000E+00	4.33072E-06	3.37999E-02
15	2.87193E-02	1.63196E-03	2.88123E-02	1.18105E-03	.00000E+00	.00000E+00	2.33184E-06	1.89399E-02
16	1.59224E-02	8.92325E-04	1.59870E-02	6.24742E-04	.00000E+00	.00000E+00	1.16979E-06	1.05058E-02
17	6.91462E-03	7.23082E-04	6.98732E-03	4.72211E-04	.00000E+00	.00000E+00	4.68736E-07	4.57964E-03
18	4.99230E-03	1.82004E-03	5.21621E-03	1.12547E-03	.00000E+00	.00000E+00	3.36750E-07	3.37257E-03
19	1.06553E-02	1.29056E-03	1.06781E-02	8.55444E-04	.00000E+00	.00000E+00	7.31945E-07	6.99529E-03
20	3.52344E-02	3.26920E-03	3.55359E-02	2.20925E-03	.00000E+00	.00000E+00	2.73192E-06	2.33082E-02
21	1.06201E-02	2.39837E-03	1.08969E-02	1.53125E-03	.00000E+00	.00000E+00	6.50794E-07	7.09766E-03
22	2.12198E-02	7.12838E-03	2.20924E-02	4.56176E-03	.00000E+00	.00000E+00	1.30748E-06	1.43025E-02
23	7.24597E-02	1.81208E-02	7.47458E-02	1.21846E-02	.00000E+00	.00000E+00	4.00482E-06	4.85552E-02
24	5.75483E-02	1.64669E-02	6.00340E-02	1.09861E-02	.00000E+00	.00000E+00	2.37873E-06	3.88071E-02
25	2.53804E-02	7.73739E-03	2.67609E-02	5.12420E-03	.00000E+00	.00000E+00	8.15224E-07	1.72156E-02
26	1.75147E-02	5.95300E-03	1.88568E-02	3.74982E-03	.00000E+00	.00000E+00	4.20567E-07	1.20962E-02
27	3.13751E-03	1.20719E-03	3.52022E-03	6.48672E-04	.00000E+00	.00000E+00	4.82731E-08	2.20946E-03
28	1.74758E+00	-1.02434E-02	1.75082E+00	-7.04818E-03	1.91669E-11	.00000E+00	3.11309E-04	1.15158E+00

1fine group summary for zone 4 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	2.28114E-02	.00000E+00	2.11662E-02	2.00885E-02	3.73352E-03	1.24388E-03	9.98901E-01
2	.00000E+00	1.93451E-01	6.95103E-03	2.49902E-01	1.72096E-01	1.52776E-02	1.30409E-02	1.00002E+00
3	.00000E+00	2.15779E-01	7.10660E-02	2.57202E-01	2.53828E-01	1.62432E-02	1.67778E-02	9.99888E-01
4	.00000E+00	1.23886E-01	1.05270E-01	1.76577E-01	2.10887E-01	7.76092E-03	1.05079E-02	1.00000E+00
5	.00000E+00	1.64335E-01	1.91693E-01	4.44291E-01	3.34737E-01	5.19278E-03	1.61016E-02	9.99991E-01
6	.00000E+00	1.77430E-01	3.90580E-01	1.19102E+00	5.30475E-01	8.22250E-03	2.98054E-02	1.00001E+00
7	.00000E+00	8.77290E-02	5.93168E-01	1.56426E+00	6.55129E-01	8.20879E-03	1.75656E-02	9.99991E-01
8	.00000E+00	1.35181E-02	6.89349E-01	1.57544E+00	6.86009E-01	1.32535E-02	3.66022E-03	9.99921E-01
9	.00000E+00	9.81112E-04	6.78112E-01	1.37170E+00	6.58225E-01	2.18491E-02	-9.05390E-04	9.99887E-01
10	.00000E+00	7.28725E-05	6.55269E-01	1.24725E+00	6.24712E-01	3.29826E-02	-2.28817E-03	9.99902E-01
11	.00000E+00	5.73310E-06	6.28783E-01	1.16117E+00	5.80357E-01	5.38009E-02	-5.33400E-03	9.99945E-01

12	.00000E+00	4.02740E-07	5.05519E-01	6.34508E-01	4.53522E-01	5.83351E-02	-6.32414E-03	9.99973E-01
13	.00000E+00	6.39515E-08	4.48175E-01	5.03635E-01	3.99449E-01	5.45948E-02	-5.85654E-03	9.99973E-01
14	.00000E+00	1.26735E-08	4.31066E-01	4.70113E-01	3.62302E-01	7.73835E-02	-8.61438E-03	9.99989E-01
15	.00000E+00	1.43224E-09	2.37505E-01	2.15883E-01	2.31499E-01	7.59882E-03	-1.63653E-03	1.00018E+00
16	.00000E+00	4.20556E-10	1.62281E-01	9.98110E-02	1.57667E-01	5.47975E-03	-8.95428E-04	1.00018E+00
17	.00000E+00	1.35440E-10	8.70766E-02	3.14683E-02	8.11535E-02	6.63470E-03	-7.27074E-04	1.00018E+00
18	.00000E+00	9.69708E-11	7.77200E-02	2.08377E-02	5.82871E-02	2.12485E-02	-1.82174E-03	1.00008E+00
19	.00000E+00	1.37096E-10	1.22542E-01	6.07375E-02	1.14678E-01	9.14271E-03	-1.29525E-03	1.00013E+00
20	.00000E+00	2.22932E-10	2.98208E-01	3.48657E-01	2.69031E-01	2.74015E-02	-3.27833E-03	1.00018E+00
21	.00000E+00	3.26301E-11	1.44934E-01	7.03732E-02	1.25743E-01	2.35772E-02	-2.40192E-03	1.00010E+00
22	.00000E+00	3.78584E-11	2.75593E-01	1.84239E-01	2.12917E-01	6.97813E-02	-7.13160E-03	1.00009E+00
23	.00000E+00	3.61968E-11	6.61892E-01	1.00662E+00	5.40511E-01	1.39414E-01	-1.81174E-02	1.00012E+00
24	.00000E+00	9.85229E-12	7.01257E-01	8.67952E-01	5.78934E-01	1.38722E-01	-1.66675E-02	1.00010E+00
25	.00000E+00	2.88411E-12	4.64370E-01	3.51888E-01	3.95410E-01	7.66693E-02	-7.73850E-03	1.00006E+00
26	.00000E+00	2.02235E-12	3.59944E-01	3.53346E-01	2.96283E-01	6.95957E-02	-5.95318E-03	1.00005E+00
27	.00000E+00	4.81937E-13	1.18737E-01	7.14249E-02	1.00129E-01	1.98126E-02	-1.20721E-03	1.00002E+00
28	.00000E+00	1.00000E+00	9.10206E+00	1.45514E+01	9.10206E+00	9.91916E-01	1.02111E-02	1.00001E+00

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*db**2	total flux
1	1.32552E-02	-6.95225E-09	1.29591E-02	-1.24388E-03	2.22678E-03	2.48146E-03	2.92453E-04	3.36935E-01
2	9.64634E-02	-6.52760E-08	9.31681E-02	-1.30409E-02	1.59615E-05	1.10063E-02	1.58569E-03	2.44945E+00
3	1.20666E-01	-9.26605E-08	1.16307E-01	-1.67779E-02	.00000E+00	1.33450E-02	1.82658E-03	3.06311E+00
4	7.44527E-02	-7.14484E-08	7.16350E-02	-1.05079E-02	.00000E+00	5.73192E-03	8.83625E-04	1.88964E+00
5	1.11647E-01	-9.81703E-08	1.07056E-01	-1.61017E-02	.00000E+00	1.65429E-03	1.05172E-03	2.83257E+00
6	2.09722E-01	-1.33088E-07	2.00904E-01	-2.93056E-02	.00000E+00	1.40539E-03	1.73132E-03	5.31884E+00
7	2.08569E-01	-5.84223E-07	1.98020E-01	-1.75662E-02	.00000E+00	1.37206E-03	1.22622E-03	5.16943E+00
8	1.48917E-01	-7.29270E-08	1.47752E-01	-3.66025E-03	.00000E+00	1.39834E-03	6.97876E-04	3.78851E+00
9	1.15253E-01	4.32258E-06	1.15593E-01	9.07712E-04	.00000E+00	1.87880E-03	4.71088E-04	2.93539E+00
10	1.05550E-01	-9.69711E-07	1.06351E-01	2.28720E-03	.00000E+00	4.01284E-03	4.28496E-04	2.68968E+00
11	9.73316E-02	-1.77639E-06	9.91815E-02	5.33222E-03	.00000E+00	8.54482E-03	3.86770E-04	2.48329E+00
12	6.12884E-02	4.14981E-07	6.34683E-02	6.32456E-03	.00000E+00	1.12827E-02	2.27619E-04	1.56643E+00
13	5.21527E-02	-5.72706E-07	5.41477E-02	5.85596E-03	.00000E+00	1.21320E-02	1.95190E-04	1.33341E+00
14	4.78785E-02	-1.98471E-07	5.08119E-02	8.61418E-03	.00000E+00	7.80568E-03	1.75561E-04	1.22699E+00
15	2.81867E-02	-4.57024E-06	2.87195E-02	1.63196E-03	.00000E+00	1.92742E-03	1.11247E-04	7.19535E-01
16	1.56334E-02	-3.10303E-06	1.59224E-02	8.92325E-04	.00000E+00	1.33047E-03	5.78601E-05	3.98904E-01
17	6.67426E-03	-3.99226E-06	6.91462E-03	7.23082E-04	.00000E+00	1.69296E-03	2.22116E-05	1.70583E-01
18	4.36092E-03	-1.69247E-06	4.99230E-03	1.82004E-03	.00000E+00	1.50362E-03	1.12376E-05	1.12568E-01
19	1.01122E-02	-4.68952E-06	1.05553E-02	1.29056E-03	.00000E+00	2.70100E-03	3.43877E-05	2.58742E-01
20	3.41080E-02	-9.13532E-06	3.52344E-02	3.26920E-03	.00000E+00	1.50121E-02	1.25958E-04	8.71708E-01
21	9.75682E-03	-3.55369E-06	1.06201E-02	2.39837E-03	.00000E+00	1.39646E-02	2.76321E-05	2.50869E-01
22	1.85156E-02	-3.21685E-06	2.12198E-02	7.12838E-03	.00000E+00	4.12870E-02	4.88083E-05	4.79539E-01
23	6.43097E-02	3.40332E-06	7.24599E-02	1.81208E-02	.00000E+00	8.03394E-02	1.72789E-04	1.66672E+00
24	4.91885E-02	-5.81248E-07	5.75483E-02	1.64669E-02	.00000E+00	7.92781E-02	1.03698E-04	1.28337E+00
25	2.10510E-02	-1.10419E-06	2.53804E-02	7.73739E-03	.00000E+00	4.56524E-02	3.54042E-05	5.51998E-01
26	1.38363E-02	-1.79258E-07	1.75147E-02	5.95300E-03	.00000E+00	4.20342E-02	1.74231E-05	3.64978E-01
27	2.32861E-03	-1.97389E-08	3.13751E-03	1.20719E-03	.00000E+00	1.17903E-02	1.78722E-06	6.15910E-02
28	1.73620E+00	-3.23578E-05	1.74758E+00	-1.02434E-02	2.24272E-03	4.22563E-01	1.19306E-02	4.42743E+01

1fine group summary for system

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	2.28114E-02	.00000E+00	2.21404E-02	2.12526E-02	3.81906E-03	-6.95225E-09	9.98900E-01
2	.00000E+00	1.93451E-01	7.55369E-03	2.60726E-01	1.85458E-01	1.55995E-02	-6.52760E-08	1.00002E+00
3	.00000E+00	2.15779E-01	7.70654E-02	2.68320E-01	2.76444E-01	1.64053E-02	-9.26605E-08	9.99987E-01
4	.00000E+00	1.23886E-01	1.14093E-01	1.84395E-01	2.30141E-01	7.83838E-03	-7.14484E-08	9.99999E-01
5	.00000E+00	1.64335E-01	2.08014E-01	4.66396E-01	3.67067E-01	5.28587E-03	-9.81703E-08	9.99991E-01
6	.00000E+00	1.77430E-01	4.24561E-01	1.25640E+00	5.98605E-01	8.37900E-03	-1.33088E-07	1.00001E+00
7	.00000E+00	8.77290E-02	6.58667E-01	1.67020E+00	7.38074E-01	8.32933E-03	-5.84223E-07	9.99991E-01
8	.00000E+00	1.35181E-02	7.75796E-01	1.70414E+00	7.76047E-01	1.33311E-02	-7.29270E-08	9.99919E-01
9	.00000E+00	9.81112E-04	7.66750E-01	1.48864E+00	7.45843E-01	2.19704E-02	4.32258E-06	9.99887E-01
10	.00000E+00	7.28725E-05	7.42281E-01	1.35746E+00	7.09332E-01	3.30968E-02	-9.69711E-07	9.99901E-01
11	.00000E+00	5.73310E-06	7.13853E-01	1.26522E+00	6.59926E-01	5.39747E-02	-1.77639E-06	9.99944E-01
12	.00000E+00	4.02740E-07	5.74548E-01	6.90431E-01	5.16131E-01	5.84324E-02	4.14981E-07	9.99974E-01

13	.00000E+00	6.39515E-08	5.09729E-01	5.49283E-01	4.55014E-01	5.47298E-02	-5.72706E-07	9.99973E-01
14	.00000E+00	1.26735E-08	4.90928E-01	5.15033E-01	4.13336E-01	7.75980E-02	-1.98471E-07	9.99989E-01
15	.00000E+00	1.43224E-09	2.70365E-01	2.33648E-01	2.62549E-01	7.77682E-03	-4.57024E-06	1.00016E+00
16	.00000E+00	4.20556E-10	1.83941E-01	1.07447E-01	1.78314E-01	5.60015E-03	-3.10303E-06	1.00016E+00
17	.00000E+00	1.35440E-10	9.82526E-02	3.37009E-02	9.15477E-02	6.69839E-03	-3.99226E-06	1.00016E+00
18	.00000E+00	9.69708E-11	8.76509E-02	2.24768E-02	6.63507E-02	2.12958E-02	-1.69247E-06	1.00007E+00
19	.00000E+00	1.37096E-10	1.38961E-01	6.56654E-02	1.29702E-01	9.24686E-03	-4.68952E-06	1.00012E+00
20	.00000E+00	2.22952E-10	3.33454E-01	3.82420E-01	3.05574E-01	2.78852E-02	-9.13552E-06	1.00016E+00
21	.00000E+00	3.26301E-11	1.64375E-01	7.72122E-02	1.40620E-01	2.37438E-02	-3.55369E-06	1.00009E+00
22	.00000E+00	3.78584E-11	3.14078E-01	2.04921E-01	2.43881E-01	7.01752E-02	-3.21685E-06	1.00008E+00
23	.00000E+00	3.61968E-11	7.61279E-01	1.13035E+00	6.19973E-01	1.41215E-01	3.40332E-06	1.00011E+00
24	.00000E+00	9.85229E-12	8.07507E-01	9.83431E-01	6.66599E-01	1.40838E-01	-5.81248E-07	1.00009E+00
25	.00000E+00	2.88411E-12	5.35050E-01	4.00580E-01	4.57114E-01	7.79167E-02	-1.10419E-06	1.00006E+00
26	.00000E+00	2.02235E-12	4.16211E-01	4.07085E-01	3.45337E-01	7.08544E-02	-1.79258E-07	1.00005E+00
27	.00000E+00	4.81937E-13	1.37770E-01	8.29884E-02	1.17509E-01	2.02583E-02	-1.97389E-08	1.00002E+00
28	.00000E+00	1.00000E+00	1.03127E+01	1.58307E+01	1.03127E+01	1.00220E+00	-3.23389E-05	1.00001E+00

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*db**2	total flux
1	1.32552E-02	-6.95225E-09	1.26849E-02	.00000E+00	2.23261E-03	2.48146E-03	3.24050E-04	3.63558E-01
2	9.64634E-02	-6.52760E-08	9.00880E-02	.00000E+00	1.59615E-05	1.10063E-02	1.73266E-03	2.63960E+00
3	1.20666E-01	-9.26605E-08	1.12169E-01	.00000E+00	.00000E+00	1.33450E-02	1.98046E-03	3.30027E+00
4	7.44527E-02	-7.14484E-08	6.88958E-02	.00000E+00	.00000E+00	5.73192E-03	9.55047E-04	2.08559E+00
5	1.11647E-01	-9.81708E-08	1.02664E-01	.00000E+00	.00000E+00	1.65429E-03	1.11614E-03	3.05043E+00
6	2.09722E-01	-1.33088E-07	1.92774E-01	.00000E+00	.00000E+00	1.40839E-03	1.86959E-03	5.72788E+00
7	2.08569E-01	-5.84223E-07	1.98064E-01	.00000E+00	.00000E+00	1.37206E-03	1.32532E-03	5.57615E+00
8	1.48917E-01	-7.29270E-08	1.46951E-01	.00000E+00	.00000E+00	1.39834E-03	7.53056E-04	4.09517E+00
9	1.15253E-01	4.32258E-06	1.15886E-01	.00000E+00	.00000E+00	1.87880E-03	5.08675E-04	3.17644E+00
10	1.05550E-01	-9.69711E-07	1.07077E-01	.00000E+00	.00000E+00	4.01284E-03	4.62555E-04	2.91188E+00
11	9.73316E-02	-1.77639E-06	1.00814E-01	.00000E+00	.00000E+00	8.54482E-03	4.18725E-04	2.69160E+00
12	6.12884E-02	4.14981E-07	6.53688E-02	.00000E+00	.00000E+00	1.12827E-02	2.46758E-04	1.70072E+00
13	5.21527E-02	-5.72706E-07	5.58641E-02	.00000E+00	.00000E+00	1.21320E-02	2.11178E-04	1.44805E+00
14	4.78785E-02	-1.98471E-07	5.33628E-02	.00000E+00	.00000E+00	7.80568E-03	1.90960E-04	1.33566E+00
15	2.81867E-02	-4.57024E-06	2.91097E-02	.00000E+00	.00000E+00	1.92742E-03	1.19480E-04	7.79512E-01
16	1.56334E-02	-3.10303E-06	1.61490E-02	.00000E+00	.00000E+00	1.33047E-03	6.20660E-05	4.32289E-01
17	6.67426E-03	-3.99226E-06	7.12217E-03	.00000E+00	.00000E+00	1.69296E-03	2.39528E-05	1.85211E-01
18	4.36092E-03	-1.69247E-06	5.56075E-03	.00000E+00	.00000E+00	1.50862E-03	1.25116E-05	1.23629E-01
19	1.01122E-02	-4.68952E-06	1.09254E-02	.00000E+00	.00000E+00	2.70100E-03	3.70675E-05	2.81125E-01
20	3.41030E-02	-9.13532E-06	3.61650E-02	.00000E+00	.00000E+00	1.50121E-02	1.35721E-04	9.46065E-01
21	9.75482E-03	-3.55369E-06	1.13854E-02	.00000E+00	.00000E+00	1.39646E-02	3.01056E-05	2.73844E-01
22	1.85156E-02	-3.21685E-06	2.36096E-02	.00000E+00	.00000E+00	4.12870E-02	5.38324E-05	5.26215E-01
23	6.43097E-02	3.40332E-06	7.95166E-02	.00000E+00	.00000E+00	8.03394E-02	1.88464E-04	1.82508E+00
24	4.91885E-02	-5.81248E-07	6.50713E-02	.00000E+00	.00000E+00	7.92781E-02	1.13825E-04	1.41116E+00
25	2.10510E-02	-1.10419E-06	2.94096E-02	.00000E+00	.00000E+00	4.56524E-02	3.91868E-05	6.09131E-01
26	1.38363E-02	-1.79258E-07	2.12106E-02	.00000E+00	.00000E+00	4.20342E-02	1.96269E-05	4.05460E-01
27	2.32861E-03	-1.97389E-08	4.02919E-03	.00000E+00	.00000E+00	1.17903E-02	2.10219E-06	6.91608E-02
28	1.73620E+00	-3.23576E-05	1.75693E+00	.00000E+00	2.24857E-03	4.22563E-01	1.29331E-02	4.79209E+01

- elapsed time .02 min.

Odirect access unit 9 requires 556 blocks of length 216 for cross section weighting.

1 transport cross section weighting function

Ozone	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	1.13510E-03	5.03136E-03	5.28543E-03	2.50764E-03	3.18244E-03	5.52617E-03	3.71774E-03	1.74328E-03
2	6.91531E-04	4.96888E-03	5.78279E-03	3.44171E-03	4.29908E-03	6.15591E-03	4.33455E-03	2.14811E-03
3	1.16375E-03	5.45359E-03	5.86882E-03	2.91415E-03	3.86310E-03	6.78281E-03	4.37964E-03	1.82367E-03
4	7.99375E-04	4.28258E-03	4.98001E-03	2.38791E-03	2.82864E-03	4.80131E-03	3.32670E-03	1.79768E-03
5	8.22747E-04	4.34888E-03	4.97383E-03	2.41233E-03	2.87840E-03	4.88998E-03	3.37580E-03	1.79794E-03

Ozone	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	1.11285E-03	1.01465E-03	1.09481E-03	8.73901E-04	7.91769E-04	1.03299E-03	3.16366E-04	1.61275E-04
2	1.79064E-03	1.95368E-03	2.04364E-03	1.60151E-03	1.42107E-03	1.69218E-03	6.26149E-04	3.43908E-04
3	1.12172E-03	1.05509E-03	1.29677E-03	1.22117E-03	1.11805E-03	1.56292E-03	3.78139E-04	1.98357E-04
4	1.19509E-03	1.09481E-03	1.08054E-03	6.77942E-04	6.01865E-04	6.41390E-04	3.11253E-04	1.61329E-04
5	1.19319E-03	1.09540E-03	1.04597E-03	7.05454E-04	6.27823E-04	6.87639E-04	3.14990E-04	1.63316E-04

0zone	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	9.32159E-05	1.84645E-04	1.64559E-04	4.71573E-04	2.64740E-04	7.68202E-04	2.13828E-03	1.89339E-03
2	1.77245E-04	2.91583E-04	2.95430E-04	8.70172E-04	4.29408E-04	1.19092E-03	3.30816E-03	2.92166E-03
3	1.34967E-04	3.13059E-04	2.39291E-04	6.41944E-04	4.21506E-04	1.24608E-03	3.25212E-03	2.93205E-03
4	7.07468E-05	7.53990E-05	1.17095E-04	3.84825E-04	1.35903E-04	3.40228E-04	1.07862E-03	8.60599E-04
5	7.39512E-05	8.73712E-05	1.23248E-04	3.97865E-04	1.50383E-04	3.86550E-04	1.19240E-03	9.69697E-04

0zone	grp. 25	grp. 26	grp. 27	grp. 28
1	8.61494E-04	6.10558E-04	9.30382E-05	4.20715E-02
2	1.34549E-03	9.80382E-04	1.68602E-04	5.52724E-02
3	1.37027E-03	1.02844E-03	1.92210E-04	5.19737E-02
4	3.60308E-04	2.18904E-04	2.71435E-05	3.45382E-02
5	4.13273E-04	2.60728E-04	3.49507E-05	3.54241E-02

1broad group parameters

grp	upper energy	mid energy	velocity	fiss spec
1	2.0000E+07	2.6512E+06	1.9675E+09	7.2026E-01
2	9.0000E+05	1.5116E+05	9.8844E+06	2.7974E-01
3	4.0000E-01	1.2602E-01	3.6640E+05	1.2193E-10
4	1.0000E-05			

1 560 d, second part of sas2h pass to make library

0cell averaged fluxes

0zone	grp. 1	grp. 2	grp. 3
1	3.89825E-01	1.13679E+00	2.26610E-01
2	3.95069E-01	1.13809E+00	2.17225E-01
3	3.98022E-01	1.13838E+00	2.13005E-01
4	4.15189E-01	1.14066E+00	1.82970E-01
5	4.13500E-01	1.14041E+00	1.85886E-01

0flux disadvantage factors (zone average/cell average-flux)

0zone	grp. 1	grp. 2	grp. 3
1	9.42745E-01	9.96824E-01	1.21908E+00
2	9.55428E-01	9.97966E-01	1.16859E+00
3	9.62569E-01	9.98223E-01	1.14589E+00
4	1.00409E+00	1.00022E+00	9.84313E-01
5	1.00000E+00	1.00000E+00	1.00000E+00

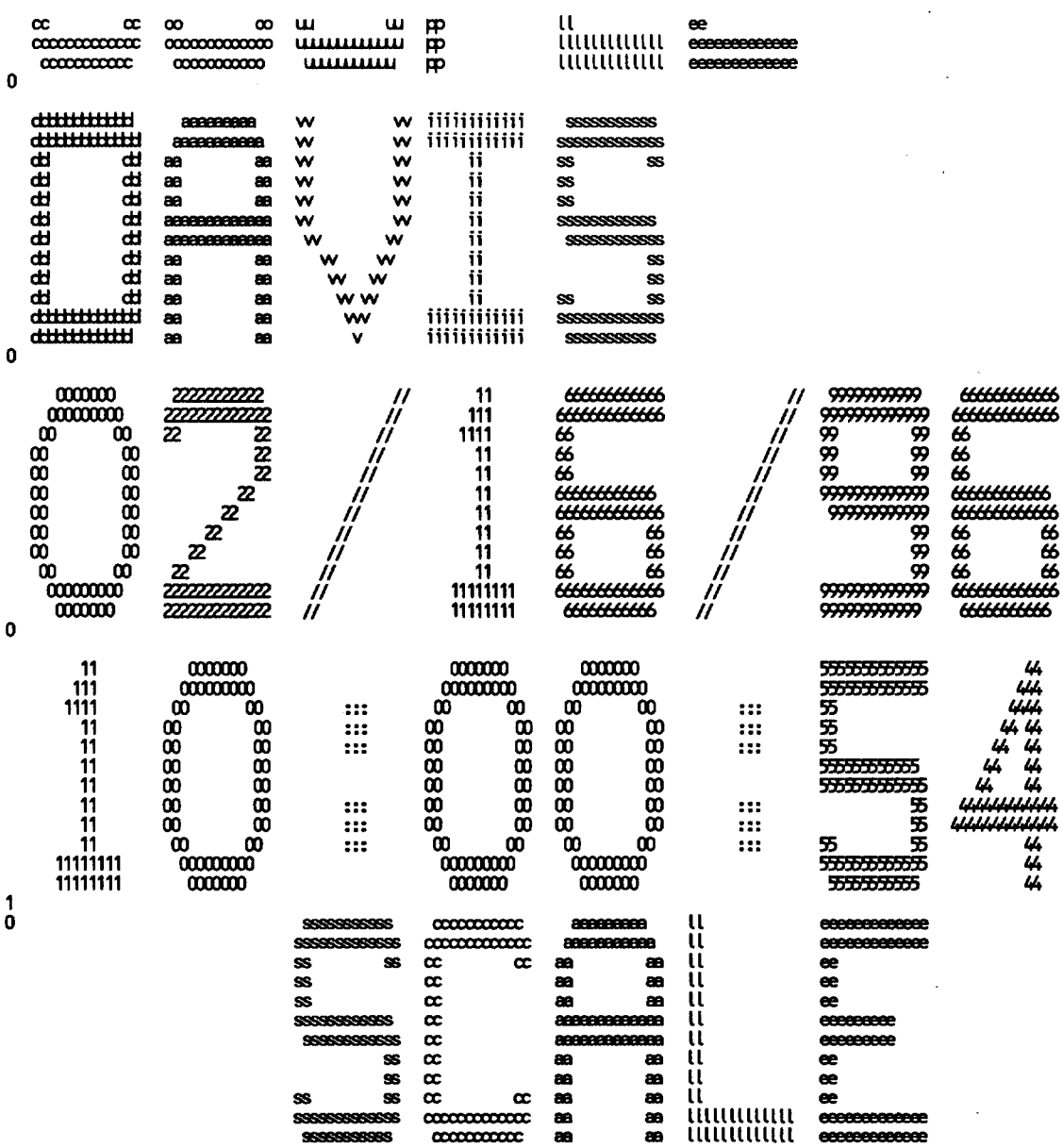
0cell averaged currents

0zone	grp. 1	grp. 2	grp. 3
1	1.71420E-02	1.82998E-02	6.62971E-03
2	1.91840E-02	2.57438E-02	1.03446E-02
3	1.92634E-02	2.22676E-02	1.04427E-02
4	1.52285E-02	1.62880E-02	3.02171E-03
5	1.54362E-02	1.65799E-02	3.40798E-03

0zone	volume	vol. fraction
1	1.25665E+00	4.56236E-02
2	1.66687E-01	6.05165E-03
3	6.58265E-01	2.38987E-02
4	2.54624E+01	9.24426E-01
5	2.75440E+01	1.00000E+00

\- elapsed time .03 min.

```
1  cccccccccc    oooooooooo    uu        uu  pppppppppppp    ll           eeeeeeeeeeee
  cccccccccccc  oooooooooooo   uu        uu  ppppppppppppp   ll           eeeeeeeeeeee
  cc        cc  oo        oo   uu        uu  pp         pp   ll           ee
  cc            oo        oo   uu        uu  pp         pp   ll           ee
  cc            oo        oo   uu        uu  pp         pp   ll           ee
  cc            oo        oo   uu        uu  ppppppppppppp   ll           eeeeeeee
  cc            oo        oo   uu        uu  pppppppppppp    ll           eeeeeeee
  cc            oo        oo   uu        uu  pp              ll           ee
  cc            oo        oo   uu        uu  pp              ll           ee
```



```
                    ********************************************************************************
                    ********************************************************************************
                    ********************************************************************************
                    *****                                                                      *****
                    *****                  program verification information                   *****
                    *****                                                                      *****
                    *****                  code system:    scale  version:    4.2             *****
                    *****                                                                      *****
                    ********************************************************************************
                    ********************************************************************************
                    *****                                                                      *****
                    *****                                                                      *****
                    *****              program:  c0c005                                        *****
                    *****                                                                      *****
                    *****         creation date:  04/27/95                                     *****
                    *****                                                                      *****
                    *****              library:  /neutronics/scale/exe                         *****
                    *****                                                                      *****
                    *****                                                                      *****
                    *****     this is not a    scale  configuration controlled code          *****
                    *****                                                                      *****
                    *****              jobname:  davis                                         *****
                    *****                                                                      *****
                    *****     date of execution:  02/16/96                                     *****
                    *****                                                                      *****
                    *****     time of execution:  10:00:54                                     *****
                    *****                                                                      *****
                    *****                                                                      *****
                    ********************************************************************************
                    ********************************************************************************
                    ********************************************************************************
1
0       -1q array has       1 entries.
0        0q array has       1 entries.
0        0q array has       1 entries.
0        1q array has       1 entries.
0        1q array has       1 entries.
0        1q array has       1 entries.
0        1q array has       1 entries.
0        1q array has       1 entries.
0        2q array has       1 entries.
0         * core allocated to array-data (by -1$$ or default) was   200000 words. *
1          * broad 3-group flux weighting factors *
0
0                  therm =    .5102
0                  res   =    .4194
0                  fast  =   3.2255
0 user requested (see jackl) that only the nuclide transitions presently included in
0 origen library be updated.
1cross sections, available from ampx (normalized to thermal flux), barns

                      10010 to  10020  2.81074E-01
                      10010 tot-cap    2.81074E-01
                      50100 to  40100  2.30587E-02
                      50100 to  10010  2.30587E-02
                      50100 to  40090  3.49785E-03
                      50100 to  10020  3.49785E-03
```

50100	to 30070	3.23223E+03
50100	to 20040	3.23240E+03
50100	to 10080	8.63863E-02
50100	tot-cap	3.23234E+03
50110	to 50100	1.00341E-05
50110	to 50120	4.27805E-03
50110	to 40110	1.28045E-06
50110	to 10010	1.28045E-06
50110	to 40090	1.14267E-05
50110	to 10080	1.14267E-05
50110	to 30080	1.49170E-04
50110	to 20040	1.49170E-04
50110	tot-cap	4.44997E-03
80160	to 80170	1.50153E-04
80160	to 70160	8.77965E-05
80160	to 10010	8.77965E-05
80160	to 70150	1.65583E-05
80160	to 10020	1.65583E-05
80160	to 60130	2.46487E-02
80160	to 20040	2.46487E-02
80160	to 80161	3.85045E-03
80160	tot-cap	2.49032E-02
360830	to 360820	1.99539E-02
360830	to 360810	2.10453E-09
360830	to 360840	1.52183E+02
360830	to 350830	8.20360E-04
360830	to 10010	8.20360E-04
360830	to 350820	6.58364E-06
360830	to 10020	6.58364E-06
360830	to 350810	2.30111E-06
360830	to 10080	2.30111E-06
360830	to 340810	3.72415E-08
360830	to 20080	3.72415E-08
360830	to 340800	4.37489E-05
360830	to 20040	4.37489E-05
360830	tot-cap	1.52204E+02
360850	to 360860	1.37560E+00
360850	tot-cap	1.37560E+00
380900	to 380910	6.23767E-01
380900	tot-cap	6.23767E-01
390890	to 390900	9.75890E-01
390890	tot-cap	9.75890E-01
400930	to 400940	1.28827E+01
400930	tot-cap	1.28827E+01
400940	to 400950	1.79301E-01
400940	tot-cap	1.79301E-01
400950	to 400960	2.13947E+00
400950	tot-cap	2.13947E+00
410940	to 410950	3.72018E+01
410940	tot-cap	3.72018E+01
420950	to 420960	3.72416E+01
420950	tot-cap	3.72416E+01
430990	to 430980	6.04825E-03
430990	to 431000	8.67993E+01
430990	tot-cap	8.68054E+01
441010	to 441020	2.71307E+01
441010	tot-cap	2.71307E+01
441060	to 441070	8.32121E-01
441060	tot-cap	8.32121E-01
451080	to 451020	2.19045E-03

451030 to 451040 3.49009E+02
451030 tot-cap 3.49011E+02
451050 to 451060 8.09421E+03
451050 tot-cap 8.09421E+03
461050 to 461060 3.27097E+01
461050 tot-cap 3.27097E+01
461080 to 461090 6.58777E+01
461080 tot-cap 6.58777E+01
471090 to 471080 5.09575E-03
471090 to 471100 3.58892E+02
471090 to 461090 2.89243E-04
471090 to 10010 2.89243E-04
471090 to 451060 2.38972E-04
471090 to 20040 2.38972E-04
471090 to 471091 6.08942E-01
471090 tot-cap 3.58897E+02
511240 to 511250 1.16768E+01
511240 tot-cap 1.16768E+01
541310 to 541300 6.17635E-02
541310 to 541290 1.29149E-05
541310 to 541320 2.51254E+02
541310 to 531310 3.72901E-05
541310 to 10010 3.72901E-05
541310 to 531300 5.17949E-07
541310 to 10020 5.17949E-07
541310 to 531290 5.31105E-07
541310 to 10030 5.31105E-07
541310 to 521280 1.74336E-05
541310 to 20040 1.74336E-05
541310 tot-cap 2.51316E+02
541320 to 541310 9.97762E-03
541320 to 541300 2.11618E-05
541320 to 541330 8.96878E-01
541320 to 531320 7.62170E-06
541320 to 10010 7.62170E-06
541320 to 531310 3.21580E-07
541320 to 10020 3.21580E-07
541320 to 531300 4.33008E-08
541320 to 10030 4.33008E-08
541320 to 521290 9.37729E-07
541320 to 20040 9.37729E-07
541320 tot-cap 9.06886E-01
541350 to 541360 1.45939E+06
541350 tot-cap 1.45939E+06
541360 to 541350 1.70674E-02
541360 to 541340 5.21279E-05
541360 to 541370 1.21829E-01
541360 to 531360 3.15184E-07
541360 to 10010 3.15184E-07
541360 to 531350 1.17333E-07
541360 to 10020 1.17333E-07
541360 to 531340 2.65076E-08
541360 to 10030 2.65076E-08
541360 to 521330 2.64371E-07
541360 to 20040 2.64371E-07
541360 tot-cap 1.38949E-01
551330 to 551320 7.99233E-03
551330 to 551340 9.87234E+01
551330 to 541330 8.68658E-04
551330 to 10010 8.68658E-04

551330 to 531300	1.36559E-05
551330 to 20040	1.36559E-05
551330 tot-cap	9.87323E+01
551340 to 551350	1.26588E+02
551340 tot-cap	1.26588E+02
551350 to 551360	2.06987E+01
551350 tot-cap	2.06987E+01
551370 to 551380	2.22268E-01
551370 tot-cap	2.22268E-01
561360 to 561370	8.71651E-01
561360 tot-cap	8.71651E-01
571390 to 571400	7.82258E+00
571390 tot-cap	7.82258E+00
581440 to 581450	1.20753E+00
581440 tot-cap	1.20753E+00
591410 to 591400	5.72711E-03
591410 to 591390	1.64554E-06
591410 to 571370	2.46396E-06
591410 to 20040	5.08915E-05
591410 to 581400	1.74672E-05
591410 to 10010	4.97664E-05
591410 to 591420	1.16124E+01
591410 to 581410	4.68908E-05
591410 to 10020	1.45916E-05
591410 to 581390	1.53025E-06
591410 to 10030	1.53025E-06
591410 to 571390	1.47785E-08
591410 to 20030	1.47785E-08
591410 to 571380	4.84276E-05
591410 tot-cap	1.16182E+01
591430 to 591440	9.58312E+01
591430 tot-cap	9.58312E+01
601430 to 601420	8.76411E-02
601430 to 601410	8.94352E-06
601430 to 581390	1.94490E-05
601430 to 20040	5.43945E-04
601430 to 591420	3.74375E-06
601430 to 10010	3.85492E-05
601430 to 601440	1.97699E+02
601430 to 591430	3.71388E-05
601430 to 10020	2.33330E-06
601430 to 591410	3.36227E-06
601430 to 10030	3.36227E-06
601430 to 581410	1.61544E-08
601430 to 20030	1.61544E-08
601430 to 581400	5.24498E-04
601430 tot-cap	1.97788E+02
601450 to 601440	1.12467E-01
601450 to 601430	1.14189E-04
601450 to 581410	8.09598E-06
601450 to 20040	2.08831E-04
601450 to 591440	2.14496E-06
601450 to 10010	1.39538E-05
601450 to 601460	7.63322E+01
601450 to 591450	1.30983E-05
601450 to 10020	1.28959E-06
601450 to 591430	2.03274E-06
601450 to 10030	2.03274E-06
601450 to 581430	4.13866E-09
601450 to 20030	4.13866E-09

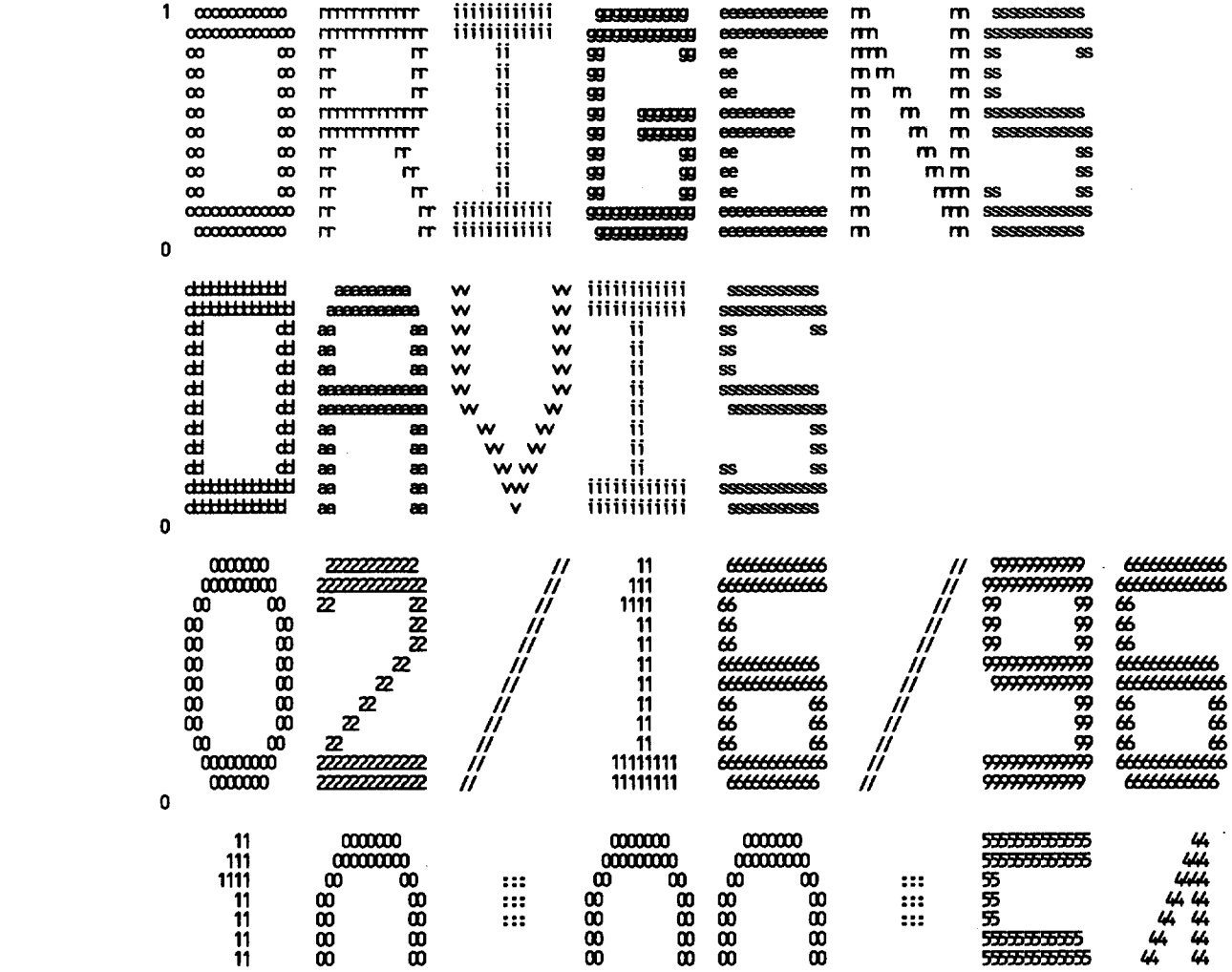
601450 to 581420 1.94735E-04
601450 tot-cap 7.64450E+01
601470 to 601480 1.82057E+02
601470 tot-cap 1.82057E+02
611470 to 611460 3.07682E-02
611470 to 611450 9.60014E-05
611470 to 591430 8.52691E-06
611470 to 20040 7.90907E-05
611470 to 601460 1.17661E-05
611470 to 10010 2.68168E-05
611470 to 611480 5.65792E+02
611470 to 601470 2.39051E-05
611470 to 10020 8.85435E-06
611470 to 601450 3.34307E-06
611470 to 10080 3.34307E-06
611470 to 591450 5.02640E-09
611470 to 20080 5.02640E-09
611470 to 591440 7.05638E-05
611470 tot-cap 5.65825E+02
611480 to 611490 1.19245E+04
611480 tot-cap 1.19245E+04
621470 to 621460 8.02674E-02
621470 to 621450 7.22730E-03
621470 to 601430 6.27083E-05
621470 to 20040 1.20681E-03
621470 to 611460 1.45664E-04
621470 to 10010 2.08286E-04
621470 to 621480 2.24593E+02
621470 to 611470 1.83730E-04
621470 to 10020 1.21108E-04
621470 to 611450 1.30043E-04
621470 to 10080 1.30043E-04
621470 to 601450 5.98351E-06
621470 to 20080 5.98351E-06
621470 to 601440 1.14410E-03
621470 to 621471 1.59214E+00
621470 tot-cap 2.24682E+02
621490 to 621480 4.53697E-02
621490 to 621470 3.60249E-05
621490 to 621500 4.49604E+04
621490 to 611490 4.64906E-04
621490 to 10010 4.64906E-04
621490 to 601460 4.64906E-04
621490 to 20040 4.64906E-04
621490 tot-cap 4.49604E+04
621500 to 621510 1.31000E+02
621500 tot-cap 1.31000E+02
621510 to 621500 1.51533E-01
621510 to 621490 1.35559E-04
621510 to 601470 1.52300E-05
621510 to 20040 1.18783E-04
621510 to 611500 1.85620E-06
621510 to 10010 1.44460E-05
621510 to 621520 4.90133E+03
621510 to 611510 1.33119E-05
621510 to 10020 7.22131E-07
621510 to 611490 1.31243E-06
621510 to 10080 1.31243E-06
621510 to 601490 1.35205E-09
621510 to 20080 1.35205E-09

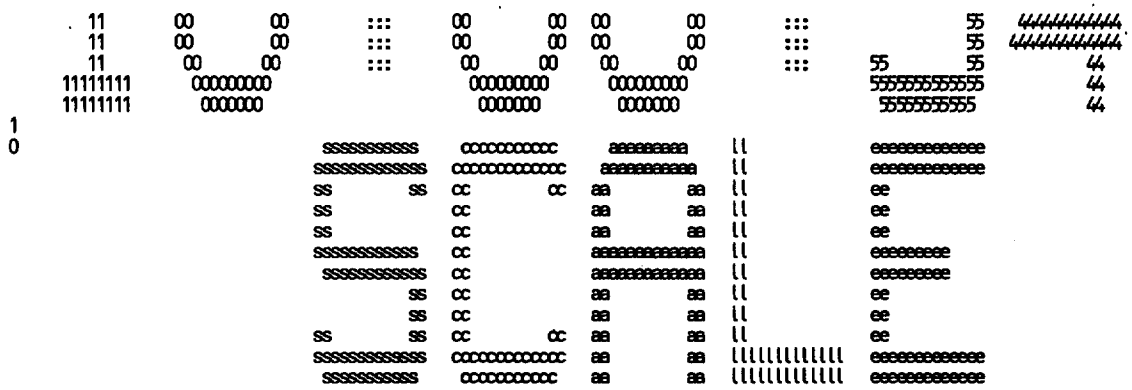
621510 to 601480 1.03653E-04
621510 tot-cap 4.90148E+03
621520 to 621510 1.81528E-02
621520 to 621500 1.22659E-04
621520 to 601480 2.74143E-06
621520 to 20040 1.13869E-05
621520 to 611510 7.86272E-07
621520 to 10010 2.32027E-06
621520 to 621530 7.15683E+02
621520 to 611520 2.06111E-06
621520 to 10020 5.27119E-07
621520 to 611500 1.37091E-07
621520 to 10030 1.37091E-07
621520 to 601500 4.15464E-10
621520 to 20030 4.15464E-10
621520 to 601490 8.64546E-06
621520 tot-cap 7.15702E+02
631530 to 631520 1.76307E-02
631530 to 631510 2.63281E-05
631530 to 611490 4.21162E-05
631530 to 20040 6.08376E-04
631530 to 621520 7.37617E-06
631530 to 10010 6.22333E-05
631530 to 631540 6.01907E+02
631530 to 621530 5.97147E-05
631530 to 10020 4.85759E-06
631530 to 621510 1.08846E-06
631530 to 10030 1.08846E-06
631530 to 611510 2.48821E-08
631530 to 20030 2.48821E-08
631530 to 611500 5.66260E-04
631530 tot-cap 6.01925E+02
631540 to 631530 2.81847E-02
631540 to 631520 1.01245E-05
631540 to 611500 9.84430E-11
631540 to 20040 7.29194E-04
631540 to 621530 2.21619E-06
631540 to 10010 1.18422E-03
631540 to 631550 1.05700E+03
631540 to 621540 1.18422E-03
631540 to 10020 2.21496E-06
631540 to 621520 3.75205E-06
631540 to 10030 3.75205E-06
631540 to 611520 1.59074E-08
631540 to 20030 1.59074E-08
631540 to 611510 7.29194E-04
631540 tot-cap 1.05703E+03
631550 to 631540 2.31407E-02
631550 to 631530 6.47992E-05
631550 to 611510 1.74437E-06
631550 to 20040 8.58506E-06
631550 to 621540 3.53338E-06
631550 to 10010 7.42022E-06
631550 to 631560 2.53912E+03
631550 to 621550 5.70099E-06
631550 to 10020 1.81415E-06
631550 to 621530 6.00547E-07
631550 to 10030 6.00547E-07
631550 to 611530 1.36117E-10
631550 to 20030 1.36117E-10

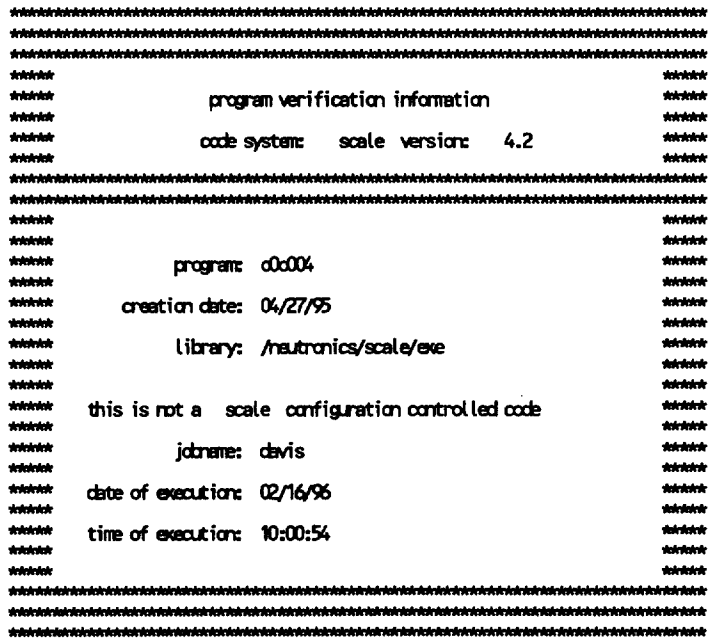
631550	to 611520	6.84069E-06
631550	tot-cap	2.53915E+03
641550	to 641560	1.68507E+04
641550	tot-cap	1.68507E+04
922340	to 922330	6.06255E-03
922340	fission	4.24957E+00
922340	nu-sigf	1.11695E+01
922340	to 922320	8.79035E-05
922340	to 922350	1.80808E+02
922340	to 922341	2.85447E+00
922340	tot-cap	1.84563E+02
922350	to 922340	2.77011E-02
922350	fission	3.58046E+02
922350	nu-sigf	8.67034E+02
922350	to 922330	2.64796E-05
922350	to 922360	8.43002E+01
922350	to 922351	8.11872E-02
922350	tot-cap	4.42574E+02
922360	to 922350	3.08839E-02
922360	fission	1.82111E+00
922360	nu-sigf	4.99822E+00
922360	to 922340	4.11580E-04
922360	to 922370	7.15549E+01
922360	to 922361	3.12284E+00
922360	tot-cap	7.34073E+01
922380	to 922370	6.16837E-02
922380	fission	9.12398E-01
922380	nu-sigf	2.56852E+00
922380	to 922360	3.98626E-04
922380	to 922390	8.18410E+00
922380	tot-cap	9.15858E+00
952370	to 952360	1.40615E-02
952370	fission	4.92771E+00
952370	nu-sigf	1.48387E+01
952370	to 952350	5.37949E-05
952370	to 952380	2.92721E+02
952370	to 952371	7.31933E-01
952370	tot-cap	2.97663E+02
942380	to 942370	2.26019E-03
942380	fission	2.15714E+01
942380	nu-sigf	6.11386E+01
942380	to 942360	1.26492E-05
942380	to 942390	2.62479E+02
942380	to 942381	2.86197E+00
942380	tot-cap	2.84053E+02
942390	to 942380	1.19732E-02
942390	fission	8.43174E+02
942390	nu-sigf	2.42426E+03
942390	to 942370	2.03645E-05
942390	to 942360	2.01876E-03
942390	to 942400	4.73873E+02
942390	tot-cap	1.31706E+03
942400	to 942390	5.62889E-03
942400	fission	5.63826E+00
942400	nu-sigf	1.76464E+01
942400	to 942380	5.49290E-05
942400	to 942410	1.61630E+03
942400	tot-cap	1.62194E+03
942410	to 942400	7.11470E-02
942410	fission	8.93907E+02

```
                  942410 nu-sigf    2.62283E+03
                  942410 to 942390  1.17533E-04
                  942410 to 942420  2.93295E+02
                  942410 tot-cap    1.18727E+03
                  942420 to 942410  2.29460E-02
                  942420 fission    4.27076E+00
                  942420 nu-sigf    1.33775E+01
                  942420 to 942400  2.78960E-04
                  942420 to 942430  3.21212E+02
                  942420 tot-cap    3.25506E+02
                  952410 fission    1.21625E+01
                  952410 nu-sigf    3.92645E+01
                  952410 to 952420  1.01112E+03
                  952410 tot-cap    1.02328E+03
                  952430 fission    3.29622E+00
                  952430 nu-sigf    1.10808E+01
                  952430 to 952440  4.07930E+02
                  952430 tot-cap    4.11227E+02
                  962440 to 962430  5.51456E-03
                  962440 fission    1.47615E+01
                  962440 nu-sigf    4.94557E+01
                  962440 to 962420  5.49934E-05
                  962440 to 962450  1.36522E+02
                  962440 to 962441  3.65043E+00
                  962440 tot-cap    1.51089E+02
Othe reaction  50100 to  30070 was not used, because  50100 is not in library., (in subr pool)
                                    in the search of library number 3
Othe reaction  50100 to  40090 was not used, because  50100 is not in library., (in subr pool)
                                    in the search of library number 3
Othe reaction  50110 to  40090 was not used, because  50110 is not in library., (in subr pool)
                                    in the search of library number 3
Othe reaction  50100 to  40100 was not used, because  50100 is not in library., (in subr pool)
                                    in the search of library number 3
Othe reaction  80160 to  80161 was not used, because  80161 is not in library., (in subr pool)
Othe reaction 621470 to 621471 was not used, because 621471 is not in library., (in subr pool)
Othe fission product transitions for  922340 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
Ouse substitute nuclide in block 8 data.  or, update with new fission yield data.
Othe reaction  922340 to 922341 was not used, because  922341 is not in library., (in subr pool)
Othe reaction  922350 to 922351 was not used, because  922351 is not in library., (in subr pool)
Othe fission product transitions for  922360 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
Ouse substitute nuclide in block 8 data.  or, update with new fission yield data.
Othe reaction  922360 to 922361 was not used, because  922361 is not in library., (in subr pool)
Othe fission product transitions for  952370 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
Ouse substitute nuclide in block 8 data.  or, update with new fission yield data.
Othe reaction  952370 to 952371 was not used, because  952371 is not in library., (in subr pool)
Othe fission product transitions for  942380 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
Ouse substitute nuclide in block 8 data.  or, update with new fission yield data.
Othe reaction  942380 to 942381 was not used, because  942381 is not in library., (in subr pool)
Othe fission product transitions for  942400 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
Ouse substitute nuclide in block 8 data.  or, update with new fission yield data.
Othe fission product transitions for  942420 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
Ouse substitute nuclide in block 8 data.  or, update with new fission yield data.
Othe fission product transitions for  952410 were not used.  library fissile nuclides are
  922330  922350  942410  922380  942390
```

```
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the fission product transitions for  952430 were not used.  library fissile nuclides are
   922330   922350   942410   922380   942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the fission product transitions for  962440 were not used.  library fissile nuclides are
   922330   922350   942410   922380   942390
0use substitute nuclide in block 8 data.  or, update with new fission yield data.
0the reaction  962440 to 962441 was not used, because  962441 is not in library., (in subr pool)
1
0                          case completed.  date,  2/16/1996
0 * normal termination *
```








```
1
0     -1q array has     1 entries.
0      0q array has     1 entries.
0      0q array has     1 entries.
0      0q array has     1 entries.
0      0q array has     1 entries.
```

```
0        dbl. prec. machine word applied has, at least, a 16 significant figure accuracy.
0            short-lived split test fraction, qxn =    9.1188E-04
0            half-norm of matrix used, axn =    7.0000E+00
0            4-place-accuracy-retention ratio, ratio4 =    6.4516E-13
0        1q array has      20 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        4q array has       1 entries.
0       54q array has      12 entries.
1library information...

         cross-section data taken from position number  1 of library on unit 15.

         pass   4
         pass   1
         pass   0
         *scale-system control module sas2 library*
         used a time-dependant neutron spectrum, for each of the above passes
           pass 0 applies start-up fuel densiities
           pass n applies mid time densities of nth library interval
         first library updated was...
         pass   1
         pass   0
         *scale-system control module sas2 library*
         used a time-dependant neutron spectrum, for each of the above passes
           pass 0 applies start-up fuel densiities
           pass n applies mid time densities of nth library interval
         first library updated was...
         ************************************************************************
         *                                                                      *
         *           prelim lwr origen-s binary working library--id = 1143      *
         *        made from modified card-image origen-s libraries of scale 4.2 *
         *      data from the light element, actinide, and fission product libraries *
         *        decay data, including gamma and total energy, are from endf/b-vi *
         *                                                                      *
         *      neutron flux spectrum factors and cross sections were produced from *
         *     the "presas2" case updating all nuclides on the scale "burnup" library *
         *                                                                      *
         *                  fission product yields are from endf/b-v            *
         *                                                                      *
         *              photon libraries use an 18-energy-group structure       *
         *             the photon data are from the master photon data base,    *
         *              produced to include bremsstrahlung from us2 matrix      *
         *                                                                      *
         *       see information above this box (if present) for later updates  *
         *                                                                      *
         ************************************************************************
         *                                                                      *
0        ************************************************************************
0                 .other identification and sizes of library.
0                  data set name:  ft15f001
0               2/16/1996    date library was produced
0                    1697    total number of nuclides in library
                      689    number of light-element nuclides
                      129    number of actinide nuclides
                      879    number of fission product nuclides
0                    7955    number of nonzero off-diagonal matrix elements
0        ************************************************************************
1
```

sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp actinides page 1
power= 8.466E-05mw, burnup=2.0318E-02mwd, flux= 1.61E+13n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = converted to atoms/(barn-cm)

	charge	520.0 d	560.0 d	600.0 d	640.0 d	640.1 d	680.1 d	720.1 d
he 4	4.44E-09	5.87E-09	7.66E-09	9.90E-09	1.27E-08	1.27E-08	1.60E-08	2.00E-08
u230	2.18E-21	2.67E-21	3.19E-21	3.75E-21	4.39E-21	4.38E-21	5.10E-21	5.89E-21
u231	4.75E-20	5.79E-20	6.77E-20	7.86E-20	9.08E-20	9.04E-20	1.04E-19	1.19E-19
u232	6.36E-13	7.56E-13	8.91E-13	1.04E-12	1.21E-12	1.21E-12	1.40E-12	1.61E-12
u233	2.43E-11	2.60E-11	2.76E-11	2.92E-11	3.07E-11	3.07E-11	3.21E-11	3.34E-11
u234	4.95E-06	4.90E-06	4.85E-06	4.80E-06	4.75E-06	4.75E-06	4.70E-06	4.66E-06
u235	5.15E-04	5.02E-04	4.90E-04	4.78E-04	4.67E-04	4.67E-04	4.56E-04	4.44E-04
u236	3.59E-05	3.77E-05	3.95E-05	4.20E-05	4.40E-05	4.40E-05	4.60E-05	4.79E-05
u237	5.10E-08	5.41E-08	5.62E-08	5.83E-08	6.08E-08	6.02E-08	6.23E-08	6.43E-08
u238	2.19E-02	2.19E-02	2.19E-02	2.19E-02	2.19E-02	2.19E-02	2.19E-02	2.19E-02
u239	2.52E-09	5.85E-09	5.84E-09	5.85E-09	5.85E-09	1.97E-09	5.85E-09	5.85E-09
u240	.00E+00	7.72E-35	1.71E-34	3.56E-34	7.05E-34	7.05E-34	1.34E-33	2.43E-33
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	1.80E-14	2.17E-14	2.57E-14	2.99E-14	3.45E-14	3.45E-14	3.94E-14	4.46E-14
np236m	2.94E-14	3.49E-14	3.87E-14	4.27E-14	4.67E-14	4.59E-14	5.09E-14	5.52E-14
np236	1.54E-12	1.88E-12	2.27E-12	2.69E-12	3.15E-12	3.15E-12	3.66E-12	4.21E-12
np237	1.60E-06	1.79E-06	1.98E-06	2.19E-06	2.39E-06	2.39E-06	2.60E-06	2.82E-06
np238	1.94E-09	2.21E-09	2.45E-09	2.70E-09	2.98E-09	2.94E-09	3.23E-09	3.50E-09
np239	8.23E-07	8.44E-07	8.44E-07	8.44E-07	8.44E-07	8.42E-07	8.45E-07	8.46E-07
np240m	.00E+00	6.59E-37	1.46E-36	3.04E-36	6.02E-36	6.02E-36	1.14E-35	2.08E-35
np240	1.04E-11	1.48E-11	1.48E-11	1.49E-11	1.49E-11	9.84E-12	1.49E-11	1.49E-11
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	1.89E-12	2.29E-12	2.74E-12	3.22E-12	3.75E-12	3.75E-12	4.31E-12	4.92E-12
pu237	1.37E-13	1.52E-13	1.67E-13	1.81E-13	1.95E-13	1.95E-13	2.09E-13	2.23E-13
pu238	1.23E-07	1.49E-07	1.78E-07	2.10E-07	2.46E-07	2.46E-07	2.84E-07	3.26E-07
pu239	7.50E-05	7.93E-05	8.32E-05	8.69E-05	9.04E-05	9.04E-05	9.36E-05	9.65E-05
pu240	9.39E-06	1.05E-05	1.17E-05	1.29E-05	1.40E-05	1.40E-05	1.51E-05	1.62E-05
pu241	3.61E-06	4.22E-06	4.90E-06	5.62E-06	6.40E-06	6.40E-06	7.22E-06	8.09E-06
pu242	2.08E-07	2.68E-07	3.37E-07	4.17E-07	5.07E-07	5.07E-07	6.09E-07	7.24E-07
pu243	2.52E-11	3.55E-11	4.47E-11	5.53E-11	6.74E-11	6.18E-11	8.10E-11	9.64E-11
pu244	1.64E-24	3.84E-24	8.49E-24	1.77E-23	3.51E-23	3.51E-23	6.65E-23	1.21E-22
pu245	1.14E-30	2.74E-30	6.06E-30	1.27E-29	2.51E-29	2.41E-29	4.76E-29	8.69E-29
pu246	.00E+00	9.00E-33	2.10E-32	4.46E-32	8.99E-32	8.98E-32	1.73E-31	3.20E-31
am239	8.99E-19	1.25E-18	1.53E-18	1.88E-18	2.27E-18	2.19E-18	2.71E-18	3.20E-18
am240	3.96E-16	5.29E-16	6.62E-16	8.13E-16	9.83E-16	9.75E-16	1.17E-15	1.38E-15
am241	5.98E-08	7.67E-08	9.59E-08	1.18E-07	1.42E-07	1.42E-07	1.69E-07	1.99E-07
am242m	9.19E-10	1.24E-09	1.62E-09	2.08E-09	2.61E-09	2.61E-09	3.21E-09	3.90E-09
am242	6.66E-11	8.66E-11	1.08E-10	1.33E-10	1.61E-10	1.56E-10	1.92E-10	2.26E-10
am243	9.57E-09	1.36E-08	1.86E-08	2.49E-08	3.26E-08	3.26E-08	4.18E-08	5.28E-08
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	3.12E-12	4.65E-12	6.39E-12	8.55E-12	1.12E-11	1.07E-11	1.44E-11	1.82E-11
am245	1.05E-28	2.48E-28	5.45E-28	1.13E-27	2.21E-27	2.21E-27	4.14E-27	7.47E-27
am246	.00E+00	2.25E-35	5.24E-35	1.11E-34	2.25E-34	2.25E-34	4.33E-34	8.00E-34
cm241	2.56E-19	4.04E-19	6.01E-19	8.61E-19	1.20E-18	1.19E-18	1.62E-18	2.14E-18
cm242	4.63E-09	6.30E-09	8.35E-09	1.08E-08	1.37E-08	1.37E-08	1.70E-08	2.09E-08
cm243	3.84E-11	5.72E-11	8.22E-11	1.14E-10	1.55E-10	1.55E-10	2.05E-10	2.65E-10
cm244	4.58E-10	7.10E-10	1.06E-09	1.54E-09	2.16E-09	2.16E-09	2.97E-09	3.99E-09
cm245	5.42E-12	9.12E-12	1.47E-11	2.27E-11	3.39E-11	3.39E-11	4.94E-11	7.01E-11
cm246	1.18E-13	2.15E-13	3.73E-13	6.23E-13	1.00E-12	1.00E-12	1.56E-12	2.37E-12
cm247	4.36E-16	8.72E-16	1.64E-15	2.94E-15	5.06E-15	5.06E-15	8.40E-15	1.35E-14

1

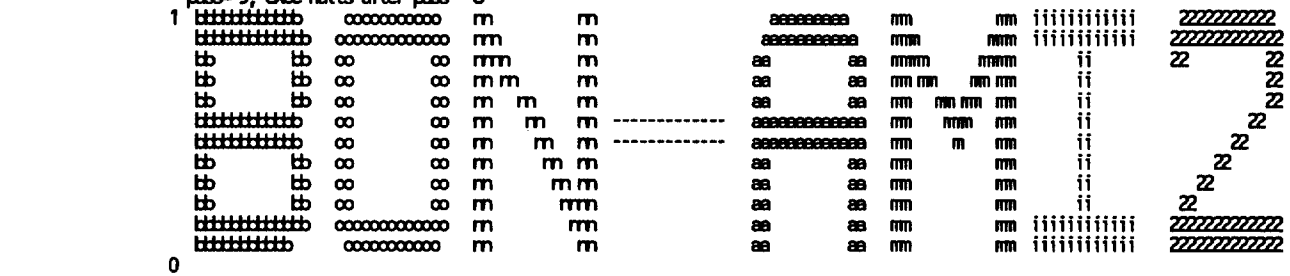
sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp actinides page 2
power= 8.466E-05mw, burnup=2.0318E-02mwd, flux= 1.61E+13n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = converted to atoms/(barn-cm)

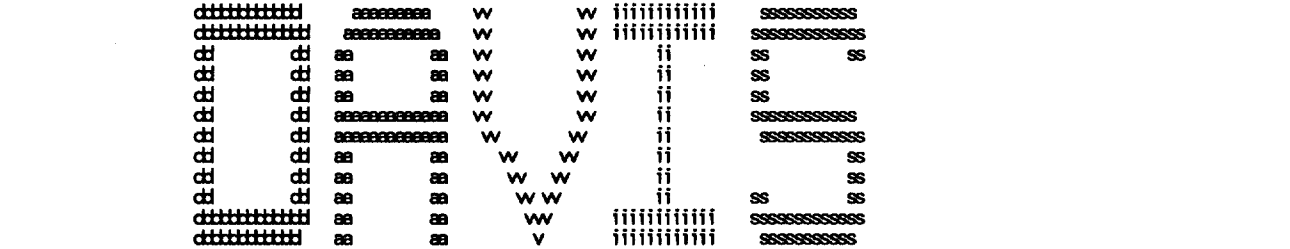
```
          charge   520.0 d  560.0 d  600.0 d  640.0 d  640.1 d  680.1 d  720.1 d
    cm248 7.07E-18 1.55E-17 3.16E-17 6.13E-17 1.13E-16 1.13E-16 2.01E-16 3.44E-16
    cm249 3.31E-23 1.01E-22 2.06E-22 3.99E-22 7.39E-22 4.96E-22 1.31E-21 2.25E-21
    cm250 4.02E-27 9.57E-27 2.13E-26 4.45E-26 8.84E-26 8.84E-26 1.68E-25 3.07E-25
    cm251  .00E+00 2.28E-34 5.06E-34 1.06E-33 2.11E-33 4.61E-34 4.01E-33 7.33E-33
   totals 2.26E-02 2.26E-02 2.26E-02 2.25E-02 2.25E-02 2.25E-02 2.25E-02 2.25E-02
0   flux           1.60E+13 1.60E+13 1.60E+13 1.61E+13  .00E+00 1.61E+13 1.61E+13
0 .results on logical unit no. 71, position  1, for time step  7, subcase 1. (run position 1, case position 1)
  title: sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0 .results on logical unit no. 71, position  2, for time step  5, subcase 1. (run position 1, case position 1)
  title: sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0 .results on logical unit no. 71, position  3, for time step  4, subcase 1. (run position 1, case position 1)
  title: sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0    .terminated logical unit no. 71 with zero flag record.
1 * normal termination of execution *
0                                   table of contents for material tables
0                                     case or subcase printed      page

                                                1                1
0ndset      33
         15         4         1        27         6         0         0         0         0         0
          0         0         0         0         0         0        -1      1698       690       130
        880      7935         0         5        99         2        16        96        18        18
         18         0        71
0      56q array has     2 entries.
0      56q array has     1 entries.
0      56q array has     1 entries.
0      56q array has     1 entries.
0      56q array has     1 entries.
0      56q array has     1 entries.
0      56q array has     1 entries.
0      57q array has     3 entries.
0       1q array has    20 entries.
0       1q array has    10 entries.
    l90  97376
    l116 60826
    l32  33663 nudata (library) storage size
    l44  33734
    l103 75953
0      58q array has     4 entries.
0      60q array has     7 entries.
0      58q array has     7 entries.
0      66q array has     1 entries.
0      73q array has  1697 entries.
0      74q array has  1697 entries.
0      75q array has  1697 entries.
    l140 66991
    used   101044 in size   200000
0jopt       12
          0         0         0         0         0         0         0         0         0         0
          0         0
0therm       4
 5.102450E-01 4.194440E-01 3.225492E+00 1.000000E-31
0non         5
       7935        20         6        18      1697
0mm         19
          7         7         0         0         1         1         0         0         0         0
         21       100      1697         4         3        74         4         1         0
0tconst      5
 8.640000E+04 4.800385E+02  .000000E+00  .000000E+00 1.000000E-08
```

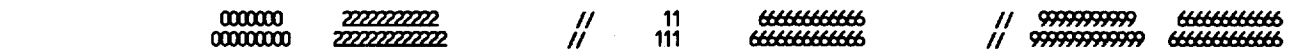
```
0nzero          4
          0         689         129         879
0pow            3
   .000000E+00 .000000E+00 .000000E+00
0 lirp          9
          6           0          51          26           2        3000        1000        1697          94
 n-gamma, fission and total mev/fission =              6.1975E+00  1.9583E+02  2.0203E+02
 start of interval flux =          1.60283E+13
 n-gamma, fission and total mev/fission =              6.2896E+00  1.9593E+02  2.0222E+02
 start of interval flux =          1.60309E+13
 n-gamma, fission and total mev/fission =              6.3902E+00  1.9602E+02  2.0241E+02
 start of interval flux =          1.60378E+13
 n-gamma, fission and total mev/fission =              6.4906E+00  1.9612E+02  2.0261E+02
 start of interval flux =          1.60502E+13
 start of interval flux =           .00000E+00
 n-gamma, fission and total mev/fission =              6.6029E+00  1.9621E+02  2.0281E+02
 start of interval flux =          1.60661E+13
 n-gamma, fission and total mev/fission =              6.6899E+00  1.9629E+02  2.0298E+02
 start of interval flux =          1.60891E+13
0 case or subcase    1  sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0       56q array has     20 entries.
0       56q array has      1 entries.
0       56q array has      1 entries.
0       56q array has     20 entries.
0       56q array has      1 entries.
0       56q array has      1 entries.
0       56q array has     20 entries.
0       56q array has     20 entries.
0requested parm=halt8,skipcellwt,skipshipdata
  pass= 5, exec halts after pass  8
```

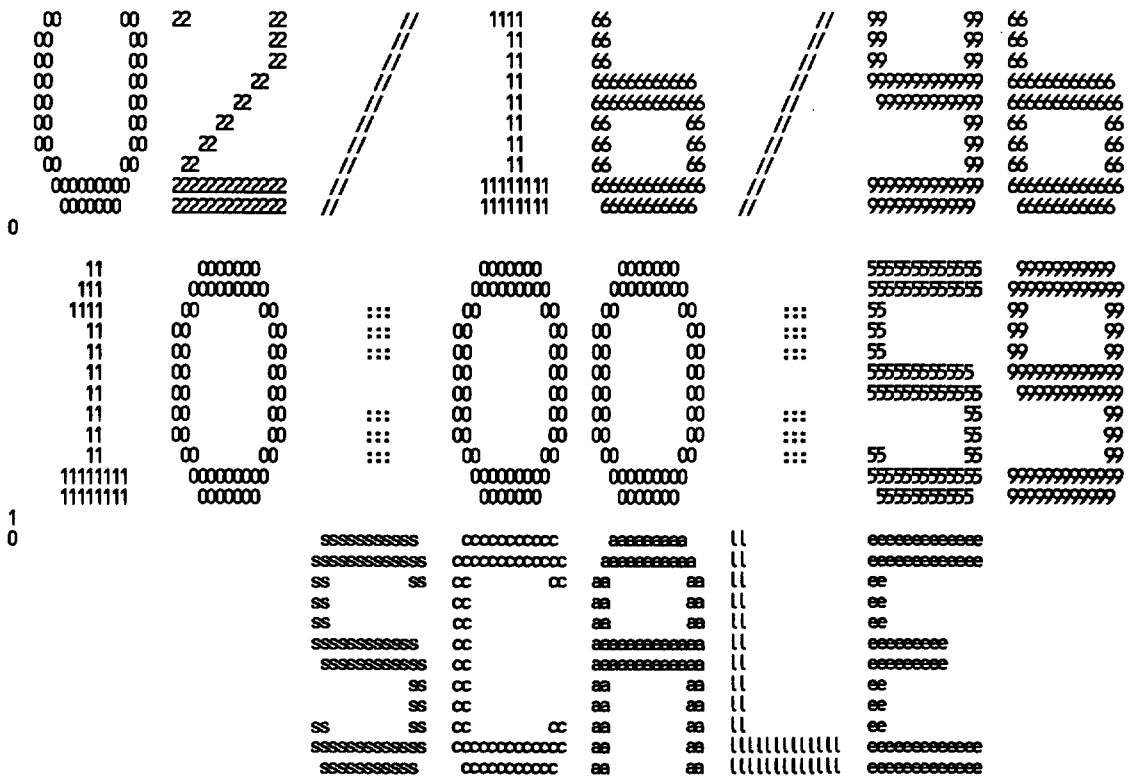


```
0
```



```
0
```





```
**********************************************************************
**********************************************************************
**********************************************************************
******                                                          ******
******                program verification information          ******
******                                                          ******
******              code system:   scale  version:  4.2         ******
******                                                          ******
**********************************************************************
**********************************************************************
******                                                          ******
******                                                          ******
******                   program:  c0c008                       ******
******                                                          ******
******              creation date:  04/27/95                    ******
******                                                          ******
******                   library:  /neutronics/scale/exe        ******
******                                                          ******
```

```
                    *****                                                        *****
                    *****   this is not a   scale  configuration controlled code *****
                    *****                                                        *****
                    *****               jobname:  davis                          *****
                    *****                                                        *****
                    *****   date of execution:  02/16/96                         *****
                    *****                                                        *****
                    *****   time of execution:  10:00:59                         *****
                    *****                                                        *****
                    *****                                                        *****
                    ******************************************************************
                    ******************************************************************
                    ******************************************************************
1
0      -1q array has      1 entries.
0       0q array has      4 entries.
0       1q array has      6 entries.
0       2q array has      2 entries.
1logical assignments
0master library   12
 working library   0
 scratch file     18
 new library       1
0p r o b l e m   d e s c r i p t i o n
0igr--geometry (0/1/2/3--inf med/slab/cyl/sphere            2
0izm--number of zones or material regions                   4
0ms--mixing table length                                   66
0ibl--shielded cross section edit option (0/1--no/yes)      0
0ibr--bondarenko factor edit option (0/1--no/yes)           0
0issopt--dancoff factor option                              0
0convergence criterion    1.00000E-03
0geometry correction factor for wigner rational approximation  1.350E+00
0       3q array has     66 entries.
0       4q array has     66 entries.
0       5q array has     66 entries.
0       6q array has      4 entries.
0       7q array has      4 entries.
0       8q array has      4 entries.
0       9q array has      4 entries.
0      10q array has     66 entries.
0      11q array has      4 entries.
0m i x i n g   t a b l e
0entry  mixture   isotope   number density   new identifier
   1       1       92235     4.44493E-04          92235
   2       1       92234     4.65638E-06          92234
   3       1       92236     4.78943E-05          92236
   4       1       92238     2.18734E-02          92238
   5       1        8016     4.55359E-02           8016
   6       3        8016     2.09710E-02              6
   7       1       36083     1.21060E-06          36083
   8       1       36085     5.82772E-07          36085
   9       1       38090     1.32013E-05          38090
  10       1       39089     1.02024E-05          39089
  11       1       42095     1.31680E-05          42095
  12       1       40093     1.03725E-05          40093
  13       1       40094     1.62229E-05          40094
  14       1       40095     2.03583E-06          40095
  15       1       41094     7.53797E-12          41094
  16       1       43099     1.58444E-05          43099
  17       1       45103     8.51543E-06          45103
```

18	1	45105	2.07139E-08	45105
19	1	44101	1.42308E-05	44101
20	1	44106	2.14911E-06	44106
21	1	46105	5.27789E-06	46105
22	1	46108	1.39536E-06	46108
23	1	47109	9.89759E-07	47109
24	1	51124	2.30439E-10	51124
25	1	54131	7.31080E-06	54131
26	1	54132	1.32259E-05	54132
27	1	54135	6.67573E-09	54135
28	1	54136	2.70686E-05	54136
29	1	55134	6.68995E-07	55134
30	1	55135	8.57012E-06	55135
31	1	55137	1.68757E-05	55137
32	1	56136	1.31478E-07	56136
33	1	57139	1.67362E-05	57139
34	1	59141	1.43133E-05	59141
35	1	59143	3.77677E-07	59143
36	1	58144	6.39792E-06	58144
37	1	60143	1.33774E-05	60143
38	1	60145	9.77101E-06	60145
39	1	61147	3.64313E-06	61147
40	1	61148	1.04656E-08	61148
41	1	60147	1.30684E-07	60147
42	1	62147	1.01929E-06	62147
43	1	62149	8.40493E-08	62149
44	1	62150	3.35633E-06	62150
45	1	62151	3.68860E-07	62151
46	1	62152	1.63140E-06	62152
47	1	64155	1.63702E-09	64155
48	1	63153	9.03257E-07	63153
49	1	63154	1.63879E-07	63154
50	1	63155	9.91552E-08	63155
51	2	40302	4.25156E-02	40302
52	3	1001	4.19420E-02	1001
53	3	5010	3.81515E-06	5010
54	3	5011	1.54884E-05	5011
55	1	55133	1.73735E-05	55133
56	1	95237	2.81758E-06	95237
57	1	94238	3.26250E-07	94238
58	1	94239	9.65273E-05	94239
59	1	94240	1.62385E-05	94240
60	1	94241	8.08937E-06	94241
61	1	94242	7.23719E-07	94242
62	1	95241	1.99179E-07	95241
63	1	95243	5.27834E-08	95243
64	1	96244	3.99487E-09	96244
65	1	999	1.00000E-20	999
66	4	999	1.00000E-20	66

Ogeometry and material description

Ozone	mixture	outer dimension	temperature	extra xs	type (0/1--fuel/mod)
1	1	4.68122E-01	9.75000E+02	9.05844E-01	0
2	4	4.78790E-01	2.93000E+02	5.49010E-01	0
3	2	5.46100E-01	6.50000E+02	.00000E+00	0
4	3	8.13968E-01	6.07600E+02	.00000E+00	0

7711 locations of 200000 available are required to make a new master containing the self-shielded values

Ono nuclides in your problem have bondarenko factor data**bonami will copy from logical 12 to logical 1

Ocopy 999 1/v cross sectio from log 12 to log 18 bondarenko trigger 0

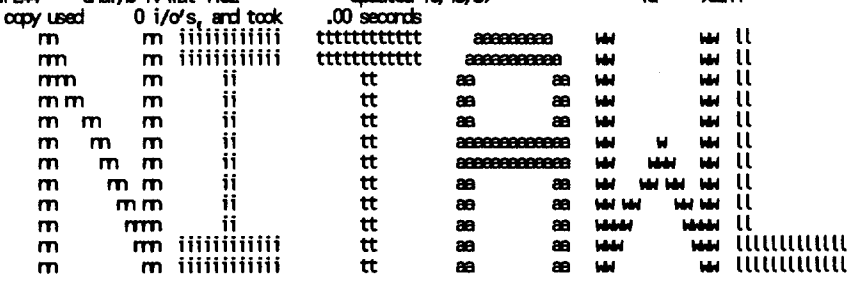
Ocopy 999 1/v cross sectio from log 18 to log 1 bondarenko trigger 0

Ocopy 999 1/v cross sectio from log 18 to log 1 bondarenko trigger 0

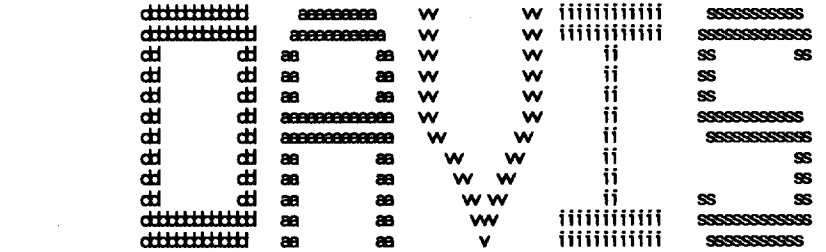
```
Ocopy    1001  hydrogen          from log 12 to log  1   bondarenko trigger 0
Ocopy    5010  b-10 1273 218ngp from log 12 to log  1   bondarenko trigger 0
Ocopy    5011  boron-11          from log 12 to log  1   bondarenko trigger 0
Ocopy    8016  oxygen-16         from log 12 to log 18   bondarenko trigger 0
Ocopy    8016  oxygen-16         from log 18 to log  1   bondarenko trigger 0
Ocopy    8016  oxygen-16         from log 18 to log  1   bondarenko trigger 0
Ocopy   36083  kr-83             from log 12 to log  1   bondarenko trigger 0
Ocopy   36085  kr-85             from log 12 to log  1   bondarenko trigger 0
Ocopy   38090  sr-90             from log 12 to log  1   bondarenko trigger 0
Ocopy   39089   y-89             from log 12 to log  1   bondarenko trigger 0
Ocopy   40093  zr-93             from log 12 to log  1   bondarenko trigger 0
Ocopy   40094  zr-94             from log 12 to log  1   bondarenko trigger 0
Ocopy   40095  zr-95             from log 12 to log  1   bondarenko trigger 0
Ocopy   40302  zircalloy         from log 12 to log  1   bondarenko trigger 0
Ocopy   41094  rb-94             from log 12 to log  1   bondarenko trigger 0
Ocopy   42095  mo-95             from log 12 to log  1   bondarenko trigger 0
Ocopy   43099  tc-99             from log 12 to log  1   bondarenko trigger 0
Ocopy   44101  ru-101            from log 12 to log  1   bondarenko trigger 0
Ocopy   44106  ru-106            from log 12 to log  1   bondarenko trigger 0
Ocopy   45103  rh-103            from log 12 to log  1   bondarenko trigger 0
Ocopy   45105  rh-105            from log 12 to log  1   bondarenko trigger 0
Ocopy   46105  pd-105            from log 12 to log  1   bondarenko trigger 0
Ocopy   46108  pd-108            from log 12 to log  1   bondarenko trigger 0
Ocopy   47109  silver-109        from log 12 to log  1   bondarenko trigger 0
Ocopy   51124  sb-124            from log 12 to log  1   bondarenko trigger 0
Ocopy   54131  xe-131            from log 12 to log  1   bondarenko trigger 0
Ocopy   54132  xe-132            from log 12 to log  1   bondarenko trigger 0
Ocopy   54135  xenon-135         from log 12 to log  1   bondarenko trigger 0
Ocopy   54136  xe-136            from log 12 to log  1   bondarenko trigger 0
Ocopy   55133  cesium-133        from log 12 to log  1   bondarenko trigger 0
Ocopy   55134  cs-134            from log 12 to log  1   bondarenko trigger 0
Ocopy   55135  cs-135            from log 12 to log  1   bondarenko trigger 0
Ocopy   55137  cs-137            from log 12 to log  1   bondarenko trigger 0
Ocopy   56136  ba-136            from log 12 to log  1   bondarenko trigger 0
Ocopy   57139  la-139            from log 12 to log  1   bondarenko trigger 0
Ocopy   58144  ce-144            from log 12 to log  1   bondarenko trigger 0
Ocopy   59141  pr-141            from log 12 to log  1   bondarenko trigger 0
Ocopy   59143  pr-143            from log 12 to log  1   bondarenko trigger 0
Ocopy   60143  nd-143            from log 12 to log  1   bondarenko trigger 0
Ocopy   60145  nd-145            from log 12 to log  1   bondarenko trigger 0
Ocopy   60147  nd-147            from log 12 to log  1   bondarenko trigger 0
Ocopy   61147  pm-147            from log 12 to log  1   bondarenko trigger 0
Ocopy   61148  pm-148            from log 12 to log  1   bondarenko trigger 0
Ocopy   62147  sm-147            from log 12 to log  1   bondarenko trigger 0
Ocopy   62149  sm-149            from log 12 to log  1   bondarenko trigger 0
Ocopy   62150  sm-150            from log 12 to log  1   bondarenko trigger 0
Ocopy   62151  sm-151            from log 12 to log  1   bondarenko trigger 0
Ocopy   62152  sm-152            from log 12 to log  1   bondarenko trigger 0
Ocopy   63153  eu-153            from log 12 to log  1   bondarenko trigger 0
Ocopy   63154  eu-154            from log 12 to log  1   bondarenko trigger 0
Ocopy   63155  eu-155            from log 12 to log  1   bondarenko trigger 0
Ocopy   64155  gd-155            from log 12 to log  1   bondarenko trigger 0
Ocopy   92234  u-234 1043 sigo=  from log 12 to log  1   bondarenko trigger 0
Ocopy   92235   uranium-235      from log 12 to log  1   bondarenko trigger 0
Ocopy   92236  u-236 1163 sigo=  from log 12 to log  1   bondarenko trigger 0
Ocopy   92238   uranium-238      from log 12 to log  1   bondarenko trigger 0
Ocopy   93237   neptunium-237    from log 12 to log  1   bondarenko trigger 0
Ocopy   94238  pu-238 1060 sigo  from log 12 to log  1   bondarenko trigger 0
Ocopy   94239   plutonium-239    from log 12 to log  1   bondarenko trigger 0
Ocopy   94240   plutonium-240    from log 12 to log  1   bondarenko trigger 0
```

```
0copy    94241  plutonium-241   from log 12 to log  1   bondarenko trigger 0
0copy    94242  plutonium-242   from log 12 to log  1   bondarenko trigger 0
0copy    95241  am-241 1056 sigp from log 12 to log  1   bondarenko trigger 0
0copy    95243  am-243 1057 218  from log 12 to log  1   bondarenko trigger 0
0copy    96244  curium-244      from log 12 to log  1   bondarenko trigger 0
1     scale 4.2 - 27 group neutron burnup library
       based on endf-b version 4 data with endf-b version 5 fission products
          compiled for nrc      1/27/89
            last updated       9/16/93
              l.m.petrie  -  ornl
        tape id                          4321        number of nuclides          66
        number of neutron groups           27        number of gamma groups       0
        first thermal group                15        logical unit                 1
                                  table of contents
      1/v cross sections normalized to 1.0 at 0.0253 ev                        id    999
      1/v cross sections normalized to 1.0 at 0.0253 ev                        id     66
       hydrogen       endf/b-iv mat 1269/thrml002   updated 10/13/89          id   1001
      b-10 1273 218grp 042375 p-3 295k                                         id   5010
       boron-11       endf/b-iv mat 1160            updated 10/13/89          id   5011
       oxygen-16      endf/b-iv mat 1276            updated 10/13/89          id   8016
       oxygen-16      endf/b-iv mat 1276            updated 10/13/89          id      6
       kr-83          mt=102,103,103,105,106,107    updated 10/13/89          id  36083
       kr-85            mt=  102                                               id  36085
       sr-90          mt=102                        updated 10/13/89          id  38090
        y-89          mt=102                        updated 10/13/89          id  39089
       zr-93            mt=  102                                               id  40093
       zr-94          mt=102                        updated 10/13/89          id  40094
       zr-95          mt=102                        updated 10/13/89          id  40095
       zircalloy      endf/b-iv mat 1284            updated 10/13/89          id  40302
       nb-94          mt=102                        updated 10/13/89          id  41094
       mo-95          mt=102                        updated 10/13/89          id  42095
       tc-99          mt=102                        updated 10/13/89          id  43099
       ru-101         mt=102                        updated 10/13/89          id  44101
       ru-106         mt=102                        updated 10/13/89          id  44106
       rh-103         mt=102                        updated 10/13/89          id  45103
       rh-105           mt=  102                                               id  45105
       pd-105         mt=102                        updated 10/13/89          id  46105
       pd-108         mt=102                        updated 10/13/89          id  46108
       silver-109     endf/b-iv mat 1139            updated 10/13/89          id  47109
       sb-124         mt=102                        updated 10/13/89          id  51124
       xe-131         mt=102,103,104,105,106        updated 10/13/89          id  54131
       xe-132         mt=102,103,104,105,106        updated 10/13/89          id  54132
       xenon-135      endf/b-iv mat 1294            updated 10/13/89          id  54135
       xe-136           mt=  102, 103, 104, 105, 107                           id  54136
       cesium-133     endf/b-iv mat 1141            updated 10/13/89          id  55133
       cs-134         mt=102                        updated 10/13/89          id  55134
       cs-135           mt=  102                                               id  55135
       cs-137         mt=102                        updated 10/13/89          id  55137
       ba-136         mt=102                        updated 10/13/89          id  56136
       la-139         mt=102                        updated 10/13/89          id  57139
       ce-144           mt=  102                                               id  58144
       pr-141         mt=102,103,104,105,106,107    updated 10/13/89          id  59141
       pr-143         mt=102                        updated 10/13/89          id  59143
       nd-143         mt=102                        updated 10/13/89          id  60143
       nd-145         mt=102                        updated 10/13/89          id  60145
       nd-147         mt=102                        updated 10/13/89          id  60147
       pm-147         mt=102                        updated 10/13/89          id  61147
       pm-148           mt=  102                                               id  61148
       sm-147         endf/b-v fission product      updated 10/13/89          id  62147
       sm-149         mt=102,103,107                updated 10/13/89          id  62149
```

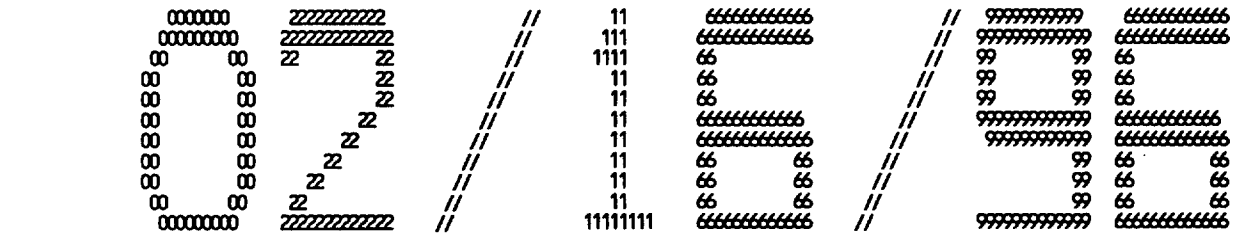
```
        sm-150        mt=102                          updated 10/13/89              id    62150
        sm-151        mt=102,103,104,105,106,107      updated 10/13/89              id    62151
        sm-152        mt=102,103,104,105,106,107      updated 10/13/89              id    62152
        eu-153        mt=102,103,104,105,106,107      updated 10/13/89              id    63153
        eu-154        mt=102,103,104,105,106,107      updated 10/13/89              id    63154
        eu-155        mt=102,103,104,105,106,107      updated 10/13/89              id    63155
        gd-155        mt=102                          updated 10/13/89              id    64155
       u-234 1043 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                         id    92234
        uranium-235   endf/b-iv mat 1261              updated 10/13/89              id    92235
       u-236 1163 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                         id    92236
        uranium-238   endf/b-iv mat 1262              updated 10/13/89              id    92238
        neptunium-237 endf/b-iv mat 1263              updated 10/13/89              id    93237
       pu-238 1050 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                        id    94238
        plutonium-239 endf/b-iv mat 1264              updated 10/13/89              id    94239
        plutonium-240 endf/b-iv mat 1265              updated 10/13/89              id    94240
        plutonium-241 endf/b-iv mat 1266              updated 10/13/89              id    94241
        plutonium-242 endf/b-iv mat 1161              updated 10/13/89              id    94242
       am-241 1056 sigo=5+4 newklacs 218ngp p-3 293k                               id    95241
       am-243 1057 218 gp wt f-1/e-m 090576 p3 293k                                id    95243
        curium-244    endf/b-iv mat 1162              updated 10/13/89              id    96244
0        tape copy used      0 i/o's, and took      .00 seconds
1
```

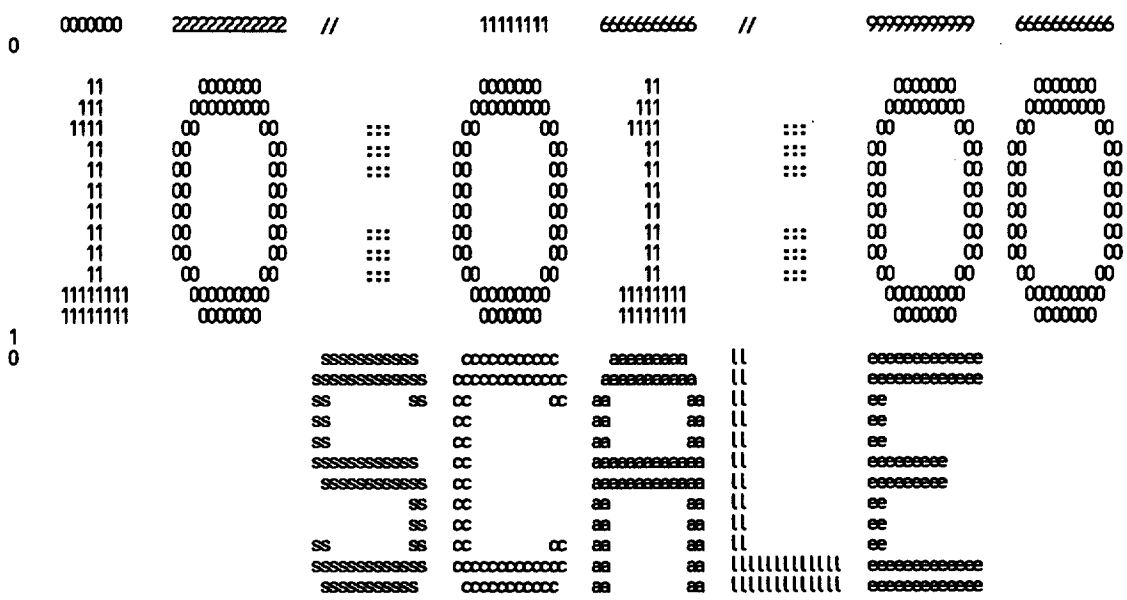


```
0
```



```
0
```






```
**********************************************************************
**********************************************************************
**********************************************************************
******                                                          ******
******              program verification information            ******
******                                                          ******
******              code system:   scale  version:   4.2        ******
******                                                          ******
**********************************************************************
**********************************************************************
******                                                          ******
******                                                          ******
******           program:  c0c002                               ******
******                                                          ******
******      creation date:  04/27/95                            ******
******                                                          ******
******           library:  /neutronics/scale/exe                ******
******                                                          ******
******                                                          ******
******  this is not a  scale  configuration controlled code     ******
******                                                          ******
******           jobname:  davis                                ******
******                                                          ******
******  date of execution:  02/16/96                            ******
******                                                          ******
******  time of execution:  10:01:00                            ******
******                                                          ******
```

```
                    *****                                                                      *****
                    *****************************************************************************
                    *****************************************************************************
                    *****************************************************************************
1
0      -1q array has      1 entries.
0       0q array has      9 entries.
0       1q array has     12 entries.
0select 65 nuclides from the master  library on logical  1
        0 nuclides from the working library on logical  2
        0 nuclides from the working library on logical  3
          to create the new working library on logical  4

       61 resonance calculations have been requested
        0 output option for ampx formatted cross section data
0the storage allocated for this case is 200000 words
0       2q array has     65 entries.
0       3q array has    915 entries.
0       4q array has     65 entries.
0 general information concerning cross section library
    tape identification number              4321
    number of nuclides on tape                66
    number of neutron energy groups           27
    first thermal neutron energy group        15
    number of gamma energy groups              0
0   direct access unit number  9 requires 117 blocks of length  1484 words
- xsdrn tape   4321
                    scale 4.2 - 27 group neutron burnup library
                      based on endf-b version 4 data with endf-b version 5 fission products
                         compiled for nrc     1/27/89
                            last updated      9/16/93
                               l.m.petrie  -   ornl
0 nuclides from xsdrn tape
     1   1/v cross sections normalized to 1.0 at 0.0253 ev                        999
     2    hydrogen     endf/b-iv mat 1269/thrm1002     updated 10/13/89          1001
     3   b-10 1273 218ngp 042375 p-3 293k                                        5010
     4    boron-11     endf/b-iv mat 1160              updated 10/13/89          5011
     5    oxygen-16    endf/b-iv mat 1276              updated 10/13/89          8016
     6    oxygen-16    endf/b-iv mat 1276              updated 10/13/89             6
     7    kr-83        mt=102,103,103,105,106,107      updated 10/13/89         36083
     8    kr-85           mt=  102                                              36085
     9    sr-90        mt=102                          updated 10/13/89         38090
    10     y-89        mt=102                          updated 10/13/89         39089
    11    zr-93           mt=  102                                              40093
    12    zr-94        mt=102                          updated 10/13/89         40094
    13    zr-95        mt=102                          updated 10/13/89         40095
    14    zircalloy    endf/b-iv mat 1284              updated 10/13/89         40302
    15    nb-94        mt=102                          updated 10/13/89         41094
    16    mo-95        mt=102                          updated 10/13/89         42095
    17    tc-99        mt=102                          updated 10/13/89         43099
    18    ru-101       mt=102                          updated 10/13/89         44101
    19    ru-106       mt=102                          updated 10/13/89         44106
    20    rh-103       mt=102                          updated 10/13/89         45103
    21    rh-105          mt=  102                                              45105
    22    pd-105       mt=102                          updated 10/13/89         46105
    23    pd-108       mt=102                          updated 10/13/89         46108
    24    silver-109   endf/b-iv mat 1139              updated 10/13/89         47109
    25    sb-124       mt=102                          updated 10/13/89         51124
    26    xe-131       mt=102,103,104,105,106          updated 10/13/89         54131
    27    xe-132       mt=102,103,104,105,106          updated 10/13/89         54132
```

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    28    xenon-135      endf/b-iv mat 1294              updated 10/13/89              54135
    29    xe-136           mt=  102, 103, 104, 105, 107                                54136
    30    cesium-133     endf/b-iv mat 1141              updated 10/13/89              55133
    31    cs-134         mt=102                          updated 10/13/89              55134
    32    cs-135           mt=  102                                                    55135
    33    cs-137         mt=102                          updated 10/13/89              55137
    34    ba-136         mt=102                          updated 10/13/89              56136
    35    la-139         mt=102                          updated 10/13/89              57139
    36    ce-144           mt=  102                                                    58144
    37    pr-141         mt=102,103,104,105,106,107      updated 10/13/89              59141
    38    pr-143         mt=102                          updated 10/13/89              59143
    39    nd-143         mt=102                          updated 10/13/89              60143
    40    nd-145         mt=102                          updated 10/13/89              60145
    41    nd-147         mt=102                          updated 10/13/89              60147
    42    pm-147         mt=102                          updated 10/13/89              61147
    43    pm-148           mt=  102                                                    61148
    44    sm-147         endf/b-v fission product        updated 10/13/89              62147
    45    sm-149         mt=102,103,107                  updated 10/13/89              62149
    46    sm-150         mt=102                          updated 10/13/89              62150
    47    sm-151         mt=102,103,104,105,106,107      updated 10/13/89              62151
    48    sm-152         mt=102,103,104,105,106,107      updated 10/13/89              62152
    49    eu-153         mt=102,103,104,105,106,107      updated 10/13/89              63153
    50    eu-154         mt=102,103,104,105,106,107      updated 10/13/89              63154
    51    eu-155         mt=102,103,104,105,106,107      updated 10/13/89              63155
    52    gd-155         mt=102                          updated 10/13/89              64155
    53   u-234 1043 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                            92234
    54    uranium-235    endf/b-iv mat 1261              updated 10/13/89              92235
    55   u-236 1163 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                            92236
    56    uranium-238    endf/b-iv mat 1262              updated 10/13/89              92238
    57    neptunium-237  endf/b-iv mat 1263              updated 10/13/89              93237
    58   pu-238 1050 sigo=5+4 newxlacs p-3 293k f-1/e-m(1.+5)                            94238
    59    plutonium-239  endf/b-iv mat 1264              updated 10/13/89              94239
    60    plutonium-240  endf/b-iv mat 1265              updated 10/13/89              94240
    61    plutonium-241  endf/b-iv mat 1266              updated 10/13/89              94241
    62    plutonium-242  endf/b-iv mat 1161              updated 10/13/89              94242
    63   am-241 1056 sigo=5+4 newxlacs 218grp p-3 293k                                  95241
    64   am-243 1057 218 gp wt f-1/e-m 090576 p3 293k                                   95243
    65    curium-244     endf/b-iv mat 1162              updated 10/13/89              96244
01/v cross sections normalized to 1.0 at 0.0253 ev                          999    temperature=  975.00
0 hydrogen       endf/b-iv mat 1269/thrmf1002   updated 10/13/89            1001    temperature=  607.60
                        thermal scattering matrix number  2 at a temperature of  550.00 was selected.
0b-10 1273 218ngp 042375 p-3 293k                                          5010    temperature=  607.60
                        thermal scattering matrix number  2 at a temperature of  550.00 was selected.
0 boron-11       endf/b-iv mat 1160             updated 10/13/89            5011    temperature=  607.60
                        thermal scattering matrix number  2 at a temperature of  550.00 was selected.
0 oxygen-16      endf/b-iv mat 1276             updated 10/13/89            8016    temperature=  975.00
0 oxygen-16      endf/b-iv mat 1276             updated 10/13/89               6    temperature=  607.60
0 kr-83          mt=102,103,103,105,106,107     updated 10/13/89           36083    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   82.202          temperature(kelvin)      =  975.000
0potential scatter sigma  =    7.004          lumped nuclear density   = 1.2106000E-06
0spin factor (g)          =  4988.190          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1   =   15.995              sigma(per absorber atom)= 1.4105377E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2   =  237.933              sigma(per absorber atom)= 1.5737203E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
```

```
0group       res abs        res fiss       res scat
  11      -1.760477E-03    .000000E+00   -2.230056E-03
  12       2.166095E-02    .000000E+00    9.896840E-03
  13      -3.971375E-01    .000000E+00   -1.204416E-01
  14       4.782771E-05    .000000E+00   -1.723045E-05
0excess resonance integrals
0                resolved
0absorption      1.44817E+02
 fission          .00000E+00
- elapsed time    .00 min.
0 kr-85           mt=  102                                        36085    temperature=  975.00
0 sr-90         mt=102                  updated 10/13/89        38090    temperature=  975.00
0  y-89         mt=102                  updated 10/13/89        39089    temperature=  975.00
0resonance data for this nuclide
0mass number (a)        =   88.142          temperature(kelvin)     =  975.000
0potential scatter sigma =   3.644          lumped nuclear density  = 1.0202441E-05
0spin factor (g)        =   78.664          lump dimension (a-bar)  = 4.6812201E-01
0inner radius           = .0000000E+00      dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =   15.995          sigma(per absorber atom)= 1.6737141E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =  237.933          sigma(per absorber atom)= 1.8673432E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
   9      -2.549601E-06    .000000E+00   -1.696828E-04
  10      -6.170661E-05    .000000E+00   -1.739975E-04
0excess resonance integrals
0                resolved
0absorption      1.46419E-01
 fission          .00000E+00
- elapsed time    .00 min.
0 zr-93           mt=  102                                        40093    temperature=  975.00
0 zr-94         mt=102                  updated 10/13/89        40094    temperature=  975.00
0resonance data for this nuclide
0mass number (a)        =   93.100          temperature(kelvin)     =  975.000
0potential scatter sigma =   3.779          lumped nuclear density  = 1.6222863E-05
0spin factor (g)        =  180.853          lump dimension (a-bar)  = 4.6812201E-01
0inner radius           = .0000000E+00      dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =   15.995          sigma(per absorber atom)= 1.0525867E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =  237.933          sigma(per absorber atom)= 1.1743585E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
   8      -9.432010E-07    .000000E+00   -8.957890E-04
   9      -3.135993E-05    .000000E+00   -2.775020E-03
0excess resonance integrals
0                resolved
0absorption      3.43817E-02
 fission          .00000E+00
- elapsed time    .00 min.
0 zr-95         mt=102                  updated 10/13/89        40095    temperature=  975.00
0 zircalloy     endf/b-iv mat 1284      updated 10/13/89        40302    temperature=  650.00
0resonance data for this nuclide
0mass number (a)        =   90.436          temperature(kelvin)     =  650.000
0potential scatter sigma =    6.385         lumped nuclear density  = 4.2515602E-02
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0spin factor (g)          =    1.079              lump dimension (a-bar)    = 5.4610002E-01
0inner radius             = 4.7878999E-01         dancoff correction (c)    = 5.0364637E-01
0the absorber will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
   8     -1.780596E-03     .000000E+00   -1.286907E+00
   9     -5.893373E-02     .000000E+00   -2.695297E+00
  10     -6.959935E-02     .000000E+00   -1.601321E+00
  11     -1.883937E-01     .000000E+00   -7.920912E-01
0excess resonance integrals
0                resolved
0absorption     2.28539E-01
 fission         .00000E+00
- elapsed time    .02 min.
0 rb-94         mt=102                  updated 10/13/89          41094     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =    93.101             temperature(kelvin)       =   975.000
0potential scatter sigma  =     3.779             lumped nuclear density    = 7.5379746E-12
0spin factor (g)          = 43808.801             lump dimension (a-bar)    = 4.6812201E-01
0inner radius             =  .0000000E+00         dancoff correction (c)    = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 2.2653258E+10
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 2.5273973E+10
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  13      1.043223E-02     .000000E+00    9.253080E-04
  14      9.836712E-03     .000000E+00   -4.064845E-04
0excess resonance integrals
0                resolved
0absorption     9.15001E+01
 fission         .00000E+00
- elapsed time    .02 min.
0 mo-95         mt=102                  updated 10/13/89          42095     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =    94.091             temperature(kelvin)       =   975.000
0potential scatter sigma  =     3.806             lumped nuclear density    = 1.3167981E-05
0spin factor (g)          =   607.724             lump dimension (a-bar)    = 4.6812201E-01
0inner radius             =  .0000000E+00         dancoff correction (c)    = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 1.2967796E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933              sigma(per absorber atom)= 1.4468017E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  10     -2.827058E-03     .000000E+00   -1.666167E-02
  11     -5.154489E-03     .000000E+00   -8.604292E-03
  12     -3.707084E+00     .000000E+00   -4.265654E+00
  13      1.583315E-04     .000000E+00   -2.254974E-05
0excess resonance integrals
0                resolved
0absorption     9.86300E+01
 fission         .00000E+00
- elapsed time    .02 min.
0 tc-99         mt=102                  updated 10/13/89          43099     temperature=   975.00
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0resonance data for this nuclide
0mass number (a)          =    98.150          temperature(kelvin)      =   975.000
0potential scatter sigma  =     6.000          lumped nuclear density   = 1.5844425E-05
0spin factor (g)          =  4527.940          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 1.0777272E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 1.2024076E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  11      -2.038773E-02     .000000E+00    -9.611921E-03
  12      -5.333800E-03     .000000E+00    -1.853597E-04
  13      -3.317793E-01     .000000E+00    -1.747611E-02
  14      -7.128074E+00     .000000E+00    -2.274936E-01
  15       1.070480E-02     .000000E+00    -5.392398E-04
  16       4.836007E-03     .000000E+00    -2.802095E-04
  17       2.073955E-04     .000000E+00    -1.191064E-05
0excess resonance integrals
0                 resolved
0absorption      3.25462E+02
 fission          .00000E+00
- elapsed time    .03 min.
0 ru-101        mt=102                    updated 10/13/89          44101     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   100.039          temperature(kelvin)      =   975.000
0potential scatter sigma  =     3.965          lumped nuclear density   = 1.4230770E-05
0spin factor (g)          =  8785.290          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 1.1999329E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 1.3387510E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  11      -3.624243E-02     .000000E+00    -3.672971E-03
  12      -1.064926E-01     .000000E+00    -2.812458E-02
  13      -3.819752E-01     .000000E+00    -1.028591E-02
  14       2.372863E-04     .000000E+00    -4.161137E-05
0excess resonance integrals
0                 resolved
0absorption      7.93820E+01
 fission          .00000E+00
- elapsed time    .03 min.
0 ru-106        mt=102                    updated 10/13/89          44106     temperature=   975.00
0 rh-103        mt=102                    updated 10/13/89          45103     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   102.021          temperature(kelvin)      =   975.000
0potential scatter sigma  =     5.408          lumped nuclear density   = 8.5154315E-06
0spin factor (g)          =      .500          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 2.0052971E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 2.2372861E+04
0moderator-2 will be treated by the nordheim integral method.
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```
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
   9      1.253997E-03      .000000E+00      1.942356E-03
  10     -3.509026E-03      .000000E+00     -4.880561E-03
  11     -1.699512E-02      .000000E+00     -1.499881E-02
  12     -2.625307E-04      .000000E+00     -2.159846E-05
  13       .000000E+00      .000000E+00       .000000E+00
  14       .000000E+00      .000000E+00       .000000E+00
  15      2.281068E-01      .000000E+00      3.284026E-03
  16      3.328770E+01      .000000E+00     -6.208614E-02
  17     -1.852185E+02      .000000E+00     -1.574388E-01
  18      8.714719E+01      .000000E+00      2.610259E-01
  19      1.148543E+01      .000000E+00     -1.472395E-03
  20      1.087088E+00      .000000E+00     -2.470565E-03
  21      2.165863E-01      .000000E+00      1.925008E-03
  22      2.583985E-01      .000000E+00      2.928524E-03
  23     -9.879865E-02      .000000E+00      1.798960E-03
0excess resonance integrals
0                resolved
0absorption      1.14672E+03
 fission          .00000E+00
- elapsed time    .07 min.
0 rh-105          mt=  102                                          45105     temperature=  975.00
0 pd-105         mt=102                    updated 10/13/89         46105     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   104.004          temperature(kelvin)      =   975.000
0potential scatter sigma  =     4.069          lumped nuclear density   = 5.2778869E-06
0spin factor (g)          = 15210.000          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995            sigma(per absorber atom)= 3.2353799E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933            sigma(per absorber atom)= 3.6096754E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  12     -5.613977E-02      .000000E+00     -1.338439E-03
  13     -1.381487E-02      .000000E+00     -6.986314E-04
  14      7.769155E-04      .000000E+00     -8.145468E-05
0excess resonance integrals
0                resolved
0absorption      6.12433E+01
 fission          .00000E+00
- elapsed time    .07 min.
0 pd-108         mt=102                    updated 10/13/89         46108     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   106.977          temperature(kelvin)      =   975.000
0potential scatter sigma  =     4.146          lumped nuclear density   = 1.3933571E-06
0spin factor (g)          = 21175.100          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995            sigma(per absorber atom)= 1.2255271E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.933            sigma(per absorber atom)= 1.3673061E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
```

```
  11      1.170302E-04     .000000E+00    3.532026E-04
  12     -1.263694E+00     .000000E+00   -9.304958E-01
  13      6.849444E-03     .000000E+00    1.844850E-03
  14      8.561260E-02     .000000E+00   -3.207809E-05
  15     -1.840706E-01     .000000E+00    8.085708E-05
  16      2.946590E-04     .000000E+00   -9.255679E-06
0excess resonance integrals
0                resolved
0absorption      2.1256OE+02
 fission          .00000E+00
- elapsed time    .07 min.
0 silver-109     endf/b-iv mat 1139          updated 10/13/89          47109     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   107.969          temperature(kelvin)      =   975.000
0potential scatter sigma  =     4.988          lumped nuclear density   = 9.8975897E-07
0spin factor (g)          =  1441.870          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1   =    15.995             sigma(per absorber atom)= 1.7252653E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2   =   257.933             sigma(per absorber atom)= 1.9248583E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs          res fiss        res scat
  10     -9.785545E-05     .000000E+00   -9.223403E-05
  11     -4.345954E-03     .000000E+00   -3.223391E-03
  12     -7.193846E-01     .000000E+00   -3.343606E-02
  13      7.670446E-01     .000000E+00    3.380743E-02
  14     -9.331539E+00     .000000E+00   -8.741142E-01
0excess resonance integrals
0                resolved
0absorption      1.39101E+03
 fission          .00000E+00
- elapsed time    .07 min.
0 sb-124         mt=102                      updated 10/13/89          51124     temperature=  975.00
0 xe-131         mt=102,103,104,105,106      updated 10/13/89          54131     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   129.781          temperature(kelvin)      =   975.000
0potential scatter sigma  =     4.301          lumped nuclear density   = 7.3108028E-06
0spin factor (g)          =   246.825          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1   =    15.995             sigma(per absorber atom)= 2.3357174E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2   =   257.933             sigma(per absorber atom)= 2.6059524E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs          res fiss        res scat
   9     -2.310630E-06     .000000E+00   -2.154477E-05
  10     -1.586759E-04     .000000E+00   -1.347479E-04
  11     -1.955774E-03     .000000E+00   -1.464922E-03
  12     -3.751650E-02     .000000E+00   -3.496011E-03
  13     -6.002438E+01     .000000E+00   -1.407475E+02
  14      1.073748E-02     .000000E+00    1.503469E-02
0excess resonance integrals
0                resolved
0absorption      7.7043BE+02
 fission          .00000E+00
```

```
- elapsed time    .08 min.
0 xe-132        mt=102,103,104,105,106        updated 10/13/89            54132    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =  130.771            temperature(kelvin)      =  975.000
0potential scatter sigma  =    4.301            lumped nuclear density   = 1.3225989E-05
0spin factor (g)          =  675.899            lump dimension (a-bar)   = 4.6812201E-01
0inner radius             = .0000000E+00        dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =   15.995              sigma(per absorber atom)= 1.2910969E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =  237.953              sigma(per absorber atom)= 1.4404615E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
   9     -2.032215E-05    .000000E+00   -9.309781E-05
  10     -6.258887E-03    .000000E+00   -7.967591E-02
  11      3.345203E-08    .000000E+00   -9.291076E-07
0excess resonance integrals
0                resolved
0absorption     9.7372SE-01
 fission         .00000E+00
- elapsed time    .08 min.
0 xenon-135     endf/b-iv mat 1294            updated 10/13/89            54135    temperature=  975.00
0 xe-136          mt=  102, 103, 104, 105, 107                          54136    temperature=  975.00
0 cesium-133    endf/b-iv mat 1141            updated 10/13/89            55133    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =  131.764            temperature(kelvin)      =  975.000
0potential scatter sigma  =    7.100            lumped nuclear density   = 1.7373461E-05
0spin factor (g)          =  374.437            lump dimension (a-bar)   = 4.6812201E-01
0inner radius             = .0000000E+00        dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =   15.995              sigma(per absorber atom)= 9.8287666E+03
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =  238.051              sigma(per absorber atom)= 1.0542641E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
   9     -4.871677E-05    .000000E+00   -3.152509E-04
  10     -2.382956E-03    .000000E+00   -4.567832E-03
  11     -8.948965E-02    .000000E+00   -1.566151E-01
  12     -1.386060E-01    .000000E+00   -1.929299E-02
  13     -2.304727E-01    .000000E+00   -1.254356E-02
  14     -1.013023E+01    .000000E+00   -4.436112E-01
  15      5.623127E-03    .000000E+00   -4.050744E-04
  16      2.777900E-03    .000000E+00   -2.215233E-04
  17      2.352204E-03    .000000E+00   -1.830751E-04
  18      2.215039E-03    .000000E+00   -1.679543E-04
  19      1.317312E-03    .000000E+00   -9.676453E-05
0excess resonance integrals
0                resolved
0absorption     3.5386SE+02
 fission         .00000E+00
- elapsed time    .10 min.
0 cs-134        mt=102                        updated 10/13/89            55134    temperature=  975.00
0 cs-135          mt=  102                                                55135    temperature=  975.00
0 cs-137        mt=102                        updated 10/13/89            55137    temperature=  975.00
0 ba-136        mt=102                        updated 10/13/89            56136    temperature=  975.00
0resonance data for this nuclide
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```
0mass number (a)          =   134.737          temperature(kelvin)      =   975.000
0potential scatter sigma  =     4.835          lumped nuclear density   = 1.3147822E-07
0spin factor (g)          =  1247.690          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 1.2987680E+06
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 1.4490201E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  10       1.195235E-06     .0000000E+00     5.099283E-07
  11       4.140539E-07     .0000000E+00     7.002787E-07
0excess resonance integrals
0                 resolved
0absorption      1.38473E+00
 fission          .0000E+00
- elapsed time    .10 min.
0 la-139        mt=102                    updated 10/13/89          57139     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   137.713          temperature(kelvin)      =   975.000
0potential scatter sigma  =     4.906          lumped nuclear density   = 1.6736218E-05
0spin factor (g)          =   145.855          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 1.0203004E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 1.1383371E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
   9      -1.465711E-07     .0000000E+00     1.238383E-03
  10      -3.355732E-04     .0000000E+00    -1.989544E-02
  11       .0000000E+00     .0000000E+00     .0000000E+00
  12      -5.739985E-02     .0000000E+00    -3.466246E-02
0excess resonance integrals
0                 resolved
0absorption      8.08078E+00
 fission          .0000E+00
- elapsed time    .12 min.
0 ce-144          mt=  102                                                 58144     temperature=   975.00
0 pr-141        mt=102,103,104,105,106,107    updated 10/13/89           59141     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   139.697          temperature(kelvin)      =   975.000
0potential scatter sigma  =     4.953          lumped nuclear density   = 1.4313312E-05
0spin factor (g)          =  1026.500          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 1.1930131E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933          sigma(per absorber atom)= 1.3310307E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  10      -5.609108E-03     .0000000E+00    -1.904915E-01
  11      -9.225772E-02     .0000000E+00    -1.226486E+00
  12      -2.091378E-03     .0000000E+00    -2.041713E-04
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0excess resonance integrals
0                resolved
0absorption      1.21355E+01
 fission          .00000E+00
- elapsed time    .12 min.
0 pr-143        mt=102                    updated 10/13/89          59143    temperature=  975.00
0 nd-143        mt=102                    updated 10/13/89          60143    temperature=  975.00
0resonance data for this nuclide
0mass number (a)         =   141.682          temperature(kelvin)      =   975.000
0potential scatter sigma =     5.000          lumped nuclear density   = 1.3377376E-05
0spin factor (g)         =  1964.860          lump dimension (a-bar)   = 4.6812201E-01
0inner radius            =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1     =    15.995          sigma(per absorber atom)= 1.2764813E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2     =   237.933          sigma(per absorber atom)= 1.4241551E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  10      -1.332625E-04    .000000E+00   -6.817683E-05
  11      -3.122534E-01    .000000E+00   -3.629994E+00
  12      -2.059421E-01    .000000E+00   -1.013043E-01
0excess resonance integrals
0                resolved
0absorption      5.09093E+01
 fission          .00000E+00
- elapsed time    .12 min.
0 nd-145        mt=102                    updated 10/13/89          60145    temperature=  975.00
0resonance data for this nuclide
0mass number (a)         =   143.668          temperature(kelvin)      =   975.000
0potential scatter sigma =     5.047          lumped nuclear density   = 9.7710117E-06
0spin factor (g)         =  1007.250          lump dimension (a-bar)   = 4.6812201E-01
0inner radius            =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1     =    15.995          sigma(per absorber atom)= 1.7476152E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2     =   237.933          sigma(per absorber atom)= 1.9497938E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  10      -3.969052E-03    .000000E+00   -6.238655E-02
  11      -6.007329E-02    .000000E+00   -1.817612E-01
  12      -1.459763E+00    .000000E+00   -9.188076E+00
  13       9.598655E-05    .000000E+00    2.042558E-04
  14      -1.322929E+00    .000000E+00   -3.478257E-02
  15       5.901529E-03    .000000E+00   -4.614201E-04
  16       1.326675E-03    .000000E+00   -1.451290E-04
  17       9.642597E-04    .000000E+00   -1.069946E-04
  18       8.539732E-04    .000000E+00   -9.314383E-05
  19       7.634159E-04    .000000E+00   -8.070004E-05
  20       2.839149E-05    .000000E+00   -2.919262E-06
0excess resonance integrals
0                resolved
0absorption      2.06675E+02
 fission          .00000E+00
- elapsed time    .13 min.
0 nd-147        mt=102                    updated 10/13/89          60147    temperature=  975.00
0 pm-147        mt=102                    updated 10/13/89          61147    temperature=  975.00
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0resonance data for this nuclide
0mass number (a)          =   145.653          temperature(kelvin)      =   975.000
0potential scatter sigma  =     5.093          lumped nuclear density   = 3.643130E-06
0spin factor (g)          = 21589.500          lump dimension (a-bar)   = 4.681220E-01
0inner radius             =  .000000E+00       dancoff correction (c)   = 3.426926E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 4.687169E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.953          sigma(per absorber atom)= 5.229419E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  12      -1.823680E-01     .000000E+00   -5.851357E-02
  13      -4.676967E-02     .000000E+00   -2.688727E-03
  14      -8.253029E+01     .000000E+00   -3.548271E+01
  15       4.128564E-02     .000000E+00    6.978664E-03
  16       1.697942E-02     .000000E+00    1.746660E-03
  17       1.369772E-02     .000000E+00    1.150461E-03
  18       1.253757E-02     .000000E+00    9.649097E-04
  19       6.998888E-04     .000000E+00    5.070170E-05
0excess resonance integrals
0                resolved
0absorption     2.01524E+03
 fission         .00000E+00
-  elapsed time    .13 min.
0 pm-148          mt=  102                                          61148    temperature=  975.00
0 sm-147       endf/b-v fission product       updated 10/13/89      62147    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   145.653          temperature(kelvin)      =   975.000
0potential scatter sigma  =     5.093          lumped nuclear density   = 1.019287E-06
0spin factor (g)          =      .000          lump dimension (a-bar)   = 4.681220E-01
0inner radius             =  .000000E+00       dancoff correction (c)   = 3.426926E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 1.675284E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.953          sigma(per absorber atom)= 1.869094E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  11       2.767026E-01     .000000E+00    1.093160E+00
  12       9.978251E-01     .000000E+00   -1.498843E+00
  13      -3.338374E+00     .000000E+00   -1.778746E+00
  14      -3.342486E-01     .000000E+00   -3.189418E-03
  15       3.115590E-01     .000000E+00   -1.911954E-03
  16       7.287758E-03     .000000E+00   -3.738602E-04
  17       4.281449E-03     .000000E+00   -2.401556E-04
  18       3.510413E-03     .000000E+00   -1.997200E-04
  19       2.910596E-03     .000000E+00   -1.649500E-04
  20       8.434589E-04     .000000E+00   -4.626394E-05
0excess resonance integrals
0                resolved
0absorption     7.22673E+02
 fission         .00000E+00
-  elapsed time    .15 min.
                        thermal scattering matrix number   3 at a temperature of    900.03 was selected.
0 sm-149        mt=102,103,107              updated 10/13/89      62149    temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   147.638          temperature(kelvin)      =   975.000
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0potential scatter sigma =    3.260          lumped nuclear density   = 8.4049255E-08
0spin factor (g)         = 10407.900         lump dimension (a-bar)   = 4.6812201E-01
0inner radius            =  .0000000E+00     dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1     =   15.995          sigma(per absorber atom)= 2.0316621E+06
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2     =  237.933          sigma(per absorber atom)= 2.2667015E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
  11      8.546605E-03    .000000E+00   3.071165E-02
  12     -5.476413E-02    .000000E+00  -1.810656E-01
  13      2.318233E-02    .000000E+00   2.840699E-03
  14      5.777774E-03    .000000E+00  -7.572224E-03
0excess resonance integrals
0                resolved
0absorption     8.04337E+02
 fission         .0000E+00
- elapsed time    .15 min.
0 sm-150       mt=102                  updated 10/13/89          62150    temperature=  975.00
0resonance data for this nuclide
0mass number (a)         =  148.629          temperature(kelvin)      =  975.000
0potential scatter sigma =    5.162          lumped nuclear density   = 3.3563288E-06
0spin factor (g)         = 4376.420          lump dimension (a-bar)   = 4.6812201E-01
0inner radius            =  .0000000E+00     dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1     =   15.995          sigma(per absorber atom)= 5.0876930E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2     =  237.933          sigma(per absorber atom)= 5.6762789E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
  10     -1.140486E-03    .000000E+00  -1.081808E-02
  11     -2.526795E-02    .000000E+00  -2.863482E-01
  12     -8.222108E-02    .000000E+00  -2.484979E-02
  13     -5.859069E+00    .000000E+00  -4.613210E+00
  14      1.065659E-04    .000000E+00  -6.400712E-05
0excess resonance integrals
0                resolved
0absorption     2.88255E+02
 fission         .0000E+00
- elapsed time    .15 min.
0 sm-151       mt=102,103,104,105,106,107  updated 10/13/89          62151    temperature=  975.00
0resonance data for this nuclide
0mass number (a)         =  149.623          temperature(kelvin)      =  975.000
0potential scatter sigma =    5.185          lumped nuclear density   = 3.6886007E-07
0spin factor (g)         = 75574.703         lump dimension (a-bar)   = 4.6812201E-01
0inner radius            =  .0000000E+00     dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1     =   15.995          sigma(per absorber atom)= 4.6295894E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2     =  237.933          sigma(per absorber atom)= 5.1649550E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
  14     -2.119385E-01    .000000E+00  -2.082594E-02
  15      1.487428E+01    .000000E+00   7.527953E-02
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  16     -2.180708E+01     .000000E+00   -6.195250E-02
  17      1.736728E+02     .000000E+00    8.278137E-01
  18     -3.205240E+02     .000000E+00   -1.785263E+00
  19      6.254583E+01     .000000E+00    3.867906E-01
  20      1.141286E+00     .000000E+00   -1.400558E-04
  21     -7.117704E-02     .000000E+00    1.244100E-02
  22      6.952549E-02     .000000E+00    3.838918E-03
  23     -1.091917E-02     .000000E+00    3.374044E-04
0excess resonance integrals
0                resolved
0absorption      2.05636E+03
 fission          .00000E+00
- elapsed time    .15 min.
0 sm-152       mt=102,103,104,105,106,107     updated 10/13/89            62152     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   150.615              temperature(kelvin)      =   975.000
0potential scatter sigma  =     5.208              lumped nuclear density   = 1.631402E-06
0spin factor (g)          =   863.594              lump dimension (a-bar)   = 4.681220E-01
0inner radius             =  .0000000E+00          dancoff correction (c)   = 3.426926E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995              sigma(per absorber atom)= 1.046704E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933              sigma(per absorber atom)= 1.167796E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs          res fiss         res scat
   9      2.402817E-06     .000000E+00    1.158716E-04
  10     -1.295784E-03     .000000E+00   -2.024398E-02
  11     -1.885441E-02     .000000E+00   -7.182702E-02
  12     -1.270521E-01     .000000E+00   -4.032254E-01
  13      4.204180E-02     .000000E+00    1.022422E-01
  14     -1.129931E+02     .000000E+00   -2.182695E+02
0excess resonance integrals
0                resolved
0absorption      2.76491E+03
 fission          .00000E+00
- elapsed time    .17 min.
0 eu-153       mt=102,103,104,105,106,107     updated 10/13/89            63153     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   151.607              temperature(kelvin)      =   975.000
0potential scatter sigma  =     9.731              lumped nuclear density   = 9.052567E-07
0spin factor (g)          = 12265.900              lump dimension (a-bar)   = 4.681220E-01
0inner radius             =  .0000000E+00          dancoff correction (c)   = 3.426926E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995              sigma(per absorber atom)= 1.890489E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.933              sigma(per absorber atom)= 2.109196E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs          res fiss         res scat
  12     -2.856052E-01     .000000E+00   -5.575946E-02
  13     -1.361445E-01     .000000E+00   -4.143751E-03
  14     -7.920873E-01     .000000E+00   -1.004343E-06
  15      1.863243E+00     .000000E+00   -3.434145E-02
  16     -3.297554E+00     .000000E+00    8.156992E-03
  17      1.505598E-01     .000000E+00   -3.437752E-03
  18      7.726870E-02     .000000E+00   -2.251252E-03
  19      5.055447E-02     .000000E+00   -1.541113E-03
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  20      -1.253804E-01     .000000E+00   -1.275023E-03
0excess resonance integrals
0                 resolved
0absorption       1.35457E+03
 fission           .00000E+00
-  elapsed time    .17 min.
0 eu-154         mt=102,103,104,105,106,107     updated 10/13/89              63154     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   152.601              temperature(kelvin)      =   975.000
0potential scatter sigma  =     9.731              lumped nuclear density   = 1.6387885E-07
0spin factor (g)          = 19135.801              lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00          dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995              sigma(per absorber atom)= 1.0419873E+06
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.953              sigma(per absorber atom)= 1.1625330E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  12      -3.904129E-01     .000000E+00   -6.094527E-02
  13      -3.135098E-01     .000000E+00   -2.495858E-02
  14       3.300923E-01     .000000E+00    1.465073E-02
  15       1.597103E-01     .000000E+00    2.097988E-02
  16       7.214694E+00     .000000E+00    9.233953E-02
  17      -1.440717E+02     .000000E+00   -1.896719E+00
  18       1.135982E+02     .000000E+00    1.858201E+00
  19      -1.014681E+02     .000000E+00    1.187304E+00
0excess resonance integrals
0                 resolved
0absorption       2.13664E+03
 fission           .00000E+00
-  elapsed time    .18 min.
0 eu-155         mt=102,103,104,105,106,107     updated 10/13/89              63155     temperature=   975.00
0 gd-155         mt=102                         updated 10/13/89              64155     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   153.592              temperature(kelvin)      =   975.000
0potential scatter sigma  =     5.277              lumped nuclear density   = 1.6370191E-09
0spin factor (g)          = 12700.100              lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00          dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995              sigma(per absorber atom)= 1.0431136E+08
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.953              sigma(per absorber atom)= 1.1637895E+08
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  12      -1.439306E+00     .000000E+00   -1.839472E-01
  13       1.541165E+00     .000000E+00    1.985090E-01
  14       2.190007E-01     .000000E+00    9.806014E-03
  15      -3.336552E-01     .000000E+00   -7.197123E-05
  16       1.477358E+00     .000000E+00   -4.148861E-03
  17       1.568658E-01     .000000E+00   -1.479142E-03
  18       9.605140E-02     .000000E+00   -1.078062E-03
  19       6.295324E-02     .000000E+00   -8.026497E-04
  20       1.670480E-02     .000000E+00    1.626478E-04
  21        .000000E+00     .000000E+00     .000000E+00
  22        .000000E+00     .000000E+00     .000000E+00
  23        .000000E+00     .000000E+00     .000000E+00
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  24       .000000E+00     .000000E+00     .000000E+00
  25      -2.127812E+03    .000000E+00    -1.622019E+00
  26      -5.205697E+03    .000000E+00     1.961483E+00
  27      -1.659984E+03    .000000E+00     7.392656E-01
0excess resonance integrals
0                  resolved
0absorption       3.97046E+04
 fission           .0000E+00
- elapsed time     .18 min.
0u-234 1043 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                    92234     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   232.029          temperature(kelvin)      =   975.000
0potential scatter sigma  =    10.021          lumped nuclear density   = 4.656384E-06
0spin factor (g)          =  6948.450          lump dimension (a-bar)   = 4.681220E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.426926E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 3.667216E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   237.935          sigma(per absorber atom)= 4.090217E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  11      -2.226899E-02    .000000E+00    -6.494590E-02
  12      -1.815901E-01    .000000E+00    -7.606152E-02
  13       7.759999E-04    .000000E+00    -6.471838E-04
  14      -1.782052E+01    .000000E+00    -2.918325E+00
0excess resonance integrals
0                  resolved
0absorption       5.82763E+02
 fission           .0000E+00
- elapsed time     .20 min.
0 uranium-235   endf/b-iv mat 1261          updated 10/13/89            92235     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   233.025          temperature(kelvin)      =   975.000
0potential scatter sigma  =    11.500          lumped nuclear density   = 4.444934E-04
0spin factor (g)          = 15171.100          lump dimension (a-bar)   = 4.681220E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.426926E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1      =    15.995          sigma(per absorber atom)= 3.841669E+02
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2      =   238.049          sigma(per absorber atom)= 4.122754E+02
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  12      -1.865952E+00    -1.162127E+00    -4.369178E-02
  13      -6.545614E+00    -3.259067E+00    -1.416060E-01
  14      -5.261562E+00    -3.231865E+00    -3.592915E-02
0excess resonance integrals
0                  resolved
0absorption       2.12116E+02
 fission           1.2629E+02
- elapsed time     .22 min.
0u-236 1163 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                    92236     temperature=  975.00
0resonance data for this nuclide
0mass number (a)          =   234.017          temperature(kelvin)      =   975.000
0potential scatter sigma  =    10.995          lumped nuclear density   = 4.789430E-05
0spin factor (g)          =  6328.490          lump dimension (a-bar)   = 4.681220E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.426926E-01
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0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 3.5653447E+03
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   237.954              sigma(per absorber atom)= 3.9771189E+03
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  11      -2.324609E-01     .000000E+00    -5.832797E-01
  12      -1.251467E+00     .000000E+00    -8.535315E-01
  13      -6.528463E-02     .000000E+00    -3.466214E-03
  14      -4.155770E+01     .000000E+00    -3.635741E+00
0excess resonance integrals
0                 resolved
0absorption      2.80006E+02
 fission          .00000E+00
- elapsed time    .22 min.
0 uranium-238   endf/b-iv mat 1262          updated 10/13/89          92238     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   236.006          temperature(kelvin)      =   975.000
0potential scatter sigma  =    10.599          lumped nuclear density   = 2.1873431E-02
0spin factor (g)          =   656.527          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 7.8067169E+00
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   235.041              sigma(per absorber atom)= 3.3613515E-01
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
   9      -3.935817E-02     .000000E+00    -4.043145E-01
  10      -1.025260E+00    -1.747810E-05    -6.478466E+00
  11      -9.706285E+00     .000000E+00    -2.689441E+01
  12      -4.304482E+01     .000000E+00    -4.998457E+01
  13      -5.401085E+01     .000000E+00    -1.769053E+01
  14      -1.044943E+02     .000000E+00    -6.059432E+00
0excess resonance integrals
0                 resolved
0absorption      1.80270E+01
 fission          5.04017E-04
- elapsed time    .23 min.
0 neptunium-237  endf/b-iv mat 1263          updated 10/13/89          93237     temperature=   975.00
0resonance data for this nuclide
0mass number (a)          =   235.012          temperature(kelvin)      =   975.000
0potential scatter sigma  =    10.500          lumped nuclear density   = 2.8175818E-06
0spin factor (g)          = 10100.800          lump dimension (a-bar)   = 4.6812201E-01
0inner radius             =  .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 6.0605043E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   238.051              sigma(per absorber atom)= 6.5006855E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  11      -6.355906E-02    -2.086214E-06    -7.414002E-03
  12       2.491776E-02    -1.071069E-04     7.235728E-03
  13      -2.751440E-02     8.779010E-05    -1.433365E-03
  14      -7.346514E-02    -9.089304E-06    -1.443095E-03
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0excess resonance integrals
0                resolved
0absorption     2.95033E+02
 fission        1.38657E-01
- elapsed time    .27 min.
0pu-238 1050 sigo=5+4 newklacs p-3 295k f-1/e-m(1.+5)                    9423B     temperature=  975.00
0resonance data for this nuclide
0mass number (a)         =  236.167          temperature(kelvin)      =  975.000
0potential scatter sigma =   10.890          lumped nuclear density   = 3.2625022E-07
0spin factor (g)         = 13130.600         lump dimension (a-bar)   = 4.6812201E-01
0inner radius            = .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1     =   15.995          sigma(per absorber atom)= 5.2340097E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2     =  238.051          sigma(per absorber atom)= 5.6141619E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
  11     -1.838366E-03  -2.820870E-04  -1.799045E-03
  12     -1.235117E-03  -1.398544E-04  -6.016181E-04
  13      4.025275E-01   7.519357E-02  -1.026164E-02
  14     -3.825064E-01  -6.992719E-02   8.539043E-03
0excess resonance integrals
0                resolved
0absorption     8.25335E+01
 fission        9.08421E+00
- elapsed time    .27 min.
0 plutonium-239  endf/b-iv mat 1264          updated 10/13/89          9423B     temperature=  975.00
0resonance data for this nuclide
0mass number (a)         =  236.999          temperature(kelvin)      =  975.000
0potential scatter sigma =   10.200          lumped nuclear density   = 9.6527292E-05
0spin factor (g)         = 6435.710          lump dimension (a-bar)   = 4.6812201E-01
0inner radius            = .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1     =   15.995          sigma(per absorber atom)= 1.7690300E+03
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2     =  238.051          sigma(per absorber atom)= 1.8975167E+03
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs        res fiss       res scat
  11     -2.017084E-01  -8.120036E-02  -6.177880E-02
  12     -1.791471E+00  -6.724600E-01  -2.357042E-01
  13     -5.869735E+00  -3.453876E+00  -8.969605E-02
  14     -1.871555E+00  -9.958552E-01  -1.665454E-02
0excess resonance integrals
0                resolved
0absorption     3.08014E+02
 fission        1.73024E+02
- elapsed time    .28 min.
0 plutonium-240  endf/b-iv mat 1265          updated 10/13/89          9424O     temperature=  975.00
0resonance data for this nuclide
0mass number (a)         =  237.992          temperature(kelvin)      =  975.000
0potential scatter sigma =   10.599          lumped nuclear density   = 1.6239499E-05
0spin factor (g)         =  669.244          lump dimension (a-bar)   = 4.6812201E-01
0inner radius            = .0000000E+00      dancoff correction (c)   = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1     =   15.995          sigma(per absorber atom)= 1.0515730E+04
0moderator-1 will be treated by the nordheim integral method.
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0mass of moderator-2    =   238.051              sigma(per absorber atom)= 1.127950E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
  9      -4.579711E-05   -1.264809E-06   -1.838715E-04
 10      -3.865992E-03   -2.392602E-04   -1.766385E-02
 11      -1.257893E-01   -7.158898E-04   -1.646513E-01
 12      -1.718537E+00   -9.383978E-03   -1.649603E+00
 13      -2.116805E-01   -1.297953E-03   -1.542849E-02
 14       .000000E+00     .000000E+00     .000000E+00
 15       1.738746E-02    3.318474E-06    3.429983E-03
 16       2.951208E+00    5.632511E-04    3.697441E-01
 17       4.608201E+02    8.785412E-02    4.117713E+01
 18      -7.401299E+03   -1.412571E+00   -5.844975E+02
 19       6.729597E+02    1.284373E-01    5.275318E+01
 20      -9.357052E+01   -1.785835E-02    1.798074E+00
0excess resonance integrals
0                resolved
0absorption     4.9604E+03
 fission        1.9598E+00
- elapsed time    .30 min.
0 plutonium-241  endf/b-iv mat 1266          updated 10/13/89          94241     temperature=   975.00
0resonance data for this nuclide
0mass number (a)        =   238.978          temperature(kelvin)     =   975.000
0potential scatter sigma =    10.939         lumped nuclear density  = 8.0893651E-06
0spin factor (g)        = 16402.100          lump dimension (a-bar)  = 4.6812201E-01
0inner radius           =  .0000000E+00      dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995          sigma(per absorber atom)= 2.1109156E+04
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   238.051          sigma(per absorber atom)= 2.2642338E+04
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
 12       1.322123E-03    8.439866E-04    6.005169E-04
 13      -5.462229E-01   -4.209879E-01   -1.635962E-02
 14      -5.012358E-01   -3.475752E-01   -8.718508E-04
 15       1.790424E-02    1.604663E-02   -4.657629E-04
0excess resonance integrals
0                resolved
0absorption     5.0805E+02
 fission        4.2598E+02
- elapsed time    .32 min.
0 plutonium-242  endf/b-iv mat 1161          updated 10/13/89          94242     temperature=   975.00
0resonance data for this nuclide
0mass number (a)        =   240.145          temperature(kelvin)     =   975.000
0potential scatter sigma =    10.694         lumped nuclear density  = 7.2571876E-07
0spin factor (g)        = 6606.710           lump dimension (a-bar)  = 4.6812201E-01
0inner radius           =  .0000000E+00      dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995          sigma(per absorber atom)= 2.3594758E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   238.051          sigma(per absorber atom)= 2.5308472E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group       res abs         res fiss        res scat
 11      -1.854130E-03    .000000E+00   -5.150098E-03
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  12     -4.052668E-02     .000000E+00   -7.886203E-02
  13     -1.853779E-05     .000000E+00    3.537324E-06
  14      8.138350E-02     .000000E+00    1.523547E-02
  15     -1.424625E+01     .000000E+00   -1.174394E+00
  16      4.031559E-02     .000000E+00   -3.454563E-03
  17      1.550382E-02     .000000E+00   -1.848172E-03
  18      1.112574E-02     .000000E+00   -1.430661E-03
0excess resonance integrals
0                 resolved
0absorption      1.10276E+03
 fission          .00000E+00
- elapsed time    .32 min.
0am-241 1056 sigp=5+4 newklacs 218ngp p-3 295k                          95241     temperature=  975.00
0resonance data for this nuclide
0mass number (a)         =   238.950          temperature(kelvin)     =   975.000
0potential scatter sigma =     9.511          lumped nuclear density  = 1.9917980E-07
0spin factor (g)         = 82058.203          lump dimension (a-bar)  = 4.6812201E-01
0inner radius            = .0000000E+00       dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1     =    15.995          sigma(per absorber atom)= 8.5731644E+05
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2     =   238.051          sigma(per absorber atom)= 9.1958431E+05
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  13      4.891248E-01     1.210977E-02     4.768714E-03
  14     -4.461041E-01    -1.120480E-02    -4.801333E-03
0excess resonance integrals
0                 resolved
0absorption      1.93451E+02
 fission         1.07595E+00
- elapsed time    .32 min.
0am-243 1057 218 gp wt f-1/e-m 090376 p3 295k                           95243     temperature=  975.00
0resonance data for this nuclide
0mass number (a)         =   240.940          temperature(kelvin)     =   975.000
0potential scatter sigma =     9.511          lumped nuclear density  = 5.2783381E-08
0spin factor (g)         = 82052.602          lump dimension (a-bar)  = 4.6812201E-01
0inner radius            = .0000000E+00       dancoff correction (c)  = 3.4269261E-01
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1     =    15.995          sigma(per absorber atom)= 3.2351033E+06
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2     =   238.051          sigma(per absorber atom)= 3.4700725E+06
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group        res abs          res fiss         res scat
  13     -7.188834E-03     .000000E+00    4.218795E-04
  14      1.949712E-02     .000000E+00    1.945697E-04
0excess resonance integrals
0                 resolved
0absorption      1.60148E+02
 fission          .00000E+00
- elapsed time    .32 min.
0 curium-244     endf/b-iv mat 1162          updated 10/13/89           96244     temperature=  975.00
0resonance data for this nuclide
0mass number (a)         =   242.133          temperature(kelvin)     =   975.000
0potential scatter sigma =    10.320          lumped nuclear density  = 3.9948742E-09
0spin factor (g)         =  5251.150          lump dimension (a-bar)  = 4.6812201E-01
0inner radius            = .0000000E+00       dancoff correction (c)  = 3.4269261E-01
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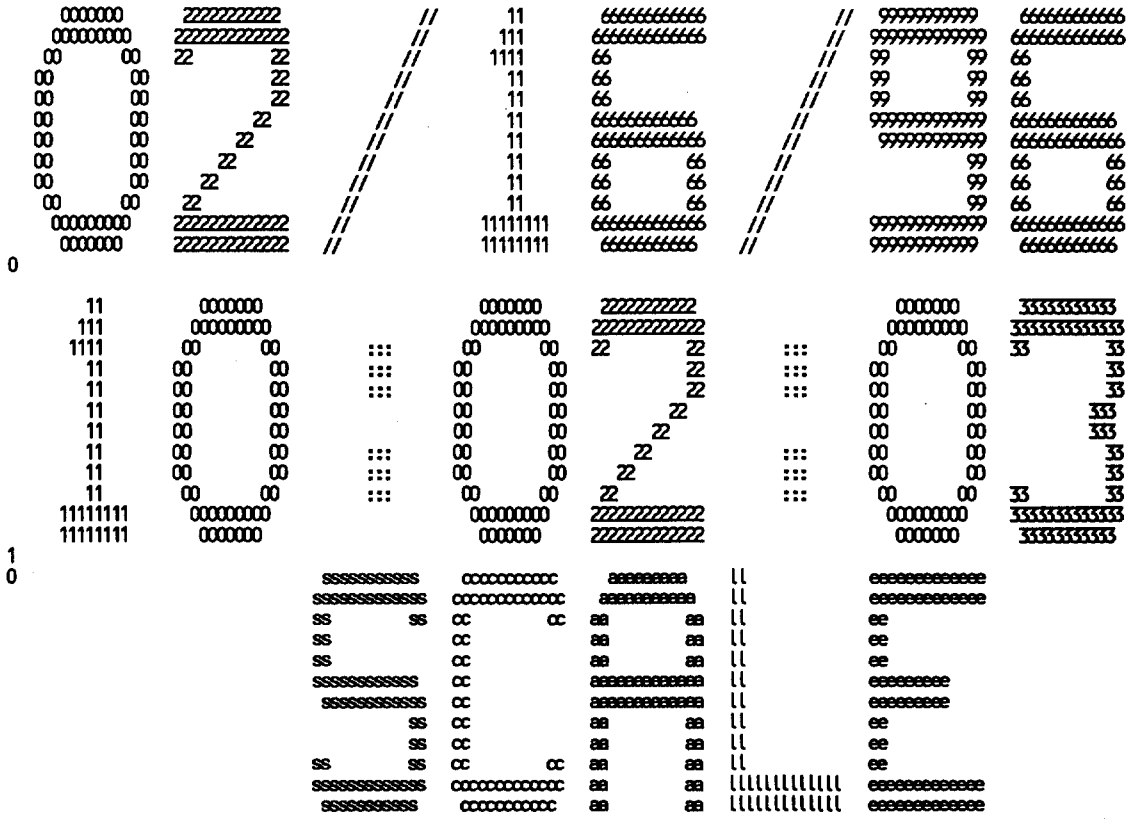
0the absorber will be treated by the nordheim integral method.
0mass of moderator-1    =    15.995              sigma(per absorber atom)= 4.274469E+07
0moderator-1 will be treated by the nordheim integral method.
0mass of moderator-2    =   238.051              sigma(per absorber atom)= 4.584929E+07
0moderator-2 will be treated by the nordheim integral method.
0this resonance material will be treated as a 2-dimensional object.
0volume fraction of lump in cell used to account for spatial self-shielding=1.00000
0group      res abs       res fiss       res scat
  11     2.461100E-04   6.736606E-06   2.889803E-04
  12     6.544668E-04   3.101118E-05   1.239800E-04
  13     2.654965E-03   1.309495E-04   7.104585E-04
  14     6.526409E-02   3.904689E-03   1.058714E-02
0excess resonance integrals
0               resolved
0absorption    6.13880E+02
 fission       3.54207E+01
-  elapsed time    .33 min.
-  elapsed time    .33 min.
1      this xsdrn working tape was created 02/16/96 at 10:01:00
       the title of the parent case is as follows
       scale 4.2 - 27 group neutron burnup library
          based on endf-b version 4 data with endf-b version 5 fission products
             compiled for nrc     1/27/89
           tape id                              4321          number of nuclides                   65
           number of neutron groups               27          number of gamma groups                0
           first thermal group                    15          logical unit                          4
                                         table of contents
         1/v cross sections normalized to 1.0 at 0.0253 ev                                   id       999
          hydrogen      endf/b-iv mat 1269/thrm1002     updated 10/13/89                     id      1001
         b-10 1273 218ngp 042375 p-3 293k                                                    id      5010
          boron-11      endf/b-iv mat 1160              updated 10/13/89                     id      5011
          oxygen-16     endf/b-iv mat 1276              updated 10/13/89                     id      8016
          oxygen-16     endf/b-iv mat 1276              updated 10/13/89                     id         6
          kr-83         mt=102,103,103,105,106,107      updated 10/13/89                     id     36083
          kr-85            mt=  102                                                          id     36085
          sr-90         mt=102                          updated 10/13/89                     id     38090
           y-89         mt=102                          updated 10/13/89                     id     39089
          zr-93            mt=  102                                                          id     40093
          zr-94         mt=102                          updated 10/13/89                     id     40094
          zr-95         mt=102                          updated 10/13/89                     id     40095
          zircalloy     endf/b-iv mat 1284              updated 10/13/89                     id     40302
          nb-94         mt=102                          updated 10/13/89                     id     41094
          mo-95         mt=102                          updated 10/13/89                     id     42095
          tc-99         mt=102                          updated 10/13/89                     id     43099
          ru-101        mt=102                          updated 10/13/89                     id     44101
          ru-106        mt=102                          updated 10/13/89                     id     44106
          rh-103        mt=102                          updated 10/13/89                     id     45103
          rh-105           mt=  102                                                          id     45105
          pd-105        mt=102                          updated 10/13/89                     id     46105
          pd-108        mt=102                          updated 10/13/89                     id     46108
          silver-109    endf/b-iv mat 1139              updated 10/13/89                     id     47109
          sb-124        mt=102                          updated 10/13/89                     id     51124
          xe-131        mt=102,103,104,105,106          updated 10/13/89                     id     54131
          xe-132        mt=102,103,104,105,106          updated 10/13/89                     id     54132
          xenon-135     endf/b-iv mat 1294              updated 10/13/89                     id     54135
          xe-136           mt=  102, 103, 104, 105, 107                                      id     54136
          cesium-133    endf/b-iv mat 1141              updated 10/13/89                     id     55133
          cs-134        mt=102                          updated 10/13/89                     id     55134
          cs-135           mt=  102                                                          id     55135
          cs-137        mt=102                          updated 10/13/89                     id     55137
```

```
        be-136          mt=102                          updated 10/13/89                id    56136
        la-139          mt=102                          updated 10/13/89                id    57139
        ce-144            mt=  102                                                      id    58144
        pr-141          mt=102,103,104,105,106,107      updated 10/13/89                id    59141
        pr-143          mt=102                          updated 10/13/89                id    59143
        nd-143          mt=102                          updated 10/13/89                id    60143
        nd-145          mt=102                          updated 10/13/89                id    60145
        nd-147          mt=102                          updated 10/13/89                id    60147
        pm-147          mt=102                          updated 10/13/89                id    61147
        pm-148            mt=  102                                                      id    61148
        sm-147          endf/b-v fission product        updated 10/13/89                id    62147
        sm-149          mt=102,103,107                  updated 10/13/89                id    62149
        sm-150          mt=102                          updated 10/13/89                id    62150
        sm-151          mt=102,103,104,105,106,107      updated 10/13/89                id    62151
        sm-152          mt=102,103,104,105,106,107      updated 10/13/89                id    62152
        eu-153          mt=102,103,104,105,106,107      updated 10/13/89                id    63153
        eu-154          mt=102,103,104,105,106,107      updated 10/13/89                id    63154
        eu-155          mt=102,103,104,105,106,107      updated 10/13/89                id    63155
        gd-155          mt=102                          updated 10/13/89                id    64155
       u-234 1043 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                              id    92234
        uranium-235     endf/b-iv mat 1261              updated 10/13/89                id    92235
       u-236 1163 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                              id    92236
        uranium-238     endf/b-iv mat 1262              updated 10/13/89                id    92238
        neptunium-237   endf/b-iv mat 1263              updated 10/13/89                id    93237
       pu-238 1050 sigo=5+4 newklacs p-3 293k f-1/e-m(1.+5)                             id    94238
        plutonium-239   endf/b-iv mat 1264              updated 10/13/89                id    94239
        plutonium-240   endf/b-iv mat 1265              updated 10/13/89                id    94240
        plutonium-241   endf/b-iv mat 1266              updated 10/13/89                id    94241
        plutonium-242   endf/b-iv mat 1161              updated 10/13/89                id    94242
       am-241 1056 sigo=5+4 newklacs 218ngp p-3 293k                                    id    95241
       am-243 1057 218 gp wt f-1/e-m 090376 p3 293k                                     id    95243
        curium-244      endf/b-iv mat 1162              updated 10/13/89                id    96244
0        tape copy used      0 i/o's, and took     .00 seconds
1  xx         xx   sssssssssss   ddddddddddd   rrrrrrrrrrr   mm         mm  ppppppppppp   mm         mm
   xx         xx   sssssssssssss  ddddddddddd   rrrrrrrrrrrr  mm         mm  ppppppppppp   mmm       mmm
    xx       xx    ss          ss  dd        dd  rr        rr  mmm       mm  pp         pp  mmmm     mmmm
     xx     xx     ss              dd        dd  rr        rr  mm mm     mm  pp         pp  mm mm   mm mm
      xx   xx      ss              dd        dd  rr        rr  mm  mm    mm  pp         pp  mm  mm mm  mm
       xx xx       sssssssssss     dd        dd  rrrrrrrrrrrr  mm   mm   mm  ppppppppppp   mm   mmm   mm
        xxx         sssssssssss    dd        dd  rrrrrrrrrrr   mm    mm  mm  ppppppppppp   mm    m    mm
       xx xx                ss     dd        dd  rr       rr   mm     mm mm  pp             mm         mm
      xx   xx               ss     dd        dd  rr        rr  mm      mmm  pp             mm         mm
     xx     xx    ss         ss     dd        dd  rr         rr mm       m   pp             mm         mm
   xx         xx  sssssssssssss     ddddddddddd   rr         rr mm           pp             mm         mm
  xx           xx  sssssssssss      ddddddddddd   rr         rr mm           pp             mm         mm
0

   ddddddddddd     aaaaaaaa    w          w  iiiiiiiiiii    sssssssssss
   ddddddddddd    aaaaaaaaaa   w          w  iiiiiiiiiii   sssssssssssss
   dd         dd  aa        aa  w          w      ii        ss         ss
   dd         dd  aa        aa  w          w      ii        ss
   dd         dd  aa        aa  w          w      ii        ss
   dd         dd  aaaaaaaaaaaa  w          w      ii        sssssssssss
   dd         dd  aaaaaaaaaaaa   w        w       ii         sssssssssss
   dd         dd  aa        aa    w      w       ii                 ss
   dd         dd  aa        aa     w    w        ii                 ss
   dd         dd  aa        aa      w  w         ii        ss       ss
   ddddddddddd    aa        aa       ww      iiiiiiiiiii   sssssssssss
   ddddddddddd    aa        aa        v      iiiiiiiiiii    sssssssssss
0
```



program verification information

code system: scale version: 4.2

program: c0c001

creation date: 04/27/95

```
                  *****                                                                       *****
                  *****              library:  /neutronics/scale/exe                          *****
                  *****                                                                       *****
                  *****                                                                       *****
                  *****     this is not a   scale  configuration controlled code              *****
                  *****                                                                       *****
                  *****              jobname:  davis                                          *****
                  *****                                                                       *****
                  *****     date of execution:  02/16/96                                      *****
                  *****                                                                       *****
                  *****     time of execution:  10:02:03                                      *****
                  *****                                                                       *****
                  *****                                                                       *****
                  ***********************************************************************************
                  ***********************************************************************************
                  ***********************************************************************************
1
                  720 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0      -1q array has     1 entries.
0       1q array has    15 entries.
0       2q array has    10 entries.
0       3q array has    12 entries.
0       4q array has     9 entries.
0       5q array has    12 entries.
0direct access unit  9 requires    12 blocks of length  704 for cross section mixing.
1                 720 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0general problem description data block
0                                general problem data

 ige  1/2/3 = plane/cylinder/sphere       2       isn  quadrature order                   8
 izm  number of zones                     4       isct order of scattering                3
 im   number of spacial intervals        24       ievt 0/1/2/3/4/5/6=q/k/alpha/c/z/r/h    1
 ibl  0/1/2/3 = vacuum/refl/per/white     1       iim  inner iteration maximum           20
 ibr  right boundary condition            3       icm  outer iteration maximum           25
 mxx  number of mixtures                  3       iclc -1/0/n--flat res/sn/opt            0
 ms   mixing table length                65       ith  0/1 = forward/adjoint              0
 igm  number of energy groups            27       iflu not used(always wgtd)              0
 mg   number of neutron groups           27       iprt -2/-1/0/n=mixture xsec print      -2
 ngg  number of gamma groups              0       id1  0/1/2/3=no/prt nd/pdh n/both      53
 iftg number of first thermal group      15       ipbt -1/0/1=none/fine/all bal. prt      0
0                                 special options

 ifg  0/1 = none/weighting calculation    1       ipn  0/1/2 diff. coef. param            0
 iqm  volumetric sources (0/n=no/yes)     0       idfm 0/1 = none/density factors 38*     1
 ipm  boundary sources (0/n=no/yes)       0       iaz  0/n = none/n activities by zone    0
 ifn  0/1/2 = input 33*/34*/use last     53       iai  0/1=none/activities by interval    0
 itmx maximum time (minutes)             10       ifct 0/1=no/yes upscatter scaling       0
 idt1 0/1/2/3=no/xsect/srce/flux--out     0       ipvt 0/1/2=no/k/alpha parametric srch   0
 isx  broad group fluxes                  0       isen outer iteration acceleration       0
 ibln activity data unit                  0       rbnd band rebaln parameter              0
 jbkl 0/1/2 buckling geometry             0
0                                  weighting data (ifg=1)

 icon -1/0/1=cell/zone/region weight     -1       ihtf total xsect psn in brd gp tables   3
 igmf number of broad groups             27       ndsf psn g-g or file number             4
 itp  0/10/20/30/40 0/c/e/ac/a            0       nusf table length or max order          4
 ipp  -2/-1/0/n=wgted xsect print        -2       mscm extra 1-d x-sect positions         0
 iap  -1/n anisn xsect print             -1
0                                 floating point parameters
```

eps	overall convergence	1.00000E-04	dy	cyl/pla ht for buckling	.00000E+00
ptc	point convergence	1.00000E-04	dz	plane depth for buckling	.00000E+00
xnf	normalization factor	1.00000E+00	vsc	void streaming correction	.00000E+00
ev	eigenvalue guess	.00000E+00	pv	ipvt=1/2--k/alpha	1.00000E+00
evm	eigenvalue modifier	.00000E+00	eql	ev change eps for search	1.00000E-03
bf	buckling factor=1.420892	1.42089E+00	xnpm	new param mod for search	7.50000E-01

this case will require 2535 locations for mixing
this case has been allocated 200000 locations

1 720 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp
0 13q array has 65 entries.
0 14q array has 65 entries.
0 15q array has 65 entries.
0 data block 2 (mixing table, etc.)

0	nuclides on tape	cccc identification	mixing table mixture	component	atom density	extra xsect id's
1	999		1	92235	4.44493E-04	
2	1001		1	92234	4.65638E-06	
3	5010		1	92236	4.78943E-05	
4	5011		1	92238	2.18734E-02	
5	8016		1	8016	4.55359E-02	
6	6		3	6	2.09710E-02	
7	36083		1	36083	1.21060E-06	
8	36085		1	36085	5.82772E-07	
9	38090		1	38090	1.32013E-05	
10	39089		1	39089	1.02024E-05	
11	40095		1	42095	1.31680E-05	
12	40094		1	40093	1.03725E-05	
13	40095		1	40094	1.62229E-05	
14	40802		1	40095	2.03583E-06	
15	41094		1	41094	7.53797E-12	
16	42095		1	43099	1.58444E-05	
17	43099		1	45103	8.51543E-06	
18	44101		1	45105	2.07139E-08	
19	44106		1	44101	1.42308E-05	
20	45103		1	44106	2.14911E-06	
21	45105		1	46105	5.27789E-06	
22	46105		1	46108	1.39536E-06	
23	46108		1	47109	9.89759E-07	
24	47109		1	51124	2.30439E-10	
25	51124		1	54131	7.31080E-06	
26	54131		1	54132	1.32259E-05	
27	54132		1	54135	6.67573E-09	
28	54135		1	54136	2.70586E-05	
29	54136		1	55134	6.68995E-07	
30	55133		1	55135	8.57012E-06	
31	55134		1	55137	1.68757E-05	
32	55135		1	56136	1.31478E-07	
33	55137		1	57139	1.67362E-05	
34	56136		1	59141	1.43133E-05	
35	57139		1	59143	3.77677E-07	
36	58144		1	58144	6.39792E-06	
37	59141		1	60143	1.33774E-05	
38	59143		1	60145	9.77101E-06	
39	60143		1	61147	3.64313E-06	
40	60145		1	61148	1.04656E-08	
41	60147		1	60147	1.30684E-07	
42	61147		1	62147	1.01929E-06	
43	61148		1	62149	8.40495E-08	
44	62147		1	62150	3.35633E-06	
45	62149		1	62151	3.68860E-07	

46	62150	1	62152	1.63140E-06
47	62151	1	64155	1.63702E-09
48	62152	1	63153	9.03257E-07
49	63153	1	63154	1.63879E-07
50	63154	1	63155	9.91552E-08
51	63155	2	40302	4.25156E-02
52	64155	3	1001	4.19420E-02
53	92234	3	5010	3.81515E-06
54	92235	3	5011	1.54884E-05
55	92236	1	55133	1.73735E-05
56	92238	1	95237	2.81758E-06
57	95237	1	94238	3.26250E-07
58	94238	1	94239	9.65273E-05
59	94239	1	94240	1.62385E-05
60	94240	1	94241	8.08937E-06
61	94241	1	94242	7.23719E-07
62	94242	1	95241	1.99179E-07
63	95241	1	95243	5.27834E-08
64	95243	1	96244	3.99487E-09
65	96244	1	999	1.00000E-20

elapsed time .00 min.
0 21649 locations will be used
0 35q array has 25 entries.
0 36q array has 24 entries.
0 38q array has 24 entries.
0 39q array has 4 entries.
0 40q array has 4 entries.
0 47q array has 27 entries.
0 51q array has 27 entries.
1 720 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp

neutron group parameters

0 gp	energy boundaries	lethargy boundaries	weighted velocities	broad gp numbers	calc type	group band	right albedo	left albedo
1	2.00000E+07	-6.93147E-01	4.60581E+09	1	0	1	1.00000E+00	
2	6.43400E+06	4.40989E-01	2.88737E+09	2	0	2	1.00000E+00	
3	3.00000E+06	1.20397E+00	2.12201E+09	3	0	3	1.00000E+00	
4	1.85000E+06	1.68740E+00	1.75673E+09	4	0	4	1.00000E+00	
5	1.40000E+06	1.96611E+00	1.46535E+09	5	0	5	1.00000E+00	
6	9.00000E+05	2.40795E+00	1.06620E+09	6	0	6	1.00000E+00	
7	4.00000E+05	3.21888E+00	6.07557E+08	7	0	7	1.00000E+00	
8	1.00000E+05	4.60517E+00	2.72415E+08	8	0	8	1.00000E+00	
9	1.70000E+04	6.37713E+00	1.13526E+08	9	0	9	1.00000E+00	
10	3.00000E+03	8.11173E+00	4.82126E+07	10	0	10	1.00000E+00	
11	5.50000E+02	9.80818E+00	2.05946E+07	11	0	11	1.00000E+00	
12	1.00000E+02	1.15129E+01	1.01036E+07	12	0	12	1.00000E+00	
13	3.00000E+01	1.27169E+01	5.69595E+06	13	0	13	1.00000E+00	
14	1.00000E+01	1.38155E+01	3.20957E+06	14	0	14	1.00000E+00	
15	3.04999E+00	1.50030E+01	2.10601E+06	15	0	15	1.00000E+00	
16	1.77000E+00	1.55471E+01	1.70522E+06	16	0	16	1.00000E+00	
17	1.29999E+00	1.58657E+01	1.52545E+06	17	0	17	1.00000E+00	
18	1.12999E+00	1.59959E+01	1.42867E+06	18	0	18	1.00000E+00	
19	1.00000E+00	1.61181E+01	1.31002E+06	19	0	19	1.00000E+00	
20	8.00000E-01	1.63412E+01	9.05898E+05	20	0	20	1.00000E+00	
21	4.00000E-01	1.70844E+01	8.17974E+05	21	0	21	1.00000E+00	
22	3.25000E-01	1.72420E+01	6.90070E+05	22	0	22	1.00000E+00	
23	2.25000E-01	1.76098E+01	4.86953E+05	23	0	23	1.00000E+00	
24	9.99999E-02	1.84207E+01	3.57766E+05	24	0	24	1.00000E+00	
25	5.00000E-02	1.91138E+01	2.71895E+05	25	0	25	1.00000E+00	
26	3.00000E-02	1.96247E+01	1.87283E+05	26	0	26	1.00000E+00	
27	1.00000E-02	2.07233E+01	8.88201E+04	27	0	27	1.00000E+00	

28 1.00000E-05 2.76310E+01

1 720 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp

0

	mixture by zone	order p(l) by zone	activity table matl no.	reaction	quadrature constants weights	directions	refl direc	wt x cos
1	1	3			0	-2.79004E-01	3	0
2	1	3			5.06143E-02	-1.97286E-01	3	-9.98548E-03
3	2	3			5.06143E-02	1.97286E-01	2	9.98548E-03
4	3	3			0	-6.04419E-01	8	0
5					5.55953E-02	-5.58410E-01	8	-3.10450E-02
6					5.55953E-02	-2.31301E-01	7	-1.28593E-02
7					5.55953E-02	2.31301E-01	6	1.28593E-02
8					5.55953E-02	5.58410E-01	5	3.10450E-02
9					0	-8.50774E-01	15	0
10					5.22844E-02	-8.21784E-01	15	-4.29665E-02
11					5.22844E-02	-6.01588E-01	14	-3.14537E-02
12					5.22844E-02	-2.20196E-01	13	-1.15128E-02
13					5.22844E-02	2.20196E-01	12	1.15128E-02
14					5.22844E-02	6.01588E-01	11	3.14537E-02
15					5.22844E-02	8.21784E-01	10	4.29665E-02
16					0	-9.83032E-01	24	0
17					4.53365E-02	-9.64143E-01	24	-4.37099E-02
18					4.53365E-02	-8.17361E-01	23	-3.70555E-02
19					4.53365E-02	-5.46143E-01	22	-2.47597E-02
20					4.53365E-02	-1.91780E-01	21	-8.69444E-03
21					4.53365E-02	1.91780E-01	20	8.69444E-03
22					4.53365E-02	5.46143E-01	19	2.47597E-02
23					4.53365E-02	8.17361E-01	18	3.70555E-02
24					4.53365E-02	9.64143E-01	17	4.37099E-02

0constants for p(3) scattering

0angl	set 1	set 2	set 3	set 4	set 5
1	-2.79004E-01	8.83236E-01	6.74143E-02	-6.16919E-01	-1.71701E-02
2	-1.97286E-01	8.83236E-01	.00000E+00	-4.36228E-01	1.21411E-02
3	1.97286E-01	8.83236E-01	.00000E+00	4.36228E-01	-1.21411E-02
4	-6.04419E-01	4.52016E-01	3.16379E-01	-8.04435E-01	-1.74564E-01
5	-5.58410E-01	4.52016E-01	2.23714E-01	-7.43201E-01	-6.68028E-02
6	-2.31301E-01	4.52016E-01	-2.23713E-01	-3.07844E-01	1.61276E-01
7	2.31301E-01	4.52016E-01	-2.23713E-01	3.07844E-01	-1.61276E-01
8	5.58410E-01	4.52016E-01	2.23713E-01	7.43201E-01	6.68028E-02
9	-8.50774E-01	-8.57235E-02	6.26843E-01	-1.98456E-01	-4.86835E-01
10	-8.21784E-01	-8.57235E-02	5.42862E-01	-1.91694E-01	-3.44245E-01
11	-6.01588E-01	-8.57235E-02	.00000E+00	-1.40830E-01	3.44244E-01
12	-2.20196E-01	-8.57235E-02	-5.42862E-01	-5.13643E-02	3.44245E-01
13	2.20196E-01	-8.57235E-02	-5.42862E-01	5.13643E-02	-3.44245E-01
14	6.01588E-01	-8.57235E-02	.00000E+00	1.40830E-01	-3.44245E-01
15	8.21784E-01	-8.57235E-02	5.42862E-01	1.91694E-01	3.44245E-01
16	-9.83032E-01	-4.49528E-01	8.36886E-01	5.00705E-01	-7.51005E-01
17	-9.64143E-01	-4.49528E-01	7.73181E-01	4.91083E-01	-6.24438E-01
18	-8.17361E-01	-4.49528E-01	3.20262E-01	4.16320E-01	1.46514E-01
19	-5.46143E-01	-4.49528E-01	-3.20262E-01	2.78176E-01	7.36575E-01
20	-1.91780E-01	-4.49528E-01	-7.73181E-01	9.76824E-02	4.17236E-01
21	1.91780E-01	-4.49528E-01	-7.73181E-01	-9.76824E-02	-4.17236E-01
22	5.46143E-01	-4.49528E-01	-3.20262E-01	-2.78176E-01	-7.36575E-01
23	8.17361E-01	-4.49528E-01	3.20262E-01	-4.16320E-01	-1.46514E-01
24	9.64143E-01	-4.49528E-01	7.73181E-01	-4.91083E-01	6.24438E-01

1 int	radii	mid pts	zone no.	areas	volumes	dens fact	radius mod	spec(int)
1	0	1.29551E-02	1	0	2.10906E-03	1.00000E+00	0	
2	2.59102E-02	4.33406E-02	1	1.62798E-01	9.49518E-03	1.00000E+00	0	
3	6.07710E-02	8.75100E-02	1	3.81835E-01	2.94045E-02	1.00000E+00	0	
4	1.14249E-01	1.74155E-01	1	7.17848E-01	1.31104E-01	1.00000E+00	0	
5	2.34061E-01	2.93967E-01	1	1.47065E+00	2.21259E-01	1.00000E+00		

6	3.53873E-01	3.80612E-01	1	2.22345E+00	1.27890E-01	1.00000E+00
7	4.07351E-01	4.24781E-01	1	2.55946E+00	9.30429E-02	1.00000E+00
8	4.42212E-01	4.55167E-01	1	2.77850E+00	7.41004E-02	1.00000E+00
9	4.68122E-01	4.68814E-01	2	2.94130E+00	4.07946E-03	0
10	4.69507E-01	4.71481E-01	2	2.95000E+00	1.16988E-02	0
11	4.73456E-01	4.75431E-01	2	2.97481E+00	1.17968E-02	0
12	4.77405E-01	4.78098E-01	2	2.99962E+00	4.16023E-03	0
13	4.78790E-01	4.83159E-01	3	3.00833E+00	2.65268E-02	1.00000E+00
14	4.87528E-01	4.99987E-01	3	3.06323E+00	7.82768E-02	1.00000E+00
15	5.12445E-01	5.24908E-01	3	3.21979E+00	8.21777E-02	1.00000E+00
16	5.37362E-01	5.41731E-01	3	3.37634E+00	2.97427E-02	1.00000E+00
17	5.46100E-01	5.53513E-01	4	3.43125E+00	5.15631E-02	1.00000E+00
18	5.60926E-01	5.70900E-01	4	3.52440E+00	7.15548E-02	1.00000E+00
19	5.80874E-01	5.96175E-01	4	3.64974E+00	1.14628E-01	1.00000E+00
20	6.11475E-01	6.45755E-01	4	3.84201E+00	2.78169E-01	1.00000E+00
21	6.80034E-01	7.14313E-01	4	4.27278E+00	3.07702E-01	1.00000E+00
22	7.48592E-01	7.63895E-01	4	4.70854E+00	1.46875E-01	1.00000E+00
23	7.79193E-01	7.89167E-01	4	4.89582E+00	9.89116E-02	1.00000E+00
24	7.99141E-01	8.06554E-01	4	5.02115E+00	7.51357E-02	1.00000E+00
25	8.13968E-01			5.11431E+00		

- elapsed time .00 min.

1 outer iter	inner iters	1 - balance	eigenvalue	1 - source ratio	1 - scatter ratio	1 - upscat ratio	search parameter	time (min)
1	129	2.30684E-06	1.05050E+00	-5.54241E-02	1.00000E+00	-1.89484E-02	.00000E+00	.0000
2	201	-3.31959E-06	1.05598E+00	-1.19188E-03	-5.77070E-03	-2.77019E-03	.00000E+00	.0000
3	259	-3.35895E-06	1.05675E+00	-1.88910E-04	-7.85543E-04	-6.33710E-04	.00000E+00	.0000
4	302	1.09928E-05	1.05676E+00	-4.10437E-05	-1.82366E-04	-1.42894E-04	.00000E+00	.0000

grp to grp	grp inner iters	mfd int.	max. flux difference	msf int.	max. scale factor	coarse mesh
1	1	1	1.60256E-07	24	1.00000E+00	1
2	1	1	1.82710E-07	24	1.00000E+00	1
3	1	1	1.66012E-07	24	1.00000E+00	1
4	1	1	1.57203E-07	24	1.00000E+00	1
5	1	1	1.47925E-07	24	1.00000E+00	1
6	1	1	8.90491E-08	24	1.00000E+00	1
7	1	1	5.57681E-08	24	1.00000E+00	1
8	1	1	1.21885E-08	24	1.00000E+00	1
9	1	2	7.34707E-09	24	1.00000E+00	1
10	1	2	7.04445E-09	24	1.00000E+00	1
11	1	2	7.28211E-09	24	1.00000E+00	1
12	1	24	1.75957E-08	24	1.00000E+00	1
13	1	24	2.20915E-08	24	1.00000E+00	1
14	1	24	2.13140E-08	24	1.00000E+00	1
15	1	20	4.85868E-05	24	9.99838E-01	1
16	1	20	5.97910E-05	24	9.99844E-01	1
17	1	19	7.68363E-05	24	9.99850E-01	1
18	2	24	4.75161E-05	24	1.00003E+00	1
19	1	20	7.57303E-05	24	9.99834E-01	1
20	1	20	5.73101E-05	24	9.99794E-01	1
21	2	24	5.05713E-05	24	1.00002E+00	1
22	1	19	5.68041E-05	24	9.99885E-01	1
23	1	24	1.09517E-05	24	1.00000E+00	1
24	1	24	4.63568E-05	24	1.00003E+00	1
25	1	24	5.66416E-05	24	1.00002E+00	1
26	1	2	2.57303E-05	24	1.00002E+00	2
27	1	24	3.24004E-05	19	1.00001E+00	2

5	331	-1.38528E-05	1.05708E+00	-9.66132E-06	-4.09050E-05	-2.89992E-05	.00000E+00	.0167

final monitor
lambda 1.05694E+00 production/absorption 1.05693E+00 angular flux cn 16

- elapsed time .02 min.

1 720 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp

0 int.	zone number	radius	int. midpoint	area	volume	prod density
1	1	.00000E+00	1.29551E-02	.00000E+00	2.10906E-03	3.09008E-03
2	1	2.59102E-02	4.33406E-02	1.62798E-01	9.49318E-03	1.39024E-02
3	1	6.07710E-02	8.75100E-02	3.81835E-01	2.94045E-02	4.31432E-02
4	1	1.14249E-01	1.74155E-01	7.17848E-01	1.31104E-01	1.94239E-01
5	1	2.34061E-01	2.93967E-01	1.47065E+00	2.21299E-01	3.35787E-01
6	1	3.53873E-01	3.80612E-01	2.22345E+00	1.27890E-01	1.99196E-01
7	1	4.07351E-01	4.24781E-01	2.59946E+00	9.30429E-02	1.47765E-01
8	1	4.42212E-01	4.55167E-01	2.77850E+00	7.41004E-02	1.19812E-01
9	2	4.68122E-01	4.68814E-01	2.94130E+00	4.07946E-03	.00000E+00
10	2	4.69507E-01	4.71481E-01	2.95000E+00	1.16988E-02	.00000E+00
11	2	4.73456E-01	4.75431E-01	2.97481E+00	1.17968E-02	.00000E+00
12	2	4.77405E-01	4.78098E-01	2.99962E+00	4.16023E-03	.00000E+00
13	3	4.78790E-01	4.83159E-01	3.00833E+00	2.65268E-02	.00000E+00
14	3	4.87528E-01	4.99987E-01	3.06323E+00	7.82768E-02	.00000E+00
15	3	5.12445E-01	5.24903E-01	3.21979E+00	8.21777E-02	.00000E+00
16	3	5.37362E-01	5.41731E-01	3.37634E+00	2.97427E-02	.00000E+00
17	4	5.46100E-01	5.53513E-01	3.43125E+00	5.15631E-02	.00000E+00
18	4	5.60926E-01	5.70900E-01	3.52440E+00	7.15548E-02	.00000E+00
19	4	5.80874E-01	5.96175E-01	3.64974E+00	1.14628E-01	.00000E+00
20	4	6.11475E-01	6.45755E-01	3.84201E+00	2.78169E-01	.00000E+00
21	4	6.80034E-01	7.14313E-01	4.27278E+00	3.07702E-01	.00000E+00
22	4	7.48592E-01	7.63895E-01	4.70354E+00	1.46875E-01	.00000E+00
23	4	7.79198E-01	7.89167E-01	4.89582E+00	9.89116E-02	.00000E+00
24	4	7.99141E-01	8.06554E-01	5.02115E+00	7.51357E-02	.00000E+00
25		8.13968E-01		5.11431E+00		

1 720 d, sas2h: babcock wilcox 15x15, 3.00wt%, 20gwd/mtu burn high temp

0 total flux

0 int.	grp. 1	grp. 2	grp. 3	grp. 4	grp. 5	grp. 6	grp. 7	grp. 8
1	1.79147E-01	1.33355E+00	1.68345E+00	1.04266E+00	1.57657E+00	3.03138E+00	2.90569E+00	2.08120E+00
2	1.79212E-01	1.33418E+00	1.68429E+00	1.04316E+00	1.57727E+00	3.03269E+00	2.90635E+00	2.08126E+00
3	1.79155E-01	1.33356E+00	1.68351E+00	1.04269E+00	1.57649E+00	3.03108E+00	2.90533E+00	2.08107E+00
4	1.78754E-01	1.32930E+00	1.67807E+00	1.03938E+00	1.57122E+00	3.02061E+00	2.89902E+00	2.08001E+00
5	1.77714E-01	1.31833E+00	1.66424E+00	1.03101E+00	1.55797E+00	2.99465E+00	2.88349E+00	2.07740E+00
6	1.76514E-01	1.30582E+00	1.64855E+00	1.02164E+00	1.54325E+00	2.96621E+00	2.86656E+00	2.07451E+00
7	1.75557E-01	1.29601E+00	1.63662E+00	1.01450E+00	1.53217E+00	2.94522E+00	2.85417E+00	2.07234E+00
8	1.74605E-01	1.28644E+00	1.62507E+00	1.00774E+00	1.52184E+00	2.92605E+00	2.84295E+00	2.07029E+00
9	1.74084E-01	1.28126E+00	1.61887E+00	1.00415E+00	1.51641E+00	2.91606E+00	2.83715E+00	2.06920E+00
10	1.73976E-01	1.28022E+00	1.61763E+00	1.00346E+00	1.51541E+00	2.91427E+00	2.83617E+00	2.06901E+00
11	1.73817E-01	1.27870E+00	1.61584E+00	1.00247E+00	1.51399E+00	2.91174E+00	2.83477E+00	2.06872E+00
12	1.73712E-01	1.27770E+00	1.61466E+00	1.00183E+00	1.51308E+00	2.91011E+00	2.83388E+00	2.06853E+00
13	1.73517E-01	1.27585E+00	1.61244E+00	1.00059E+00	1.51127E+00	2.90667E+00	2.83195E+00	2.06815E+00
14	1.72987E-01	1.27058E+00	1.60592E+00	9.96753E-01	1.50546E+00	2.89541E+00	2.82553E+00	2.06711E+00
15	1.72392E-01	1.26419E+00	1.59752E+00	9.91434E-01	1.49706E+00	2.87877E+00	2.81595E+00	2.06597E+00
16	1.72101E-01	1.26066E+00	1.59250E+00	9.87963E-01	1.49134E+00	2.86729E+00	2.80924E+00	2.06545E+00
17	1.71961E-01	1.25863E+00	1.58988E+00	9.85632E-01	1.48736E+00	2.85927E+00	2.80457E+00	2.06531E+00
18	1.71778E-01	1.25601E+00	1.58639E+00	9.82660E-01	1.48230E+00	2.84930E+00	2.79871E+00	2.06517E+00
19	1.71548E-01	1.25289E+00	1.58078E+00	9.79294E-01	1.47662E+00	2.83816E+00	2.79214E+00	2.06493E+00
20	1.71242E-01	1.24886E+00	1.57488E+00	9.75078E-01	1.46955E+00	2.82431E+00	2.78400E+00	2.06460E+00
21	1.71051E-01	1.24605E+00	1.57074E+00	9.72092E-01	1.46452E+00	2.81449E+00	2.77831E+00	2.06450E+00
22	1.71052E-01	1.24592E+00	1.57044E+00	9.71810E-01	1.46400E+00	2.81348E+00	2.77787E+00	2.06473E+00
23	1.71110E-01	1.24678E+00	1.57157E+00	9.72538E-01	1.46518E+00	2.81577E+00	2.77935E+00	2.06501E+00
24	1.71199E-01	1.24780E+00	1.57293E+00	9.73436E-01	1.46663E+00	2.81862E+00	2.78114E+00	2.06528E+00

0 int.	grp. 9	grp. 10	grp. 11	grp. 12	grp. 13	grp. 14	grp. 15	grp. 16
1	1.58778E+00	1.44719E+00	1.30657E+00	7.96177E-01	6.70742E-01	5.84450E-01	3.68940E-01	2.02984E-01
2	1.58771E+00	1.44709E+00	1.30636E+00	7.95945E-01	6.70531E-01	5.84161E-01	3.68908E-01	2.02960E-01
3	1.58785E+00	1.44731E+00	1.30683E+00	7.96495E-01	6.70994E-01	5.84871E-01	3.68987E-01	2.03008E-01
4	1.58892E+00	1.44852E+00	1.30946E+00	7.99580E-01	6.73628E-01	5.88824E-01	3.69420E-01	2.03284E-01
5	1.59150E+00	1.45150E+00	1.31594E+00	8.07199E-01	6.80131E-01	5.98634E-01	3.70464E-01	2.03963E-01

6	1.59437E+00	1.45475E+00	1.32302E+00	8.15587E-01	6.87282E-01	6.09496E-01	3.71589E-01	2.04702E-01
7	1.59654E+00	1.45713E+00	1.32824E+00	8.21806E-01	6.92576E-01	6.17606E-01	3.72978E-01	2.05243E-01
8	1.59860E+00	1.45929E+00	1.33299E+00	8.27516E-01	6.97431E-01	6.25087E-01	3.73120E-01	2.05735E-01
9	1.59970E+00	1.46041E+00	1.33545E+00	8.30482E-01	6.99953E-01	6.28977E-01	3.73490E-01	2.05990E-01
10	1.59989E+00	1.46059E+00	1.33585E+00	8.30959E-01	7.00365E-01	6.29596E-01	3.73552E-01	2.06034E-01
11	1.60018E+00	1.46085E+00	1.33641E+00	8.31640E-01	7.00954E-01	6.30482E-01	3.73642E-01	2.06096E-01
12	1.60036E+00	1.46102E+00	1.33677E+00	8.32081E-01	7.01334E-01	6.31055E-01	3.73699E-01	2.06137E-01
13	1.60074E+00	1.46136E+00	1.33752E+00	8.32980E-01	7.02112E-01	6.32226E-01	3.73818E-01	2.06219E-01
14	1.60176E+00	1.46246E+00	1.33990E+00	8.35798E-01	7.04547E-01	6.35890E-01	3.74199E-01	2.06478E-01
15	1.60289E+00	1.46408E+00	1.34326E+00	8.39673E-01	7.07905E-01	6.40938E-01	3.74739E-01	2.06837E-01
16	1.60342E+00	1.46507E+00	1.34547E+00	8.42177E-01	7.10069E-01	6.44185E-01	3.75096E-01	2.07068E-01
17	1.60371E+00	1.46585E+00	1.34713E+00	8.44017E-01	7.11628E-01	6.46654E-01	3.75290E-01	2.07218E-01
18	1.60414E+00	1.46691E+00	1.34938E+00	8.46533E-01	7.13740E-01	6.49781E-01	3.75504E-01	2.07410E-01
19	1.60468E+00	1.46812E+00	1.35195E+00	8.49429E-01	7.16177E-01	6.53501E-01	3.75756E-01	2.07635E-01
20	1.60544E+00	1.46964E+00	1.35522E+00	8.53118E-01	7.19281E-01	6.58240E-01	3.76064E-01	2.07918E-01
21	1.60600E+00	1.47073E+00	1.35755E+00	8.55748E-01	7.21466E-01	6.61596E-01	3.76217E-01	2.08096E-01
22	1.60606E+00	1.47084E+00	1.35777E+00	8.55980E-01	7.21611E-01	6.61858E-01	3.76127E-01	2.08076E-01
23	1.60591E+00	1.47056E+00	1.35719E+00	8.55296E-01	7.20995E-01	6.60953E-01	3.75978E-01	2.07993E-01
24	1.60572E+00	1.47023E+00	1.35644E+00	8.54453E-01	7.20250E-01	6.59847E-01	3.75828E-01	2.07903E-01

0 int.	grp. 17	grp. 18	grp. 19	grp. 20	grp. 21	grp. 22	grp. 23	grp. 24
1	8.22947E-02	3.69456E-02	1.21623E-01	4.23045E-01	1.06336E-01	1.76019E-01	6.67073E-01	4.91611E-01
2	8.22669E-02	3.69358E-02	1.21575E-01	4.22940E-01	1.06268E-01	1.75895E-01	6.66661E-01	4.91274E-01
3	8.25232E-02	3.71640E-02	1.21680E-01	4.23148E-01	1.06467E-01	1.76520E-01	6.67697E-01	4.92220E-01
4	8.26555E-02	3.82301E-02	1.22275E-01	4.24354E-01	1.07545E-01	1.79682E-01	6.73457E-01	4.97389E-01
5	8.34796E-02	4.09748E-02	1.23732E-01	4.27316E-01	1.10240E-01	1.87644E-01	6.87741E-01	5.10237E-01
6	8.43891E-02	4.41961E-02	1.25318E-01	4.30651E-01	1.13253E-01	1.96684E-01	7.03548E-01	5.24521E-01
7	8.50657E-02	4.67821E-02	1.26475E-01	4.32986E-01	1.15530E-01	2.03633E-01	7.15343E-01	5.35257E-01
8	8.56892E-02	4.95228E-02	1.27520E-01	4.35089E-01	1.17651E-01	2.10209E-01	7.26220E-01	5.45180E-01
9	8.60140E-02	5.06765E-02	1.28058E-01	4.36211E-01	1.18758E-01	2.13661E-01	7.31869E-01	5.50358E-01
10	8.60674E-02	5.08487E-02	1.28145E-01	4.36397E-01	1.18927E-01	2.14150E-01	7.32740E-01	5.51135E-01
11	8.61437E-02	5.10954E-02	1.28270E-01	4.36663E-01	1.19168E-01	2.14849E-01	7.33980E-01	5.52240E-01
12	8.61981E-02	5.12556E-02	1.28350E-01	4.36835E-01	1.19324E-01	2.15302E-01	7.34780E-01	5.52952E-01
13	8.62942E-02	5.15806E-02	1.28516E-01	4.37186E-01	1.19642E-01	2.16224E-01	7.36416E-01	5.54406E-01
14	8.66099E-02	5.25832E-02	1.29041E-01	4.38286E-01	1.20636E-01	2.19085E-01	7.41507E-01	5.58891E-01
15	8.70440E-02	5.39557E-02	1.29775E-01	4.39797E-01	1.22000E-01	2.22966E-01	7.48419E-01	5.64887E-01
16	8.75227E-02	5.47874E-02	1.30256E-01	4.40764E-01	1.22872E-01	2.25420E-01	7.52778E-01	5.68598E-01
17	8.75268E-02	5.54283E-02	1.30600E-01	4.41442E-01	1.23544E-01	2.27332E-01	7.56369E-01	5.71993E-01
18	8.78065E-02	5.63208E-02	1.31058E-01	4.42357E-01	1.24491E-01	2.30062E-01	7.61717E-01	5.77345E-01
19	8.81290E-02	5.73463E-02	1.31606E-01	4.43427E-01	1.25587E-01	2.33237E-01	7.68101E-01	5.83805E-01
20	8.85401E-02	5.86489E-02	1.32291E-01	4.44797E-01	1.26993E-01	2.37327E-01	7.76589E-01	5.92525E-01
21	8.88320E-02	5.95812E-02	1.32772E-01	4.45743E-01	1.28008E-01	2.40294E-01	7.82998E-01	5.99328E-01
22	8.88562E-02	5.96760E-02	1.32808E-01	4.45771E-01	1.28115E-01	2.40621E-01	7.83948E-01	6.00620E-01
23	8.87795E-02	5.94501E-02	1.32666E-01	4.45466E-01	1.27871E-01	2.39919E-01	7.82657E-01	5.99540E-01
24	8.86855E-02	5.91669E-02	1.32501E-01	4.45109E-01	1.27564E-01	2.39031E-01	7.80956E-01	5.98002E-01

0 int.	grp. 25	grp. 26	grp. 27
1	2.04150E-01	1.23962E-01	1.62609E-02
2	2.04009E-01	1.23874E-01	1.62612E-02
3	2.04507E-01	1.24353E-01	1.64089E-02
4	2.07134E-01	1.26761E-01	1.70795E-02
5	2.13672E-01	1.32779E-01	1.87817E-02
6	2.20974E-01	1.39573E-01	2.07691E-02
7	2.26487E-01	1.44775E-01	2.23667E-02
8	2.31638E-01	1.49702E-01	2.39514E-02
9	2.34329E-01	1.52290E-01	2.47990E-02
10	2.34719E-01	1.52640E-01	2.48969E-02
11	2.35275E-01	1.53138E-01	2.50362E-02
12	2.35634E-01	1.53459E-01	2.51259E-02
13	2.36363E-01	1.54110E-01	2.53081E-02
14	2.38576E-01	1.56072E-01	2.58468E-02
15	2.41457E-01	1.58587E-01	2.65125E-02

16	2.43181E-01	1.60059E-01	2.69841E-02
17	2.44910E-01	1.61817E-01	2.74610E-02
18	2.47773E-01	1.64887E-01	2.85150E-02
19	2.51269E-01	1.68619E-01	2.97503E-02
20	2.56042E-01	1.73708E-01	3.13762E-02
21	2.59853E-01	1.77863E-01	3.27133E-02
22	2.60684E-01	1.78927E-01	3.31109E-02
23	2.60187E-01	1.78562E-01	3.30648E-02
24	2.59424E-01	1.77890E-01	3.29159E-02

- elapsed time .02 min.

1fine group summary for zone 1 by group including sum for all groups in line 28

0 grp.	fix source	fiss source	in scatter	slf scatter	out scatter	absorption	leakage	balance
1	.00000E+00	2.27834E-02	.00000E+00	1.27835E-02	1.06397E-02	3.23724E-03	1.12142E-02	9.98836E-01
2	.00000E+00	1.95360E-01	2.35212E-03	1.67378E-01	6.66508E-02	1.36418E-02	1.15429E-01	1.00004E+00
3	.00000E+00	2.15763E-01	2.63562E-02	1.61228E-01	8.13114E-02	1.55438E-02	1.45263E-01	1.00000E+00
4	.00000E+00	1.23897E-01	3.90464E-02	1.05435E-01	6.78865E-02	7.40609E-03	8.76483E-02	1.00001E+00
5	.00000E+00	1.64367E-01	6.80627E-02	2.59700E-01	9.47652E-02	4.41163E-03	1.33256E-01	9.99992E-01
6	.00000E+00	1.77483E-01	1.34857E-01	6.53829E-01	5.43823E-02	6.94352E-03	2.50985E-01	1.00003E+00
7	.00000E+00	8.77626E-02	9.84879E-02	7.44822E-01	3.63351E-02	7.47750E-03	1.42437E-01	1.00001E+00
8	.00000E+00	1.35239E-02	4.25805E-02	6.30765E-01	2.15051E-02	1.38255E-02	2.07712E-02	1.00005E+00
9	.00000E+00	9.81536E-04	2.17281E-02	5.35545E-01	2.06897E-02	2.29246E-02	-2.09042E-02	9.99991E-01
10	.00000E+00	7.29039E-05	2.07116E-02	4.61417E-01	1.07058E-02	3.55838E-02	-2.55057E-02	1.00001E+00
11	.00000E+00	5.73558E-06	1.07067E-02	4.23345E-01	8.15330E-03	5.80208E-02	-5.54615E-02	1.00001E+00
12	.00000E+00	4.02915E-07	8.15335E-03	2.39571E-01	9.37688E-03	6.40570E-02	-6.52571E-02	9.99960E-01
13	.00000E+00	6.39792E-08	9.37689E-03	1.78695E-01	6.15287E-03	5.94453E-02	-5.62217E-02	1.00001E+00
14	.00000E+00	1.26790E-08	6.15287E-03	1.52008E-01	7.38436E-03	8.35490E-02	-8.47806E-02	1.00000E+00
15	.00000E+00	1.43286E-09	7.47109E-03	8.44814E-02	8.86820E-03	6.94069E-03	-8.39745E-03	1.00377E+00
16	.00000E+00	4.20738E-10	9.03061E-03	4.25418E-02	9.55262E-03	5.38954E-03	-5.95372E-03	1.00282E+00
17	.00000E+00	1.35498E-10	7.65731E-03	1.44202E-02	7.36023E-03	7.62079E-03	-7.34180E-03	1.00121E+00
18	.00000E+00	9.70128E-11	7.05739E-03	8.59951E-03	4.25206E-03	2.56773E-02	-2.28560E-02	1.00013E+00
19	.00000E+00	1.37155E-10	6.48623E-03	2.36319E-02	8.66922E-03	1.01044E-02	-1.23063E-02	1.00101E+00
20	.00000E+00	2.23029E-10	9.86478E-03	1.01120E-01	9.56416E-03	2.60108E-02	-2.57754E-02	1.00185E+00
21	.00000E+00	3.26442E-11	8.97754E-03	2.08262E-02	8.09340E-03	2.43936E-02	-2.35238E-02	1.00044E+00
22	.00000E+00	3.78747E-11	1.17446E-02	4.05430E-02	9.13392E-03	7.02846E-02	-6.77078E-02	1.00043E+00
23	.00000E+00	3.62124E-11	1.41527E-02	1.62453E-01	1.78592E-02	1.21836E-01	-1.25645E-01	1.00073E+00
24	.00000E+00	9.85656E-12	2.17814E-02	1.12898E-01	2.18441E-02	1.13778E-01	-1.13917E-01	1.00056E+00
25	.00000E+00	2.88535E-12	1.86887E-02	4.27495E-02	1.41086E-02	6.19250E-02	-5.73766E-02	1.00042E+00
26	.00000E+00	2.02529E-12	9.19215E-03	2.97282E-02	6.33813E-03	5.56420E-02	-5.28068E-02	1.00030E+00
27	.00000E+00	4.82146E-13	1.98517E-03	4.44053E-03	1.08145E-03	1.55400E-02	-1.46389E-02	1.00016E+00
28	.00000E+00	1.00000E+00	6.22642E-01	5.41485E+00	6.22642E-01	9.41190E-01	6.05264E-02	1.00030E+00

0 grp.	rt bdy flux	rt leakage	lft bdy flux	lft leakage	n2n rate	fiss rate	flux*db**2	total flux
1	1.74113E-01	1.12142E-02	1.79086E-01	.00000E+00	2.27852E-03	2.65102E-03	.00000E+00	1.21957E-01
2	1.28154E+00	1.15429E-01	1.33295E+00	.00000E+00	1.70654E-05	1.18697E-02	.00000E+00	9.03624E-01
3	1.61919E+00	1.45263E-01	1.68264E+00	.00000E+00	.00000E+00	1.45190E-02	.00000E+00	1.14088E+00
4	1.00434E+00	8.76483E-02	1.04218E+00	.00000E+00	.00000E+00	6.25975E-03	.00000E+00	7.06913E-01
5	1.51667E+00	1.33256E-01	1.57586E+00	.00000E+00	.00000E+00	1.80747E-03	.00000E+00	1.06812E+00
6	2.91654E+00	2.50985E-01	3.03003E+00	.00000E+00	.00000E+00	1.54159E-03	.00000E+00	2.05324E+00
7	2.85742E+00	1.42437E-01	2.90495E+00	.00000E+00	.00000E+00	1.49123E-03	.00000E+00	1.98016E+00
8	2.06925E+00	2.07712E-02	2.08110E+00	.00000E+00	.00000E+00	1.50630E-03	.00000E+00	1.42990E+00
9	1.59965E+00	-2.09042E-02	1.58788E+00	.00000E+00	.00000E+00	2.00510E-03	.00000E+00	1.09653E+00
10	1.46036E+00	-2.55057E-02	1.44731E+00	.00000E+00	.00000E+00	4.27114E-03	.00000E+00	1.00025E+00
11	1.33535E+00	-5.54615E-02	1.30683E+00	.00000E+00	.00000E+00	9.09949E-03	.00000E+00	9.08034E-01
12	8.30856E-01	-6.52571E-02	7.96471E-01	.00000E+00	.00000E+00	1.19534E-02	.00000E+00	5.58204E-01
13	6.99845E-01	-5.62217E-02	6.71002E-01	.00000E+00	.00000E+00	1.31836E-02	.00000E+00	4.70354E-01
14	6.28813E-01	-8.47806E-02	5.84819E-01	.00000E+00	.00000E+00	8.23038E-03	.00000E+00	4.15382E-01
15	3.73518E-01	-8.39745E-03	3.69026E-01	.00000E+00	.00000E+00	1.98407E-03	.00000E+00	2.55366E-01
16	2.06002E-01	-5.95372E-03	2.03057E-01	.00000E+00	.00000E+00	1.38096E-03	.00000E+00	1.40633E-01
17	8.60092E-02	-7.34180E-03	8.23378E-02	.00000E+00	.00000E+00	1.66006E-03	.00000E+00	5.77425E-02
18	5.06276E-02	-2.28560E-02	3.69961E-02	.00000E+00	.00000E+00	1.28586E-03	.00000E+00	2.92610E-02
19	1.28051E-01	-1.23063E-02	1.21697E-01	.00000E+00	.00000E+00	2.62594E-03	.00000E+00	8.56450E-02