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Los Alamos Benchmarks: Calculations Based on ENDF/B-V Data

Los Alamos Los Alamos National Laboratory
Los Alamos, New Mexico 87545

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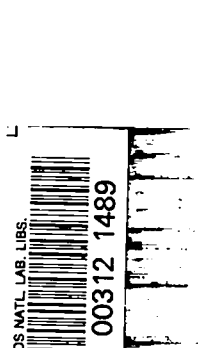
R. B. Kidman



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LOS ALAMOS BENCHMARKS: CALCULATIONS BASED ON ENDF/B-V DATA

by

R. B. Kidman

ABSTRACT

The new and revised benchmark specifications for nine Los Alamos National Laboratory critical assemblies are used to compute the entire set of parameters that were measured in the experiments. A comparison between the computed and experimental values provides a measure of the adequacy of the specifications, cross sections, and physics codes used in the calculations.

I. INTRODUCTION

Over the years, the Los Alamos National Laboratory has constructed several small, fast critical assemblies. Numerous experimental measurements of various reactor parameters provide an opportunity to test nuclear data and computational methods. Such testing has been facilitated by the recent generation[1] of simplified specifications for nine of the Los Alamos critical assemblies. Since the spherical, one-dimensional specifications are relatively simple, they are conveniently and compactly shown in Table I.

This report documents our first try at using these new specifications, the latest nuclear data, and the latest computational methods to calculate all of the parameters and compare them to the experimental results.

This manual of Los Alamos criticals can be considered an extension of a previous report[2] in which similar calculations were performed on 15 other benchmark assemblies.

II. PROCEDURE

The nuclear data and calculational procedures used in this study are identical to those described in Ref. 2. Very briefly, the NJOY[3] code was used to

TABLE I

LOS ALAMOS NATIONAL LABORATORY BENCHMARK SPECIFICATIONS[a]

Material	Jezebel Core	Godiva Core	Jezebel -23 Core	Jezebel -Pu Core	Bigten		Flattop-25		Flattop-Pu		Flattop-23			Thor	
					Core	Refl.	Core	Refl.	Core	Refl.	Core	Void	Refl.	Core	Refl.
Ga	0.001375			0.00138					0.00138					0.00133	
Th-232															0.03005
U-233			0.04671								0.04671				
U-234		0.000492	0.00059		0.00005		0.00049				0.00059				
U-235		0.04500	0.00001		0.00484	0.00010	0.04449	0.00034		0.00034	0.00001		0.00034		
U-238		0.002498	0.00029		0.04268	0.04797	0.00270	0.04774		0.04774	0.00028		0.04774		
Pu-239	0.03705			0.02994					0.03674					0.03618	
Pu-240	0.001751			0.00788					0.00186					0.00194	
Pu-241	0.000117			0.00121					0.00012						
Pu-242				0.00016											
Radius (cm)	6.385	8.741	5.983	6.599	30.48	45.72	6.116	24.13	4.533	24.13	4.317	4.610	24.13	5.310	29.88
Intervals	40	40	40	40	20	40	30	30	30	30	30	2	30	30	30

[a]Densities given in units of atoms/b-cm.

generate 70-group cross sections from ENDF/B-V data.[4] Self-shielded, effective cross sections for each benchmark were generated by running the 70-group cross sections through SUPERX. [SUPERX is an unpublished, overhauled version of 1DX[5] that incorporates the following changes: (1) improved f-factor interpolation; (2) improved elastic downscatter iteration; (3) inclusion of elastic scattering transfer matrices; (4) inclusion of elastic downscatter f-factors; (5) improved transport cross-section computation; (6) addition of isotope and region-dependent fission source matrices.] Fluxes and adjoints from SUPERX were fed into SUPERB for the calculation of diffusion theory material worths and fluxes and adjoints from $P_{1/2}S_{16}$ ONETRAN[6] runs were fed into SUPERB to generate transport theory material worths. [SUPERB is an unpublished, overhauled version of PERTV[7] that can accept cross sections, isotopes, and region-dependent fission source matrices from SUPERX.] The group velocities and delayed neutron data used by SUPERB are presented in Appendix A of Ref. 2.

III. RESULTS

All of the computed results and comparisons with every experimental measurement are compiled in Appendix A. Although transport theory results are more sound, diffusion theory parameter results are also shown as a matter of passing interest. However, all of the fluxes, adjoints, fission sources, and average cross sections tabulated for each benchmark are $P_{1/2}S_{16}$ transport theory

We wish to convert the $P_{1/2}S_{16}$ transport theory eigenvalues of Appendix A to $P_\infty S_\infty$ estimates. Eigenvalue behaviors vs P_i and vs S_i are shown in Tables II and III, respectively. These results were obtained using ONEDANT,[8] infinitely dilute cross sections, and a single vector fission source for each benchmark. The P_∞ eigenvalue estimates were obtained by continuing the same fractional decreases exhibited by $(K_3 - K_4)/(K_4 - K_5)$, on out to infinity. The S_∞ estimate was obtained from a Lagrange 5-point interpolation scheme on the points $(1/i, K_i)$. Now, if one assumes that computing the P_i eigenvalues at $S_{i\neq 16}$, or computing the S_i eigenvalues at $P_{i\neq 3}$, or that improvements like self-shielding or fission source matrices will not change the eigenvalue behavior significantly, then the results in Tables II and III can be used to convert the more refined $P_{1/2}S_{16}$ eigenvalues of Appendix A to $P_\infty S_\infty$ results. This is done in Table IV.

The calculations of Appendix A made use of the transport theory code ONETRAN, which used cross sections processed with SUPERX. ONETRAN was used in place

of the more recent version, ONEDANT, because ONETRAN has the capability to use the region-dependent fission source matrices from SUPERX. But SUPERX is an overhauled version of 1DX containing many changes. Since one frequently wishes to know how certain changes may affect his results, estimates of how the above changes affect the eigenvalues are shown in Table V. The column labeled "Elastic Matrix" indicates the eigenvalue change one obtains by using an elastic scattering matrix in SUPERX rather than just using one elastic outscatter term as in 1DX. The column labeled "Chi Matrix" displays mainly the effect of computing with a chi matrix rather than just using a single chi vector. This column also includes smaller effects caused by self-shielding and spectral adjustment of elastic downscatter. The next column shows how the eigenvalue decreases when computing with ONETRAN rather than with ONEDANT. The last column shows the sum of these effects which are incorporated in the Appendix A results.

Other reactor parameters also respond to the above code changes. Table VI lists the C/E (calculated/experimental) changes to a few selected central parameters. These changes should be compared to the corresponding C/E values in Appendix A to get a more balanced picture of the changes involved.

The computer run times for most of the code submittals of this study are shown in Appendix B.

IV. DISCUSSION

Previous $P_{1/2} \rightarrow P_{\infty}$ and $S_{16} \rightarrow S_{\infty}$ corrections[9] for Jezebel and Godiva summed to -0.0053 and -0.0047, respectively. The corresponding results from this study are -0.0034 and -0.0039, respectively. Obviously, such corrections are not constant across varying cross sections and changing methods. The most probable cause for the above differences is the change in cross sections (ENDF/B-IV → ENDF/B-V). However, eigenvalue behavior (and hence, the corrections) could change slightly if it were determined at different angular quadratures and Legendre orders, or if self-shielding and fission source matrices were used. Also, more suitable extrapolation schemes could yield slightly different P_{∞}, and S_{∞} eigenvalue estimates. P_{∞} and S_{∞} corrections become less important for larger systems (note the relatively small corrections for Bigten).

The methods improvements coded into SUPERX and SUPERB are beneficial for these nine benchmarks. According to Tables IV and V, only the Jezebel-23 and Jezebel-Pu eigenvalues suffered as a result of the code changes. The Godiva

TABLE II

EIGENVALUE BEHAVIOR VS P_i (ALL S_{16})

	P_0	$P_{1/2}$	P_1	P_2	P_3	P_4	P_5	P_∞
JEZEBEL	1.009107	1.012750	1.003351	1.009515	1.009407	1.009411	1.009410	1.009410
GODIVA	1.111715	1.004524	0.995863	1.001335	1.001287	1.001293	1.001291	1.001292
JEZEBEL-23	1.104118	0.998695	0.987885	0.994773	0.994688	0.994692	0.994691	0.994691
JEZEBEL-Pu	1.092024	1.004189	0.994834	1.000952	1.000852	1.000856	1.000855	1.000855
BIGTEN	1.065059	1.012091	1.010722	1.011627	1.011591	1.011595	1.011594	1.011594
FLATTOP-25	1.146298	1.017309	0.994933	1.012890	1.009223	1.010013	1.009849	1.009877
FLATTOP-Pu	1.159393	1.023888	0.990812	1.019677	1.011958	1.013995	1.013496	1.013594
FLATTOP-23	1.148283	1.016788	0.985888	1.013658	1.005577	1.007753	1.007196	1.007310
THOR	1.151387	1.028662	0.991730	1.026523	1.015258	1.018901	1.017836	1.018077

TABLE III

EIGENVALUE BEHAVIOR VS S_i (ALL P_3)

	S_4	S_8	S_{16}	S_{32}	S_{48}	S_∞
JEZEBEL	1.021764	1.012103	1.009407	1.008665	1.008522	1.008410
GODIVA	1.009787	1.003115	1.001287	1.000778	1.000679	1.000601
JEZEBEL-23	1.005988	0.997147	0.994688	0.994009	0.993878	0.993776
JEZEBEL-Pu	1.012844	1.003465	1.000852	1.000131	0.999992	0.999884
BIGTEN	1.012258	1.011723	1.011591	1.011555	1.011548	1.011542
FLATTOP-25	1.021648	1.011491	1.009223	1.008612	1.008494	1.008404
FLATTOP-Pu	1.030267	1.015254	1.011958	1.011072	1.010900	1.010766
FLATTOP-23	1.022704	1.008602	1.005577	1.004737	1.004561	1.004383
THOR	1.035998	1.019100	1.015258	1.014254	1.014048	1.013827

TABLE IV

BEST EIGENVALUE ESTIMATES

	Uncorrected $P_{1/2}$ S_{16} Eigenvalue	$P_{1/2} \rightarrow P_{\infty}$ Correction	$S_{16} \rightarrow S_{\infty}$ Correction	Corrected P_{∞} S_{∞} Eigenvalue
JEZEBEL	1.0111	-0.0033	-0.0010	1.0068
GODIVA	1.0028	-0.0032	-0.0007	0.9989
JEZEBEL-23	0.9983	-0.0040	-0.0009	0.9933
JEZEBEL-Pu	1.0023	-0.0033	-0.0010	0.9980
BIGTEN	1.0107	-0.0005	-0.0000	1.0101
FLATTOP-25	1.0149	-0.0074	-0.0008	1.0067
FLATTOP-Pu	1.0207	-0.0103	-0.0012	1.0093
FLATTOP-23	1.0145	-0.0095	-0.0012	1.0038
THOR	1.0266	-0.0106	-0.0014	1.0146

TABLE V

EIGENVALUE EFFECTS OF CODE CHANGES

	Elastic Matrix	Chi Matrix	ONETRAN -ONEDANT	Sum of Effects
JEZEBEL[a]	-0.0001	-0.0015	-0.0001	-0.0017
GODIVA	-0.0004	-0.0016	-0.0001	-0.0021
JEZEBEL-23	-0.0001	-0.0003	-0.0001	-0.0005
JEZEBEL-Pu	-0.0000	-0.0017	-0.0001	-0.0019
BIGTEN[a]	-0.0046	-0.0014	-0.0001	-0.0060
FLATTOP-25[a]	-0.0034	-0.0021	-0.0003	-0.0058
FLATTOP-Pu[a]	-0.0034	-0.0026	-0.0006	-0.0065
FLATTOP-23[a]	-0.0031	-0.0017	-0.0006	-0.0054
THOR[a]	-0.0022	-0.0016	-0.0004	-0.0042

[a]Results for these criticals are improvements with respect to experimental measurements.

TABLE VI

SOME CENTRAL PARAMETER C/E EFFECTS DUE TO ALL CODE CHANGES

	$\frac{\sigma_f^{U-238}}{\sigma_f^{U-235}}$	$\frac{\sigma_f^{U-233}}{\sigma_f^{U-235}}$	$\frac{\sigma_f^{Np-237}}{\sigma_f^{U-235}}$	$\frac{\sigma_f^{Pu-239}}{\sigma_f^{U-235}}$	Be-9 Worth	Fe Worth	U-235 Worth	Pu-239 Worth	Void Worth
JEZEBEL	-0.0068	0.0005[a]	0.0011[a]	0.0006[a]	-0.2447[a]	-0.0497[a]	-0.0038[a]	0.0045	-------
GODIVA	0.0021	0.0000	0.0049	0.0010[a]	0.1298[a]	-0.9783[a]	0.0042[a]	0.0073[a]	-------
JEZEBEL-23	-0.0071	------	0.0026[a]	------	------	------	------	------	0.0060[a]
JEZEBEL-Pu	-0.0083	------	0.0003	------	------	------	------	------	------
BIGTEN	-0.0018[a]	0.0001[a]	0.0047	0.0000	0.1680	-0.0321[a]	0.0015	0.0185	------
FLATTOP-25	0.0035	-0.0001	0.0061	0.0011	------	------	0.0106[a]	0.0145[a]	------
FLATTOP-Pu	0.0081[a]	------	0.0072	------	------	------	0.0138[a]	0.0220[a]	------
FLATTOP-23	0.0023[a]	------	0.0016	------	------	------	------	------	0.0193[a]
THOR	-0.0068	------	0.0018[a]	------	------	------	------	------	0.0120

[a]These are improvements with respect to experimental measurements.

eigenvalue is no worse off whereas the remaining six eigenvalues reflect definite improvements. About 60% of all the parameter C/E changes (some of which are featured in Table VI) were improvements.

Past hopes were that introducing elastic scattering matrices and elastic downscatter f-factors would improve light element worth calculations to the same level as heavy element worth calculations. That did not happen. Even though light element calculated worths were helped the most, they still remain spurious, long distances from the experimental values. On the other hand, the elastic matrix changes produced much larger effects in the reflected assembly eigenvalues than expected (see Table V).

The introduction of isotope- and region-dependent fission source matrices produced disappointingly small eigenvalue effects (see Table V). This is surprising since the change from a single vector chi for each assembly to region-dependent chi matrices is quite substantial. Some of the heavy element central worths were directly affected by this change because their worths are now computed using their own unique isotope chi matrix rather than using some sort of globally/compositionally averaged vector chi.

If one ignores for the moment the Jezebel eigenvalue in Table IV, the reflected assembly eigenvalues appear to be systematically high. The problem was addressed previously,[10] at which point it was found that higher Legendre order cross sections ($>P_3$) and chi matrices were required (as was done in this study) for adequate calculation, although this did not solve the problem. That study also suggested that improved clean specifications would not solve the problem and one would have to resort to cross-section adjustment. This study does not change that conclusion. However, the relatively large elastic matrix effects registered by the reflected assemblies (see Table V) suggest that perhaps the elastic/inelastic scattering matrices of the involved heavy elements should be scrutinized.

Although one always desires a better match between theory and experiment, the results of this study can be considered more a validation than a nullification of the specifications, cross sections, and codes.

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APPENDIX A

LOS ALAMOS NATIONAL LABORATORY BENCHMARK RESULTS

This appendix contains the one-dimensional diffusion theory and one-dimensional $P_{1/2}S_{16}$ transport theory results for each of the nine Los Alamos National Laboratory benchmarks. Tables A-I through A-IX compare calculated results to the available experimental results.

Tables A-X through A-XXXVII show the 70-group and collapsed 25-group transport theory central fluxes, central adjoints, edge fluxes, edge adjoints, and region fission fractions. The fluxes are normalized so that the central flux sum is 1.0. The adjoints are normalized so that the sum of the product of the central adjoint and the central effective fission source is 1.0. The reactor fission fraction vectors were obtained by computing the total number of $\nu\sigma_f f$ neutrons born into each group and then normalizing so that the sum over all groups would be 1.0. The 25-group adjoints were obtained by a simple addition of the original fine-group adjoints in each coarse group.

Tables A-XXXVIII through A-XLVI contain several centrally averaged one-group cross sections. The fission and "capture" cross sections are simply flux averaged. [Actually, "capture" = capture - (n,2n)-2*(n,3n). However, if the central reaction rate ratios called for an isotope's capture or (n,γ) reaction rate, then efforts were taken to make "capture" = capture.] Nu is $\phi\sigma_f$ averaged, and the transport cross section is $(\phi_1-\phi_2)/\Sigma_{tr}$ averaged (where ϕ_i is the flux at mesh point i, and Σ_{tr} is the macroscopic transport cross section).

Several symbols used in the tables are defined below.

% Uncer	= per cent error on measured values
A(/s)	= Rossi Alpha in units of 1/s
s	= seconds
Beta	= effective delayed neutron fraction
E	= exponent to the base 10 follows
L	= neutron generation time
R/IH	= reactivity/in-hour conversion factor
$	= dollar, another unit of reactivity
kg	= kilogram
C/E	= calculated/experimental ratio

Fij = fission reaction rate for the material with atomic number ending with i and atomic mass number ending with j

Gij = (n,γ) reaction rate

A sym = (n,α) reaction rate for material sym

2n sym = (n,2n) reaction rate for material sym

$n/cm^2/s$ = neutrons per square centimeter per second

rho/n/s = reactivity gain per neutron insertio per second

eV = electron volts

The measured worths reported in the specifications have all been converted to units of \$/kg for this study. Normally, this conversion requires knowledge of the effective delayed neutron fraction (β). If β was not explicitly specified, it was inferred from some material worth (for example, ^{235}U) that was specified in units of $\delta K/K/g \cdot atom$ but was measured in units of $\phi/g \cdot atom$.

TABLE A-I

JEZEBEL RESULTS

Parameter	Measured Value	% Uncer.	Diffusion Theory Calculated Value	Diffusion Theory C/E	Transport Theory Calculated Value	Transport Theory C/E
Miscellaneous Parameters						
Eigenvalue	1.000E+00	0.20	9.600E-01	0.9600	1.011E+00	1.0111
A (/S)	-6.400E+05	1.56	-5.224E+05	0.8163	-5.204E+05	0.8131
Beta	1.900E-03	1.56	1.872E-03	0.9853	1.864E-03	0.9811
L (S)	2.969E-09	1.56	3.583E-09	1.2069	3.582E-09	1.2065
R/IH			7.489E-06		7.461E-06	
Central Reaction Rate Ratios						
F28/F25	2.137E-01	1.08	1.925E-01	0.9010	1.959E-01	0.9169
F23/F25	1.578E+00	1.71	1.557E+00	0.9869	1.557E+00	0.9866
F37/F25	9.620E-01	1.66	9.402E-01	0.9774	9.515E-01	0.9891
F49/F25	1.448E+00	2.00	1.404E+00	0.9698	1.408E+00	0.9724
GV/F25	2.300E-03	13.04	1.818E-03	0.7902	1.782E-03	0.7750
GMN55/F25	2.400E-03	12.50	2.895E-03	1.2064	2.838E-03	1.1826
GCU/F25	1.000E-02	6.00	8.498E-03	0.8498	8.379E-03	0.8379
GNB93/F25	2.300E-02	8.70	2.767E-02	1.2031	2.712E-02	1.1791
GAU197/F25	8.300E-02	2.41	8.059E-02	0.9709	7.910E-02	0.9530
Central Reactivity Worths ($/kg)						
H-1	2.089E+02	50.00	4.111E+02	1.9680	8.789E+00	0.0421
BE-9	1.752E+01	6.67	1.936E+01	1.1051	1.775E+01	1.0133
B-10	-2.576E+02	2.04	-1.686E+02	0.6544	-2.573E+02	0.9988
C	-6.135E+00	14.29	-1.270E+00	0.2070	-7.128E+00	1.1619
N-14	-1.654E+01	4.55	-2.238E+01	1.3530	-3.905E+01	2.3609
O-16	-6.252E+00	10.53	-2.118E+00	0.3388	-6.961E+00	1.1134
AL-27	-5.462E+00	7.14	-1.833E+00	0.3356	-5.073E+00	0.9288
TI	-5.604E+00	3.92	-2.040E+00	0.3640	-4.751E+00	0.8478
V	-3.100E+00	6.67	-1.315E+00	0.4242	-3.751E+00	1.2101
FE	-3.958E+00	4.76	-1.866E+00	0.4715	-4.447E+00	1.1235
CO-59	-4.287E+00	4.17	-1.908E+00	0.4451	-4.440E+00	1.0358
NI	-8.428E+00	2.13	-4.557E+00	0.5407	-8.597E+00	1.0200
ZR	-4.039E+00	2.86	-1.350E+00	0.3343	-3.165E+00	0.7835
MO	-4.718E+00	2.33	-2.343E+00	0.4966	-5.124E+00	1.0860
AG	-8.929E+00	1.64	-4.864E+00	0.5448	-8.868E+00	0.9931
TA-181	-5.730E+00	1.52	-3.251E+00	0.5674	-6.349E+00	1.1080
W	-4.094E+00	2.10	-1.908E+00	0.4661	-4.336E+00	1.0590
AU-197	-4.569E+00	1.75	-2.579E+00	0.5645	-5.268E+00	1.1530
TH-232	-2.881E+00	1.57	-1.057E+00	0.3670	-3.123E+00	1.0840
U-233	6.069E+01	1.00	4.287E+01	0.7064	6.178E+01	1.0180
U-235	3.538E+01	1.01	2.539E+01	0.7176	3.613E+01	1.0212
U-238	4.864E+00	1.82	3.924E+00	0.8068	4.590E+00	0.9437
NP-237	3.619E+01	6.13	2.793E+01	0.7718	3.964E+01	1.0954
PU-239	6.944E+01	0.98	4.862E+01	0.7001	7.052E+01	1.0156
PU-240	4.495E+01	4.88	3.119E+01	0.6938	4.500E+01	1.0010
AM-241	4.520E+01	8.21	3.453E+01	0.7639	4.968E+01	1.0992

Jezebel Leakage Flux Comparison

Fine Groups	Energy Boundary (eV)	Leth. Width	Measured Flux (n/cm²/s)	% Uncer.	Diffusion Theory Calculated Flux (n/cm²/s)	Diffusion Theory C/E	Transport Theory Calculated Flux (n/cm²/s)	Transport Theory C/E
4- 5	1.0000E+07	0.5	3.1	16.1	2.4795	0.7998	2.4174	0.7798
6- 7	6.0653E+06	0.5	11.7	6.0	9.9945	0.8542	9.8366	0.8407
8- 9	3.6788E+06	0.5	17.7	3.9	17.7660	1.0037	17.6194	0.9954
10-11	2.2313E+06	0.5	20.0	4.0	20.0000	1.0000	20.0000	1.0000
12-15	1.3533E+06	0.5	16.5	4.2	18.1752	1.1015	18.3897	1.1145
16-19	8.2085E+05	0.5	13.6	5.1	13.8272	1.0167	14.2556	1.0482
20-22	4.9787E+05	0.5	9.7	7.2	8.9477	0.9224	9.4061	0.9697
	3.0197E+05							

TABLE A-II

GODIVA RESULTS

Parameter	Measured Value	% Uncer.	Diffusion Theory Calculated Value	Diffusion Theory C/E	Transport Theory Calculated Value	Transport Theory C/E
Miscellaneous Parameters						
Eigenvalue	1.000E+00	0.10	9.666E-01	0.9666	1.003E+00	1.0028
A (/S)	-1.110E+06	1.80	-1.132E+06	1.0197	-1.129E+06	1.0167
Beta	6.450E-03	1.80	6.613E-03	1.0253	6.555E-03	1.0163
L (S)	5.811E-09	1.80	5.842E-09	1.0053	5.808E-09	0.9995
R/IH			2.303E-05		2.282E-05	
Central Reaction Rate Ratios						
F28/F25	1.647E-01	1.09	1.677E-01	1.0181	1.707E-01	1.0365
F23/F25	1.590E+00	1.89	1.568E+00	0.9861	1.567E+00	0.9857
F37/F25	8.370E-01	1.55	8.807E-01	1.0522	8.906E-01	1.0641
F49/F25	1.402E+00	1.78	1.391E+00	0.9921	1.394E+00	0.9943
GMN55/F25	2.700E-03	7.41	3.049E-03	1.1292	3.006E-03	1.1132
GC059/F25	3.800E-02	7.89	5.923E-03	0.1559	5.870E-03	0.1545
GCU/F25	1.170E-02	5.13	8.881E-03	0.7591	8.790E-03	0.7513
GNB93/F25	3.000E-02	10.00	3.003E-02	1.0010	2.958E-02	0.9860
GAU197/F25	1.000E-01	2.00	8.672E-02	0.8672	8.551E-02	0.8551
Central Reactivity Worths ($/kg)						
H-1	3.692E+02	12.50	3.473E+02	0.9408	3.638E+02	0.9853
BE-9	8.086E+00	14.89	7.539E+00	0.9323	7.960E+00	0.9844
B-10	-5.884E+01	5.26	-3.746E+01	0.6366	-4.910E+01	0.8345
C	2.065E+00	12.50	1.520E+00	0.7362	1.089E+00	0.5273
AL-27	1.724E-01	66.67	2.392E-01	1.3874	-5.683E-02	-0.3296
FE	-2.776E-02	200.00	8.531E-03	-0.3073	-2.378E-01	8.5671
CO-59	-1.052E-01	50.00	4.522E-03	-0.0430	-2.351E-01	2.2345
NI	-7.924E-01	6.67	-4.983E-01	0.6289	-9.074E-01	1.1451
CU	-2.928E-01	16.67	-4.471E-02	0.1527	-3.553E-01	1.2133
AU-197	-3.936E-01	4.00	-1.532E-01	0.3893	-4.077E-01	1.0358
TH-232	-6.013E-02	22.22	1.731E-01	-2.8793	3.086E-03	-0.0513
U-235	6.662E+00	0.99	5.175E+00	0.7768	6.527E+00	0.9798
U-238	1.055E+00	1.85	9.490E-01	0.8996	1.058E+00	1.0028
PU-239	1.254E+01	1.03	9.801E+00	0.7816	1.253E+01	0.9990
PU-240	7.427E+00	10.43	6.113E+00	0.8231	7.777E+00	1.0472

Godiva Leakage Flux Comparison

Fine Groups	Energy Boundary (eV)	Leth. Width	Measured Flux (n/cm²/s)	% Uncer.	Diffusion Theory Calculated Flux (n/cm²/s)	Diffusion Theory C/E	Transport Theory Calculated Flux (n/cm²/s)	Transport Theory C/E
4- 5	1.0000E+07	0.5	2.0	15.0	1.9232	0.9616	1.8255	0.9127
6- 7	6.0653E+06	0.5	7.8	5.1	8.0060	1.0264	7.7217	0.9900
8- 9	3.6788E+06	0.5	13.6	3.7	15.5820	1.1457	15.2334	1.1201
10-11	2.2313E+06	0.5	16.8	3.6	18.9112	1.1257	18.6916	1.1126
12-15	1.3533E+06	0.5	18.0	3.3	18.0000	1.0000	18.0000	1.0000
16-19	8.2085E+05	0.5	17.5	4.0	14.7528	0.8430	15.0717	0.8612
20-22	4.9787E+05	0.5	12.0	5.8	10.2845	0.8570	10.7501	0.8958
23-24	3.0197E+05	0.5	7.2	9.7	5.7404	0.7973	6.1062	0.8481
	1.8316E+05							

TABLE A-III

JEZEBEL-23 RESULTS

Parameter	Measured Value	% Uncer.	Diffusion Theory Calculated Value	Diffusion Theory C/E	Transport Theory Calculated Value	Transport Theory C/E
Miscellaneous Parameters						
Eigenvalue	1.000E+00	0.10	9.511E-01	0.9511	9.983E-01	0.9983
A (/S)	-1.000E+06	1.00	-8.785E+05	0.8785	-8.759E+05	0.8759
Beta	2.890E-03	1.20	2.888E-03	0.9993	2.866E-03	0.9917
L (S)	2.890E-09	1.20	3.287E-09	1.1374	3.272E-09	1.1323
R/IH			1.425E-05		1.413E-05	
Central Reaction Rate Ratios						
F28/F25	2.131E-01	1.08	2.091E-01	0.9814	2.120E-01	0.9951
F37/F25	9.770E-01	1.64	9.785E-01	1.0015	9.901E-01	1.0134
Central Reactivity Worths ($/kg)						
Void	4.350E+01	1.00	2.999E+01	0.6895	4.319E+01	0.9929

Jezebel-23 Leakage Flux Comparison

Fine Groups	Energy Boundary (eV)	Leth. Width	Measured Flux (n/cm²/s)	% Uncer.	Diffusion Theory Calculated Flux (n/cm²/s)	Diffusion Theory C/E	Transport Theory Calculated Flux (n/cm²/s)	Transport Theory C/E
4- 5	1.0000E+07	0.5	2.3	17.4	2.1445	0.9324	2.0980	0.9122
6- 7	6.0653E+06	0.5	11.0	5.4	9.6625	0.8784	9.5383	0.8671
8- 9	3.6788E+06	0.5	17.8	3.9	16.5568	0.9302	16.5309	0.9287
10-11	2.2313E+06	0.5	18.0	4.4	18.0000	1.0000	18.0000	1.0000
12-15	1.3533E+06	0.5	17.0	4.7	15.8258	0.9309	15.8785	0.9340
16-19	8.2085E+05	0.5	13.8	5.8	11.3242	0.8206	11.5421	0.8364
20-22	4.9787E+05	0.5	12.1	7.4	6.8826	0.5688	7.1559	0.5914
	3.0197E+05							

TABLE A-IV

BIGTEN RESULTS

Parameter	Measured Value	% Uncer.	Diffusion Theory Calculated Value	Diffusion Theory C/E	Transport Theory Calculated Value	Transport Theory C/E
Miscellaneous Parameters						
Eigenvalue	9.960E-01	0.30	1.006E+00	1.0096	1.011E+00	1.0147
A (/S)	-1.170E+05	0.85	-1.300E+05	1.1113	-1.306E+05	1.1161
Beta	7.222E-03	0.85	7.215E-03	0.9990	7.202E-03	0.9972
L (S)	6.173E-08	0.85	5.549E-08	0.8989	5.515E-08	0.8934
R/IH			2.040E-05		2.037E-05	
Central Reaction Rate Ratios						
F28/F25	3.730E-02	1.07	4.007E-02	1.0742	3.994E-02	1.0706
F37/F25	3.160E-01	1.58	3.584E-01	1.1341	3.578E-01	1.1322
F49/F25	1.185E+00	1.69	1.192E+00	1.0059	1.192E+00	1.0057
F23/F25	1.580E+00	1.90	1.560E+00	0.9872	1.560E+00	0.9872
G28/F25	1.100E-01	2.73	1.078E-01	0.9797	1.078E-01	0.9800
AL16/F25	7.100E-01	1.41	6.354E-01	0.8950	6.357E-01	0.8954
AB10/F25	1.011E+00	1.38	8.531E-01	0.8438	8.535E-01	0.8442
AAL27/F25	7.800E-05	2.56	9.044E-05	1.1595	9.028E-05	1.1574
GC059/F25	9.500E-03	2.11	9.065E-03	0.9542	9.068E-03	0.9545
GCU/F25	1.640E-02	6.10	1.427E-02	0.8704	1.428E-02	0.8707
GAU197/F25	1.670E-01	1.80	1.536E-01	0.9198	1.537E-01	0.9202
Central Reactivity Worths ($/kg)						
H-1	-1.789E+01	15.38	-1.887E+01	1.0547	-1.956E+01	1.0935
LI-6	-1.291E+01	1.79	-1.174E+01	0.9096	-1.186E+01	0.9186
LI-7	-2.768E-01	14.29	-4.055E-01	1.4651	-4.183E-01	1.5112
BE-9	-2.555E-01	2.41	-3.529E-01	1.3812	-3.681E-01	1.4409
B-10	-1.024E+01	0.41	-9.231E+00	0.9015	-9.317E+00	0.9099
B-11	-2.394E-01	5.26	-2.609E-01	1.0900	-2.698E-01	1.1270
C	-1.674E-01	2.75	-2.179E-01	1.3019	-2.257E-01	1.3482
O-16	-9.452E-02	6.42	-1.274E-01	1.3475	-1.326E-01	1.4030
AL-27	-6.991E-02	3.68	-9.647E-02	1.3800	-9.870E-02	1.4117
FE	-6.482E-02	2.68	-7.213E-02	1.1128	-7.320E-02	1.1292
AU-197	-1.246E-01	1.13	-1.237E-01	0.9931	-1.253E-01	1.0054
TH-232	-8.966E-02	6.67	-9.110E-02	1.0160	-9.235E-02	1.0301
U-233	1.482E+00	0.80	1.500E+00	1.0123	1.507E+00	1.0168
U-235	8.497E-01	0.69	8.566E-01	1.0081	8.599E-01	1.0120
U-238	-4.282E-02	0.95	-4.262E-02	0.9954	-4.364E-02	1.0191
NP-237	9.245E-02	5.70	1.583E-01	1.7118	1.565E-01	1.6929
PU-238	9.148E-01	2.55	9.701E-01	1.0605	9.731E-01	1.0637
PU-239	1.387E+00	0.42	1.396E+00	1.0064	1.402E+00	1.0108

Bigten Leakage Flux Comparison

Fine Groups	Energy Boundary (eV)	Leth. Width	Measured Flux (n/cm²/s)	% Uncer.	Diffusion Theory Calculated Flux (n/cm²/s)	Diffusion Theory C/E	Transport Theory Calculated Flux (n/cm²/s)	Transport Theory C/E
4- 5	1.0000E+07	0.5	0.0	0.0	0.3711		0.3704	
6- 7	6.0653E+06	0.5	1.7	25.0	1.7370	1.0217	1.7320	1.0188
8- 9	3.6788E+06	0.5	3.3	25.0	3.4902	1.0577	3.4784	1.0541
10-11	2.2313E+06	0.5	4.0	15.0	4.8479	1.2120	4.8307	1.2077
12-15	1.3533E+06	0.5	8.1	15.0	8.5414	1.0545	8.5246	1.0524
16-19	8.2085E+05	0.5	15.7	15.0	15.5244	0.9888	15.5245	0.9888
20-22	4.9787E+05	0.5	19.1	15.0	18.5949	0.9736	18.6096	0.9743
23-24	3.0197E+05	0.5	16.3	15.0	16.0220	0.9829	16.0354	0.9838
25-26	1.8316E+05	0.5	13.8	15.0	11.6048	0.8409	11.6136	0.8416
27-28	1.1109E+05	0.5	8.0	15.0	8.8836	1.1104	8.8905	1.1113
29-30	6.7379E+04	0.5	4.1	15.0	6.2977	1.5360	6.3029	1.5373
31-33	4.0868E+04	0.5	2.5	25.0	2.8338	1.1335	2.8358	1.1343
34-37	2.4787E+04	0.5	1.5	25.0	0.8862	0.5908	0.8866	0.5911
38-41	1.5034E+04	0.5	0.9	25.0	0.2439	0.2711	0.2440	0.2711
42-45	9.1188E+03	0.5	0.5	25.0	0.0721	0.1441	0.0720	0.1441
46-49	5.5308E+03	0.5	0.0	0.0	0.0212		0.0212	
	3.3546E+03							

TABLE A-V

JEZEBEL-PU RESULTS

Parameter	Measured Value	% Uncer.	Diffusion Theory Calculated Value	Diffusion Theory C/E	Transport Theory Calculated Value	Transport Theory C/E
Miscellaneous Parameters						
Eigenvalue	1.000E+00	0.20	9.528E-01	0.9528	1.002E+00	1.0023
A (/S)			-5.166E+05		-5.146E+05	
Beta			1.933E-03		1.927E-03	
L (S)			3.741E-09		3.744E-09	
R/IH			7.543E-06		7.522E-06	
Central Reaction Rate Ratios						
F28/F25	2.060E-01	1.46	1.869E-01	0.9071	1.902E-01	0.9234
F37/F25	9.200E-01	2.17	9.245E-01	1.0049	9.358E-01	1.0172
Central Reactivity Worth Ratios						
PU238/U235	2.010E+00	5.97	1.968E+00	0.9791	2.006E+00	0.9980
PU239/U235	1.990E+00	3.52	1.914E+00	0.9619	1.951E+00	0.9802
CM244/U235	1.820E+00	5.49	1.901E+00	1.0446	1.951E+00	1.0719

TABLE A-VI

FLATTOP-25 RESULTS

Parameter	Measured Value	% Uncer.	Diffusion Theory Calculated Value	Diffusion Theory C/E	Transport Theory Calculated Value	Transport Theory C/E
Miscellaneous Parameters						
Eigenvalue	1.000E+00	0.10	9.144E-01	0.9144	1.015E+00	1.0149
A (/S)	-3.800E+05	2.63	-2.712E+05	0.7137	-4.218E+05	1.1100
Beta	6.650E-03	2.63	3.623E-03	0.5448	6.999E-03	1.0525
L (S)	1.750E-08	2.63	1.336E-08	0.7634	1.659E-08	0.9480
R/IH			1.058E-05		2.292E-05	
Central Reaction Rate Ratios						
F23/F25	1.600E+00	1.88	1.570E+00	0.9813	1.568E+00	0.9801
F28/F25	1.490E-01	1.34	1.439E-01	0.9660	1.547E-01	1.0382
F37/F25	7.600E-01	1.32	7.878E-01	1.0366	8.257E-01	1.0865
F49/F25	1.370E+00	1.46	1.359E+00	0.9919	1.371E+00	1.0009
Central Reactivity Worths ($/kg)						
U-233	1.497E+01	1.29	1.749E+01	1.1685	1.370E+01	0.9151
U-235	8.509E+00	1.50	9.693E+00	1.1391	7.991E+00	0.9391
U-238	1.080E+00	3.51	-8.846E-01	-0.8191	1.028E+00	0.9515
NP-237	7.232E+00	1.75	6.426E+00	0.8886	7.757E+00	1.0726
PU-238	1.421E+01	1.33	1.650E+01	1.1608	1.511E+01	1.0630
PU-239	1.591E+01	0.79	1.794E+01	1.1278	1.528E+01	0.9605
PU-242	7.455E+00	2.50	6.190E+00	0.8304	7.300E+00	0.9792
AM-241	8.422E+00	0.74	7.920E+00	0.9404	9.157E+00	1.0873

TABLE A-VII

FLATTOP-PU RESULTS

Parameter	Measured Value	% Uncer.	Diffusion Theory Calculated Value	Diffusion Theory C/E	Transport Theory Calculated Value	Transport Theory C/E
Miscellaneous Parameters						
Eigenvalue	1.000E+00	0.10	8.492E-01	0.8492	1.021E+00	1.0207
A (/S)	-2.140E+05	2.34	-1.129E+05	0.5277	-2.121E+05	0.9910
Beta	2.761E-03	2.34	4.820E-03	1.7457	2.819E-03	1.0210
L (S)	1.290E-08	2.34	4.268E-08	3.3085	1.329E-08	1.0302
R/IH			1.297E-05		9.270E-06	
Central Reaction Rate Ratios						
F28/F25	1.800E-01	1.67	1.474E-01	0.8189	1.693E-01	0.9408
F37/F25	8.400E-01	1.19	7.761E-01	0.9239	8.516E-01	1.0138
Central Reactivity Worths ($/kg)						
U-235	3.667E+01	1.26	1.263E+01	0.3445	3.469E+01	0.9460
U-238	2.206E+00	2.76	1.024E+00	0.4642	3.211E+00	1.4554
NP-237	3.392E+01	1.35	1.043E+01	0.3075	3.294E+01	0.9712
PU-238	6.223E+01	1.47	2.176E+01	0.3497	6.604E+01	1.0613
PU-239	6.848E+01	0.44	2.277E+01	0.3325	6.658E+01	0.9723
PU-242	3.352E+01	1.79	9.809E+00	0.2926	3.124E+01	0.9321
AM-241	4.207E+01	0.71	1.245E+01	0.2959	4.056E+01	0.9642

TABLE A-VIII

FLATTOP-23 RESULTS

Parameter	Measured Value	% Uncer.	Diffusion Theory Calculated Value	Diffusion Theory C/E	Transport Theory Calculated Value	Transport Theory C/E
Miscellaneous Parameters						
Eigenvalue	1.000E+00	0.10	8.451E-01	0.8451	1.014E+00	1.0145
A (/S)	-2.670E+05	1.87	-2.170E+05	0.8128	-2.826E+05	1.0584
Beta	3.645E-03	1.87	4.546E-03	1.2472	3.734E-03	1.0244
L (S)	1.365E-08	1.87	2.095E-08	1.5348	1.321E-08	0.9678
R/IH			1.687E-05		1.531E-05	
Central Reaction Rate Ratios						
F28/F25	1.910E-01	1.57	1.661E-01	0.8697	1.897E-01	0.9930
F37/F25	8.900E-01	1.12	8.393E-01	0.9431	9.153E-01	1.0284
Central Reactivity Worths ($/kg)						
Void	4.720E+01	0.74	3.145E+01	0.6664	4.464E+01	0.9457

TABLE A-IX

THOR RESULTS

Parameter	Measured Value	% Uncer.	Diffusion Theory Calculated Value	Diffusion Theory C/E	Transport Theory Calculated Value	Transport Theory C/E
Miscellaneous Parameters						
Eigenvalue	1.000E+00	0.10	7.691E-01	0.7691	1.027E+00	1.0266
A (/S)	-1.970E+05	5.08	-1.189E+05	0.6036	-1.746E+05	0.8861
Beta			2.533E-03		2.116E-03	
L (S)			2.131E-08		1.212E-08	
R/IH			9.567E-06		8.233E-06	
Central Reaction Rate Ratios						
F28/F25	1.950E-01	1.54	1.648E-01	0.8451	1.790E-01	0.9180
F37/F25	9.200E-01	2.17	8.317E-01	0.9040	8.854E-01	0.9623
F02/F28	2.600E-01	3.85	2.458E-01	0.9453	2.473E-01	0.9511
G28/F25	8.300E-02	3.61	7.440E-02	0.8964	7.090E-02	0.8543
2N28/F28	5.300E-02	5.66	5.532E-02	1.0437	6.407E-02	1.2089
G02/G28	1.200E+00	5.00	1.274E+00	1.0616	1.282E+00	1.0679
2N02/2N28	1.040E+00	2.88	1.013E+00	0.9736	1.022E+00	0.9831
Central Reactivity Worths ($/kg)						
Void	6.641E+01	1.94	6.118E+01	0.9212	7.073E+01	1.0651

TABLE A-X

JEZEBEL 70-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.9315E-01	9.2450E-06	6.7582E-06	1.9162E+00	1.8944E-06	5.3884E-01
2	1.6487E+07	2.5000E-01	1.6364E-04	1.2057E-04	1.8021E+00	3.3437E-05	5.0108E-01
3	1.2840E+07	2.5000E-01	1.4245E-03	1.0751E-03	1.5118E+00	3.0097E-04	4.2477E-01
4	1.0000E+07	2.5000E-01	6.9441E-03	5.3239E-03	1.4307E+00	1.4738E-03	3.9715E-01
5	7.7880E+06	2.5000E-01	2.1484E-02	1.6057E-02	1.2550E+00	4.3528E-03	3.4085E-01
6	6.0653E+06	2.5000E-01	4.6658E-02	3.3986E-02	1.0587E+00	9.0023E-03	2.8092E-01
7	4.7237E+06	2.5000E-01	7.7080E-02	5.6186E-02	1.0342E+00	1.4707E-02	2.7107E-01
8	3.6788E+06	2.5000E-01	1.0321E-01	7.5715E-02	1.0370E+00	1.9607E-02	2.6884E-01
9	2.8650E+06	2.5000E-01	1.1773E-01	8.9152E-02	1.0413E+00	2.2861E-02	2.6727E-01
10	2.2313E+06	2.5000E-01	1.1889E-01	9.4681E-02	1.0398E+00	2.4146E-02	2.6538E-01
11	1.7377E+06	2.5000E-01	1.0950E-01	9.4610E-02	1.0127E+00	2.4060E-02	2.5761E-01
12	1.3533E+06	1.2500E-01	4.9176E-02	4.6015E-02	9.8039E-01	1.1691E-02	2.4901E-01
13	1.1943E+06	1.2500E-01	4.4947E-02	4.4910E-02	9.4879E-01	1.1392E-02	2.4046E-01
14	1.0540E+06	1.2500E-01	4.0564E-02	4.3305E-02	9.3388E-01	1.0919E-02	2.3512E-01
15	9.3014E+05	1.2500E-01	3.6246E-02	4.1262E-02	9.2957E-01	1.0322E-02	2.3208E-01
16	8.2085E+05	1.2500E-01	3.2095E-02	3.8831E-02	9.2313E-01	9.6300E-03	2.2843E-01
17	7.2440E+05	1.2500E-01	2.8167E-02	3.6521E-02	8.9818E-01	8.9849E-03	2.2040E-01
18	6.3928E+05	1.2500E-01	2.4577E-02	3.3836E-02	8.9485E-01	8.2455E-03	2.1742E-01
19	5.6416E+05	1.2500E-01	2.1310E-02	3.1115E-02	8.9001E-01	7.4996E-03	2.1391E-01
20	4.9787E+05	1.2500E-01	1.8362E-02	2.8378E-02	8.8879E-01	6.7552E-03	2.1107E-01
21	4.3937E+05	1.2500E-01	1.5751E-02	2.5542E-02	8.8980E-01	5.9982E-03	2.0849E-01
22	3.8774E+05	2.5000E-01	2.4958E-02	4.3013E-02	8.9035E-01	9.9180E-03	2.0502E-01
23	3.0197E+05	2.5000E-01	1.7987E-02	3.3106E-02	8.9081E-01	7.4596E-03	2.0056E-01
24	2.3518E+05	2.5000E-01	1.2825E-02	2.4922E-02	8.9743E-01	5.4837E-03	1.9738E-01
25	1.8316E+05	2.5000E-01	9.0625E-03	1.8649E-02	9.2160E-01	3.9790E-03	1.9679E-01
26	1.4264E+05	2.5000E-01	6.3747E-03	1.3416E-02	9.6570E-01	2.7758E-03	2.0027E-01
27	1.1109E+05	2.5000E-01	4.4622E-03	9.6789E-03	9.7663E-01	1.9478E-03	1.9735E-01
28	8.6517E+04	2.5000E-01	3.1077E-03	6.7260E-03	9.9195E-01	1.3218E-03	1.9611E-01
29	6.7379E+04	2.5000E-01	2.1510E-03	4.5362E-03	1.0167E+00	8.7387E-04	1.9738E-01
30	5.2475E+04	2.5000E-01	1.4857E-03	3.1591E-03	1.0037E+00	5.9767E-04	1.9142E-01
31	4.0868E+04	2.5000E-01	1.0249E-03	2.1395E-03	1.0204E+00	3.9896E-04	1.9204E-01
32	3.1828E+04	1.2500E-01	3.8589E-04	7.8171E-04	1.0231E+00	1.4452E-04	1.9107E-01
33	2.8088E+04	1.2500E-01	3.2021E-04	6.3431E-04	1.0155E+00	1.1680E-04	1.8905E-01
34	2.4787E+04	1.2500E-01	2.6567E-04	5.0682E-04	1.0061E+00	9.4078E-05	1.8888E-01
35	2.1875E+04	1.2500E-01	2.2039E-04	4.1001E-04	1.0070E+00	7.6076E-05	1.8893E-01
36	1.9304E+04	1.2500E-01	1.8279E-04	3.3361E-04	1.0049E+00	6.1846E-05	1.8834E-01
37	1.7036E+04	1.2500E-01	1.5160E-04	2.7434E-04	1.0015E+00	5.0824E-05	1.8751E-01
38	1.5034E+04	1.2500E-01	1.2572E-04	2.2681E-04	9.9840E-01	4.1950E-05	1.8671E-01
39	1.3268E+04	1.2500E-01	1.0424E-04	1.8204E-04	1.0009E+00	3.3588E-05	1.8684E-01
40	1.1709E+04	1.2497E-01	8.6410E-05	1.4650E-04	1.0055E+00	2.6975E-05	1.8738E-01
41	1.0333E+04	1.2503E-01	7.1677E-05	1.1500E-04	1.0196E+00	2.1087E-05	1.8942E-01
42	9.1188E+03	1.2500E-01	5.9407E-05	8.6862E-05	1.0764E+00	1.5872E-05	1.9990E-01
43	8.0473E+03	1.2500E-01	4.9250E-05	6.7152E-05	1.0208E+00	1.2238E-05	1.8925E-01
44	7.1017E+03	1.2500E-01	4.0827E-05	5.4265E-05	9.5115E-01	9.8782E-06	1.7584E-01
45	6.2673E+03	1.2500E-01	3.3844E-05	4.1790E-05	1.0038E+00	7.5945E-06	1.8565E-01
46	5.5308E+03	1.2500E-01	2.8055E-05	3.3088E-05	9.7588E-01	6.0158E-06	1.8039E-01
47	4.8809E+03	1.2500E-01	2.3255E-05	2.7207E-05	9.9301E-01	4.9644E-06	1.8422E-01
48	4.3074E+03	1.2500E-01	1.9277E-05	2.1336E-05	9.9472E-01	3.9012E-06	1.8484E-01
49	3.8013E+03	1.2500E-01	1.5979E-05	1.6640E-05	1.1166E+00	3.0586E-06	2.0665E-01
50	3.3546E+03	1.2500E-01	1.3245E-05	1.3193E-05	1.1564E+00	2.4113E-06	2.1471E-01
51	2.9604E+03	1.2500E-01	1.0979E-05	1.1324E-05	1.1433E+00	2.0593E-06	2.1184E-01
52	2.6126E+03	1.2500E-01	9.1003E-06	8.7692E-06	1.0315E+00	1.6193E-06	1.9439E-01
53	2.3056E+03	1.2500E-01	7.5433E-06	6.8545E-06	9.0737E-01	1.2678E-06	1.7034E-01
54	2.0347E+03	1.2500E-01	6.2524E-06	5.4646E-06	1.0069E+00	1.0102E-06	1.8919E-01
55	1.7956E+03	1.2500E-01	5.1827E-06	4.3804E-06	1.0006E+00	8.1482E-07	1.8884E-01
56	1.5846E+03	1.2500E-01	4.2957E-06	3.8110E-06	1.1299E+00	7.0483E-07	2.1195E-01
57	1.3984E+03	1.2500E-01	3.5609E-06	2.6182E-06	1.4236E+00	4.8593E-07	2.6874E-01
58	1.2341E+03	1.2500E-01	2.9516E-06	2.0633E-06	1.2438E+00	3.9034E-07	2.3840E-01
59	1.0891E+03	1.2500E-01	2.4467E-06	1.5418E-06	1.3759E+00	2.9642E-07	2.6840E-01
60	9.6112E+02	2.5000E-01	3.7091E-06	2.5581E-06	1.2378E+00	4.8540E-07	2.3754E-01
61	7.4852E+02	2.5000E-01	2.5485E-06	1.7582E-06	1.0847E+00	3.3760E-07	2.1053E-01
62	5.8295E+02	2.5000E-01	1.7512E-06	8.3248E-07	1.6020E+00	1.6532E-07	3.2174E-01
63	4.5400E+02	2.5000E-01	1.2033E-06	7.6074E-07	1.4266E+00	1.4376E-07	2.7162E-01
64	3.5357E+02	2.5000E-01	8.2683E-07	4.1406E-07	1.3207E+00	7.7003E-08	2.4862E-01
65	2.7536E+02	2.5000E-01	5.6818E-07	1.7454E-07	1.5413E+00	3.2094E-08	2.8715E-01
66	2.1445E+02	2.5000E-01	3.9043E-07	1.6293E-07	1.5328E+00	3.0315E-08	2.8767E-01
67	1.6702E+02	2.5000E-01	2.6830E-07	1.0430E-07	1.5735E+00	1.9625E-08	2.9964E-01
68	1.3007E+02	2.5000E-01	1.8437E-07	5.9515E-08	1.4775E+00	1.0900E-08	2.7305E-01
69	1.0130E+02	5.0000E-01	2.1378E-07	3.9674E-08	2.0549E+00	7.2878E-09	3.8203E-01
70	6.1442E+01	1.7500E+00	1.9134E-07	4.1138E-08	1.7109E+00	8.1627E-09	3.4278E-01
	1.0677E+01		1.0000E+00	1.0000E+00		2.4748E-01	

TABLE A-XI

JEZEBEL 25-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.1931E+00	3.0026E-02	2.2583E-02	2.8981E+00	6.1629E-03	8.0644E-01
2	6.0653E+06	5.0000E-01	1.2374E-01	9.0173E-02	7.6626E-01	2.3709E-02	2.0209E-01
3	3.6788E+06	5.0000E-01	2.2095E-01	1.6487E-01	7.6091E-01	4.2468E-02	1.9628E-01
4	2.2313E+06	5.0000E-01	2.2839E-01	1.8929E-01	7.5147E-01	4.8206E-02	1.9148E-01
5	1.3533E+06	5.0000E-01	1.7093E-01	1.7549E-01	1.3885E+00	4.4325E-02	3.5026E-01
6	8.2085E+05	5.0000E-01	1.0615E-01	1.4030E-01	1.3203E+00	3.4360E-02	3.2224E-01
7	4.9787E+05	5.0000E-01	5.9072E-02	9.6933E-02	9.7714E-01	2.2671E-02	2.2867E-01
8	3.0197E+05	5.0000E-01	3.0812E-02	5.8028E-02	6.5471E-01	1.2943E-02	1.4569E-01
9	1.8316E+05	5.0000E-01	1.5437E-02	3.2066E-02	6.9097E-01	6.7547E-03	1.4537E-01
10	1.1109E+05	5.0000E-01	7.5699E-03	1.6405E-02	7.2073E-01	3.2696E-03	1.4405E-01
11	6.7379E+04	5.0000E-01	3.6368E-03	7.6954E-03	7.3972E-01	1.4715E-03	1.4235E-01
12	4.0868E+04	5.0000E-01	1.7310E-03	3.5555E-03	1.1199E+00	6.6028E-04	2.0948E-01
13	2.4787E+04	5.0000E-01	8.2045E-04	1.5248E-03	1.4716E+00	2.8282E-04	2.7593E-01
14	1.5034E+04	5.0000E-01	3.8804E-04	6.7035E-04	1.4734E+00	1.2360E-04	2.7472E-01
15	9.1188E+03	5.0000E-01	1.8333E-04	2.5007E-04	1.4836E+00	4.5582E-05	2.7482E-01
16	5.5308E+03	5.0000E-01	8.6565E-05	9.8272E-05	1.4938E+00	1.7940E-05	2.7755E-01
17	3.3546E+03	5.0000E-01	4.0867E-05	4.0141E-05	1.5518E+00	7.3577E-06	2.8970E-01
18	2.0347E+03	5.0000E-01	1.9292E-05	1.6274E-05	1.6699E+00	3.0158E-06	3.1439E-01
19	1.2341E+03	5.0000E-01	9.1074E-06	6.1633E-06	1.4123E+00	1.1722E-06	2.7252E-01
20	7.4852E+02	5.0000E-01	4.2997E-06	2.5907E-06	9.8363E-01	5.0293E-07	1.9487E-01
21	4.5400E+02	5.0000E-01	2.0301E-06	1.1748E-06	1.0059E+00	2.2076E-07	1.9047E-01
22	2.7536E+02	5.0000E-01	9.5861E-07	3.3748E-07	1.1255E+00	6.2409E-08	2.1045E-01
23	1.6702E+02	5.0000E-01	4.5267E-07	1.6382E-07	1.1170E+00	3.0526E-08	2.0967E-01
24	1.0130E+02	5.0000E-01	2.1378E-07	3.9674E-08	7.5234E-01	7.2878E-09	1.3987E-01
25	6.1442E+01	1.7500E+00	1.9134E-07	4.1138E-08	6.2639E-01	8.1627E-09	1.2548E-01
	1.0677E+01		1.0000E+00	1.0000E+00		2.4748E-01	

TABLE A-XII

GODIVA 70-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.9315E-01	7.5113E-06	4.7366E-06	2.1307E+00	1.1430E-06	5.1922E-01
2	1.6487E+07	2.5000E-01	1.3537E-04	8.3890E-05	2.0079E+00	1.9764E-05	4.7689E-01
3	1.2840E+07	2.5000E-01	1.2037E-03	7.6020E-04	1.6723E+00	1.7975E-04	3.9886E-01
4	1.0000E+07	2.5000E-01	6.0041E-03	3.8733E-03	1.5675E+00	9.0338E-04	3.6775E-01
5	7.7880E+06	2.5000E-01	1.9026E-02	1.2082E-02	1.3105E+00	2.7551E-03	3.0004E-01
6	6.0653E+06	2.5000E-01	4.2329E-02	2.6124E-02	1.0052E+00	5.7819E-03	2.2348E-01
7	4.7237E+06	2.5000E-01	7.1598E-02	4.4723E-02	9.9821E-01	9.6933E-03	2.1734E-01
8	3.6788E+06	2.5000E-01	9.8051E-02	6.4088E-02	1.0060E+00	1.3695E-02	2.1601E-01
9	2.8650E+06	2.5000E-01	1.1421E-01	7.9928E-02	1.0126E+00	1.6834E-02	2.1426E-01
10	2.2313E+06	2.5000E-01	1.1756E-01	8.8377E-02	1.0007E+00	1.8432E-02	2.0946E-01
11	1.7377E+06	2.5000E-01	1.1014E-01	9.1587E-02	9.6885E-01	1.9028E-02	2.0165E-01
12	1.3533E+06	1.2500E-01	5.0064E-02	4.5580E-02	9.4479E-01	9.4391E-03	1.9554E-01
13	1.1943E+06	1.2500E-01	4.6150E-02	4.4698E-02	9.4008E-01	9.2105E-03	1.9322E-01
14	1.0540E+06	1.2500E-01	4.1981E-02	4.3384E-02	9.4079E-01	8.8719E-03	1.9148E-01
15	9.3014E+05	1.2500E-01	3.7822E-02	4.2222E-02	9.2904E-01	8.5524E-03	1.8696E-01
16	8.2085E+05	1.2500E-01	3.3754E-02	4.0821E-02	9.2965E-01	8.1677E-03	1.8448E-01
17	7.2440E+05	1.2500E-01	2.9755E-02	3.9088E-02	9.3408E-01	7.7134E-03	1.8277E-01
18	6.3928E+05	1.2500E-01	2.6155E-02	3.8109E-02	9.3787E-01	7.4128E-03	1.8120E-01
19	5.6416E+05	1.2500E-01	2.2835E-02	3.6137E-02	9.5271E-01	6.9114E-03	1.8089E-01
20	4.9787E+05	1.2500E-01	1.9779E-02	3.3619E-02	9.7032E-01	6.3233E-03	1.8108E-01
21	4.3937E+05	1.2500E-01	1.7054E-02	3.0942E-02	9.8874E-01	5.7199E-03	1.8148E-01
22	3.8774E+05	2.5000E-01	2.7146E-02	5.2726E-02	1.0148E+00	9.5013E-03	1.8190E-01
23	3.0197E+05	2.5000E-01	1.9708E-02	4.0820E-02	1.0475E+00	7.1203E-03	1.8214E-01
24	2.3518E+05	2.5000E-01	1.4138E-02	3.0303E-02	1.0897E+00	5.1173E-03	1.8402E-01
25	1.8316E+05	2.5000E-01	1.0104E-02	2.1991E-02	1.1356E+00	3.5687E-03	1.8486E-01
26	1.4264E+05	2.5000E-01	7.1135E-03	1.5589E-02	1.1759E+00	2.4312E-03	1.8476E-01
27	1.1109E+05	2.5000E-01	5.0005E-03	1.1008E-02	1.2066E+00	1.6585E-03	1.8413E-01
28	8.6517E+04	2.5000E-01	3.4810E-03	7.5989E-03	1.2422E+00	1.1100E-03	1.8535E-01
29	6.7379E+04	2.5000E-01	2.4034E-03	5.0071E-03	1.2734E+00	7.1434E-04	1.8668E-01
30	5.2475E+04	2.5000E-01	1.6556E-03	3.3791E-03	1.2747E+00	4.7213E-04	1.8355E-01
31	4.0868E+04	2.5000E-01	1.1391E-03	2.0980E-03	1.2966E+00	2.8946E-04	1.8463E-01
32	3.1828E+04	1.2500E-01	4.2816E-04	7.0513E-04	1.3225E+00	9.6833E-05	1.8748E-01
33	2.8088E+04	1.2500E-01	3.5494E-04	5.6507E-04	1.3251E+00	7.7235E-05	1.8685E-01
34	2.4787E+04	1.2500E-01	2.9421E-04	4.2427E-04	1.3330E+00	5.7804E-05	1.8777E-01
35	2.1875E+04	1.2500E-01	2.4385E-04	3.4081E-04	1.3322E+00	4.6430E-05	1.8729E-01
36	1.9304E+04	1.2500E-01	2.0208E-04	2.7003E-04	1.3765E+00	3.6810E-05	1.9375E-01
37	1.7036E+04	1.2500E-01	1.6746E-04	2.1795E-04	1.3589E+00	2.9720E-05	1.9083E-01
38	1.5034E+04	1.2500E-01	1.3877E-04	1.6529E-04	1.4093E+00	2.2537E-05	1.9840E-01
39	1.3268E+04	1.2500E-01	1.1498E-04	1.3103E-04	1.3778E+00	1.7873E-05	1.9364E-01
40	1.1709E+04	1.2497E-01	9.5249E-05	9.9368E-05	1.4028E+00	1.3544E-05	1.9747E-01
41	1.0333E+04	1.2503E-01	7.8959E-05	7.6688E-05	1.4208E+00	1.0469E-05	2.0049E-01
42	9.1188E+03	1.2500E-01	6.5403E-05	5.7805E-05	1.3821E+00	7.8930E-06	1.9501E-01
43	8.0473E+03	1.2500E-01	5.4189E-05	4.3791E-05	1.4187E+00	5.9760E-06	2.0054E-01
44	7.1017E+03	1.2500E-01	4.4898E-05	3.3774E-05	1.4478E+00	4.6233E-06	2.0525E-01
45	6.2673E+03	1.2500E-01	3.7200E-05	2.4951E-05	1.4626E+00	3.4303E-06	2.0826E-01
46	5.5308E+03	1.2500E-01	3.0822E-05	1.9964E-05	1.5600E+00	2.7519E-06	2.2252E-01
47	4.8809E+03	1.2500E-01	2.5537E-05	1.5613E-05	1.5466E+00	2.1576E-06	2.2121E-01
48	4.3074E+03	1.2500E-01	2.1160E-05	1.1947E-05	1.5960E+00	1.6574E-06	2.2915E-01
49	3.8013E+03	1.2500E-01	1.7532E-05	1.0223E-05	1.6140E+00	1.4224E-06	2.3187E-01
50	3.3546E+03	1.2500E-01	1.4527E-05	7.4913E-06	1.6143E+00	1.0455E-06	2.3306E-01
51	2.9604E+03	1.2500E-01	1.2037E-05	6.0601E-06	1.6533E+00	8.4702E-07	2.3869E-01
52	2.6126E+03	1.2500E-01	9.9742E-06	4.6769E-06	1.6135E+00	6.5817E-07	2.3512E-01
53	2.3056E+03	1.2500E-01	8.2650E-06	3.5714E-06	1.5105E+00	5.0509E-07	2.2074E-01
54	2.0347E+03	1.2500E-01	6.8486E-06	2.6869E-06	1.5462E+00	3.8726E-07	2.3128E-01
55	1.7956E+03	1.2500E-01	5.6752E-06	2.0668E-06	1.6275E+00	2.9724E-07	2.4104E-01
56	1.5846E+03	1.2500E-01	4.7027E-06	1.8177E-06	1.5590E+00	2.6144E-07	2.3115E-01
57	1.3984E+03	1.2500E-01	3.8973E-06	1.2764E-06	1.6379E+00	1.8668E-07	2.4690E-01
58	1.2341E+03	1.2500E-01	3.2297E-06	9.3625E-07	1.6114E+00	1.3993E-07	2.4870E-01
59	1.0891E+03	1.2500E-01	2.6766E-06	8.1954E-07	1.3904E+00	1.2140E-07	2.1221E-01
60	9.6112E+02	2.5000E-01	4.0564E-06	1.1278E-06	1.4726E+00	1.6933E-07	2.2684E-01
61	7.4852E+02	2.5000E-01	2.7861E-06	6.5535E-07	1.6087E+00	1.0239E-07	2.5891E-01
62	5.8295E+02	2.5000E-01	1.9138E-06	3.7751E-07	1.7144E+00	6.1159E-08	2.8379E-01
63	4.5400E+02	2.5000E-01	1.3146E-06	2.8998E-07	1.6235E+00	4.5868E-08	2.6210E-01
64	3.5357E+02	2.5000E-01	9.0310E-07	1.8848E-07	1.5451E+00	3.0369E-08	2.5451E-01
65	2.7536E+02	2.5000E-01	6.2044E-07	1.0295E-07	1.6239E+00	1.7878E-08	2.8811E-01
66	2.1445E+02	2.5000E-01	4.2626E-07	7.4411E-08	1.5089E+00	1.2288E-08	2.5441E-01
67	1.6702E+02	2.5000E-01	2.9286E-07	5.0942E-08	1.4781E+00	8.5723E-09	2.5403E-01
68	1.3007E+02	2.5000E-01	2.0122E-07	3.4602E-08	1.4545E+00	5.7398E-09	2.4602E-01
69	1.0130E+02	5.0000E-01	2.3327E-07	3.8575E-08	1.5198E+00	6.2529E-09	2.5099E-01
70	6.1442E+01	1.7500E+00	2.0869E-07	1.7697E-08	1.6925E+00	2.7125E-09	2.6787E-01
	1.0677E+01		1.0000E+00	1.0000E+00		1.9807E-01	

TABLE A-XIII

GODIVA 25-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.1931E+00	2.6377E-02	1.6804E-02	3.1389E+00	3.8591E-03	7.4517E-01
2	6.0653E+06	5.0000E-01	1.1393E-01	7.0846E-02	7.2372E-01	1.5475E-02	1.5924E-01
3	3.6788E+06	5.0000E-01	2.1226E-01	1.4402E-01	7.2921E-01	3.0529E-02	1.5544E-01
4	2.2313E+06	5.0000E-01	2.2770E-01	1.7996E-01	7.1151E-01	3.7460E-02	1.4851E-01
5	1.3533E+06	5.0000E-01	1.7602E-01	1.7588E-01	1.3564E+00	3.6074E-02	2.7715E-01
6	8.2085E+05	5.0000E-01	1.1250E-01	1.5415E-01	1.3562E+00	3.0205E-02	2.6347E-01
7	4.9787E+05	5.0000E-01	6.3979E-02	1.1729E-01	1.0743E+00	2.1544E-02	1.9668E-01
8	3.0197E+05	5.0000E-01	3.3846E-02	7.1123E-02	7.7207E-01	1.2238E-02	1.3228E-01
9	1.8316E+05	5.0000E-01	1.7218E-02	3.7580E-02	8.3503E-01	5.9999E-03	1.3352E-01
10	1.1109E+05	5.0000E-01	8.4814E-03	1.8607E-02	8.8466E-01	2.7685E-03	1.3347E-01
11	6.7379E+04	5.0000E-01	4.0590E-03	8.3862E-03	9.2051E-01	1.1865E-03	1.3374E-01
12	4.0868E+04	5.0000E-01	1.9222E-03	3.3682E-03	1.4249E+00	4.6353E-04	2.0192E-01
13	2.4787E+04	5.0000E-01	9.0760E-04	1.2531E-03	1.9510E+00	1.7076E-04	2.7442E-01
14	1.5034E+04	5.0000E-01	4.2795E-04	4.7237E-04	2.0268E+00	6.4423E-05	2.8539E-01
15	9.1188E+03	5.0000E-01	2.0169E-04	1.6032E-04	2.0632E+00	2.1923E-05	2.9227E-01
16	5.5308E+03	5.0000E-01	9.5051E-05	5.7746E-05	2.2819E+00	7.9894E-06	3.2684E-01
17	3.3546E+03	5.0000E-01	4.4803E-05	2.1800E-05	2.3090E+00	3.0557E-06	3.3510E-01
18	2.0347E+03	5.0000E-01	2.1124E-05	7.8477E-06	2.3014E+00	1.1326E-06	3.4332E-01
19	1.2341E+03	5.0000E-01	9.9627E-06	2.8836E-06	1.6164E+00	4.3067E-07	2.4845E-01
20	7.4852E+02	5.0000E-01	4.6999E-06	1.0329E-06	1.2005E+00	1.6354E-07	1.9605E-01
21	4.5400E+02	5.0000E-01	2.2177E-06	4.7846E-07	1.1447E+00	7.6237E-08	1.8663E-01
22	2.7536E+02	5.0000E-01	1.0467E-06	1.7736E-07	1.1317E+00	3.0166E-08	1.9598E-01
23	1.6702E+02	5.0000E-01	4.9409E-07	8.5544E-08	1.0594E+00	1.4312E-08	1.8064E-01
24	1.0130E+02	5.0000E-01	2.3327E-07	3.8575E-08	5.4903E-01	6.2529E-09	9.0670E-02
25	6.1442E+01	1.7500E+00	2.0869E-07	1.7697E-08	6.1142E-01	2.7125E-09	9.6767E-02
	1.0677E+01		1.0000E+00	1.0000E+00		1.9807E-01	

TABLE A-XIV

JEZEBEL-23 70-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.9315E-01	8.0284E-06	6.5161E-06	1.7667E+00	1.7707E-06	4.8187E-01
2	1.6487E+07	2.5000E-01	1.4658E-04	1.1755E-04	1.6860E+00	3.1434E-05	4.5215E-01
3	1.2840E+07	2.5000E-01	1.3038E-03	1.0520E-03	1.4872E+00	2.8315E-04	4.0151E-01
4	1.0000E+07	2.5000E-01	6.4665E-03	5.3046E-03	1.3908E+00	1.4280E-03	3.7521E-01
5	7.7880E+06	2.5000E-01	2.0307E-02	1.6456E-02	1.2354E+00	4.3823E-03	3.2952E-01
6	6.0653E+06	2.5000E-01	4.4694E-02	3.8029E-02	9.6578E-01	1.0124E-02	2.5769E-01
7	4.7237E+06	2.5000E-01	7.4739E-02	6.3064E-02	9.8852E-01	1.6292E-02	2.5586E-01
8	3.6788E+06	2.5000E-01	1.0119E-01	8.4792E-02	1.0163E+00	2.1409E-02	2.5693E-01
9	2.8650E+06	2.5000E-01	1.1658E-01	9.7441E-02	1.0210E+00	2.4373E-02	2.5557E-01
10	2.2313E+06	2.5000E-01	1.1875E-01	1.0077E-01	1.0038E+00	2.5203E-02	2.5107E-01
11	1.7377E+06	2.5000E-01	1.1016E-01	9.7648E-02	9.6959E-01	2.4648E-02	2.4464E-01
12	1.3533E+06	1.2500E-01	4.9707E-02	4.6428E-02	9.4277E-01	1.1787E-02	2.3919E-01
13	1.1943E+06	1.2500E-01	4.5560E-02	4.4537E-02	9.2835E-01	1.1331E-02	2.3605E-01
14	1.0540E+06	1.2500E-01	4.1228E-02	4.2420E-02	9.1992E-01	1.0783E-02	2.3372E-01
15	9.3014E+05	1.2500E-01	3.6927E-02	3.9854E-02	9.2051E-01	1.0075E-02	2.3256E-01
16	8.2085E+05	1.2500E-01	3.2769E-02	3.6938E-02	9.2710E-01	9.2629E-03	2.3228E-01
17	7.2440E+05	1.2500E-01	2.8800E-02	3.3906E-02	9.4003E-01	8.4048E-03	2.3269E-01
18	6.3928E+05	1.2500E-01	2.5170E-02	3.0927E-02	9.5789E-01	7.5610E-03	2.3370E-01
19	5.6416E+05	1.2500E-01	2.1862E-02	2.7930E-02	9.7807E-01	6.7367E-03	2.3529E-01
20	4.9787E+05	1.2500E-01	1.8870E-02	2.5059E-02	9.9978E-01	5.9618E-03	2.3714E-01
21	4.3937E+05	1.2500E-01	1.6212E-02	2.2360E-02	1.0213E+00	5.2468E-03	2.3891E-01
22	3.8774E+05	2.5000E-01	2.5677E-02	3.7439E-02	1.0469E+00	8.6095E-03	2.4033E-01
23	3.0197E+05	2.5000E-01	1.8542E-02	2.8824E-02	1.0796E+00	6.4406E-03	2.4094E-01
24	2.3518E+05	2.5000E-01	1.3243E-02	2.1880E-02	1.1003E+00	4.7443E-03	2.3826E-01
25	1.8316E+05	2.5000E-01	9.4036E-03	1.6428E-02	1.1242E+00	3.4501E-03	2.3587E-01
26	1.4264E+05	2.5000E-01	6.6182E-03	1.2064E-02	1.1592E+00	2.4514E-03	2.3562E-01
27	1.1109E+05	2.5000E-01	4.6389E-03	8.7501E-03	1.1988E+00	1.7222E-03	2.3636E-01
28	8.6517E+04	2.5000E-01	3.2296E-03	6.2108E-03	1.2441E+00	1.1859E-03	2.3834E-01
29	6.7379E+04	2.5000E-01	2.2366E-03	4.3503E-03	1.2928E+00	8.0782E-04	2.4126E-01
30	5.2475E+04	2.5000E-01	1.5454E-03	3.0082E-03	1.3401E+00	5.4641E-04	2.4515E-01
31	4.0868E+04	2.5000E-01	1.0663E-03	2.0473E-03	1.3848E+00	3.6603E-04	2.4986E-01
32	3.1828E+04	1.2500E-01	4.0160E-04	7.5768E-04	1.4224E+00	1.3405E-04	2.5408E-01
33	2.8088E+04	1.2500E-01	3.3333E-04	6.2020E-04	1.4441E+00	1.0904E-04	2.5649E-01
34	2.4787E+04	1.2500E-01	2.7662E-04	5.0631E-04	1.4678E+00	8.8403E-05	2.5901E-01
35	2.1875E+04	1.2500E-01	2.2952E-04	4.1362E-04	1.4893E+00	7.1787E-05	2.6132E-01
36	1.9304E+04	1.2500E-01	1.9040E-04	3.3953E-04	1.5144E+00	5.8576E-05	2.6413E-01
37	1.7036E+04	1.2500E-01	1.5794E-04	2.7752E-04	1.5420E+00	4.7581E-05	2.6737E-01
38	1.5034E+04	1.2500E-01	1.3100E-04	2.2151E-04	1.5709E+00	3.7739E-05	2.7103E-01
39	1.3268E+04	1.2500E-01	1.0864E-04	1.7917E-04	1.5996E+00	3.0384E-05	2.7481E-01
40	1.1709E+04	1.2497E-01	9.0072E-05	1.4599E-04	1.6281E+00	2.4643E-05	2.7874E-01
41	1.0333E+04	1.2503E-01	7.4727E-05	1.1312E-04	1.6637E+00	1.9261E-05	2.8772E-01
42	9.1188E+03	1.2500E-01	6.1944E-05	8.5768E-05	1.7060E+00	1.4670E-05	2.9654E-01
43	8.0473E+03	1.2500E-01	5.1360E-05	6.3782E-05	1.7382E+00	1.0900E-05	3.0224E-01
44	7.1017E+03	1.2500E-01	4.2581E-05	4.9243E-05	1.7642E+00	8.4204E-06	3.0687E-01
45	6.2673E+03	1.2500E-01	3.5303E-05	3.8515E-05	1.7851E+00	6.5860E-06	3.1058E-01
46	5.5308E+03	1.2500E-01	2.9268E-05	3.0295E-05	1.8022E+00	5.1804E-06	3.1364E-01
47	4.8809E+03	1.2500E-01	2.4263E-05	2.4023E-05	1.8157E+00	4.1110E-06	3.1625E-01
48	4.3074E+03	1.2500E-01	2.0115E-05	1.9189E-05	1.8271E+00	3.2868E-06	3.1852E-01
49	3.8013E+03	1.2500E-01	1.6675E-05	1.5514E-05	1.8391E+00	2.6601E-06	3.2096E-01
50	3.3546E+03	1.2500E-01	1.3823E-05	1.2274E-05	1.8650E+00	2.1181E-06	3.2780E-01
51	2.9604E+03	1.2500E-01	1.1459E-05	9.7751E-06	1.8917E+00	1.6981E-06	3.3483E-01
52	2.6126E+03	1.2500E-01	9.4991E-06	7.9922E-06	1.9125E+00	1.3948E-06	3.4043E-01
53	2.3056E+03	1.2500E-01	7.8744E-06	7.1910E-06	1.9287E+00	1.2555E-06	3.4511E-01
54	2.0347E+03	1.2500E-01	6.5274E-06	3.4539E-06	1.9420E+00	6.0816E-07	3.4895E-01
55	1.7956E+03	1.2500E-01	5.4110E-06	2.5799E-06	1.9527E+00	4.5986E-07	3.5200E-01
56	1.5846E+03	1.2500E-01	4.4852E-06	2.0885E-06	1.9618E+00	3.7380E-07	3.5529E-01
57	1.3984E+03	1.2500E-01	3.7182E-06	1.6736E-06	1.9641E+00	3.0087E-07	3.5702E-01
58	1.2341E+03	1.2500E-01	3.0822E-06	1.4105E-06	1.9495E+00	2.5280E-07	3.5350E-01
59	1.0891E+03	1.2500E-01	2.5550E-06	1.1626E-06	1.9375E+00	2.0802E-07	3.5041E-01
60	9.6112E+02	2.5000E-01	3.8736E-06	1.5976E-06	1.9701E+00	2.9175E-07	3.6389E-01
61	7.4852E+02	2.5000E-01	2.6618E-06	9.2815E-07	2.0268E+00	1.7627E-07	3.8968E-01
62	5.8295E+02	2.5000E-01	1.8291E-06	6.5328E-07	1.9852E+00	1.2220E-07	3.7464E-01
63	4.5400E+02	2.5000E-01	1.2569E-06	4.3195E-07	1.9915E+00	8.1773E-08	3.8034E-01
64	3.5357E+02	2.5000E-01	8.6374E-07	2.4729E-07	2.0316E+00	4.9267E-08	4.0835E-01
65	2.7536E+02	2.5000E-01	5.9357E-07	1.6004E-07	2.0404E+00	3.2649E-08	4.1951E-01
66	2.1445E+02	2.5000E-01	4.0790E-07	1.0310E-07	2.0206E+00	2.1305E-08	4.2070E-01
67	1.6702E+02	2.5000E-01	2.8031E-07	7.4566E-08	2.0052E+00	1.5191E-08	4.1187E-01
68	1.3007E+02	2.5000E-01	1.9264E-07	4.3084E-08	2.0053E+00	9.7479E-09	4.5776E-01
69	1.0130E+02	5.0000E-01	2.2336E-07	4.5503E-08	1.9743E+00	1.1162E-08	4.8623E-01
70	6.1442E+01	1.7500E+00	1.9992E-07	3.2124E-08	2.1591E+00	6.1412E-09	4.1621E-01
	1.0677E+01		1.0000E+00	1.0000E+00		2.4633E-01	

TABLE A-XV

JEZEBEL-23 25-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.1931E+00	2.8232E-02	2.2937E-02	2.7629E+00	6.1266E-03	7.4504E-01
2	6.0653E+06	5.0000E-01	1.1943E-01	1.0109E-01	7.1365E-01	2.6416E-02	1.8753E-01
3	3.6788E+06	5.0000E-01	2.1777E-01	1.8223E-01	7.4393E-01	4.5782E-02	1.8715E-01
4	2.2313E+06	5.0000E-01	2.2891E-01	1.9842E-01	7.2060E-01	4.9850E-02	1.8102E-01
5	1.3533E+06	5.0000E-01	1.7342E-01	1.7324E-01	1.3553E+00	4.3975E-02	3.4381E-01
6	8.2085E+05	5.0000E-01	1.0860E-01	1.2970E-01	1.3888E+00	3.1966E-02	3.4105E-01
7	4.9787E+05	5.0000E-01	6.0759E-02	8.4858E-02	1.1203E+00	1.9818E-02	2.6160E-01
8	3.0197E+05	5.0000E-01	3.1784E-02	5.0704E-02	7.9602E-01	1.1185E-02	1.7499E-01
9	1.8316E+05	5.0000E-01	1.6022E-02	2.8492E-02	8.3381E-01	5.9015E-03	1.7217E-01
10	1.1109E+05	5.0000E-01	7.8685E-03	1.4961E-02	8.9208E-01	2.9081E-03	1.7335E-01
11	6.7379E+04	5.0000E-01	3.7820E-03	7.3585E-03	9.6143E-01	1.3542E-03	1.7762E-01
12	4.0868E+04	5.0000E-01	1.8012E-03	3.4252E-03	1.5524E+00	6.0912E-04	2.7768E-01
13	2.4787E+04	5.0000E-01	8.5447E-04	1.5370E-03	2.1959E+00	2.6635E-04	3.8409E-01
14	1.5034E+04	5.0000E-01	4.0444E-04	6.5979E-04	2.3598E+00	1.1203E-04	4.0618E-01
15	9.1188E+03	5.0000E-01	1.9119E-04	2.3731E-04	2.5538E+00	4.0577E-05	4.4412E-01
16	5.5308E+03	5.0000E-01	9.0320E-05	8.9020E-05	2.6599E+00	1.5238E-05	4.6353E-01
17	3.3546E+03	5.0000E-01	4.2655E-05	3.7232E-05	2.7745E+00	6.4665E-06	4.9230E-01
18	2.0347E+03	5.0000E-01	2.0142E-05	9.7960E-06	2.8558E+00	1.7427E-06	5.1608E-01
19	1.2341E+03	5.0000E-01	9.5108E-06	4.1707E-06	2.1388E+00	7.5257E-07	3.8992E-01
20	7.4852E+02	5.0000E-01	4.4909E-06	1.5814E-06	1.4651E+00	2.9848E-07	2.7911E-01
21	4.5400E+02	5.0000E-01	2.1207E-06	6.7924E-07	1.4691E+00	1.3104E-07	2.8800E-01
22	2.7536E+02	5.0000E-01	1.0015E-06	2.6314E-07	1.4829E+00	5.3954E-08	3.0682E-01
23	1.6702E+02	5.0000E-01	4.7295E-07	1.1765E-07	1.4645E+00	2.4939E-08	3.1756E-01
24	1.0130E+02	5.0000E-01	2.2336E-07	4.5503E-08	7.2094E-01	1.1162E-08	1.7756E-01
25	6.1442E+01	1.7500E+00	1.9992E-07	3.2124E-08	7.8841E-01	6.1412E-09	1.5199E-01
	1.0677E+01		1.0000E+00	1.0000E+00		2.4633E-01	

TABLE A-XVI

BIGTEN 70-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.9315E-01	6.2369E-06	9.7821E-07	3.2681E+00	6.1982E-09	9.9231E-02
2	1.6487E+07	2.5000E-01	1.2050E-04	1.8627E-05	2.8456E+00	1.1167E-07	8.2152E-02
3	1.2840E+07	2.5000E-01	1.1192E-03	1.6802E-04	2.3739E+00	9.0709E-07	6.5547E-02
4	1.0000E+07	2.5000E-01	5.7505E-03	8.7532E-04	2.1265E+00	4.5511E-06	5.5958E-02
5	7.7880E+06	2.5000E-01	1.8589E-02	2.8283E-03	1.7297E+00	1.4340E-05	4.5438E-02
6	6.0653E+06	2.5000E-01	4.1887E-02	6.3474E-03	1.3071E+00	3.0871E-05	3.3905E-02
7	4.7237E+06	2.5000E-01	7.1393E-02	1.0972E-02	1.2198E+00	5.1911E-05	2.9920E-02
8	3.6788E+06	2.5000E-01	9.8156E-02	1.5579E-02	1.1688E+00	7.0941E-05	2.7353E-02
9	2.8650E+06	2.5000E-01	1.1451E-01	1.9206E-02	1.1239E+00	8.4569E-05	2.5396E-02
10	2.2313E+06	2.5000E-01	1.1789E-01	2.1953E-02	1.0768E+00	9.4666E-05	2.2911E-02
11	1.7377E+06	2.5000E-01	1.1034E-01	2.6354E-02	9.8255E-01	1.2388E-04	1.9750E-02
12	1.3533E+06	1.2500E-01	5.0112E-02	1.5973E-02	8.2927E-01	8.9694E-05	1.4833E-02
13	1.1943E+06	1.2500E-01	4.6203E-02	1.8868E-02	7.9848E-01	1.2514E-04	1.4305E-02
14	1.0540E+06	1.2500E-01	4.2009E-02	2.3224E-02	7.7874E-01	1.8725E-04	1.4806E-02
15	9.3014E+05	1.2500E-01	3.7808E-02	2.7182E-02	7.6617E-01	2.5376E-04	1.4928E-02
16	8.2085E+05	1.2500E-01	3.3750E-02	3.1729E-02	7.6048E-01	3.3842E-04	1.5310E-02
17	7.2440E+05	1.2500E-01	2.9724E-02	3.7111E-02	7.7066E-01	4.4956E-04	1.5400E-02
18	6.3928E+05	1.2500E-01	2.6168E-02	4.1905E-02	7.8222E-01	5.5929E-04	1.4630E-02
19	5.6416E+05	1.2500E-01	2.2857E-02	4.4501E-02	7.9277E-01	6.3776E-04	1.3705E-02
20	4.9787E+05	1.2500E-01	1.9809E-02	4.6211E-02	8.0128E-01	6.9679E-04	1.2697E-02
21	4.3937E+05	1.2500E-01	1.7066E-02	4.6700E-02	8.0746E-01	7.3087E-04	1.1611E-02
22	3.8774E+05	2.5000E-01	2.7162E-02	9.3184E-02	8.1119E-01	1.5494E-03	1.0455E-02
23	3.0197E+05	2.5000E-01	1.9734E-02	8.5073E-02	8.1187E-01	1.4664E-03	8.6999E-03
24	2.3518E+05	2.5000E-01	1.4203E-02	7.5281E-02	8.0642E-01	1.3406E-03	7.1542E-03
25	1.8316E+05	2.5000E-01	1.0165E-02	6.2644E-02	7.9360E-01	1.1535E-03	5.9728E-03
26	1.4264E+05	2.5000E-01	7.1865E-03	5.3493E-02	7.7763E-01	1.0380E-03	5.1079E-03
27	1.1109E+05	2.5000E-01	5.0536E-03	4.7300E-02	7.5620E-01	9.8649E-04	4.4053E-03
28	8.6517E+04	2.5000E-01	3.5144E-03	4.1605E-02	7.4391E-01	9.4720E-04	3.8619E-03
29	6.7379E+04	2.5000E-01	2.4190E-03	3.5917E-02	7.2385E-01	9.4383E-04	3.4641E-03
30	5.2475E+04	2.5000E-01	1.6613E-03	2.7111E-02	6.8561E-01	7.8685E-04	3.0245E-03
31	4.0868E+04	2.5000E-01	1.1402E-03	1.7879E-02	6.7053E-01	5.6628E-04	2.6010E-03
32	3.1828E+04	1.2500E-01	4.2782E-04	5.9979E-03	6.7441E-01	2.0087E-04	2.3737E-03
33	2.8088E+04	1.2500E-01	3.5430E-04	4.4808E-03	6.6924E-01	1.5388E-04	2.2713E-03
34	2.4787E+04	1.2500E-01	2.9341E-04	3.2646E-03	6.7188E-01	1.1460E-04	2.1834E-03
35	2.1875E+04	1.2500E-01	2.4297E-04	2.4674E-03	6.6757E-01	8.9360E-05	2.0808E-03
36	1.9304E+04	1.2500E-01	2.0119E-04	1.8199E-03	6.7042E-01	6.7480E-05	1.9590E-03
37	1.7036E+04	1.2500E-01	1.6660E-04	1.3141E-03	6.5929E-01	4.8792E-05	1.8665E-03
38	1.5034E+04	1.2500E-01	1.3795E-04	9.2777E-04	6.7847E-01	3.4545E-05	1.8502E-03
39	1.3268E+04	1.2500E-01	1.1423E-04	6.7221E-04	6.7546E-01	2.4589E-05	1.8623E-03
40	1.1709E+04	1.2497E-01	9.4568E-05	4.8376E-04	6.9747E-01	1.7638E-05	1.9130E-03
41	1.0333E+04	1.2503E-01	7.8349E-05	3.5595E-04	7.1663E-01	1.2827E-05	1.9806E-03
42	9.1188E+03	1.2500E-01	6.4863E-05	2.6841E-04	7.2514E-01	9.6654E-06	2.0453E-03
43	8.0473E+03	1.2500E-01	5.3714E-05	1.9478E-04	7.4189E-01	7.0951E-06	2.0422E-03
44	7.1017E+03	1.2500E-01	4.4483E-05	1.4684E-04	7.6679E-01	5.3406E-06	2.0793E-03
45	6.2673E+03	1.2500E-01	3.6840E-05	1.1041E-04	7.9792E-01	4.0599E-06	2.1319E-03
46	5.5308E+03	1.2500E-01	3.0511E-05	7.7997E-05	8.4273E-01	3.0290E-06	2.1982E-03
47	4.8809E+03	1.2500E-01	2.5270E-05	5.8356E-05	8.7075E-01	2.3648E-06	2.2068E-03
48	4.3074E+03	1.2500E-01	2.0930E-05	4.3210E-05	8.9165E-01	1.6639E-06	1.9774E-03
49	3.8013E+03	1.2500E-01	1.7336E-05	3.2147E-05	8.6926E-01	1.3767E-06	2.0841E-03
50	3.3546E+03	1.2500E-01	1.4360E-05	2.2935E-05	8.4545E-01	9.8470E-07	1.9329E-03
51	2.9604E+03	1.2500E-01	1.1895E-05	1.5456E-05	8.7102E-01	5.9819E-07	2.1907E-03
52	2.6126E+03	1.2500E-01	9.8537E-06	1.2905E-05	9.0183E-01	5.7486E-07	3.0564E-03
53	2.3056E+03	1.2500E-01	8.1630E-06	9.5575E-06	9.1237E-01	4.1247E-07	3.1251E-03
54	2.0347E+03	1.2500E-01	6.7623E-06	7.1649E-06	9.8149E-01	3.3882E-07	3.7520E-03
55	1.7956E+03	1.2500E-01	5.6022E-06	6.0121E-06	9.9779E-01	3.2717E-07	3.8945E-03
56	1.5846E+03	1.2500E-01	4.6410E-06	4.2551E-06	9.9231E-01	1.9512E-07	3.6941E-03
57	1.3984E+03	1.2500E-01	3.8450E-06	3.5770E-06	1.1223E+00	1.9334E-07	4.1771E-03
58	1.2341E+03	1.2500E-01	3.1857E-06	2.1791E-06	9.9976E-01	1.1360E-07	2.8972E-03
59	1.0891E+03	1.2500E-01	2.6397E-06	1.7220E-06	9.6972E-01	7.8714E-08	3.4741E-03
60	9.6112E+02	2.5000E-01	3.9997E-06	2.3754E-06	9.9499E-01	1.2150E-07	3.7888E-03
61	7.4852E+02	2.5000E-01	2.7462E-06	2.0569E-06	1.1494E+00	1.1870E-07	3.6175E-03
62	5.8295E+02	2.5000E-01	1.8857E-06	5.3321E-07	1.3000E+00	4.0074E-08	4.5078E-03
63	4.5400E+02	2.5000E-01	1.2948E-06	2.5493E-07	1.2223E+00	6.9330E-09	3.6867E-03
64	3.5357E+02	2.5000E-01	8.8930E-07	1.6913E-07	1.2480E+00	1.8108E-09	4.5859E-03
65	2.7536E+02	2.5000E-01	6.1074E-07	8.4330E-08	1.3041E+00	7.0516E-10	3.2932E-03
66	2.1445E+02	2.5000E-01	4.1941E-07	5.7160E-08	1.1376E+00	4.7676E-10	3.5269E-03
67	1.6702E+02	2.5000E-01	2.8812E-07	3.9383E-08	1.1761E+00	3.5452E-10	3.2189E-03
68	1.3007E+02	2.5000E-01	1.9787E-07	2.2559E-08	1.0352E+00	1.2761E-10	1.8117E-03
69	1.0130E+02	5.0000E-01	2.2934E-07	2.5817E-08	1.1515E+00	1.5739E-10	5.0789E-03
70	6.1442E+01	1.7500E+00	2.0512E-07	1.8193E-08	1.4887E+00	3.0250E-10	7.4858E-03
	1.0677E+01		1.0000E+00	1.0000E+00		1.6127E-02	

TABLE A-XVII

BIGTEN 70-GROUP ZONE FISSION FRACTIONS

Group	Energy Boundary (eV)	Lethargy Width	Core	Reflector
1	2.0000E+07	1.9315E-01	6.3092E-06	5.0669E-06
2	1.6487E+07	2.5000E-01	1.2142E-04	1.0561E-04
3	1.2840E+07	2.5000E-01	1.1245E-03	1.0330E-03
4	1.0000E+07	2.5000E-01	5.7659E-03	5.5014E-03
5	7.7880E+06	2.5000E-01	1.8612E-02	1.8207E-02
6	6.0653E+06	2.5000E-01	4.1904E-02	4.1615E-02
7	4.7237E+06	2.5000E-01	7.1389E-02	7.1451E-02
8	3.6788E+06	2.5000E-01	9.8136E-02	9.8485E-02
9	2.8650E+06	2.5000E-01	1.1449E-01	1.1486E-01
10	2.2313E+06	2.5000E-01	1.1788E-01	1.1806E-01
11	1.7377E+06	2.5000E-01	1.1035E-01	1.1024E-01
12	1.3533E+06	1.2500E-01	5.0119E-02	4.9987E-02
13	1.1943E+06	1.2500E-01	4.6208E-02	4.6121E-02
14	1.0540E+06	1.2500E-01	4.2015E-02	4.1916E-02
15	9.3014E+05	1.2500E-01	3.7817E-02	3.7667E-02
16	8.2085E+05	1.2500E-01	3.3755E-02	3.3660E-02
17	7.2440E+05	1.2500E-01	2.9730E-02	2.9626E-02
18	6.3928E+05	1.2500E-01	2.6168E-02	2.6174E-02
19	5.6416E+05	1.2500E-01	2.2854E-02	2.2892E-02
20	4.9787E+05	1.2500E-01	1.9805E-02	1.9876E-02
21	4.3937E+05	1.2500E-01	1.7064E-02	1.7106E-02
22	3.8774E+05	2.5000E-01	2.7158E-02	2.7233E-02
23	3.0197E+05	2.5000E-01	1.9729E-02	1.9816E-02
24	2.3518E+05	2.5000E-01	1.4194E-02	1.4348E-02
25	1.8316E+05	2.5000E-01	1.0158E-02	1.0282E-02
26	1.4264E+05	2.5000E-01	7.1781E-03	7.3229E-03
27	1.1109E+05	2.5000E-01	5.0479E-03	5.1460E-03
28	8.6517E+04	2.5000E-01	3.5110E-03	3.5684E-03
29	6.7379E+04	2.5000E-01	2.4177E-03	2.4407E-03
30	5.2475E+04	2.5000E-01	1.6611E-03	1.6659E-03
31	4.0868E+04	2.5000E-01	1.1404E-03	1.1371E-03
32	3.1828E+04	1.2500E-01	4.2800E-04	4.2503E-04
33	2.8088E+04	1.2500E-01	3.5450E-04	3.5119E-04
34	2.4787E+04	1.2500E-01	2.9360E-04	2.9021E-04
35	2.1875E+04	1.2500E-01	2.4316E-04	2.3984E-04
36	1.9304E+04	1.2500E-01	2.0137E-04	1.9822E-04
37	1.7036E+04	1.2500E-01	1.6676E-04	1.6385E-04
38	1.5034E+04	1.2500E-01	1.3810E-04	1.3545E-04
39	1.3268E+04	1.2500E-01	1.1437E-04	1.1198E-04
40	1.1709E+04	1.2497E-01	9.4691E-05	9.2570E-05
41	1.0333E+04	1.2503E-01	7.8458E-05	7.6587E-05
42	9.1188E+03	1.2500E-01	6.4958E-05	6.3321E-05
43	8.0473E+03	1.2500E-01	5.3797E-05	5.2373E-05
44	7.1017E+03	1.2500E-01	4.4554E-05	4.3321E-05
45	6.2673E+03	1.2500E-01	3.6902E-05	3.5839E-05
46	5.5308E+03	1.2500E-01	3.0564E-05	2.9651E-05
47	4.8809E+03	1.2500E-01	2.5315E-05	2.4534E-05
48	4.3074E+03	1.2500E-01	2.0969E-05	2.0302E-05
49	3.8013E+03	1.2500E-01	1.7369E-05	1.6802E-05
50	3.3546E+03	1.2500E-01	1.4388E-05	1.3906E-05
51	2.9604E+03	1.2500E-01	1.1919E-05	1.1510E-05
52	2.6126E+03	1.2500E-01	9.8738E-06	9.5283E-06
53	2.3056E+03	1.2500E-01	8.1800E-06	7.8881E-06
54	2.0347E+03	1.2500E-01	6.7766E-06	6.5300E-06
55	1.7956E+03	1.2500E-01	5.6143E-06	5.4055E-06
56	1.5846E+03	1.2500E-01	4.6513E-06	4.4749E-06
57	1.3984E+03	1.2500E-01	3.8538E-06	3.7040E-06
58	1.2341E+03	1.2500E-01	3.1931E-06	3.0673E-06
59	1.0891E+03	1.2500E-01	2.6458E-06	2.5404E-06
60	9.6112E+02	2.5000E-01	4.0091E-06	3.8477E-06
61	7.4852E+02	2.5000E-01	2.7528E-06	2.6392E-06
62	5.8295E+02	2.5000E-01	1.8904E-06	1.8102E-06
63	4.5400E+02	2.5000E-01	1.2981E-06	1.2412E-06
64	3.5357E+02	2.5000E-01	8.9160E-07	8.5203E-07
65	2.7536E+02	2.5000E-01	6.1237E-07	5.8438E-07
66	2.1445E+02	2.5000E-01	4.2057E-07	4.0056E-07
67	1.6702E+02	2.5000E-01	2.8892E-07	2.7507E-07
68	1.3007E+02	2.5000E-01	1.9844E-07	1.8859E-07
69	1.0130E+02	5.0000E-01	2.3001E-07	2.1850E-07
70	6.1442E+01	1.7500E+00	2.0573E-07	1.9528E-07
			1.0000E+00	1.0000E+00

TABLE A-XVIII

BIGTEN 25-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.1931E+00	2.5585E-02	3.8912E-03	4.5169E+00	1.9916E-05	1.2746E-01
2	6.0653E+06	5.0000E-01	1.1328E-01	1.7320E-02	9.2464E-01	8.2782E-05	2.3355E-02
3	3.6788E+06	5.0000E-01	2.1267E-01	3.4784E-02	8.3896E-01	1.5551E-04	1.9302E-02
4	2.2313E+06	5.0000E-01	2.2823E-01	4.8307E-02	7.5359E-01	2.1855E-04	1.5611E-02
5	1.3533E+06	5.0000E-01	1.7613E-01	8.5246E-02	1.1610E+00	6.5584E-04	2.1543E-02
6	8.2085E+05	5.0000E-01	1.1250E-01	1.5525E-01	1.1366E+00	1.9850E-03	2.1606E-02
7	4.9787E+05	5.0000E-01	6.4038E-02	1.8610E-01	8.8552E-01	2.9770E-03	1.2721E-02
8	3.0197E+05	5.0000E-01	3.3937E-02	1.6035E-01	5.9218E-01	2.8070E-03	5.8014E-03
9	1.8316E+05	5.0000E-01	1.7351E-02	1.1614E-01	5.7496E-01	2.1914E-03	4.0547E-03
10	1.1109E+05	5.0000E-01	8.5680E-03	8.8905E-02	5.4893E-01	1.9337E-03	3.0252E-03
11	6.7379E+04	5.0000E-01	4.0804E-03	6.3029E-02	5.1576E-01	1.7307E-03	2.3744E-03
12	4.0868E+04	5.0000E-01	1.9223E-03	2.8358E-02	7.3704E-01	9.2103E-04	2.6515E-03
13	2.4787E+04	5.0000E-01	9.0415E-04	8.8659E-03	9.7672E-01	3.2023E-04	2.9603E-03
14	1.5034E+04	5.0000E-01	4.2510E-04	2.4397E-03	1.0129E+00	8.9599E-05	2.7833E-03
15	9.1188E+03	5.0000E-01	1.9990E-04	7.2045E-04	1.1094E+00	2.6161E-05	3.0367E-03
16	5.5308E+03	5.0000E-01	9.4046E-05	2.1171E-04	1.2714E+00	8.4344E-06	3.0981E-03
17	3.3546E+03	5.0000E-01	4.4272E-05	6.0853E-05	1.2920E+00	2.5702E-06	3.7709E-03
18	2.0347E+03	5.0000E-01	2.0850E-05	2.1009E-05	1.4981E+00	1.0544E-06	5.6784E-03
19	1.2341E+03	5.0000E-01	9.8251E-06	6.2765E-06	1.0848E+00	3.1381E-07	3.7178E-03
20	7.4852E+02	5.0000E-01	4.6319E-06	2.5902E-06	8.9632E-01	1.5877E-07	2.9733E-03
21	4.5400E+02	5.0000E-01	2.1841E-06	4.2406E-07	9.0398E-01	8.7438E-09	3.0272E-03
22	2.7536E+02	5.0000E-01	1.0302E-06	1.4149E-07	8.9348E-01	1.1819E-09	2.4957E-03
23	1.6702E+02	5.0000E-01	4.8598E-07	6.1942E-08	8.0915E-01	4.8213E-10	1.8408E-03
24	1.0130E+02	5.0000E-01	2.2934E-07	2.5817E-08	4.2136E-01	1.5739E-10	1.8585E-03
25	6.1442E+01	1.7500E+00	2.0512E-07	1.8193E-08	5.4474E-01	3.0250E-10	2.7392E-03
	1.0677E+01		1.0000E+00	1.0000E+00		1.6127E-02	

TABLE A-XIX

BIGTEN 25-GROUP ZONE FISSION FRACTIONS

Group	Energy Boundary (eV)	Lethargy Width	Core	Reflector
1	2.0000E+07	1.1931E+00	2.5630E-02	2.4852E-02
2	6.0653E+06	5.0000E-01	1.1329E-01	1.1307E-01
3	3.6788E+06	5.0000E-01	2.1263E-01	2.1334E-01
4	2.2313E+06	5.0000E-01	2.2823E-01	2.2830E-01
5	1.3533E+06	5.0000E-01	1.7616E-01	1.7569E-01
6	8.2085E+05	5.0000E-01	1.1251E-01	1.1235E-01
7	4.9787E+05	5.0000E-01	6.4027E-02	6.4214E-02
8	3.0197E+05	5.0000E-01	3.3923E-02	3.4164E-02
9	1.8316E+05	5.0000E-01	1.7336E-02	1.7605E-02
10	1.1109E+05	5.0000E-01	8.5590E-03	8.7144E-03
11	6.7379E+04	5.0000E-01	4.0787E-03	4.1067E-03
12	4.0868E+04	5.0000E-01	1.9229E-03	1.9133E-03
13	2.4787E+04	5.0000E-01	9.0490E-04	8.9212E-04
14	1.5034E+04	5.0000E-01	4.2562E-04	4.1659E-04
15	9.1188E+03	5.0000E-01	2.0021E-04	1.9485E-04
16	5.5308E+03	5.0000E-01	9.4217E-05	9.1289E-05
17	3.3546E+03	5.0000E-01	4.4360E-05	4.2833E-05
18	2.0347E+03	5.0000E-01	2.0896E-05	2.0114E-05
19	1.2341E+03	5.0000E-01	9.8480E-06	9.4554E-06
20	7.4852E+02	5.0000E-01	4.6432E-06	4.4494E-06
21	4.5400E+02	5.0000E-01	2.1897E-06	2.0932E-06
22	2.7536E+02	5.0000E-01	1.0329E-06	9.8494E-07
23	1.6702E+02	5.0000E-01	4.8736E-07	4.6365E-07
24	1.0130E+02	5.0000E-01	2.3001E-07	2.1850E-07
25	6.1442E+01	1.7500E+00	2.0573E-07	1.9528E-07
			1.0000E+00	1.0000E+00

TABLE A-XX

JEZEBEL-PU 70-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.9315E-01	1.1933E-05	8.5228E-06	1.9609E+00	2.3691E-06	5.4638E-01
2	1.6487E+07	2.5000E-01	1.8532E-04	1.3374E-04	1.8463E+00	3.6729E-05	5.0818E-01
3	1.2840E+07	2.5000E-01	1.5095E-03	1.1107E-03	1.5654E+00	3.0705E-04	4.3423E-01
4	1.0000E+07	2.5000E-01	7.0998E-03	5.2855E-03	1.4777E+00	1.4427E-03	4.0439E-01
5	7.7880E+06	2.5000E-01	2.1549E-02	1.5572E-02	1.2818E+00	4.1546E-03	3.4259E-01
6	6.0653E+06	2.5000E-01	4.6352E-02	3.2953E-02	1.0694E+00	8.6330E-03	2.8066E-01
7	4.7237E+06	2.5000E-01	7.6285E-02	5.4231E-02	1.0464E+00	1.4030E-02	2.7111E-01
8	3.6788E+06	2.5000E-01	1.0212E-01	7.3020E-02	1.0512E+00	1.8677E-02	2.6921E-01
9	2.8650E+06	2.5000E-01	1.1671E-01	8.6330E-02	1.0546E+00	2.1859E-02	2.6730E-01
10	2.2313E+06	2.5000E-01	1.1821E-01	9.2145E-02	1.0527E+00	2.3194E-02	2.6520E-01
11	1.7377E+06	2.5000E-01	1.0927E-01	9.2988E-02	1.0222E+00	2.3342E-02	2.5667E-01
12	1.3533E+06	1.2500E-01	4.9213E-02	4.5637E-02	9.8996E-01	1.1437E-02	2.4801E-01
13	1.1943E+06	1.2500E-01	4.5071E-02	4.4752E-02	9.6302E-01	1.1183E-02	2.4041E-01
14	1.0540E+06	1.2500E-01	4.0749E-02	4.3375E-02	9.4743E-01	1.0765E-02	2.3478E-01
15	9.3014E+05	1.2500E-01	3.6476E-02	4.1588E-02	9.3331E-01	1.0242E-02	2.2941E-01
16	8.2085E+05	1.2500E-01	3.2354E-02	3.9413E-02	9.1303E-01	9.6290E-03	2.2258E-01
17	7.2440E+05	1.2500E-01	2.8440E-02	3.7222E-02	8.7982E-01	9.0221E-03	2.1271E-01
18	6.3928E+05	1.2500E-01	2.4853E-02	3.4637E-02	8.6523E-01	8.3205E-03	2.0725E-01
19	5.6416E+05	1.2500E-01	2.1578E-02	3.1983E-02	8.4846E-01	7.6016E-03	2.0106E-01
20	4.9787E+05	1.2500E-01	1.8615E-02	2.9321E-02	8.3733E-01	6.8779E-03	1.9587E-01
21	4.3937E+05	1.2500E-01	1.5985E-02	2.6547E-02	8.3333E-01	6.1349E-03	1.9205E-01
22	3.8774E+05	2.5000E-01	2.5369E-02	4.4908E-02	8.3273E-01	1.0175E-02	1.8834E-01
23	3.0197E+05	2.5000E-01	1.8316E-02	3.4713E-02	8.3354E-01	7.6737E-03	1.8404E-01
24	2.3518E+05	2.5000E-01	1.3081E-02	2.6197E-02	8.4067E-01	5.6467E-03	1.8106E-01
25	1.8316E+05	2.5000E-01	9.2526E-03	1.9625E-02	8.6264E-01	4.1022E-03	1.8041E-01
26	1.4264E+05	2.5000E-01	6.5131E-03	1.4152E-02	9.0233E-01	2.8678E-03	1.8330E-01
27	1.1109E+05	2.5000E-01	4.5621E-03	1.0226E-02	9.1403E-01	2.0138E-03	1.8079E-01
28	8.6517E+04	2.5000E-01	3.1790E-03	7.1496E-03	9.3004E-01	1.3725E-03	1.7976E-01
29	6.7379E+04	2.5000E-01	2.2010E-03	4.8610E-03	9.5361E-01	9.1311E-04	1.8083E-01
30	5.2475E+04	2.5000E-01	1.5205E-03	3.3868E-03	9.4214E-01	6.2418E-04	1.7542E-01
31	4.0868E+04	2.5000E-01	1.0491E-03	2.2823E-03	9.5818E-01	4.1413E-04	1.7588E-01
32	3.1828E+04	1.2500E-01	3.9501E-04	8.3143E-04	9.6172E-01	1.4960E-04	1.7518E-01
33	2.8088E+04	1.2500E-01	3.2780E-04	6.7326E-04	9.5588E-01	1.2067E-04	1.7357E-01
34	2.4787E+04	1.2500E-01	2.7198E-04	5.3740E-04	9.5020E-01	9.6895E-05	1.7360E-01
35	2.1875E+04	1.2500E-01	2.2563E-04	4.3333E-04	9.5198E-01	7.8077E-05	1.7375E-01
36	1.9304E+04	1.2500E-01	1.8715E-04	3.5161E-04	9.5086E-01	6.3288E-05	1.7332E-01
37	1.7036E+04	1.2500E-01	1.5521E-04	2.8813E-04	9.4863E-01	5.1823E-05	1.7270E-01
38	1.5034E+04	1.2500E-01	1.2872E-04	2.3763E-04	9.4701E-01	4.2674E-05	1.7218E-01
39	1.3268E+04	1.2500E-01	1.0673E-04	1.9004E-04	9.4995E-01	3.4048E-05	1.7242E-01
40	1.1709E+04	1.2497E-01	8.8478E-05	1.5248E-04	9.5440E-01	2.7270E-05	1.7294E-01
41	1.0333E+04	1.2503E-01	7.3393E-05	1.1950E-04	9.6812E-01	2.1291E-05	1.7495E-01
42	9.1188E+03	1.2500E-01	6.0831E-05	9.0539E-05	1.0207E+00	1.6079E-05	1.8440E-01
43	8.0473E+03	1.2500E-01	5.0430E-05	7.0060E-05	9.7387E-01	1.2410E-05	1.7563E-01
44	7.1017E+03	1.2500E-01	4.1806E-05	5.6438E-05	9.1705E-01	9.9856E-06	1.6489E-01
45	6.2673E+03	1.2500E-01	3.4656E-05	4.3767E-05	9.6728E-01	7.7318E-06	1.7399E-01
46	5.5308E+03	1.2500E-01	2.8728E-05	3.4724E-05	9.4656E-01	6.1362E-06	1.7016E-01
47	4.8809E+03	1.2500E-01	2.3813E-05	2.8358E-05	9.6419E-01	5.0278E-06	1.7392E-01
48	4.3074E+03	1.2500E-01	1.9740E-05	2.2300E-05	9.6727E-01	3.9589E-06	1.7461E-01
49	3.8013E+03	1.2500E-01	1.6362E-05	1.7499E-05	1.0744E+00	3.1241E-06	1.9513E-01
50	3.3546E+03	1.2500E-01	1.3563E-05	1.3701E-05	1.1092E+00	2.4294E-06	1.9979E-01
51	2.9604E+03	1.2500E-01	1.1242E-05	1.1948E-05	1.1114E+00	2.1121E-06	2.0033E-01
52	2.6126E+03	1.2500E-01	9.3188E-06	9.2241E-06	1.0006E+00	1.6511E-06	1.8288E-01
53	2.3056E+03	1.2500E-01	7.7244E-06	7.1554E-06	8.9764E-01	1.2869E-06	1.6390E-01
54	2.0347E+03	1.2500E-01	6.4026E-06	5.6903E-06	9.9684E-01	1.0206E-06	1.8186E-01
55	1.7956E+03	1.2500E-01	5.3071E-06	4.5617E-06	9.8392E-01	8.2557E-07	1.8074E-01
56	1.5846E+03	1.2500E-01	4.3989E-06	3.9212E-06	1.1048E+00	7.0668E-07	2.0206E-01
57	1.3984E+03	1.2500E-01	3.6464E-06	2.7429E-06	1.3598E+00	4.9618E-07	2.5027E-01
58	1.2341E+03	1.2500E-01	3.0225E-06	2.1445E-06	1.1972E+00	3.9433E-07	2.2303E-01
59	1.0891E+03	1.2500E-01	2.5054E-06	1.6374E-06	1.3341E+00	3.0523E-07	2.5237E-01
60	9.6112E+02	2.5000E-01	3.7982E-06	2.6187E-06	1.1878E+00	4.8394E-07	2.2206E-01
61	7.4852E+02	2.5000E-01	2.6097E-06	1.8493E-06	1.0742E+00	3.4589E-07	2.0326E-01
62	5.8295E+02	2.5000E-01	1.7932E-06	8.6832E-07	1.5406E+00	1.6642E-07	2.9881E-01
63	4.5400E+02	2.5000E-01	1.2322E-06	7.4767E-07	1.3807E+00	1.3706E-07	2.5505E-01
64	3.5357E+02	2.5000E-01	8.4669E-07	4.0306E-07	1.2776E+00	7.2582E-08	2.3293E-01
65	2.7536E+02	2.5000E-01	5.8183E-07	1.8505E-07	1.5266E+00	3.3431E-08	2.7938E-01
66	2.1445E+02	2.5000E-01	3.9982E-07	1.6613E-07	1.5321E+00	3.0205E-08	2.8098E-01
67	1.6702E+02	2.5000E-01	2.7475E-07	1.0615E-07	1.5345E+00	1.9562E-08	2.8610E-01
68	1.3007E+02	2.5000E-01	1.8881E-07	6.2525E-08	1.4526E+00	1.1239E-08	2.6350E-01
69	1.0130E+02	5.0000E-01	2.1893E-07	4.1924E-08	1.9829E+00	7.5757E-09	3.6259E-01
70	6.1442E+01	1.7500E+00	1.9602E-07	4.4482E-08	1.7094E+00	8.6273E-09	3.3467E-01
	1.0677E+01		1.0000E+00	1.0000E+00		2.4345E-01	

TABLE A-XXI

JEZEBEL-PU 25-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.1931E+00	3.0356E-02	2.2110E-02	2.9727E+00	5.9434E-03	8.1728E-01
2	6.0653E+06	5.0000E-01	1.2264E-01	8.7184E-02	7.7345E-01	2.2663E-02	2.0170E-01
3	3.6788E+06	5.0000E-01	2.1883E-01	1.5935E-01	7.6977E-01	4.0535E-02	1.9612E-01
4	2.2313E+06	5.0000E-01	2.2749E-01	1.8513E-01	7.5847E-01	4.6536E-02	1.9077E-01
5	1.3533E+06	5.0000E-01	1.7151E-01	1.7535E-01	1.4014E+00	4.3626E-02	3.4822E-01
6	8.2085E+05	5.0000E-01	1.0723E-01	1.4326E-01	1.2818E+00	3.4573E-02	3.0837E-01
7	4.9787E+05	5.0000E-01	5.9970E-02	1.0078E-01	9.1511E-01	2.3188E-02	2.1065E-01
8	3.0197E+05	5.0000E-01	3.1397E-02	6.0910E-02	6.1200E-01	1.3320E-02	1.3346E-01
9	1.8316E+05	5.0000E-01	1.5766E-02	3.3777E-02	6.4518E-01	6.9700E-03	1.3295E-01
10	1.1109E+05	5.0000E-01	7.7411E-03	1.7376E-02	6.7409E-01	3.3863E-03	1.3180E-01
11	6.7379E+04	5.0000E-01	3.7215E-03	8.2478E-03	6.9298E-01	1.5373E-03	1.3023E-01
12	4.0868E+04	5.0000E-01	1.7719E-03	3.7870E-03	1.0512E+00	6.8439E-04	1.9177E-01
13	2.4787E+04	5.0000E-01	8.3997E-04	1.6105E-03	1.3897E+00	2.9008E-04	2.5346E-01
14	1.5034E+04	5.0000E-01	3.9732E-04	6.9965E-04	1.3962E+00	1.2528E-04	2.5314E-01
15	9.1188E+03	5.0000E-01	1.8772E-04	2.6080E-04	1.4179E+00	4.6206E-05	2.5549E-01
16	5.5308E+03	5.0000E-01	8.8643E-05	1.0288E-04	1.4448E+00	1.8247E-05	2.6093E-01
17	3.3546E+03	5.0000E-01	4.1848E-05	4.2028E-05	1.5057E+00	7.4795E-06	2.7303E-01
18	2.0347E+03	5.0000E-01	1.9755E-05	1.6916E-05	1.6250E+00	3.0491E-06	2.9790E-01
19	1.2341E+03	5.0000E-01	9.3261E-06	6.4005E-06	1.3595E+00	1.1835E-06	2.5495E-01
20	7.4852E+02	5.0000E-01	4.4030E-06	2.7176E-06	9.5586E-01	5.1231E-07	1.8353E-01
21	4.5400E+02	5.0000E-01	2.0789E-06	1.1507E-06	9.7176E-01	2.0964E-07	1.7838E-01
22	2.7536E+02	5.0000E-01	9.8164E-07	3.5117E-07	1.1181E+00	6.3636E-08	2.0484E-01
23	1.6702E+02	5.0000E-01	4.6356E-07	1.6867E-07	1.0919E+00	3.0801E-08	2.0090E-01
24	1.0130E+02	5.0000E-01	2.1893E-07	4.1924E-08	7.2486E-01	7.5757E-09	1.3254E-01
25	6.1442E+01	1.7500E+00	1.9602E-07	4.4482E-08	6.2485E-01	8.6273E-09	1.2234E-01
	1.0677E+01		1.0000E+00	1.0000E+00		2.4345E-01	

TABLE A-XXII

FLATTOP-25 70-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.9315E-01	6.7968E-06	4.2075E-06	2.2692E+00	8.0459E-09	6.0064E-02
2	1.6487E+07	2.5000E-01	1.2687E-04	7.5418E-05	2.1022E+00	1.4208E-07	5.0512E-02
3	1.2840E+07	2.5000E-01	1.1552E-03	6.8517E-04	1.7624E+00	1.1834E-06	4.0776E-02
4	1.0000E+07	2.5000E-01	5.8599E-03	3.5010E-03	1.6391E+00	5.9426E-06	3.5280E-02
5	7.7880E+06	2.5000E-01	1.8784E-02	1.0984E-02	1.3579E+00	1.8525E-05	2.8585E-02
6	6.0653E+06	2.5000E-01	4.2099E-02	2.3921E-02	1.0351E+00	3.9508E-05	2.1385E-02
7	4.7237E+06	2.5000E-01	7.1515E-02	4.1016E-02	1.0190E+00	6.6348E-05	1.9168E-02
8	3.6788E+06	2.5000E-01	9.8141E-02	5.8662E-02	1.0218E+00	9.1386E-05	1.7705E-02
9	2.8650E+06	2.5000E-01	1.1439E-01	7.2887E-02	1.0241E+00	1.0988E-04	1.6537E-02
10	2.2313E+06	2.5000E-01	1.1773E-01	8.0496E-02	1.0092E+00	1.2327E-04	1.5081E-02
11	1.7377E+06	2.5000E-01	1.1022E-01	8.3698E-02	9.7019E-01	1.5814E-04	1.3207E-02
12	1.3533E+06	1.2500E-01	5.0070E-02	4.1917E-02	9.3104E-01	1.1029E-04	1.0362E-02
13	1.1943E+06	1.2500E-01	4.6164E-02	4.1484E-02	9.2288E-01	1.4766E-04	9.9079E-03
14	1.0540E+06	1.2500E-01	4.1982E-02	4.0912E-02	9.2048E-01	2.0853E-04	9.9691E-03
15	9.3014E+05	1.2500E-01	3.7798E-02	4.0406E-02	9.0856E-01	2.6861E-04	9.8616E-03
16	8.2085E+05	1.2500E-01	3.3741E-02	3.9769E-02	9.0782E-01	3.4062E-04	9.9539E-03
17	7.2440E+05	1.2500E-01	2.9728E-02	3.8970E-02	9.1300E-01	4.2943E-04	1.0101E-02
18	6.3928E+05	1.2500E-01	2.6161E-02	3.8805E-02	9.1947E-01	5.0964E-04	9.8549E-03
19	5.6416E+05	1.2500E-01	2.2849E-02	3.7451E-02	9.3542E-01	5.5776E-04	9.5011E-03
20	4.9787E+05	1.2500E-01	1.9800E-02	3.5495E-02	9.5380E-01	5.8841E-04	9.0585E-03
21	4.3937E+05	1.2500E-01	1.7064E-02	3.3298E-02	9.7276E-01	5.9863E-04	8.5267E-03
22	3.8774E+05	2.5000E-01	2.7161E-02	5.8569E-02	9.9843E-01	1.2062E-03	7.8780E-03
23	3.0197E+05	2.5000E-01	1.9729E-02	4.7137E-02	1.0304E+00	1.0925E-03	6.8611E-03
24	2.3518E+05	2.5000E-01	1.4185E-02	3.6457E-02	1.0696E+00	9.6080E-04	5.8604E-03
25	1.8316E+05	2.5000E-01	1.0145E-02	2.7217E-02	1.1095E+00	7.9705E-04	5.0271E-03
26	1.4264E+05	2.5000E-01	7.1629E-03	1.9985E-02	1.1438E+00	6.9064E-04	4.3827E-03
27	1.1109E+05	2.5000E-01	5.0356E-03	1.4796E-02	1.1698E+00	6.2972E-04	3.8409E-03
28	8.6517E+04	2.5000E-01	3.5025E-03	1.0814E-02	1.2023E+00	5.7701E-04	3.4131E-03
29	6.7379E+04	2.5000E-01	2.4130E-03	7.5828E-03	1.2296E+00	5.3563E-04	3.0926E-03
30	5.2475E+04	2.5000E-01	1.6586E-03	5.2918E-03	1.2274E+00	4.1982E-04	2.7470E-03
31	4.0868E+04	2.5000E-01	1.1391E-03	3.2582E-03	1.2485E+00	2.8696E-04	2.4080E-03
32	3.1828E+04	1.2500E-01	4.2762E-04	1.0642E-03	1.2748E+00	9.8510E-05	2.2214E-03
33	2.8088E+04	1.2500E-01	3.5423E-04	8.2915E-04	1.2772E+00	7.4401E-05	2.1341E-03
34	2.4787E+04	1.2500E-01	2.9342E-04	5.9692E-04	1.2877E+00	5.5015E-05	2.0634E-03
35	2.1875E+04	1.2500E-01	2.4304E-04	4.6708E-04	1.2866E+00	4.2374E-05	1.9755E-03
36	1.9304E+04	1.2500E-01	2.0129E-04	3.5943E-04	1.3302E+00	3.1660E-05	1.8708E-03
37	1.7036E+04	1.2500E-01	1.6671E-04	2.8114E-04	1.3132E+00	2.2777E-05	1.7767E-03
38	1.5034E+04	1.2500E-01	1.3807E-04	2.0589E-04	1.3648E+00	1.6126E-05	1.7573E-03
39	1.3268E+04	1.2500E-01	1.1435E-04	1.5915E-04	1.3350E+00	1.1586E-05	1.7468E-03
40	1.1709E+04	1.2497E-01	9.4683E-05	1.1814E-04	1.3616E+00	8.3876E-06	1.7802E-03
41	1.0333E+04	1.2503E-01	7.8456E-05	8.9711E-05	1.3811E+00	6.1721E-06	1.8255E-03
42	9.1188E+03	1.2500E-01	6.4961E-05	6.7150E-05	1.3452E+00	4.7087E-06	1.8652E-03
43	8.0473E+03	1.2500E-01	5.3802E-05	5.0697E-05	1.3815E+00	3.4658E-06	1.8603E-03
44	7.1017E+03	1.2500E-01	4.4561E-05	3.8711E-05	1.4116E+00	2.6020E-06	1.8913E-03
45	6.2673E+03	1.2500E-01	3.6909E-05	2.8294E-05	1.4288E+00	1.9967E-06	1.9423E-03
46	5.5308E+03	1.2500E-01	3.0571E-05	2.2312E-05	1.5240E+00	1.4653E-06	2.0089E-03
47	4.8809E+03	1.2500E-01	2.5322E-05	1.7210E-05	1.5131E+00	1.1224E-06	2.0318E-03
48	4.3074E+03	1.2500E-01	2.0976E-05	1.3047E-05	1.5638E+00	8.0590E-07	1.8630E-03
49	3.8013E+03	1.2500E-01	1.7375E-05	1.0997E-05	1.5800E+00	6.4570E-07	1.9407E-03
50	3.3546E+03	1.2500E-01	1.4394E-05	8.0351E-06	1.5807E+00	4.5652E-07	1.7893E-03
51	2.9604E+03	1.2500E-01	1.1924E-05	6.4303E-06	1.6195E+00	2.8196E-07	1.9271E-03
52	2.6126E+03	1.2500E-01	9.8783E-06	4.9399E-06	1.5817E+00	2.6576E-07	2.5491E-03
53	2.3056E+03	1.2500E-01	8.1839E-06	3.7554E-06	1.4826E+00	1.9124E-07	2.5577E-03
54	2.0347E+03	1.2500E-01	6.7800E-06	2.8362E-06	1.5202E+00	1.5623E-07	3.0328E-03
55	1.7956E+03	1.2500E-01	5.6173E-06	2.1557E-06	1.5987E+00	1.4785E-07	3.1305E-03
56	1.5846E+03	1.2500E-01	4.6539E-06	1.8936E-06	1.5314E+00	9.0483E-08	2.9810E-03
57	1.3984E+03	1.2500E-01	3.8560E-06	1.3188E-06	1.6118E+00	8.8173E-08	3.4137E-03
58	1.2341E+03	1.2500E-01	3.1950E-06	9.6640E-07	1.5863E+00	5.2100E-08	2.5542E-03
59	1.0891E+03	1.2500E-01	2.6474E-06	8.5016E-07	1.3690E+00	3.6917E-08	2.8604E-03
60	9.6112E+02	2.5000E-01	4.0117E-06	1.1440E-06	1.4495E+00	5.7133E-08	3.1330E-03
61	7.4852E+02	2.5000E-01	2.7547E-06	6.7792E-07	1.5854E+00	5.5958E-08	3.2438E-03
62	5.8295E+02	2.5000E-01	1.8917E-06	3.7845E-07	1.6905E+00	1.7328E-08	4.0179E-03
63	4.5400E+02	2.5000E-01	1.2991E-06	2.8798E-07	1.6009E+00	3.6459E-09	3.4514E-03
64	3.5357E+02	2.5000E-01	8.9228E-07	1.8729E-07	1.5237E+00	1.7074E-09	4.1125E-03
65	2.7536E+02	2.5000E-01	6.1286E-07	1.0253E-07	1.6019E+00	7.8359E-10	3.6367E-03
66	2.1445E+02	2.5000E-01	4.2092E-07	7.3865E-08	1.4875E+00	5.2553E-10	3.5793E-03
67	1.6702E+02	2.5000E-01	2.8916E-07	5.0637E-08	1.4576E+00	3.6395E-10	3.5509E-03
68	1.3007E+02	2.5000E-01	1.9862E-07	3.4339E-08	1.4339E+00	1.4147E-10	2.3329E-03
69	1.0130E+02	5.0000E-01	2.3022E-07	3.8288E-08	1.4988E+00	1.7694E-10	4.8079E-03
70	6.1442E+01	1.7500E+00	2.0592E-07	1.7519E-08	1.6731E+00	2.5969E-10	7.4427E-03
	1.0677E+01		1.0000E+00	1.0000E+00		1.1956E-02	

TABLE A-XXIII

FLATTOP-25 70-GROUP ZONE FISSION FRACTIONS

Group	Energy Boundary (eV)	Lethargy Width	Core	Reflector
1	2.0000E+07	1.9315E-01	7.3352E-06	5.1904E-06
2	1.6487E+07	2.5000E-01	1.3344E-04	1.0728E-04
3	1.2840E+07	2.5000E-01	1.1927E-03	1.0432E-03
4	1.0000E+07	2.5000E-01	5.9693E-03	5.5333E-03
5	7.7880E+06	2.5000E-01	1.8959E-02	1.8263E-02
6	6.0653E+06	2.5000E-01	4.2243E-02	4.1669E-02
7	4.7237E+06	2.5000E-01	7.1530E-02	7.1472E-02
8	3.6788E+06	2.5000E-01	9.8032E-02	9.8465E-02
9	2.8650E+06	2.5000E-01	1.1424E-01	1.1482E-01
10	2.2313E+06	2.5000E-01	1.1763E-01	1.1803E-01
11	1.7377E+06	2.5000E-01	1.1021E-01	1.1024E-01
12	1.3533E+06	1.2500E-01	5.0096E-02	4.9991E-02
13	1.1943E+06	1.2500E-01	4.6177E-02	4.6123E-02
14	1.0540E+06	1.2500E-01	4.2003E-02	4.1920E-02
15	9.3014E+05	1.2500E-01	3.7839E-02	3.7676E-02
16	8.2085E+05	1.2500E-01	3.3766E-02	3.3665E-02
17	7.2440E+05	1.2500E-01	2.9760E-02	2.9633E-02
18	6.3928E+05	1.2500E-01	2.6158E-02	2.6171E-02
19	5.6416E+05	1.2500E-01	2.2836E-02	2.2887E-02
20	4.9787E+05	1.2500E-01	1.9777E-02	1.9868E-02
21	4.3937E+05	1.2500E-01	1.7052E-02	1.7101E-02
22	3.8774E+05	2.5000E-01	2.7140E-02	2.7223E-02
23	3.0197E+05	2.5000E-01	1.9704E-02	1.9806E-02
24	2.3518E+05	2.5000E-01	1.4135E-02	1.4333E-02
25	1.8316E+05	2.5000E-01	1.0104E-02	1.0269E-02
26	1.4264E+05	2.5000E-01	7.1141E-03	7.3086E-03
27	1.1109E+05	2.5000E-01	5.0020E-03	5.1359E-03
28	8.6517E+04	2.5000E-01	3.4825E-03	3.5621E-03
29	6.7379E+04	2.5000E-01	2.4047E-03	2.4376E-03
30	5.2475E+04	2.5000E-01	1.6566E-03	1.6646E-03
31	4.0868E+04	2.5000E-01	1.1399E-03	1.1367E-03
32	3.1828E+04	1.2500E-01	4.2850E-04	4.2501E-04
33	2.8088E+04	1.2500E-01	3.5523E-04	3.5124E-04
34	2.4787E+04	1.2500E-01	2.9447E-04	2.9030E-04
35	2.1875E+04	1.2500E-01	2.4407E-04	2.3995E-04
36	1.9304E+04	1.2500E-01	2.0227E-04	1.9834E-04
37	1.7036E+04	1.2500E-01	1.6763E-04	1.6397E-04
38	1.5034E+04	1.2500E-01	1.3891E-04	1.3557E-04
39	1.3268E+04	1.2500E-01	1.1511E-04	1.1209E-04
40	1.1709E+04	1.2497E-01	9.5357E-05	9.2674E-05
41	1.0333E+04	1.2503E-01	7.9051E-05	7.6681E-05
42	9.1188E+03	1.2500E-01	6.5482E-05	6.3406E-05
43	8.0473E+03	1.2500E-01	5.4256E-05	5.2448E-05
44	7.1017E+03	1.2500E-01	4.4954E-05	4.3388E-05
45	6.2673E+03	1.2500E-01	3.7248E-05	3.5897E-05
46	5.5308E+03	1.2500E-01	3.0862E-05	2.9702E-05
47	4.8809E+03	1.2500E-01	2.5572E-05	2.4578E-05
48	4.3074E+03	1.2500E-01	2.1189E-05	2.0340E-05
49	3.8013E+03	1.2500E-01	1.7557E-05	1.6834E-05
50	3.3546E+03	1.2500E-01	1.4548E-05	1.3934E-05
51	2.9604E+03	1.2500E-01	1.2054E-05	1.1534E-05
52	2.6126E+03	1.2500E-01	9.9888E-06	9.5483E-06
53	2.3056E+03	1.2500E-01	8.2773E-06	7.9051E-06
54	2.0347E+03	1.2500E-01	6.8589E-06	6.5447E-06
55	1.7956E+03	1.2500E-01	5.6839E-06	5.4186E-06
56	1.5846E+03	1.2500E-01	4.7100E-06	4.4864E-06
57	1.3984E+03	1.2500E-01	3.9034E-06	3.7147E-06
58	1.2341E+03	1.2500E-01	3.2347E-06	3.0763E-06
59	1.0891E+03	1.2500E-01	2.6808E-06	2.5479E-06
60	9.6112E+02	2.5000E-01	4.0629E-06	3.8588E-06
61	7.4852E+02	2.5000E-01	2.7906E-06	2.6474E-06
62	5.8295E+02	2.5000E-01	1.9169E-06	1.8164E-06
63	4.5400E+02	2.5000E-01	1.3168E-06	1.2462E-06
64	3.5357E+02	2.5000E-01	9.0461E-07	8.5550E-07
65	2.7536E+02	2.5000E-01	6.2149E-07	5.8711E-07
66	2.1445E+02	2.5000E-01	4.2698E-07	4.0283E-07
67	1.6702E+02	2.5000E-01	2.9336E-07	2.7663E-07
68	1.3007E+02	2.5000E-01	2.0157E-07	1.8981E-07
69	1.0130E+02	5.0000E-01	2.3367E-07	2.1992E-07
70	6.1442E+01	1.7500E+00	2.0906E-07	1.9656E-07
			1.0000E+00	1.0000E+00

TABLE A-XXIV

FLATTOP-25 25-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.1931E+00	2.5933E-02	1.5249E-02	3.3024E+00	2.5801E-05	7.7839E-02
2	6.0653E+06	5.0000E-01	1.1361E-01	6.4937E-02	7.4290E-01	1.0586E-04	1.4667E-02
3	3.6788E+06	5.0000E-01	2.1253E-01	1.3155E-01	7.3996E-01	2.0127E-04	1.2385E-02
4	2.2313E+06	5.0000E-01	2.2795E-01	1.6419E-01	7.1589E-01	2.8141E-04	1.0231E-02
5	1.3533E+06	5.0000E-01	1.7601E-01	1.6472E-01	1.3320E+00	7.3510E-04	1.4504E-02
6	8.2085E+05	5.0000E-01	1.1248E-01	1.5499E-01	1.3294E+00	1.8375E-03	1.4254E-02
7	4.9787E+05	5.0000E-01	6.4025E-02	1.2736E-01	1.0579E+00	2.3933E-03	9.2094E-03
8	3.0197E+05	5.0000E-01	3.3914E-02	8.3595E-02	7.5949E-01	2.0533E-03	4.6011E-03
9	1.8316E+05	5.0000E-01	1.7308E-02	4.7202E-02	8.1494E-01	1.4877E-03	3.4033E-03
10	1.1109E+05	5.0000E-01	8.5380E-03	2.5610E-02	8.5790E-01	1.2067E-03	2.6236E-03
11	6.7379E+04	5.0000E-01	4.0716E-03	1.2875E-02	8.8861E-01	9.5546E-04	2.1120E-03
12	4.0868E+04	5.0000E-01	1.9209E-03	5.1516E-03	1.3746E+00	4.5987E-04	2.4462E-03
13	2.4787E+04	5.0000E-01	9.0446E-04	1.7046E-03	1.8871E+00	1.5183E-04	2.7800E-03
14	1.5034E+04	5.0000E-01	4.2556E-04	5.7289E-04	1.9684E+00	4.2272E-05	2.5715E-03
15	9.1188E+03	5.0000E-01	2.0023E-04	1.8485E-04	2.0135E+00	1.2773E-05	2.7339E-03
16	5.5308E+03	5.0000E-01	9.4244E-05	6.3567E-05	2.2355E+00	4.0393E-06	2.8372E-03
17	3.3546E+03	5.0000E-01	4.4379E-05	2.3161E-05	2.2657E+00	1.1955E-06	3.1911E-03
18	2.0347E+03	5.0000E-01	2.0907E-05	8.2043E-06	2.2649E+00	4.8273E-07	4.5419E-03
19	1.2341E+03	5.0000E-01	9.8541E-06	2.9605E-06	1.5931E+00	1.4615E-07	3.0915E-03
20	7.4852E+02	5.0000E-01	4.6463E-06	1.0564E-06	1.1848E+00	7.3286E-08	2.6264E-03
21	4.5400E+02	5.0000E-01	2.1914E-06	4.7526E-07	1.1301E+00	5.3533E-09	2.7357E-03
22	2.7536E+02	5.0000E-01	1.0338E-06	1.7639E-07	1.1174E+00	1.3091E-09	2.6099E-03
23	1.6702E+02	5.0000E-01	4.8778E-07	8.4977E-08	1.0458E+00	5.0543E-10	2.1200E-03
24	1.0130E+02	5.0000E-01	2.3022E-07	3.8288E-08	5.4207E-01	1.7694E-10	1.7389E-03
25	6.1442E+01	1.7500E+00	2.0592E-07	1.7519E-08	6.0513E-01	2.5969E-10	2.6918E-03
	1.0677E+01		1.0000E+00	1.0000E+00		1.1956E-02	

TABLE A-XXV

FLATTOP-25 25-GROUP ZONE FISSION FRACTIONS

Group	Energy Boundary (eV)	Lethargy Width	Core	Reflector
1	2.0000E+07	1.1931E+00	2.6261E-02	2.4952E-02
2	6.0653E+06	5.0000E-01	1.1377E-01	1.1314E-01
3	3.6788E+06	5.0000E-01	2.1228E-01	2.1328E-01
4	2.2313E+06	5.0000E-01	2.2784E-01	2.2826E-01
5	1.3533E+06	5.0000E-01	1.7612E-01	1.7571E-01
6	8.2085E+05	5.0000E-01	1.1252E-01	1.1236E-01
7	4.9787E+05	5.0000E-01	6.3969E-02	6.4192E-02
8	3.0197E+05	5.0000E-01	3.3839E-02	3.4138E-02
9	1.8316E+05	5.0000E-01	1.7218E-02	1.7578E-02
10	1.1109E+05	5.0000E-01	8.4845E-03	8.6979E-03
11	6.7379E+04	5.0000E-01	4.0613E-03	4.1022E-03
12	4.0868E+04	5.0000E-01	1.9236E-03	1.9129E-03
13	2.4787E+04	5.0000E-01	9.0844E-04	8.9256E-04
14	1.5034E+04	5.0000E-01	4.2843E-04	4.1702E-04
15	9.1188E+03	5.0000E-01	2.0194E-04	1.9514E-04
16	5.5308E+03	5.0000E-01	9.5180E-05	9.1453E-05
17	3.3546E+03	5.0000E-01	4.4868E-05	4.2921E-05
18	2.0347E+03	5.0000E-01	2.1156E-05	2.0164E-05
19	1.2341E+03	5.0000E-01	9.9784E-06	9.4830E-06
20	7.4852E+02	5.0000E-01	4.7075E-06	4.4638E-06
21	4.5400E+02	5.0000E-01	2.2214E-06	2.1017E-06
22	2.7536E+02	5.0000E-01	1.0485E-06	9.8994E-07
23	1.6702E+02	5.0000E-01	4.9493E-07	4.6644E-07
24	1.0130E+02	5.0000E-01	2.3367E-07	2.1992E-07
25	6.1442E+01	1.7500E+00	2.0906E-07	1.9656E-07
			1.0000E+00	1.0000E+00

TABLE A-XXVI

FLATTOP-PU 70-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.9315E-01	7.9082E-06	5.6845E-06	2.0561E+00	5.1569E-09	3.5813E-02
2	1.6487E+07	2.5000E-01	1.4548E-04	1.0227E-04	1.9084E+00	9.1098E-08	3.0057E-02
3	1.2840E+07	2.5000E-01	1.3036E-03	9.1405E-04	1.6151E+00	7.4772E-07	2.4258E-02
4	1.0000E+07	2.5000E-01	6.5025E-03	4.5458E-03	1.5142E+00	3.7017E-06	2.0931E-02
5	7.7880E+06	2.5000E-01	2.0487E-02	1.3827E-02	1.3043E+00	1.1373E-05	1.7000E-02
6	6.0653E+06	2.5000E-01	4.5130E-02	2.9512E-02	1.0793E+00	2.4072E-05	1.2770E-02
7	4.7237E+06	2.5000E-01	7.5385E-02	4.8969E-02	1.0478E+00	4.0092E-05	1.1395E-02
8	3.6788E+06	2.5000E-01	1.0180E-01	6.6236E-02	1.0453E+00	5.4384E-05	1.0501E-02
9	2.8650E+06	2.5000E-01	1.1690E-01	7.8090E-02	1.0457E+00	6.4610E-05	9.8060E-03
10	2.2313E+06	2.5000E-01	1.1869E-01	8.3169E-02	1.0428E+00	7.2144E-05	8.9169E-03
11	1.7377E+06	2.5000E-01	1.0977E-01	8.3821E-02	1.0098E+00	9.2431E-05	7.7753E-03
12	1.3533E+06	1.2500E-01	4.9442E-02	4.1225E-02	9.6046E-01	6.4635E-05	6.0120E-03
13	1.1943E+06	1.2500E-01	4.5316E-02	4.0729E-02	9.2842E-01	8.7125E-05	5.7707E-03
14	1.0540E+06	1.2500E-01	4.0983E-02	4.0120E-02	9.1249E-01	1.2440E-04	5.8868E-03
15	9.3014E+05	1.2500E-01	3.6682E-02	3.9086E-02	9.0853E-01	1.6178E-04	5.8790E-03
16	8.2085E+05	1.2500E-01	3.2568E-02	3.7827E-02	9.0297E-01	2.0708E-04	5.9740E-03
17	7.2440E+05	1.2500E-01	2.8606E-02	3.6825E-02	8.8326E-01	2.6378E-04	6.0348E-03
18	6.3928E+05	1.2500E-01	2.5051E-02	3.5353E-02	8.8299E-01	3.1551E-04	5.8178E-03
19	5.6416E+05	1.2500E-01	2.1776E-02	3.3472E-02	8.8137E-01	3.4748E-04	5.5366E-03
20	4.9787E+05	1.2500E-01	1.8805E-02	3.1475E-02	8.8341E-01	3.6854E-04	5.2130E-03
21	4.3937E+05	1.2500E-01	1.6147E-02	2.9167E-02	8.8717E-01	3.7666E-04	4.8466E-03
22	3.8774E+05	2.5000E-01	2.5619E-02	5.1384E-02	8.9166E-01	7.6469E-04	4.4288E-03
23	3.0197E+05	2.5000E-01	1.8515E-02	4.1801E-02	8.9711E-01	6.9741E-04	3.7824E-03
24	2.3518E+05	2.5000E-01	1.3261E-02	3.3330E-02	9.0662E-01	6.1753E-04	3.1771E-03
25	1.8316E+05	2.5000E-01	9.4117E-03	2.5947E-02	9.2825E-01	5.1577E-04	2.6912E-03
26	1.4264E+05	2.5000E-01	6.6444E-03	1.9749E-02	9.6430E-01	4.5005E-04	2.3235E-03
27	1.1109E+05	2.5000E-01	4.6570E-03	1.5431E-02	9.7023E-01	4.1349E-04	2.0202E-03
28	8.6517E+04	2.5000E-01	3.2393E-03	1.1704E-02	9.8004E-01	3.8214E-04	1.7805E-03
29	6.7379E+04	2.5000E-01	2.2341E-03	8.7158E-03	9.9588E-01	3.6090E-04	1.6087E-03
30	5.2475E+04	2.5000E-01	1.5377E-03	6.3811E-03	9.7658E-01	2.8783E-04	1.4217E-03
31	4.0868E+04	2.5000E-01	1.0574E-03	4.2906E-03	9.8775E-01	1.9956E-04	1.2323E-03
32	3.1828E+04	1.2500E-01	3.9728E-04	1.5135E-03	9.8770E-01	6.9393E-05	1.1199E-03
33	2.8088E+04	1.2500E-01	3.2926E-04	1.1849E-03	9.7922E-01	5.2733E-05	1.0685E-03
34	2.4787E+04	1.2500E-01	2.7286E-04	9.1151E-04	9.7084E-01	3.9167E-05	1.0260E-03
35	2.1875E+04	1.2500E-01	2.2611E-04	7.1210E-04	9.7008E-01	3.0361E-05	9.7483E-04
36	1.9304E+04	1.2500E-01	1.8735E-04	5.5667E-04	9.6604E-01	2.2809E-05	9.1959E-04
37	1.7036E+04	1.2500E-01	1.5523E-04	4.3329E-04	9.6102E-01	1.6464E-05	8.7237E-04
38	1.5034E+04	1.2500E-01	1.2861E-04	3.3874E-04	9.5732E-01	1.1674E-05	8.6487E-04
39	1.3268E+04	1.2500E-01	1.0655E-04	2.6211E-04	9.5909E-01	8.3814E-06	8.6039E-04
40	1.1709E+04	1.2497E-01	8.8258E-05	2.0305E-04	9.6299E-01	6.0601E-06	8.7611E-04
41	1.0333E+04	1.2503E-01	7.3156E-05	1.5705E-04	9.7609E-01	4.4510E-06	8.9386E-04
42	9.1188E+03	1.2500E-01	6.0591E-05	1.1706E-04	1.0295E+00	3.3905E-06	9.0184E-04
43	8.0473E+03	1.2500E-01	5.0198E-05	8.9154E-05	9.7613E-01	2.4974E-06	8.8745E-04
44	7.1017E+03	1.2500E-01	4.1588E-05	7.0821E-05	9.1049E-01	1.8783E-06	8.9966E-04
45	6.2673E+03	1.2500E-01	3.4456E-05	5.3789E-05	9.6092E-01	1.4389E-06	9.2731E-04
46	5.5308E+03	1.2500E-01	2.8546E-05	4.0935E-05	9.3610E-01	1.0625E-06	9.6303E-04
47	4.8809E+03	1.2500E-01	2.3651E-05	3.2819E-05	9.5453E-01	8.1886E-07	9.8630E-04
48	4.3074E+03	1.2500E-01	1.9596E-05	2.5582E-05	9.5996E-01	5.7927E-07	9.2129E-04
49	3.8013E+03	1.2500E-01	1.6236E-05	1.9522E-05	1.0657E+00	4.7360E-07	9.5475E-04
50	3.3546E+03	1.2500E-01	1.3452E-05	1.5030E-05	1.1041E+00	3.3593E-07	8.8166E-04
51	2.9604E+03	1.2500E-01	1.1146E-05	1.2486E-05	1.0950E+00	2.0499E-07	9.4237E-04
52	2.6126E+03	1.2500E-01	9.2357E-06	9.6382E-06	9.8076E-01	1.9752E-07	1.2269E-03
53	2.3056E+03	1.2500E-01	7.6528E-06	7.4739E-06	8.6673E-01	1.4165E-07	1.2574E-03
54	2.0347E+03	1.2500E-01	6.3411E-06	5.8881E-06	9.5836E-01	1.1631E-07	1.5138E-03
55	1.7956E+03	1.2500E-01	5.2544E-06	4.7811E-06	9.5310E-01	1.1186E-07	1.5942E-03
56	1.5846E+03	1.2500E-01	4.3538E-06	4.0740E-06	1.0790E+00	6.7644E-08	1.5948E-03
57	1.3984E+03	1.2500E-01	3.6079E-06	2.7868E-06	1.3652E+00	6.6427E-08	1.8519E-03
58	1.2341E+03	1.2500E-01	2.9898E-06	2.1458E-06	1.1914E+00	3.9032E-08	1.3980E-03
59	1.0891E+03	1.2500E-01	2.4777E-06	1.5959E-06	1.3261E+00	2.7265E-08	1.5608E-03
60	9.6112E+02	2.5000E-01	3.7551E-06	2.6143E-06	1.1810E+00	4.2497E-08	1.6779E-03
61	7.4852E+02	2.5000E-01	2.5790E-06	1.8328E-06	1.0463E+00	4.0578E-08	1.7795E-03
62	5.8295E+02	2.5000E-01	1.7714E-06	8.3788E-07	1.5563E+00	1.2981E-08	2.2725E-03
63	4.5400E+02	2.5000E-01	1.2166E-06	7.3965E-07	1.3789E+00	2.7758E-09	1.9375E-03
64	3.5357E+02	2.5000E-01	8.3576E-07	4.0150E-07	1.2841E+00	1.3039E-09	2.3057E-03
65	2.7536E+02	2.5000E-01	5.7410E-07	1.7017E-07	1.5138E+00	5.4356E-10	2.0959E-03
66	2.1445E+02	2.5000E-01	3.9433E-07	1.5713E-07	1.4887E+00	3.4999E-10	2.0580E-03
67	1.6702E+02	2.5000E-01	2.7092E-07	1.0091E-07	1.5351E+00	2.4014E-10	2.0672E-03
68	1.3007E+02	2.5000E-01	1.8609E-07	5.7657E-08	1.4485E+00	8.9265E-11	1.3680E-03
69	1.0130E+02	5.0000E-01	2.1573E-07	3.8531E-08	2.0286E+00	1.1239E-10	2.8168E-03
70	6.1442E+01	1.7500E+00	1.9301E-07	3.9966E-08	1.6859E+00	1.5925E-10	4.4517E-03
	1.0677E+01		1.0000E+00	1.0000E+00		7.6451E-03	

TABLE A-XXVII

FLATTOP-PU 70-GROUP ZONE FISSION FRACTIONS

Group	Energy Boundary (eV)	Lethargy Width	Core	Reflector
1	2.0000E+07	1.9315E-01	9.0016E-06	5.2483E-06
2	1.6487E+07	2.5000E-01	1.6085E-04	1.0807E-04
3	1.2840E+07	2.5000E-01	1.4085E-03	1.0483E-03
4	1.0000E+07	2.5000E-01	6.8940E-03	5.5502E-03
5	7.7880E+06	2.5000E-01	2.1388E-02	1.8295E-02
6	6.0653E+06	2.5000E-01	4.6539E-02	4.1704E-02
7	4.7237E+06	2.5000E-01	7.6987E-02	7.1488E-02
8	3.6788E+06	2.5000E-01	1.0318E-01	9.8450E-02
9	2.8650E+06	2.5000E-01	1.1777E-01	1.1478E-01
10	2.2313E+06	2.5000E-01	1.1897E-01	1.1799E-01
11	1.7377E+06	2.5000E-01	1.0959E-01	1.1022E-01
12	1.3533E+06	1.2500E-01	4.9218E-02	4.9988E-02
13	1.1943E+06	1.2500E-01	4.4985E-02	4.6122E-02
14	1.0540E+06	1.2500E-01	4.0596E-02	4.1923E-02
15	9.3014E+05	1.2500E-01	3.6272E-02	3.7680E-02
16	8.2085E+05	1.2500E-01	3.2116E-02	3.3670E-02
17	7.2440E+05	1.2500E-01	2.8182E-02	2.9639E-02
18	6.3928E+05	1.2500E-01	2.4588E-02	2.6176E-02
19	5.6416E+05	1.2500E-01	2.1318E-02	2.2890E-02
20	4.9787E+05	1.2500E-01	1.8367E-02	1.9870E-02
21	4.3937E+05	1.2500E-01	1.5754E-02	1.7102E-02
22	3.8774E+05	2.5000E-01	2.4959E-02	2.7225E-02
23	3.0197E+05	2.5000E-01	1.7985E-02	1.9804E-02
24	2.3518E+05	2.5000E-01	1.2822E-02	1.4329E-02
25	1.8316E+05	2.5000E-01	9.0607E-03	1.0265E-02
26	1.4264E+05	2.5000E-01	6.3731E-03	7.3044E-03
27	1.1109E+05	2.5000E-01	4.4616E-03	5.1323E-03
28	8.6517E+04	2.5000E-01	3.1078E-03	3.5594E-03
29	6.7379E+04	2.5000E-01	2.1512E-03	2.4358E-03
30	5.2475E+04	2.5000E-01	1.4860E-03	1.6633E-03
31	4.0868E+04	2.5000E-01	1.0252E-03	1.1358E-03
32	3.1828E+04	1.2500E-01	3.8601E-04	4.2469E-04
33	2.8088E+04	1.2500E-01	3.2033E-04	3.5097E-04
34	2.4787E+04	1.2500E-01	2.6578E-04	2.9007E-04
35	2.1875E+04	1.2500E-01	2.2049E-04	2.3976E-04
36	1.9304E+04	1.2500E-01	1.8289E-04	1.9819E-04
37	1.7036E+04	1.2500E-01	1.5169E-04	1.6384E-04
38	1.5034E+04	1.2500E-01	1.2579E-04	1.3546E-04
39	1.3268E+04	1.2500E-01	1.0431E-04	1.1201E-04
40	1.1709E+04	1.2497E-01	8.6473E-05	9.2600E-05
41	1.0333E+04	1.2503E-01	7.1732E-05	7.6620E-05
42	9.1188E+03	1.2500E-01	5.9455E-05	6.3354E-05
43	8.0473E+03	1.2500E-01	4.9291E-05	5.2405E-05
44	7.1017E+03	1.2500E-01	4.0863E-05	4.3352E-05
45	6.2673E+03	1.2500E-01	3.3875E-05	3.5868E-05
46	5.5308E+03	1.2500E-01	2.8081E-05	2.9677E-05
47	4.8809E+03	1.2500E-01	2.3278E-05	2.4557E-05
48	4.3074E+03	1.2500E-01	1.9297E-05	2.0323E-05
49	3.8013E+03	1.2500E-01	1.5995E-05	1.6820E-05
50	3.3546E+03	1.2500E-01	1.3259E-05	1.3922E-05
51	2.9604E+03	1.2500E-01	1.0991E-05	1.1524E-05
52	2.6126E+03	1.2500E-01	9.1105E-06	9.5403E-06
53	2.3056E+03	1.2500E-01	7.5519E-06	7.8984E-06
54	2.0347E+03	1.2500E-01	6.2597E-06	6.5391E-06
55	1.7956E+03	1.2500E-01	5.1888E-06	5.4140E-06
56	1.5846E+03	1.2500E-01	4.3009E-06	4.4826E-06
57	1.3984E+03	1.2500E-01	3.5653E-06	3.7115E-06
58	1.2341E+03	1.2500E-01	2.9553E-06	3.0737E-06
59	1.0891E+03	1.2500E-01	2.4497E-06	2.5457E-06
60	9.6112E+02	2.5000E-01	3.7138E-06	3.8554E-06
61	7.4852E+02	2.5000E-01	2.5519E-06	2.6451E-06
62	5.8295E+02	2.5000E-01	1.7535E-06	1.8148E-06
63	4.5400E+02	2.5000E-01	1.2049E-06	1.2451E-06
64	3.5357E+02	2.5000E-01	8.2796E-07	8.5475E-07
65	2.7536E+02	2.5000E-01	5.6896E-07	5.8660E-07
66	2.1445E+02	2.5000E-01	3.9098E-07	4.0247E-07
67	1.6702E+02	2.5000E-01	2.6868E-07	2.7639E-07
68	1.3007E+02	2.5000E-01	1.8464E-07	1.8964E-07
69	1.0130E+02	5.0000E-01	2.1408E-07	2.1973E-07
70	6.1442E+01	1.7500E+00	1.9162E-07	1.9639E-07
			1.0000E+00	1.0000E+00

TABLE A-XXVIII

FLATTOP-PU 25-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.1931E+00	2.8447E-02	1.9395E-02	3.0741E+00	1.5918E-05	4.6875E-02
2	6.0653E+06	5.0000E-01	1.2051E-01	7.8481E-02	7.7861E-01	6.4164E-05	8.8453E-03
3	3.6788E+06	5.0000E-01	2.1870E-01	1.4433E-01	7.6540E-01	1.1899E-04	7.4332E-03
4	2.2313E+06	5.0000E-01	2.2846E-01	1.6699E-01	7.5134E-01	1.6457E-04	6.1101E-03
5	1.3533E+06	5.0000E-01	1.7242E-01	1.6116E-01	1.3580E+00	4.3795E-04	8.6199E-03
6	8.2085E+05	5.0000E-01	1.0800E-01	1.4348E-01	1.2997E+00	1.1339E-03	8.5520E-03
7	4.9787E+05	5.0000E-01	6.0571E-02	1.1203E-01	9.7450E-01	1.5099E-03	5.3034E-03
8	3.0197E+05	5.0000E-01	3.1777E-02	7.5131E-02	6.6025E-01	1.3149E-03	2.5475E-03
9	1.8316E+05	5.0000E-01	1.6056E-02	4.5696E-02	6.9276E-01	9.6582E-04	1.8356E-03
10	1.1109E+05	5.0000E-01	7.8963E-03	2.7135E-02	7.1389E-01	7.9563E-04	1.3913E-03
11	6.7379E+04	5.0000E-01	3.7718E-03	1.5097E-02	7.2201E-01	6.4873E-04	1.1093E-03
12	4.0868E+04	5.0000E-01	1.7839E-03	6.9890E-03	1.0815E+00	3.2168E-04	1.2521E-03
13	2.4787E+04	5.0000E-01	8.4154E-04	2.6136E-03	1.4159E+00	1.0880E-04	1.3883E-03
14	1.5034E+04	5.0000E-01	3.9658E-04	9.6095E-04	1.4113E+00	3.0567E-05	1.2794E-03
15	9.1188E+03	5.0000E-01	1.8683E-04	3.3082E-04	1.4192E+00	9.2051E-06	1.3237E-03
16	5.5308E+03	5.0000E-01	8.8028E-05	1.1886E-04	1.4335E+00	2.9342E-06	1.4003E-03
17	3.3546E+03	5.0000E-01	4.1487E-05	4.4628E-05	1.4812E+00	8.8011E-07	1.5770E-03
18	2.0347E+03	5.0000E-01	1.9557E-05	1.7530E-05	1.5944E+00	3.6224E-07	2.3993E-03
19	1.2341E+03	5.0000E-01	9.2226E-06	6.3560E-06	1.3538E+00	1.0879E-07	1.6973E-03
20	7.4852E+02	5.0000E-01	4.3504E-06	2.6707E-06	9.5270E-01	5.3559E-08	1.4832E-03
21	4.5400E+02	5.0000E-01	2.0524E-06	1.1412E-06	9.7480E-01	4.0796E-09	1.5532E-03
22	2.7536E+02	5.0000E-01	9.6842E-07	3.2729E-07	1.0990E+00	8.9355E-10	1.5205E-03
23	1.6702E+02	5.0000E-01	4.5702E-07	1.5857E-07	1.0921E+00	3.2941E-10	1.2575E-03
24	1.0130E+02	5.0000E-01	2.1573E-07	3.8531E-08	7.4255E-01	1.1239E-10	1.0311E-03
25	6.1442E+01	1.7500E+00	1.9301E-07	3.9966E-08	6.1712E-01	1.5925E-10	1.6295E-03
	1.0677E+01		1.0000E+00	1.0000E+00		7.6451E-03	

TABLE A-XXIX

FLATTOP-PU 25-GROUP ZONE FISSION FRACTIONS

Group	Energy Boundary (eV)	Lethargy Width	Core	Reflector
1	2.0000E+07	1.1931E+00	2.9861E-02	2.5007E-02
2	6.0653E+06	5.0000E-01	1.2353E-01	1.1319E-01
3	3.6788E+06	5.0000E-01	2.2095E-01	2.1323E-01
4	2.2313E+06	5.0000E-01	2.2857E-01	2.2821E-01
5	1.3533E+06	5.0000E-01	1.7107E-01	1.7571E-01
6	8.2085E+05	5.0000E-01	1.0620E-01	1.1237E-01
7	4.9787E+05	5.0000E-01	5.9081E-02	6.4197E-02
8	3.0197E+05	5.0000E-01	3.0808E-02	3.4134E-02
9	1.8316E+05	5.0000E-01	1.5434E-02	1.7570E-02
10	1.1109E+05	5.0000E-01	7.5694E-03	8.6917E-03
11	6.7379E+04	5.0000E-01	3.6372E-03	4.0991E-03
12	4.0868E+04	5.0000E-01	1.7315E-03	1.9115E-03
13	2.4787E+04	5.0000E-01	8.2085E-04	8.9187E-04
14	1.5034E+04	5.0000E-01	3.8831E-04	4.1669E-04
15	9.1188E+03	5.0000E-01	1.8348E-04	1.9498E-04
16	5.5308E+03	5.0000E-01	8.6651E-05	9.1377E-05
17	3.3546E+03	5.0000E-01	4.0912E-05	4.2885E-05
18	2.0347E+03	5.0000E-01	1.9315E-05	2.0147E-05
19	1.2341E+03	5.0000E-01	9.1189E-06	9.4749E-06
20	7.4852E+02	5.0000E-01	4.3054E-06	4.4599E-06
21	4.5400E+02	5.0000E-01	2.0329E-06	2.0999E-06
22	2.7536E+02	5.0000E-01	9.5994E-07	9.8907E-07
23	1.6702E+02	5.0000E-01	4.5331E-07	4.6603E-07
24	1.0130E+02	5.0000E-01	2.1408E-07	2.1973E-07
25	6.1442E+01	1.7500E+00	1.9162E-07	1.9639E-07
			1.0000E+00	1.0000E+00

TABLE A-XXX

FLATTOP-23 70-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.9315E-01	7.1201E-06	5.6899E-06	1.9123E+00	4.8858E-09	3.7920E-02
2	1.6487E+07	2.5000E-01	1.3424E-04	1.0364E-04	1.7891E+00	8.7155E-08	3.1880E-02
3	1.2840E+07	2.5000E-01	1.2229E-03	9.3089E-04	1.5749E+00	7.1984E-07	2.5773E-02
4	1.0000E+07	2.5000E-01	6.1785E-03	4.7068E-03	1.4680E+00	3.6181E-06	2.2294E-02
5	7.7880E+06	2.5000E-01	1.9678E-02	1.4678E-02	1.2822E+00	1.1295E-05	1.8095E-02
6	6.0653E+06	2.5000E-01	4.3767E-02	3.3777E-02	1.0021E+00	2.4761E-05	1.3558E-02
7	4.7237E+06	2.5000E-01	7.3742E-02	5.6263E-02	1.0080E+00	4.1104E-05	1.2143E-02
8	3.6788E+06	2.5000E-01	1.0037E-01	7.6032E-02	1.0237E+00	5.5549E-05	1.1203E-02
9	2.8650E+06	2.5000E-01	1.1605E-01	8.7842E-02	1.0239E+00	6.5693E-05	1.0472E-02
10	2.2313E+06	2.5000E-01	1.1855E-01	9.1437E-02	1.0087E+00	7.3141E-05	9.5408E-03
11	1.7377E+06	2.5000E-01	1.1021E-01	8.9654E-02	9.7352E-01	9.3482E-05	8.3642E-03
12	1.3533E+06	1.2500E-01	4.9804E-02	4.3189E-02	9.3181E-01	6.5214E-05	6.5058E-03
13	1.1943E+06	1.2500E-01	4.5739E-02	4.1990E-02	9.1429E-01	8.7640E-05	6.2057E-03
14	1.0540E+06	1.2500E-01	4.1444E-02	4.0863E-02	9.0300E-01	1.2477E-04	6.2637E-03
15	9.3014E+05	1.2500E-01	3.7159E-02	3.9245E-02	9.0270E-01	1.6180E-04	6.2324E-03
16	8.2085E+05	1.2500E-01	3.3044E-02	3.7358E-02	9.0852E-01	2.0648E-04	6.3454E-03
17	7.2440E+05	1.2500E-01	2.9056E-02	3.5390E-02	9.2208E-01	2.6194E-04	6.4656E-03
18	6.3928E+05	1.2500E-01	2.5473E-02	3.3251E-02	9.4101E-01	3.1204E-04	6.3008E-03
19	5.6416E+05	1.2500E-01	2.2170E-02	3.0737E-02	9.6221E-01	3.4228E-04	6.0541E-03
20	4.9787E+05	1.2500E-01	1.9169E-02	2.8240E-02	9.8485E-01	3.6167E-04	5.7442E-03
21	4.3937E+05	1.2500E-01	1.6478E-02	2.5732E-02	1.0072E+00	3.6837E-04	5.3733E-03
22	3.8774E+05	2.5000E-01	2.6139E-02	4.4497E-02	1.0337E+00	7.4357E-04	4.9331E-03
23	3.0197E+05	2.5000E-01	1.8918E-02	3.5494E-02	1.0663E+00	6.7490E-04	4.2452E-03
24	2.3518E+05	2.5000E-01	1.3565E-02	2.7921E-02	1.0861E+00	5.9519E-04	3.5921E-03
25	1.8316E+05	2.5000E-01	9.6592E-03	2.1484E-02	1.1066E+00	4.9522E-04	3.0665E-03
26	1.4264E+05	2.5000E-01	6.8213E-03	1.6385E-02	1.1357E+00	4.3051E-04	2.6672E-03
27	1.1109E+05	2.5000E-01	4.7851E-03	1.2535E-02	1.1680E+00	3.9394E-04	2.3358E-03
28	8.6517E+04	2.5000E-01	3.3274E-03	9.4407E-03	1.2056E+00	3.6249E-04	2.0735E-03
29	6.7379E+04	2.5000E-01	2.2959E-03	7.0609E-03	1.2441E+00	3.4062E-04	1.8795E-03
30	5.2475E+04	2.5000E-01	1.5807E-03	4.9873E-03	1.2825E+00	2.7056E-04	1.6738E-03
31	4.0868E+04	2.5000E-01	1.0872E-03	3.3132E-03	1.3223E+00	1.8686E-04	1.4662E-03
32	3.1828E+04	1.2500E-01	4.0859E-04	1.1734E-03	1.3566E+00	6.4829E-05	1.3530E-03
33	2.8088E+04	1.2500E-01	3.3869E-04	9.2721E-04	1.3761E+00	4.9216E-05	1.2996E-03
34	2.4787E+04	1.2500E-01	2.8072E-04	7.2775E-04	1.3976E+00	3.6535E-05	1.2548E-03
35	2.1875E+04	1.2500E-01	2.3265E-04	5.7642E-04	1.4171E+00	2.8301E-05	1.1995E-03
36	1.9304E+04	1.2500E-01	1.9280E-04	4.5748E-04	1.4398E+00	2.1255E-05	1.1373E-03
37	1.7036E+04	1.2500E-01	1.5977E-04	3.5962E-04	1.4655E+00	1.5345E-05	1.0858E-03
38	1.5034E+04	1.2500E-01	1.3239E-04	2.7822E-04	1.4936E+00	1.0885E-05	1.0817E-03
39	1.3268E+04	1.2500E-01	1.0970E-04	2.1891E-04	1.5221E+00	7.8201E-06	1.0854E-03
40	1.1709E+04	1.2497E-01	9.0872E-05	1.7365E-04	1.5514E+00	5.6580E-06	1.1139E-03
41	1.0333E+04	1.2503E-01	7.5331E-05	1.3277E-04	1.5897E+00	4.1587E-06	1.1481E-03
42	9.1188E+03	1.2500E-01	6.2399E-05	1.0008E-04	1.6342E+00	3.1706E-06	1.1711E-03
43	8.0473E+03	1.2500E-01	5.1701E-05	7.4091E-05	1.6673E+00	2.3358E-06	1.1579E-03
44	7.1017E+03	1.2500E-01	4.2837E-05	5.6812E-05	1.6945E+00	1.7561E-06	1.1672E-03
45	6.2673E+03	1.2500E-01	3.5493E-05	4.4216E-05	1.7164E+00	1.3463E-06	1.1892E-03
46	5.5308E+03	1.2500E-01	2.9408E-05	3.4213E-05	1.7348E+00	9.9251E-07	1.2225E-03
47	4.8809E+03	1.2500E-01	2.4367E-05	2.6862E-05	1.7500E+00	7.6353E-07	1.2345E-03
48	4.3074E+03	1.2500E-01	2.0190E-05	2.1339E-05	1.7638E+00	5.4033E-07	1.1351E-03
49	3.8013E+03	1.2500E-01	1.6729E-05	1.7101E-05	1.7717E+00	4.4090E-07	1.1848E-03
50	3.3546E+03	1.2500E-01	1.3862E-05	1.3421E-05	1.7999E+00	3.1257E-07	1.1065E-03
51	2.9604E+03	1.2500E-01	1.1486E-05	1.0598E-05	1.8295E+00	1.9099E-07	1.2100E-03
52	2.6126E+03	1.2500E-01	9.5183E-06	8.6920E-06	1.8480E+00	1.8351E-07	1.6067E-03
53	2.3056E+03	1.2500E-01	7.8874E-06	7.9695E-06	1.8682E+00	1.3223E-07	1.6206E-03
54	2.0347E+03	1.2500E-01	6.5358E-06	3.6072E-06	1.8811E+00	1.0884E-07	1.9128E-03
55	1.7956E+03	1.2500E-01	5.4160E-06	2.6748E-06	1.8925E+00	1.0349E-07	1.9709E-03
56	1.5846E+03	1.2500E-01	4.4879E-06	2.1438E-06	1.9046E+00	6.2347E-08	1.8818E-03
57	1.3984E+03	1.2500E-01	3.7191E-06	1.7189E-06	1.9085E+00	6.0773E-08	2.1522E-03
58	1.2341E+03	1.2500E-01	3.0821E-06	1.4439E-06	1.8924E+00	3.5798E-08	1.6280E-03
59	1.0891E+03	1.2500E-01	2.5543E-06	1.1762E-06	1.8824E+00	2.5176E-08	1.8456E-03
60	9.6112E+02	2.5000E-01	3.8713E-06	1.6123E-06	1.9147E+00	3.9249E-08	1.9966E-03
61	7.4852E+02	2.5000E-01	2.6590E-06	9.5650E-07	1.9768E+00	3.7647E-08	2.0227E-03
62	5.8295E+02	2.5000E-01	1.8264E-06	6.5588E-07	1.9359E+00	1.1973E-08	2.4832E-03
63	4.5400E+02	2.5000E-01	1.2545E-06	4.2689E-07	1.9448E+00	2.5586E-09	2.1988E-03
64	3.5357E+02	2.5000E-01	8.6181E-07	2.4470E-07	1.9867E+00	1.1632E-09	2.6442E-03
65	2.7536E+02	2.5000E-01	5.9202E-07	1.5852E-07	1.9963E+00	5.0732E-10	2.3163E-03
66	2.1445E+02	2.5000E-01	4.0665E-07	1.0188E-07	1.9737E+00	3.3917E-10	2.3008E-03
67	1.6702E+02	2.5000E-01	2.7940E-07	7.3763E-08	1.9610E+00	2.3201E-10	2.2827E-03
68	1.3007E+02	2.5000E-01	1.9193E-07	4.2862E-08	1.9659E+00	8.7537E-11	1.5062E-03
69	1.0130E+02	5.0000E-01	2.2249E-07	4.5315E-08	1.9349E+00	1.1036E-10	3.1424E-03
70	6.1442E+01	1.7500E+00	1.9906E-07	3.1694E-08	2.1225E+00	1.6523E-10	4.7800E-03
	1.0677E+01		1.0000E+00	1.0000E+00		7.4122E-03	

TABLE A-XXXI

FLATTOP-23 70-GROUP ZONE FISSION FRACTIONS

Group	Energy Boundary (eV)	Lethargy Width	Core	Void	Reflector
1	2.0000E+07	1.9315E-01	7.8760E-06	0.0000E+00	5.2317E-06
2	1.6487E+07	2.5000E-01	1.4479E-04	0.0000E+00	1.0790E-04
3	1.2840E+07	2.5000E-01	1.2930E-03	0.0000E+00	1.0475E-03
4	1.0000E+07	2.5000E-01	6.4303E-03	0.0000E+00	5.5493E-03
5	7.7880E+06	2.5000E-01	2.0231E-02	0.0000E+00	1.8298E-02
6	6.0653E+06	2.5000E-01	4.4587E-02	0.0000E+00	4.1717E-02
7	4.7237E+06	2.5000E-01	7.4633E-02	0.0000E+00	7.1515E-02
8	3.6788E+06	2.5000E-01	1.0112E-01	0.0000E+00	9.8485E-02
9	2.8650E+06	2.5000E-01	1.1655E-01	0.0000E+00	1.1481E-01
10	2.2313E+06	2.5000E-01	1.1876E-01	0.0000E+00	1.1800E-01
11	1.7377E+06	2.5000E-01	1.1021E-01	0.0000E+00	1.1021E-01
12	1.3533E+06	1.2500E-01	4.9734E-02	0.0000E+00	4.9977E-02
13	1.1943E+06	1.2500E-01	4.5590E-02	0.0000E+00	4.6109E-02
14	1.0540E+06	1.2500E-01	4.1258E-02	0.0000E+00	4.1909E-02
15	9.3014E+05	1.2500E-01	3.6957E-02	0.0000E+00	3.7666E-02
16	8.2085E+05	1.2500E-01	3.2798E-02	0.0000E+00	3.3658E-02
17	7.2440E+05	1.2500E-01	2.8827E-02	0.0000E+00	2.9627E-02
18	6.3928E+05	1.2500E-01	2.5195E-02	0.0000E+00	2.6167E-02
19	5.6416E+05	1.2500E-01	2.1885E-02	0.0000E+00	2.2883E-02
20	4.9787E+05	1.2500E-01	1.8891E-02	0.0000E+00	1.9865E-02
21	4.3937E+05	1.2500E-01	1.6230E-02	0.0000E+00	1.7098E-02
22	3.8774E+05	2.5000E-01	2.5707E-02	0.0000E+00	2.7218E-02
23	3.0197E+05	2.5000E-01	1.8564E-02	0.0000E+00	1.9801E-02
24	2.3518E+05	2.5000E-01	1.3260E-02	0.0000E+00	1.4329E-02
25	1.8316E+05	2.5000E-01	9.4164E-03	0.0000E+00	1.0266E-02
26	1.4264E+05	2.5000E-01	6.6275E-03	0.0000E+00	7.3057E-03
27	1.1109E+05	2.5000E-01	4.6457E-03	0.0000E+00	5.1334E-03
28	8.6517E+04	2.5000E-01	3.2343E-03	0.0000E+00	3.5601E-03
29	6.7379E+04	2.5000E-01	2.2397E-03	0.0000E+00	2.4362E-03
30	5.2475E+04	2.5000E-01	1.5475E-03	0.0000E+00	1.6635E-03
31	4.0868E+04	2.5000E-01	1.0677E-03	0.0000E+00	1.1359E-03
32	3.1828E+04	1.2500E-01	4.0213E-04	0.0000E+00	4.2470E-04
33	2.8088E+04	1.2500E-01	3.3377E-04	0.0000E+00	3.5098E-04
34	2.4787E+04	1.2500E-01	2.7697E-04	0.0000E+00	2.9007E-04
35	2.1875E+04	1.2500E-01	2.2981E-04	0.0000E+00	2.3976E-04
36	1.9304E+04	1.2500E-01	1.9064E-04	0.0000E+00	1.9818E-04
37	1.7036E+04	1.2500E-01	1.5814E-04	0.0000E+00	1.6384E-04
38	1.5034E+04	1.2500E-01	1.3116E-04	0.0000E+00	1.3545E-04
39	1.3268E+04	1.2500E-01	1.0877E-04	0.0000E+00	1.1200E-04
40	1.1709E+04	1.2497E-01	9.0183E-05	0.0000E+00	9.2593E-05
41	1.0333E+04	1.2503E-01	7.4818E-05	0.0000E+00	7.6613E-05
42	9.1188E+03	1.2500E-01	6.2019E-05	0.0000E+00	6.3348E-05
43	8.0473E+03	1.2500E-01	5.1421E-05	0.0000E+00	5.2400E-05
44	7.1017E+03	1.2500E-01	4.2632E-05	0.0000E+00	4.3348E-05
45	6.2673E+03	1.2500E-01	3.5345E-05	0.0000E+00	3.5863E-05
46	5.5308E+03	1.2500E-01	2.9302E-05	0.0000E+00	2.9673E-05
47	4.8809E+03	1.2500E-01	2.4292E-05	0.0000E+00	2.4554E-05
48	4.3074E+03	1.2500E-01	2.0138E-05	0.0000E+00	2.0320E-05
49	3.8013E+03	1.2500E-01	1.6694E-05	0.0000E+00	1.6817E-05
50	3.3546E+03	1.2500E-01	1.3839E-05	0.0000E+00	1.3920E-05
51	2.9604E+03	1.2500E-01	1.1472E-05	0.0000E+00	1.1522E-05
52	2.6126E+03	1.2500E-01	9.5101E-06	0.0000E+00	9.5387E-06
53	2.3056E+03	1.2500E-01	7.8835E-06	0.0000E+00	7.8971E-06
54	2.0347E+03	1.2500E-01	6.5348E-06	0.0000E+00	6.5380E-06
55	1.7956E+03	1.2500E-01	5.4171E-06	0.0000E+00	5.4131E-06
56	1.5846E+03	1.2500E-01	4.4903E-06	0.0000E+00	4.4818E-06
57	1.3984E+03	1.2500E-01	3.7224E-06	0.0000E+00	3.7109E-06
58	1.2341E+03	1.2500E-01	3.0857E-06	0.0000E+00	3.0732E-06
59	1.0891E+03	1.2500E-01	2.5579E-06	0.0000E+00	2.5453E-06
60	9.6112E+02	2.5000E-01	3.8780E-06	0.0000E+00	3.8548E-06
61	7.4852E+02	2.5000E-01	2.6648E-06	0.0000E+00	2.6446E-06
62	5.8295E+02	2.5000E-01	1.8312E-06	0.0000E+00	1.8145E-06
63	4.5400E+02	2.5000E-01	1.2583E-06	0.0000E+00	1.2449E-06
64	3.5357E+02	2.5000E-01	8.6470E-07	0.0000E+00	8.5461E-07
65	2.7536E+02	2.5000E-01	5.9423E-07	0.0000E+00	5.8651E-07
66	2.1445E+02	2.5000E-01	4.0835E-07	0.0000E+00	4.0242E-07
67	1.6702E+02	2.5000E-01	2.8062E-07	0.0000E+00	2.7635E-07
68	1.3007E+02	2.5000E-01	1.9285E-07	0.0000E+00	1.8962E-07
69	1.0130E+02	5.0000E-01	2.2361E-07	0.0000E+00	2.1970E-07
70	6.1442E+01	1.7500E+00	2.0014E-07	0.0000E+00	1.9637E-07
			1.0000E+00	0.0000E+00	1.0000E+00

TABLE A-XXXII

FLATTOP-23 25-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.1931E+00	2.7221E-02	2.0425E-02	2.9309E+00	1.5725E-05	4.9648E-02
2	6.0653E+06	5.0000E-01	1.1751E-01	9.0040E-02	7.3401E-01	6.5865E-05	9.3850E-03
3	3.6788E+06	5.0000E-01	2.1642E-01	1.6387E-01	7.4771E-01	1.2124E-04	7.9148E-03
4	2.2313E+06	5.0000E-01	2.2875E-01	1.8109E-01	7.2383E-01	1.6662E-04	6.5382E-03
5	1.3533E+06	5.0000E-01	1.7415E-01	1.6529E-01	1.3335E+00	4.3943E-04	9.2048E-03
6	8.2085E+05	5.0000E-01	1.0974E-01	1.3674E-01	1.3634E+00	1.1227E-03	9.1896E-03
7	4.9787E+05	5.0000E-01	6.1786E-02	9.8468E-02	1.1049E+00	1.4736E-03	5.8610E-03
8	3.0197E+05	5.0000E-01	3.2483E-02	6.3416E-02	7.8595E-01	1.2701E-03	2.8619E-03
9	1.8316E+05	5.0000E-01	1.6480E-02	3.7869E-02	8.1880E-01	9.2572E-04	2.0937E-03
10	1.1109E+05	5.0000E-01	8.1125E-03	2.1975E-02	8.6673E-01	7.5644E-04	1.6101E-03
11	6.7379E+04	5.0000E-01	3.8766E-03	1.2048E-02	9.2261E-01	6.1117E-04	1.2975E-03
12	4.0868E+04	5.0000E-01	1.8345E-03	5.4138E-03	1.4807E+00	3.0091E-04	1.5040E-03
13	2.4787E+04	5.0000E-01	8.6594E-04	2.1213E-03	2.0887E+00	1.0144E-04	1.7080E-03
14	1.5034E+04	5.0000E-01	4.0829E-04	8.0354E-04	2.2482E+00	2.8522E-05	1.6173E-03
15	9.1188E+03	5.0000E-01	1.9243E-04	2.7520E-04	2.4511E+00	8.6088E-06	1.7109E-03
16	5.5308E+03	5.0000E-01	9.0695E-05	9.9517E-05	2.5636E+00	2.7373E-06	1.7443E-03
17	3.3546E+03	5.0000E-01	4.2754E-05	4.0681E-05	2.6823E+00	8.1930E-07	2.0244E-03
18	2.0347E+03	5.0000E-01	2.0159E-05	1.0145E-05	2.7703E+00	3.3545E-07	2.8912E-03
19	1.2341E+03	5.0000E-01	9.5077E-06	4.2324E-06	2.0776E+00	1.0022E-07	1.9975E-03
20	7.4852E+02	5.0000E-01	4.4854E-06	1.6124E-06	1.4288E+00	4.9620E-08	1.6454E-03
21	4.5400E+02	5.0000E-01	2.1163E-06	6.7159E-07	1.4357E+00	3.7217E-09	1.7685E-03
22	2.7536E+02	5.0000E-01	9.9867E-07	2.6040E-07	1.4497E+00	8.4649E-10	1.6860E-03
23	1.6702E+02	5.0000E-01	4.7133E-07	1.1663E-07	1.4339E+00	3.1955E-10	1.3836E-03
24	1.0130E+02	5.0000E-01	2.2249E-07	4.5315E-08	7.0655E-01	1.1036E-10	1.1475E-03
25	6.1442E+01	1.7500E+00	1.9906E-07	3.1694E-08	7.7507E-01	1.6523E-10	1.7455E-03
	1.0677E+01		1.0000E+00	1.0000E+00		7.4122E-03	

TABLE A-XXXIII

FLATTOP-23 25-GROUP ZONE FISSION FRACTIONS

Group	Energy Boundary (eV)	Lethargy Width	Core	Void	Reflector
1	2.0000E+07	1.1931E+00	2.8107E-02	0.0000E+00	2.5008E-02
2	6.0653E+06	5.0000E-01	1.1922E-01	0.0000E+00	1.1323E-01
3	3.6788E+06	5.0000E-01	2.1767E-01	0.0000E+00	2.1329E-01
4	2.2313E+06	5.0000E-01	2.2897E-01	0.0000E+00	2.2821E-01
5	1.3533E+06	5.0000E-01	1.7354E-01	0.0000E+00	1.7566E-01
6	8.2085E+05	5.0000E-01	1.0870E-01	0.0000E+00	1.1234E-01
7	4.9787E+05	5.0000E-01	6.0828E-02	0.0000E+00	6.4180E-02
8	3.0197E+05	5.0000E-01	3.1824E-02	0.0000E+00	3.4130E-02
9	1.8316E+05	5.0000E-01	1.6044E-02	0.0000E+00	1.7571E-02
10	1.1109E+05	5.0000E-01	7.8800E-03	0.0000E+00	8.6935E-03
11	6.7379E+04	5.0000E-01	3.7873E-03	0.0000E+00	4.0997E-03
12	4.0868E+04	5.0000E-01	1.8036E-03	0.0000E+00	1.9116E-03
13	2.4787E+04	5.0000E-01	8.5556E-04	0.0000E+00	8.9185E-04
14	1.5034E+04	5.0000E-01	4.0494E-04	0.0000E+00	4.1666E-04
15	9.1188E+03	5.0000E-01	1.9142E-04	0.0000E+00	1.9496E-04
16	5.5308E+03	5.0000E-01	9.0426E-05	0.0000E+00	9.1365E-05
17	3.3546E+03	5.0000E-01	4.2705E-05	0.0000E+00	4.2878E-05
18	2.0347E+03	5.0000E-01	2.0165E-05	0.0000E+00	2.0144E-05
19	1.2341E+03	5.0000E-01	9.5215E-06	0.0000E+00	9.4732E-06
20	7.4852E+02	5.0000E-01	4.4959E-06	0.0000E+00	4.4591E-06
21	4.5400E+02	5.0000E-01	2.1230E-06	0.0000E+00	2.0995E-06
22	2.7536E+02	5.0000E-01	1.0026E-06	0.0000E+00	9.8893E-07
23	1.6702E+02	5.0000E-01	4.7347E-07	0.0000E+00	4.6598E-07
24	1.0130E+02	5.0000E-01	2.2361E-07	0.0000E+00	2.1970E-07
25	6.1442E+01	1.7500E+00	2.0014E-07	0.0000E+00	1.9637E-07
			1.0000E+00	0.0000E+00	1.0000E+00

TABLE A-XXXIV

THOR 70-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.9315E-01	9.9205E-06	6.1012E-06	1.9514E+00	5.7251E-09	2.1561E-02
2	1.6487E+07	2.5000E-01	1.7020E-04	1.0957E-04	1.8169E+00	1.1411E-07	1.7970E-02
3	1.2840E+07	2.5000E-01	1.4565E-03	9.7734E-04	1.5317E+00	9.3300E-07	1.5162E-02
4	1.0000E+07	2.5000E-01	7.0306E-03	4.8525E-03	1.4452E+00	4.5653E-06	1.3271E-02
5	7.7880E+06	2.5000E-01	2.1625E-02	1.4673E-02	1.2501E+00	1.1200E-05	9.3995E-03
6	6.0653E+06	2.5000E-01	4.6797E-02	3.1169E-02	1.0516E+00	2.2068E-05	7.5415E-03
7	4.7237E+06	2.5000E-01	7.7147E-02	5.1630E-02	1.0295E+00	3.3315E-05	7.1178E-03
8	3.6788E+06	2.5000E-01	1.0318E-01	6.9710E-02	1.0335E+00	3.9534E-05	6.6711E-03
9	2.8650E+06	2.5000E-01	1.1761E-01	8.2136E-02	1.0377E+00	4.5761E-05	6.3044E-03
10	2.2313E+06	2.5000E-01	1.1873E-01	8.7310E-02	1.0347E+00	5.7167E-05	6.1015E-03
11	1.7377E+06	2.5000E-01	1.0932E-01	8.7529E-02	1.0088E+00	7.5129E-05	5.9108E-03
12	1.3533E+06	1.2500E-01	4.9096E-02	4.2704E-02	9.7824E-01	4.4981E-05	5.5614E-03
13	1.1943E+06	1.2500E-01	4.4885E-02	4.1893E-02	9.4877E-01	5.6342E-05	5.3708E-03
14	1.0540E+06	1.2500E-01	4.0517E-02	4.0690E-02	9.3546E-01	6.9498E-05	5.2003E-03
15	9.3014E+05	1.2500E-01	3.6218E-02	3.9163E-02	9.3018E-01	8.8256E-05	4.9551E-03
16	8.2085E+05	1.2500E-01	3.2084E-02	3.7712E-02	9.2243E-01	1.4034E-04	5.3353E-03
17	7.2440E+05	1.2500E-01	2.8152E-02	3.6519E-02	9.0209E-01	1.9813E-04	5.4483E-03
18	6.3928E+05	1.2500E-01	2.4578E-02	3.4692E-02	9.0248E-01	2.3883E-04	5.2747E-03
19	5.6416E+05	1.2500E-01	2.1321E-02	3.2643E-02	9.0069E-01	2.6942E-04	5.1247E-03
20	4.9787E+05	1.2500E-01	1.8376E-02	3.0419E-02	9.0248E-01	2.8623E-04	4.9378E-03
21	4.3937E+05	1.2500E-01	1.5768E-02	2.7966E-02	9.0613E-01	2.9184E-04	4.7111E-03
22	3.8774E+05	2.5000E-01	2.4994E-02	4.8582E-02	9.0927E-01	5.8732E-04	4.4386E-03
23	3.0197E+05	2.5000E-01	1.8025E-02	3.8992E-02	9.1266E-01	5.4449E-04	4.0365E-03
24	2.3518E+05	2.5000E-01	1.2860E-02	3.0997E-02	9.2051E-01	5.1702E-04	3.6496E-03
25	1.8316E+05	2.5000E-01	9.1006E-03	2.4952E-02	9.4297E-01	5.4868E-04	3.3330E-03
26	1.4264E+05	2.5000E-01	6.4005E-03	1.9088E-02	9.8267E-01	5.2730E-04	2.9938E-03
27	1.1109E+05	2.5000E-01	4.4834E-03	1.4183E-02	9.9142E-01	4.1718E-04	2.6127E-03
28	8.6517E+04	2.5000E-01	3.1226E-03	9.9034E-03	1.0030E+00	2.9582E-04	2.1817E-03
29	6.7379E+04	2.5000E-01	2.1600E-03	6.5435E-03	1.0213E+00	1.8442E-04	1.7896E-03
30	5.2475E+04	2.5000E-01	1.4911E-03	4.3848E-03	1.0035E+00	1.0454E-04	1.5303E-03
31	4.0868E+04	2.5000E-01	1.0280E-03	2.8637E-03	1.0156E+00	6.0441E-05	1.4126E-03
32	3.1828E+04	1.2500E-01	3.8692E-04	1.0190E-03	1.0148E+00	1.9898E-05	1.2642E-03
33	2.8088E+04	1.2500E-01	3.2101E-04	8.1650E-04	1.0058E+00	1.5114E-05	1.1754E-03
34	2.4787E+04	1.2500E-01	2.6629E-04	6.4669E-04	9.9626E-01	1.1613E-05	1.0931E-03
35	2.1875E+04	1.2500E-01	2.2086E-04	5.1683E-04	9.9544E-01	8.9134E-06	1.0192E-03
36	1.9304E+04	1.2500E-01	1.8316E-04	4.1605E-04	9.9178E-01	6.8447E-06	9.5446E-04
37	1.7036E+04	1.2500E-01	1.5188E-04	3.3569E-04	9.8690E-01	5.1123E-06	8.9816E-04
38	1.5034E+04	1.2500E-01	1.2593E-04	2.7232E-04	9.8251E-01	3.8141E-06	8.5062E-04
39	1.3268E+04	1.2500E-01	1.0441E-04	2.1602E-04	9.8358E-01	2.8616E-06	8.1045E-04
40	1.1709E+04	1.2497E-01	8.6537E-05	1.7243E-04	9.8686E-01	2.1669E-06	7.7380E-04
41	1.0333E+04	1.2503E-01	7.1775E-05	1.3504E-04	9.9909E-01	1.6562E-06	7.3741E-04
42	9.1188E+03	1.2500E-01	5.9482E-05	1.0081E-04	1.0521E+00	1.2601E-06	6.9700E-04
43	8.0473E+03	1.2500E-01	4.9307E-05	7.6595E-05	9.9669E-01	9.0443E-07	6.5489E-04
44	7.1017E+03	1.2500E-01	4.0871E-05	6.2648E-05	9.2836E-01	7.3884E-07	6.2877E-04
45	6.2673E+03	1.2500E-01	3.3878E-05	4.7040E-05	9.7852E-01	5.3794E-07	6.1035E-04
46	5.5308E+03	1.2500E-01	2.8080E-05	3.5959E-05	9.5071E-01	3.5499E-07	5.8060E-04
47	4.8809E+03	1.2500E-01	2.3275E-05	3.0538E-05	9.6689E-01	3.7370E-07	5.4436E-04
48	4.3074E+03	1.2500E-01	1.9292E-05	2.3329E-05	9.6855E-01	2.2611E-07	4.8616E-04
49	3.8013E+03	1.2500E-01	1.5990E-05	1.7594E-05	1.0884E+00	1.2982E-07	4.8096E-04
50	3.3546E+03	1.2500E-01	1.3253E-05	1.3663E-05	1.1230E+00	7.4925E-08	4.4080E-04
51	2.9604E+03	1.2500E-01	1.0985E-05	1.1673E-05	1.1109E+00	4.7066E-08	4.9311E-04
52	2.6126E+03	1.2500E-01	9.1052E-06	9.0158E-06	9.9953E-01	3.6606E-08	5.4763E-04
53	2.3056E+03	1.2500E-01	7.5469E-06	6.9802E-06	8.7883E-01	2.5387E-08	5.1150E-04
54	2.0347E+03	1.2500E-01	6.2552E-06	5.5486E-06	9.7663E-01	1.7708E-08	5.7577E-04
55	1.7956E+03	1.2500E-01	5.1847E-06	4.4423E-06	9.6900E-01	1.2927E-08	7.2429E-04
56	1.5846E+03	1.2500E-01	4.2973E-06	3.8805E-06	1.0920E+00	1.6021E-08	9.4005E-04
57	1.3984E+03	1.2500E-01	3.5620E-06	2.6151E-06	1.3788E+00	1.1072E-08	7.2452E-04
58	1.2341E+03	1.2500E-01	2.9524E-06	2.0440E-06	1.2077E+00	6.6840E-09	7.1978E-04
59	1.0891E+03	1.2500E-01	2.4472E-06	1.5324E-06	1.3397E+00	4.4754E-09	7.3798E-04
60	9.6112E+02	2.5000E-01	3.7098E-06	2.5323E-06	1.2024E+00	6.4318E-09	8.5212E-04
61	7.4852E+02	2.5000E-01	2.5489E-06	1.7306E-06	1.0480E+00	7.7315E-09	9.4337E-04
62	5.8295E+02	2.5000E-01	1.7513E-06	8.1633E-07	1.5615E+00	2.3078E-09	9.7391E-04
63	4.5400E+02	2.5000E-01	1.2033E-06	7.4498E-07	1.3820E+00	1.1564E-09	1.0185E-03
64	3.5357E+02	2.5000E-01	8.2681E-07	4.0385E-07	1.2786E+00	5.5838E-10	7.5633E-04
65	2.7536E+02	2.5000E-01	5.6814E-07	1.7068E-07	1.5072E+00	2.6379E-10	8.4127E-04
66	2.1445E+02	2.5000E-01	3.9040E-07	1.5919E-07	1.4904E+00	1.1991E-10	8.0276E-04
67	1.6702E+02	2.5000E-01	2.6825E-07	1.0186E-07	1.5339E+00	2.5501E-10	2.0639E-03
68	1.3007E+02	2.5000E-01	1.8434E-07	5.7990E-08	1.4422E+00	4.7497E-11	2.7218E-04
69	1.0130E+02	5.0000E-01	2.1373E-07	3.8688E-08	2.0188E+00	2.8140E-11	1.2611E-03
70	6.1442E+01	1.7500E+00	1.9128E-07	4.0196E-08	1.6759E+00	7.2996E-11	8.9516E-04
	1.0677E+01		1.0000E+00	1.0000E+00		5.8437E-03	

TABLE A-XXXV

THOR 70-GROUP ZONE FISSION FRACTIONS

Group	Energy Boundary (eV)	Lethargy Width	Core	Reflector
1	2.0000E+07	1.9315E-01	9.0619E-06	2.9298E-05
2	1.6487E+07	2.5000E-01	1.6158E-04	3.6481E-04
3	1.2840E+07	2.5000E-01	1.4129E-03	2.4423E-03
4	1.0000E+07	2.5000E-01	6.9081E-03	9.7942E-03
5	7.7880E+06	2.5000E-01	2.1417E-02	2.6318E-02
6	6.0653E+06	2.5000E-01	4.6576E-02	5.1788E-02
7	4.7237E+06	2.5000E-01	7.7018E-02	8.0052E-02
8	3.6788E+06	2.5000E-01	1.0320E-01	1.0270E-01
9	2.8650E+06	2.5000E-01	1.1777E-01	1.1414E-01
10	2.2313E+06	2.5000E-01	1.1895E-01	1.1360E-01
11	1.7377E+06	2.5000E-01	1.0957E-01	1.0388E-01
12	1.3533E+06	1.2500E-01	4.9205E-02	4.6635E-02
13	1.1943E+06	1.2500E-01	4.4973E-02	4.2894E-02
14	1.0540E+06	1.2500E-01	4.0586E-02	3.8951E-02
15	9.3014E+05	1.2500E-01	3.6263E-02	3.5199E-02
16	8.2085E+05	1.2500E-01	3.2108E-02	3.1522E-02
17	7.2440E+05	1.2500E-01	2.8177E-02	2.7597E-02
18	6.3928E+05	1.2500E-01	2.4584E-02	2.4444E-02
19	5.6416E+05	1.2500E-01	2.1314E-02	2.1475E-02
20	4.9787E+05	1.2500E-01	1.8365E-02	1.8620E-02
21	4.3937E+05	1.2500E-01	1.5752E-02	1.6128E-02
22	3.8774E+05	2.5000E-01	2.4957E-02	2.5839E-02
23	3.0197E+05	2.5000E-01	1.7984E-02	1.8942E-02
24	2.3518E+05	2.5000E-01	1.2822E-02	1.3728E-02
25	1.8316E+05	2.5000E-01	9.0602E-03	1.0012E-02
26	1.4264E+05	2.5000E-01	6.3728E-03	7.0261E-03
27	1.1109E+05	2.5000E-01	4.4612E-03	4.9853E-03
28	8.6517E+04	2.5000E-01	3.1073E-03	3.4681E-03
29	6.7379E+04	2.5000E-01	2.1509E-03	2.3667E-03
30	5.2475E+04	2.5000E-01	1.4857E-03	1.6114E-03
31	4.0868E+04	2.5000E-01	1.0250E-03	1.0975E-03
32	3.1828E+04	1.2500E-01	3.8592E-04	4.0963E-04
33	2.8088E+04	1.2500E-01	3.2025E-04	3.3817E-04
34	2.4787E+04	1.2500E-01	2.6571E-04	2.7921E-04
35	2.1875E+04	1.2500E-01	2.2043E-04	2.3057E-04
36	1.9304E+04	1.2500E-01	1.8283E-04	1.9042E-04
37	1.7036E+04	1.2500E-01	1.5164E-04	1.5729E-04
38	1.5034E+04	1.2500E-01	1.2575E-04	1.2994E-04
39	1.3268E+04	1.2500E-01	1.0428E-04	1.0736E-04
40	1.1709E+04	1.2497E-01	8.6442E-05	8.8698E-05
41	1.0333E+04	1.2503E-01	7.1706E-05	7.3342E-05
42	9.1188E+03	1.2500E-01	5.9433E-05	6.0606E-05
43	8.0473E+03	1.2500E-01	4.9272E-05	5.0103E-05
44	7.1017E+03	1.2500E-01	4.0846E-05	4.1424E-05
45	6.2673E+03	1.2500E-01	3.3861E-05	3.4253E-05
46	5.5308E+03	1.2500E-01	2.8069E-05	2.8327E-05
47	4.8809E+03	1.2500E-01	2.3268E-05	2.3429E-05
48	4.3074E+03	1.2500E-01	1.9288E-05	1.9381E-05
49	3.8013E+03	1.2500E-01	1.5988E-05	1.6034E-05
50	3.3546E+03	1.2500E-01	1.3253E-05	1.3265E-05
51	2.9604E+03	1.2500E-01	1.0985E-05	1.0976E-05
52	2.6126E+03	1.2500E-01	9.1061E-06	9.0835E-06
53	2.3056E+03	1.2500E-01	7.5482E-06	7.5178E-06
54	2.0347E+03	1.2500E-01	6.2566E-06	6.2223E-06
55	1.7956E+03	1.2500E-01	5.1862E-06	5.1507E-06
56	1.5846E+03	1.2500E-01	4.2988E-06	4.2637E-06
57	1.3984E+03	1.2500E-01	3.5635E-06	3.5294E-06
58	1.2341E+03	1.2500E-01	2.9538E-06	2.9221E-06
59	1.0891E+03	1.2500E-01	2.4485E-06	2.4196E-06
60	9.6112E+02	2.5000E-01	3.7119E-06	3.6629E-06
61	7.4852E+02	2.5000E-01	2.5505E-06	2.5123E-06
62	5.8295E+02	2.5000E-01	1.7526E-06	1.7236E-06
63	4.5400E+02	2.5000E-01	1.2042E-06	1.1826E-06
64	3.5357E+02	2.5000E-01	8.2751E-07	8.1117E-07
65	2.7536E+02	2.5000E-01	5.6865E-07	5.5680E-07
66	2.1445E+02	2.5000E-01	3.9076E-07	3.8225E-07
67	1.6702E+02	2.5000E-01	2.6853E-07	2.6200E-07
68	1.3007E+02	2.5000E-01	1.8453E-07	1.7991E-07
69	1.0130E+02	5.0000E-01	2.1396E-07	2.0841E-07
70	6.1442E+01	1.7500E+00	1.9151E-07	1.8621E-07
			1.0000E+00	1.0000E+00

TABLE A-XXXVI

THOR 25-GROUP TRANSPORT THEORY SPECTRA

Group	Energy Boundary (eV)	Lethargy Width	Reactor Fission Fractions	Central Flux (n/cm²/s)	Central Adjoint (rho/n/s)	Edge Flux (n/cm²/s)	Edge Adjoint (rho/n/s)
1	2.0000E+07	1.1931E+00	3.0292E-02	2.0618E-02	2.9226E+00	1.6818E-05	2.8279E-02
2	6.0653E+06	5.0000E-01	1.2394E-01	8.2799E-02	7.6072E-01	5.5383E-05	5.3586E-03
3	3.6788E+06	5.0000E-01	2.2079E-01	1.5185E-01	7.5710E-01	8.5294E-05	4.7431E-03
4	2.2313E+06	5.0000E-01	2.2805E-01	1.7484E-01	7.4698E-01	1.3230E-04	4.3910E-03
5	1.3533E+06	5.0000E-01	1.7072E-01	1.6445E-01	1.3864E+00	2.5908E-04	7.7084E-03
6	8.2085E+05	5.0000E-01	1.0613E-01	1.4157E-01	1.3261E+00	8.4672E-04	7.7433E-03
7	4.9787E+05	5.0000E-01	5.9138E-02	1.0697E-01	9.9350E-01	1.1654E-03	5.1496E-03
8	3.0197E+05	5.0000E-01	3.0885E-02	6.9989E-02	6.7010E-01	1.0615E-03	2.8096E-03
9	1.8316E+05	5.0000E-01	1.5501E-02	4.4040E-02	7.0390E-01	1.0760E-03	2.3127E-03
10	1.1109E+05	5.0000E-01	7.6060E-03	2.4086E-02	7.2903E-01	7.1301E-04	1.7525E-03
11	6.7379E+04	5.0000E-01	3.6511E-03	1.0928E-02	7.4013E-01	2.8896E-04	1.2136E-03
12	4.0868E+04	5.0000E-01	1.7360E-03	4.6992E-03	1.1099E+00	9.5453E-05	1.4082E-03
13	2.4787E+04	5.0000E-01	8.2218E-04	1.9153E-03	1.4513E+00	3.2483E-05	1.4493E-03
14	1.5034E+04	5.0000E-01	3.8865E-04	7.9581E-04	1.4446E+00	1.0499E-05	1.1596E-03
15	9.1188E+03	5.0000E-01	1.8354E-04	2.8709E-04	1.4460E+00	3.4413E-06	9.4712E-04
16	5.5308E+03	5.0000E-01	8.6637E-05	1.0742E-04	1.4528E+00	1.0846E-06	7.6474E-04
17	3.3546E+03	5.0000E-01	4.0891E-05	4.1332E-05	1.5032E+00	1.8398E-07	7.2854E-04
18	2.0347E+03	5.0000E-01	1.9299E-05	1.6486E-05	1.6144E+00	5.7728E-08	1.0837E-03
19	1.2341E+03	5.0000E-01	9.1095E-06	6.1087E-06	1.3707E+00	1.7591E-08	8.4436E-04
20	7.4852E+02	5.0000E-01	4.3002E-06	2.5469E-06	9.5387E-01	1.0039E-08	7.0065E-04
21	4.5400E+02	5.0000E-01	2.0301E-06	1.1488E-06	9.7259E-01	1.7148E-09	6.4879E-04
22	2.7536E+02	5.0000E-01	9.5854E-07	3.2987E-07	1.0958E+00	3.8371E-10	6.0096E-04
23	1.6702E+02	5.0000E-01	4.5259E-07	1.5985E-07	1.0879E+00	3.0250E-10	8.5393E-04
24	1.0130E+02	5.0000E-01	2 1373E-07	3.8688E-08	7.3796E-01	2.8140E-11	4.6098E-04
25	6.1442E+01	1.7500E+00	1.9128E-07	4.0196E-08	6.1261E-01	7.2996E-11	3.2722E-04
	1.0677E+01		1.0000E+00	1.0000E+00		5.8437E-03	

TABLE A-XXXVII

THOR 25-GROUP ZONE FISSION FRACTIONS

Group	Energy Boundary (eV)	Lethargy Width	Core	Reflector
1	2.0000E+07	1.1931E+00	2.9908E-02	3.8948E-02
2	6.0653E+06	5.0000E-01	1.2359E-01	1.3184E-01
3	3.6788E+06	5.0000E-01	2.2096E-01	2.1684E-01
4	2.2313E+06	5.0000E-01	2.2852E-01	2.1748E-01
5	1.3533E+06	5.0000E-01	1.7103E-01	1.6368E-01
6	8.2085E+05	5.0000E-01	1.0618E-01	1.0504E-01
7	4.9787E+05	5.0000E-01	5.9074E-02	6.0587E-02
8	3.0197E+05	5.0000E-01	3.0806E-02	3.2671E-02
9	1.8316E+05	5.0000E-01	1.5433E-02	1.7038E-02
10	1.1109E+05	5.0000E-01	7.5685E-03	8.4534E-03
11	6.7379E+04	5.0000E-01	3.6366E-03	3.9781E-03
12	4.0868E+04	5.0000E-01	1.7311E-03	1.8453E-03
13	2.4787E+04	5.0000E-01	8.2062E-04	8.5749E-04
14	1.5034E+04	5.0000E-01	3.8818E-04	3.9934E-04
15	9.1188E+03	5.0000E-01	1.8341E-04	1.8639E-04
16	5.5308E+03	5.0000E-01	8.6613E-05	8.7172E-05
17	3.3546E+03	5.0000E-01	4.0893E-05	4.0842E-05
18	2.0347E+03	5.0000E-01	1.9305E-05	1.9166E-05
19	1.2341E+03	5.0000E-01	9.1142E-06	9.0047E-06
20	7.4852E+02	5.0000E-01	4.3031E-06	4.2359E-06
21	4.5400E+02	5.0000E-01	2.0318E-06	1.9938E-06
22	2.7536E+02	5.0000E-01	9.5941E-07	9.3905E-07
23	1.6702E+02	5.0000E-01	4.5306E-07	4.4191E-07
24	1.0130E+02	5.0000E-01	2.1396E-07	2.0841E-07
25	6.1442E+01	1.7500E+00	1.9151E-07	1.8621E-07
			1.0000E+00	1.0000E+00

TABLE A-XXXVIII

JEZEBEL CENTRAL AVERAGE CROSS SECTIONS

Material	Fission	Capture	Nu	Transport
PU-239	1.75579E+00	5.77883E-02	3.15322E+00	5.45076E+00
PU-240	1.19034E+00	1.08830E-01	3.14921E+00	5.38819E+00
PU-241	1.62250E+00	1.05567E-01	3.14429E+00	5.45816E+00
GA	0.00000E+00	3.12996E-02	0.00000E+00	3.66128E+00
U-238	2.44328E-01	6.74352E-02	2.82424E+00	5.37163E+00
U-235	1.24699E+00	1.17241E-01	2.62634E+00	5.24713E+00
U-233	1.94137E+00	6.96737E-02	2.66345E+00	4.94977E+00
NP-237	1.18657E+00	2.40580E-01	3.03397E+00	5.68847E+00
V	0.00000E+00	2.22275E-03	0.00000E+00	3.00589E+00
MN-55	0.00000E+00	3.53936E-03	0.00000E+00	2.86744E+00
CU	0.00000E+00	1.04490E-02	0.00000E+00	2.85326E+00
NB-93	0.00000E+00	3.38166E-02	0.00000E+00	4.21483E+00
AU-197	0.00000E+00	9.86331E-02	0.00000E+00	4.62689E+00
H-1	0.00000E+00	4.56915E-05	0.00000E+00	1.37805E+00
BE-9	0.00000E+00	-6.66598E-02	0.00000E+00	2.30149E+00
B-10	0.00000E+00	5.54970E-01	0.00000E+00	2.39302E+00
C	0.00000E+00	1.69424E-03	0.00000E+00	2.21541E+00
N-14	0.00000E+00	1.03117E-01	0.00000E+00	1.86611E+00
O-16	0.00000E+00	7.51183E-03	0.00000E+00	2.66507E+00
AL-27	0.00000E+00	4.85717E-03	0.00000E+00	2.35737E+00
TI	0.00000E+00	5.62303E-03	0.00000E+00	2.40826E+00
FE	0.00000E+00	8.65849E-03	0.00000E+00	2.50076E+00
CO-59	0.00000E+00	8.27693E-03	0.00000E+00	2.83078E+00
NI	0.00000E+00	6.84930E-02	0.00000E+00	2.89721E+00
ZR	0.00000E+00	9.01648E-03	0.00000E+00	4.32266E+00
MO	0.00000E+00	2.97271E-02	0.00000E+00	4.44940E+00
AG-107	0.00000E+00	1.25732E-01	0.00000E+00	4.05161E+00
AG-109	0.00000E+00	1.37477E-01	0.00000E+00	4.03375E+00
TA-181	0.00000E+00	1.22270E-01	0.00000E+00	4.57687E+00
W-182	0.00000E+00	5.35738E-02	0.00000E+00	4.50621E+00
W-183	0.00000E+00	2.61822E-02	0.00000E+00	4.45531E+00
W-184	0.00000E+00	3.91364E-02	0.00000E+00	4.58672E+00
W-186	0.00000E+00	3.11573E-02	0.00000E+00	4.53192E+00
TH-232	6.04543E-02	9.12867E-02	2.44657E+00	5.42515E+00
AM-241	1.23896E+00	3.59570E-01	3.49327E+00	4.87800E+00

TABLE A-XXXIX

GODIVA CENTRAL AVERAGE CROSS SECTIONS

Material	Fission	Capture	Nu	Transport
U-235	1.24818E+00	1.29960E-01	2.60208E+00	5.35282E+00
U-238	2.13082E-01	7.69488E-02	2.80395E+00	5.47722E+00
U-234	1.02730E+00	2.15468E-01	2.63279E+00	6.33198E+00
U-233	1.95613E+00	7.98282E-02	2.63936E+00	5.02313E+00
PU-239	1.73995E+00	6.63661E-02	3.12300E+00	5.54783E+00
NP-237	1.11165E+00	2.67483E-01	3.01005E+00	5.76466E+00
MN-55	0.00000E+00	3.75148E-03	0.00000E+00	2.90205E+00
CO-59	0.00000E+00	7.32704E-03	0.00000E+00	2.88690E+00
CU	0.00000E+00	1.09715E-02	0.00000E+00	2.90733E+00
AU-197	0.00000E+00	1.06729E-01	0.00000E+00	4.69441E+00
NB-93	0.00000E+00	3.69218E-02	0.00000E+00	4.36046E+00
H-1	0.00000E+00	4.64817E-05	0.00000E+00	1.44882E+00
BE-9	0.00000E+00	-5.16129E-02	0.00000E+00	2.39517E+00
B-10	0.00000E+00	5.85682E-01	0.00000E+00	2.49574E+00
C	0.00000E+00	1.40358E-03	0.00000E+00	2.28417E+00
AL-27	0.00000E+00	3.84452E-03	0.00000E+00	2.43458E+00
FE	0.00000E+00	7.89884E-03	0.00000E+00	2.53210E+00
NI	0.00000E+00	5.70077E-02	0.00000E+00	2.95382E+00
TH-232	5.21682E-02	1.02470E-01	2.42435E+00	5.54526E+00
PU-240	1.11530E+00	1.17906E-01	3.12461E+00	5.48241E+00

TABLE A-XL

JEZEBEL-23 CENTRAL AVERAGE CROSS SECTIONS

Material	Fission	Capture	Nu	Transport
U-233	1.93123E+00	6.37848E-02	2.67631E+00	4.86727E+00
U-234	1.12913E+00	1.93555E-01	2.66508E+00	6.10461E+00
U-235	1.24495E+00	1.09838E-01	2.63819E+00	5.14947E+00
U-238	2.63989E-01	6.34696E-02	2.82423E+00	5.26797E+00
NP-237	1.23264E+00	2.21975E-01	3.04319E+00	5.61432E+00
P-31	0.00000E+00	3.32225E-02	0.00000E+00	2.06988E+00
AL-27	0.00000E+00	5.09178E-03	0.00000E+00	2.29439E+00
FE	0.00000E+00	8.86064E-03	0.00000E+00	2.46260E+00
CU	0.00000E+00	2.07291E-02	0.00000E+00	2.79371E+00

TABLE A-XLI

BIGTEN CENTRAL AVERAGE CROSS SECTIONS

Material	Fission	Capture	Nu	Transport
U-234	4.85378E-01	3.12138E-01	2.53917E+00	7.94380E+00
U-235	1.36153E+00	2.70796E-01	2.49333E+00	7.01475E+00
U-238	5.43731E-02	1.46774E-01	2.78958E+00	7.08415E+00
NP-237	4.87110E-01	6.71579E-01	2.91766E+00	7.13537E+00
PU-239	1.62269E+00	1.72533E-01	2.97601E+00	7.03690E+00
U-233	2.12360E+00	1.62719E-01	2.53515E+00	6.47156E+00
LI-6	0.00000E+00	8.44854E-01	0.00000E+00	2.45310E+00
B-10	0.00000E+00	1.16875E+00	0.00000E+00	3.55879E+00
AL-27	0.00000E+00	2.13392E-03	0.00000E+00	3.41184E+00
CO-59	0.00000E+00	1.23459E-02	0.00000E+00	4.16122E+00
CU	0.00000E+00	1.94416E-02	0.00000E+00	4.00626E+00
AU-197	0.00000E+00	2.09226E-01	0.00000E+00	6.10512E+00
H-1	0.00000E+00	7.48858E-05	0.00000E+00	2.38364E+00
LI-7	0.00000E+00	8.34848E-07	0.00000E+00	1.59696E+00
BE-9	0.00000E+00	-1.16375E-02	0.00000E+00	3.39757E+00
B-11	0.00000E+00	1.52962E-04	0.00000E+00	2.97528E+00
C	0.00000E+00	8.48782E-04	0.00000E+00	3.03146E+00
O-16	0.00000E+00	1.36485E-03	0.00000E+00	3.68063E+00
FE	0.00000E+00	7.96683E-03	0.00000E+00	3.29109E+00
TH-232	1.31182E-02	1.78212E-01	2.41145E+00	7.34467E+00
PU-238	1.22123E+00	3.66940E-01	3.03359E+00	6.90196E+00

TABLE A-XLII

JEZEBEL-PU CENTRAL AVERAGE CROSS SECTIONS

Material	Fission	Capture	Nu	Transport
PU-239	1.75185E+00	6.02035E-02	3.14781E+00	5.48448E+00
PU-240	1.17204E+00	1.11325E-01	3.14622E+00	5.41936E+00
PU-241	1.62550E+00	1.07966E-01	3.13913E+00	5.49888E+00
PU-242	9.66295E-01	8.58408E-02	3.15657E+00	5.29506E+00
GA	0.00000E+00	3.19774E-02	0.00000E+00	3.68911E+00
U-238	2.37472E-01	6.92061E-02	2.82439E+00	5.41137E+00
U-235	1.24839E+00	1.20560E-01	2.62206E+00	5.28524E+00
NP-237	1.16830E+00	2.49270E-01	3.03113E+00	5.71795E+00
PU-238	1.82709E+00	1.82408E-01	3.19250E+00	5.08358E+00
CM-244	1.39762E+00	1.69346E-01	3.87729E+00	5.02225E+00

TABLE A-XLIII

FLATTOP-25 CENTRAL AVERAGE CROSS SECTIONS

Material	Fission	Capture	Nu	Transport
U-234	9.64841E-01	2.25317E-01	2.62726E+00	6.14493E+00
U-235	1.25842E+00	1.44558E-01	2.58894E+00	5.16148E+00
U-238	1.94666E-01	8.39212E-02	2.80366E+00	5.27477E+00
U-233	1.97348E+00	8.90122E-02	2.62655E+00	4.85679E+00
NP-237	1.03910E+00	3.08488E-01	3.00508E+00	5.60651E+00
PU-239	1.72567E+00	7.73638E-02	3.10724E+00	5.37593E+00
PU-238	1.71655E+00	2.12988E-01	3.15767E+00	4.94642E+00
PU-242	8.52602E-01	1.01682E-01	3.13040E+00	5.15693E+00
AM-241	1.04594E+00	4.51398E-01	3.46714E+00	4.78789E+00
P-31	0.00000E+00	2.36714E-02	0.00000E+00	2.07786E+00
AL-27	0.00000E+00	3.62882E-03	0.00000E+00	2.32044E+00
FE	0.00000E+00	7.87779E-03	0.00000E+00	2.44519E+00
CU	0.00000E+00	1.91806E-02	0.00000E+00	2.78082E+00

TABLE A-XLIV

FLATTOP-PU CENTRAL AVERAGE CROSS SECTIONS

Material	Fission	Capture	Nu	Transport
PU-239	1.73437E+00	7.53247E-02	3.12672E+00	5.30701E+00
PU-240	1.08178E+00	1.27913E-01	3.13916E+00	5.24489E+00
PU-241	1.65009E+00	1.22761E-01	3.11820E+00	5.28656E+00
GA	0.00000E+00	3.59834E-02	0.00000E+00	3.55857E+00
U-235	1.26362E+00	1.40772E-01	2.60357E+00	5.08549E+00
U-238	2.13989E-01	7.97057E-02	2.82202E+00	5.20139E+00
NP-237	1.07607E+00	3.06322E-01	3.02496E+00	5.55653E+00
PU-238	1.74504E+00	2.07221E-01	3.17821E+00	4.87702E+00
PU-242	8.86034E-01	9.93085E-02	3.15103E+00	5.06783E+00
AM-241	1.10400E+00	4.39557E-01	3.48731E+00	4.75165E+00
P-31	0.00000E+00	2.71004E-02	0.00000E+00	2.05680E+00
AL-27	0.00000E+00	4.38786E-03	0.00000E+00	2.26057E+00
FE	0.00000E+00	8.51140E-03	0.00000E+00	2.42969E+00
CU	0.00000E+00	2.03081E-02	0.00000E+00	2.74736E+00

TABLE A-XLV

FLATTOP-23 CENTRAL AVERAGE CROSS SECTIONS

Material	Fission	Capture	Nu	Transport
U-233	1.95140E+00	7.48318E-02	2.65766E+00	4.73530E+00
U-234	1.05744E+00	2.07046E-01	2.65582E+00	5.95025E+00
U-235	1.25512E+00	1.26749E-01	2.61947E+00	4.99305E+00
U-238	2.38047E-01	7.26335E-02	2.82191E+00	5.10290E+00
NP-237	1.14882E+00	2.67765E-01	3.03434E+00	5.48688E+00

TABLE A-XLVI

THOR CENTRAL AVERAGE CROSS SECTIONS

Material	Fission	Capture	Nu	Transport
PU-239	1.74135E+00	6.86244E-02	3.13639E+00	5.36389E+00
PU-240	1.11784E+00	1.20396E-01	3.14377E+00	5.30258E+00
GA	0.00000E+00	3.42750E-02	1.47400E-02	3.59815E+00
TH-232	5.56369E-02	1.14204E-01	2.44554E+00	5.31903E+00
U-238	2.25001E-01	8.91162E-02	2.82327E+00	5.26795E+00
U-235	1.25685E+00	1.31874E-01	2.61185E+00	5.14996E+00
NP-237	1.11277E+00	2.81017E-01	3.02918E+00	5.60934E+00

APPENDIX B

COMPUTER RUN TIMES

Tabulating the present computer run times can prove to be convenient and useful. It can assist the execution of future runs and provide a basis for determining the run time effects of future code changes.

Table B-I is a compilation of the Appendix A computer run times. Table B-II shows the times required to produce Table II (eigenvalue vs P_i), and Table B-III contains the run times expended to produce Table III (eigenvalue vs S_i). Because we operate in a computer time sharing system, these times are subject to variation depending on the characteristics of other jobs running simultaneously. Such variation could easily be ±20%.

TABLE B-I

COMPUTER RUN TIMES FOR APPENDIX A RESULTS

	SUPERX Flux and X Section (Cray s)	SUPERX Adjoint (Cray s)	SUPERB Diffusion Theory Worths (Cray s)	ONETRAN Flux (CDC7600 s)	ONETRAN Adjoint (CDC7600 s)	SUPERB Transport Theory Worths (Cray s)
JEZEBEL	353	63	60	39	38	66
GODIVA	178	38	37	40	37	39
JEZEBEL-23	80	24	29	38	38	25
JEZEBEL-Pu	99	25	22	38	38	23
BIGTEN	229	65	62	116	132	68
FLATTOP-25	142	19	27	55	111	53
FLATTOP-Pu	157	22	29	96	115	48
FLATTOP-23	93	30	39	100	123	38
THOR	94	26	23	54	87	22

TABLE B-II

ONEDANT CDC-7600 RUN TIMES (s) FOR P_i EIGENVALUES (ALL S_{16})

	P_0	P_1	P_2	P_3	P_4	P_5
JEZEBEL	40	54	56	63	69	76
GODIVA	39	64	65	71	77	83
JEZEBEL-23	40	61	61	76	76	81
JEZEBEL-Pu	39	55	56	64	70	76
BIGTEN	41	73	80	88	98	107
FLATTOP-25	60	107	125	139	152	166
FLATTOP-Pu	52	104	114	129	141	151
FLATTOP-23	49	88	109	124	136	149
THOR	41	68	78	87	100	109

TABLE B-III

ONEDANT CDC-7600 RUN TIMES (s) FOR S_i EIGENVALUES (ALL P_3)

	S_4	S_8	S_{16}	S_{32}	S_{48}
JEZEBEL	57	60	63	72	78
GODIVA	69	71	71	79	90
JEZEBEL-23	61	62	76	75	83
JEZEBEL-Pu	58	60	64	72	80
BIGTEN	78	83	88	104	118
FLATTOP-25	131	132	139	154	169
FLATTOP-Pu	114	120	129	140	157
FLATTOP-23	112	115	124	139	156
THOR	80	82	87	100	111

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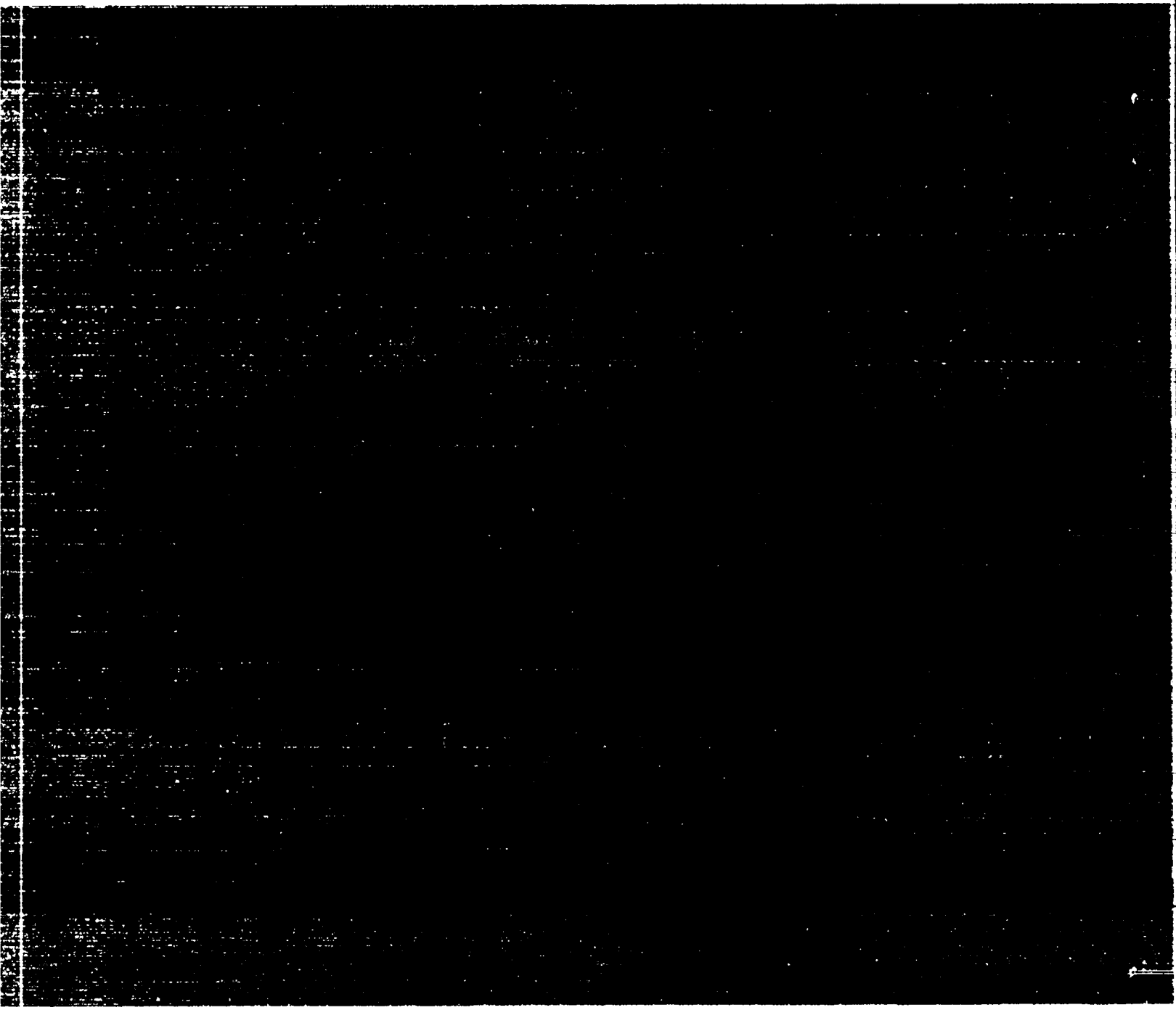

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