

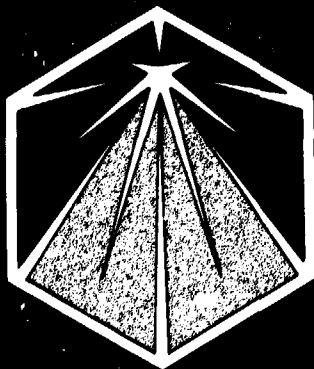
BR8920

GERAÇÃO E TESTES DA NOVA BIBLIOTECA
VERSÃO 88, PARA O SISTEMA HAMMER

E.S. Chalhoub e Jaime Anaf

CTA - IEAV - RP -- 024/88

RELATÓRIO DE PESQUISA-IEAV-024/88 (Ago/88)



RESUMO

Uma nova biblioteca, versão 88, para o sistema HAMMER, foi gerada a partir dos dados nucleares avaliados da ENDF/B-IV e FREN DL. É constituída pelas bibliotecas epitérmica e térmica obtidas, respectivamente, pelo processamento das novas versões dos códigos ETOG-3 e FLANGE-II. São apresentados resultados de testes para dois problemas-padrão de arranjos críticos.

ABSTRACT

A new library, version 88, for the HAMMER system, was generated using the ENDF/B-IV and FREN DL evaluated nuclear data libraries. It is composed of epithermal and thermal libraries obtained by processing the new versions of ETOG-3 and FLANGE-II codes, respectively. Test results for two benchmark critical assemblies are presented.

ÍNDICE

1. INTRODUÇÃO	1
2. BIBLIOTECAS	1
3. TESTES E RESULTADOS	4
4. CONCLUSÕES E RECOMENDAÇÕES	7
5. AGRADECIMENTOS	8
6. REFERÊNCIAS BIBLIOGRÁFICAS	8
APÊNDICE A: ESTRUTURA ENERGÉTICA	10
APÊNDICE B: EXEMPLOS DE DADOS DE ENTRADA	13
APÊNDICE C: COMPARAÇÕES DE SEÇÕES DE CHOQUE MULTIGRUPO	17

ÍNDICE DE TABELAS

Tab-ela 1: Materiais constantes da biblioteca epitérmica	2
Tab-ela 2: Materiais constantes da biblioteca térmica	3
Tab-ela 3: Parâmetros integrais calculados por HAMMER	5

1. INTRODUÇÃO

Bibliotecas de seções de choque multigrupo são fundamentais para a análise de células de reatores. À medida que surgem novas bibliotecas de dados nucleares avaliados ou modificações são introduzidas nos códigos geradores de seções de choque multigrupo, novas bibliotecas multigrupo devem ser produzidas.

Na tentativa de melhorar os resultados do sistema HAMMER /1/, uma nova biblioteca (versão 88) foi elaborada a partir de dados nucleares avaliados da ENDF/B-IV /2/ e FREN DL /3/, por intermédio das novas versões /4/ dos códigos ETOG-3 /5/ e FLANGE-II /6/.

A biblioteca do sistema HAMMER é constituída pelas bibliotecas epitérmica e térmica, apresentadas no Capítulo 2.

Testes e resultados são analisados no Capítulo 3, sendo o Capítulo 4 composto de conclusões e recomendações.

2. BIBLIOTECAS

Na biblioteca epitérmica, gerada pela nova versão de ETOG-3 /4,5/ e reformatada pelo programa HELP /7/, constam 40 materiais, relacionados na Tabela 1. Os materiais foram processados a zero grau absoluto (Kelvin) e com função de ponderação combinada de $1/E$ e espectro de fissão, calculado por

$$S(E) = \left[\frac{4E}{\pi \theta^3} \right]^{1/2} \exp(-E/\theta), \quad (1)$$

onde, E é a energia em eV e θ a temperatura nuclear. Como dado de entrada é fornecido o valor de $1,323 \times 10^6$ eV para a temperatura nuclear e $6,738 \times 10^4$ eV para a energia de junção dos dois espectros.

Na biblioteca térmica, gerada pela nova versão de FLANGE-II /4,6/ e reformatada pelo programa LITHE3 /1/, constam 57 materiais, relacionados na Tabela 2. Os materiais foram processados a zero grau absoluto (Kelvin), exceto quando indicado, e com função de ponderação constante.

As estruturas energéticas /1/ epitérmica (MUFT) e térmica (THERMOS) usadas, respectivamente, por ETOG-3 e FLANGE-II, são apresentadas no Apêndice A.

Os programas HELP e LITHE3 foram alterados para otimizar a leitura das bibliotecas. Não é mais necessário inserir um cartão em branco, no fim da biblioteca gerada por ETOG-3, e um comando indicador de EOF ("END OF FILE"), entre materiais da biblioteca produzida por FLANGE-II. As novas versões

Tabela 1: Materiais constantes da biblioteca epitérmica

1)	ISOTOPE	1.	1/V ABS WCAP=3079	MAT	
2)	ISOTOPE	2.	UNIT SCATTERER	MAT	
3)	ISOTOPE	72176.	176-HF	FRENDL	MAT 440
4)	ISOTOPE	72177.	177-HF	FRENDL	MAT 441
5)	ISOTOPE	72178.	178-HF	FRENDL	MAT 442
6)	ISOTOPE	72179.	179-HF	FRENDL	MAT 443
7)	ISOTOPE	72180.	180-HF	FRENDL	MAT 444
8)	ISOTOPE	62149.	62-SM-149	ENDF/B-IV	MAT 1027
9)	ISOTOPE	64000.	64-GD	ENDF/B-IV	MAT 1030
10)	ISOTOPE	92234.	92-U -234	ENDF/B-IV	MAT 1043
11)	ISOTOPE	95241.	95-AH-241	ENDF/B-IV	MAT 1056
12)	ISOTOPE	95243.	95-AH-243	ENDF/B-IV	MAT 1057
13)	ISOTOPE	1002.	1-H = 2	ENDF/B-IV	MAT 1120
14)	ISOTOPE	47107.	47-AG-107	ENDF/B-IV	MAT 1138
15)	ISOTOPE	47109.	47-AG-109	ENDF/B-IV	MAT 1139
16)	ISOTOPE	5011.	5-B-11	ENDF/B-IV	MAT 1160
17)	ISOTOPE	94242.	94-PU-242	ENDF/B-IV	MAT 1161
18)	ISOTOPE	92236.	92-U -236	ENDF/B-IV	MAT 1163
19)	ISOTOPE	28000.	28-NI	ENDF/B-IV	MAT 1190
20)	ISOTOPE	24000.	24-CR	ENDF/B-IV	MAT 1191
21)	ISOTOPE	26000.	26-FE	ENDF/B-IV	MAT 1192
22)	ISOTOPE	13027.	13-AL-27	ENDF/B-IV	MAT 1193
23)	ISOTOPE	25055.	25-MN- 55	ENDF/B-IV	MAT 1197
24)	ISOTOPE	92233.	92-U- 233	ENDF/B-IV	MAT 1260
25)	ISOTOPE	92235.	92-U -235	ENDF/B-IV	MAT 1261
26)	ISOTOPE	92238.	92-U- 238	ENDF/B-IV	MAT 1262
27)	ISOTOPE	94239.	94-PU-239,	ENDF/B-IV	MAT 1264
28)	ISOTOPE	94240.	94-PU-240	ENDF/B-IV	MAT 1265
29)	ISOTOPE	94241.	94-PU-241	ENDF/B-IV	MAT 1266
30)	ISOTOPE	1001.	1- H= 1	ENDF/B-IV	MAT 1269
31)	ISOTOPE	5010.	5-B = 10	ENDF/B-IV	MAT 1273
32)	ISOTOPE	6012.	6- C= 12	ENDF/B-IV	MAT 1274
33)	ISOTOPE	7014.	7- N= 14	ENDF/B-IV	MAT 1275
34)	ISOTOPE	8016.	8- O= 16	ENDF/B-IV	MAT 1276
35)	ISOTOPE	48000.	48-C?	ENDF/B-IV	MAT 1281
36)	ISOTOPE	48113.	48-CO-113	ENDF/B-IV	MAT 1282
37)	ISOTOPE	302.	40-ZIRC-2	ENDF/B-IV	MAT 1284
38)	ISOTOPE	42000.	42-MO	ENDF/B-IV	MAT 1287
39)	ISOTOPE	54135.	54-XE-135	ENDF/B-IV	MAT 1294
40)	ISOTOPE	90232.	90-TH-232	ENDF/B-IV	MAT 1296

Tabela 2: Materiais constantes da biblioteca térmica

DESCRIPTION	IDENT	T/M	KERNELS
1/V ABSORBER	1.	0.	0
UNIT SCATTERER	2.	0.	0
LONG LIVED FP PRS	3.	0.	0
HF-176	72176.	0.	0
HF-177	72177.	0.	0
HF-178	72178.	0.	0
HF-179	72179.	0.	0
HF-180	72180.	0.	0
SM-149	62149.	0.	0
GD	64000.	0.	0
U-234	92234.	0.	0
AM-241	95241.	0.	0
AM-243	95243.	0.	0
H-2 T= 23C	1002.	4030.	2
AG-107	47107.	0.	0
AG-109	47109.	0.	0
B-11	5011.	0.	0
PU-242	94242.	0.	0
U-236	92236.	0.	0
NI	28000.	0.	0
CR	24000.	0.	0
FE	26000.	0.	0
AL-27	13027.	0.	0
MN-55	25055.	0.	0
U-233	92233.	0.	0
U-235	92235.	0.	0
U-238	92238.	0.	0
PU-239	94239.	0.	0
PU-240	94240.	0.	0
PU-241	94241.	0.	0
H-1 T= 20C	1001.	4029.	2
H-1 T= 23C	1001.	4030.	2
H-1 T= 70C	1001.	4034.	2
H-1 T=120C	1001.	4039.	2
H-1 T=170C	1001.	4044.	2
H-1 T=220C	1001.	4049.	2
H-1 T=250C	1001.	4052.	2
H-1 T=260C	1001.	4053.	2
H-1 T=270C	1001.	4054.	2
H-1 T=275C	1001.	4055.	2
H-1 T=280C	1001.	4155.	2
H-1 T=285C	1001.	4056.	2
H-1 T=300C	1001.	4057.	2
H-1 T=310C	1001.	4058.	2
H-1 T=335C	1001.	4061.	2
B-10	5010.	0.	0
C-12 T= 23C	6012.	4030.	2
C-12 T=285C	6012.	4056.	2
N-14	7014.	0.	0
O-16 T= 20C	8016.	2029.	1
O-16 T=260C	8016.	2059.	1
CD	48000.	0.	0
CD-113	48113.	0.	0
ZIRC-2	302.	0.	0
MO	42000.	0.	0
XE-135	54135.	0.	0
TH-232	90232.	0.	0

continuam, entretanto, sendo capazes de interpretar as bibliotecas no formato original.

Um caso exemplo de dados de entrada para cada um dos códigos processados é apresentado no Apêndice B.

As Tabelas 1 e 2 e os Apêndices A e B foram obtidos com auxílio do programa LIST /8/.

3. TESTES E RESULTADOS

Visando avaliar as novas bibliotecas em cálculos de reatores térmicos, dois problemas-padrão de arranjos críticos, TRX1 e TRX2, propostos pelo Grupo de Avaliação de Seções de Choque (CSEWG) /9/ foram processados com o código HAMMER. Os dados de entrada utilizados são apresentados no Apêndice B.

As diferenças observadas entre as seções de choque multigrupo calculadas pelas versões antiga e nova dos códigos ETOG-3 e FLANGE-II foram consideráveis, conforme relatório de pesquisa IEAv/RP-008/88. No sentido de verificar os efeitos de tais diferenças em valores integrais, os arranjos críticos foram processados utilizando a biblioteca antiga /7/ e a biblioteca nova, apresentada no Capítulo 2.

Os valores de k_{ef} e índices espectrais calculados por HAMMER, foram pouco afetados pelas diferenças observadas nas seções de choque multigrupo /4/. Na Tabela 3 são apresentados os resultados obtidos com as bibliotecas antiga e nova, respectivamente como casos 1 e 2. Resolveu-se, então, efetuar testes nas regiões energéticas térmica e epitérmica, na tentativa de melhorar os resultados obtidos.

Como primeiro teste decidiu-se estudar as influências de temperatura e função de ponderação na região térmica. Para tanto, os materiais contidos nos arranjos críticos (H-1, H-2, O-16, Al-27, U-235 e U-238) foram processados pelos códigos LINEAR, RECENT, SIGMA1 e GROUPIE /10-14/. Foram geradas duas bibliotecas a 293 graus Kelvin, a primeira com função de ponderação constante ($W = cte$) e a segunda com Maxwelliana ($W = Max$). Estas bibliotecas foram transformadas para o formato de saída de FLANGE-II, possibilitando sua leitura por LITHE3. Foram mantidos nas duas bibliotecas, para os isótopos ligados H-1 e H-2, os dados referentes à matriz de espalhamento calculada por FLANGE-II. Os valores integrais calculados, utilizando estas bibliotecas térmicas, mantendo a epitérmica, são mostrados na Tabela 3 como casos 3 ($W = Cte$) e 4 ($W = Max$). Os resultados indicam que os efeitos de temperatura e função de ponderação na região térmica, para materiais não ligados, não são os responsáveis pelas discrepâncias com os resultados experimentais. O Apêndice C (C.1 a C.4) mostra

Tabela 3: Parâmetros integrais calculados por HAMMER

BENCHMARK		K_{ef}	ρ_{28}	δ_{25}	δ_{28}	C
TRX1	EXP.	1,0000	1,320 $\pm 0,021$	0,0987 $\pm 0,0010$	0,0946 $\pm 0,0041$	0,797 $\pm 0,008$
	CASO 1	0,9861	1,383	0,1012	0,0947	0,803
	CASO 2	0,9858	1,382	0,1007	0,0948	0,803
	CASO 3	0,9855	1,381	0,1007	0,0948	0,804
	CASO 4	0,9855	1,382	0,1007	0,0948	0,804
	CASO 5	0,9897	1,352	0,0981	0,0944	0,795
	CASO 6	1,0398	1,068	0,0794	0,0821	0,711
	CASO 7	1,0375	1,064	0,0796	0,0823	0,715
TRX2	EXP.	1,0000	0,837 $\pm 0,016$	0,0614 $\pm 0,0008$	0,0693 $\pm 0,0035$	0,647 $\pm 0,006$
	CASO 1	0,9907	0,857	0,0618	0,0668	0,644
	CASO 2	0,9905	0,857	0,0614	0,0668	0,644
	CASO 3	0,9901	0,856	0,0615	0,0668	0,644
	CASO 4	0,9899	0,857	0,0615	0,0668	0,644

Bibliotecas utilizadas nos casos acima

CASO 1 - LITAB4/HELAB4
CASO 2 - LITNB4/HELNB4
CASO 3 - LITNB4/HELNB4 (teste região térmica: T=293 K, W=Cte)
CASO 4 - LITNB4/HELNB4 (teste região térmica: T=293 K, W=Max)
CASO 5 - LITNB4/PROFB4
CASO 6 - LITNB4/PROFJ2 (teste: JENDL-2)
CASO 7 - LITNJ2/PROFJ2 (teste: JENDL-2)

Definição

ρ_{28} = Captura epitérmica U-238 / Captura térmica U-238
 δ_{25} = Fissão epitérmica U-235 / Fissão térmica U-235
 δ_{28} = Fissão U-238 / Fissão U-235
C = Captura U-238 / Fissão U-235
LITA: sistema FLANGE-II/LITHE3 antigo
LITN: sistema FLANGE-II/LITHE3 novo
HELA: sistema ETOG-3/HELP antigo
HELN: sistema ETOG-3/HELP novo
PROF: "profile data" através de LINEAR/RECENT/SIGMA1/PRODAG/HELP
B4 : biblioteca ENDF/B-IV
J2 : biblioteca JENDL-2

comparações entre seções de choque multigrupo a zero grau absoluto e função de ponderação constante vs. 293 K e Maxwelliana.

Como segundo teste foi estudada a influência da biblioteca de dados nucleares avaliados. A JENDL-2 /15/ foi utilizada em lugar da ENDF/B-IV na preparação das bibliotecas para HAMMER. Os materiais contidos nos arranjos críticos foram separados da JENDL-2 pelo código MERGER /16/, excetuando o 0-16 mantido da ENDF/B-IV por não existir na JENDL-2, e processados pelos códigos ETOG-3, FLANGE-II, HELP e LITHE3.

Ao processar HAMMER com estas bibliotecas a sub-rotina "ESCAPE" originou o seguinte erro de execução:

```
"ARITHMETIC INDEFINITE"
"ARGUMENT LT.  $\phi$  .
ERROR DETECTED BY ALOG".
```

Isto se deve a uma seção de choque negativa de espalhamento elástico transmitida como "background", determinada por ETOG-3 no grupo energético 19 para o material Al-27 (MAT = 2131). O valor negativo é devido à contribuição de uma ressonância resolvida, do formalismo "Multi-Level Breit Wigner" (MLBW), na energia E_0 acima da região de ressonâncias resolvidas. A maior contribuição positiva, para este grupo de energia, provém de uma ressonância resolvida cujos parâmetros são transmitidos pela biblioteca produzida por ETOG-3, a fim de que sua contribuição seja calculada por HAMMER. Esta situação foi contornada reprocessando o Al-27 com ETOG-3 sem passar parâmetros de ressonâncias, incluindo suas contribuições no "background".

O código HAMMER utiliza somente o formalismo "Single Level Breit Wigner" (SLBW) para ressonâncias resolvidas, conforme concluído da análise do manual do usuário /1/. Surgiu, então, um problema na utilização dos dados gerados a partir da JENDL-2, pois dos materiais contidos nos arranjos críticos, Al-27 e U-238 possuem parâmetros MLBW. O problema foi contornado para o Al-27 conforme descrito no parágrafo anterior.

Para o U-238, a solução encontrada foi processar HAMMER com dados "profile data" gerados pelos códigos LINEAR, RECENT (0,5% de precisão) e SIGMA1 (T = 293 K), e reformatados por PRODAG e HELP /7/. O código PRODAG /7/ foi alterado para processar o grande número de pontos gerados no "profile data" devido a JENDL-2 (Ex: para captura do U-238, 26000 pontos para JENDL-2 vs. 16000 pontos para ENDF/B-IV). Além do U-238, optou-se por utilizar dados "profile data" também para o U-235, seguindo o procedimento adotado na Ref. 7.

Os parâmetros integrais, calculados com os "profile data", são mostrados na Tabela 3 como casos 5, 6 e 7. Para observar a influência nos resultados das diferentes bibliotecas a ENDF/B-IV foi utilizada no caso 5 nas regiões térmica e epitérmica e no caso 6 na região térmica, e a JENDL-2 foi utilizada no caso 6 na

região epitérmica e no caso 7 em ambas as regiões. Para facilitar a compreensão, a Tabela 3 é seguida por uma definição resumida dos casos processados.

Os resultados apresentados na Tabela 3 não são satisfatórios nem conclusivos (ver recomendações no Capítulo 4).

No Apêndice C (C.5 a C.14), obtido com o auxílio dos programas COMPAR /17/ e LIST /8/, são mostradas tabelas de comparações de seções de choque multigrupo geradas por ETOG-3Q e FLANGE-II /4/, utilizando as bibliotecas ENDF/B-IV e JENDL-2 para os materiais dos arranjos críticos selecionados. As comparações são a zero grau absoluto (Kelvin) e com função de ponderação constante, incluindo as contribuições de ressonâncias resolvidas e não resolvidas. Na Tabela C.7, as seções de choque de captura (σ_c) negativas, nos grupos de mais alta energia, devem-se a opção $IN2N = 3 / 5/$, onde $\sigma_{n,2n}$ é subtraído de σ_c , por ter sido incluído duas vezes na seção de choque inelástico.

4. CONCLUSÕES E RECOMENDAÇÕES

Uma nova biblioteca, para o sistema HAMMER, foi gerada e está disponível no formato BCD. Cada usuário deve produzir sua biblioteca binária, em seu próprio sistema computacional, utilizando as novas versões dos programas HELP e LITHE3.

Sugerimos que a nova biblioteca seja testada pelos interessados, agradecendo eventuais comentários sobre resultados obtidos.

Em relação aos resultados dos testes realizados conclui-se que:

- a- existem grandes discrepâncias entre as bibliotecas de dados nucleares avaliadas utilizadas, ENDF/B-IV e JENDL-2; e
- b- acreditamos que uma análise profunda dos procedimentos utilizados pelo código HAMMER deve ser realizada, antes de responsabilizar unicamente as bibliotecas de dados nucleares avaliados, pelas discrepâncias com os resultados experimentais.

Em relação à validação dos códigos ETOG-3 e FLANGE-II /4/ gostaríamos de enfatizar alguns itens que podem afetar os resultados obtidos de HAMMER:

- a- ETOG-3 não efetua o alargamento Doppler e FLANGE-II somente alarga ressonâncias, deixando o "background" inalterado, o que não é correto, principalmente para baixas energias;
- b- FLANGE-II somente processa com função de ponderação constante; e
- c- as matrizes de espalhamento de ETOG-3 e FLANGE-II não foram ainda avaliadas.

5. AGRADECIMENTOS

Os autores agradecem a Sergio Q. Bogado Leite pela orientação dispensada no que se refere ao código HAMMER e a Roberto D.M. Garcia e Alexandre David Caldeira pela revisão do texto.

6. REFERÊNCIAS BIBLIOGRÁFICAS

- [1] J. Barhen, W. Rothenstein, E. Taviv, "The HAMMER Code System", NP-565, Research Project 709, Electric Power Research Institute, Oct 1978.
- [2] D. Garber et al, "ENDF-102, Data Formats and Procedures for the Evaluated Nuclear Data File", BNL Report (ENDF-102) ENDF/B-IV, Oct 1975.
- [3] R.P. Corcuera, E. Tanaka, "Catálogo de Dados Nucleares", IEAv/NT-007/80, Ago 1980.
- [4] E.S. Chalhoub, J. Anaf, "Validação dos Códigos ETOG-3 e FLANGE-II no que Tange à Contribuição de Ressonâncias e Seções de Choque de Referência", IEAv/RP-008/88, Abr 1988.
- [5] A. Aronson, W. Rothenstein, "ETOG-3 Modifications for HAMMER with ENDF/B-IV Data", BNL Memorandum, Brookhaven National Laboratory, Dec 1974.
- [6] H.C. Horeck, D.R. Finch, "FLANGE-II (Version 71-1), a Code to Process Thermal Neutron Data from an ENDF/B Tape", DP-1278, ENDF-152, Savannah River Laboratory, Oct 1971.
- [7] S.Q.B. Leite, E.S. Chalhoub, M. de Moraes, "Geração e Testes de Biblioteca para o Sistema HAMMER a partir de Dados do ENDF/B-IV", IEAv/NT-015/83, Mai 1983.
- [8] J. Anaf, A.D. Caldeira, "LIST: um Programa que Auxilia na Obtenção de Cópias Reduzidas de Listagens de Arquivos no CDC CYBER 170/750", IEAv/RI-008/87, Out 1987.
- [9] "Cross Section Evaluation Working Group Benchmark Specifications", Brookhaven National Laboratory, BNL 19302, ENDF-202, Nov 1974.

- [10] D.E. Cullen, "Program LINEAR: Linearize Data in the Evaluated Nuclear Data File/Version B (ENDF/B) Format", UCRL-50400, Vol. 17, Part A, Jul 1978.
- [11] D.E. Cullen, "Program RECENT: Reconstruction of Energy-Dependent Neutron Cross Sections from Resonance Parameters in the ENDF/B Format", UCRL-50400, Vol. 17, Part C, Oct 1979.
- [12] D.E. Cullen, "Program SIGMA1: Doppler Broaden Evaluated Cross Sections in the Evaluated Nuclear Data File/Version B (ENDF/B) Format", UCRL-50400, Vol. 17, Part B, Oct 1979.
- [13] D.E. Cullen, "Program GROUPIE: Calculation of Bondarenko Self-Shielded Neutron Cross Sections and Multiband Parameters from Data in the ENDF/B Format", UCRL-50400, Vol. 17, Part D, Jul 1980.
- [14] E.S. Chalhoub, Jaime Anaf, "Implantação dos Programas LINEAR(87-1), RECENT(87-1), SIGMA1(86-1) e GROUPIE(86-1)", IEAv/RI-010/87, Nov 1987.
- [15] T. Nakagawa, "Summary of JENDL-2 General Purpose File", Japan Atomic Energy Research Institute, JAERI-M, 84-103, Jun 1984.
- [16] D.E. Cullen, "Program MERGER: Retrieve and/or Merge Data from the Evaluated Nuclear Data File/Version B (ENDF/B) Format", UCRL-50400, Vol. 17, Jan 1980.
- [17] J. Anaf, E.S. Chalhoub, "COMPAR: Sistema para Comparar Seções de Choque Multigrupo Geradas por NJOY, GROUPIE, FLANGE-II, ETOG-3 e XLACS", IEAv/NT-014/87, Nov 1987.

APÊNDICE A
ESTRUTURA ENERGÉTICA

A.1 - ESTRUTURA EPITÉRMICA - MUFT

GROUP	ENERGY RANGE	LETHARGY RANGE	GROUP	ENERGY RANGE	LETHARGY RANGE
1	7.7880E+06 - 1.0000E+07	0.000 - .250	28	1.2341E+03 - 2.0347E+03	8.500 - 9.000
2	6.0653E+06 - 7.7880E+06	.250 - .500	29	7.4852E+02 - 1.2341E+03	9.000 - 9.500
3	4.7237E+06 - 6.0653E+06	.500 - .750	30	4.3400E+02 - 7.4852E+02	9.500 - 10.000
4	3.6788E+06 - 4.7237E+06	.750 - 1.000	31	2.7336E+02 - 4.3400E+02	10.000 - 10.500
5	2.8650E+06 - 3.6788E+06	1.000 - 1.250	32	1.6702E+02 - 2.7336E+02	10.500 - 11.000
6	2.2313E+06 - 2.8650E+06	1.250 - 1.500	33	1.3007E+02 - 1.6702E+02	11.000 - 11.250
7	1.7377E+06 - 2.2313E+06	1.500 - 1.750	34	1.0130E+02 - 1.3007E+02	11.250 - 11.500
8	1.3534E+06 - 1.7377E+06	1.750 - 2.000	35	7.8893E+01 - 1.0130E+02	11.500 - 11.750
9	1.0540E+06 - 1.3534E+06	2.000 - 2.250	36	6.1442E+01 - 7.8893E+01	11.750 - 12.000
10	8.2083E+05 - 1.0540E+06	2.250 - 2.500	37	4.7831E+01 - 6.1442E+01	12.000 - 12.250
11	6.3928E+05 - 8.2083E+05	2.500 - 2.750	38	3.7267E+01 - 4.7831E+01	12.250 - 12.500
12	4.9787E+05 - 6.3928E+05	2.750 - 3.000	39	2.9023E+01 - 3.7267E+01	12.500 - 12.750
13	3.8774E+05 - 4.9787E+05	3.000 - 3.250	40	2.2603E+01 - 2.9023E+01	12.750 - 13.000
14	3.0197E+05 - 3.8774E+05	3.250 - 3.500	41	1.7603E+01 - 2.2603E+01	13.000 - 13.250
15	2.3518E+05 - 3.0197E+05	3.500 - 3.750	42	1.3710E+01 - 1.7603E+01	13.250 - 13.500
16	1.8316E+05 - 2.3518E+05	3.750 - 4.000	43	1.0677E+01 - 1.3710E+01	13.500 - 13.750
17	1.4264E+05 - 1.8316E+05	4.000 - 4.250	44	8.3153E+00 - 1.0677E+01	13.750 - 14.000
18	1.1109E+05 - 1.4264E+05	4.250 - 4.500	45	6.4760E+00 - 8.3153E+00	14.000 - 14.250
19	8.6317E+04 - 1.1109E+05	4.500 - 4.750	46	5.0435E+00 - 6.4760E+00	14.250 - 14.500
20	6.7379E+04 - 8.6317E+04	4.750 - 5.000	47	3.9279E+00 - 5.0435E+00	14.500 - 14.750
21	4.0868E+04 - 6.7379E+04	5.000 - 5.500	48	3.0590E+00 - 3.9279E+00	14.750 - 15.000
22	2.4788E+04 - 4.0868E+04	5.500 - 6.000	49	2.3824E+00 - 3.0590E+00	15.000 - 15.250
23	1.5034E+04 - 2.4788E+04	6.000 - 6.500	50	1.8554E+00 - 2.3824E+00	15.250 - 15.500
24	9.1188E+03 - 1.5034E+04	6.500 - 7.000	51	1.4395E+00 - 1.8554E+00	15.500 - 15.754
25	5.5308E+03 - 9.1188E+03	7.000 - 7.500	52	1.1254E+00 - 1.4395E+00	15.754 - 16.000
26	3.3546E+03 - 5.5308E+03	7.500 - 8.000	53	8.3368E-01 - 1.1254E+00	16.000 - 16.300
27	2.0347E+03 - 3.3546E+03	8.000 - 8.500	54	6.2401E-01 - 8.3368E-01	16.300 - 16.588

A.2 - ESTRUTURA TÉRMICA - THERMOS

GROUP	ENERGY	VELOCITY	WEIGHT	E BOUNDARY	V BOUNDARY
				.0000633	.0500000
1	.0002530	.1000000	.0005060	.0005693	.1500000
2	.0010120	.2000000	.0010120	.0015213	.2500000
3	.0022770	.3000000	.0015180	.0030993	.3500000
4	.0040480	.4000000	.0020240	.0051233	.4500000
5	.0063250	.5000000	.0025300	.0076533	.5500000
6	.0091080	.6000000	.0030360	.0106893	.6500000
7	.0123970	.7000000	.0035420	.0142313	.7500000
8	.0161920	.8000000	.0040480	.0182793	.8500000
9	.0204930	.9000000	.0045540	.0228333	.9500000
10	.0253000	1.0000000	.0050600	.0278933	1.0500000
11	.0306130	1.1000000	.0055660	.0334593	1.1500000
12	.0364320	1.2000000	.0060720	.0395313	1.2500000
13	.0427570	1.3000000	.0065780	.0461093	1.3500000
14	.0495880	1.4000000	.0070840	.0531933	1.4500000
15	.0569250	1.5000000	.0075900	.0607833	1.5500000
16	.0651734	1.6050000	.0089334	.0697167	1.6600000
17	.0748475	1.7200000	.0104438	.0801605	1.7800000
18	.0861218	1.8450000	.0121364	.0922969	1.9100000
19	.0991861	1.9800000	.0140263	.1063233	2.0500000
20	.1139767	2.1225000	.0155728	.1218960	2.1950000
21	.1312313	2.2775000	.0190148	.1409109	2.3600000
22	.1524837	2.4550000	.0236024	.1645133	2.5500000
23	.1790127	2.6600000	.0296111	.1941244	2.7700000
24	.2124063	2.8975000	.0373864	.2315108	3.0250000
25	.2546383	3.1725000	.0473559	.2788667	3.3200000
26	.3081565	3.4900000	.0600420	.3389087	3.6600000
27	.3759839	3.8550000	.0760746	.4149833	4.0500000
28	.4618327	4.2725000	.0962039	.5111871	4.4950000
29	.5665730	4.7322500	.1136199	.6248070	4.9695000
30	.7025877	5.2697500	.1601229	.7849300	5.5700000

APÉNDICE B
EXEMPLOS DE DADOS DE ENTRADA

B.1 - CÓDIGO ETOG-3

1	1027	1	1	0			.0	.0001	.0026	1.E+8
0	3	4	54	4	4	0	2	1	0	1.323E+06
1	25	3	3	4	3	1	1			
0	1030	1	1	0			.0	.0001	.0026	1.E+8

B.2 - CÓDIGO FLANGE-II

H BOUND IN H2O - 523K - MAT 1269 - VELOCITY MESH

0	1269	1001.	523.	1472.0		3	1002
1	1					0	0
1	0	0	0	0		0	0
1	2	0	2	2		-2	-2
0	0	3	-1	2		1	
4	2	0	2				
30	2	2	1	0.05			

THERMOS V MESH

0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.1	0.11	0.12	0.13	0.14	0.145	0.165	
0.19	0.22	0.255	0.295	0.34	0.39	0.445	
0.4745	0.6005						

U-234 AT OOK MAT 1043 - GROUP AVERAGED CROSS SECTIONS

0	1043	92234.	000.	000.0		3	0
1	0						
0	1	1	0			0	0
1	2	1	2	2		-2	0
1	-2	1	-2	2		2	
0	0	0	0				

B.3 - CÓDIGO HELP

CTA/IEAV 07/88

54
 0.25 0.25 0.25 0.25 0.25 0.25 0.25
 0.25 0.25 0.25 0.25 0.25 0.25 0.25
 0.25 0.25 0.25 0.25 0.25 0.25 0.90
 0.50 0.50 0.50 0.50 0.50 0.50 0.50
 0.50 0.50 0.50 0.50 0.25 0.25 0.25
 0.25 0.25 0.25 0.25 0.25 0.25 0.25
 0.25 0.25 0.25 0.25 0.25 0.25 0.25
 0.25 0.2538 0.2462 0.30 0.2884
 .32802E-01.75698E-01.16166E+00.26991E+00.37135E+00.43897E+00.46073E+00
 .44063E+00.39186E+00.32925E+00.26466E+00.20552E+00.15534E+00.11498E+00
 .83721E-01.60188E-01.42842E-01.30259E-01.21244E-01.14844E-01.87547E-02
 .42032E-02.20051E-02.95282E-03.45172E-03.21385E-03.10115E-03.47818E-04
 .22599E-04.10678E-04.50449E-05.23833E-05.13345E-05.91721E-06.63040E-06
 .43328E-06.29779E-06.20467E-06.14067E-06.96680E-07.66447E-07.45669E-07
 .31388E-07.21572E-07.14827E-07.10190E-07.70036E-08.48135E-08.33083E-08
 .22737E-08.15585E-08.10708E-08.71284E-09.45820E-09

B.4 - CÓDIGO LITHE3

CTA/IEAV 07/88

0 30 0
 0.1 0.2 0.3 0.4 0.5 0.6 0.7
 0.8 0.9 1.0 1.1 1.2 1.3 1.4
 1.5 1.605 1.72 1.845 1.98 2.1225 2.2775
 2.455 2.66 2.8975 3.1725 3.49 3.855 4.2725
 4.73225 5.26975
 0.1 0.1 0.1 0.1 0.1 0.1 0.1
 0.1 0.1 0.1 0.1 0.1 0.1 0.1
 0.1 0.11 0.12 0.13 0.14 0.145 0.165
 0.19 0.22 0.255 0.295 0.34 0.39 0.445
 0.4745 0.6005
 H-1 T= 23C 1001. 4030. 3 4 3 2 0 0
 0. 0. 0. 0. 0.99917 20.449 296. 1396.8
 U-235 92235. 0. 3 4 3 0 0 0
 0. 0. 0. 2.4188 233.025 13.376 0. 0.

B.5 - CÓDIGO HAMMER - TRX1

```

11          2110000      210111          210
0          0 5000 1 1 THERMAL REACTOR BENCHM TRX1
0 1          5001      CASE1 BENCHM TRX1
0 2 2 5      5 1 10      57.00
0 3 1 1      0 2 80 0.38700787
0 4          92235.      0.0
0 5          92238.      0.0
0 6 2 2      0 1 20 0.39700787
0 7          8016.      2029.0
0 8 3 3      1 20 0.45299213
0 9          13027.      0.0
0 10 4 4      0 2 61 0.74662823
0 11         1001.      4029.0
0 12         8016.      2029.0
1 13 5 5 206 0 20 0.75062823      0.0
          25 10 25
          92238.      92235.
1
LAT 1 2 3 4 5

```

B.6 - CÓDIGO HAMMER - TRX2

```

11          2110000      210111          210
0          0 5000 1 1 THERMAL REACTOR BENCHM TRX2
0 1          5001      CASE2 BENCHM TRX2
0 2 2 5      5 1 10      54.69
0 3 1 1      0 2 80 0.38700787
0 4          92235.      0.0
0 5          92238.      0.0
0 6 2 2      0 1 20 0.39700787
0 7          8016.      2029.0
0 8 3 3      1 20 0.45299213
0 9          13027.      0.0
0 10 4 4      0 2 61 0.89876490
0 11         1001.      4029.0
0 12         8016.      2029.0
1 13 5 5 206 0 20 0.90276490      0.0
          25 10 25
          92238.      92235.
1
LAT 1 2 3 4 5

```

APÊNDICE C**COMPARAÇÕES DE SEÇÕES DE CHOQUE MULTIGRUPO**

C.1 - SEÇÕES DE CHOQUE MULTIGRUPO DO 0-16, MAT 1276, GERADOS POR LINEAR/RECENT/SIGMA1/GROUPIE

SEÇÃO DE CHOQUE:		ELÁSTICA			FISSAO			CAPTURA			
CÓDIGO→		OK/CTE	293K/MAX	ZDESVM	REFERENCIA	VALOR	ZDESVM	OK/CTE	293K/MAX	ZDESVM	GRUPO
GRUPO	REFERENCIA	VALOR	ZDESVM	REFERENCIA	VALOR	ZDESVM	REFERENCIA	VALOR	ZDESVM	GRUPO	
1	30	3.7481E+00	1.3421E+01	258.1	0.0000E+00	0.0000E+00	.0	1.7042E-03	2.1708E-03	21.7	1 30
2	29	3.7481E+00	6.5908E+00	75.8	0.0000E+00	0.0000E+00	.0	8.9287E-04	9.3342E-04	4.6	2 29
3	28	3.7481E+00	3.8849E+00	39.7	0.0000E+00	0.0000E+00	.0	3.9488E-04	6.8734E-04	2.1	3 28
4	27	3.7481E+00	4.5129E+00	28.4	0.0000E+00	0.0000E+00	.0	4.4689E-04	4.5194E-04	1.3	4 27
5	26	3.7481E+00	4.2387E+00	19.1	0.0000E+00	0.0000E+00	.0	3.8678E-04	3.6887E-04	.9	5 26
6	25	3.7481E+00	4.0921E+00	9.2	0.0000E+00	0.0000E+00	.0	2.9747E-04	2.9989E-04	.7	6 25
7	24	3.7481E+00	4.8060E+00	8.9	0.0000E+00	0.0000E+00	.0	2.5484E-04	2.5689E-04	.5	7 24
8	23	3.7481E+00	3.9449E+00	5.3	0.0000E+00	0.0000E+00	.0	2.2312E-04	2.2416E-04	.5	8 23
9	22	3.7481E+00	3.9028E+00	4.1	0.0000E+00	0.0000E+00	.0	1.9827E-04	1.9988E-04	.4	9 22
10	21	3.7481E+00	3.8834E+00	3.6	0.0000E+00	0.0000E+00	.0	1.7858E-04	1.7898E-04	.3	10 21
11	20	3.7481E+00	3.8619E+00	3.0	0.0000E+00	0.0000E+00	.0	1.6236E-04	1.6388E-04	.4	11 20
12	19	3.7481E+00	3.8383E+00	2.4	0.0000E+00	0.0000E+00	.0	1.4899E-04	1.4941E-04	.3	12 19
13	18	3.7481E+00	3.8218E+00	1.9	0.0000E+00	0.0000E+00	.0	1.3734E-04	1.3882E-04	.5	13 18
14	17	3.7481E+00	3.8179E+00	1.9	0.0000E+00	0.0000E+00	.0	1.2751E-04	1.2819E-04	.9	14 17
15	16	3.7481E+00	3.8142E+00	1.8	0.0000E+00	0.0000E+00	.0	1.1918E-04	1.1944E-04	.2	15 16
16	15	3.7481E+00	3.8109E+00	1.7	0.0000E+00	0.0000E+00	.0	1.1117E-04	1.1189E-04	.6	16 15
17	14	3.7481E+00	3.8061E+00	1.5	0.0000E+00	0.0000E+00	.0	1.0391E-04	1.0417E-04	.3	17 14
18	13	3.7481E+00	3.8018E+00	1.4	0.0000E+00	0.0000E+00	.0	9.6744E-05	9.7289E-05	.5	18 13
19	12	3.7481E+00	3.7951E+00	1.3	0.0000E+00	0.0000E+00	.0	9.0133E-05	9.0598E-05	.9	19 12
20	11	3.7481E+00	3.7884E+00	1.1	0.0000E+00	0.0000E+00	.0	8.4284E-05	8.4598E-05	.2	20 11
21	10	3.7481E+00	3.7809E+00	.9	0.0000E+00	0.0000E+00	.0	7.8548E-05	7.8889E-05	.6	21 10
22	9	3.7481E+00	3.7718E+00	.6	0.0000E+00	0.0000E+00	.0	7.2767E-05	7.3088E-05	.4	22 9
23	8	3.7481E+00	3.7643E+00	.5	0.0000E+00	0.0000E+00	.0	6.7197E-05	6.7389E-05	.3	23 8
24	7	3.7481E+00	3.7643E+00	.3	0.0000E+00	0.0000E+00	.0	6.1615E-05	6.1921E-05	.5	24 7
25	6	3.7481E+00	3.7643E+00	.3	0.0000E+00	0.0000E+00	.0	5.6298E-05	5.6588E-05	.5	25 6
26	5	3.7481E+00	3.7643E+00	.3	0.0000E+00	0.0000E+00	.0	5.1138E-05	5.1388E-05	.5	26 5
27	4	3.7481E+00	3.7643E+00	.3	0.0000E+00	0.0000E+00	.0	4.6297E-05	4.6521E-05	.5	27 4
28	3	3.7481E+00	3.7643E+00	.3	0.0000E+00	0.0000E+00	.0	4.1779E-05	4.1978E-05	.9	28 3
29	2	3.7481E+00	3.7643E+00	.3	0.0000E+00	0.0000E+00	.0	3.7711E-05	3.7892E-05	.9	29 2
30	1	3.7481E+00	3.7643E+00	.3	0.0000E+00	0.0000E+00	.0	3.3868E-05	3.4035E-05	.5	30 1
Z RMS				49.81			.00				4.10
Z RMS P				49.81			.00				11.13

OBSERVAÇÕES:

%RMS - Desvio quadrático médio (percentual); e

%RMS P - Desvio quadrático médio ponderado pela seção de choque (percentual)

C.2 - SEÇÕES DE CHOQUE MULTIGRUPO DO A1-27, MAT 1193, GERADOS POR LINEAR/RECENT/SIGMA1/GROUPE

SEÇÃO DE CHOQUE: ELASTICA				FISSAO			CAPTURA					
CODIGO->	OK/CTE	Z93K/MAX		OK/CTE	Z93K/MAX		OK/CTE	Z93K/MAX		GRUPO		
GRUPO	REFERENCIA	VALOR	ZDESVIO	REFERENCIA	VALOR	ZDESVIO	REFERENCIA	VALOR	ZDESVIO	GRUPO		
1	30	1.3488E+00	3.8094E+00	182.6	0.0000E+00	0.0000E+00	.0	2.3259E+00	2.8293E+00	21.6	1	30
2	29	1.3488E+00	2.0039E+00	48.7	0.0000E+00	0.0000E+00	.0	1.1627E+00	1.2170E+00	4.7	2	29
3	28	1.3488E+00	1.6421E+00	21.8	0.0000E+00	0.0000E+00	.0	7.7519E-01	7.9180E-01	2.1	3	28
4	27	1.3488E+00	1.3134E+00	12.3	0.0000E+00	0.0000E+00	.0	5.8136E-01	5.8862E-01	1.2	4	27
5	26	1.3488E+00	1.4341E+00	7.9	0.0000E+00	0.0000E+00	.0	4.6320E-01	4.6914E-01	.8	5	26
6	25	1.3488E+00	1.4241E+00	5.6	0.0000E+00	0.0000E+00	.0	3.8773E-01	3.9009E-01	.6	6	25
7	24	1.3488E+00	1.4021E+00	4.0	0.0000E+00	0.0000E+00	.0	3.3213E-01	3.3489E-01	.6	7	24
8	23	1.3488E+00	1.3931E+00	3.3	0.0000E+00	0.0000E+00	.0	2.9073E-01	2.9203E-01	.4	8	23
9	22	1.3488E+00	1.3837E+00	2.6	0.0000E+00	0.0000E+00	.0	2.5861E-01	2.5993E-01	.3	9	22
10	21	1.3488E+00	1.3743E+00	2.0	0.0000E+00	0.0000E+00	.0	2.3240E-01	2.3389E-01	.6	10	21
11	20	1.3479E+00	1.3717E+00	1.8	0.0000E+00	0.0000E+00	.0	2.1149E-01	2.1230E-01	.5	11	20
12	19	1.3479E+00	1.3702E+00	1.7	0.0000E+00	0.0000E+00	.0	1.9394E-01	1.9471E-01	.4	12	19
13	18	1.3479E+00	1.3685E+00	1.5	0.0000E+00	0.0000E+00	.0	1.7900E-01	1.7991E-01	.3	13	18
14	17	1.3477E+00	1.3667E+00	1.4	0.0000E+00	0.0000E+00	.0	1.6643E-01	1.6713E-01	.4	14	17
15	16	1.3476E+00	1.3648E+00	1.3	0.0000E+00	0.0000E+00	.0	1.5529E-01	1.5581E-01	.3	15	16
16	15	1.3475E+00	1.3626E+00	1.1	0.0000E+00	0.0000E+00	.0	1.4518E-01	1.4594E-01	.3	16	15
17	14	1.3473E+00	1.3601E+00	1.0	0.0000E+00	0.0000E+00	.0	1.3556E-01	1.3593E-01	.3	17	14
18	13	1.3472E+00	1.3571E+00	.7	0.0000E+00	0.0000E+00	.0	1.2632E-01	1.2689E-01	.3	18	13
19	12	1.3470E+00	1.3540E+00	.5	0.0000E+00	0.0000E+00	.0	1.1771E-01	1.1829E-01	.3	19	12
20	11	1.3470E+00	1.3534E+00	.5	0.0000E+00	0.0000E+00	.0	1.0999E-01	1.1019E-01	.2	20	11
21	10	1.3470E+00	1.3534E+00	.5	0.0000E+00	0.0000E+00	.0	1.0233E-01	1.0263E-01	.3	21	10
22	9	1.3470E+00	1.3534E+00	.5	0.0000E+00	0.0000E+00	.0	9.4934E-02	9.5249E-02	.3	22	9
23	8	1.3470E+00	1.3534E+00	.5	0.0000E+00	0.0000E+00	.0	8.7663E-02	8.8161E-02	.3	23	8
24	7	1.3470E+00	1.3534E+00	.5	0.0000E+00	0.0000E+00	.0	8.0434E-02	8.0792E-02	.3	24	7
25	6	1.3470E+00	1.3534E+00	.5	0.0000E+00	0.0000E+00	.0	7.3391E-02	7.3673E-02	.4	25	6
26	5	1.3470E+00	1.3533E+00	.5	0.0000E+00	0.0000E+00	.0	6.6417E-02	6.7088E-02	.4	26	5
27	4	1.3470E+00	1.3533E+00	.5	0.0000E+00	0.0000E+00	.0	6.0319E-02	6.0562E-02	.4	27	4
28	3	1.3470E+00	1.3533E+00	.5	0.0000E+00	0.0000E+00	.0	5.4931E-02	5.4759E-02	.5	28	3
29	2	1.3470E+00	1.3532E+00	.5	0.0000E+00	0.0000E+00	.0	4.9249E-02	4.9440E-02	.4	29	2
30	1	1.3470E+00	1.3532E+00	.5	0.0000E+00	0.0000E+00	.0	4.4107E-02	4.4306E-02	.3	30	1
ZRMS				34.87			.00			4.00		
ZRMSP				34.88			.00			11.12		

C.3 - SEÇÕES DE CHOQUE MULTIGRUPO DO U-235, MAT 1261, GERADOS POR LINEAR/RECENT/SIGMA1/GROUPIE

SEÇÃO DE CHOQUE:		ELÁSTICA			FISSÃO			CAPTURA			
CODIGO→	GRUPO	OK/CTE	293K/MAX	2DESVMIO	REFERENCIA	VALOR	2DESVMIO	REFERENCIA	VALOR	2DESVMIO	GRUPO
1	30	1.5630E+01	2.0000E+01	33.1	6.2290E+03	7.3772E+03	21.6	1.0709E+03	1.3117E+03	21.6	1 30
2	29	1.5627E+01	1.6610E+01	6.3	3.1103E+03	3.2521E+03	4.6	3.3622E+02	3.6269E+02	4.9	2 29
3	28	1.5621E+01	1.6037E+01	2.8	2.0630E+03	2.1079E+03	2.1	3.3690E+02	3.6431E+02	2.1	3 28
4	27	1.5613E+01	1.5092E+01	1.6	1.5424E+03	1.5629E+03	1.3	2.6629E+02	2.6970E+02	1.3	4 27
5	26	1.5603E+01	1.3797E+01	1.2	1.2273E+03	1.2376E+03	.6	2.1142E+02	2.2390E+02	.6	5 26
6	25	1.5590E+01	1.2606E+01	.7	1.0164E+03	1.0231E+03	.7	1.7430E+02	1.7575E+02	.7	6 25
7	24	1.5575E+01	1.1668E+01	.6	8.6497E+02	8.6920E+02	.3	1.4749E+02	1.4826E+02	.3	7 24
8	23	1.5558E+01	1.0630E+01	.6	7.5011E+02	7.5323E+02	.4	1.2683E+02	1.2737E+02	.4	8 23
9	22	1.5538E+01	1.0429E+01	.6	6.5917E+02	6.6200E+02	.4	1.1068E+02	1.1123E+02	.3	9 22
10	21	1.5516E+01	1.0607E+01	.6	5.8685E+02	5.8844E+02	.3	9.7980E+01	9.8399E+01	.4	10 21
11	20	1.5492E+01	1.0382E+01	.6	5.2620E+02	5.2833E+02	.4	8.7533E+01	8.7912E+01	.4	11 20
12	19	1.5466E+01	1.0334E+01	.6	4.7676E+02	4.7787E+02	.2	7.9176E+01	7.9370E+01	.2	12 19
13	18	1.5437E+01	1.0324E+01	.6	4.3300E+02	4.3433E+02	.3	7.1949E+01	7.2217E+01	.4	13 18
14	17	1.5406E+01	1.0402E+01	.6	3.9387E+02	3.9704E+02	.3	6.3970E+01	6.6161E+01	.3	14 17
15	16	1.5372E+01	1.0457E+01	.6	3.6331E+02	3.6486E+02	.4	6.0778E+01	6.0967E+01	.3	15 16
16	15	1.5335E+01	1.0418E+01	.3	3.3394E+02	3.3490E+02	.3	5.6134E+01	5.6296E+01	.3	16 15
17	14	1.5291E+01	1.0373E+01	.3	3.0330E+02	3.0634E+02	.3	5.1740E+01	5.1970E+01	.4	17 14
18	13	1.5239E+01	1.0319E+01	.3	2.7926E+02	2.8021E+02	.3	4.7833E+01	4.8027E+01	.4	18 13
19	12	1.5180E+01	1.0290E+01	.3	2.5526E+02	2.5610E+02	.3	4.4334E+01	4.4378E+01	.3	19 12
20	11	1.5112E+01	1.0180E+01	.3	2.3335E+02	2.3443E+02	.4	4.1680E+01	4.2019E+01	.3	20 11
21	10	1.5033E+01	1.0107E+01	.3	2.1363E+02	2.1418E+02	.3	3.9630E+01	3.9772E+01	.3	21 10
22	9	1.4936E+01	1.0006E+01	.3	1.9636E+02	1.9710E+02	.4	3.8324E+01	3.8436E+01	.3	22 9
23	8	1.4819E+01	1.0001E+01	.4	1.8270E+02	1.8361E+02	.3	3.8233E+01	3.8397E+01	.4	23 8
24	7	1.4663E+01	1.0724E+01	.4	1.7790E+02	1.7866E+02	.3	4.1696E+01	4.1893E+01	.1	24 7
25	6	1.4514E+01	1.0943E+01	.2	1.6812E+02	1.6760E+02	-.2	4.3931E+01	4.3948E+01	-.4	25 6
26	5	1.4474E+01	1.0437E+01	-.3	1.6336E+02	1.6200E+02	-.3	4.2743E+01	4.2667E+01	-.2	26 5
27	4	1.4306E+01	1.0263E+01	-.3	1.3133E+02	1.3200E+02	1.0	2.3291E+01	2.3393E+01	1.8	27 4
28	3	1.4073E+01	1.0042E+01	-.2	9.3413E+01	9.4239E+01	.9	1.1786E+01	1.1937E+01	1.3	28 3
29	2	1.3793E+01	1.3773E+01	-.1	7.2206E+01	7.2637E+01	.6	7.7004E+00	7.7710E+00	.9	29 2
30	1	1.0423E+01	1.0424E+01	.0	6.0239E+01	6.0530E+01	.3	3.8223E+00	3.8610E+00	.7	30 1
XRMS				6.21			4.00			4.10	
XRMS				6.31			11.37			11.36	

C.4 - SEÇÕES DE CHOQUE MULTIGRUPO DO U-238, MAT 1262, GERADOS POR LINEAR/RECENT/SIGMA1/GROUPIE

SEÇÃO DE CHOQUE ELASTICA				FISSAO			CAPTURA					
CODIGO->	GRUPO	OK/CTE REFERENCIA	293K/MAX VALOR	OK/CTE REFERENCIA	293K/MAX VALOR	DESVIO	OK/CTE REFERENCIA	293K/MAX VALOR	DESVIO	GRUPO		
	1	30	0.9530E+00	1.1000E+01	0.0000E+00	0.0000E+00	.0	2.4937E+01	3.2700E+01	21.6	1	30
	2	29	0.9540E+00	0.5107E+00	0.0000E+00	0.0000E+00	.0	1.3482E+01	1.4100E+01	4.6	2	29
	3	28	0.9547E+00	0.2021E+00	0.0000E+00	0.0000E+00	.0	0.9077E+00	0.1071E+00	2.2	3	28
	4	27	0.9544E+00	0.1043E+00	0.0000E+00	0.0000E+00	.0	0.7440E+00	0.0326E+00	1.3	4	27
	5	26	0.9542E+00	0.0433E+00	0.0000E+00	0.0000E+00	.0	3.3906E+00	3.442E+00	.9	5	26
	6	25	0.9538E+00	0.0402E+00	0.0000E+00	0.0000E+00	.0	4.4970E+00	4.5334E+00	.0	6	25
	7	24	0.9534E+00	0.0336E+00	0.0000E+00	0.0000E+00	.0	3.8597E+00	3.8700E+00	.0	7	24
	8	23	0.9529E+00	0.0260E+00	0.0000E+00	0.0000E+00	.0	3.3761E+00	3.3944E+00	.0	8	23
	9	22	0.9524E+00	0.0174E+00	0.0000E+00	0.0000E+00	.0	3.0046E+00	3.0166E+00	.4	9	22
	10	21	0.9517E+00	0.0077E+00	0.0000E+00	0.0000E+00	.0	2.7070E+00	2.7160E+00	.3	10	21
	11	20	0.9510E+00	0.0070E+00	0.0000E+00	0.0000E+00	.0	2.4666E+00	2.4756E+00	.4	11	20
	12	19	0.9503E+00	0.0034E+00	0.0000E+00	0.0000E+00	.0	2.2610E+00	2.2699E+00	.3	12	19
	13	18	0.9495E+00	0.0027E+00	0.0000E+00	0.0000E+00	.0	2.0088E+00	2.0097E+00	.4	13	18
	14	17	0.9488E+00	0.0002E+00	0.0000E+00	0.0000E+00	.0	1.9439E+00	1.9460E+00	.1	14	17
	15	16	0.9476E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	1.0163E+00	1.0247E+00	.5	15	16
	16	15	0.9463E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	1.6983E+00	1.7043E+00	.4	16	15
	17	14	0.9453E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	1.5906E+00	1.5956E+00	.3	17	14
	18	13	0.9438E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	1.4027E+00	1.4000E+00	.4	18	13
	19	12	0.9421E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	1.3046E+00	1.3000E+00	.4	19	12
	20	11	0.9402E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	1.2955E+00	1.2991E+00	.3	20	11
	21	10	0.9379E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	1.2130E+00	1.2162E+00	.3	21	10
	22	9	0.9352E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	1.1201E+00	1.1214E+00	.3	22	9
	23	8	0.9317E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	1.0402E+00	1.0401E+00	.3	23	8
	24	7	0.9273E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	0.6673E-01	0.7115E-01	.5	24	7
	25	6	0.9210E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	0.9019E-01	0.9267E-01	.3	25	6
	26	5	0.9140E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	0.1036E-01	0.2152E-01	.4	26	5
	27	4	0.9060E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	7.3047E-01	7.3397E-01	.4	27	4
	28	3	0.8940E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	0.0000E-01	0.0195E-01	.5	28	3
	29	2	0.8811E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	0.3507E-01	0.3001E-01	.5	29	2
	30	1	0.8653E+00	0.0000E+00	0.0000E+00	0.0000E+00	.0	0.0676E-01	0.0000E-01	.5	30	1
	ZRMS						.00			4.09		
	ZRMSP						.00			11.00		

C.5 - SEÇÕES DE CHOQUE MULTIGRUPO DO H-1, MAT 1269/2011, GERADOS POR ETOG-3Q

SECAO DE		CHOQUE:		ELASTICA		FISSAO		CAPTURA				
CODIGO->		EMDFO-IV		JEMOL-2		JEMOL-2		JEMOL-2				
GRUPO	REFERENCIA	VALOR	ZDESVID	REFERENCIA	VALOR	ZDESVID	REFERENCIA	VALOR	ZDESVID	GRUPO		
1	54	2.0449E+01	2.0437E+01	-1	0.0000E+00	0.0000E+00	.0	6.1981E-02	6.1981E-02	.0	1	54
2	53	2.0449E+01	2.0437E+01	-1	0.0000E+00	0.0000E+00	.0	5.3490E-02	5.3490E-02	.0	2	53
3	52	2.0449E+01	2.0437E+01	-1	0.0000E+00	0.0000E+00	.0	4.6704E-02	4.6704E-02	.0	3	52
4	51	2.0449E+01	2.0436E+01	-1	0.0000E+00	0.0000E+00	.0	4.1210E-02	4.1210E-02	.0	4	51
5	50	2.0449E+01	2.0436E+01	-1	0.0000E+00	0.0000E+00	.0	3.6335E-02	3.6335E-02	.0	5	50
6	49	2.0449E+01	2.0436E+01	-1	0.0000E+00	0.0000E+00	.0	3.2065E-02	3.2065E-02	.0	6	49
7	48	2.0449E+01	2.0436E+01	-1	0.0000E+00	0.0000E+00	.0	2.8296E-02	2.8296E-02	.0	7	48
8	47	2.0449E+01	2.0436E+01	-1	0.0000E+00	0.0000E+00	.0	2.4971E-02	2.4971E-02	.0	8	47
9	46	2.0449E+01	2.0436E+01	-1	0.0000E+00	0.0000E+00	.0	2.2036E-02	2.2036E-02	.0	9	46
10	45	2.0449E+01	2.0436E+01	-1	0.0000E+00	0.0000E+00	.0	1.9447E-02	1.9447E-02	.0	10	45
11	44	2.0449E+01	2.0435E+01	-1	0.0000E+00	0.0000E+00	.0	1.7161E-02	1.7161E-02	.0	11	44
12	43	2.0449E+01	2.0435E+01	-1	0.0000E+00	0.0000E+00	.0	1.5144E-02	1.5144E-02	.0	12	43
13	42	2.0449E+01	2.0434E+01	-1	0.0000E+00	0.0000E+00	.0	1.3365E-02	1.3365E-02	.0	13	42
14	41	2.0449E+01	2.0433E+01	-1	0.0000E+00	0.0000E+00	.0	1.1794E-02	1.1794E-02	.0	14	41
15	40	2.0449E+01	2.0432E+01	-1	0.0000E+00	0.0000E+00	.0	1.0405E-02	1.0405E-02	.0	15	40
16	39	2.0449E+01	2.0431E+01	-1	0.0000E+00	0.0000E+00	.0	9.1847E-03	9.1847E-03	.0	16	39
17	38	2.0449E+01	2.0431E+01	-1	0.0000E+00	0.0000E+00	.0	8.1035E-03	8.1035E-03	.0	17	38
18	37	2.0449E+01	2.0429E+01	-1	0.0000E+00	0.0000E+00	.0	7.1527E-03	7.1527E-03	.0	18	37
19	36	2.0449E+01	2.0427E+01	-1	0.0000E+00	0.0000E+00	.0	6.3121E-03	6.3121E-03	.0	19	36
20	35	2.0449E+01	2.0424E+01	-1	0.0000E+00	0.0000E+00	.0	5.5703E-03	5.5703E-03	.0	20	35
21	34	2.0442E+01	2.0419E+01	-1	0.0000E+00	0.0000E+00	.0	4.9140E-03	4.9140E-03	.0	21	34
22	33	2.0428E+01	2.0410E+01	-1	0.0000E+00	0.0000E+00	.0	4.3338E-03	4.3338E-03	.0	22	33
23	32	2.0408E+01	2.0397E+01	-1	0.0000E+00	0.0000E+00	.0	3.8685E-03	3.8685E-03	.0	23	32
24	31	2.0382E+01	2.0380E+01	.0	0.0000E+00	0.0000E+00	.0	3.4756E-03	3.4756E-03	.0	24	31
25	30	2.0356E+01	2.0352E+01	.0	0.0000E+00	0.0000E+00	.0	3.1509E-03	3.1509E-03	.0	25	30
26	29	2.0323E+01	2.0293E+01	-1	0.0000E+00	0.0000E+00	.0	2.8814E-03	2.8814E-03	.0	26	29
27	28	2.0238E+01	2.0147E+01	-1	0.0000E+00	0.0000E+00	.0	2.6224E-03	2.6224E-03	.0	27	28
28	27	2.0104E+01	1.9997E+01	-1	0.0000E+00	0.0000E+00	.0	2.3724E-03	2.3724E-03	.0	28	27
29	26	1.9883E+01	1.9820E+01	-1	0.0000E+00	0.0000E+00	.0	2.1321E-03	2.1321E-03	.0	29	26
30	25	1.9526E+01	1.9460E+01	-1	0.0000E+00	0.0000E+00	.0	1.9066E-03	1.9066E-03	.0	30	25
31	24	1.8962E+01	1.8878E+01	-1	0.0000E+00	0.0000E+00	.0	1.6961E-03	1.6961E-03	.0	31	24
32	23	1.8131E+01	1.7992E+01	-1.3	0.0000E+00	0.0000E+00	.0	1.5072E-03	1.5072E-03	.0	32	23
33	22	1.6930E+01	1.6834E+01	-1.6	0.0000E+00	0.0000E+00	.0	1.3362E-03	1.3362E-03	.0	33	22
34	21	1.5507E+01	1.5237E+01	-1.5	0.0000E+00	0.0000E+00	.0	1.1895E-03	1.1895E-03	.0	34	21
35	20	1.3900E+01	1.3664E+01	-1.3	0.0000E+00	0.0000E+00	.0	1.0717E-03	1.0717E-03	.0	35	20
36	19	1.2836E+01	1.2606E+01	-1.2	0.0000E+00	0.0000E+00	.0	9.8011E-04	9.8011E-04	.0	36	19
37	18	1.1726E+01	1.1623E+01	-1.9	0.0000E+00	0.0000E+00	.0	9.0114E-04	9.0114E-04	.0	37	18
38	17	1.0603E+01	1.0516E+01	-1.8	0.0000E+00	0.0000E+00	.0	8.3375E-04	8.3375E-04	.0	38	17
39	16	9.4895E+00	9.4675E+00	-1.2	0.0000E+00	0.0000E+00	.0	7.7527E-04	7.7527E-04	.0	39	16
40	15	8.4424E+00	8.3916E+00	-1.6	0.0000E+00	0.0000E+00	.0	7.2454E-04	7.2454E-04	.0	40	15
41	14	7.4591E+00	7.4284E+00	-1.4	0.0000E+00	0.0000E+00	.0	6.8226E-04	6.8226E-04	.0	41	14
42	13	6.5564E+00	6.543E+00	.0	0.0000E+00	0.0000E+00	.0	6.4822E-04	6.4822E-04	.0	42	13
43	12	5.7555E+00	5.7540E+00	.0	0.0000E+00	0.0000E+00	.0	6.2186E-04	6.2186E-04	.0	43	12
44	11	5.0455E+00	5.0449E+00	.0	0.0000E+00	0.0000E+00	.0	6.0377E-04	6.0377E-04	.0	44	11
45	10	4.4189E+00	4.4183E+00	.0	0.0000E+00	0.0000E+00	.0	5.9288E-04	5.9288E-04	.0	45	10
46	9	3.8694E+00	3.8581E+00	-1.3	0.0000E+00	0.0000E+00	.0	5.8441E-04	5.8441E-04	.0	46	9
47	8	3.3795E+00	3.3644E+00	-1.4	0.0000E+00	0.0000E+00	.0	5.7829E-04	5.7829E-04	.0	47	8
48	7	2.9348E+00	2.9306E+00	-1.1	0.0000E+00	0.0000E+00	.0	5.7323E-04	5.7323E-04	.0	48	7
49	6	2.5364E+00	2.5318E+00	-1.2	0.0000E+00	0.0000E+00	.0	5.6926E-04	5.6926E-04	.0	49	6
50	5	2.1769E+00	2.1745E+00	-1.1	0.0000E+00	0.0000E+00	.0	5.6629E-04	5.6629E-04	.0	50	5
51	4	1.8495E+00	1.8479E+00	-1.1	0.0000E+00	0.0000E+00	.0	5.6271E-04	5.6271E-04	.0	51	4
52	3	1.5519E+00	1.5509E+00	-1.1	0.0000E+00	0.0000E+00	.0	5.6145E-04	5.6145E-04	.0	52	3
53	2	1.2537E+00	1.2429E+00	-1.1	0.0000E+00	0.0000E+00	.0	5.5136E-04	5.5136E-04	.0	53	2
54	1	1.0462E+00	1.0460E+00	.0	0.0000E+00	0.0000E+00	.0	5.3371E-04	5.3371E-04	.0	54	1
****				.34			.00			.00		
****				.34			.00			.00		

C.6 - SEÇÕES DE CHOQUE MULTIGRUPO DO H-1, MAT 1269/2011, GERADOS POR FLANGE-II

SECAO DE CODIGO->	CHOQUE ELASTICA				FISSAO				CAPTURA			
	GRUPO	REFERENCIA	VALOR	ZDESVIO	REFERENCIA	VALOR	ZDESVIO	REFERENCIA	VALOR	ZDESVIO	GRUPO	
1	30	2.1366E+02	2.1366E+02	.0	0.0000E+00	0.0000E+00	.0	9.3200E+00	9.3200E+00	.0	1	30
2	29	1.2154E+02	1.2154E+02	.0	0.0000E+00	0.0000E+00	.0	1.6600E+00	1.6600E+00	.0	2	29
3	28	9.4679E+01	9.4679E+01	.0	0.0000E+00	0.0000E+00	.0	1.1067E+00	1.1067E+00	.0	3	28
4	27	8.2602E+01	8.2602E+01	.0	0.0000E+00	0.0000E+00	.0	8.3000E-01	8.3000E-01	.0	4	27
5	26	7.5079E+01	7.5079E+01	.0	0.0000E+00	0.0000E+00	.0	6.6400E-01	6.6400E-01	.0	5	26
6	25	6.9601E+01	6.9601E+01	.0	0.0000E+00	0.0000E+00	.0	5.5334E-01	5.5334E-01	.0	6	25
7	24	6.5023E+01	6.5023E+01	.0	0.0000E+00	0.0000E+00	.0	4.7429E-01	4.7429E-01	.0	7	24
8	23	6.0921E+01	6.0921E+01	.0	0.0000E+00	0.0000E+00	.0	4.1500E-01	4.1500E-01	.0	8	23
9	22	5.7128E+01	5.7128E+01	.0	0.0000E+00	0.0000E+00	.0	3.6889E-01	3.6889E-01	.0	9	22
10	21	5.3603E+01	5.3603E+01	.0	0.0000E+00	0.0000E+00	.0	3.3200E-01	3.3200E-01	.0	10	21
11	20	5.0340E+01	5.0340E+01	.0	0.0000E+00	0.0000E+00	.0	3.0180E-01	3.0180E-01	.0	11	20
12	19	4.7356E+01	4.7356E+01	.0	0.0000E+00	0.0000E+00	.0	2.7665E-01	2.7665E-01	.0	12	19
13	18	4.4672E+01	4.4672E+01	.0	0.0000E+00	0.0000E+00	.0	2.5537E-01	2.5537E-01	.0	13	18
14	17	4.2306E+01	4.2306E+01	.0	0.0000E+00	0.0000E+00	.0	2.3713E-01	2.3713E-01	.0	14	17
15	16	4.0262E+01	4.0262E+01	.0	0.0000E+00	0.0000E+00	.0	2.2132E-01	2.2132E-01	.0	15	16
16	15	3.8449E+01	3.8449E+01	.0	0.0000E+00	0.0000E+00	.0	2.0683E-01	2.0683E-01	.0	16	15
17	14	3.6801E+01	3.6801E+01	.0	0.0000E+00	0.0000E+00	.0	1.9300E-01	1.9300E-01	.0	17	14
18	13	3.5314E+01	3.5314E+01	.0	0.0000E+00	0.0000E+00	.0	1.7992E-01	1.7992E-01	.0	18	13
19	12	3.3943E+01	3.3943E+01	.0	0.0000E+00	0.0000E+00	.0	1.6766E-01	1.6766E-01	.0	19	12
20	11	3.2670E+01	3.2670E+01	.0	0.0000E+00	0.0000E+00	.0	1.5640E-01	1.5640E-01	.0	20	11
21	10	3.1452E+01	3.1452E+01	.0	0.0000E+00	0.0000E+00	.0	1.4575E-01	1.4575E-01	.0	21	10
22	9	3.0234E+01	3.0234E+01	.0	0.0000E+00	0.0000E+00	.0	1.3521E-01	1.3521E-01	.0	22	9
23	8	2.8984E+01	2.8984E+01	.0	0.0000E+00	0.0000E+00	.0	1.2479E-01	1.2479E-01	.0	23	8
24	7	2.7771E+01	2.7771E+01	.0	0.0000E+00	0.0000E+00	.0	1.1456E-01	1.1456E-01	.0	24	7
25	6	2.6662E+01	2.6662E+01	.0	0.0000E+00	0.0000E+00	.0	1.0463E-01	1.0463E-01	.0	25	6
26	5	2.5535E+01	2.5535E+01	.0	0.0000E+00	0.0000E+00	.0	9.5105E-02	9.5105E-02	.0	26	5
27	4	2.4404E+01	2.4404E+01	.0	0.0000E+00	0.0000E+00	.0	8.6102E-02	8.6102E-02	.0	27	4
28	3	2.3298E+01	2.3298E+01	.0	0.0000E+00	0.0000E+00	.0	7.7687E-02	7.7687E-02	.0	28	3
29	2	2.2445E+01	2.2445E+01	.0	0.0000E+00	0.0000E+00	.0	7.0138E-02	7.0138E-02	.0	29	2
30	1	2.1600E+01	2.1600E+01	.0	0.0000E+00	0.0000E+00	.0	6.2983E-02	6.2983E-02	.0	30	1
ZRMS				.00								.00
ZRMSP				.00								.00

C.7 - SEÇÕES DE CHOQUE MULTIGRUPO DO H-2, MAT 1120/2012, GERADOS POR ETOG-3Q

SECAO DE CHOQUE ELASTICA				FISSAO				CAPTURA				
CODIGO->	GRUPO	EMDFB-IV REFERENCIA	JENDL-2 VALOR	ZDESVID	EMDFB-IV REFERENCIA	JENDL-2 VALOR	ZDESVID	EMDFB-IV REFERENCIA	JENDL-2 VALOR	ZDESVID	GRUPO	
1	54	3.3500E+00	3.3899E+00	1.2	0.0000E+00	0.0000E+00	.0	9.6896E-05	1.0271E-04	6.0	1 54	
2	53	3.3500E+00	3.3899E+00	1.2	0.0000E+00	0.0000E+00	.0	8.3607E-05	8.8644E-05	6.0	2 53	
3	52	3.3500E+00	3.3899E+00	1.2	0.0000E+00	0.0000E+00	.0	7.2990E-05	7.7405E-05	6.0	3 52	
4	51	3.3500E+00	3.3899E+00	1.2	0.0000E+00	0.0000E+00	.0	6.4395E-05	6.8304E-05	6.1	4 51	
5	50	3.3500E+00	3.3899E+00	1.2	0.0000E+00	0.0000E+00	.0	5.6769E-05	6.0226E-05	6.1	5 50	
6	49	3.3500E+00	3.3899E+00	1.2	0.0000E+00	0.0000E+00	.0	5.0090E-05	5.3151E-05	6.1	6 49	
7	48	3.3500E+00	3.3900E+00	1.2	0.0000E+00	0.0000E+00	.0	4.4197E-05	4.6909E-05	6.1	7 48	
8	47	3.3500E+00	3.3900E+00	1.2	0.0000E+00	0.0000E+00	.0	3.8998E-05	4.1401E-05	6.2	8 47	
9	46	3.3500E+00	3.3900E+00	1.2	0.0000E+00	0.0000E+00	.0	3.4410E-05	3.6540E-05	6.2	9 46	
10	45	3.3500E+00	3.3900E+00	1.2	0.0000E+00	0.0000E+00	.0	3.0362E-05	3.2250E-05	6.2	10 45	
11	44	3.3500E+00	3.3900E+00	1.2	0.0000E+00	0.0000E+00	.0	2.6790E-05	2.8463E-05	6.2	11 44	
12	43	3.3500E+00	3.3900E+00	1.2	0.0000E+00	0.0000E+00	.0	2.3638E-05	2.5126E-05	6.3	12 43	
13	42	3.3500E+00	3.3900E+00	1.2	0.0000E+00	0.0000E+00	.0	2.0857E-05	2.2180E-05	6.3	13 42	
14	41	3.3500E+00	3.3900E+00	1.2	0.0000E+00	0.0000E+00	.0	1.8403E-05	1.9580E-05	6.4	14 41	
15	40	3.3500E+00	3.3900E+00	1.2	0.0000E+00	0.0000E+00	.0	1.6238E-05	1.7285E-05	6.4	15 40	
16	39	3.3500E+00	3.3900E+00	1.2	0.0000E+00	0.0000E+00	.0	1.4328E-05	1.5263E-05	6.5	16 39	
17	38	3.3500E+00	3.3900E+00	1.2	0.0000E+00	0.0000E+00	.0	1.2642E-05	1.3483E-05	6.7	17 38	
18	37	3.3500E+00	3.3900E+00	1.2	0.0000E+00	0.0000E+00	.0	1.1155E-05	1.1911E-05	6.8	18 37	
19	36	3.3500E+00	3.3900E+00	1.2	0.0000E+00	0.0000E+00	.0	9.8426E-06	1.0522E-05	6.9	19 36	
20	35	3.3500E+00	3.3900E+00	1.2	0.0000E+00	0.0000E+00	.0	8.6846E-06	9.2953E-06	7.0	20 35	
21	34	3.3500E+00	3.3900E+00	1.2	0.0000E+00	0.0000E+00	.0	7.6629E-06	8.2183E-06	7.2	21 34	
22	33	3.3500E+00	3.3896E+00	1.2	0.0000E+00	0.0000E+00	.0	6.7614E-06	7.2709E-06	7.5	22 33	
23	32	3.3500E+00	3.3884E+00	1.1	0.0000E+00	0.0000E+00	.0	5.9717E-06	6.0203E-06	8.1	23 32	
24	31	3.3500E+00	3.3869E+00	1.1	0.0000E+00	0.0000E+00	.0	4.3454E-06	4.7343E-06	8.9	24 31	
25	30	3.3500E+00	3.3854E+00	1.1	0.0000E+00	0.0000E+00	.0	3.3917E-06	3.7460E-06	10.4	25 30	
26	29	3.3498E+00	3.3839E+00	1.0	0.0000E+00	0.0000E+00	.0	2.6613E-06	2.9947E-06	12.9	26 29	
27	28	3.3479E+00	3.3824E+00	1.0	0.0000E+00	0.0000E+00	.0	2.1747E-06	2.4307E-06	11.8	27 28	
28	27	3.3449E+00	3.3808E+00	1.1	0.0000E+00	0.0000E+00	.0	1.8541E-06	2.0178E-06	10.0	28 27	
29	26	3.3413E+00	3.3793E+00	1.1	0.0000E+00	0.0000E+00	.0	1.5965E-06	1.7327E-06	8.5	29 26	
30	25	3.3368E+00	3.3776E+00	1.2	0.0000E+00	0.0000E+00	.0	1.4628E-06	1.5560E-06	6.4	30 25	
31	24	3.3292E+00	3.3713E+00	1.3	0.0000E+00	0.0000E+00	.0	1.3921E-06	1.4809E-06	6.4	31 24	
32	23	3.3208E+00	3.3604E+00	1.2	0.0000E+00	0.0000E+00	.0	1.3627E-06	1.4924E-06	7.9	32 23	
33	22	3.3083E+00	3.3424E+00	1.0	0.0000E+00	0.0000E+00	.0	1.4196E-06	1.5980E-06	12.6	33 22	
34	21	3.2917E+00	3.2830E+00	-3	0.0000E+00	0.0000E+00	.0	1.5174E-06	1.8047E-06	18.9	34 21	
35	20	3.2759E+00	3.2288E+00	-1.4	0.0000E+00	0.0000E+00	.0	1.6156E-06	2.0165E-06	24.8	35 20	
36	19	3.2619E+00	3.1944E+00	-2.1	0.0000E+00	0.0000E+00	.0	1.7184E-06	2.2043E-06	28.4	36 19	
37	18	3.2411E+00	3.1466E+00	-2.9	0.0000E+00	0.0000E+00	.0	1.8410E-06	2.4275E-06	31.9	37 18	
38	17	3.2161E+00	3.1037E+00	-3.5	0.0000E+00	0.0000E+00	.0	1.9785E-06	2.6817E-06	35.5	38 17	
39	16	3.1843E+00	3.0638E+00	-3.8	0.0000E+00	0.0000E+00	.0	2.1312E-06	2.9771E-06	39.7	39 16	
40	15	3.1477E+00	3.0258E+00	-3.9	0.0000E+00	0.0000E+00	.0	2.3128E-06	3.3155E-06	43.4	40 15	
41	14	3.1076E+00	3.0009E+00	-3.4	0.0000E+00	0.0000E+00	.0	2.5028E-06	3.7006E-06	47.9	41 14	
42	13	3.0637E+00	2.9857E+00	-2.5	0.0000E+00	0.0000E+00	.0	2.7317E-06	4.1355E-06	51.4	42 13	
43	12	3.0161E+00	2.9738E+00	-1.4	0.0000E+00	0.0000E+00	.0	3.0347E-06	4.6231E-06	52.3	43 12	
44	11	2.9665E+00	2.9438E+00	-0.8	0.0000E+00	0.0000E+00	.0	3.4814E-06	5.1656E-06	48.4	44 11	
45	10	2.9122E+00	2.8993E+00	-4	0.0000E+00	0.0000E+00	.0	4.0366E-06	5.7625E-06	42.8	45 10	
46	9	2.7933E+00	2.8291E+00	1.3	0.0000E+00	0.0000E+00	.0	4.6033E-06	6.4047E-06	39.1	46 9	
47	8	2.6457E+00	2.7197E+00	2.8	0.0000E+00	0.0000E+00	.0	5.2348E-06	7.1008E-06	35.6	47 8	
48	7	2.4725E+00	2.5531E+00	3.3	0.0000E+00	0.0000E+00	.0	6.0443E-06	7.8235E-06	29.4	48 7	
49	6	2.2693E+00	2.3309E+00	2.7	0.0000E+00	0.0000E+00	.0	6.9896E-06	8.5509E-06	22.3	49 6	
50	5	2.0392E+00	2.0653E+00	1.3	0.0000E+00	0.0000E+00	.0	8.2640E-06	9.2470E-06	101.8	50 5	
51	4	1.7903E+00	1.7798E+00	-6	0.0000E+00	0.0000E+00	.0	1.2940E-02	9.8488E-06	-100.1	51 4	
52	3	1.5199E+00	1.5123E+00	-5	0.0000E+00	0.0000E+00	.0	4.6690E-02	1.0309E-05	-100.0	52 3	
53	2	1.2563E+00	1.2598E+00	3	0.0000E+00	0.0000E+00	.0	8.1920E-02	1.0545E-05	-100.0	53 2	
54	1	1.0103E+00	1.0257E+00	1.5	0.0000E+00	0.0000E+00	.0	1.1690E-01	1.0489E-05	-100.0	54 1	
ENDS			1.69				.00				37.48	
ENDSP			1.69				.00				99.86	

C.9 - SEÇÕES DE CHOQUE MULTIGRUPO DO A1-27, MAT 1193/2131, GERADOS POR ETOG-3Q

SEÇÃO DE CHOQUE ELÁSTICA				FISSAO				CAPTURA			
CODIGO	ENDFB-IV	JENDL-2	DESVIO	ENDFB-IV	JENDL-2	DESVIO	ENDFB-IV	JENDL-2	DESVIO	GRUPO	
GRUPO	REFERENCIA	VALOR	DESVIO	REFERENCIA	VALOR	DESVIO	REFERENCIA	VALOR	DESVIO	GRUPO	
1 34	1.3471E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	4.3338E-02	4.2991E-02	-.9	1 34	
2 53	1.3471E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	3.7391E-02	3.7047E-02	-.9	2 53	
3 52	1.3471E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	3.2655E-02	3.2366E-02	-.9	3 52	
4 51	1.3471E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	2.8223E-02	2.8560E-02	-.9	4 51	
5 50	1.3471E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	2.5421E-02	2.5181E-02	-.9	5 50	
6 49	1.3471E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	2.2448E-02	2.2222E-02	-1.0	6 49	
7 48	1.3472E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	1.9809E-02	1.9611E-02	-1.0	7 48	
8 47	1.3472E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	1.7487E-02	1.7307E-02	-1.0	8 47	
9 46	1.3472E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	1.5437E-02	1.5273E-02	-1.1	9 46	
10 45	1.3472E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	1.3627E-02	1.3479E-02	-1.1	10 45	
11 44	1.3473E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	1.2028E-02	1.1895E-02	-1.1	11 44	
12 43	1.3473E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	1.0614E-02	1.0497E-02	-1.1	12 43	
13 42	1.3473E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	9.3640E-03	9.2637E-03	-1.1	13 42	
14 41	1.3473E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	8.2613E-03	8.1752E-03	-1.0	14 41	
15 40	1.3473E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	7.2884E-03	7.2146E-03	-1.0	15 40	
16 39	1.3473E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	6.4302E-03	6.3668E-03	-1.0	16 39	
17 38	1.3473E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	5.6729E-03	5.6107E-03	-1.0	17 38	
18 37	1.3473E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	5.0049E-03	4.9505E-03	-.9	18 37	
19 36	1.3473E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	4.4155E-03	4.3799E-03	-.9	19 36	
20 35	1.3473E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	3.8938E-03	3.8618E-03	-.9	20 35	
21 34	1.3473E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	3.5299E-03	3.4965E-03	-2.6	21 34	
22 33	1.3473E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	3.2652E-03	3.0780E-03	-5.7	22 33	
23 32	1.3473E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	2.8931E-03	2.5952E-03	-10.3	23 32	
24 31	1.3473E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	2.4755E-03	2.0820E-03	-15.9	24 31	
25 30	1.3472E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	2.1182E-03	1.7949E-03	-18.1	25 30	
26 29	1.3471E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	1.8952E-03	1.6138E-03	-14.8	26 29	
27 28	1.3459E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	2.4062E-03	1.7013E-03	-29.3	27 28	
28 27	1.3435E+00	1.5017E+00	11.8	0.0000E+00	0.0000E+00	.0	3.4194E-03	2.1168E-03	-38.1	28 27	
29 26	1.3340E+00	1.4413E+00	8.0	0.0000E+00	0.0000E+00	.0	5.0911E-03	3.5157E-03	-30.9	29 26	
30 25	1.8678E+00	1.7886E+00	-4.2	0.0000E+00	0.0000E+00	.0	1.7962E-02	4.8576E-02	170.4	30 25	
31 24	1.2195E+00	1.2293E+00	.8	0.0000E+00	0.0000E+00	.0	3.2120E-03	2.7782E-03	-13.5	31 24	
32 23	8.0164E-01	7.5403E-01	-5.9	0.0000E+00	0.0000E+00	.0	2.9470E-03	2.9862E-03	1.3	32 23	
33 22	1.0094E+01	9.8744E+00	-2.2	0.0000E+00	0.0000E+00	.0	1.1057E-02	1.1108E-02	.5	33 22	
34 21	2.5095E+00	2.7269E+00	8.7	0.0000E+00	0.0000E+00	.0	1.6738E-03	1.5464E-03	-7.6	34 21	
35 20	6.0888E+00	4.3013E+00	-29.4	0.0000E+00	0.0000E+00	.0	1.8656E-03	1.8927E-03	1.5	35 20	
36 19	8.0820E+00	9.5103E+00	17.7	0.0000E+00	0.0000E+00	.0	2.6507E-03	2.3599E-03	-11.0	36 19	
37 18	4.1013E+00	4.1164E+00	.4	0.0000E+00	0.0000E+00	.0	2.6954E-03	2.3815E-03	-11.6	37 18	
38 17	7.4575E+00	8.2246E+00	10.3	0.0000E+00	0.0000E+00	.0	1.9181E-03	1.5555E-03	-18.9	38 17	
39 16	4.4517E+00	4.8234E+00	8.3	0.0000E+00	0.0000E+00	.0	8.9005E-04	8.4697E-04	-4.8	39 16	
40 15	3.4102E+00	3.4939E+00	2.5	0.0000E+00	0.0000E+00	.0	7.6040E-04	7.3955E-04	-2.7	40 15	
41 14	3.5910E+00	3.8313E+00	6.7	0.0000E+00	0.0000E+00	.0	8.3112E-04	8.1173E-04	-2.3	41 14	
42 13	4.1814E+00	4.2791E+00	2.3	0.0000E+00	0.0000E+00	.0	7.2158E-04	6.6445E-04	-7.9	42 13	
43 12	3.8457E+00	3.8700E+00	.6	0.0000E+00	0.0000E+00	.0	3.6494E-04	3.6071E-04	-1.2	43 12	
44 11	4.0144E+00	3.9774E+00	-1.4	0.0000E+00	0.0000E+00	.0	3.0518E-04	2.9169E-04	-4.4	44 11	
45 10	3.3544E+00	3.2559E+00	-2.9	0.0000E+00	0.0000E+00	.0	1.8175E-04	1.6888E-04	-7.1	45 10	
46 9	3.1234E+00	3.1121E+00	-.4	0.0000E+00	0.0000E+00	.0	1.3407E-04	1.2449E-04	-7.1	46 9	
47 8	2.8299E+00	2.8024E+00	-1.0	0.0000E+00	0.0000E+00	.0	1.4091E-04	1.2779E-04	-9.3	47 8	
48 7	2.7137E+00	2.6531E+00	-2.2	0.0000E+00	0.0000E+00	.0	1.4591E-04	1.4094E-04	-3.4	48 7	
49 6	2.5980E+00	2.4787E+00	-3.9	0.0000E+00	0.0000E+00	.0	2.7040E-04	1.8410E-04	-61.5	49 6	
50 5	1.9253E+00	1.9344E+00	.5	0.0000E+00	0.0000E+00	.0	4.1738E-05	7.1409E-05	-98.3	50 5	
51 4	1.5706E+00	1.4915E+00	-5.7	0.0000E+00	0.0000E+00	.0	1.1721E-02	5.0862E-05	-94.6	51 4	
52 3	2.1175E+00	1.1775E+00	-13.7	0.0000E+00	0.0000E+00	.0	3.2799E-02	6.4795E-05	-99.8	52 3	
53 2	1.0271E+00	9.5100E-01	-7.4	0.0000E+00	0.0000E+00	.0	8.1496E-02	1.0639E-04	-99.9	53 2	
54 1	7.4467E-01	9.0989E-01	8.5	0.0000E+00	0.0000E+00	.0	1.6246E-01	1.7466E-04	-99.9	54 1	
ΣMS			10.18			.00			40.31		
ΣMS²			10.85			.00			70.28		

C.10 - SEÇÕES DE CHOQUE MULTIGRUPO DO A1-27, MAT 1193/2131, GERADOS POR FLANGE-II

SECAO DE CHOQUE:				ELASTICA			FISSAO			CAPTURA			
CODIGO->	ENDFB-IV	JENDL2		ENDFB-IV	JENDL2		ENDFB-IV	JENDL2		ENDFB-IV	JENDL2		GRUPO
GRUPO	REFERENCIA	VALOR	DESVIO	REFERENCIA	VALOR	DESVIO	REFERENCIA	VALOR	DESVIO	REFERENCIA	VALOR	DESVIO	GRUPO
1	30	1.3480E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	2.3200E+00	2.3000E+00	-.9	1	30	
2	29	1.3480E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	1.1601E+00	1.1500E+00	-.9	2	29	
3	28	1.3480E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	7.7335E-01	7.6667E-01	-.9	3	28	
4	27	1.3480E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	5.7999E-01	5.7500E-01	-.9	4	27	
5	26	1.3480E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	4.6399E-01	4.6000E-01	-.9	5	26	
6	25	1.3480E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	3.8665E-01	3.8333E-01	-.9	6	25	
7	24	1.3480E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	3.3142E-01	3.2837E-01	-.9	7	24	
8	23	1.3480E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	2.8999E-01	2.8750E-01	-.9	8	23	
9	22	1.3480E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	2.5778E-01	2.5554E-01	-.9	9	22	
10	21	1.3480E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	2.3201E-01	2.3000E-01	-.9	10	21	
11	20	1.3479E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	2.1098E-01	2.0909E-01	-.9	11	20	
12	19	1.3479E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	1.9346E-01	1.9166E-01	-.9	12	19	
13	18	1.3478E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	1.7864E-01	1.7692E-01	-1.0	13	18	
14	17	1.3477E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	1.6592E-01	1.6428E-01	-1.0	14	17	
15	16	1.3476E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	1.5490E-01	1.5333E-01	-1.0	15	16	
16	15	1.3475E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	1.4481E-01	1.4330E-01	-1.0	16	15	
17	14	1.3473E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	1.3516E-01	1.3372E-01	-1.1	17	14	
18	13	1.3472E+00	1.5000E+00	11.3	0.0000E+00	0.0000E+00	.0	1.2604E-01	1.2464E-01	-1.1	18	13	
19	12	1.3470E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	1.1747E-01	1.1614E-01	-1.1	19	12	
20	11	1.3470E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	1.0957E-01	1.0834E-01	-1.1	20	11	
21	10	1.3470E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	1.0210E-01	1.0099E-01	-1.1	21	10	
22	9	1.3470E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	9.4701E-02	9.3689E-02	-1.1	22	9	
23	8	1.3470E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	8.7388E-02	8.6464E-02	-1.1	23	8	
24	7	1.3470E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	8.0207E-02	7.9377E-02	-1.0	24	7	
25	6	1.3470E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	7.3239E-02	7.2496E-02	-1.0	25	6	
26	5	1.3470E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	6.6561E-02	6.5900E-02	-1.0	26	5	
27	4	1.3470E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	6.0247E-02	5.9663E-02	-1.0	27	4	
28	3	1.3470E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	5.4347E-02	5.3833E-02	-.9	28	3	
29	2	1.3471E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	4.9055E-02	4.8603E-02	-.9	29	2	
30	1	1.3471E+00	1.5000E+00	11.4	0.0000E+00	0.0000E+00	.0	4.4041E-02	4.3645E-02	-.9	30	1	
WRMS				11.32			.00					.97	
WRMS				11.32			.00					.90	

C.11 - SEÇÕES DE CHOQUE MULTIGRUPO DO U-235, MAT 1261/2923, GERADOS POR ETOG-3Q

SFCAD DE CODIGO->	CNOQUET ENDFB-IV	ELASTICA			FISSAO			CAPTURA			GRUPO
		REFERENCIA	VALOR	JEMDL-2 ZDESVMO	REFERENCIA	VALOR	JEMDL-2 ZDESVMO	REFERENCIA	VALOR	JEMDL-2 ZDESVMC	
1 54	1.3317E+01	1.4219E+01	6.7	5.9108E+01	6.0621E+01	2.6	5.7740E+00	5.7358E+00	-0.7	1 54	
2 33	1.2857E+01	1.3598E+01	5.8	7.2737E+01	7.1341E+01	-1.9	1.1631E+01	1.1625E+01	-0.1	2 33	
3 52	1.2907E+01	1.3436E+01	4.1	4.1052E+01	4.3763E+01	6.6	1.3445E+01	1.4235E+01	5.9	3 52	
4 51	1.2325E+01	1.2817E+01	4.2	1.4965E+01	1.4704E+01	-1.7	3.6350E+00	4.5446E+00	25.2	4 51	
5 50	1.1991E+01	1.2398E+01	3.1	1.4448E+01	1.3597E+01	8.0	1.2912E+01	1.3755E+01	6.5	5 50	
6 49	1.1366E+01	1.1763E+01	1.7	1.4145E+01	1.3570E+01	-4.1	3.4395E+00	3.5413E+00	5.0	6 49	
7 48	1.1360E+01	1.1571E+01	1.9	3.2078E+01	3.2220E+01	.4	1.5557E+01	1.7163E+01	10.3	7 48	
8 47	1.0926E+01	1.1051E+01	1.1	5.4902E+00	5.7521E+00	4.8	2.1490E+01	2.1927E+01	2.0	8 47	
9 46	1.0663E+01	1.0499E+01	-1.6	3.1006E+01	3.0624E+01	-1.2	4.8132E+01	4.6240E+01	-4.0	9 46	
10 45	1.0462E+01	1.0447E+01	-0.1	1.3462E+01	1.3879E+01	3.1	1.6177E+01	1.7051E+01	5.4	10 45	
11 44	1.1905E+01	1.1971E+01	.6	1.0199E+02	9.5530E+01	-6.3	3.5264E+01	4.8346E+01	37.1	11 44	
12 43	1.2477E+01	1.2437E+01	-0.3	4.9487E+01	4.1638E+01	-15.9	7.1268E+01	7.7165E+01	6.3	12 43	
13 42	1.0893E+01	1.0810E+01	-0.8	3.2933E+01	3.0959E+01	-6.1	1.7960E+01	2.2181E+01	23.5	13 42	
14 41	1.3725E+01	1.3335E+01	-2.8	6.7231E+01	6.0150E+01	-10.5	4.5330E+01	5.1239E+01	13.0	14 41	
15 40	1.1687E+01	1.1339E+01	-1.3	4.5026E+01	4.2504E+01	-5.6	2.0211E+01	2.2640E+01	12.3	15 40	
16 39	1.3394E+01	1.2912E+01	-3.6	9.8845E+01	6.0043E+01	2.4	3.6397E+01	4.1448E+01	13.9	16 39	
17 38	1.1983E+01	1.1450E+01	-3.3	3.4634E+01	3.5276E+01	1.9	1.7887E+01	2.1250E+01	16.8	17 38	
18 37	1.3189E+01	1.3474E+01	2.2	5.6488E+01	5.4956E+01	-2.7	2.4622E+01	2.7623E+01	12.2	18 37	
19 36	1.2408E+01	1.2770E+01	2.9	2.4444E+01	2.2889E+01	-6.4	9.7895E+00	1.1920E+01	22.0	19 36	
20 35	1.2662E+01	1.3570E+01	7.2	2.3291E+01	2.4681E+01	6.0	1.4847E+01	1.6479E+01	11.0	20 35	
21 34	1.2637E+01	1.1297E+01	-10.9	2.2863E+01	2.2646E+01	-1.0	1.3609E+01	1.3705E+01	.7	21 34	
22 33	1.2338E+01	1.1497E+01	-8.3	2.1280E+01	2.1296E+01	.1	1.1199E+01	1.3398E+01	19.6	22 33	
23 32	1.3015E+01	1.2716E+01	-2.3	2.0842E+01	2.1026E+01	.9	1.0197E+01	1.1270E+01	10.5	23 32	
24 31	1.2297E+01	1.1433E+01	-7.0	1.3691E+01	1.4898E+01	6.8	5.9527E+00	6.5710E+00	10.4	24 31	
25 30	1.2430E+01	1.1058E+01	-11.0	1.3209E+01	1.3569E+01	2.7	4.7568E+00	4.8280E+00	1.5	25 30	
26 29	1.2455E+01	1.3083E+01	5.0	8.5200E+00	8.1181E+00	-4.7	4.3365E+00	4.2291E+00	-2.5	26 29	
27 28	1.2125E+01	1.1617E+01	-4.2	6.8846E+00	7.5700E+00	10.0	2.6624E+00	2.4024E+00	-9.0	27 28	
28 27	1.1929E+01	1.2862E+01	7.8	5.2048E+00	5.4919E+00	5.5	1.8977E+00	2.2209E+00	17.0	28 27	
29 26	1.1805E+01	1.2572E+01	6.5	4.2386E+00	4.4518E+00	5.0	1.4562E+00	1.6984E+00	16.6	29 26	
30 25	1.1836E+01	1.2352E+01	4.4	3.2713E+00	3.3327E+00	1.9	1.4160E+00	1.2530E+00	-11.5	30 25	
31 24	1.1585E+01	1.2191E+01	5.2	2.7135E+00	2.7919E+00	2.9	1.1076E+00	1.0413E+00	-8.0	31 24	
32 23	1.1311E+01	1.1805E+01	4.4	2.2506E+00	2.3336E+00	3.7	8.8780E-01	8.6340E-01	-2.7	32 23	
33 22	1.0977E+01	1.1219E+01	2.2	2.0273E+00	2.0667E+00	1.9	7.2196E-01	7.3132E-01	1.3	33 22	
34 21	1.0473E+01	1.0912E+01	3.4	1.8406E+00	1.8553E+00	.8	5.8998E-01	5.9256E-01	.4	34 21	
35 20	9.9203E+00	9.9462E+00	.3	1.7148E+00	1.7309E+00	.9	5.0588E-01	5.1197E-01	1.2	35 20	
36 19	9.4169E+00	9.5019E+00	.9	1.5830E+00	1.6098E+00	1.7	4.3670E-01	4.6230E-01	5.9	36 19	
37 18	8.8804E+00	9.0811E+00	2.3	1.5148E+00	1.5456E+00	2.0	3.9087E-01	3.9525E-01	1.1	37 18	
38 17	8.3854E+00	8.6013E+00	2.6	1.4310E+00	1.4453E+00	1.0	3.4023E-01	3.4907E-01	2.6	38 17	
39 16	7.8730E+00	7.8900E+00	.2	1.3398E+00	1.3675E+00	2.1	2.9612E-01	3.0620E-01	3.4	39 16	
40 15	7.2808E+00	7.3602E+00	1.1	1.2985E+00	1.2964E+00	-0.2	2.6210E-01	2.6030E-01	-0.7	40 15	
41 14	6.7318E+00	6.6955E+00	-0.5	1.2339E+00	1.2410E+00	.6	2.1624E-01	2.1650E-01	.1	41 14	
42 13	6.0981E+00	5.9625E+00	-2.2	1.1980E+00	1.1898E+00	-0.7	1.9005E-01	1.8431E-01	-3.0	42 13	
43 12	5.4837E+00	5.2425E+00	-4.4	1.1563E+00	1.1620E+00	.5	1.6231E-01	1.5948E-01	-1.8	43 12	
44 11	4.7978E+00	4.6029E+00	-3.9	1.1343E+00	1.1597E+00	2.2	1.3777E-01	1.4397E-01	4.5	44 11	
45 10	4.2711E+00	4.1033E+00	-3.9	1.1928E+00	1.1971E+00	.4	1.2112E-01	1.4939E-01	23.3	45 10	
46 9	3.9160E+00	3.8615E+00	-1.4	1.2536E+00	1.2378E+00	-1.3	9.7787E-02	1.6357E-01	67.3	46 9	
47 8	3.8862E+00	3.7964E+00	-2.3	1.2550E+00	1.2697E+00	1.2	7.1980E-02	1.4090E-01	123.5	47 8	
48 7	4.1010E+00	3.9554E+00	-3.6	1.2731E+00	1.2971E+00	1.9	5.4277E-02	1.1221E-01	143.6	48 7	
49 6	4.5110E+00	4.2181E+00	-6.5	1.2684E+00	1.2739E+00	.4	4.1968E-02	8.5409E-02	103.3	49 6	
50 5	4.8291E+00	4.4135E+00	-8.6	1.2056E+00	1.2139E+00	.7	3.1949E-02	4.1300E-02	29.2	50 5	
51 4	4.8960E+00	4.5043E+00	-8.0	1.1378E+00	1.1368E+00	-0.1	2.4102E-02	1.4587E-02	-39.5	51 4	
52 3	4.5693E+00	4.1807E+00	-8.9	1.0909E+00	1.0772E+00	-1.3	1.7598E-02	3.3127E-02	-80.0	52 3	
53 2	4.1754E+00	3.4889E+00	-19.4	1.4984E+00	1.5106E+00	.8	1.7853E-02	3.9293E-02	-98.9	53 2	
54 1	3.5840E+00	3.2278E+00	-9.9	1.7853E+00	1.7713E+00	-0.8	7.0541E-03	3.0463E-03	-99.6	54 1	
RMS			5.25			4.62			39.86		
RMSE			4.96			4.14			19.02		

C.12 - SEÇÕES DE CHOQUE MULTIGRUPO DO U-235, MAT 1261/2923, GERADOS POR FLANGE-II

SECAO DE CHOQUE ELASTICA				FISSAO				CAPTURA				
CODIGO->	ENDFB-IV	JENDL2		ENDFB-IV	JENDL2		ENDFB-IV	JENDL2		GRUPO		
GRUPO	REFERENCIA	VALOR	DESVIO	REFERENCIA	VALOR	DESVIO	REFERENCIA	VALOR	DESVIO	GRUPO		
1	30	1.5630E+01	1.7000E+01	8.8	6.2145E+03	6.5916E+03	6.1	1.0758E+03	1.0289E+03	-4.4	1	30
2	29	1.5625E+01	1.7000E+01	8.8	3.1028E+03	3.2602E+03	5.1	5.3642E+02	5.0343E+02	-6.2	2	29
3	28	1.5618E+01	1.7000E+01	8.8	2.0597E+03	2.1102E+03	2.5	3.5596E+02	3.3154E+02	-6.9	3	28
4	27	1.5609E+01	1.7000E+01	8.9	1.5393E+03	1.5512E+03	.8	2.6575E+02	2.4653E+02	-7.2	4	27
5	26	1.5596E+01	1.7000E+01	9.0	1.2248E+03	1.2216E+03	-3	2.1100E+02	1.9591E+02	-7.2	5	26
6	25	1.5582E+01	1.7000E+01	9.1	1.0141E+03	1.0044E+03	-1.0	1.7416E+02	1.6238E+02	-6.8	6	25
7	24	1.5565E+01	1.7000E+01	9.2	8.6228E+02	8.5479E+02	-9	1.4700E+02	1.3854E+02	-5.8	7	24
8	23	1.5545E+01	1.7000E+01	9.4	7.4773E+02	7.3987E+02	-1.1	1.2640E+02	1.2074E+02	-4.5	8	23
9	22	1.5523E+01	1.7000E+01	9.5	6.3782E+02	6.3193E+02	-9	1.1043E+02	1.0696E+02	-3.1	9	22
10	21	1.5499E+01	1.7000E+01	9.7	5.8526E+02	5.8261E+02	-5	9.7692E+01	9.5939E+01	-1.8	10	21
11	20	1.5471E+01	1.7000E+01	9.9	5.2537E+02	5.1914E+02	-1.2	8.7354E+01	8.6628E+01	-.8	11	20
12	19	1.5442E+01	1.7000E+01	10.1	4.7500E+02	4.6619E+02	-1.9	7.8864E+01	7.8873E+01	.0	12	19
13	18	1.5410E+01	1.7000E+01	10.3	4.3202E+02	4.2298E+02	-2.1	7.1793E+01	7.2689E+01	1.2	13	18
14	17	1.5376E+01	1.7000E+01	10.6	3.9487E+02	3.8740E+02	-1.9	6.5797E+01	6.7801E+01	3.0	14	17
15	16	1.5339E+01	1.6998E+01	10.8	3.6248E+02	3.5698E+02	-1.5	6.0626E+01	6.3546E+01	4.8	15	16
16	15	1.5299E+01	1.6738E+01	9.4	3.3272E+02	3.3018E+02	-.8	5.5956E+01	5.9267E+01	5.9	16	15
17	14	1.5252E+01	1.6253E+01	6.6	3.0449E+02	3.0530E+02	.3	5.1602E+01	5.4960E+01	6.5	17	14
18	13	1.5197E+01	1.6000E+01	5.3	2.7842E+02	2.8123E+02	1.0	4.7691E+01	5.1115E+01	7.2	18	13
19	12	1.5135E+01	1.6000E+01	5.7	2.5456E+02	2.5824E+02	1.4	4.4245E+01	4.7640E+01	7.7	19	12
20	11	1.5065E+01	1.6000E+01	6.2	2.3286E+02	2.3713E+02	1.8	4.1786E+01	4.4094E+01	5.5	20	11
21	10	1.4984E+01	1.6000E+01	6.8	2.1304E+02	2.1743E+02	2.1	3.9520E+01	4.0697E+01	3.0	21	10
22	9	1.4887E+01	1.6000E+01	7.5	1.9571E+02	1.9825E+02	1.3	3.8307E+01	3.7366E+01	-2.5	22	9
23	8	1.4767E+01	1.6000E+01	8.3	1.8256E+02	1.8092E+02	-.9	3.8253E+01	3.5101E+01	-8.2	23	8
24	7	1.4627E+01	1.6000E+01	9.4	1.7795E+02	1.7501E+02	-1.7	4.1103E+01	4.0662E+01	-1.1	24	7
25	6	1.4511E+01	1.6000E+01	10.3	1.8815E+02	1.8478E+02	-1.8	4.5888E+01	4.5869E+01	.0	25	6
26	5	1.4493E+01	1.5519E+01	7.1	1.8318E+02	1.8092E+02	-1.2	4.2678E+01	3.6941E+01	-13.4	26	5
27	4	1.4342E+01	1.5000E+01	4.6	1.8122E+02	1.8114E+02	-.1	2.3244E+01	2.3504E+01	1.1	27	4
28	3	1.4048E+01	1.4997E+01	8.9	9.3242E+01	8.9342E+01	-4.2	1.1761E+01	1.1724E+01	-.3	28	3
29	2	1.3732E+01	1.4731E+01	7.3	7.2091E+01	6.9748E+01	-3.3	7.6875E+00	7.6629E+00	-.3	29	2
30	1	1.3376E+01	1.4295E+01	6.8	6.0078E+01	6.1291E+01	2.0	5.8202E+00	5.8080E+00	-.2	30	1
WRMS				8.52						5.29		
WRMSP				8.55						5.55		

C.13 - SEÇÕES DE CHOQUE MULTIGRUPO DO U-238, MAT 1262/2925, GERADOS POR ETQG-3Q

SECAO DE CODIGO->	CHOQUE I ELASTICA			FISSAO			CAPTURA			GRUPO
	GRUPO	REFERENCIA	VALOR	REFERENCIA	VALOR	DESVIO	REFERENCIA	VALOR	DESVIO	
1 34	8.8627E+00	8.7803E+00	-0.9	0.0000E+00	6.4005E-07	*****	5.7853E-01	5.7442E-01	-0.7	1 34
2 33	8.8268E+00	8.7442E+00	-0.9	3.4097E-08	5.6736E-07	1564.0	5.2763E-01	5.2212E-01	-1.0	2 33
3 32	8.7734E+00	8.6900E+00	-0.9	7.2366E-08	5.1230E-07	607.9	4.9583E-01	4.8798E-01	-1.6	3 32
4 31	8.7020E+00	8.6379E+00	-0.7	6.3916E-08	4.7271E-07	639.6	4.8097E-01	4.7087E-01	-2.1	4 31
5 30	8.5994E+00	8.5315E+00	-0.6	5.6424E-08	4.4553E-07	689.6	4.8646E-01	4.7361E-01	-2.6	5 30
6 49	8.4456E+00	8.4218E+00	-0.3	4.9871E-08	4.3679E-07	775.8	5.2995E-01	5.1111E-01	-3.5	6 49
7 48	8.1892E+00	8.2057E+00	.2	4.4099E-08	4.6510E-07	954.7	6.6326E-01	6.3277E-01	-4.6	7 48
8 47	7.6561E+00	7.7573E+00	1.3	3.9018E-08	6.2700E-07	1507.0	1.1550E+00	1.1767E+00	1.9	8 47
9 46	5.0646E+00	5.6565E+00	11.7	3.4547E-08	4.6604E-06	13390.0	1.2537E+01	1.1494E+01	-8.3	9 46
10 45	3.9472E+01	4.0960E+01	3.8	3.0617E-08	1.8001E-04	*****	4.6445E+02	4.6321E+02	-0.3	10 45
11 44	9.6195E+00	9.4190E+00	-2.1	2.7168E-08	4.5950E-07	1576.6	8.9999E-01	8.7329E-01	-3.0	11 44
12 43	8.5243E+00	8.4650E+00	-0.7	2.4145E-08	4.0459E-07	1575.7	2.9577E-01	3.8511E-01	13.3	12 43
13 42	7.1937E+00	7.2662E+00	1.0	2.1503E-08	8.4968E-07	3851.4	4.5867E-01	4.6184E-01	.7	13 42
14 41	9.2526E+01	1.2837E+02	39.0	1.9200E-08	5.7665E-04	*****	2.6037E+02	2.7642E+02	6.2	14 41
15 40	9.9900E+00	1.0131E+01	1.4	1.7204E-08	1.1385E-06	6517.6	6.7741E-01	6.5706E-01	-3.0	15 40
16 39	2.2642E+02	2.6403E+02	16.6	1.9484E-08	9.4619E-05	*****	1.8874E+02	1.8506E+02	-1.9	16 39
17 38	2.0573E+01	2.0197E+01	-1.8	1.4019E-08	1.1439E-06	8059.6	2.7887E+00	2.1045E+00	-24.5	17 38
18 37	9.1562E+00	1.0027E+01	9.5	1.2792E-08	2.3349E-07	1725.3	1.4206E-01	1.4101E-01	-0.7	18 37
19 36	5.6380E+01	5.7075E+01	1.2	1.1793E-08	9.4985E-05	*****	4.3501E+01	4.2696E+01	-1.9	19 36
20 35	6.1527E+00	7.8649E+00	27.8	1.1030E-08	1.0936E-05	99047.8	4.8887E+00	4.5825E+00	-6.1	20 35
21 34	1.0327E+02	1.0270E+02	-0.6	1.0514E-08	1.2271E-05	*****	4.2038E+01	4.0505E+01	-3.6	21 34
22 33	9.1084E+00	1.0615E+01	16.5	1.0298E-08	5.9488E-08	477.7	2.7329E+00	2.7104E+00	-0.8	22 33
23 32	5.1538E+01	5.3031E+01	3.3	1.0965E-08	2.4636E-05	*****	1.1262E+01	1.0772E+01	-4.4	23 32
24 31	1.5833E+01	1.6773E+01	5.9	1.6756E-08	1.4455E-05	86167.6	3.5222E+00	3.4112E+00	-3.2	24 31
25 30	1.7179E+01	1.7612E+01	2.5	1.0792E-03	1.6697E-03	54.7	3.5514E+00	3.4932E+00	-1.6	25 30
26 29	2.0095E+01	2.1918E+01	9.1	2.3226E-04	6.2360E-04	168.5	2.6841E+00	2.7796E+00	3.6	26 29
27 28	2.0951E+01	2.2285E+01	6.4	3.1298E-08	9.1671E-06	29189.7	1.7411E+00	1.6774E+00	-3.7	27 28
28 27	1.8114E+01	1.9773E+01	9.2	0.0000E+00	1.2250E-09	*****	1.3443E+00	1.3308E+00	-1.0	28 27
29 26	1.6959E+01	1.7235E+01	1.6	0.0000E+00	0.0000E+00	.0	1.0234E+00	9.6671E-01	-5.5	29 26
30 25	1.5022E+01	1.4338E+01	-4.6	3.0951E-06	1.1973E-04	3768.4	8.0718E-01	7.4158E-01	-8.1	30 25
31 24	1.4110E+01	1.3579E+01	-3.8	8.3193E-05	8.8453E-05	6.3	6.5765E-01	6.0822E-01	-7.5	31 24
32 23	1.3464E+01	1.3771E+01	-1.8	8.7800E-05	1.0992E-04	26.3	5.3055E-01	5.1477E-01	-3.0	32 23
33 22	1.2905E+01	1.2918E+01	.1	6.9850E-05	4.8681E-05	-30.3	4.2250E-01	4.3108E-01	2.0	33 22
34 21	1.2521E+01	1.2597E+01	.3	4.0000E-05	8.7426E-05	118.6	3.2442E-01	3.3001E-01	1.7	34 21
35 20	1.2076E+01	1.1929E+01	-1.2	4.0000E-05	3.9577E-05	-1.1	2.2484E-01	2.3837E-01	6.0	35 20
36 19	1.1567E+01	1.1395E+01	-1.5	4.0375E-05	4.4073E-05	9.2	1.9064E-01	1.9683E-01	3.2	36 19
37 18	1.0873E+01	1.0833E+01	-0.4	4.4030E-05	7.5067E-05	70.5	1.7107E-01	1.6728E-01	-2.2	37 18
38 17	1.0183E+01	1.0149E+01	-0.4	4.9435E-05	9.6816E-05	95.8	1.5922E-01	1.4518E-01	-5.2	38 17
39 16	9.5674E+00	9.4277E+00	-1.5	5.6375E-05	9.2492E-05	64.1	1.3832E-01	1.3002E-01	-6.0	39 16
40 15	8.8715E+00	8.8815E+00	-2.1	6.5297E-05	1.1063E-04	69.4	1.2088E-01	1.1912E-01	-1.5	40 15
41 14	8.0626E+00	7.9216E+00	-1.7	9.3326E-05	1.9088E-04	104.3	1.1048E-01	1.1205E-01	1.4	41 14
42 13	7.2287E+00	7.1940E+00	-0.5	1.7835E-04	3.1526E-04	85.1	1.0765E-01	1.0888E-01	1.1	42 13
43 12	6.4741E+00	6.4508E+00	-0.4	6.9927E-04	7.0881E-04	1.4	1.1133E-01	1.1272E-01	1.2	43 12
44 11	5.6768E+00	5.7214E+00	.8	2.0208E-03	2.7069E-03	34.0	1.1955E-01	1.2105E-01	1.3	44 11
45 10	5.0126E+00	4.9299E+00	-1.6	1.2596E-02	1.4521E-02	15.3	1.2057E-01	1.2543E-01	4.0	45 10
46 9	4.4268E+00	4.2333E+00	-4.4	4.3398E-02	5.8014E-02	33.7	1.0376E-01	9.2999E-02	-10.4	46 9
47 8	4.0318E+00	4.0791E+00	1.2	3.1199E-01	3.5869E-01	15.0	7.6627E-02	5.8370E-02	-26.4	47 8
48 7	4.1365E+00	4.3064E+00	4.1	5.2094E-01	5.3528E-01	2.8	5.1858E-02	3.5658E-02	-31.2	48 7
49 6	4.5238E+00	4.7127E+00	4.2	5.5121E-01	5.5138E-01	.0	3.3480E-02	2.8175E-02	-30.8	49 6
50 5	4.8222E+00	5.0539E+00	4.8	5.4852E-01	5.4668E-01	-0.3	2.0404E-02	1.9351E-02	-24.8	50 5
51 4	4.8012E+00	5.1534E+00	7.3	5.6191E-01	5.6014E-01	-0.5	1.2207E-02	1.0343E-02	-15.3	51 4
52 3	4.4076E+00	4.9327E+00	11.9	5.8112E-01	5.7203E-01	-1.6	7.2724E-03	7.4138E-03	1.9	52 3
53 2	3.7037E+00	4.0390E+00	9.1	8.8959E-01	9.0288E-01	1.7	4.3407E-03	5.5781E-03	28.5	53 2
54 1	3.1209E+00	3.3902E+00	8.7	9.8897E-01	1.0020E+00	1.3	2.5915E-03	4.5034E-03	73.8	54 1
TRMS			8.41			*****			14.41	
TRMSP			14.60			*****			3.74	

C.14 - SEÇÕES DE CHOQUE MULTIGRUPO DO U-238, MAT 1262/2925, GERADOS POR FLANGE-II

SEÇÃO DE CHOQUE ELÁSTICA				FISSÃO			CAPTURA				
CODIGO->	ENDFB-IV	JENDL2		ENDFB-IV	JENDL2		ENDFB-IV	JENDL2		GRUPO	
GRUPO	REFERENCIA	VALOR	ZDESIVIO	REFERENCIA	VALOR	ZDESIVIO	REFERENCIA	VALOR	ZDESIVIO		
1	30	8.9548E+00	8.8762E+00	-9	0.0000E+00	3.2138E-09	2.6879E+01	2.6881E+01	.0	1	30
2	29	8.9548E+00	8.8761E+00	-9	0.0000E+00	1.6070E-09	1.3441E+01	1.3443E+01	.0	2	29
3	28	8.9545E+00	8.8740E+00	-9	0.0000E+00	1.0714E-09	8.9628E+00	8.9635E+00	.0	3	28
4	27	8.9544E+00	8.8738E+00	-9	0.0000E+00	8.0370E-09	6.7243E+00	6.7256E+00	.0	4	27
5	26	8.9542E+00	8.8735E+00	-9	0.0000E+00	6.4308E-06	5.3818E+00	5.3824E+00	.0	5	26
6	25	8.9539E+00	8.8731E+00	-9	0.0000E+00	5.3602E-06	4.4869E+00	4.4878E+00	.0	6	25
7	24	8.9535E+00	8.8747E+00	-9	0.0000E+00	4.5957E-06	3.8482E+00	3.8503E+00	.1	7	24
8	23	8.9530E+00	8.8742E+00	-9	0.0000E+00	4.0225E-06	3.3693E+00	3.3703E+00	.0	8	23
9	22	8.9522E+00	8.8737E+00	-9	0.0000E+00	3.5769E-06	2.9974E+00	2.9981E+00	.0	9	22
10	21	8.9519E+00	8.8731E+00	-9	0.0000E+00	3.2205E-06	2.7000E+00	2.7006E+00	.0	10	21
11	20	8.9512E+00	8.8725E+00	-9	0.0000E+00	2.9290E-06	2.4569E+00	2.4574E+00	.0	11	20
12	19	8.9506E+00	8.8717E+00	-9	0.0000E+00	2.6862E-06	2.2545E+00	2.2552E+00	.0	12	19
13	18	8.9498E+00	8.8709E+00	-9	0.0000E+00	2.4809E-06	2.0835E+00	2.0838E+00	.0	13	18
14	17	8.9490E+00	8.8701E+00	-9	0.0000E+00	2.3050E-06	1.9371E+00	1.9372E+00	.0	14	17
15	16	8.9482E+00	8.8691E+00	-9	0.0000E+00	2.1526E-06	1.8103E+00	1.8104E+00	.0	15	16
16	15	8.9472E+00	8.8681E+00	-9	0.0000E+00	2.0132E-06	1.6944E+00	1.6944E+00	.0	16	15
17	14	8.9460E+00	8.8669E+00	-9	0.0000E+00	1.8801E-06	1.5839E+00	1.5838E+00	.0	17	14
18	13	8.9447E+00	8.8655E+00	-9	0.0000E+00	1.7544E-06	1.4797E+00	1.4794E+00	.0	18	13
19	12	8.9431E+00	8.8638E+00	-9	0.0000E+00	1.6366E-06	1.3821E+00	1.3817E+00	.0	19	12
20	11	8.9413E+00	8.8620E+00	-9	0.0000E+00	1.5286E-06	1.2929E+00	1.2927E+00	.0	20	11
21	10	8.9392E+00	8.8598E+00	-9	0.0000E+00	1.4267E-06	1.2087E+00	1.2083E+00	.0	21	10
22	9	8.9366E+00	8.8571E+00	-9	0.0000E+00	1.3260E-06	1.1257E+00	1.1250E+00	-.1	22	9
23	8	8.9332E+00	8.8538E+00	-9	0.0000E+00	1.2266E-06	1.0441E+00	1.0432E+00	-.1	23	8
24	7	8.9292E+00	8.8495E+00	-9	0.0000E+00	1.1293E-06	9.6454E-01	9.6334E-01	-.1	24	7
25	6	8.9241E+00	8.8441E+00	-9	0.0000E+00	1.0352E-06	8.8799E-01	8.8649E-01	-.2	25	6
26	5	8.9174E+00	8.8371E+00	-9	0.0000E+00	9.4548E-07	8.1552E-01	8.1312E-01	-.2	26	5
27	4	8.9089E+00	8.8282E+00	-9	0.0000E+00	8.6119E-07	7.4809E-01	7.4592E-01	-.3	27	4
28	3	8.8974E+00	8.8188E+00	-9	0.0000E+00	7.8515E-07	6.8659E-01	6.8386E-01	-.4	28	3
29	2	8.8843E+00	8.8026E+00	-9	0.0000E+00	7.1403E-07	6.3312E-01	6.2989E-01	-.5	29	2
30	1	8.8660E+00	8.7837E+00	-9	0.0000E+00	6.4969E-07	5.8493E-01	5.8099E-01	-.7	30	1
RMS			.89							.19	
RMS*			.89							.08	