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EVALUATION OF RESONANCE PARAMETERS OF ^{233}U, ^{235}U, ^{238}U, ^{239}Pu, ^{240}Pu, ^{241}Pu AND ^{242}Pu

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This report contains two papers entitled "Evaluation of Resonance Parameters of ^{233}U, ^{235}U, ^{239}Pu and ^{241}Pu" and "Evaluation of Resonance Parameters of ^{238}U, ^{240}Pu and ^{242}Pu", which were submitted to IAEA Consultants Meeting on Uranium and Plutonium Isotope Resonance Parameters held on the 28th Sept. - 2nd Oct., 1981 at Vienna as contributed papers. Summaries of the contributed papers will be quoted in the IAEA proceedings.

These two parts describe the evaluation of the resonance parameters of main fissile and fertile materials for JENDL-2, and discuss briefly the problems encountered in the evaluation. In part III of this report, the presently evaluated resonance parameters were tabulated.

Keywords : Evaluation, Resonance Parameters, JENDL-2, Uranium-233, Uranium-235, Uranium-238, Plutonium-239, Plutonium-240, Plutonium-241, Plutonium-242.

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^{233}U, ^{235}U, ^{238}U, ^{239}Pu, ^{240}Pu, ^{241}Pu, ^{242}Puの共鳴パラメータの評価

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（1981年11月9日受理）

本報告書は2編の論文より成る。その各々の標題は「^{233}U, ^{235}U, ^{239}Pu, ^{241}Pu の共鳴パラメータの評価」と「^{238}U, ^{240}Pu, ^{242}Puの共鳴パラメータの評価」であり，1981年9月28日～10月2日にウィーンで開催された「ウラン・プルトニウム同位体の共鳴パラメータに関するIAEAコンサルタント会議」に寄稿したものである。寄稿論文の要旨はIAEA発行の報文集に掲載されるが，ここではその全体を発刊する。これら2編の論文は，JENDL－2のために行なった主な核燃料および親物質核種の共鳴パラメータの評価と，その際に指摘された諸問題を述べている。本報告書の第3部には，今回の評価結果のパラメータが与えられている。

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Contents

Part I

Evaluation of Resonance Parameters of ^{233}U, ^{235}U, ^{239}Pu and ^{241}Pu

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Evaluation of Resonance Parameters of ^{233}U, ^{235}U, ^{239}Pu and ^{241}Pu

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Abstract

The resonance parameters of ^{233}U, ^{235}U, ^{239}Pu and ^{241}Pu were evaluated for Japanese Evaluated Nuclear Data Library Version 2 (JENDL-2). The evaluation was made by two steps. At first, the parameters were evaluated on the basis of the reported measured data with a suitable method which depends on the status of measured data. The most reliable parameter set could be found after some simple examinations for ^{233}U, ^{239}Pu and ^{241}Pu, since total number of measured parameter sets is limited for these nuclides. On the other hand, numerous measurements exist for ^{235}U, and the evaluation was made by taking a suitable average, considering the fission and capture areas. Secondly, the cross sections were calculated with the parameters thus obtained, and were compared with the measured cross sections. Then the parameters were so modified that the calculated cross sections well reproduced the measured data. After modifying the resonance parameters, the remaining discrepancies between the calculated and measured cross sections, which are mainly caused by the interference among levels and are inevitable with the single-level Breit-Wigner formula, were corrected by applying slight background cross sections. The resonance integrals calculated from the presently evaluated parameters agree well with the measured data.

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1. Introduction

Evaluation of resonance parameters for main fissile and fertile materials has been made for several years by a working group of Japanese Nuclear Data Committee in order to provide the evaluataed resonance parameters to Japanese Evaluated Nuclear Data Library (JENDL). The evaluation of resonance parameters is a very complicated problem, and the working group recommended some existing evaluated data such as those of ENDF/B-IV for the first version of JENDL (JENDL-1)[1] in 1975.

After that the evaluation was continued and finished in 1979, and the presently evaluated resonance parameters were adopted in the second version of JENDL (JENDL-2). The present paper describes the evaluation for the fissile materials, while the evaluation for the fertile materials is reported in another paper[2] presented in this meeting. The general evaluation method is described in Chapter 2. The detailed evaluation procedure is given in Chapter 3 for each nuclide. The presently evaluated resonance parameters are tabulated in Appendix.

2. Evaluation Method

Experimental data of resonance parameters were surveyed through CINDA[3] up to CINDA 78. The collected resonance parameters were stored in the resonance parameter storage system REPSTOR[4]. In this system many types of resonance parameters including complicated forms such as $g\Gamma_n\Gamma_\gamma/\Gamma$ or $\sigma_0\Gamma$ can be stored and can be compared with one another in simple tabulation forms.

Experimental cross section data were also surveyed through CINDA. Most of numerical data were obtained from NEA Data Bank, and were stored in the neutron data storage and retrieval system NESTOR[4].

In evaluating nuclear cross sections, a common procedure is to plot at first all the experimental data as a function of neutron energy, and then deduce the most reasonable curve by carefully comparing the different sets of data and studying the accuracy and errors of the data. In the resonance region, however, this procedure is not always adequate, because a resonance shape usually depends on the resolution function of the spectrometer used for the measurement but this function is not well known in many cases. Furthermore, it is not practical to apply this procedure in the case where many resonances exist in a limited region.

In the present evaluation, therefore, two steps were taken. Firstly, the resonance parameters were evaluated on the basis of the reported measured parameters with a suitable method which depends on the status of measured data. As total number of measured parameter sets is limited for ^{233}U, ^{239}Pu and ^{241}Pu, the most reliable set could be found after some simple examinations for these nuclides. On the other hand, numerous measurements exist for ^{235}U, and the evaluation was made by taking a suitable average of the measured parameters.

Secondly, the cross sections were calculated with the parameters thus obtained, and were compared with the measured cross sections. Then the parameters were so modified that the calculated cross sections well reproduced the measured data. This process was made by using NDES[5] (Neutron Data Evaluation System) in which conversation with the computer is made from a terminal having a cathode ray tube. The calculated cross sections are displayed on the cathode ray tube with the experimental data, and the cross sections calculated with the modified parameters can be also displayed and compared. At present NDES has no function of automatic search for the resonance parameters, and the fitting procedure above mentioned was done by trial and error.

Even after modifying the resonance parameters, the calculated fission cross section failed to reproduce the measured data in limited energy ranges particularly in valleys between resonances. This is caused by the interference among resonances. The multi-level formula is essentially required for fissile nuclides. In the present work, however, the discrepancy was corrected by applying a positive or negative background cross section to the fission cross section. This work was made also by using NDES which has a function to record the X-Y coodinates of any point in the graph displayed on the cathode ray tube into computer memory by using a cross hair cursor.

The thermal cross sections below 1 eV cannot be well reproduced with the resonance parameters for the fissile nuclides because of the interference among levels. Hence the cross sections were given as point-wise data below 1 eV for these 4 nuclides.

3. Evaluation and Discussion

3.1 Uranium-233

This nuclide was not contained in JENDL-1. The resolved resonance region is defined between 1 and 100 eV. Details of the evaluation were described in Ref. (6).

A total of six parameter sets have so far been reported. After examing their experimental conditions and comparing the calculated areas and cross sections, it was concluded that the parameter set deduced by Nizamuddin and Blons[7] was the most reliable. Their parameters were deduced from both the high resolution measurements of fission cross section by Blons[8] and the transmission measurements by Kolar et al.[9] Nizamuddin and Blons gave the parameters for 169 levels, 33 of which are artificial levels added to partially compensate the interference effects among levels. In the energy range below 6 eV, where Nizamuddin and Blons did not give the parameters, the recommended data in BNL-325, 3rd edition[10] were adopted as the initial guess.

The cross sections were calculated from the parameters by assuming the effective scattering radius of 9.93 fm. The calculated total and fission cross sections agree well with the measured data within their scatters in most of energy ranges. It should be noted that the calculated capture cross section agreed well with the measured data by Weston et al.[11], though the resonance parameters were deduced by Nizamuddin and Blons without considering the capture data. This suggests reliability of the parameters of Nizamuddin and Blons. In some energy ranges, however, agreement was not satisfactory between the calculated and measured cross sections. The resonance parameters were modified to improve the agreement in such energy ranges by using NDES[5].

After modifying the parameters, the remaining discrepancies between the calculated and measured fission cross sections were corrected by applying positive or negative background cross sections. Figure 1 shows the fission cross sections calculated with and without the background cross section as well as the measured data in the energy range between 13 and 16 eV. No background correction was applied to the capture and elastic scattering cross sections.

As shown in Table 1 the fission and capture resonance integrals calculated from the present parameters agree with the recommended values in BNL-325, 3rd edition[10] within the quoted errors. They also agree with those calculated from the ENDF/B-IV parameters.

3.2 Uranium-235

The parameters of ENDF/B-IV were recommended in JENDL-1. In JENDL-2, the presently evaluated parameters were applied in the energy region between 1 and 100 eV.

Tremendous number of measurements were made for the resonance parameters of ^{235}U, since this nuclide is one of the most important nuclide in nuclear reactor development. In the present evaluation only the data reported in the last twenty years were collected and stored in REPSTOR.

The evaluation of the resonance parameters at the first step was made in the following way. Since $2g\Gamma_n$ values do not differ appreciably among those of different experiments, a simple average was taken over them to give the evaluated values. In determining Γ_γ values, a weighted average was taken, where a weight of a half was given to those data which were obtained indirectly by analyzing the fission and total cross sections. The evaluation of Γ_f values seems to require a special care, as the reported values are considerably discrepant with one another. Hence the fission area $A_f = g\Gamma_n\Gamma_f/\Gamma$ was first calculated in this case. In the case where only Γ_f values were given, A_f is calculated using the Γ_f and evaluated $g\Gamma_n$ and Γ_γ values. Discrepancy of A_f is usually less than that of Γ_f. A resonance area is, as is well known, independent of the resolution of the spectrometer, and therefore is one of the most suitable quantities to be used in the resonance parameter evaluation. The value of fission width was calculated from the average of fission areas.

The fission, capture and total cross sections were calculated from these parameters thus obtained and were compared with the experimental data. As to the experimental data, we mainly relied on the data of Michaudon et al.[12], Cao et al.[13] and Blons et al.[14] for fission, those of de Saussure et al.[15] and Perez et al.[16] for capture and those of Garg et al.[17] and Michaudon et al.[12] for the total cross section. In the region where the difference is appreciable between the two, correction of the parameters was made for resonances responsible for this difference. If the magnitudes of the total and either of fission or capture areas were considered to deviate from the experimental values, the $g\Gamma_n$ value was varied. If only the capture area was unsuitable, small corrections $\Delta\Gamma_\gamma$ and $\Delta\Gamma_f$ were obtained by

$$\Delta\Gamma_\gamma = \frac{\Delta A_\gamma}{A_\gamma} \frac{1 + r_1}{1 - r_1 - 2r_1/r_2}, \tag{1}$$

$$\Delta\Gamma_f = \Delta\Gamma_\gamma / r_2,$$

where

$$r_1 = \frac{\Gamma_\gamma}{\Gamma_f}, \quad \text{and} \quad r_2 = \frac{1}{2}(r_1 - 1). \tag{2}$$

If the fission cross section is to be varied, similar corrections are obtained by exchanging suffix γ and f. With these corrected parameters, the cross sections were calculated and compared again with the experimental values.

Figure 2 shows an example of the results thus obtained. All the experimental data of the capture and total cross sections available are shown, whereas only some typical data are shown for the fission cross sections. As is seen in the figure, there is a good agreement. In the calculation the Doppler broadening effect is included, which is essential to obtain good fit to the experimental data for most of the resonances in this nuclide. At some energies, particularly at the valleys of resonances, discrepancies still remain. The difference was corrected by the background cross sections. Table 2 compares the fission and capture resonance integrals with the recommended values in BNL-325, 3rd edition[10]. The calculated integrals agree well with the recommended values.

3.3 Plutonium-239

In the compilation of JENDL-1, a set of resonance parameters evaluated by Ribon[18] was adopted, for it is a complete set of parameters which reproduces experimental data fairly well. This parameter set covers the energy range between 1 and 600 eV. Since then, no complete set of resonance parameters has been evaluated on the basis of new extensive cross section measurements.

For JENDL-2, Ribon's set was adopted again as the initial guess values. Modification of parameters was limited to several resonances, since his parameter set well reproduces the measured cross sections as a whole. Background cross sections were also added to improve agreement between the calculated and measured cross sections. We fitted the calculated data mainly to the fission cross section measured by Derrien et al.[19] and the capture cross section by Gwin et al.[20,21] by using NDES.

Figure 3 shows the fission cross section of JENDL-2 with those of JENDL-1 and ENDF/B-IV as well as the experimental data. The difference between JENDL-2 and JENDL-1 was mainly caused by the background cross section.

Table 3 compares the averaged values of the fission cross section and the capture to fission ratio (α-value) between the evaluated and the measured data. The fission cross section of JENDL-2 seems to be too small in the interval between 200 and 300 eV and too large between 300 and 400 eV. This is reflected on overestimate of the α-value between 200 and 300 eV. The present background correction was made by comparing the resonance cross sections without considering the average cross sections. This drawback on the average cross sections is left for future improvement. Table 2 also compares the fission and capture resonance integrals with those recommended in BNL-325, 3rd edition[10]. Satisfactory agreement is observed for both the integrals.

3.4 Plutonium-241

In JENDL-1, the resonance parameters recommended in BNL-325, 3rd edition[10] were adopted[24] in the energy range from 1 eV to 100 eV. These parameters were mainly taken from analyses by Blons et al.[25] and by Kolar et al.[26] These paremeters satisfactorily reproduce the total and fission cross sections but a little underestimate the capture cross section[24].

In the evaluation of JENDL-2, the same parameters were adopted as the initial guess values, since no extensive measurements have so far been reported on the resonance parameters of ^{241}Pu after JENDL-1.

The cross sections were calculated by assuming the effective scattering radius of 10.0 fm. The resonance parameters were modified so that the calculated total, fission and capture cross sections might reproduce the measured data by Kolar and Carraro[27], by Blons[8] and by Weston and Todd[28], respectively. As the numerical data of Weston and Todd were not available at the time of the present evaluation, the fitting to the capture cross section was made to the resonances below 20 eV for which the peak values of Weston and Todd were read from graphs in Ref. (28).

The background cross sections were applied to both the fission and capture cross sections. The background fission cross section was determined by NDES so as to compensate the remaining discrepancies between the calculated and measured data due to the interference among levels.

As was pointed out previously, the present resonance parameters a little underestimate the capture cross section and the discrepancy was corrected by the smooth background cross section. Table 4 shows the average fission and capture cross sections calculated with and without the background cross sections as well as the average values of measured data. Figure 4 shows the calculated fission and capture cross sections with the measured data as an example.

Table 4 also compares the calculated resonance integrals with the measured data by Eiland et al.[31] The present parameters slightly overestimate the capture integral and underestimate the fission integral, but give better results than JENDL-1 and ENDF/B-IV. Further inprovement is required for the lowest few resonances taking account of the numerical cross section data of Weston and Todd.

4. Concluding Remarks

The resonance parameters were evaluated for ^{233}U, ^{235}U, ^{239}Pu and ^{241}Pu, and were adopted in JENDL-2. In the present work, the resonance parameters were first evaluated on the basis of the measured parameter data, and then were adjusted by fitting the calculated cross sections to the measured ones. Hence the presently evaluated parameters can reproduce the measured total, fission and capture cross sections very well. The agreement was further improved by applying slight background corrections. Moreover the calculated resonance integrals agree well with the measured ones. Hence the data of JENDL-2 are expected to well predict the thermal reactor characteristics.

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Table 1 Resonance Intgrals of ^{233}U.

(barns)

	JENDL-2	ENDF/B-IV	BNL-325[10]
fission	771	763	764 ± 13
capture	138	135	140 ± 6

Table 2 Resonance integrals of ^{235}U.

(barns)

	JENDL-2	ENDF/B-IV (JENDL-1)	BNL-325[10]
fission	279	284	275 ± 5
capture	146	139	144 ± 6

Table 3 Average cross sections and resonance integrals of ^{239}Pu.

(barns)

	Energy (keV)	JENDL-2	JENDL-1	ENDF/B-IV	Gwin 76[21]	Weston 72[22]
σ_f	0.05 ∿ 0.1	60.17	60.30	56.94	56.96	58.76
	0.1 ∿ 0.2	18.67	18.42	18.38	17.96 ± 0.04	18.41
	0.2 ∿ 0.3	17.21	17.49	17.64	17.90 ± 0.05	17.77
	0.3 ∿ 0.4	9.09	9.50	8.35	8.48 ± 0.03	8.43
	0.4 ∿ 0.5	9.64	9.66	9.55	9.40 ± 0.05	9.47
	0.5 ∿ 0.6	15.70	16.20	15.44	15.46 ± 0.09	15.64

	Energy (keV)	JENDL-2	JENDL-1	ENDF/B-IV	Gwin 76[21]	Sowerby 72[23]	Weston 72[22]
α	0.05 ∿ 0.1	0.62	0.61	0.64	0.63	-	0.64
	0.1 ∿ 0.2	0.92	0.82	0.93	0.87 ± 0.015	0.845 ± 0.077	0.87
	0.2 ∿ 0.3	0.98	0.89	0.99	0.94 ± 0.010	0.912 ± 0.094	0.92
	0.3 ∿ 0.4	1.11	0.91	1.13	1.16 ± 0.014	1.15 ± 0.099	1.15
	0.4 ∿ 0.5	0.51	0.40	0.46	0.44 ± 0.013	0.483 ± 0.058	0.42
	0.5 ∿ 0.6	0.69	0.57	0.73	0.72 ± 0.040	0.704 ± 0.069	0.72

		JENDL-2	JENDL-1	ENDF/B-IV	BNL-325[10]
R.I.	fission	302	302	304	301 ± 10
	capture	195	193	194	200 ± 20

Table 4 Average cross sections and resonance integrals of ^{241}Pu.

Fission cross section (barns)

E_{min} (ev)	E_{max} (eV)	Calculated with B.C.S.	Calculated wihout B.C.S.	Experimental Blons[8]*	Experimental Migneco[29]	Experimental James[30]	Experimental Weston[28]
10	20	149.1	147.2	145.9	146.8	—	151.7
20	30	83.9	86.3	81.5	82.9	74.9	86.2
30	40	49.1	50.1	46.6	46.5	45.0	49.3
40	50	40.6	41.5	38.9	36.5	41.0	43.7
50	60	16.7	17.3	15.9	16.8	20.3	17.5
60	70	56.7	59.1	53.8	56.5	59.0	58.7
70	80	22.6	21.6	24.8	28.9	28.7	25.7
80	90	68.9	68.3	65.6	68.6	64.5	73.7
90	100	25.4	25.4	24.9	27.7	31.3	27.2

* Average value of the results with 11 and 50 m flight paths.

Capture cross section (barns)

E_{min} (eV)	E_{max} (eV)	Calculated with B.C.S.	Calculated without B.C.S.	Experimental (Weston and Todd[28]) α	Experimental (Weston and Todd[28]) σ_c*
10	20	81.1	69.7	0.559	83.3 ± 5.0
20	30	18.7	16.7	0.213	17.9 ± 1.1
30	40	10.7	10.7	0.216	10.6 ± 0.6
40	50	7.38	4.49	0.184	7.47 ± 0.44
50	60	3.01	1.35	0.198	3.31 ± 0.20
60	70	14.2	7.49	0.279	15.8 ± 0.9
70	80	15.2	15.2	0.572	12.9 ± 0.8
80	90	22.7	20.6	0.337	23.2 ± 1.4
90	100	5.42	4.92	0.207	5.26 ± 0.32

* Deduced from α-values using the present evaluated fission cross section. Errors are quoted 6 % errors in α-values.

Resonance integral with cut-off energy of 3 eV (barns)

Quantity	JENDL-2	JENDL-1	ENDF/B-IV	Eiland et al.[31]
fission	531	524	527	569 ± 37
capture	172	138	115	162 ± 8

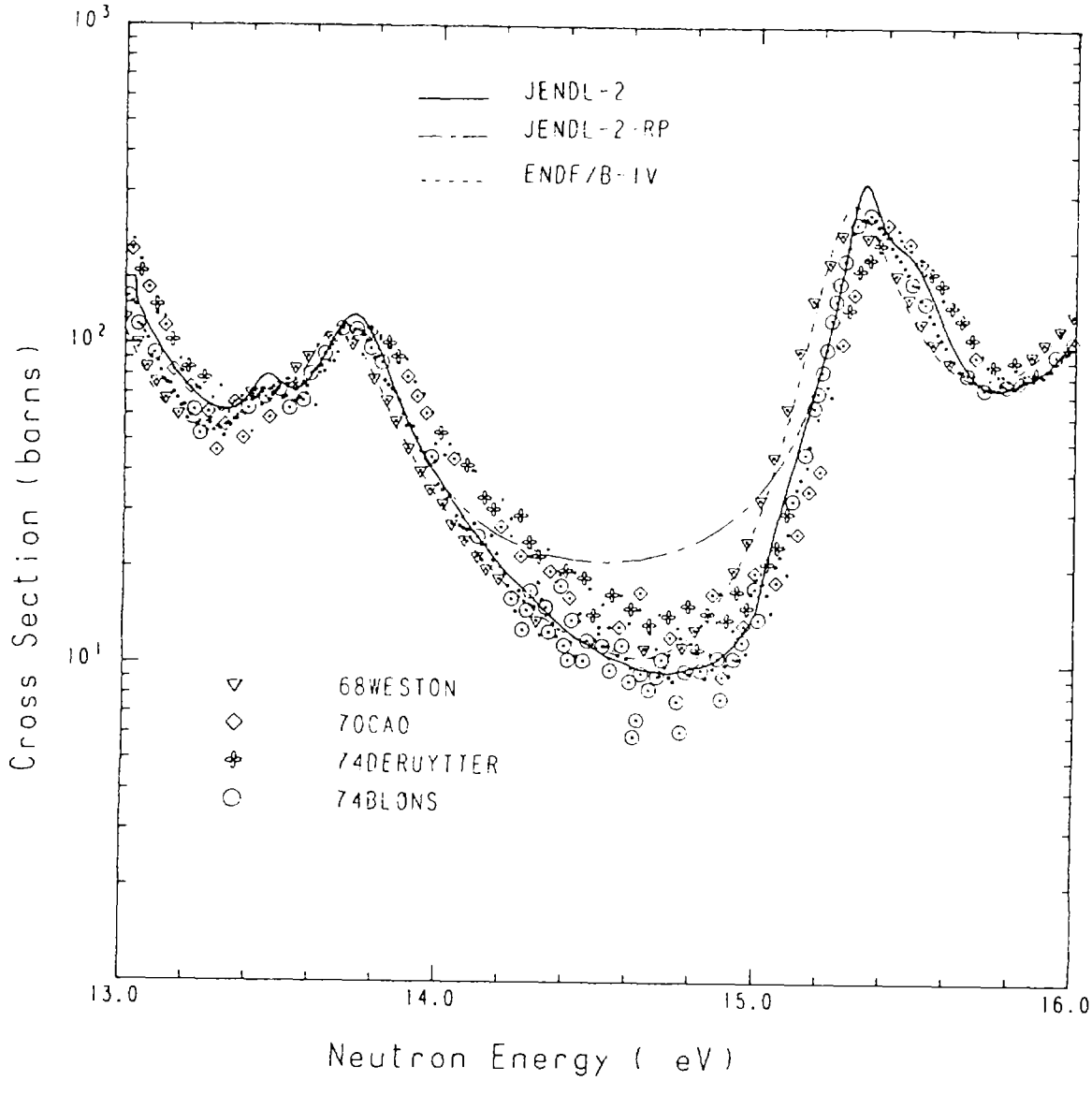

Fig. 1 Fission cross sections of ^{233}U in the energy range between 13 and 16 eV. The solid and dash-dotted lines are calculated from the present resonance parameters with and without the background cross section, respectively. The dotted line represents the value of ENDF/B-IV.

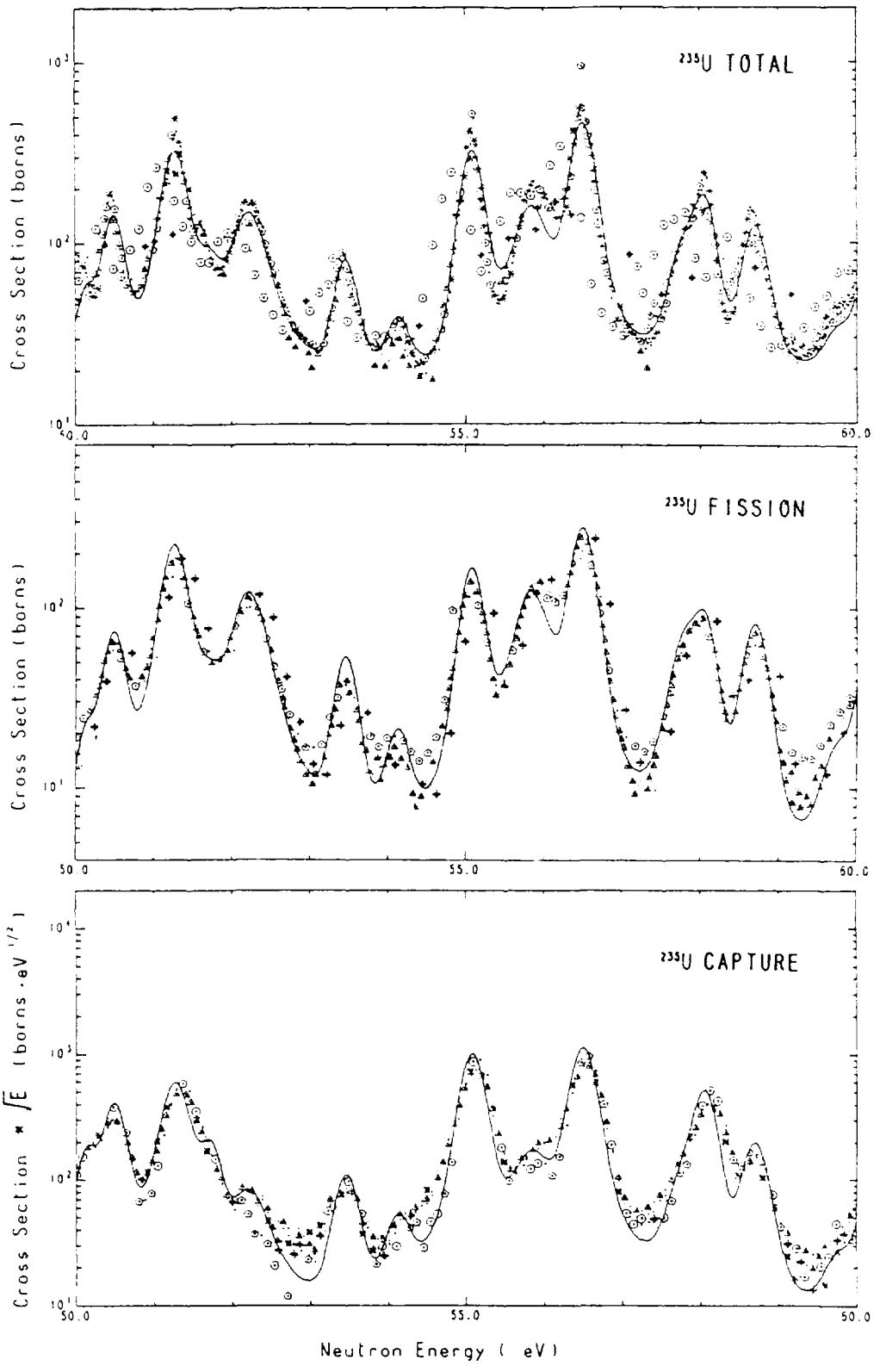

Fig. 2 Total, fission and capture cross sections of ^{235}U in the energy range between 50 and 60 eV. Note that the capture cross section is multiplied by the square root of neutron energy ($\sigma_c \sqrt{E}$ in barn eV$^{1/2}$ unit)

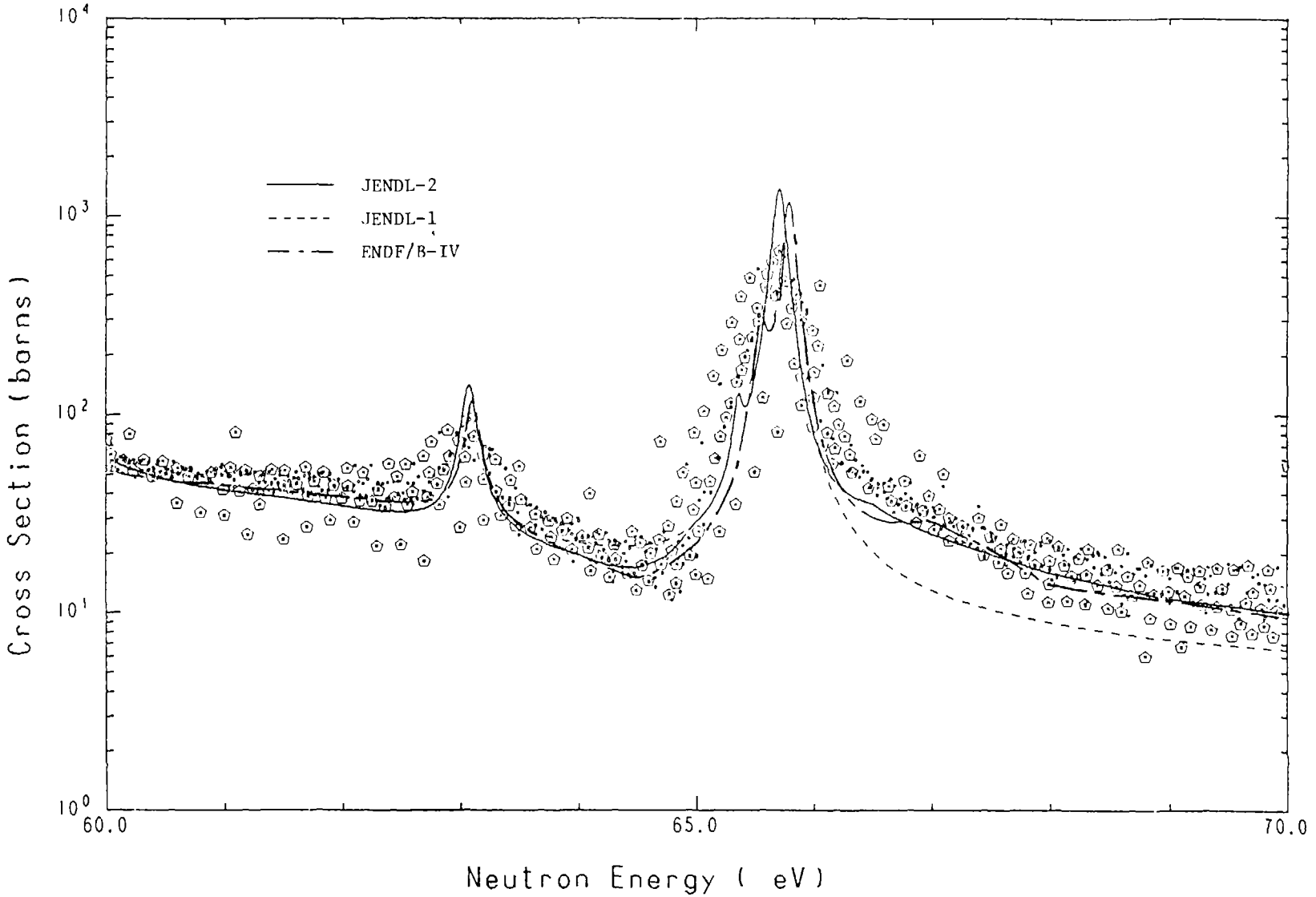

Fig. 3 Fission cross sections of ^{239}Pu in the energy range between 60 and 70 eV. The solid line represents the value of JENDL-2, the dotted line JENDL-1 and the dot-dashed line ENDF/B-IV.

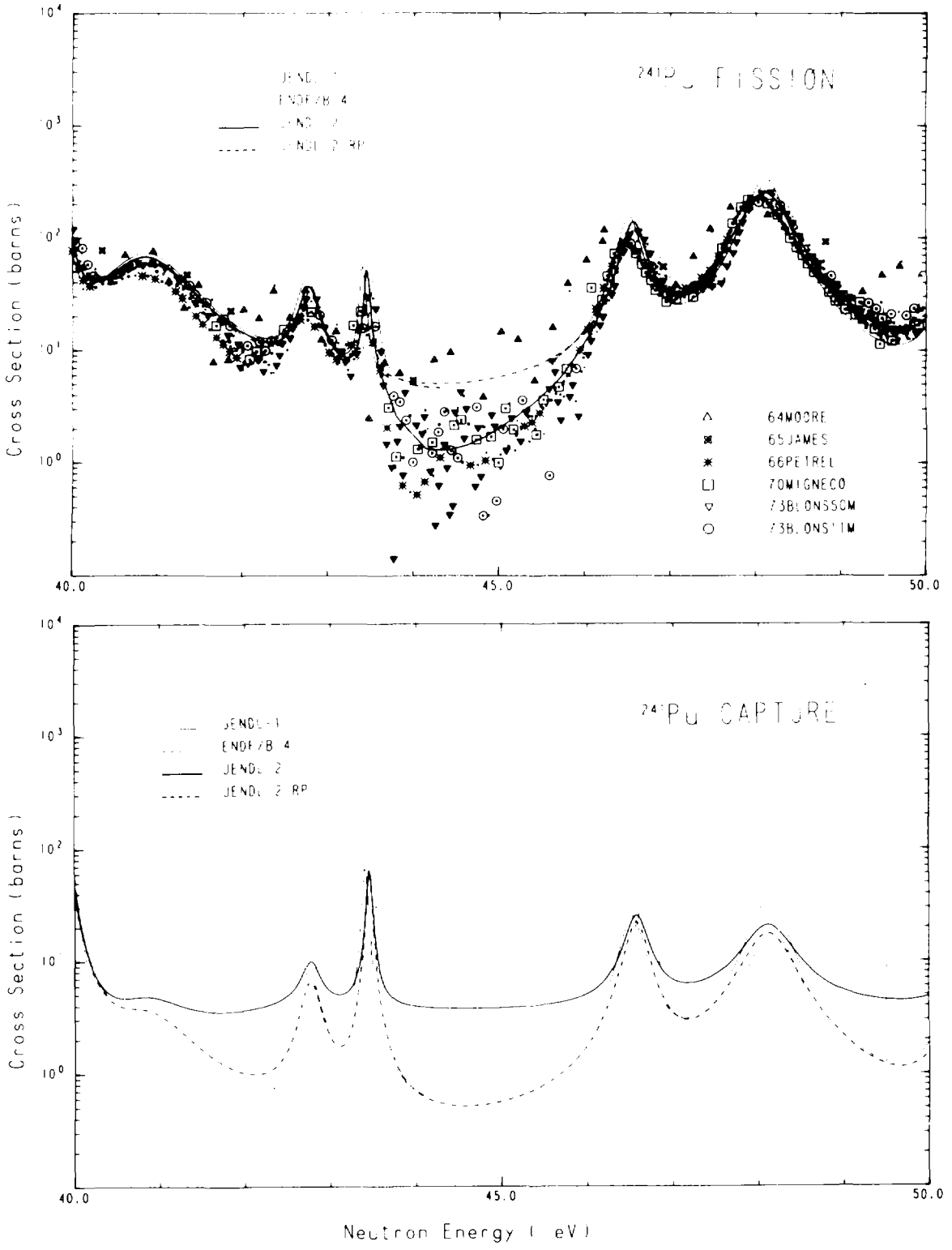

Fig. 4 Fission and capture cross sections of ^{241}Pu in the energy range between 40 and 50 eV. The thick solid and dotted lines are calculated from the present parameters with and without the background cross sections, respectively. The thin solid and dotted lines represent the values of JENDL-1 and ENDF/B-IV, respectively.

Part II

Evaluation of Resonance Parameters of ^{238}U, ^{240}Pu and ^{242}Pu

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Evaluation of Resonance Parameters of ^{238}U, ^{240}Pu and ^{242}Pu

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Abstract

The evaluation of the resolved resonance parameters of ^{238}U, ^{240}Pu and ^{242}Pu was performed for the second version of Japanese Evaluated Nuclear Data Library JENDL-2. In this work, all the resonance parameters measured so far were compiled and examined. The evaluation was made by mainly using recent measurements for each isotope. The presently evaluated resonances are 183 s-wave and 265 p-wave resonances up to 4.73 keV for ^{238}U, 267 s-wave resonances up to 5.69 keV for ^{240}Pu and 95 s-wave resonances up to 1.89 keV for ^{242}Pu. For ^{238}U and ^{240}Pu, negative resonances were also recommended. The multi-level Breit-Wigner formula was applied, and the their resolved resonance regions were chosen to be from 10^{-5} eV to 4 keV for ^{238}U and ^{240}Pu and from 10^{-5} eV to 1.29 keV for ^{242}Pu. Furthermore, background cross sections were determined to correct the cross sections calculated from the evaluated resonance parameters.

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1. Introduction

The first version of Japanese Evaluated Nuclear Data Library JENDL-1[1] was released in 1977. In JENDL-1, the resolved resonance parameters of ^{238}U and ^{240}Pu were mainly taken from ENDF/B-IV[2] because our own evaluation work had not been completed. The data of ^{242}Pu were not contained in JENDL-1.

New experimental data of resonance parameters for these three nuclides have been accumulated after the compilation of JENDL-1. For ^{238}U, low lying resonances were particularly investigated, because benchmark tests[3] for thermal reactors indicated that the underprediction of criticality was due to too large capture widths of the low lying resonances. Transmission measurements were carried out also at various laboratories in wide energy ranges. New measurements of the sub-threshold fission were also performed for ^{238}U, ^{240}Pu and ^{242}Pu. These new data are different from the evaluated parameters adopted in JENDL-1 more or less. This indicates the necessity for a new evaluation work of resolved resonance parameters for JENDL-2.

Our evaluation work of resolved resonance parameters was started around 1975. At first, measured resonance parameters were compiled by using the Resonance Parameter Storage and Retrieval System REPSTOR[4]. Evaluation was performed on the basis of these compiled data. The present evaluation of resonance parameters was mainly based on the recent experiments. The evaluation and results are described in this paper. The results are tabulated in Appendix. The presently evaluated data were compiled in JENDL-2 with ENDF/B format[5].

2. Evaluation of Resolved Resonance Parameters

2.1 Uranium-238

At the time of the JENDL-1 compilation, the most reliable evaluated data were those by McCrosson[6] for ENDF/B-IV who took account of data measured until about 1973. Many new experiments, however, have been made by various experiments since then.

In the present evaluation, the resolved resonance parameters measured until 1980[7-44] were compiled by using REPSTOR. By comparing them with one another, it was found that there were discrepancies among resonance energies and parameters. The present evaluation was carried out as follows.

Resonance energy

Systematic discrepancies were found in resonance energies reported by various experimenters. These discrepancies can be interpreted in terms of systematic errors of flight-path length and initial time delay in time-of-flight spectrometers. Neutron energies are represented as follows by using flight-path length L(m), time of flight t(sec) and initial time delay t_0 (sec),

$$E(eV) = \left(\frac{72.2977\ L}{t - t_0}\right)^2 . \qquad (1)$$

A systematic error of E caused by errors of L and t_0 can be written as

$$\Delta E(eV) = \frac{2\Delta L}{L} E + \frac{2\Delta t_0}{72.2977\ L} E^{3/2} . \qquad (2)$$

In the present evaluation, measured resonance energies were compared with those of Olsen et al.[39] which were adopted as standards. An example of energy discrepancies between Rahn et al.[28] and Olsen et al. is shown in Fig. 1 where these discrepancies were reproduced by Eq. (2) with the least squares method. The solid curves in Fig. 1 give the fitted one and one standard deviations. After correction of resonance energies in each measurement by using Eq. (2), the resonance energies were averaged over all the measurements in order to obtain an evaluated value. In the present work, resonance levels reported by neither Poortmans et al.[38], Olsen et al.[36,39] nor Nakajima[44] were abandoned.

Finally we adopted 187 s-wave resonances including 4 negative ones and 265 p-wave resonances in the energy range from -113 eV to 4728.0 eV. The energy range where the cross sections are calculated from the resonance parameters was selected to be from 10^{-5} eV to 4 keV.

Neutron and capture widths

The neutron and capture widths were determined by taking account of resonance areas. In the case of ^{238}U, the resonance areas can be approximated as follows, because the sub-threshold fission widths are negligibly small.

(1) Thin sample transmission area

$$A_1 = 2\pi^2 \lambda\!\!\!^{-2}\ g\Gamma_n . \qquad (3)$$

(2) Thick sample transmission area

$$A_2 = 2\pi \lambda\!\!\!^{-} \sqrt{g\Gamma_n(\Gamma_n + \Gamma_\gamma)} . \qquad (4)$$

(3) Thin sample capture area

$$A_3 = 2\pi^2 \lambda\!\!\!^{-2}\ g\Gamma_n\Gamma_\gamma/(\Gamma_n + \Gamma_\gamma)\ . \tag{5}$$

(4) Thin sample scattering area

$$A_4 = 2\pi^2 \lambda\!\!\!^{-2}\ g\Gamma_n{}^2/(\Gamma_n + \Gamma_\gamma)\ . \tag{6}$$

For a certain resonance energy, these relations are essentially expressed as

$$a_1 = \Gamma_n, \tag{3'}$$

$$a_2 = \sqrt{\Gamma_n(\Gamma_n + \Gamma_\gamma)}\ , \tag{4'}$$

$$a_3 = \Gamma_n\Gamma_\gamma/(\Gamma_n + \Gamma_\gamma), \tag{5'}$$

$$a_4 = \Gamma_n{}^2/(\Gamma_n + \Gamma_\gamma). \tag{6'}$$

In the present evaluation, the values of a_1, a_2, a_3 and a_4 were calculated from the reported values of Γ_n and Γ_γ for each measurement. The values of a_1, a_2, a_3 and a_4 are less discrepant than the values of Γ_n and Γ_γ among the different measurements. Then, averaged values of a_1, a_2, a_3 and a_4 were obtained, by giving especially high weights to new data measured after 1977. The best values of Γ_n and Γ_γ were so obtained as to minimize the following sum of squares of residuals.

$$I = w_1[\langle a_1\rangle - \Gamma_n]^2 + w_2[\langle a_2\rangle - \sqrt{\Gamma_n(\Gamma_n + \Gamma_\gamma)}\ ]^2$$
$$+ w_3[\langle a_3\rangle - \frac{\Gamma_n\Gamma_\gamma}{\Gamma_n + \Gamma_\gamma}\ ]^2 + w_4[\langle a_4\rangle - \frac{\Gamma_n{}^2}{\Gamma_n + \Gamma_\gamma}]^2, \tag{7}$$

where w_1, w_2, w_3 and w_4 are weights for residuals, and $\langle a_1\rangle$, $\langle a_2\rangle$, $\langle a_3\rangle$ and $\langle a_4\rangle$ stand for averaged values of a_1, a_2, a_3 and a_4, respectively. Figure 2 shows an example of the evaluation of Γ_n and Γ_γ of a resonance at 66.01 eV. Measured resonance parameters are shown in the figure together with errors, and four solid curves give the relations between Γ_n and Γ_γ corresponding to $\langle a_1\rangle$, $\langle a_2\rangle$, $\langle a_3\rangle$ and $\langle a_4\rangle$. In this example, the best values of Γ_n and Γ_γ were determined to be 24.9 and 22.9 meV, respectively. This method was applied to determine the neutron and capture widths of all the resonances where more than one experiments existed.

As the results of the present work, smaller capture widths were obtained for the low lying s-wave resonances on the basis of small values in recent measurements. An average capture width obtained from the present parameters is (23.6 ± 1.9) meV which agrees well with (23.5 ± 1.2) meV which is a weighted average of the reported values.

Sub-threshold fission width

The sub-threshold fission widths were determined from the fission resonance areas measured by Difilippo et al.[43] Finally, a total of 28 s-wave resonances were given their sub-threshold fission widths.

Effective scattering radius and formula

Olsen et al.[39] analyzed their transmission data with a shape analysis code by the multi-level Breit-Wigner formula in various energy intervals and obtained effective scattering radii for those intervals. We adopted the multi-level Breit-Wigner formula and the effective scattering radius of 9.48 fm obtained by averaging the values of Olsen et al. below 2.2 keV.

Correction of calculated cross sections

In order to take account of contributions from negative resonances, four s-wave resonances were added artificially. The first negative resonance was located at -41 eV and its neutron width was determined so as to reproduce at 0.0253 eV the capture cross section of (2.7 ± 0.02) barns, the elastic scattering cross section of (8.90 ± 0.16) barns and the total cross section of (11.60 ± 0.16) barns recommended in BNL-325 3rd edition[45].

Contributions from the resonances lying outside of the presently considered resonance range (truncation effects) were taken into account by using the picket-fence model. The truncation effects were approximated by

$$\Delta\sigma_{tot} = \frac{4\pi}{k^2} S_0\sqrt{E}\,\left[\frac{\langle\Gamma\rangle}{4}\,\frac{E^+ - E^- + D}{(E^+-E+0.5D)(E-E^-+0.5D)} - \frac{1}{2}\ln\left(\frac{E-E^-+0.582D}{E^+-E+0.582D}\right)kR\right], \tag{8}$$

$$\Delta\sigma_{cap} = \frac{\pi}{k^2} S_0\sqrt{E}\,\langle\Gamma_\gamma\rangle\,\frac{E^+ - E^- + D}{(E^+-E+0.5D)(E-E^-+0.5D)}, \tag{9}$$

$$\Delta\sigma_{el} = \Delta\sigma_{tot} - \Delta\sigma_{cap}, \tag{10}$$

where E^+ and E^- are the upper and lower limit energies, respectively, of the presently considered resonances. Equation (8) was derived by de Saussure et al.[46] and Eq. (9) was obtained in this work with the same procedure. The following values were applied to calculate Eqs. (8), (9) and (10).

$S_0 = 1.1 \times 10^{-4}$, $D = 23.92$ eV,

$E^+ = 4278.0$ eV, $E^- = -113.0$ eV,

$R = 9.48$ fm, $\langle\Gamma_\gamma\rangle = 23.5$ meV.

It was found out from a ploting of cumulative numbers of p-wave resonances that the number of p-wave resonances decreased above 1.5 keV. Taking account of contributions from the missed p-wave resonances, the capture cross section above 1.5 keV was corrected by adding small background cross section calculated by the following equation.

$$\Delta\sigma_{cap} = 3.2 \times 10^{-3}\sqrt{E} - 4.8126 \frac{1}{\sqrt{E}} . \qquad (11)$$

Figure 3 shows an example of the comparison of the calculated total cross section with measured one. The solid curve shows the present value and the dashed curve JENDL-1. Table 1 lists the thermal properties of the present results. The resonance integral of the capture cross section agrees with the recommended value within the quoted error. The thermal fission cross section also agrees with measured values of $(3 \pm 5) \times 10^{-6}$ barns by Silbert and Bergen[25] and $(2.7 \pm 0.3) \times 10^{-6}$ barns by Slovacek et al.[37]

2.2 Plutonium-240

JENDL-1 adopted the resonance parameters of ENDF/B-IV[2] up to 3.91 keV, which used the multi-level Breit-Wigner formula in order to avoid the negative values of the elastic scattering cross section. The parameters were given for 201 s-wave resonances including a negative resonance at -4.099 eV, 20 of which were given the sub-threshold fission widths. The present evaluation of ^{240}Pu resonance parameters was made by using all the experimental data[47-66] reported so far.

Resonance energy

The resonance energy of the lowest level was determined to be 1.056 eV on the basis of the measurement by Pattenden and Rainey[51]. The other resonance energies above 20 eV were based on the transmission measurement by Kolar and Böckhoff[58]. A negative resonance at -4.099 eV was taken from ENDF/B-IV. Finally a total of 268 resonances from -4.099 eV to 5.692 keV were adopted, and the resolved resonance energy region was defined to be from 10^{-5} eV to 4 keV.

Neutron and capture widths

The resonance parameters of the first resonance at 1.056 eV were taken from the total cross section measurement made by Pattenden and Rainey, and those of the negative resonance from the ENDF/B-IV evaluation.

The neutron and capture widths of resonances from 20 eV to 500 eV were based on the experimental data by Hockenbury et al.[63] which agree with those by Kolar and Böckhoff. For the resonances from 500 eV to 5.7 keV, the neutron widths obtained by Kolar and Böckhoff were adopted. For the resonances whose capture widths were not reported, the value of 29.5 meV was assumed by averaging the data of Hockenbury et al. This assumed value is higher than the average value of 23.2 meV obtained by Weigmann and Schmid[59]. Weigmann and Theobald[64], however, reanalyzed the experimental data by Weigmann and Schmid, and obtained the higher average capture width of (32 $\pm$ 2) meV. The ENDF/B-IV evaluation also assumed the value of 29.5 meV.

Sub-threshold fission width

The sub-threshold fission widths were taken from the measured data by Auchampaugh and Weston[66] in the energy range of 500 eV to 10 keV with the ORELA neutron facility. They obtained the sub-threshold fission widths for 82 resonances with the area and shape analyses by assuming the neutron widths deduced by Kolar and Böckhoff. Furthermore, Auchampaugh and Weston estimated the minimum fission width $\Gamma_{f,min}$ with the formula[66,67] by Gai et al. in terms of the penetrabilities through the inner and outer fission barriers,

$$\Gamma_{f,min} = \frac{1}{2} \pi \left(\frac{\Gamma^{\downarrow}\Gamma^{\uparrow}}{D_{II}^{2}}\right) D_{I}, \tag{12}$$

where $\Gamma^{\downarrow} = \frac{P_A}{2\pi} D_{II}$, $\Gamma^{\uparrow} = \frac{P_B}{2\pi} D_{II}$,

P_A, P_B = penetrabilities for the inner and outer barriers,

D_I, D_{II} = average class-I and class-II level spacing.

Auchampaugh and Weston obtained the $\Gamma_{f,min}$ value of (0.22 ± 0.17) meV which was a little higher than 0.20 meV of the ENDF/B-IV value. These 82 sub-threshold fission widths and the minimum fission width of 0.22 meV were used in the present work.

Correction of calculated cross sections

The average capture cross section is compared in Table 2 with the measured data by Weston and Todd[68]. The differences between them were corrected by applying the background cross sections.

The multi-level Breit-Wigner formula was adopted together with the effective scattering radius of 9.184 fm which is the same as that of ENDF/B-IV. Figure 4 shows the fission cross sections calculated from the present and ENDF/B-IV parameters as well as experimental data. The capture and fission cross sections at 0.0253 eV and their resonance integrals are compared with the recommended values of BNL-325 3rd edition in Table 1. All the values are in agreement with the recommended ones in the quoted errors.

2.3 Plutonium-242

In the case of ^{242}Pu, resolved resonance parameters are given to only eleven levels up to 390 eV in ENDF/B-IV[2]. They were evaluated on the basis of the data[69-74] measured until 1971. After the ENDF/B-IV evaluation, several new measurements were performed. Bergen and Fullwood[75] measured the sub-threshold fission cross section by using nuclear explosion and obtained the fission widths of 23 resonances lying from 53.4 to 788.2 eV. Poortmans et al.[76] determined Γ_n and Γ_γ of 72 levels from 2.68 eV to 1286 eV on the basis of the scattering capture and transmission data measured with the CBNM linac. Harvey et al.[77], Hockenbury et al.[78] and Auchampaugh and Bowman[79] obtained

Γ_n values of resonances from 22.57 eV to 494.75 eV, from 205.0 eV to 382.4 eV and from 595.2 eV to 3836 eV, respectively, by using their transmission data. Auchampaugh and Bowman gave also the sub-threshold fission widths on the basis of another measurement[80] of the sub-threshold fission cross section.

In the present evaluation, the measured data mentioned above were compiled together with old ones by using REPSTOR and examined, and a complete set of resolved resonance parameters was determined up to 1891 eV. The multi-level Breit-Wigner formula was applied.

Resonance energy

Resonance energies up to 1891 eV were taken from the recommended values of BNL-325 3rd edition[45], but the resolved resonance energy region was determined to be from 10^{-5} eV to 1290 eV because resonance parameters were not given between 1290 to 1700 eV.

Neutron and capture widths

The neutron and capture widths were determined by averaging the measured values. The obtained neutron widths are close to those of Poortmans et al.[76] and Auchampaugh and Bowman[79]. For the resonances whose capture widths were not measured, the value of 24.2 meV was applied.

Sub-threshold fission width

The sub-threshold fission widths were deduced from the fission areas given by Bergen and Fullwood[75] and by Auchampaugh and Bowman[79]. In order to give the sub-threshold fission widths to the resonances whose fission widths were not measured, an average was taken over the resonances locating outside an intermediate fission resonance near 750 eV. The average value of 0.116 meV was thus obtained in the energy range from 200 to 900 eV, and was applied in this energy region. For the other energy regions, Γ_f = 0.05 meV was assumed, by taking account of the neutron energy dependence of the sub-threshold fission width near the intermediate fission resonance.

Correction of calculated cross sections

Using the resonance parameters thus obtained and the effective scattering radius of 9.6 fm recommended in BNL-325 3rd edition, the

cross sections were calculated. It was found that the thermal capture cross section agreed well with the experimental values[70,73,74,81,82], and the thermal fission cross section fell below the experimental upper limit of 0.2 barns. The elastic scattering and total cross sections, however, were lower than recommended values of BNL-325 3rd edition. We corrected them by adding the background cross sections of 0.67 barns so as to reproduce the measured data of the elastic[83] and total cross sections[73,74].

Table 1 shows comparison of thermal cross sections and resonance integrals with values recommended in BNL-325 3rd edition. The present resonance integral for capture agrees well with the BNL-325 data and the measured data by Young et al.[73,74], and the value for fission is slightly larger than the BNL-325 recommendation. Figure 5 displays the total cross section in the energy range of 1 eV to 100 eV. The present result shown with a thick solid line slightly underestimates the total cross section at off-resonance energies. The same problems are also found in the other evaluations. This disagreement may be diminished by the adjustment of the scattering radius. The evaluated fission cross sections are shown in Fig. 6 below 10 keV. There are very large discrepancies among the present results, ENDF/B-V[84], KEDAK-3[85] and ENDL-78[86]. Particularly the present fission cross section is higher than the others by an order of magnitude below 0.5 eV as seen in Fig. 6.

Average resonance parameters were obtained from the presently evaluated parameters below 500 eV which were regarded as s-wave resonances. They are D_0 = 13.04 eV, $S_0 = 0.85 \times 10^{-4}$ and $\overline{\Gamma}_\gamma$ = 24.2 meV.

3. Concluding Remarks

The evaluation of the resolved resonance parameters of ^{238}U, ^{240}Pu and ^{242}Pu was performed for the second version of Japanese Evaluated Nuclear Data Library JENDL-2 by using all the experimental data reported so far. The evaluated parameters are listed in Appendix. The multi-level Breit-Wigner formula was adopted to avoid the negative values in the elastic scattering cross section.

The neutron and capture widths of ^{238}U were determined by applying the least squares method to resonance areas. The capture widths of the low lying resonances became smaller than those of ENDF/B-IV. The

evaluated fission widths were based on the measured fission areas. The resonance energies were determined by averaging the values of recent measurements after correction of their systematic errors. Finally 183 s-wave and 265 p-wave resonances were recommended up to 4.73 keV.

A total of 267 resonances up to 5.69 keV were recommended for ^{240}Pu. Their sub-threshold fission widths were obtained by taking account of the ORELA measurement by Auchampaugh and Weston. The resonance parameters of ^{242}Pu were determined for 95 resonances up to 1.89 keV. Their neutron and capture widths were obtained by averaging the measured values, and the sub-threshold fission widths were given to all the resonances on the basis of measured fission areas. All the resonances were assigned as s-wave resonances for ^{240}Pu and ^{242}Pu. This seems improbable taking account of the situation of ^{238}U. Probably some p-wave resonances were misassigned as s-wave ones and some p-wave resonances might be missing.

The energy region where the cross sections are calculated from the parameters were determined to be from 10^{-5} eV to 4 keV for ^{238}U and ^{240}Pu, and from 10^{-5} eV to 1.29 keV for ^{242}Pu. The background cross sections were also evaluated in order to reproduce well the measured cross sections. The thermal fission and capture cross sections and their resonance integrals agree with the recommended values in BNL-325 3rd edition.

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Table 1 Comparison of thermal properties*

Isotope	Quantity	BNL-325 (3rd)	JENDL-2
^{238}U	σ_{cap}	2.70 ± 0.02	2.699
	σ_f		3.86×10^{-6}
	I_γ	275 ± 5	279
	I_f		2.05
^{240}Pu	σ_{cap}	289.5 ± 1.4	288.5
	σ_f	0.030 ± 0.045	0.0676
	I_γ	8013 ± 960	8454
	I_f		10.1
^{242}Pu	σ_{cap}	18.5 ± 0.4	18.43
	σ_f	<0.2	0.013
	I_γ	1130 ± 60	1117
	I_f	5	6.3

* All the values are given in barns.

Table 2 Background values for the ^{240}Pu capture cross section*

E (keV)	experiment[68] (E)	calculated (C)	E-C	adopted** background
0.1 - 0.3	8.71 ± 0.61	7.15	1.56	1.92
0.3 - 0.4	10.27 ± 0.72	8.00	2.27	
0.4 - 0.5	6.60 ± 0.46	6.24	0.36	0.80
0.5 - 0.6	7.14 ± 0.50	6.34	0.80	
0.6 - 0.7	5.09 ± 0.36	3.85	1.24	
0.7 - 0.8	2.63 ± 0.18	1.71	0.92	1.60
0.8 - 0.9	6.63 ± 0.46	3.73	2.92	
0.9 - 1.0	5.53 ± 0.39	4.55	0.98	
1.0 - 1.5	3.50 ± 0.25	2.44	1.06	1.04
1.5 - 2.0	3.03 ± 0.21	2.01	1.02	
2.0 - 3.0	2.42 ± 0.17	1.43	0.99	0.99
3.0 - 4.0	1.89 ± 0.13	0.798	1.092	1.092

* All the values are given in barns.

** Average values of (E-C) were adopted as background cross sections.

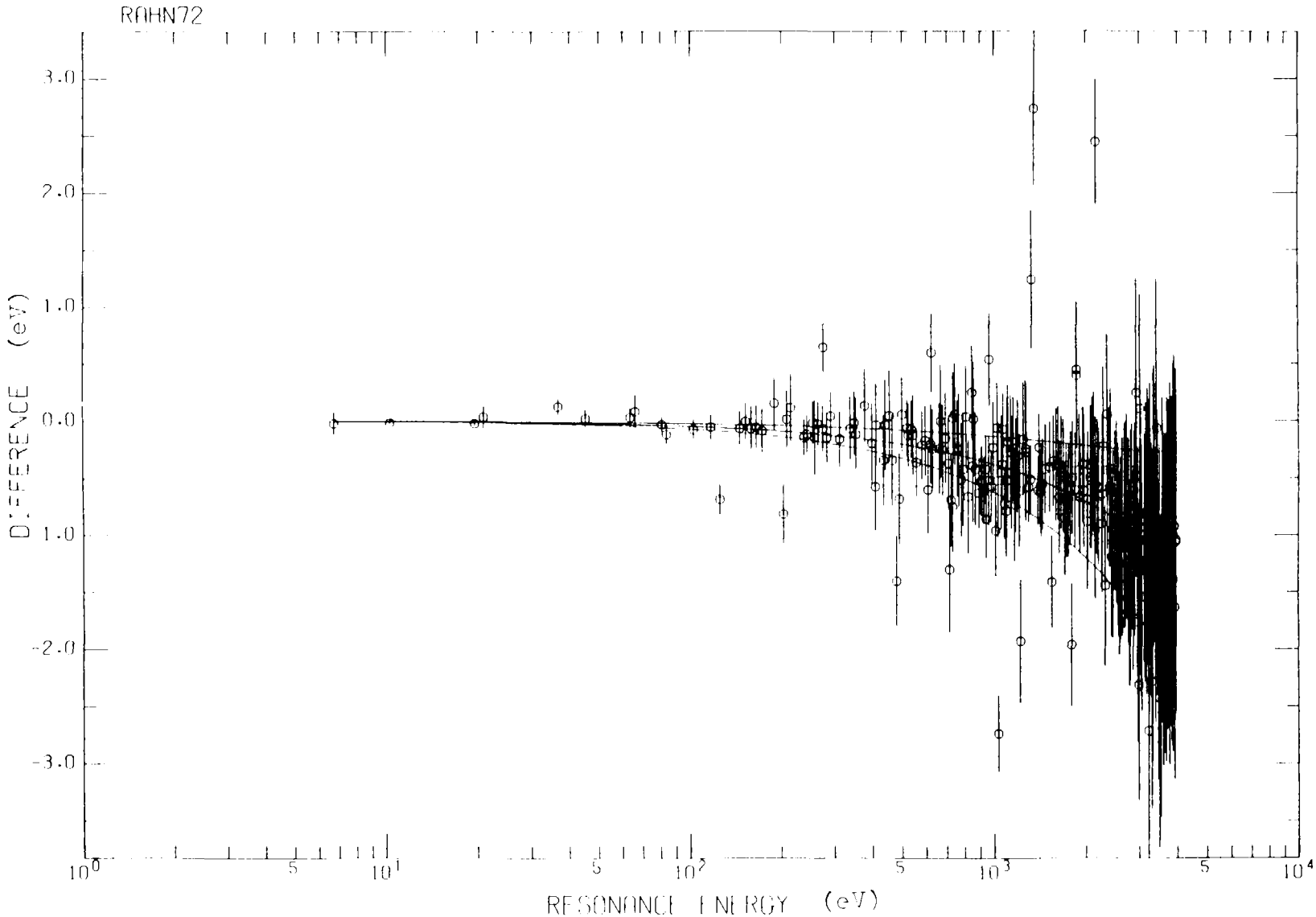

Fig. 1 Resonance energy discrepancies in ^{238}U between the measurements by Rahn et al. and by Olsen et al. Solid curves show the fitted values with the least squares method and its one standard deviations.

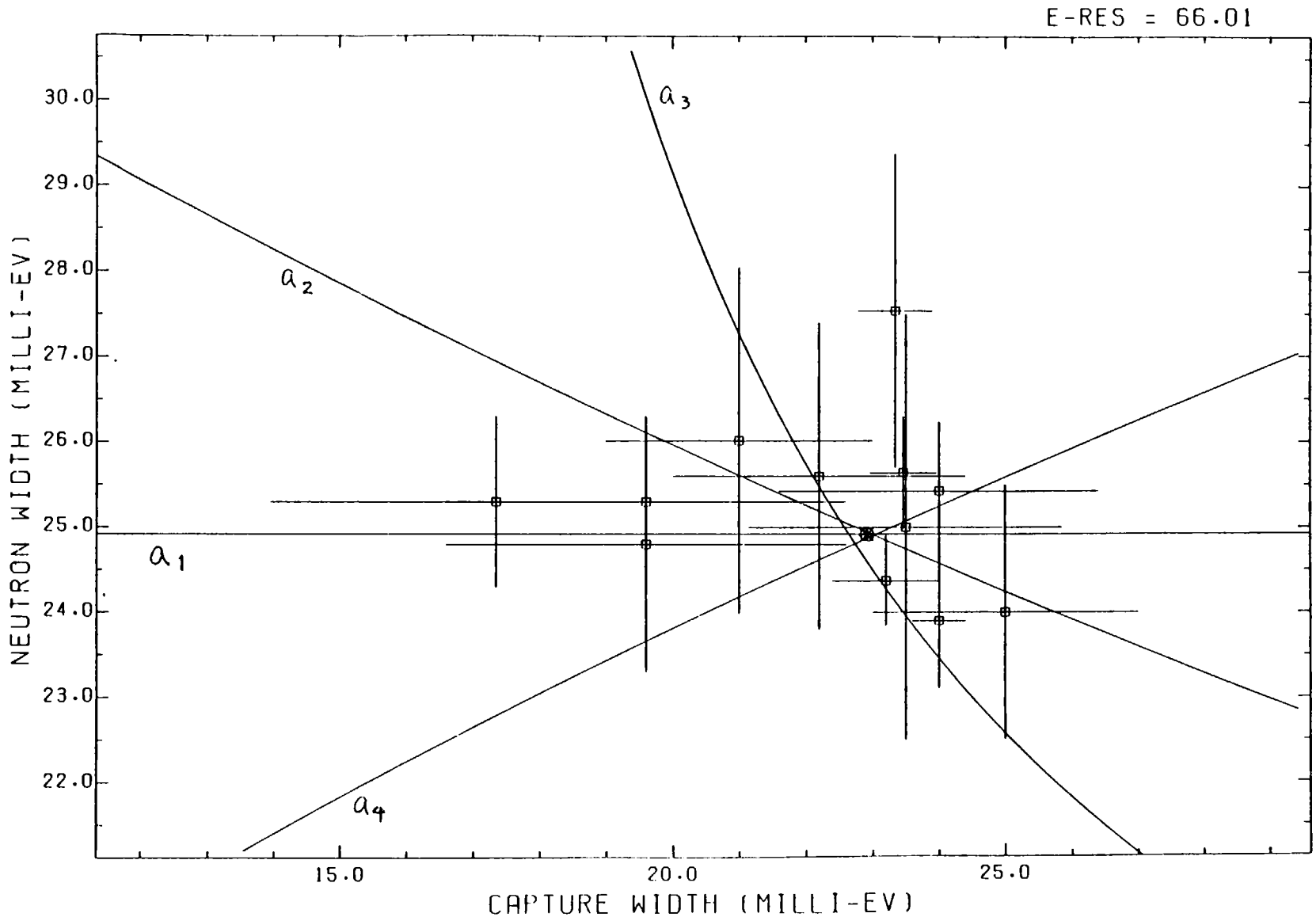

Fig. 2 Typical example of relations between neutron and capture widths of ^{238}U resonance at 66.01 eV. Four curves a_1, a_2, a_3 and a_4 represent the relations by Eqs. (3'), (4'), (5') and (6') , respectively, corresponding to the average values obtained from the reported resonance parameters.

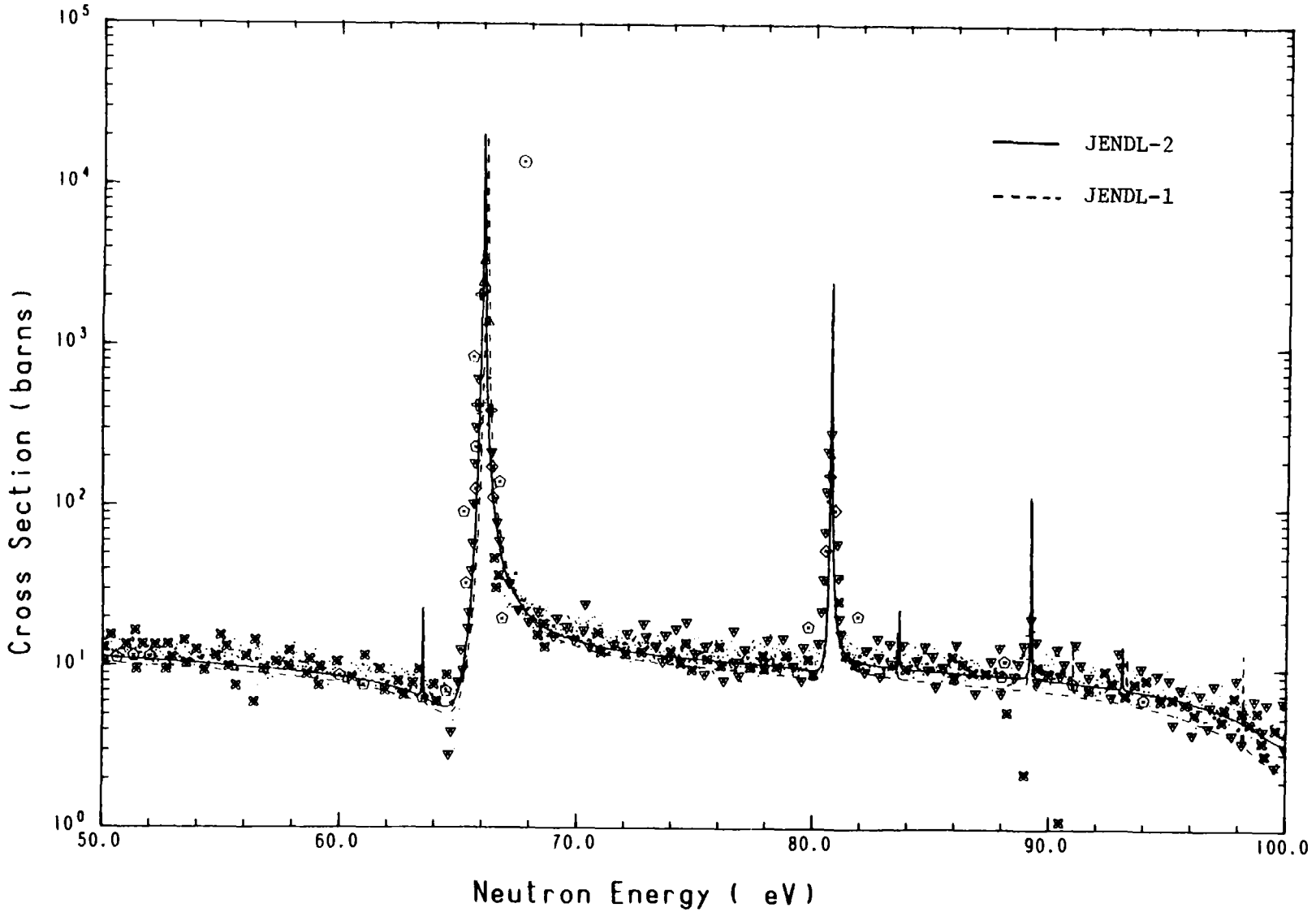

Fig. 3 Total cross sections of ^{238}U in the energy range from 50 eV to 100 eV.

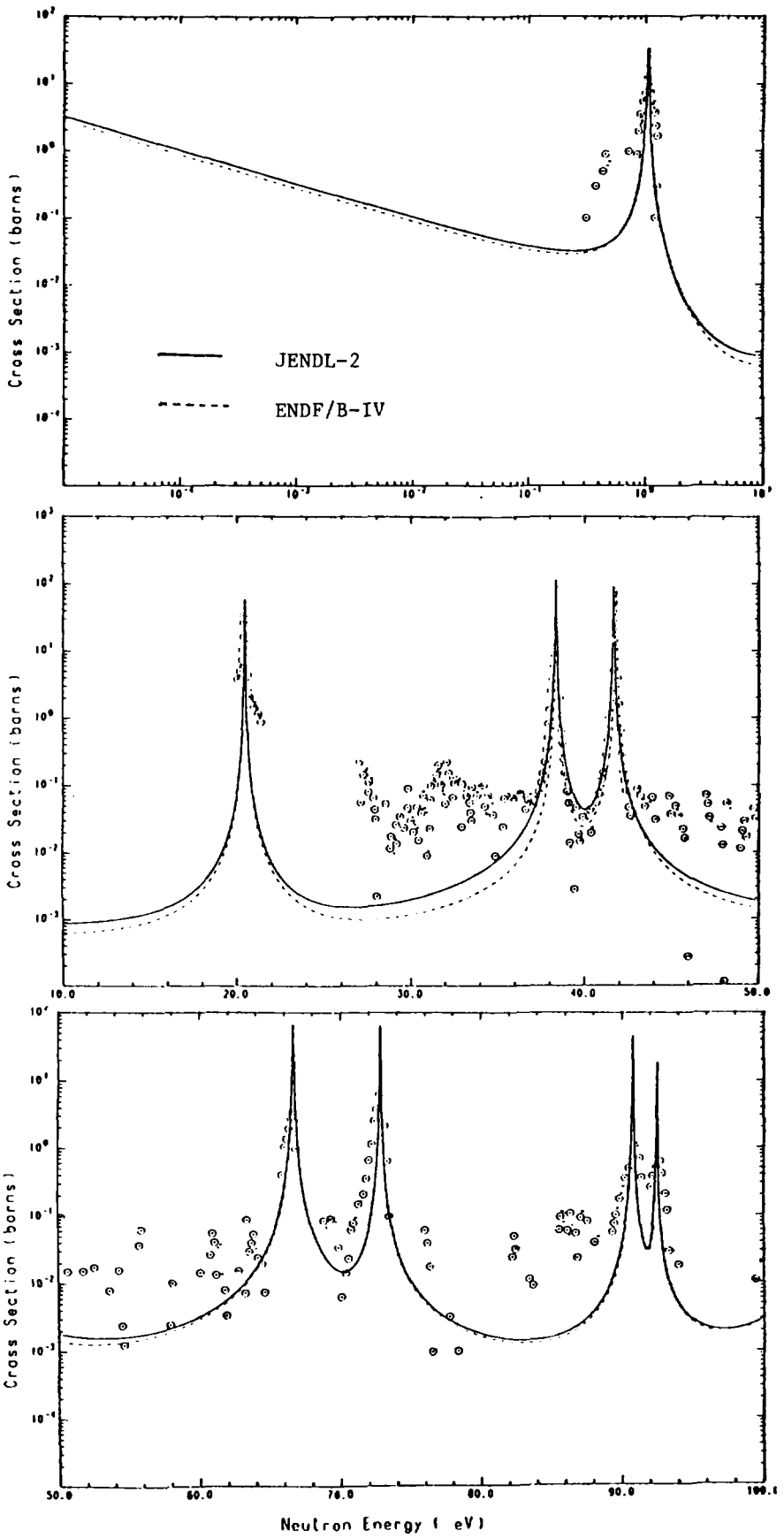

Fig. 4 Fission cross sections of ^{240}Pu up to 100 eV.

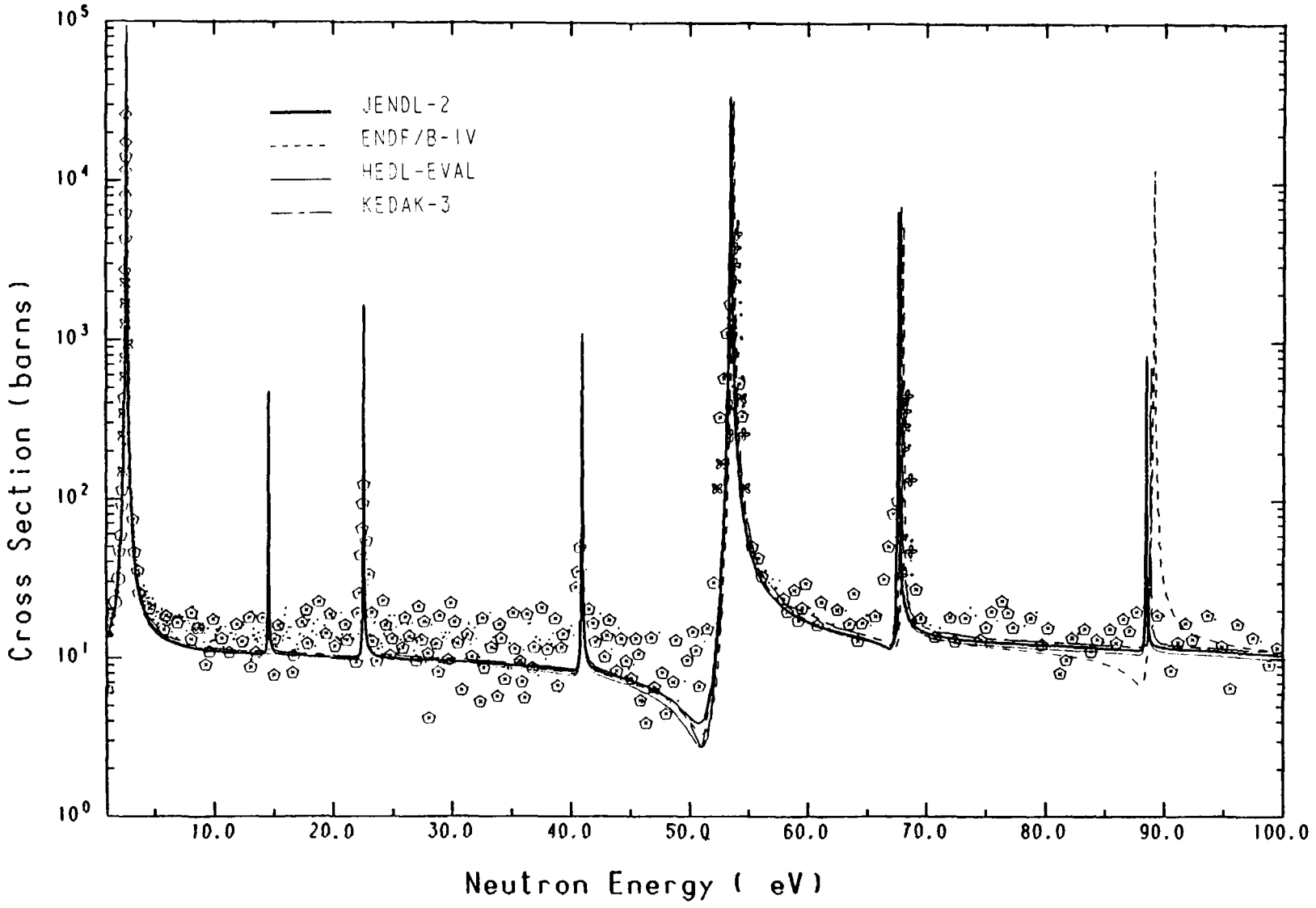

Fig. 5 Total cross sections of ^{242}Pu in the energy range from 1 to 100 eV.

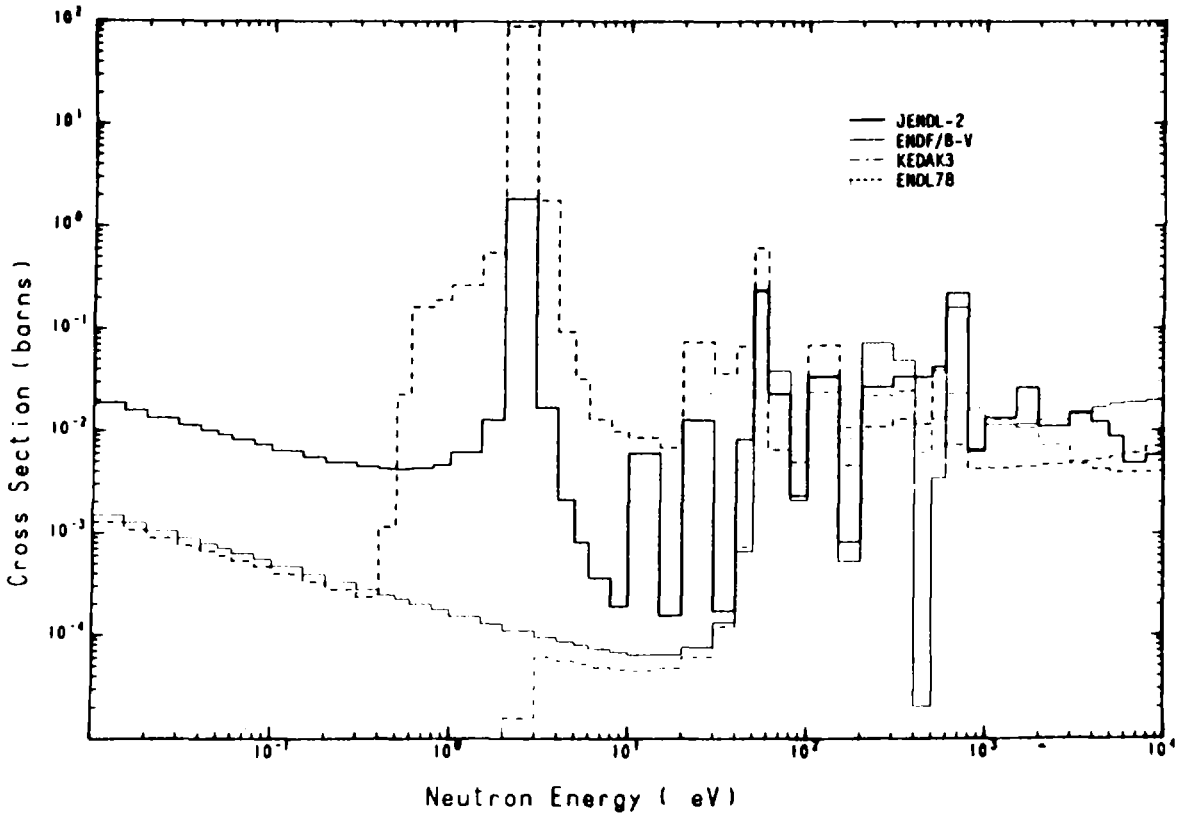

Fig. 6 Average fission cross sections of ^{242}Pu in the energy range from 0.01 eV to 10 keV.

Part III

Appendix

List of Resonance Parameters Adopted in JENDL-2

U-233 1

ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
-2.81	0	2.5	754.5	4.5	30.0	720.0	JENDL-2
0.17	0	2.5	100.0	0.0002	40.0	60.0	JENDL-2
1.45	0	2.5	530.11	0.11	30.0	500.0	JENDL-2
1.78	0	2.5	260.334	0.334	50.0	210.0	JENDL-2
2.17	0	2.5	125.03	0.03	10.0	115.0	JENDL-2
2.29	0	2.5	110.17	0.17	50.0	60.0	JENDL-2
3.49	0	2.5	500.07	0.07	45.0	455.0	JENDL-2
3.62	0	2.5	185.1	0.1	50.0	135.0	JENDL-2
4.76	0	2.5	900.31	0.31	45.0	855.0	JENDL-2
5.89	0	2.5	320.133	0.13282	39.0	281.0	JENDL-2
6.27	0	2.5	538.062	6.178-2	39.0	499.0	JENDL-2
6.64	0	2.5	500.313	0.31264	39.0	461.0	JENDL-2
6.82	0	2.5	138.796	0.79645	39.0	99.0	JENDL-2
7.5	0	2.5	200.028	0.028	39.0	161.0	JENDL-2
8.0	0	2.5	2039.08	0.08	39.0	2000.0	JENDL-2
8.64	0	2.5	339.05	0.05	39.0	300.0	JENDL-2
9.26	0	2.5	298.12	0.12	39.0	259.0	JENDL-2
9.71	0	2.5	500.06	0.06	39.0	461.0	JENDL-2
10.39	0	2.5	316.662	1.8618	57.0	258.0	JENDL-2
10.86	0	2.5	1000.01	8.606-3	39.0	961.0	JENDL-2
11.31	0	2.5	439.2	0.2	39.0	400.0	JENDL-2
11.89	0	2.5	2000.5	0.5	39.0	1961.0	JENDL-2
12.79	0	2.5	310.446	1.4457	55.0	254.0	JENDL-2
13.45	0	2.5	144.056	5.619-2	39.0	105.0	JENDL-2
13.73	0	2.5	255.309	0.30863	39.0	216.0	JENDL-2
15.33	0	2.5	122.464	0.45448	30.0	92.0	JENDL-2
15.47	0	2.5	255.473	0.47292	39.0	216.0	JENDL-2
15.82	0	2.5	200.02	0.02	39.0	161.0	JENDL-2
16.2	0	2.5	426.896	0.89638	39.0	387.0	JENDL-2
16.56	0	2.5	219.706	0.70587	39.0	180.0	JENDL-2
17.97	0	2.5	208.32	0.32005	39.0	169.0	JENDL-2
18.28	0	2.5	379.015	0.015	39.0	340.0	JENDL-2
18.48	0	2.5	135.158	0.15834	39.0	96.0	JENDL-2
18.96	0	2.5	317.754	1.7538	22.0	294.0	JENDL-2
19.63	0	2.5	2500.39	0.39487	39.0	2461.0	JENDL-2
20.59	0	2.5	364.773	0.77279	39.0	325.0	JENDL-2
21.58	0	2.5	2000.59	0.58669	39.0	1961.0	JENDL-2
21.86	0	2.5	255.062	1.0621	39.0	215.0	JENDL-2
22.34	0	2.5	415.332	3.3317	48.0	364.0	JENDL-2
22.9	0	2.5	692.554	0.55448	39.0	653.0	JENDL-2
23.75	0	2.5	453.554	0.55419	39.0	414.0	JENDL-2
24.3	0	2.5	1000.52	0.51997	39.0	961.0	JENDL-2
25.25	0	2.5	274.74	0.73993	39.0	235.0	JENDL-2
25.78	0	2.5	660.522	0.52169	39.0	621.0	JENDL-2
26.25	0	2.5	495.239	0.23872	39.0	456.0	JENDL-2
26.62	0	2.5	260.358	0.35778	39.0	221.0	JENDL-2
26.98	0	2.5	592.154	0.15398	39.0	553.0	JENDL-2
27.76	0	2.5	900.508	0.5083	39.0	861.0	JENDL-2
28.07	0	2.5	168.028	2.784-2	39.0	129.0	JENDL-2
28.28	0	2.5	230.233	0.23343	39.0	191.0	JENDL-2
29.04	0	2.5	541.764	1.7641	39.0	501.0	JENDL-2
29.58	0	2.5	112.138	0.13826	39.0	73.0	JENDL-2
30.35	0	2.5	396.154	0.15384	39.0	357.0	JENDL-2
30.72	0	2.5	261.627	0.62701	37.0	224.0	JENDL-2
31.33	0	2.5	325.298	0.29827	39.0	286.0	JENDL-2
31.69	0	2.5	600.465	0.45464	39.0	561.0	JENDL-2
32.01	0	2.5	217.951	0.95107	39.0	178.0	JENDL-2
33.14	0	2.5	740.719	0.71939	39.0	701.0	JENDL-2
33.95	0	2.5	1301.79	1.786	39.0	1261.0	JENDL-2
34.51	0	2.5	648.192	1.1924	48.0	599.0	JENDL-2
35.25	0	2.5	395.238	0.2383	39.0	356.0	JENDL-2
35.75	0	2.5	900.683	0.68306	39.0	861.0	JENDL-2
36.53	0	2.5	197.798	0.79785	39.0	158.0	JENDL-2
37.2	0	2.5	420.094	9.369-2	39.0	381.0	JENDL-2
37.48	0	2.5	395.697	0.69679	39.0	356.0	JENDL-2
39.33	0	2.5	686.794	0.794	39.0	647.0	JENDL-2
39.83	0	2.5	445.266	0.25599	39.0	406.0	JENDL-2
40.41	0	2.5	901.062	1.0616	39.0	861.0	JENDL-2
41.03	0	2.5	175.34	0.34	39.0	136.0	JENDL-2
41.79	0	2.5	392.035	3.534-2	39.0	353.0	JENDL-2
42.09	0	2.5	592.137	0.13727	39.0	553.0	JENDL-2
42.62	0	2.5	209.77	0.77	57.0	152.0	JENDL-2
43.5	0	2.5	341.4	0.4	20.0	321.0	JENDL-2
44.52	0	2.5	519.3	0.3	19.0	500.0	JENDL-2
45.25	0	2.5	138.025	0.025	39.0	99.0	JENDL-2
45.45	0	2.5	150.025	0.025	39.0	111.0	JENDL-2
46.1	0	2.5	192.39	0.39	39.0	153.0	JENDL-2
46.53	0	2.5	245.08	0.08	39.0	206.0	JENDL-2
47.22	0	2.5	507.88	0.88	39.0	468.0	JENDL-2
48.68	0	2.5	172.6	1.6	40.0	131.0	JENDL-2
49.1	0	2.5	516.5	0.5	39.0	477.0	JENDL-2
50.4	0	2.5	1100.84	0.84	39.0	1061.0	JENDL-2
51.0	0	2.5	500.114	0.114	39.0	461.0	JENDL-2
51.85	0	2.5	150.021	0.021	39.0	111.0	JENDL-2
52.1	0	2.5	280.055	0.055	39.0	241.0	JENDL-2
53.03	0	2.5	240.47	0.47	39.0	201.0	JENDL-2
53.32	0	2.5	360.44	0.44	39.0	321.0	JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
53.94	0	2.5	230.198	0.19788	39.0	191.0	JENDL-2
54.05	0	2.5	501.3	1.3	39.0	461.0	JENDL-2
54.41	0	2.5	295.095	9.550-2	39.0	256.0	JENDL-2
54.78	0	2.5	264.1	1.1	39.0	224.0	JENDL-2
55.2	0	2.5	490.137	0.13703	39.0	451.0	JENDL-2
55.95	0	2.5	862.678	2.6782	39.0	821.0	JENDL-2
56.44	0	2.5	374.04	1.04	42.0	331.0	JENDL-2
56.88	0	2.5	1501.25	1.2454	39.0	1461.0	JENDL-2
57.48	0	2.5	782.36	2.36	49.0	731.0	JENDL-2
58.18	0	2.5	1301.51	1.5075	39.0	1261.0	JENDL-2
58.52	0	2.5	225.56	0.56	39.0	186.0	JENDL-2
60.95	0	2.5	940.87	0.87	39.0	901.0	JENDL-2
61.38	0	2.5	401.45	1.45	39.0	361.0	JENDL-2
62.59	0	2.5	213.5	1.5	52.0	160.0	JENDL-2
63.49	0	2.5	1000.2	0.2	39.0	961.0	JENDL-2
64.03	0	2.5	370.763	0.76317	39.0	331.0	JENDL-2
64.44	0	2.5	240.466	1.4662	39.0	200.0	JENDL-2
65.09	0	2.5	238.593	0.59289	39.0	199.0	JENDL-2
65.49	0	2.5	630.478	0.47853	39.0	591.0	JENDL-2
66.56	0	2.5	770.641	0.64077	39.0	731.0	JENDL-2
67.3	0	2.5	940.396	0.39572	39.0	901.0	JENDL-2
67.98	0	2.5	333.469	0.46914	39.0	294.0	JENDL-2
69.23	0	2.5	1002.3	2.3044	39.0	961.0	JENDL-2
70.19	0	2.5	534.989	1.9892	46.0	487.0	JENDL-2
71.75	0	2.5	349.246	0.24608	39.0	310.0	JENDL-2
72.22	0	2.5	800.52	0.5204	39.0	761.0	JENDL-2
73.43	0	2.5	126.707	1.707	39.0	86.0	JENDL-2
74.03	0	2.5	514.762	4.762	39.0	471.0	JENDL-2
75.0	0	2.5	258.673	0.57293	39.0	219.0	JENDL-2
75.49	0	2.5	293.255	3.255	39.0	251.0	JENDL-2
76.77	0	2.5	872.551	0.55086	39.0	833.0	JENDL-2
78.18	0	2.5	571.981	1.9814	39.0	531.0	JENDL-2
78.46	0	2.5	900.375	0.37478	39.0	861.0	JENDL-2
79.0	0	2.5	1200.68	0.68408	39.0	1161.0	JENDL-2
79.78	0	2.5	598.536	2.5356	39.0	557.0	JENDL-2
81.47	0	2.5	1301.6	1.5992	39.0	1261.0	JENDL-2
82.35	0	2.5	741.721	1.7214	39.0	701.0	JENDL-2
82.78	0	2.5	137.128	2.1278	39.0	96.0	JENDL-2
84.75	0	2.5	815.475	0.47454	39.0	776.0	JENDL-2
85.22	0	2.5	400.791	0.79108	39.0	361.0	JENDL-2
85.73	0	2.5	590.349	0.34957	39.0	551.0	JENDL-2
86.78	0	2.5	295.075	7.616-2	39.0	256.0	JENDL-2
87.13	0	2.5	150.359	0.3587	39.0	111.0	JENDL-2
87.7	0	2.5	88.012	1.199-2	39.0	49.0	JENDL-2
88.89	0	2.5	344.139	2.1396	39.0	303.0	JENDL-2
89.76	0	2.5	558.588	0.588	39.0	519.0	JENDL-2
90.55	0	2.5	260.256	7.2564	39.0	214.0	JENDL-2
91.72	0	2.5	740.59	0.58993	39.0	701.0	JENDL-2
92.67	0	2.5	518.298	1.2977	39.0	478.0	JENDL-2
93.25	0	2.5	590.38	0.38024	39.0	551.0	JENDL-2
93.77	0	2.5	105.6	1.5997	39.0	65.0	JENDL-2
95.22	0	2.5	102.654	1.6539	39.0	62.0	JENDL-2
96.42	0	2.5	1603.31	3.3119	39.0	1561.0	JENDL-2
97.81	0	2.5	233.759	4.7586	39.0	190.0	JENDL-2
98.58	0	2.5	316.971	1.9708	39.0	276.0	JENDL-2
99.3	0	2.5	541.386	1.3858	39.0	501.0	JENDL-2
99.95	0	2.5	542.626	2.6256	39.0	501.0	JENDL-2
101.29	0	2.5	1000.24	0.24082	39.0	961.0	JENDL-2
102.89	0	2.5	226.517	1.5167	39.0	186.0	JENDL-2
104.79	0	2.5	46140.6	1.5581	39.0	46100.0	JENDL-2
105.23	0	2.5	430.088	8.813-2	39.0	391.0	JENDL-2
105.95	0	2.5	192.437	2.4368	39.0	151.0	JENDL-2
106.51	0	2.5	273.034	3.0341	39.0	231.0	JENDL-2
106.95	0	2.5	327.869	2.8694	39.0	286.0	JENDL-2
107.83	0	2.5	351.479	1.4788	39.0	311.0	JENDL-2
108.2	0	2.5	400.822	0.82178	39.0	361.0	JENDL-2
108.64	0	2.5	220.402	0.40228	39.0	181.0	JENDL-2
109.36	0	2.5	419.045	4.0449	39.0	376.0	JENDL-2
109.98	0	2.5	520.815	0.81499	39.0	481.0	JENDL-2
110.88	0	2.5	409.234	5.2344	39.0	365.0	JENDL-2
112.53	0	2.5	1203.37	3.3662	39.0	1161.0	JENDL-2
113.55	0	2.5	1003.78	3.7796	39.0	961.0	JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
-1.49	0	3.5	245.881	3.68	35.2015	207.0	JENDL-2
0.273	0	3.5	135.003	0.0032	36.0	99.0	JENDL-2
1.14	0	3.5	162.015	0.0154	41.0	121.0	JENDL-2
2.035	0	3.5	48.0081	0.0081	37.0	11.0	JENDL-2
2.84	0	3.5	191.005	0.0048	40.0	151.0	JENDL-2
3.14	0	3.5	131.021	0.021	36.0	95.0	JENDL-2
3.61	0	3.5	90.0469	0.047	36.0	54.0	JENDL-2
4.85	0	3.5	39.462	0.062	36.0	3.4	JENDL-2
5.45	0	3.5	90.0029	0.003	60.0	30.0	JENDL-2
5.6	0	3.5	620.033	0.033	20.0	600.0	JENDL-2
6.21	0	3.5	269.056	0.056	42.0	227.0	JENDL-2
6.39	0	3.5	49.27	0.27	38.0	11.0	JENDL-2
7.08	0	3.5	51.125	0.125	35.0	26.0	JENDL-2
8.79	0	3.5	131.15	1.15	33.0	97.0	JENDL-2
9.29	0	3.5	137.182	0.182	42.0	95.0	JENDL-2
9.73	0	3.5	245.046	0.046	45.0	200.0	JENDL-2
10.2	0	3.5	95.063	0.063	41.0	54.0	JENDL-2
10.8	0	3.5	927.093	0.093	67.0	860.0	JENDL-2
11.65	0	3.5	48.103	0.603	42.0	5.5	JENDL-2
12.4	0	3.5	69.28	1.28	43.0	25.0	JENDL-2
12.86	0	3.5	79.0448	0.0448	31.0	48.0	JENDL-2
13.28	0	3.5	98.047	0.047	36.0	62.0	JENDL-2
13.69	0	3.5	115.046	0.046	34.0	81.0	JENDL-2
14.0	0	3.5	469.48	0.48	36.0	433.0	JENDL-2
14.51	0	3.5	63.135	0.135	40.0	23.0	JENDL-2
15.4	0	3.5	85.245	0.245	43.0	42.0	JENDL-2
16.08	0	3.5	51.36	0.36	35.0	16.0	JENDL-2
16.69	0	3.5	124.283	0.283	34.0	90.0	JENDL-2
18.07	0	3.5	169.37	0.37	40.0	129.0	JENDL-2
18.96	0	3.5	91.095	0.095	48.0	43.0	JENDL-2
19.31	0	3.5	104.14	3.14	42.0	59.0	JENDL-2
20.13	0	3.5	260.12	0.12	31.0	229.0	JENDL-2
20.61	0	3.5	92.2	0.2	44.0	48.0	JENDL-2
21.08	0	3.5	67.49	1.49	42.0	24.0	JENDL-2
22.94	0	3.5	84.47	0.47	40.0	44.0	JENDL-2
23.42	0	3.5	37.66	0.66	30.0	7.0	JENDL-2
23.63	0	3.5	185.77	0.77	45.0	140.0	JENDL-2
24.25	0	3.5	70.322	0.322	37.0	33.0	JENDL-2
24.37	0	3.5	88.1399	0.14	35.0	53.0	JENDL-2
25.2	0	3.5	770.5	0.5	40.0	730.0	JENDL-2
25.59	0	3.5	414.66	0.66	24.0	390.0	JENDL-2
26.48	0	3.5	192.48	0.48	32.0	160.0	JENDL-2
27.15	0	3.5	115.12	0.12	40.0	75.0	JENDL-2
27.82	0	3.5	129.68	0.68	44.0	85.0	JENDL-2
28.38	0	3.5	146.17	0.17	35.0	111.0	JENDL-2
28.71	0	3.5	202.055	0.055	50.0	152.0	JENDL-2
29.64	0	3.5	68.18	0.18	40.0	28.0	JENDL-2
30.59	0	3.5	149.21	0.21	50.0	99.0	JENDL-2
30.86	0	3.5	60.5	0.5	39.0	21.0	JENDL-2
32.07	0	3.5	114.04	2.04	46.0	66.0	JENDL-2
33.53	0	3.5	59.82	1.82	36.0	22.0	JENDL-2
34.39	0	3.5	83.2199	2.22	44.0	37.0	JENDL-2
34.83	0	3.5	118.95	0.95	40.0	78.0	JENDL-2
35.2	0	3.5	134.6	3.6	43.0	88.0	JENDL-2
35.3	0	3.5	691.57	1.57	40.0	650.0	JENDL-2
36.4	0	3.5	1540.12	0.12	40.0	1500.0	JENDL-2
37.5	0	3.5	1540.17	0.17	40.0	1500.0	JENDL-2
38.3	0	3.5	308.34	0.34	42.0	266.0	JENDL-2
39.41	0	3.5	94.4999	2.5	38.0	54.0	JENDL-2
39.9	0	3.5	112.29	0.29	28.0	84.0	JENDL-2
40.54	0	3.5	222.43	0.43	36.0	186.0	JENDL-2
41.35	0	3.5	347.38	0.38	37.0	310.0	JENDL-2
41.59	0	3.5	165.224	0.224	31.0	134.0	JENDL-2
41.88	0	3.5	72.4	1.4	47.0	24.0	JENDL-2
42.23	0	3.5	139.3	0.3	53.0	86.0	JENDL-2
42.7	0	3.5	62.3	0.3	47.0	15.0	JENDL-2
43.39	0	3.5	68.7	0.7	44.0	24.0	JENDL-2
43.9	0	3.5	103.17	0.17	28.0	75.0	JENDL-2
43.97	0	3.5	250.34	0.34	20.0	230.0	JENDL-2
44.6	0	3.5	186.93	0.93	40.0	145.0	JENDL-2
45.0	0	3.5	535.76	0.76	31.0	504.0	JENDL-2
45.79	0	3.5	105.188	0.188	26.0	79.0	JENDL-2
46.79	0	3.5	152.65	0.65	34.0	118.0	JENDL-2
47.01	0	3.5	140.96	0.96	39.0	101.0	JENDL-2
47.95	0	3.5	78.8799	0.88	41.0	37.0	JENDL-2
48.3	0	3.5	165.771	0.771	25.0	140.0	JENDL-2
48.8	0	3.5	79.87	0.87	29.0	50.0	JENDL-2
49.0	0	3.5	240.177	0.177	20.0	220.0	JENDL-2
49.43	0	3.5	60.82	0.82	40.0	20.0	JENDL-2
50.14	0	3.5	53.27	0.27	32.0	21.0	JENDL-2
50.49	0	3.5	96.09	1.09	43.0	52.0	JENDL-2
51.27	0	3.5	190.67	3.67	51.0	136.0	JENDL-2
51.72	0	3.5	62.29	0.29	36.0	26.0	JENDL-2
52.22	0	3.5	353.25	2.25	26.0	325.0	JENDL-2
53.46	0	3.5	100.61	0.61	22.0	78.0	JENDL-2
54.13	0	3.5	142.23	0.23	36.0	106.0	JENDL-2
55.08	0	3.5	107.16	3.16	48.0	56.0	JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
55.84	0	3.5	335.5	2.5	45.0	288.0	JENDL-2
56.5	0	3.5	125.92	4.92	43.0	78.0	JENDL-2
57.8	0	3.5	221.13	1.13	35.0	185.0	JENDL-2
58.06	0	3.5	69.36	1.36	32.0	36.0	JENDL-2
58.7	0	3.5	127.25	1.25	30.0	96.0	JENDL-2
59.76	0	3.5	267.245	0.245	41.0	226.0	JENDL-2
60.19	0	3.5	129.9	0.9	18.0	111.0	JENDL-2
60.85	0	3.5	148.51	0.51	25.0	123.0	JENDL-2
61.18	0	3.5	100.35	0.35	30.0	70.0	JENDL-2
61.57	0	3.5	540.23	0.23	40.0	500.0	JENDL-2
61.9	0	3.5	540.17	0.17	40.0	500.0	JENDL-2
62.4	0	3.5	460.26	0.26	60.0	400.0	JENDL-2
63.02	0	3.5	240.091	0.091	40.0	200.0	JENDL-2
63.32	0	3.5	250.102	0.102	50.0	200.0	JENDL-2
63.69	0	3.5	592.8	0.8	16.0	576.0	JENDL-2
64.31	0	3.5	54.25	1.25	45.0	8.0	JENDL-2
65.82	0	3.5	83.42	0.42	40.0	43.0	JENDL-2
66.38	0	3.5	81.4699	0.47	39.0	42.0	JENDL-2
67.25	0	3.5	97.0809	0.0809	48.0	49.0	JENDL-2
68.53	0	3.5	150.12	0.12	60.0	90.0	JENDL-2
69.29	0	3.5	200.72	0.72	40.0	160.0	JENDL-2
70.4	0	3.5	182.8	2.8	50.0	130.0	JENDL-2
70.75	0	3.5	229.3	2.3	36.0	191.0	JENDL-2
71.61	0	3.5	110.25	0.25	15.0	95.0	JENDL-2
72.4	0	3.5	141.7	2.7	31.0	108.0	JENDL-2
72.91	0	3.5	571.33	0.33	40.0	531.0	JENDL-2
74.57	0	3.5	103.9	2.9	46.0	55.0	JENDL-2
75.17	0	3.5	258.9	0.9	45.0	213.0	JENDL-2
75.54	0	3.5	237.27	1.27	28.0	208.0	JENDL-2
76.75	0	3.5	110.081	0.081	36.0	74.0	JENDL-2
77.53	0	3.5	147.01	1.01	39.0	107.0	JENDL-2
78.11	0	3.5	162.23	1.23	45.0	116.0	JENDL-2
78.7	0	3.5	86.13	0.13	48.0	38.0	JENDL-2
79.69	0	3.5	137.78	0.78	46.0	91.0	JENDL-2
80.37	0	3.5	203.8	0.8	35.0	168.0	JENDL-2
81.46	0	3.5	128.93	0.93	36.0	92.0	JENDL-2
82.06	0	3.5	64.05	0.05	40.0	24.0	JENDL-2
82.76	0	3.5	82.9	1.9	56.0	25.0	JENDL-2
83.59	0	3.5	111.17	1.17	55.0	55.0	JENDL-2
84.05	0	3.5	285.65	1.65	36.0	248.0	JENDL-2
84.37	0	3.5	234.1	2.1	29.0	203.0	JENDL-2
85.04	0	3.5	403.66	1.66	35.0	367.0	JENDL-2
85.57	0	3.5	390.6	0.6	40.0	350.0	JENDL-2
86.14	0	3.5	118.05	0.05	40.0	78.0	JENDL-2
86.88	0	3.5	127.58	0.58	41.0	86.0	JENDL-2
87.54	0	3.5	208.47	0.47	43.0	165.0	JENDL-2
88.75	0	3.5	340.28	2.28	18.0	320.0	JENDL-2
89.11	0	3.5	135.18	0.18	50.0	85.0	JENDL-2
89.85	0	3.5	134.79	0.79	45.0	89.0	JENDL-2
90.44	0	3.5	60.23	4.83	46.0	9.4	JENDL-2
91.28	0	3.5	286.96	2.96	33.0	251.0	JENDL-2
92.06	0	3.5	119.72	0.72	44.0	75.0	JENDL-2
92.6	0	3.5	94.53	2.53	48.0	44.0	JENDL-2
93.23	0	3.5	83.33	0.33	26.0	57.0	JENDL-2
94.12	0	3.5	75.4999	4.0	62.0	9.5	JENDL-2
94.76	0	3.5	107.5	0.5	41.0	66.0	JENDL-2
95.58	0	3.5	481.96	0.96	34.0	447.0	JENDL-2
96.5	0	3.5	255.59	0.59	18.0	237.0	JENDL-2
98.13	0	3.5	219.5	2.5	34.0	183.0	JENDL-2
99.6	0	3.5	145.53	0.53	35.0	110.0	JENDL-2
100.4	0	3.5	133.66	0.66	60.0	73.0	JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
-113.0	0	0.5	51.5	28.0	23.5		JENDL-2
-89.0	0	0.5	48.5	25.0	23.5		JENDL-2
-65.0	0	0.5	44.5	21.0	23.5		JENDL-2
-41.0	0	0.5	35.35	11.85	23.5		JENDL-2
4.404	1	0.5	18.4001	1.11 -4	18.4		JENDL-2
6.672	0	0.5	25.2	1.5	23.7	9.2 -5	JENDL-2
10.235	1	0.5	23.6016	0.00159	23.6		JENDL-2
11.307	1	0.5	23.6004	3.69 -4	23.6		JENDL-2
16.28	1	0.5	23.6001	5.04 -5	23.6		JENDL-2
19.524	1	0.5	23.8014	0.00136	23.8		JENDL-2
20.864	0	0.5	33.1	10.1	23.0	4.8 -5	JENDL-2
36.671	0	0.5	56.8	33.3	23.5	1.2 -5	JENDL-2
45.176	1	0.5	27.0014	0.00136	27.0		JENDL-2
49.626	1	0.5	24.3009	9.22 -4	24.9		JENDL-2
63.504	1	0.5	23.9098	0.00978	23.9		JENDL-2
66.015	0	0.5	47.8001	24.9	22.9	5.1 -5	JENDL-2
80.729	0	0.5	26.2701	1.87	24.4	6.6 -5	JENDL-2
83.56	1	0.5	24.4104	0.0104	24.4		JENDL-2
89.219	1	0.5	24.0851	8.509-2	24.0		JENDL-2
93.109	1	0.5	24.4054	0.00538	24.4		JENDL-2
102.54	0	0.5	96.0	70.9	25.1	1.2 -5	JENDL-2
111.25	1	0.5	23.1084	0.00842	23.1		JENDL-2
116.87	0	0.5	48.7	25.6	23.1		JENDL-2
124.89	1	0.5	24.0206	0.0206	24.0		JENDL-2
133.29	1	0.5	23.4083	0.00835	23.4		JENDL-2
145.63	0	0.5	23.909	0.909	23.0		JENDL-2
152.41	1	0.5	24.0468	0.0468	24.0		JENDL-2
158.97	1	0.5	24.6134	0.0134	24.6		JENDL-2
160.8	1	0.5	23.605	0.005	23.6		JENDL-2
165.26	0	0.5	27.21	3.31	23.9		JENDL-2
173.18	1	0.5	23.8461	0.0461	23.8		JENDL-2
189.64	0	0.5	199.1	175.0	23.1	4.8 -5	JENDL-2
194.73	1	0.5	24.7455	0.0455	24.7		JENDL-2
200.68	1	0.5	24.1557	0.0557	24.1		JENDL-2
203.05	1	0.5	23.6344	0.0344	23.6		JENDL-2
208.47	0	0.5	71.8001	49.5	22.3	8.8 -5	JENDL-2
214.86	1	0.5	24.3595	0.0595	24.3		JENDL-2
218.37	1	0.5	23.5302	0.0302	23.5		JENDL-2
224.57	1	0.5	23.62	0.02	23.6		JENDL-2
237.34	0	0.5	50.7001	26.5	24.2	0.00006	JENDL-2
242.71	1	0.5	23.689	0.189	23.5		JENDL-2
253.89	1	0.5	23.507	0.107	23.4		JENDL-2
257.19	1	0.5	24.0176	0.0176	24.0		JENDL-2
263.94	1	0.5	23.868	0.268	23.6		JENDL-2
273.62	0	0.5	48.4	25.3	23.1		JENDL-2
275.2	1	0.5	23.792	0.192	23.6		JENDL-2
282.44	1	0.5	23.708	0.108	23.6		JENDL-2
290.96	0	0.5	39.6	16.5	23.1		JENDL-2
311.28	0	0.5	24.35	1.05	23.3		JENDL-2
322.85	1	0.5	22.0417	0.0417	22.0		JENDL-2
332.02	1	0.5	23.1518	0.0518	23.1		JENDL-2
337.27	1	0.5	23.708	0.108	23.6		JENDL-2
347.75	0	0.5	102.1	79.2	22.9	2.68 -4	JENDL-2
351.86	1	0.5	23.633	0.233	23.4		JENDL-2
372.91	1	0.5	24.34	0.04	24.3		JENDL-2
376.89	0	0.5	25.8502	1.25	24.6	2.05 -4	JENDL-2
395.33	1	0.5	21.4709	0.0709	21.4		JENDL-2
397.58	0	0.5	30.52	6.12	24.4		JENDL-2
408.15	1	0.5	23.8807	0.0807	23.8		JENDL-2
410.21	0	0.5	42.3	19.8	22.5		JENDL-2
434.04	0	0.5	33.86	9.76	24.1		JENDL-2
439.75	1	0.5	23.888	0.288	23.6		JENDL-2
448.5	1	0.5	23.9462	0.0462	23.9		JENDL-2
454.06	1	0.5	24.022	0.422	23.6		JENDL-2
463.14	0	0.5	28.6415	5.54	23.1	0.00147	JENDL-2
467.21	1	0.5	24.4613	0.0613	24.4		JENDL-2
478.4	0	0.5	27.8402	4.14	23.7	2.41 -4	JENDL-2
485.3	1	0.5	23.742	0.142	23.6		JENDL-2
488.87	1	0.5	24.614	0.814	23.8		JENDL-2
498.96	1	0.5	23.207	0.107	23.1		JENDL-2
518.33	0	0.5	73.0003	48.9	24.1	2.93 -4	JENDL-2
523.35	1	0.5	23.686	0.286	23.4		JENDL-2
532.44	1	0.5	23.1687	0.0687	23.1		JENDL-2
535.28	0	0.5	67.7004	43.6	24.1	3.67 -4	JENDL-2
542.41	1	0.5	25.452	0.152	25.3		JENDL-2
550.71	1	0.5	23.5855	8.549-2	23.5		JENDL-2
556.25	1	0.5	24.398	0.898	23.5		JENDL-2
580.08	0	0.5	61.6	36.5	25.1		JENDL-2
584.47	1	0.5	23.911	0.111	23.8		JENDL-2
595.01	0	0.5	108.901	85.8	23.1	0.0011	JENDL-2
606.73	1	0.5	23.564	0.264	23.3		JENDL-2
615.78	1	0.5	23.449	0.149	23.3		JENDL-2
619.95	0	0.5	53.5002	30.2	23.3	2.15 -4	JENDL-2
624.23	1	0.5	24.303	0.803	23.5		JENDL-2
628.53	0	0.5	30.2	6.3	23.9		JENDL-2
633.34	1	0.5	23.52	0.12	23.4		JENDL-2
661.14	0	0.5	150.9	126.0	24.9		JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
668.55	1	0.5	23.706	0.206	23.5		JENDL-2
677.75	1	0.5	24.3	0.7	23.6		JENDL-2
681.67	1	0.5	22.6525	0.0525	22.6		JENDL-2
693.05	0	0.5	63.3	40.4	22.9		JENDL-2
698.14	1	0.5	24.392	0.292	24.1		JENDL-2
708.27	0	0.5	46.626	21.1	25.5	0.026	JENDL-2
710.52	1	0.5	25.85	1.05	24.8		JENDL-2
713.54	1	0.5	23.917	0.217	23.7		JENDL-2
721.58	0	0.5	26.49	1.76	23.7	1.03	JENDL-2
730.12	0	0.5	24.884	1.0	23.8	0.084	JENDL-2
732.48	1	0.5	26.38	1.78	24.6		JENDL-2
734.9	1	0.5	22.363	0.163	22.2		JENDL-2
743.14	1	0.5	23.759	0.359	23.4		JENDL-2
756.2	1	0.5	24.129	0.529	23.6		JENDL-2
765.05	0	0.5	31.0773	7.57	23.5	0.0073	JENDL-2
770.89	1	0.5	23.72	0.12	23.6		JENDL-2
772.6	1	0.5	23.74	0.14	23.6		JENDL-2
779.31	1	0.5	25.64	2.14	23.5		JENDL-2
785.9	1	0.5	26.35	0.15	26.2		JENDL-2
787.3	1	0.5	24.473	0.473	24.0		JENDL-2
790.82	0	0.5	30.24	6.84	23.4		JENDL-2
808.2	1	0.5	23.903	0.403	23.5		JENDL-2
821.56	0	0.5	88.9	65.3	23.6		JENDL-2
828.46	1	0.5	24.486	0.186	24.3		JENDL-2
833.86	1	0.5	25.2947	0.0947	25.2		JENDL-2
846.68	1	0.5	24.269	0.869	23.4		JENDL-2
850.99	0	0.5	86.9011	62.9	24.0	0.0011	JENDL-2
856.08	0	0.5	110.301	86.6	23.7	0.001	JENDL-2
859.44	1	0.5	24.114	0.414	23.7		JENDL-2
866.42	0	0.5	28.91	5.41	23.5		JENDL-2
891.23	1	0.5	24.197	0.697	23.5		JENDL-2
905.03	0	0.5	77.9	54.2	23.7		JENDL-2
910.01	1	0.5	24.85	1.35	23.5		JENDL-2
925.11	0	0.5	40.0	14.0	26.0		JENDL-2
932.66	1	0.5	23.029	0.229	22.8		JENDL-2
937.22	0	0.5	173.7	150.0	23.7		JENDL-2
940.84	1	0.5	24.557	0.657	23.9		JENDL-2
958.52	0	0.5	227.8	205.0	22.8		JENDL-2
964.38	1	0.5	24.404	0.304	24.1		JENDL-2
977.34	1	0.5	24.172	0.772	23.4		JENDL-2
982.32	1	0.5	23.69	0.09	23.6		JENDL-2
985.17	1	0.5	24.969	0.169	24.8		JENDL-2
991.63	0	0.5	407.2	378.0	29.2		JENDL-2
1003.67	1	0.5	28.107	0.107	28.0		JENDL-2
1011.44	1	0.5	25.46	1.86	23.6		JENDL-2
1022.96	0	0.5	31.25	8.45	22.8		JENDL-2
1029.12	1	0.5	25.81	2.31	23.5		JENDL-2
1033.38	1	0.5	23.833	0.733	23.1		JENDL-2
1047.27	1	0.5	23.897	0.397	23.5		JENDL-2
1054.45	0	0.5	117.8	94.6	23.2		JENDL-2
1062.69	1	0.5	24.387	0.787	23.6		JENDL-2
1067.68	1	0.5	25.02	1.12	23.9		JENDL-2
1074.07	1	0.5	24.323	0.923	23.4		JENDL-2
1081.7	1	0.5	25.25	1.55	23.7		JENDL-2
1095.18	1	0.5	25.88	2.28	23.6		JENDL-2
1098.62	0	0.5	45.2	21.4	23.8		JENDL-2
1102.9	1	0.5	25.84	2.24	23.6		JENDL-2
1109.08	0	0.5	58.0	34.6	23.4		JENDL-2
1118.97	1	0.5	23.221	0.521	22.7		JENDL-2
1131.37	1	0.5	27.61	3.71	23.9		JENDL-2
1140.35	0	0.5	258.701	235.0	23.7	0.0015	JENDL-2
1145.47	1	0.5	23.61	0.01	23.6		JENDL-2
1147.97	1	0.5	23.7	0.3	23.4		JENDL-2
1152.57	1	0.5	25.176	0.476	24.7		JENDL-2
1155.07	1	0.5	23.925	0.825	23.1		JENDL-2
1159.38	1	0.5	23.44	0.74	22.7		JENDL-2
1167.63	0	0.5	109.911	86.8	23.1	0.011	JENDL-2
1177.07	0	0.5	91.9	69.2	22.7		JENDL-2
1194.81	0	0.5	115.7	94.6	21.1		JENDL-2
1201.57	1	0.5	23.724	0.524	23.2		JENDL-2
1211.11	0	0.5	33.495	9.64	23.6	0.255	JENDL-2
1219.51	1	0.5	24.881	0.581	24.3		JENDL-2
1230.08	1	0.5	23.899	0.399	23.5		JENDL-2
1233.17	1	0.5	23.908	0.408	23.5		JENDL-2
1238.36	1	0.5	23.166	0.466	22.7		JENDL-2
1245.06	0	0.5	276.8	254.0	22.8		JENDL-2
1249.85	1	0.5	23.9	0.3	23.6		JENDL-2
1251.42	1	0.5	24.606	0.606	24.0		JENDL-2
1260.94	1	0.5	23.708	0.208	23.5		JENDL-2
1267.04	0	0.5	54.3041	29.6	24.7	0.0041	JENDL-2
1272.97	0	0.5	52.0	28.3	23.7		JENDL-2
1276.53	1	0.5	24.142	0.542	23.6		JENDL-2
1278.04	1	0.5	24.3	0.7	23.6		JENDL-2
1283.64	1	0.5	24.0	0.4	23.6		JENDL-2
1285.4	1	0.5	22.91	0.41	22.5		JENDL-2
1289.04	1	0.5	24.45	0.25	24.2		JENDL-2
1296.14	1	0.5	23.7	0.1	23.6		JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
1298.69	0	0.5	27.09	3.49	23.6		JENDL-2
1310.99	1	0.5	23.125	0.225	22.9		JENDL-2
1317.01	1	0.5	28.29	4.99	23.3		JENDL-2
1324.85	1	0.5	22.915	0.315	22.6		JENDL-2
1331.48	1	0.5	25.05	1.35	23.7		JENDL-2
1361.21	1	0.5	25.706	0.506	25.2		JENDL-2
1386.15	1	0.5	27.329	0.329	27.0		JENDL-2
1387.22	1	0.5	23.68	0.08	23.6		JENDL-2
1393.81	0	0.5	235.2	211.0	24.2		JENDL-2
1405.43	0	0.5	98.2	72.8	25.4		JENDL-2
1416.92	1	0.5	27.47	3.47	24.0		JENDL-2
1419.76	0	0.5	32.66	9.16	23.5		JENDL-2
1428.01	0	0.5	53.9	28.5	25.4		JENDL-2
1438.3	1	0.5	23.941	0.441	23.5		JENDL-2
1444.05	0	0.5	37.7	15.0	22.7		JENDL-2
1447.65	1	0.5	24.95	1.15	23.8		JENDL-2
1455.1	1	0.5	26.504	0.204	26.3		JENDL-2
1456.7	1	0.5	23.84	0.24	23.6		JENDL-2
1473.82	0	0.5	144.9	121.0	23.9		JENDL-2
1487.04	1	0.5	27.025	0.225	26.8		JENDL-2
1504.3	1	0.5	27.83	0.23	27.6		JENDL-2
1508.1	1	0.5	23.9	0.4	23.5		JENDL-2
1510.53	1	0.5	25.044	0.844	24.2		JENDL-2
1522.7	0	0.5	268.8	245.0	23.8		JENDL-2
1527.86	1	0.5	24.394	0.794	23.6		JENDL-2
1534.79	1	0.5	24.086	0.786	23.3		JENDL-2
1547.18	1	0.5	27.81	3.81	24.0		JENDL-2
1550.3	1	0.5	28.18	3.18	25.0		JENDL-2
1555.38	1	0.5	23.14	0.34	22.8		JENDL-2
1565.45	0	0.5	28.97	5.67	23.3		JENDL-2
1568.23	1	0.5	24.87	1.27	23.6		JENDL-2
1591.52	1	0.5	24.77	1.17	23.6		JENDL-2
1597.89	0	0.5	400.1	378.0	22.1		JENDL-2
1622.67	0	0.5	123.3	101.0	22.3		JENDL-2
1638.07	0	0.5	73.8	50.8	23.0		JENDL-2
1646.69	1	0.5	22.775	0.475	22.3		JENDL-2
1662.45	0	0.5	248.1	224.0	24.1		JENDL-2
1672.74	1	0.5	24.6952	9.519-2	24.6		JENDL-2
1688.78	0	0.5	130.5	107.0	23.5		JENDL-2
1695.99	1	0.5	22.986	0.386	22.6		JENDL-2
1706.7	1	0.5	24.9	1.4	23.5		JENDL-2
1709.85	0	0.5	116.5	89.5	27.0		JENDL-2
1722.89	0	0.5	40.1	17.4	22.7		JENDL-2
1745.65	1	0.5	24.69	1.69	23.0		JENDL-2
1755.89	0	0.5	165.0	139.0	26.0		JENDL-2
1776.4	1	0.5	24.185	0.685	23.5		JENDL-2
1781.34	1	0.5	24.7	1.2	23.5		JENDL-2
1782.69	0	0.5	685.6	662.0	23.6		JENDL-2
1797.35	1	0.5	27.12	2.92	24.2		JENDL-2
1808.4	0	0.5	38.1	19.0	19.1		JENDL-2
1823.59	1	0.5	24.188	0.788	23.4		JENDL-2
1834.22	1	0.5	25.01	0.41	24.6		JENDL-2
1846.1	0	0.5	30.4	11.1	19.3		JENDL-2
1868.03	1	0.5	27.66	1.16	26.5		JENDL-2
1869.64	1	0.5	26.42	2.52	23.9		JENDL-2
1881.09	1	0.5	24.97	1.47	23.5		JENDL-2
1893.88	1	0.5	25.05	1.55	23.5		JENDL-2
1902.83	0	0.5	68.3	44.2	24.1		JENDL-2
1913.28	1	0.5	35.66	3.56	32.1		JENDL-2
1917.16	0	0.5	62.5	39.8	22.7		JENDL-2
1925.43	1	0.5	24.551	0.951	23.6		JENDL-2
1942.7	1	0.5	24.077	0.677	23.4		JENDL-2
1953.79	0	0.5	27.95	4.25	23.7		JENDL-2
1968.98	0	0.5	850.8	822.0	28.8		JENDL-2
1974.91	0	0.5	461.4	438.0	23.4		JENDL-2
1990.23	1	0.5	25.09	1.39	23.7		JENDL-2
2001.15	1	0.5	22.768	0.568	22.2		JENDL-2
2023.68	0	0.5	250.4	227.0	23.4		JENDL-2
2030.49	0	0.5	69.9	46.9	23.0		JENDL-2
2049.02	1	0.5	25.48	2.18	23.3		JENDL-2
2052.8	1	0.5	24.56	0.86	23.7		JENDL-2
2063.38	1	0.5	23.85	0.25	23.6		JENDL-2
2071.42	1	0.5	31.41	2.11	29.3		JENDL-2
2080.71	1	0.5	25.22	1.62	23.6		JENDL-2
2086.04	1	0.5	27.99	4.39	23.6		JENDL-2
2088.62	0	0.5	48.4	25.6	22.8		JENDL-2
2096.29	0	0.5	50.6	26.3	24.3		JENDL-2
2104.07	1	0.5	25.14	1.44	23.7		JENDL-2
2110.37	1	0.5	24.2	0.6	23.6		JENDL-2
2114.05	1	0.5	27.745	0.845	26.9		JENDL-2
2121.27	1	0.5	23.85	0.25	23.6		JENDL-2
2124.18	1	0.5	28.0	3.7	24.3		JENDL-2
2140.67	1	0.5	24.6	1.0	23.6		JENDL-2
2145.56	0	0.5	98.4	74.7	23.7		JENDL-2
2152.76	0	0.5	324.4	300.0	24.4		JENDL-2
2173.12	1	0.5	25.89	2.19	23.7		JENDL-2
2178.96	1	0.5	24.4	0.8	23.6		JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
2186.58	0	0.5	615.2	591.0	24.2		JENDL-2
2201.26	0	0.5	130.2	105.0	25.2		JENDL-2
2215.44	1	0.5	27.02	3.42	23.6		JENDL-2
2241.41	1	0.5	26.32	1.02	25.3		JENDL-2
2259.7	0	0.5	134.3	109.0	25.3		JENDL-2
2266.54	0	0.5	256.0	234.0	22.0		JENDL-2
2270.15	1	0.5	27.58	3.88	23.7		JENDL-2
2281.92	0	0.5	209.0	188.0	21.0		JENDL-2
2293.95	1	0.5	24.8	1.3	23.5		JENDL-2
2296.56	1	0.5	30.41	5.61	24.8		JENDL-2
2315.93	0	0.5	43.1	19.1	24.0		JENDL-2
2327.28	1	0.5	30.24	1.14	29.1		JENDL-2
2334.83	1	0.5	26.86	1.66	25.2		JENDL-2
2338.59	1	0.5	32.35	8.65	23.7		JENDL-2
2352.75	0	0.5	83.4	55.2	28.2		JENDL-2
2355.73	0	0.5	102.0	77.9	24.1		JENDL-2
2368.75	1	0.5	30.38	5.78	24.6		JENDL-2
2383.87	1	0.5	24.0	0.5	23.5		JENDL-2
2384.94	1	0.5	26.6	2.0	24.6		JENDL-2
2391.98	0	0.5	54.1	30.1	24.0		JENDL-2
2397.8	1	0.5	29.9	5.2	24.7		JENDL-2
2401.82	1	0.5	28.22	4.42	23.8		JENDL-2
2411.24	0	0.5	29.93	5.63	24.3		JENDL-2
2418.17	1	0.5	26.169	0.969	25.2		JENDL-2
2426.89	0	0.5	180.7	157.0	23.7		JENDL-2
2446.7	0	0.5	246.6	223.0	23.6		JENDL-2
2447.31	1	0.5	24.0	0.4	23.6		JENDL-2
2455.75	0	0.5	41.3	17.3	24.0		JENDL-2
2489.18	0	0.5	129.4	105.0	24.4		JENDL-2
2502.22	1	0.5	27.45	3.85	23.6		JENDL-2
2521.49	0	0.5	43.3	19.0	24.3		JENDL-2
2527.08	1	0.5	24.4	0.9	23.5		JENDL-2
2548.19	0	0.5	761.5	738.0	23.5		JENDL-2
2559.59	0	0.5	301.7	278.0	23.7		JENDL-2
2581.15	0	0.5	470.6	447.0	23.6		JENDL-2
2597.61	0	0.5	783.7	761.0	22.7		JENDL-2
2606.23	1	0.5	26.95	3.25	23.7		JENDL-2
2612.02	1	0.5	28.53	4.93	23.6		JENDL-2
2620.05	0	0.5	71.9	48.1	23.8		JENDL-2
2632.73	1	0.5	28.64	4.44	24.2		JENDL-2
2636.85	1	0.5	26.56	2.86	23.7		JENDL-2
2654.08	1	0.5	24.6	1.0	23.6		JENDL-2
2658.73	1	0.5	27.97	4.17	23.8		JENDL-2
2672.22	0	0.5	312.0	288.0	24.0		JENDL-2
2682.61	1	0.5	26.22	2.32	23.9		JENDL-2
2696.5	0	0.5	55.2	31.2	24.0		JENDL-2
2701.95	1	0.5	25.93	1.93	24.0		JENDL-2
2717.33	0	0.5	200.6	177.0	23.6		JENDL-2
2750.74	0	0.5	65.6	41.7	23.9		JENDL-2
2762.66	0	0.5	42.7	18.9	23.8		JENDL-2
2766.69	1	0.5	27.13	3.23	23.9		JENDL-2
2774.55	1	0.5	25.14	1.54	23.6		JENDL-2
2778.46	1	0.5	24.9	1.3	23.6		JENDL-2
2787.43	0	0.5	39.6	15.0	24.6		JENDL-2
2799.52	1	0.5	29.43	5.13	24.3		JENDL-2
2806.38	0	0.5	34.8	10.2	24.6		JENDL-2
2811.62	1	0.5	29.05	5.05	24.0		JENDL-2
2815.93	1	0.5	25.05	1.35	23.7		JENDL-2
2823.35	1	0.5	25.6	2.0	23.6		JENDL-2
2829.32	0	0.5	44.4	20.8	23.6		JENDL-2
2845.95	1	0.5	24.2	0.6	23.6		JENDL-2
2865.39	0	0.5	240.2	218.0	22.2		JENDL-2
2877.57	1	0.5	26.04	2.24	23.8		JENDL-2
2882.78	0	0.5	632.4	608.0	24.4		JENDL-2
2897.23	0	0.5	41.7	17.8	23.9		JENDL-2
2918.38	1	0.5	30.86	6.86	24.0		JENDL-2
2922.92	1	0.5	29.97	5.07	24.9		JENDL-2
2925.57	1	0.5	31.45	6.85	24.6		JENDL-2
2933.65	0	0.5	62.4	38.3	24.1		JENDL-2
2945.37	1	0.5	25.98	2.08	23.9		JENDL-2
2956.93	0	0.5	46.3	21.8	24.5		JENDL-2
2967.52	1	0.5	27.39	3.79	23.6		JENDL-2
2988.56	1	0.5	30.39	6.59	23.8		JENDL-2
3003.62	0	0.5	146.7	122.0	24.7		JENDL-2
3014.99	1	0.5	24.88	1.18	23.7		JENDL-2
3024.7	1	0.5	27.9	4.4	23.5		JENDL-2
3028.61	0	0.5	160.7	137.0	23.7		JENDL-2
3043.72	1	0.5	27.69	3.49	24.2		JENDL-2
3059.64	0	0.5	57.2	32.9	24.3		JENDL-2
3072.14	1	0.5	25.18	1.08	24.1		JENDL-2
3081.21	1	0.5	25.34	1.74	23.6		JENDL-2
3088.71	1	0.5	27.21	3.51	23.7		JENDL-2
3103.55	1	0.5	26.37	2.07	24.3		JENDL-2
3109.91	0	0.5	253.6	230.0	23.6		JENDL-2
3130.16	1	0.5	26.72	3.12	23.6		JENDL-2
3133.86	1	0.5	33.11	8.91	24.2		JENDL-2
3149.03	0	0.5	136.6	113.0	23.6		JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
3169.8	0	0.5	34.5	10.9	23.6		JENDL-2
3178.83	0	0.5	117.3	93.5	23.8		JENDL-2
3188.91	0	0.5	133.1	111.0	22.1		JENDL-2
3205.81	0	0.5	120.0	96.2	23.8		JENDL-2
3219.67	0	0.5	34.32	9.52	24.8		JENDL-2
3226.34	0	0.5	49.3	24.9	24.4		JENDL-2
3240.23	1	0.5	26.45	1.45	25.0		JENDL-2
3248.86	0	0.5	49.3	26.2	23.1		JENDL-2
3263.89	1	0.5	27.31	1.71	25.6		JENDL-2
3267.53	1	0.5	33.8	9.5	24.3		JENDL-2
3273.29	0	0.5	43.0	13.6	29.4		JENDL-2
3279.51	0	0.5	308.6	285.0	23.6		JENDL-2
3297.47	0	0.5	35.6	10.1	25.5		JENDL-2
3307.81	1	0.5	28.5	5.0	23.5		JENDL-2
3312.18	0	0.5	189.6	166.0	23.6		JENDL-2
3321.64	0	0.5	161.7	139.0	22.7		JENDL-2
3333.66	0	0.5	130.1	106.0	24.1		JENDL-2
3341.25	1	0.5	27.75	4.15	23.6		JENDL-2
3346.82	1	0.5	25.0	1.5	23.5		JENDL-2
3355.81	0	0.5	148.8	125.0	23.8		JENDL-2
3366.78	1	0.5	24.5	0.9	23.6		JENDL-2
3378.3	1	0.5	31.35	7.75	23.6		JENDL-2
3383.59	1	0.5	27.95	3.35	24.6		JENDL-2
3389.74	0	0.5	50.9	26.0	24.9		JENDL-2
3399.28	1	0.5	31.43	7.73	23.7		JENDL-2
3408.77	0	0.5	266.7	243.0	23.7		JENDL-2
3417.93	1	0.5	28.22	3.92	24.3		JENDL-2
3436.49	0	0.5	448.9	425.0	23.9		JENDL-2
3458.14	0	0.5	755.7	731.0	24.7		JENDL-2
3485.8	0	0.5	122.6	98.8	23.8		JENDL-2
3495.64	0	0.5	35.7	10.7	25.0		JENDL-2
3513.02	1	0.5	25.52	1.92	23.6		JENDL-2
3514.66	1	0.5	25.2	1.6	23.6		JENDL-2
3522.39	1	0.5	26.08	2.18	23.9		JENDL-2
3528.51	1	0.5	30.04	6.34	23.7		JENDL-2
3561.59	0	0.5	293.6	270.0	23.6		JENDL-2
3574.04	0	0.5	460.6	437.0	23.6		JENDL-2
3595.02	0	0.5	81.4	57.6	23.8		JENDL-2
3623.24	0	0.5	52.3	24.3	28.0		JENDL-2
3629.8	0	0.5	558.6	535.0	23.6		JENDL-2
3637.05	1	0.5	31.59	7.99	23.6		JENDL-2
3653.99	1	0.5	26.63	2.63	24.0		JENDL-2
3662.39	1	0.5	26.83	2.53	24.3		JENDL-2
3673.35	1	0.5	28.74	5.14	23.6		JENDL-2
3683.26	1	0.5	28.2	4.6	23.6		JENDL-2
3693.19	0	0.5	442.6	419.0	23.6		JENDL-2
3716.8	0	0.5	137.9	114.0	23.9		JENDL-2
3724.77	1	0.5	32.11	6.81	25.3		JENDL-2
3734.21	0	0.5	242.8	219.0	23.8		JENDL-2
3741.55	1	0.5	25.5	2.0	23.5		JENDL-2
3742.53	1	0.5	24.4	0.8	23.6		JENDL-2
3745.43	1	0.5	24.4	0.8	23.6		JENDL-2
3758.93	1	0.5	25.6	2.0	23.6		JENDL-2
3765.11	0	0.5	127.9	104.0	23.9		JENDL-2
3781.96	0	0.5	504.0	480.0	24.0		JENDL-2
3791.13	1	0.5	26.5	2.9	23.6		JENDL-2
3809.33	1	0.5	24.25	0.65	23.6		JENDL-2
3825.68	1	0.5	28.17	4.57	23.6		JENDL-2
3831.6	0	0.5	38.0	13.8	24.2		JENDL-2
3857.79	0	0.5	623.6	600.0	23.6		JENDL-2
3873.09	0	0.5	203.9	180.0	23.9		JENDL-2
3880.06	1	0.5	26.68	2.98	23.7		JENDL-2
3894.84	1	0.5	32.49	8.49	24.0		JENDL-2
3902.22	0	0.5	324.3	300.0	24.3		JENDL-2
3915.03	0	0.5	130.1	107.0	23.1		JENDL-2
3927.9	1	0.5	36.4	12.0	24.4		JENDL-2
3930.21	1	0.5	37.6	14.0	23.6		JENDL-2
3933.38	1	0.5	36.2	12.7	23.5		JENDL-2
3940.06	0	0.5	204.1	180.0	24.1		JENDL-2
3948.81	1	0.5	27.6	4.0	23.6		JENDL-2
3954.94	0	0.5	151.9	128.0	23.9		JENDL-2
3992.71	1	0.5	26.6	3.0	23.6		JENDL-2
4009.11	1	0.5	27.6	4.0	23.6		JENDL-2
4014.11	1	0.5	26.2	2.6	23.6		JENDL-2
4024.9	1	0.5	25.0	1.4	23.6		JENDL-2
4040.62	0	0.5	88.9	64.6	24.3		JENDL-2
4063.92	0	0.5	45.3	20.2	25.1		JENDL-2
4080.4	1	0.5	27.4	3.8	23.6		JENDL-2
4083.6	1	0.5	27.6	4.0	23.6		JENDL-2
4090.29	0	0.5	117.6	93.4	24.2		JENDL-2
4099.1	1	0.5	25.3	1.7	23.6		JENDL-2
4103.8	1	0.5	25.6	2.0	23.6		JENDL-2
4125.12	0	0.5	65.3	41.4	23.9		JENDL-2
4132.19	1	0.5	40.6	17.0	23.6		JENDL-2
4148.19	1	0.5	27.9	4.3	23.6		JENDL-2
4167.95	0	0.5	229.3	205.0	24.3		JENDL-2
4179.31	0	0.5	55.4	31.5	23.9		JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
4201.99	1	0.5	27.6	4.0	23.6		JENDL-2
4210.72	0	0.5	62.9	38.4	24.5		JENDL-2
4225.52	1	0.5	33.6	10.0	23.6		JENDL-2
4258.76	0	0.5	55.8	31.2	24.6		JENDL-2
4299.54	0	0.5	162.0	138.0	24.0		JENDL-2
4307.04	0	0.5	134.3	110.0	24.3		JENDL-2
4325.15	0	0.5	106.0	81.3	24.7		JENDL-2
4371.0	0	0.5	176.1	152.0	24.1		JENDL-2
4435.55	0	0.5	124.5	100.0	24.5		JENDL-2
4511.74	0	0.5	607.4	583.0	24.4		JENDL-2
4543.45	0	0.5	117.8	93.1	24.7		JENDL-2
4567.76	0	0.5	68.1	43.6	24.5		JENDL-2
4594.67	0	0.5	48.3	22.8	25.5		JENDL-2
4632.17	0	0.5	52.1	27.6	24.5		JENDL-2
4662.9	0	0.5	170.2	146.0	24.2		JENDL-2
4705.73	0	0.5	356.1	332.0	24.1		JENDL-2
4727.89	0	0.5	43.8	19.4	24.4		JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
-0.22	0	0	504.644	0.0437	46.6	458.0	JENDL-2
0.297	0	0	98.84	0.24	38.2	60.4	JENDL-2
7.82	0	1.0	88.3997	0.7997	40.0	47.6	JENDL-2
10.93	0	1.0	199.877	1.8769	55.0	143.0	JENDL-2
11.89	0	1.0	67.0179	1.0179	42.0	24.0	JENDL-2
14.31	0	1.0	101.601	0.6015	34.0	67.0	JENDL-2
14.68	0	1.0	69.8903	1.8903	38.0	30.0	JENDL-2
15.46	0	0	994.4	2.4	42.0	950.0	JENDL-2
17.66	0	1.0	74.8109	1.8109	39.0	34.0	JENDL-2
22.29	0	1.0	108.644	2.6437	44.0	62.0	JENDL-2
23.94	0	0.5	70.1288	0.1288	32.0	38.0	JENDL-2
26.24	0	1.0	83.454	1.454	38.0	44.0	JENDL-2
27.24	0	0.5	42.2082	0.2082	37.0	5.0	JENDL-2
32.31	0	0	151.833	0.8328	41.0	110.0	JENDL-2
34.6	0	0.5	91.5198	0.0198	41.5	50.0	JENDL-2
35.5	0	1.0	47.2841	0.2841	43.0	4.0	JENDL-2
41.42	0	1.0	52.0977	4.0977	44.0	4.0	JENDL-2
41.66	0	0.5	106.003	2.0026	58.0	46.0	JENDL-2
44.48	0	1.0	58.5895	6.5895	47.0	5.0	JENDL-2
47.6	0	0	311.671	5.6708	58.0	248.0	JENDL-2
49.71	0	0	800.362	4.362	50.0	746.0	JENDL-2
50.08	0	1.0	57.0072	3.0072	41.0	13.0	JENDL-2
52.6	0	1.0	68.3765	10.3765	49.0	9.0	JENDL-2
55.63	0	1.0	58.454	1.454	36.0	21.0	JENDL-2
57.44	0	0	499.888	12.888	42.0	445.0	JENDL-2
58.84	0	0	1099.91	10.9052	42.0	1047.0	JENDL-2
59.22	0	1.0	180.42	5.4196	52.0	123.0	JENDL-2
60.94	0	0	6797.83	19.828	42.0	6736.0	JENDL-2
63.08	0	0.5	155.19	1.1896	43.0	111.0	JENDL-2
65.36	0	0.5	92.0354	0.5354	41.5	50.0	JENDL-2
65.71	0	1.0	137.042	12.0421	54.0	71.0	JENDL-2
74.05	0	1.0	71.1393	3.1393	36.0	32.0	JENDL-2
74.95	0	1.0	146.943	21.9427	41.0	84.0	JENDL-2
78.95	0	0.5	91.66	0.16	41.5	50.0	JENDL-2
81.76	0	0	2047.91	9.914	42.0	1996.0	JENDL-2
82.68	0	0.5	70.7436	0.7436	40.0	30.0	JENDL-2
83.52	0	0	1750.38	2.3792	42.0	1706.0	JENDL-2
85.32	0	0	2096.0	52.0	42.0	2002.0	JENDL-2
85.48	0	1.0	74.7989	7.7989	51.0	16.0	JENDL-2
90.75	0	1.0	59.7941	12.1941	39.0	8.6	JENDL-2
92.97	0	0.5	57.041	1.041	47.0	9.0	JENDL-2
95.36	0	1.0	98.0819	2.0819	66.0	30.0	JENDL-2
96.491	0	0	1700.24	13.2448	42.0	1645.0	JENDL-2
100.25	0	0	6000.1	11.1036	42.0	5947.0	JENDL-2
102.99	0	1.0	47.5993	1.5993	36.0	10.0	JENDL-2
105.3	0	1.0	48.0	4.6	38.0	5.4	JENDL-2
106.67	0	1.0	75.6265	9.2265	40.0	26.4	JENDL-2
110.38	0	0.5	43.6542	0.6542	30.0	13.0	JENDL-2
114.44	0	0	1499.39	1.388	42.0	1456.0	JENDL-2
115.1	0	0.5	205.317	0.3172	40.0	165.0	JENDL-2
116.303	0	0	267.727	10.7268	39.0	218.0	JENDL-2
118.83	0	1.0	102.831	17.8307	43.0	42.0	JENDL-2
120.99	0	0	78.336	7.336	32.0	39.0	JENDL-2
123.44	0	0.5	63.694	0.694	24.0	39.0	JENDL-2
126.22	0	0	95.8688	5.8688	70.0	20.0	JENDL-2
127.51	0	0.5	64.7634	0.7634	40.0	24.0	JENDL-2
131.75	0	0	3799.69	35.6904	42.0	3722.0	JENDL-2
133.78	0	1.0	55.5385	5.5385	44.0	6.0	JENDL-2
136.75	0	0	70.1516	10.1516	32.0	28.0	JENDL-2
139.28	0	0.5	321.678	0.1784	41.5	280.0	JENDL-2
142.92	0	1.0	137.212	3.2121	52.0	82.0	JENDL-2
143.47	0	1.0	83.0448	4.0448	48.0	31.0	JENDL-2
146.25	0	1.0	69.9927	6.9927	50.5	12.5	JENDL-2
147.44	0	0	1000.38	2.3792	42.0	956.0	JENDL-2
148.21	0	0.5	149.694	0.694	47.0	102.0	JENDL-2
149.42	0	0.5	119.597	2.5974	67.0	50.0	JENDL-2
157.08	0	0	621.6	33.6	48.0	540.0	JENDL-2
160.8	0	0.5	141.208	0.2081	41.0	100.0	JENDL-2
161.96	0	0.5	150.208	0.2081	40.0	110.0	JENDL-2
164.54	0	1.0	78.7587	27.7587	43.0	8.0	JENDL-2
167.1	0	1.0	111.783	5.7831	37.0	69.0	JENDL-2
170.49	0	0.5	158.853	0.8526	38.0	120.0	JENDL-2
171.08	0	0	999.765	1.7648	42.0	956.0	JENDL-2
174.56	0	0.5	241.559	0.0594	41.5	200.0	JENDL-2
175.98	0	0.5	73.1128	3.1128	39.0	31.0	JENDL-2
177.22	0	1.0	51.5425	3.5425	41.5	6.5	JENDL-2
178.9	0	1.0	58.2095	1.2095	43.0	14.0	JENDL-2
183.64	0	0.5	72.2702	2.2702	42.0	28.0	JENDL-2
184.87	0	0	2098.64	18.638	42.0	2038.0	JENDL-2
188.27	0	0.5	52.912	0.912	43.0	9.0	JENDL-2
190.64	0	0	66.9768	4.9768	49.0	13.0	JENDL-2
195.36	0	0	446.484	59.484	52.0	335.0	JENDL-2
196.69	0	1.0	111.653	4.6529	53.0	54.0	JENDL-2
199.39	0	1.0	132.577	9.5768	43.0	80.0	JENDL-2
203.46	0	0.5	72.4484	5.9484	41.5	25.0	JENDL-2
203.93	0	0	440.6	53.6	42.0	345.0	JENDL-2
207.37	0	1.0	56.9397	6.9397	44.0	6.0	JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
211.09	0	0	789.776	2.776	42.0	745.0	JENDL-2
212.02	0	0	1500.38	2.3792	42.0	1456.0	JENDL-2
213.28	0	0.5	199.694	0.694	42.0	157.0	JENDL-2
216.35	0	1.0	67.2127	6.2127	50.0	11.0	JENDL-2
219.49	0	1.0	70.5425	3.5425	41.0	26.0	JENDL-2
220.22	0	1.0	52.3627	7.3627	34.0	11.0	JENDL-2
223.16	0	1.0	59.3839	3.3839	47.0	9.0	JENDL-2
224.89	0	0.5	85.5378	2.5378	58.0	25.0	JENDL-2
227.77	0	0	8096.03	30.5348	41.5	8024.0	JENDL-2
227.89	0	1.0	66.6787	1.6787	33.0	32.0	JENDL-2
231.4	0	1.0	53.7645	11.7645	37.0	5.0	JENDL-2
232.63	0	0.5	120.654	0.6544	40.0	80.0	JENDL-2
234.32	0	1.0	74.1452	10.1452	49.0	15.0	JENDL-2
239.04	0	1.0	72.3865	5.3865	51.0	16.0	JENDL-2
240.6	0	0.5	241.55	0.0496	41.5	200.0	JENDL-2
242.88	0	1.0	96.5564	6.5564	34.0	56.0	JENDL-2
247.5	0	0.5	280.348	1.3482	45.0	234.0	JENDL-2
248.86	0	1.0	61.6253	14.6253	42.0	5.0	JENDL-2
251.23	0	1.0	82.2293	27.2293	43.0	12.0	JENDL-2
254.5	0	1.0	54.7759	2.7759	27.0	25.0	JENDL-2
256.11	0	1.0	91.2788	6.2788	53.0	32.0	JENDL-2
259.0	0	0.5	241.897	0.3966	41.5	200.0	JENDL-2
262.73	0	0	6299.14	99.14	42.0	6158.0	JENDL-2
262.74	0	0.5	59.6086	3.6086	46.0	10.0	JENDL-2
264.23	0	0.5	341.748	0.2478	41.5	300.0	JENDL-2
269.11	0	0.5	130.082	2.0818	42.0	86.0	JENDL-2
269.54	0	1.0	71.8333	3.8333	40.0	28.0	JENDL-2
272.62	0	1.0	91.626	27.626	33.0	31.0	JENDL-2
274.8	0	0.5	791.88	13.8796	42.0	736.0	JENDL-2
275.57	0	1.0	149.199	23.1987	54.0	72.0	JENDL-2
277.23	0	0	5299.85	17.8452	42.0	5240.0	JENDL-2
279.59	0	0	111.097	21.0968	34.0	56.0	JENDL-2
282.92	0	1.0	84.983	24.983	49.0	11.0	JENDL-2
285.73	0	0.5	341.599	9.919-2	41.5	300.0	JENDL-2
288.0	0	0	6498.55	28.552	42.0	6428.0	JENDL-2
288.3	0	0.5	341.579	7.939-2	41.5	300.0	JENDL-2
292.33	0	0	114.54	11.5396	31.0	72.0	JENDL-2
296.46	0	1.0	81.2319	3.2319	48.0	30.0	JENDL-2
298.59	0	1.0	73.4427	10.4427	43.0	20.0	JENDL-2
301.81	0	1.0	108.043	18.043	42.0	48.0	JENDL-2
308.2	0	0.5	150.362	4.362	48.0	98.0	JENDL-2
309.01	0	1.0	84.945	13.945	47.0	24.0	JENDL-2
311.12	0	0.5	82.2238	0.7238	41.5	40.0	JENDL-2
313.62	0	1.0	61.483	13.483	38.0	10.0	JENDL-2
316.6	0	1.0	73.1221	5.1221	43.0	25.0	JENDL-2
320.0	0	0.5	5061.5	20.0	41.5	5000.0	JENDL-2
321.75	0	0.5	341.698	0.1982	41.5	300.0	JENDL-2
323.36	0	0	159.88	59.88	53.0	47.0	JENDL-2
325.3	0	1.0	104.46	8.4599	50.0	46.0	JENDL-2
329.65	0	0	1999.71	10.7068	42.0	1947.0	JENDL-2
333.91	0	1.0	67.446	5.446	52.0	10.0	JENDL-2
335.93	0	1.0	82.58	17.58	47.0	18.0	JENDL-2
337.95	0	1.0	73.991	7.991	55.0	11.0	JENDL-2
339.24	0	0	80.7552	9.7552	37.0	34.0	JENDL-2
343.18	0	1.0	74.657	15.657	41.0	18.0	JENDL-2
346.56	0	0	1200.31	10.3104	42.0	1148.0	JENDL-2
350.3	0	1.0	97.315	21.315	41.0	35.0	JENDL-2
352.82	0	1.0	68.8597	3.8597	48.0	17.0	JENDL-2
354.89	0	0.5	79.0948	0.5948	41.5	37.0	JENDL-2
357.87	0	0	5999.92	8.9224	42.0	5949.0	JENDL-2
359.99	0	0.5	113.646	1.6458	32.0	80.0	JENDL-2
361.28	0	0.5	341.827	0.3272	41.5	300.0	JENDL-2
364.0	0	0.5	3051.5	10.0	41.5	3000.0	JENDL-2
366.0	0	0	4999.71	10.7068	42.0	4947.0	JENDL-2
368.33	0	0.5	162.095	0.5948	41.5	120.0	JENDL-2
370.31	0	0.5	89.8664	3.8664	57.0	29.0	JENDL-2
371.72	0	0	3399.8	22.802	42.0	3335.0	JENDL-2
375.02	0	0	42.9312	7.9312	29.0	6.0	JENDL-2
377.1	0	0.5	99.9542	2.9542	58.0	39.0	JENDL-2
378.04	0	0.5	224.364	1.8638	41.5	181.0	JENDL-2
382.43	0	0.5	129.625	0.6246	43.0	86.0	JENDL-2
384.26	0	1.0	108.651	5.6509	28.0	75.0	JENDL-2
385.9	0	0	999.776	2.776	42.0	955.0	JENDL-2
389.51	0	0.5	74.072	2.072	51.0	21.0	JENDL-2
391.52	0	0.5	124.874	1.8738	55.0	68.0	JENDL-2
394.43	0	1.0	106.464	6.4639	48.0	52.0	JENDL-2
396.91	0	0.5	108.143	3.1426	44.0	61.0	JENDL-2
401.56	0	1.0	219.232	19.232	46.0	154.0	JENDL-2
404.24	0	1.0	155.0	23.0	56.0	76.0	JENDL-2
406.03	0	0.5	321.206	2.7064	41.5	277.0	JENDL-2
406.95	0	0.5	331.447	1.4474	30.0	300.0	JENDL-2
408.71	0	0.5	114.924	1.9238	55.0	58.0	JENDL-2
412.31	0	1.0	144.863	8.8631	66.0	70.0	JENDL-2
415.66	0	0.5	61.8478	4.8478	50.0	7.0	JENDL-2
417.6	0	0.5	230.399	2.3992	50.0	178.0	JENDL-2
419.85	0	1.0	139.021	6.0211	59.0	74.0	JENDL-2
425.67	0	0.5	341.897	0.3966	41.5	300.0	JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
426.37	0	0	6996.35	29.3452	42.0	6925.0	JENDL-2
429.64	0	0.5	779.411	5.4112	42.0	732.0	JENDL-2
431.29	0	0.5	3491.44	6.9398	41.5	3443.0	JENDL-2
432.73	0	0.5	341.027	1.5268	41.5	298.0	JENDL-2
437.76	0	1.0	61.6701	2.6701	49.0	10.0	JENDL-2
438.72	0	1.0	60.8835	2.8835	55.0	3.0	JENDL-2
440.07	0	0.5	341.916	0.4164	41.5	300.0	JENDL-2
442.41	0	0	411.819	20.819	44.0	347.0	JENDL-2
449.75	0	0.5	133.483	1.9828	41.5	90.0	JENDL-2
451.35	0	1.0	59.145	13.945	41.5	3.7	JENDL-2
454.45	0	0.5	402.194	0.694	41.5	360.0	JENDL-2
455.73	0	0	615.216	78.716	41.5	495.0	JENDL-2
457.33	0	0.5	170.504	11.0044	41.5	118.0	JENDL-2
458.8	0	1.0	79.0604	4.5604	41.5	33.0	JENDL-2
461.26	0	0.5	97.3698	3.4698	41.5	52.4	JENDL-2
462.64	0	0.5	128.293	0.7932	41.5	86.0	JENDL-2
468.2	0	0.5	2092.94	6.444	41.5	2045.0	JENDL-2
470.0	0	0.5	5086.37	14.871	41.5	5030.0	JENDL-2
473.1	0	1.0	55.5977	4.0977	41.5	10.0	JENDL-2
475.31	0	0.5	582.052	5.5518	41.5	535.0	JENDL-2
476.9	0	0.5	1994.18	2.6766	41.5	1950.0	JENDL-2
479.24	0	0.5	201.698	0.1982	41.5	160.0	JENDL-2
484.15	0	0.5	59.8664	3.8664	41.5	14.5	JENDL-2
487.29	0	0.5	224.772	3.2716	41.5	180.0	JENDL-2
487.81	0	0.5	226.655	5.1552	41.5	180.0	JENDL-2
490.65	0	0.5	2281.33	19.828	41.5	2220.0	JENDL-2
494.1	0	1.0	116.06	4.5604	41.5	70.0	JENDL-2
495.63	0	0.5	202.69	1.1899	41.5	160.0	JENDL-2
500.5	0	1.0	76.8707	3.3707	41.5	32.0	JENDL-2
502.86	0	1.0	85.2645	11.7645	41.5	32.0	JENDL-2
505.78	0	0.5	442.392	0.8922	41.5	400.0	JENDL-2
508.22	0	0.5	692.194	0.694	41.5	650.0	JENDL-2
509.74	0	1.0	260.184	51.684	41.5	167.0	JENDL-2
511.52	0	0.5	3354.29	12.789	41.5	3300.0	JENDL-2
515.16	0	0.5	482.491	0.9914	41.5	440.0	JENDL-2
516.57	0	0.5	321.797	0.2974	41.5	280.0	JENDL-2
517.98	0	0.5	362.194	0.694	41.5	320.0	JENDL-2
520.22	0	1.0	99.304	14.804	41.5	43.0	JENDL-2
524.21	0	1.0	91.836	30.336	41.5	20.0	JENDL-2
525.4	0	0.5	10661.4	119.898	41.5	10500.0	JENDL-2
526.0	0	0.5	92.987	1.487	41.5	50.0	JENDL-2
527.38	0	0.5	58.987	1.487	41.5	16.0	JENDL-2
530.52	0	0	243.0	126.5	41.5	75.0	JENDL-2
539.17	0	1.0	55.2019	11.3019	41.5	2.4	JENDL-2
540.71	0	0.5	85.4656	3.9656	41.5	40.0	JENDL-2
541.65	0	0.5	89.431	7.931	41.5	40.0	JENDL-2
543.08	0	1.0	58.1324	11.6324	41.5	5.0	JENDL-2
545.85	0	0.5	1178.85	17.3494	41.5	1120.0	JENDL-2
547.14	0	0.5	843.285	1.7846	41.5	800.0	JENDL-2
549.67	0	1.0	60.1984	11.6984	41.5	7.0	JENDL-2
550.5	0	0.5	61.3538	16.8538	41.5	3.0	JENDL-2
554.13	0	0.5	1233.25	51.75	41.5	1140.0	JENDL-2
555.72	0	0.5	446.358	4.8578	41.5	400.0	JENDL-2
559.16	0	1.0	89.4653	26.9653	41.5	21.0	JENDL-2
562.84	0	0.5	274.638	53.138	41.5	180.0	JENDL-2
564.03	0	0.5	53.2156	9.7156	41.5	2.0	JENDL-2
565.81	0	0.5	60.5778	14.0778	41.5	5.0	JENDL-2
571.11	0	1.0	83.026	8.526	41.5	33.0	JENDL-2
574.0	0	0	419.132	157.632	41.5	220.0	JENDL-2
575.77	0	1.0	88.957	39.457	41.5	8.0	JENDL-2
578.0	0	0.5	79.9784	2.4784	41.5	36.0	JENDL-2
579.04	0	1.0	55.3076	6.8076	41.5	7.0	JENDL-2
584.81	0	0.5	322.194	0.694	41.5	280.0	JENDL-2
588.09	0	1.0	62.6697	11.1697	41.5	10.0	JENDL-2
589.94	0	0.5	441.996	0.4956	41.5	400.0	JENDL-2
593.52	0	0.5	48.6724	3.1724	41.5	4.0	JENDL-2
597.35	0	1.0	55.026	8.526	41.5	5.0	JENDL-2
598.04	0	0.5	5977.32	20.818	41.5	5915.0	JENDL-2
604.01	0	1.0	69.8506	24.8506	41.5	3.5	JENDL-2
607.64	0	1.0	58.8496	9.6496	41.5	7.7	JENDL-2
609.29	0	1.0	63.6973	15.5973	41.5	6.6	JENDL-2
612.8	0	0.5	64.2242	8.7242	41.5	14.0	JENDL-2
620.48	0	1.0	58.6645	11.7645	41.5	5.4	JENDL-2
622.59	0	1.0	61.0156	9.7156	41.5	9.8	JENDL-2
625.17	0	1.0	56.7989	7.7989	41.5	7.5	JENDL-2
628.21	0	0.5	52.681	2.181	41.5	9.0	JENDL-2
632.97	0	0.5	3875.21	33.706	41.5	3800.0	JENDL-2
636.47	0	0.5	65.431	7.931	41.5	16.0	JENDL-2
639.28	0	1.0	56.6869	9.1869	41.5	6.0	JENDL-2
641.42	0	0.5	522.194	0.694	41.5	480.0	JENDL-2
644.94	0	1.0	50.3161	5.8161	41.5	3.0	JENDL-2
646.65	0	0.5	242.987	1.487	41.5	200.0	JENDL-2
658.29	0	1.0	141.133	80.633	41.5	19.0	JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
-4.099	0	0.5	34.0582	4.0492	30.0	0.009	JENDL-2
1.056	0	0.5	32.0457	2.44	29.6	0.0057	JENDL-2
20.46	0	0.5	32.42	2.2	30.0	0.22	JENDL-2
38.34	0	0.5	47.22	17.0	30.0	0.22	JENDL-2
41.64	0	0.5	48.72	15.5	33.0	0.22	JENDL-2
66.66	0	0.5	81.22	50.0	31.0	0.22	JENDL-2
72.83	0	0.5	53.22	21.0	32.0	0.22	JENDL-2
90.78	0	0.5	42.52	12.8	29.5	0.22	JENDL-2
92.5	0	0.5	32.92	3.2	29.5	0.22	JENDL-2
105.05	0	0.5	78.72	43.0	35.5	0.22	JENDL-2
121.67	0	0.5	44.22	14.5	29.5	0.22	JENDL-2
130.9	0	0.5	30.41	0.19	30.0	0.22	JENDL-2
135.3	0	0.5	47.72	18.0	29.5	0.22	JENDL-2
151.9	0	0.5	44.12	14.4	29.5	0.22	JENDL-2
162.7	0	0.5	38.72	9.0	29.5	0.22	JENDL-2
170.1	0	0.5	44.82	15.1	29.5	0.22	JENDL-2
185.8	0	0.5	45.92	16.2	29.5	0.22	JENDL-2
192.2	0	0.5	30.52	0.3	30.0	0.22	JENDL-2
199.6	0	0.5	30.72	1.0	29.5	0.22	JENDL-2
239.3	0	0.5	42.82	13.1	29.5	0.22	JENDL-2
260.5	0	0.5	55.42	23.2	32.0	0.22	JENDL-2
287.1	0	0.5	155.22	125.0	30.0	0.22	JENDL-2
304.9	0	0.5	37.12	7.4	29.5	0.22	JENDL-2
318.5	0	0.5	35.92	6.2	29.5	0.22	JENDL-2
320.9	0	0.5	49.42	19.7	29.5	0.22	JENDL-2
338.4	0	0.5	37.12	7.4	29.5	0.22	JENDL-2
346.0	0	0.5	47.42	17.7	29.5	0.22	JENDL-2
363.7	0	0.5	67.72	32.5	35.0	0.22	JENDL-2
372.0	0	0.5	44.42	14.7	29.5	0.22	JENDL-2
405.0	0	0.5	137.72	108.0	29.5	0.22	JENDL-2
419.0	0	0.5	36.82	7.1	29.5	0.22	JENDL-2
446.2	0	0.5	32.42	2.2	30.0	0.22	JENDL-2
449.8	0	0.5	49.42	19.7	29.5	0.22	JENDL-2
466.4	0	0.5	33.12	3.4	29.5	0.22	JENDL-2
473.2	0	0.5	34.52	4.8	29.5	0.22	JENDL-2
493.9	0	0.5	38.32	8.6	29.5	0.22	JENDL-2
499.3	0	0.5	44.57	19.3	25.05	0.22	JENDL-2
514.3	0	0.5	67.22	31.0	36.0	0.22	JENDL-2
526.1	0	0.5	33.76	4.04	29.5	0.22	JENDL-2
530.8	0	0.5	30.42	0.7	29.5	0.22	JENDL-2
546.4	0	0.5	60.72	31.0	29.5	0.22	JENDL-2
553.2	0	0.5	49.92	20.2	29.5	0.22	JENDL-2
566.3	0	0.5	61.22	31.5	29.5	0.22	JENDL-2
584.1	0	0.5	30.86	1.14	29.5	0.22	JENDL-2
596.8	0	0.5	91.22	57.5	33.5	0.22	JENDL-2
608.0	0	0.5	45.945	22.685	23.2	0.06	JENDL-2
632.0	0	0.5	36.964	13.324	23.2	0.44	JENDL-2
637.0	0	0.5	34.98	11.61	23.2	0.17	JENDL-2
665.0	0	0.5	220.697	197.017	23.2	0.48	JENDL-2
678.6	0	0.5	50.018	26.038	23.2	0.78	JENDL-2
712.1	0	0.5	25.334	1.334	23.2	0.8	JENDL-2
743.0	0	0.5	27.209	1.009	23.2	3.0	JENDL-2
750.0	0	0.5	104.091	68.191	23.2	12.7	JENDL-2
759.0	0	0.5	30.681	6.061	23.2	1.42	JENDL-2
778.3	0	0.5	124.4	1.2	23.2	100.0	JENDL-2
782.4	0	0.5	1476.0	2.8	23.2	1450.0	JENDL-2
791.0	0	0.5	59.612	23.912	23.2	12.5	JENDL-2
810.5	0	0.5	248.955	214.155	23.2	11.6	JENDL-2
819.9	0	0.5	35.2981	10.9981	23.2	1.1	JENDL-2
845.6	0	0.5	34.31	10.18	23.2	0.93	JENDL-2
854.9	0	0.5	71.454	47.954	23.2	0.3	JENDL-2
876.5	0	0.5	38.071	13.911	23.2	0.96	JENDL-2
891.5	0	0.5	118.845	94.325	23.2	1.32	JENDL-2
904.0	0	0.5	45.819	21.949	23.2	0.67	JENDL-2
909.0	0	0.5	102.252	78.992	23.2	0.06	JENDL-2
915.3	0	0.5	59.756	35.996	23.2	0.56	JENDL-2
943.5	0	0.5	146.353	122.833	23.2	0.32	JENDL-2
958.4	0	0.5	94.888	71.498	23.2	0.19	JENDL-2
971.3	0	0.5	104.005	80.395	23.2	0.41	JENDL-2
979.2	0	0.5	31.496	7.196	23.2	1.1	JENDL-2
1001.8	0	0.5	122.449	98.129	23.2	1.12	JENDL-2
1024.1	0	0.5	34.72	5.0	29.5	0.22	JENDL-2
1041.6	0	0.5	36.919	12.589	23.2	1.13	JENDL-2
1045.7	0	0.5	33.72	4.0	29.5	0.22	JENDL-2
1072.6	0	0.5	132.917	109.407	23.2	0.31	JENDL-2
1099.8	0	0.5	107.654	84.204	23.2	0.25	JENDL-2
1115.7	0	0.5	32.32	2.6	29.5	0.22	JENDL-2
1129.0	0	0.5	73.295	49.395	23.2	0.7	JENDL-2
1134.0	0	0.5	30.535	6.735	23.2	0.6	JENDL-2
1143.0	0	0.5	63.89	40.57	23.2	0.12	JENDL-2
1159.0	0	0.5	45.609	22.129	23.2	0.28	JENDL-2
1185.5	0	0.5	180.817	157.317	23.2	0.3	JENDL-2
1191.0	0	0.5	138.461	114.921	23.2	0.34	JENDL-2
1208.5	0	0.5	86.239	62.909	23.2	0.13	JENDL-2
1228.0	0	0.5	39.72	10.0	29.5	0.22	JENDL-2
1236.5	0	0.5	35.04	11.25	23.2	0.59	JENDL-2
1255.01	0	0.5	101.864	76.874	23.2	1.79	JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
1281.4	0	0.5	34.02	4.3	29.5	0.22	JENDL-2
1300.3	0	0.5	269.581	244.911	23.2	1.47	JENDL-2
1328.1	0	0.5	393.336	369.296	23.2	0.84	JENDL-2
1345.0	0	0.5	49.709	26.039	23.2	0.47	JENDL-2
1350.9	0	0.5	38.02	8.3	29.5	0.22	JENDL-2
1363.0	0	0.5	31.284	7.384	23.2	0.7	JENDL-2
1377.0	0	0.5	88.868	64.568	23.2	1.1	JENDL-2
1389.0	0	0.5	42.362	14.162	23.2	5.0	JENDL-2
1402.2	0	0.5	2028.44	5.24	23.2	2000.0	JENDL-2
1408.5	0	0.5	1524.29	1.09	23.2	1500.0	JENDL-2
1426.0	0	0.5	65.13	36.63	23.2	5.3	JENDL-2
1429.0	0	0.5	39.926	15.126	23.2	1.6	JENDL-2
1450.0	0	0.5	90.212	63.592	23.2	3.42	JENDL-2
1462.9	0	0.5	46.969	21.059	23.2	2.71	JENDL-2
1481.2	0	0.5	34.145	9.245	23.2	1.7	JENDL-2
1540.7	0	0.5	130.72	101.0	29.5	0.22	JENDL-2
1549.5	0	0.5	186.42	156.7	29.5	0.22	JENDL-2
1563.7	0	0.5	144.42	114.7	29.5	0.22	JENDL-2
1575.3	0	0.5	149.952	126.242	23.2	0.51	JENDL-2
1609.6	0	0.5	59.229	34.909	23.2	1.12	JENDL-2
1621.4	0	0.5	58.32	28.6	29.5	0.22	JENDL-2
1643.0	0	0.5	136.82	107.1	29.5	0.22	JENDL-2
1662.6	0	0.5	93.62	63.9	29.5	0.22	JENDL-2
1688.0	0	0.5	57.138	32.868	23.2	1.07	JENDL-2
1724.0	0	0.5	108.817	83.457	23.2	2.16	JENDL-2
1741.6	0	0.5	49.072	25.042	23.2	0.83	JENDL-2
1764.0	0	0.5	75.51	51.66	23.2	0.65	JENDL-2
1771.4	0	0.5	39.52	9.8	29.5	0.22	JENDL-2
1779.0	0	0.5	520.72	491.0	29.5	0.22	JENDL-2
1841.0	0	0.5	159.617	125.717	23.2	10.7	JENDL-2
1853.0	0	0.5	61.787	34.437	23.2	4.15	JENDL-2
1873.0	0	0.5	105.578	77.468	23.2	4.91	JENDL-2
1901.0	0	0.5	235.482	209.282	23.2	3.0	JENDL-2
1916.6	0	0.5	129.103	35.903	23.2	70.0	JENDL-2
1936.0	0	0.5	2225.18	1.98	23.2	2200.0	JENDL-2
1943.3	0	0.5	37.82	8.1	29.5	0.22	JENDL-2
1944.0	0	0.5	32.936	7.936	23.2	1.8	JENDL-2
1949.1	0	0.5	112.077	82.577	23.2	6.3	JENDL-2
1956.2	0	0.5	309.204	261.004	23.2	25.0	JENDL-2
1973.0	0	0.5	92.96	67.96	23.2	1.8	JENDL-2
1991.5	0	0.5	144.22	114.5	29.5	0.22	JENDL-2
1998.3	0	0.5	35.32	5.6	29.5	0.22	JENDL-2
2016.7	0	0.5	78.363	52.523	23.2	2.64	JENDL-2
2022.9	0	0.5	85.22	55.5	29.5	0.22	JENDL-2
2033.4	0	0.5	134.465	101.475	23.2	9.79	JENDL-2
2056.0	0	0.5	97.398	68.468	23.2	5.73	JENDL-2
2082.8	0	0.5	128.52	98.8	29.5	0.22	JENDL-2
2110.7	0	0.5	43.42	13.7	29.5	0.22	JENDL-2
2154.0	0	0.5	39.867	14.387	23.2	2.28	JENDL-2
2182.0	0	0.5	115.32	85.6	29.5	0.22	JENDL-2
2198.2	0	0.5	159.72	130.0	29.5	0.22	JENDL-2
2240.6	0	0.5	63.82	34.1	29.5	0.22	JENDL-2
2256.6	0	0.5	164.22	134.5	29.5	0.22	JENDL-2
2277.9	0	0.5	456.72	427.0	29.5	0.22	JENDL-2
2290.7	0	0.5	238.22	208.5	29.5	0.22	JENDL-2
2303.3	0	0.5	46.92	17.2	29.5	0.22	JENDL-2
2334.4	0	0.5	66.32	36.6	29.5	0.22	JENDL-2
2350.9	0	0.5	61.32	31.6	29.5	0.22	JENDL-2
2365.8	0	0.5	270.72	241.0	29.5	0.22	JENDL-2
2373.4	0	0.5	39.44	9.74	29.5	0.2	JENDL-2
2386.1	0	0.5	48.42	18.7	29.5	0.22	JENDL-2
2405.0	0	0.5	54.82	25.1	29.5	0.22	JENDL-2
2416.0	0	0.5	94.62	64.9	29.5	0.22	JENDL-2
2434.3	0	0.5	234.72	205.0	29.5	0.22	JENDL-2
2459.4	0	0.5	55.32	25.6	29.5	0.22	JENDL-2
2470.8	0	0.5	75.22	45.5	29.5	0.22	JENDL-2
2485.3	0	0.5	50.92	21.2	29.5	0.22	JENDL-2
2521.0	0	0.5	139.22	109.5	29.5	0.22	JENDL-2
2538.6	0	0.5	317.22	287.5	29.5	0.22	JENDL-2
2549.2	0	0.5	109.42	79.7	29.5	0.22	JENDL-2
2575.3	0	0.5	71.398	47.718	23.2	0.48	JENDL-2
2639.5	0	0.5	460.587	425.867	29.5	5.22	JENDL-2
2652.0	0	0.5	74.223	36.563	23.2	14.46	JENDL-2
2692.8	0	0.5	531.905	344.705	23.2	164.0	JENDL-2
2717.0	0	0.5	69.162	40.672	23.2	5.29	JENDL-2
2739.2	0	0.5	208.24	177.0	29.5	1.74	JENDL-2
2748.4	0	0.5	136.629	102.259	23.2	11.17	JENDL-2
2817.6	0	0.5	66.594	41.414	23.2	1.98	JENDL-2
2843.5	0	0.5	180.705	156.815	23.2	0.69	JENDL-2
2860.0	0	0.5	53.284	27.274	23.2	2.81	JENDL-2
2882.0	0	0.5	59.72	30.0	29.5	0.22	JENDL-2
2895.6	0	0.5	89.72	60.0	29.5	0.22	JENDL-2
2905.0	0	0.5	144.72	115.0	29.5	0.22	JENDL-2
2938.0	0	0.5	161.72	132.0	29.5	0.22	JENDL-2
2968.6	0	0.5	114.72	85.0	29.5	0.22	JENDL-2
2980.5	0	0.5	137.72	108.0	29.5	0.22	JENDL-2
2986.2	0	0.5	42.22	12.5	29.5	0.22	JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
2994.7	0	0.5	85.72	56.0	29.5	0.22	JENDL-2
3004.0	0	0.5	106.22	76.5	29.5	0.22	JENDL-2
3018.0	0	0.5	146.72	117.0	29.5	0.22	JENDL-2
3029.0	0	0.5	50.72	21.0	29.5	0.22	JENDL-2
3054.7	0	0.5	76.72	47.0	29.5	0.22	JENDL-2
3077.4	0	0.5	157.72	128.0	29.5	0.22	JENDL-2
3088.0	0	0.5	64.72	35.0	29.5	0.22	JENDL-2
3112.7	0	0.5	68.22	38.5	29.5	0.22	JENDL-2
3172.5	0	0.5	254.72	225.0	29.5	0.22	JENDL-2
3192.5	0	0.5	378.72	349.0	29.5	0.22	JENDL-2
3237.5	0	0.5	101.72	72.0	29.5	0.22	JENDL-2
3268.5	0	0.5	163.72	134.0	29.5	0.22	JENDL-2
3332.0	0	0.5	44.22	14.5	29.5	0.22	JENDL-2
3423.0	0	0.5	64.22	34.5	29.5	0.22	JENDL-2
3458.0	0	0.5	97.72	68.0	29.5	0.22	JENDL-2
3465.5	0	0.5	373.72	344.0	29.5	0.22	JENDL-2
3493.5	0	0.5	94.72	65.0	29.5	0.22	JENDL-2
3555.0	0	0.5	120.72	91.0	29.5	0.22	JENDL-2
3567.5	0	0.5	191.72	162.0	29.5	0.22	JENDL-2
3595.0	0	0.5	58.22	28.5	29.5	0.22	JENDL-2
3657.0	0	0.5	322.72	293.0	29.5	0.22	JENDL-2
3665.0	0	0.5	84.22	54.5	29.5	0.22	JENDL-2
3702.0	0	0.5	80.72	51.0	29.5	0.22	JENDL-2
3723.0	0	0.5	89.72	60.0	29.5	0.22	JENDL-2
3800.0	0	0.5	130.72	101.0	29.5	0.22	JENDL-2
3844.0	0	0.5	105.72	76.0	29.5	0.22	JENDL-2
3852.0	0	0.5	127.72	98.0	29.5	0.22	JENDL-2
3872.0	0	0.5	75.72	46.0	29.5	0.22	JENDL-2
3900.0	0	0.5	238.72	209.0	29.5	0.22	JENDL-2
3917.0	0	0.5	192.72	163.0	29.5	0.22	JENDL-2
3954.0	0	0.5	121.72	92.0	29.5	0.22	JENDL-2
3975.0	0	0.5	131.72	102.0	29.5	0.22	JENDL-2
3990.0	0	0.5	58.72	29.0	29.5	0.22	JENDL-2
4031.0	0	0.5	138.72	109.0	29.5	0.22	JENDL-2
4084.0	0	0.5	149.72	120.0	29.5	0.22	JENDL-2
4100.0	0	0.5	286.72	257.0	29.5	0.22	JENDL-2
4122.0	0	0.5	526.72	497.0	29.5	0.22	JENDL-2
4134.0	0	0.5	96.72	67.0	29.5	0.22	JENDL-2
4149.0	0	0.5	294.72	265.0	29.5	0.22	JENDL-2
4161.0	0	0.5	118.72	89.0	29.5	0.22	JENDL-2
4203.0	0	0.5	467.72	438.0	29.5	0.22	JENDL-2
4221.0	0	0.5	97.72	68.0	29.5	0.22	JENDL-2
4270.0	0	0.5	188.72	159.0	29.5	0.22	JENDL-2
4288.0	0	0.5	345.72	316.0	29.5	0.22	JENDL-2
4329.0	0	0.5	331.72	302.0	29.5	0.22	JENDL-2
4376.0	0	0.5	111.72	82.0	29.5	0.22	JENDL-2
4386.0	0	0.5	61.72	32.0	29.5	0.22	JENDL-2
4398.0	0	0.5	107.72	78.0	29.5	0.22	JENDL-2
4422.0	0	0.5	90.72	61.0	29.5	0.22	JENDL-2
4433.0	0	0.5	76.72	47.0	29.5	0.22	JENDL-2
4458.0	0	0.5	131.72	102.0	29.5	0.22	JENDL-2
4570.0	0	0.5	249.72	220.0	29.5	0.22	JENDL-2
4588.0	0	0.5	555.72	526.0	29.5	0.22	JENDL-2
4599.0	0	0.5	104.72	75.0	29.5	0.22	JENDL-2
4615.0	0	0.5	291.72	262.0	29.5	0.22	JENDL-2
4646.0	0	0.5	178.72	149.0	29.5	0.22	JENDL-2
4721.0	0	0.5	539.72	510.0	29.5	0.22	JENDL-2
4745.0	0	0.5	274.72	245.0	29.5	0.22	JENDL-2
4755.0	0	0.5	85.72	56.0	29.5	0.22	JENDL-2
4766.0	0	0.5	44.72	15.0	29.5	0.22	JENDL-2
4771.0	0	0.5	51.72	22.0	29.5	0.22	JENDL-2
4779.0	0	0.5	63.72	34.0	29.5	0.22	JENDL-2
4792.0	0	0.5	162.72	133.0	29.5	0.22	JENDL-2
4812.0	0	0.5	201.72	172.0	29.5	0.22	JENDL-2
4823.0	0	0.5	92.72	63.0	29.5	0.22	JENDL-2
4894.0	0	0.5	88.72	59.0	29.5	0.22	JENDL-2
4958.0	0	0.5	320.72	291.0	29.5	0.22	JENDL-2
4969.0	0	0.5	187.72	158.0	29.5	0.22	JENDL-2
4993.0	0	0.5	121.72	92.0	29.5	0.22	JENDL-2
5072.0	0	0.5	538.72	509.0	29.5	0.22	JENDL-2
5113.0	0	0.5	122.72	93.0	29.5	0.22	JENDL-2
5134.0	0	0.5	71.72	42.0	29.5	0.22	JENDL-2
5148.0	0	0.5	79.72	50.0	29.5	0.22	JENDL-2
5162.0	0	0.5	69.72	40.0	29.5	0.22	JENDL-2
5194.0	0	0.5	342.72	313.0	29,5	0.22	JENDL-2
5215.0	0	0.5	192.72	163.0	29.5	0.22	JENDL-2
5249.0	0	0.5	553.72	524.0	29.5	0.22	JENDL-2
5279.0	0	0.5	169.72	140.0	29.5	0.22	JENDL-2
5299.0	0	0.5	299.72	270.0	29.5	0.22	JENDL-2
5334.0	0	0.5	232.72	203.0	29.5	0.22	JENDL-2
5350.0	0	0.5	182.72	153.0	29.5	0.22	JENDL-2
5367.0	0	0.5	99.72	70.0	29.5	0.22	JENDL-2
5393.0	0	0.5	113.72	84.0	29.5	0.22	JENDL-2
5417.0	0	0.5	284.72	255.0	29.5	0.22	JENDL-2
5489.0	0	0.5	79.72	50.0	29.5	0.22	JENDL-2
5499.0	0	0.5	116.72	87.0	29.5	0.22	JENDL-2
5510.0	0	0.5	384.72	355.0	29.5	0.22	JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
5522.0	0	0.5	201.72	172.0	29.5	0.22	JENDL-2
5544.0	0	0.5	611.72	582.0	29.5	0.22	JENDL-2
5574.0	0	0.5	787.72	758.0	29.5	0.22	JENDL-2
5592.0	0	0.5	236.72	207.0	29.5	0.22	JENDL-2
5615.0	0	0.5	91.72	62.0	29.5	0.22	JENDL-2
5681.0	0	0.5	135.72	106.0	29.5	0.22	JENDL-2
5692.0	0	0.5	120.72	91.0	29.5	0.22	JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
-0.209	0	3.0	132.063	0.063	35.0	97.0	JENDL-2
0.257	0	3.0	132.051	0.05143	35.0	97.0	JENDL-2
4.28	0	3.0	95.69	0.69	50.0	45.0	JENDL-2
4.58	0	2.0	184.42	0.42	49.0	135.0	JENDL-2
6.11	0	2.0	1338.24	3.24	35.0	1300.0	JENDL-2
6.93	0	3.0	155.72	0.72	35.0	120.0	JENDL-2
8.62	0	3.0	141.94	0.94	41.0	100.0	JENDL-2
9.57	0	2.0	385.528	0.528	35.0	350.0	JENDL-2
10.06	0	2.0	636.32	1.32	35.0	600.0	JENDL-2
12.79	0	3.0	280.677	0.67714	50.0	230.0	JENDL-2
13.42	0	2.0	123.55	3.55	60.0	60.0	JENDL-2
14.75	0	3.0	183.4	5.4	48.0	130.0	JENDL-2
15.97	0	3.0	556.42	1.42	35.0	520.0	JENDL-2
16.67	0	2.0	227.28	1.28	42.0	184.0	JENDL-2
17.85	0	2.0	64.98	2.98	39.0	23.0	JENDL-2
18.22	0	2.5	75.15	0.15	35.0	40.0	JENDL-2
20.69	0	3.0	105.309	0.30857	43.0	62.0	JENDL-2
21.05	0	2.5	335.01	0.01	35.0	300.0	JENDL-2
21.91	0	2.5	70.17	0.17	50.0	20.0	JENDL-2
23.0	0	3.0	370.986	0.98571	35.0	335.0	JENDL-2
23.7	0	2.5	380.39	0.39	55.0	325.0	JENDL-2
24.04	0	3.0	127.183	1.18286	46.0	80.0	JENDL-2
24.61	0	2.5	549.15	0.15	40.0	509.0	JENDL-2
26.39	0	3.0	313.857	3.85714	45.0	265.0	JENDL-2
28.89	0	2.0	700.76	5.76	40.0	655.0	JENDL-2
29.42	0	3.0	125.471	0.47143	40.0	85.0	JENDL-2
31.03	0	3.0	299.203	2.20286	56.0	241.0	JENDL-2
32.5	0	2.5	2541.0	1.0	40.0	2500.0	JENDL-2
33.3	0	2.5	160.17	0.17	40.0	120.0	JENDL-2
33.77	0	2.5	140.3	0.3	40.0	100.0	JENDL-2
34.9	0	2.5	1142.07	2.07	40.0	1100.0	JENDL-2
34.98	0	2.5	55.41	0.41	40.0	15.0	JENDL-2
37.5	0	2.5	640.15	0.15	40.0	600.0	JENDL-2
38.17	0	2.5	240.5	0.5	40.0	200.0	JENDL-2
39.35	0	2.5	201.49	1.49	40.0	160.0	JENDL-2
39.89	0	2.5	154.59	1.59	53.0	100.0	JENDL-2
40.87	0	2.5	1042.12	2.12	40.0	1000.0	JENDL-2
42.77	0	2.5	240.28	0.28	40.0	200.0	JENDL-2
43.45	0	2.5	70.25	0.25	40.0	30.0	JENDL-2
46.57	0	2.5	281.5	1.5	40.0	240.0	JENDL-2
48.11	0	2.5	626.2	6.2	40.0	580.0	JENDL-2
50.35	0	2.5	540.69	0.69	40.0	500.0	JENDL-2
52.07	0	2.5	140.04	0.04	40.0	100.0	JENDL-2
58.37	0	2.5	621.75	1.75	40.0	580.0	JENDL-2
59.28	0	2.5	582.2	2.2	40.0	540.0	JENDL-2
60.53	0	2.5	281.3	4.3	27.0	250.0	JENDL-2
62.25	0	2.5	644.62	4.62	40.0	600.0	JENDL-2
63.0	0	2.5	1242.0	2.0	40.0	1200.0	JENDL-2
64.52	0	2.5	316.25	0.25	40.0	276.0	JENDL-2
65.68	0	2.5	344.26	5.26	39.0	300.0	JENDL-2
66.55	0	2.5	243.04	3.04	40.0	200.0	JENDL-2
68.22	0	2.5	141.18	1.18	40.0	100.0	JENDL-2
69.18	0	2.5	160.7	0.7	40.0	120.0	JENDL-2
71.77	0	2.5	100.07	0.07	53.0	47.0	JENDL-2
72.17	0	2.5	411.53	1.53	40.0	370.0	JENDL-2
73.8	0	2.5	53.5	0.5	40.0	13.0	JENDL-2
75.94	0	2.5	159.76	4.76	52.0	103.0	JENDL-2
77.06	0	2.5	80.45	4.45	58.0	18.0	JENDL-2
77.73	0	2.5	1698.7	1.7	60.0	1637.0	JENDL-2
80.14	0	2.5	124.87	4.87	40.0	80.0	JENDL-2
81.36	0	2.5	261.9	6.9	40.0	215.0	JENDL-2
81.98	0	2.5	1017.9	2.9	40.0	975.0	JENDL-2
83.12	0	2.5	118.02	5.02	40.0	73.0	JENDL-2
85.35	0	2.5	200.5	3.5	52.0	145.0	JENDL-2
85.67	0	2.5	272.8	2.8	40.0	230.0	JENDL-2
86.0	0	2.5	350.72	0.72	40.0	310.0	JENDL-2
86.93	0	2.5	130.4	7.4	43.0	80.0	JENDL-2
87.8	0	2.5	322.35	2.35	40.0	280.0	JENDL-2
89.12	0	2.5	792.23	2.23	40.0	750.0	JENDL-2
90.6	0	2.5	215.7	1.7	40.0	175.0	JENDL-2
91.4	0	2.5	60.1	0.1	39.0	21.0	JENDL-2
91.88	0	2.5	60.12	0.12	35.0	25.0	JENDL-2
93.77	0	2.5	296.4	0.4	46.0	250.0	JENDL-2
95.24	0	2.5	683.6	0.6	40.0	643.0	JENDL-2
96.18	0	2.5	1041.5	1.5	40.0	1000.0	JENDL-2
97.53	0	2.5	499.85	0.85	40.0	459.0	JENDL-2
98.28	0	2.5	193.28	7.28	40.0	146.0	JENDL-2
99.74	0	2.5	350.16	2.16	18.0	330.0	JENDL-2
100.5	0	2.5	55.6	1.3	40.0	14.3	JENDL-2
101.42	0	2.5	147.61	1.61	72.0	74.0	JENDL-2
102.33	0	2.5	58.7	1.4	40.0	17.3	JENDL-2
103.52	0	2.5	48.73	1.53	40.0	7.2	JENDL-2
107.54	0	2.5	41.2	0.5	40.0	0.7	JENDL-2
107.85	0	2.5	92.2	1.2	40.0	51.0	JENDL-2
109.05	0	2.5	491.92	1.92	40.0	450.0	JENDL-2
110.2	0	2.5	791.45	0.45	40.0	751.0	JENDL-2
113.13	0	2.5	86.75	0.75	40.0	46.0	JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
115.4	0	2.5	1581.7	1.7	40.0	1540.0	JENDL-2
117.23	0	2.5	357.48	3.48	40.0	314.0	JENDL-2
120.33	0	2.5	545.8	0.8	40.0	505.0	JENDL-2
122.11	0	2.5	465.95	6.95	40.0	419.0	JENDL-2
123.24	0	2.5	101.35	2.35	40.0	59.0	JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
2.67	0	0.5	27.387	1.97	25.4	0.017	JENDL-2
14.6	0	0.5	24.311	0.061	24.2	0.05	JENDL-2
22.57	0	0.5	20.336	0.286	20.0	0.05	JENDL-2
40.95	0	0.5	29.501	0.451	29.0	0.05	JENDL-2
53.46	0	0.5	75.8949	51.95	23.9	0.045	JENDL-2
67.6	0	0.5	27.1225	4.578	22.5	0.0445	JENDL-2
88.45	0	0.5	24.8782	0.64	24.2	0.0382	JENDL-2
107.32	0	0.5	38.5394	16.99	21.5	0.0494	JENDL-2
131.4	0	0.5	37.0335	6.17	30.8	0.0635	JENDL-2
141.43	0	0.5	24.369	0.119	24.2	0.05	JENDL-2
149.7	0	0.5	39.2954	14.24	25.0	0.0554	JENDL-2
163.5	0	0.5	24.787	0.537	24.2	0.05	JENDL-2
204.8	0	0.5	73.5847	52.73	20.8	0.0548	JENDL-2
210.0	0	0.5	24.74	0.424	24.2	0.116	JENDL-2
215.3	0	0.5	41.384	5.2	36.0	0.184	JENDL-2
219.3	0	0.5	24.606	0.29	24.2	0.116	JENDL-2
232.7	0	0.5	33.071	4.94	28.0	0.131	JENDL-2
264.5	0	0.5	24.697	0.381	24.2	0.116	JENDL-2
271.95	0	0.5	24.481	0.165	24.2	0.116	JENDL-2
273.8	0	0.5	39.332	15.43	23.8	0.102	JENDL-2
274.75	0	0.5	24.486	0.17	24.2	0.116	JENDL-2
281.05	0	0.5	24.446	0.13	24.2	0.116	JENDL-2
298.7	0	0.5	34.426	8.31	26.0	0.116	JENDL-2
303.6	0	0.5	39.987	17.42	22.5	0.067	JENDL-2
319.9	0	0.5	256.478	232.9	23.5	0.0783	JENDL-2
327.6	0	0.5	24.816	0.5	24.2	0.116	JENDL-2
332.4	0	0.5	107.822	77.21	30.5	0.112	JENDL-2
374.3	0	0.5	30.696	6.38	24.2	0.116	JENDL-2
379.63	0	0.5	24.586	0.27	24.2	0.116	JENDL-2
382.2	0	0.5	68.0247	44.68	23.26	0.0847	JENDL-2
396.1	0	0.5	26.816	2.5	24.2	0.116	JENDL-2
399.9	0	0.5	25.936	1.62	24.2	0.116	JENDL-2
410.6	0	0.5	31.646	7.33	24.2	0.116	JENDL-2
424.1	0	0.5	28.546	4.23	24.2	0.116	JENDL-2
425.15	0	0.5	24.596	0.28	24.2	0.116	JENDL-2
473.7	0	0.5	25.106	0.79	24.2	0.116	JENDL-2
482.5	0	0.5	44.502	20.27	23.5	0.732	JENDL-2
494.75	0	0.5	24.586	0.27	24.2	0.116	JENDL-2
503.9	0	0.5	174.386	150.0	24.2	0.186	JENDL-2
536.6	0	0.5	121.177	100.0	21.0	0.177	JENDL-2
548.6	0	0.5	99.1939	74.0	25.0	0.194	JENDL-2
576.1	0	0.5	54.316	30.0	24.2	0.116	JENDL-2
595.0	0	0.5	53.0611	32.04	21.0	0.0211	JENDL-2
599.8	0	0.5	33.412	9.11	24.2	0.102	JENDL-2
610.8	0	0.5	36.214	11.95	24.2	6.399-2	JENDL-2
638.5	0	0.5	28.65	4.41	24.2	0.04	JENDL-2
665.0	0	0.5	26.966	2.7	24.2	0.066	JENDL-2
669.3	0	0.5	37.432	13.14	24.2	9.199-2	JENDL-2
693.2	0	0.5	61.052	38.65	22.0	0.402	JENDL-2
711.6	0	0.5	141.233	121.57	19.5	0.163	JENDL-2
727.6	0	0.5	27.42	3.17	24.2	0.05	JENDL-2
736.7	0	0.5	126.566	101.59	24.2	0.776	JENDL-2
755.1	0	0.5	159.623	135.4	21.5	2.723	JENDL-2
761.2	0	0.5	208.24	4.14	24.2	179.9	JENDL-2
788.5	0	0.5	87.274	61.4	24.2	1.674	JENDL-2
794.0	0	0.5	230.843	206.6	24.2	0.043	JENDL-2
824.5	0	0.5	29.057	4.65	24.2	0.207	JENDL-2
837.7	0	0.5	57.491	37.45	20.0	0.041	JENDL-2
856.6	0	0.5	57.441	35.3	22.0	0.141	JENDL-2
865.6	0	0.5	34.553	10.31	24.2	0.043	JENDL-2
878.1	0	0.5	83.0469	58.82	24.2	0.027	JENDL-2
886.5	0	0.5	51.7555	22.74	29.0	0.0155	JENDL-2
923.2	0	0.5	77.4789	59.45	18.0	0.029	JENDL-2
935.4	0	0.5	35.25	11.0	24.2	0.05	JENDL-2
939.6	0	0.5	34.25	10.0	24.2	0.05	JENDL-2
949.1	0	0.5	40.05	14.0	26.0	0.05	JENDL-2
977.9	0	0.5	38.75	14.5	24.2	0.05	JENDL-2
1004.0	0	0.5	67.2499	43.0	24.2	0.05	JENDL-2
1030.0	0	0.5	70.2499	46.0	24.2	0.05	JENDL-2
1045.0	0	0.5	142.25	118.0	24.2	0.05	JENDL-2
1062.5	0	0.5	57.25	33.0	24.2	0.05	JENDL-2
1087.5	0	0.5	224.25	200.0	24.2	0.05	JENDL-2
1117.0	0	0.5	29.25	5.0	24.2	0.05	JENDL-2
1129.5	0	0.5	34.25	10.0	24.2	0.05	JENDL-2
1148.0	0	0.5	324.25	300.0	24.2	0.05	JENDL-2
1182.5	0	0.5	37.25	13.0	24.2	0.05	JENDL-2
1197.0	0	0.5	119.25	95.0	24.2	0.05	JENDL-2
1207.0	0	0.5	64.2499	40.0	24.2	0.05	JENDL-2
1248.0	0	0.5	33.25	9.0	24.2	0.05	JENDL-2
1267.0	0	0.5	51.25	27.0	24.2	0.05	JENDL-2
1286.0	0	0.5	83.2499	59.0	24.2	0.05	JENDL-2
1696.0	0	0.5	63.3609	39.1	24.2	0.061	JENDL-2
1708.0	0	0.5	117.401	93.2	24.2	0.001	JENDL-2
1737.0	0	0.5	33.385	9.1	24.2	0.085	JENDL-2
1739.0	0	0.5	45.789	21.5	24.2	0.089	JENDL-2
1751.0	0	0.5	33.685	9.4	24.2	0.085	JENDL-2
1762.0	0	0.5	109.616	85.4	24.2	0.016	JENDL-2

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ENERGY (EV)	L	J	TOTAL WIDTH (MEV)	NEUTRON WIDTH (MEV)	GAMMA WIDTH (MEV)	FISSION WIDTH (MEV)	REFERENCE
1783.0	0	0.5	24.367	0.022	24.2	0.145	JENDL-2
1789.0	0	0.5	25.13	0.13	24.2	0.8	JENDL-2
1806.0	0	0.5	37.212	12.9	24.2	0.112	JENDL-2
1820.0	0	0.5	28.615	4.1	24.2	0.315	JENDL-2
1836.0	0	0.5	117.8	3.0	24.2	90.6	JENDL-2
1862.0	0	0.5	29.508	4.9	24.2	0.408	JENDL-2
1881.0	0	0.5	108.553	84.3	24.2	0.053	JENDL-2
1891.0	0	0.5	29.1	4.1	24.2	0.8	JENDL-2

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