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COMPARISON OF RESONANCE ABSORPTION THEORY USED IN THE CODES GYMEA AND PEAS AND EVALUATION OF RESIDUAL BACKGROUND REACTION RATES

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ABSTRACT

Details of the resonance theory used in the code GYMEA are described and compared with exact solutions for resonances in Th232, U235 , and Pu240. The relative merits of two methods for including background cross sections are evaluated, by an exhaustive study of the reaction rates across the resonances. It was found that the analytical procedure for calculating resonance reaction rates leads to tolerable errors in reactor physics calculations. The resonance adjusted calculations emerged as the most accurate method for computing the fine structure of the reaction rates across a resonance.

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1. INTRODUCTION

An accurate calculation of reaction rates which uses numerical methods of solving the neutron slowing down equation takes a long time, even on the most modern computers, owing to the large number of points required for a satisfactory representation of each resonance of an absorber. The philosophy of the GYMEA code (Pollard and Robinson 1966) has been that small errors can be tolerated in appealing to a rapid calculational technique that uses analytical methods for solving the slowing down equation across resonance regions. These errors can be further minimised by a careful choice of background cross section in such a way that the correct "1/v" tail is produced and the correct infinitely dilute resonance integral obtained. The entire cross section, including the thermal region, should be reproducible from the resonance parameters and background cross sections.

In this paper, two methods of including background cross sections are examined and compared with precise solutions of the reaction rates across resonances obtained from PEAS (Pollard 1964) modified for resonance asymmetry. The first is the "resonance removed" cross section introduced by Doherty (1964a) and the second is the "resonance adjusted" cross section developed by Cook (1966a). Each method has its advantages and limitations; their relative merits are evaluated and the GYMEA resonance theory is verified.

2. GYMEA RESONANCE THEORY

The theoretical basis of the code GYMEA for calculating group cross sections that are self-shielded and embody Doppler broadening effects, was put forward by McKay et al. (1965) as an improvement of the Hill-Schaefer method (1962). The group resonance absorption cross section is defined as:

$$\sigma_a = (1 - p)\,\bar{\xi}\sigma_p / p\delta u \quad , \qquad \ldots\ldots(1)$$

where δu = the width of the group in lethargy units,

$\bar{\xi}$ = the average logarithmic energy decrement,

p = the resonance escape probability.

McKay et al. found that, if one uses the Hill-Schaefer definition of p, negative values may be obtained in extreme cases. To ensure that $0 \leq p \leq 1$, they write:

$$p = e^{-\rho I / \bar{\xi}\sigma_p} \quad , \qquad \ldots\ldots(2)$$

where ρ is defined as:

$$\rho = 2/(1 + p), \text{ and}$$

$$I = \frac{\Gamma_a}{E_r}\,\sigma_o\, a_\lambda\, J(\theta, a_\lambda) \quad \text{(resonance integral)}, \qquad \ldots\ldots(3)$$

= the contribution of a single level of absorption width Γ_aeV , energy E_r, peak height σ_o. The function $J(\theta,\beta)$ is calculated in GYMEA using an approximation by Doherty (1963) to the exact form (Dresner 1960):

$$J(\theta,\beta) = \int_{-\infty}^{\infty} dx \ \psi(\theta,x)/\Big(\psi(\theta,x) + \beta\Big). \qquad .....(4)$$

The function $\psi(\theta,x)$ is the usual Voigt profile function:

$$\psi(\theta,x) = \frac{1}{2\sqrt{\pi\theta}} \int_{-\infty}^{\infty} e^{-(x-y)^2/4\theta} \ \frac{dy}{1+y^2} \ . \qquad .....(5)$$

The parameter a_λ in Equation 3 is determined from the equations:

$$\lambda_\ell = 1 - \alpha_\ell \ \frac{(C_1 + C_\lambda)}{x_\ell} \ \tan^{-1}\left(\frac{x_\ell}{C_1 + \alpha_\ell C_\lambda}\right) ,$$

$$x_\ell = 2 E_r (1 - \alpha_\ell)/\Gamma ,$$

$$\sigma_{p\lambda} = \sum_{\ell=1}^{k} \lambda_\ell \ \sigma_{p\ell} ,$$

$$\sigma_{p\ell} = N_\ell \ \sigma_{s\ell}/N_k ,$$

$$C_\lambda = (1 + 1/a_\lambda)^{\frac{1}{2}}, \text{ and}$$

$$a_\lambda = \frac{\sigma_{p\lambda}}{\sigma_o} \ \frac{\Gamma}{\Gamma_a + \lambda_k \Gamma_n} ,$$

Γ_n = neutron width,

where k refers to the resonance nuclide, and ℓ = 1 to k - 1, is the number of moderator nuclides. α_ℓ is the neutron fractional energy loss per elastic collision with nuclide ℓ, Γ is the total width of the resonance, N_ℓ is the nuclide concentration while λ_ℓ is the fitting parameter of Cohen and Goldstein (1962).

GYMEA solves the above equations by iterations on p, and, after calculating σ_a, it adds in the appropriate background cross section to give a total contribution of, say,

$$\sigma_{n,\gamma} = \frac{\Gamma\gamma}{\Gamma} \ \sigma_a + \sigma_{n,\gamma}\,(\text{background}), \qquad .....(6)$$

to the (n,γ) cross section.

3. RESONANCE REMOVED CROSS SECTIONS

Early codes written to aid the preparation of MULGA data libraries (Doherty 1963a) computed a resonance removed cross section, defined as:

$$\sigma_{n,\gamma}(E,T) = \sum_{\text{resonances}} \frac{\Gamma_\gamma}{\Gamma} \ \left(\sqrt{\frac{E_r}{E}} - 1\right) \ \sigma_o \ \psi(\theta,x) \quad , \qquad .....(7)$$

where $\theta = 4 E_r \ kT/A\Gamma^2$,

$x = 2 (E_r - E)/\Gamma$,

E = the neutron energy in eV,

E_r = the resonance energy in eV,

T = the temperature in degrees Kelvin,

σ_o = the peak height of a resonance, and

$\psi(\theta,x)$ = the Doppler-broadened contour function.

The purpose of this cross section was to correct approximations made by the above resonance theory. Errors arise because the theory makes the propositions that:

(i) the entire area beneath the resonance can be contained in a single resonance group, an approximation valid for wide groups,

(ii) the asymmetry produced by the energy dependence of the neutron wavelength and neutron partial width, Γ_n, can be neglected, and

(iii) the 1/E weight factor variation across the resonance group, which normally occurs in the integrand of (4), can be neglected and factored out, to give a $1/E_r$ term as in Equation 3. This term arises from flux effects, and the approximation is a good one for very narrow resonances.

The resonance removed cross section (7) corrects for error (ii) above in the limit of very narrow groups, but takes no account of the first or third discrepancy. Needless to say, it has proved quite satisfactory in reactor calculations which use a large number of narrow groups, as does GYMEA, but it was found to suffer from the troublesome property that the energy dependence of flux-averaged group cross sections computed by GYMEA was not predicted correctly. In essence, this is chiefly because the symmetric parts of resonance wings have been subtracted from the non-resonance groups by the approximation (7), then added to the resonance groups by GYMEA. Thus the discrepancy caused by the approximation (i) becomes dispersed over a very large energy range, and leads to resonances that

are too high when compared with experiment, as well as producing deep minima in the resonance tails in energy groups lying immediately below the resonance group. A further consequence is that resonance integrals are underestimated.

Self-shielding presents such a complicated theory that it is impossible to trace possible sources of error, although plausible physical arguments lead to the conclusion that reaction rates in groups just below a resonance must be underestimated. This is due to the minimum in the cross section, and the underestimated resonance escape probability.

One advantage of Equation 7 is that it conveys the effects of Doppler-broadening. Being a point cross section, it must be averaged numerically over each energy group, a process that is quite time-consuming. It is found that the temperature dependence of the resulting group cross sections is very slight and may be neglected in cases of practical interest.

4. RESONANCE ADJUSTED CROSS SECTIONS

The detailed derivation of resonance adjusted reaction rates is straightforward but lengthy. The method of applying corrections allows for all of the above errors, and is as follows:

(i) The non-resonant groups are computed to yield analytically derived cross sections which have the symmetric resonance tails left in. This means that all non-resonant cross sections should be the same as the experimental values, and are given by:

$$(\sigma_g)_{n.r.} = \frac{1}{\Delta u} \sum_{\text{resonances}} \int_{E_1}^{E_2} \sigma(E) \frac{dE}{E} \quad , \qquad \ldots\ldots(8)$$

where Δu = the lethargy width of the group,

$\sigma(E)$ = the particular cross section evaluated with all energy dependence included, and E_1, E_2 are the energy boundaries of the group.

(ii) The GYMEA infinitely dilute resonance cross section is subtracted from the resonance group cross section, computed analytically. GYMEA neglects the 1/E variation in flux, and so the second term of Equation 9 is evaluated in the same fashion. This means that the symmetric part of the resonance tails is, in effect, subtracted from the resonance group cross section, and the energy-dependent variations of the resonance contour symmetry are fully included. This procedure gives an expression for the resonance group cross section in infinite dilution of:

$$(\sigma_g)_{r.} = \frac{1}{\Delta u} \sum_{\substack{\text{all} \\ \text{resonances}}} \int_{E_1}^{E_2} \sigma(E) \frac{dE}{E} - \sum_{\substack{\text{resonances} \\ \text{in group}}} \frac{\pi \sigma_o \Gamma_i}{2 E_r} \quad , \qquad \ldots\ldots(9)$$

where Γ_i = the appropriate reaction partial width.

(iii) The expressions (8) and (9) may be evaluated analytically as was done by Doherty (1964b). One assumes a Breit-Wigner contour of the form:

$$\sigma_{n,\gamma}(E) = \frac{6.52 \times 10^5 \, \Gamma_n \Gamma_\gamma g_J}{E_r} \sqrt{\frac{E_r}{E}} \frac{1}{(E-E_r)^2 + \Gamma^2/4} \quad ,$$

with total width Γ, and substituted into (8), this gives a correction for one resonance of:

$$(\sigma_g)_{n.r.} = \frac{1}{\Delta u} \left\{ \frac{6.52 \times 10^5 \, \Gamma_n \Gamma_\gamma g_J}{\sqrt{E_r}} \left(I(E_2) - I(E_1) \right) \right\}, \qquad \ldots\ldots(10)$$

where $I(E) = I_1(E) + I_2(E) + I_3(E)$,

$$I_1(E) = -2/(\alpha^2 \sqrt{E}) \quad ,$$

$$I_2(E) = \frac{(\beta^2 - \alpha)}{2 \alpha^3 \beta} \ln \left\{ \frac{(E + \beta/2)^2 + \gamma^2}{(E - \beta/2)^2 + \gamma^2} \right\} ,$$

$$I_3(E) = \frac{3\alpha - \beta^3}{2 \alpha^3 \gamma} \left\{ \pi - \tan^{-1} \frac{(E-\beta/2)}{\gamma} - \tan^{-1} \left(\frac{E + \beta/2}{\gamma} \right) \right\} ,$$

$$\alpha^2 = E_r^2 + \Gamma^2/4 \, ,$$

$$\beta^2 = 2(E_r + \alpha) \text{, and}$$

$$\gamma^2 = (\alpha - E_r)/2.$$

The same integral applies to the first term in (9) for the resonance groups.

The expression (10) neglects the effect upon the correction to the resonance group of flux self-shielding and Doppler broadening. However, when computing reaction rates, GYMEA itself shields the correction numerically, while the entire temperature dependence is contained in the group cross section of Equation 1. Therefore temperature coefficients of reactivity due to the Doppler effect, and shielded group cross sections, are evaluated correctly by GYMEA, despite the above assumptions.

Unlike the resonance removed concept, this method gives the correct

limiting values of the group cross sections both as $\Delta u \to 0$, and $\Delta u \to \infty$. All of the errors enumerated in the previous section are eliminated without sacrificing any advantages inherent in the resonance removed concept.

5. GYMEA CHECKOUT AND COMPARISON OF METHODS

As a check of the methods outlined above, various critical cases of resonance reaction rate calculations were chosen, both to test the GYMEA resonance theory, and the method of including background cross sections. These are listed below.

5.1 Pu240 Comparison

As a good example of a high, broad, low-energy peak, the 1eV resonance in Pu240 was considered. Three sets of cross section data were prepared (Table 1).

TABLE 1. DATA FOR Pu240 COMPARISON

Library Name	Theory	Resonance Parameter Source
PU240	R.R.	BNL-325 (1958) (Hughes and Schwartz)
'PU4Ø'	R.A.	BNL-325 (1958) (Hughes and Schwartz)
'PU4O'	R.A.	BNL-325, Supplement 2 (1965) (Stehn et al.)

These three samples, together with Be9 data were loaded as a GYMEA library using EDITOR (Ford 1966), and calculations carried out for seven different concentrations of Pu240. For each concentration, the one-group slowing down isolated resonance reaction rates at 300°K were computed using GYMEA and compared with the results obtained from PEAS. The single group studied covered the GYMEA groups 49 to 80 inclusive of a standard 120 group library NDXC (Cook 1966b). This corresponds to an energy range from 10.7 eV to 0.414 eV. The PEAS runs were assigned a similar energy range.

Owing to the fact that the GYMEA reaction rates included the effects of other high energy absorptions and thermalization, corrections had to be applied to validate the comparison with PEAS. These corrections can be summarized in the formula:

Slowing-down isolated resonance reaction rate

$$= (N\sigma_g \phi_g / \text{source neutron}) \times \frac{1}{1 + 2T/E_r} \times \frac{\phi_{g(\text{asymptotic})}}{\phi_{g(\text{group 48})}} \quad , \qquad \ldots\ldots(11)$$

where N = the concentration of Pu240 in atoms/cm^3,

σ_g = the microscopic one-group cross section of Pu240,

ϕ_g = the GYMEA one-group flux,

T = the temperature in degrees Kelvin.

Owing to this thermalization effect, it was not considered worthwhile to treat the detailed reaction rates for any resonances below ~2 eV. Furthermore, we can see no point in comparing the theories in detail below ~2 eV.

The infinitely dilute resonance integrals were also calculated and it was found that:

I (calculated from experiment) = 8452 ± 170 barns

I (R.R.) = 8454 barns

I (R.A.) = 8457 barns .

In all of the calculations, the concentration of Be9 was taken to be 10^{22} atoms/cm^3, and the temperature was 300°K in all runs. The resulting reaction rates are listed in Table 2. σ_p is the macroscopic scattering cross section per absorber atom and N_{Pu} is the concentration of Pu240 as atoms per cm^3 in units of 10^{24}. Also shown are the absolute and percentage errors. Since the error in PEAS for the extreme step length used is estimated to be about 2 per cent., (Pollard 1966) both results are within this limit for the dilute systems. However, as the system becomes progressively more concentrated in Pu240, the resonance removed theory leads to an increasing discrepancy, while the resonance adjusted approximation remains within tolerable limits, especially in view of the rough corrections applied in Equation 11 to take account of thermalization effects.

5.2 Th232 Comparison

A good example of a narrow, high peak is the 21.78 eV resonance in Th232. It has measured parameters of $\Gamma_n = 2 \times 10^{-3}$ eV and $\Gamma_\gamma = 1.9 \times 10^{-2}$ eV (Garg et al. 1964). The fine details of the group reaction rates and capture probabilities were studied for this resonance well into the tail regions. Firstly, a library was loaded containing Be9 data from the GYMEA library NDXD and all Be9 absorption cross sections were put equal to zero. Three versions of a Th232 set of cross sections were also loaded. These were:

(i) 'THRR' - This is a resonance removed version obtained from GUNYA 2 (Cook 1966a) using only the above resonance.

(ii) 'THRA' - which is the resonance adjusted version derived from GUNYA 2, again using only the single level contribution.

(iii) 'THF' - which has zero cross sections as a background, except for group 120, where we put $\sigma_a(120) = 0.3036$ barns.

This proved necessary to avoid round-off errors in normalizations carried out with GYMEA.

A set of six representative concentrations were chosen so that capture probabilities and group reaction rates covering most cases of interest could be obtained from PEAS and GYMEA, and compared. The group flux was normalized to unity in group 33 and a finite group buckling was introduced to avoid round-off errors in the absorption to source ratio. Results for temperatures of 0°K, 300°K, and 1,000°K were obtained.

In a full assessment of the accuracy of these methods, a comprehensive tabulation gives a more quantitative and conclusive vindication of the technique than a graph. Tables 3 to 8 contain the group reaction rates and capture probabilities in the range from 2.05 eV to 583 eV for the single level contribution. The PEAS and GYMEA results are shown, together with the percentage errors in each group. The general trend is that the error in the initial group is always large, but decreases as the calculation proceeds. It becomes quite small in the reaction rate table but within the range below the resonance it is clear that GYMEA does not reproduce the rapid Placzek oscillations present in the PEAS results. As can be seen from the trend in the capture probabilities, these oscillations almost cancel.

The relative deviation is smallest for the 300°K cases listed in Tables (9A,9B) to (12A,12B), at a concentration around 10^{-4}. This is the range of primary interest in thermal reactors. The results of both resonance removed and resonance adjusted calculations are shown. It is quite apparent that the resonance removed reaction rates are greatly in error in the wings of the resonance, and even yield negative reaction rates in groups above the resonance. The resonance adjusted result on the other hand follows the trend of PEAS quite well.

The integrated reaction rates are given in Table 13. Note that the resonance removed result, despite its failure to reproduce the detailed group reaction rate, does yield a satisfactory result for the integral over a sufficiently large energy range. The discrepancy between the two codes' results seems to increase with dilution, and we attribute this to an inherent inadequacy of the PEAS type of numerical integration. This is because GYMEA tends to the precise experimental result with increasing dilution, while the error in the PEAS resonance integral, also shown in Table 13, follows the trend of the discrepancy. From the 1,000°K case it can be seen that the deviation increases slightly with temperature.

Table 14 gives the results of the comparison between the resonance removed

and resonance adjusted theory at 300°K. The percentage error in the resonance group reaction rate is shown and it is evident that the resonance adjusted calculation gives slightly more overall accuracy than the resonance removed one. To estimate the goodness of fit to the background reaction rates in the other 31 groups, χ^2 was determined for each run. The values of χ^2 for the resonance adjusted calculations were some 250 times smaller than the corresponding values for the resonance removed cases, constituting a far better fit to the detailed fine structure of the reaction rate energy spectrum.

5.3 U235 Comparison

The study was considered to be incomplete without the investigation of a broad resonance of a fissile nuclide. For this case, the 8.79 eV resonance in U235 was selected, with parameters $\Gamma_n = 1.19 \times 10^{-3}$ eV, $\Gamma_\gamma = 5.3 \times 10^{-2}$ eV, and $\Gamma_f = 7.4 \times 10^{-2}$ eV. (Hughes et al. 1958). A GYMEA library was prepared with the Be9 data used for the Th232 comparison, together with nuclides 'U5RA' and 'U5RR'. These were:

'U5RA' - the U235 resonance adjusted cross section from GUNYA 2 using the single peak at 8.79 eV only. All cross sections from groups 1 to 32 were set equal to zero.

'U5RR' - the corresponding resonance removed cross section for GUNYA 2, again with cross sections in groups 1 to 32 set equal to zero.

A set of seven concentrations was chosen and the group reaction rates computed using PEAS and GYMEA. To avoid an error of 1 per cent. made by PEAS in computing resonance contours at high temperatures, the results were compared at 0°K over a region of U235 concentrations ranging from 6×10^{-3} to 6×10^{-10}. Tables 15 to 21B show reaction rates and capture probabilities with percentage errors given in each case. Again it is apparent from the resonance adjusted test cases in Tables 15 and 16 that although the error appears to be large in the first few groups, the GYMEA results oscillate around the PEAS answers, even though the Placzek variations are not faithfully reproduced. From Tables (17A, 17B) to (21A, 21B) it is evident that the resonance removed reaction rates fail entirely to predict fine structure, while the resonance adjusted calculation performs adequately.

A summary of the integrated reaction rates appears in Table 22 where it can be seen that the resonance adjusted theory is slightly better than the resonance removed theory. In Table 23 the range is divided into two distinct parts. The first part consists of the resonance group computed analytically by GYMEA, and the

other is the lumped 31 groups which are treated numerically. The table shows the error in the resonance group reaction rates for a range of concentrations from 6×10^{-5} to 6×10^{-10}. The resonance adjusted examples generally have a much smaller error in this group than the resonance removed examples. To test the goodness of fit to the background, χ^2 was calculated taking the non-resonant 31 groups together. It was found that the χ^2 for the resonance adjusted case was some 250 times smaller than the resonance removed value. Although it may appear pointless to insist on good fits to such a small background reaction rate as occurs in the remote wings of the resonance, it must be remembered that we have restricted ourselves to one level only. When large numbers of levels are present, these backgrounds add together to produce reaction rates that are quite appreciable in magnitude.

Strong self-shielding and shielding by other resonances may considerably reduce the contribution of the resonance group, thus enhancing the contribution from the background. These effects have indeed been observed in GYMEA calculations. It cannot be overemphasised that the resonance adjusted method reproduces the experimental cross sections and the resonance removed method does not.

6. SUMMARY

The analytical procedure of calculating resonance reaction rates is quite sufficient for reactor physics calculations and the ensuing errors are quite tolerable, indeed usually less than errors inherent in using a group-wise integration solution. Such large discrepancies as do arise between PEAS and GYMEA can be attributed to the coarseness of the mesh intervals used in the PEAS calculations. GYMEA gives the precise resonance integral when checked against GUNYA 2 and works exceptionally well for dilute systems.

However, as can be appreciated for both the Th232 and U235 calculations, the percentage deviation appears to undergo a systematic change at a concentration of around 10^{-4}. This is evidently a property of the resonance theory used, as one can see from the tables that the resonance group dominates the integrated reaction rates. Figure 1 illustrates the systematic trend in each case.

Although it is realised that the discrepancies between the two theories are largest for the strong concentrations, we chose a representative sample most often encountered in reactor calculations.

As regards the inclusion of background cross sections, the resonance adjusted version emerges as the better all-round prospect. It can reproduce reaction rates

for small group widths accurately, which the resonance removed calculation cannot do, and the integrated reaction rates are generally more accurate.

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TABLE 2. Pu240 ONE-GROUP REACTION RATES AT 300°K

σ_p	N_{Pu}	PEAS	RA	%RA	RR	%RR
7×10^4	8×10^{-7}	0.2856	0.2657	6.93	0.2068	26.7
10^5	6×10^{-7}	0.2389	0.2240	6.24	0.1819	23.9
5×10^5	1.2×10^{-7}	0.06895	0.06840	0.80	0.06434	6.7
10^6	6×10^{-8}	0.03674	0.03691	-0.46	0.03565	3.0
5×10^6	1.2×10^{-8}	7.766×10^{-3}	7.889×10^{-3}	-1.58	7.807×10^{-3}	- 0.5
10^7	6×10^{-9}	3.911×10^{-3}	3.982×10^{-3}	-1.82	3.954×10^{-3}	- 1.1
10^8	6×10^{-10}	3.937×10^{-4}	4.021×10^{-4}	-2.13	4.003×10^{-4}	- 1.7

(Note: Table 1 appears in text p.6)

TABLE 3: Th232 RESULTS FOR $N=6 \times 10^{-3}$ AND T=1000°K

GROUP	GROUP REACTION RATES		% DIFFERENCE	CAPTURE PROBABILITY		%
	PEAS	GYMEA		PEAS	GYMEA	
33	1.100×10^{-7}	1.592×10^{-7}	44.98	2.303×10^{-7}	1.592×10^{-7}	-30.9
34	2.102×10^{-7}	2.157×10^{-7}	2.60	4.405×10^{-7}	3.749×10^{-7}	-14.9
35	4.486×10^{-7}	4.719×10^{-7}	5.19	8.892×10^{-7}	8.469×10^{-7}	- 4.8
36	8.299×10^{-7}	9.065×10^{-7}	9.24	1.719×10^{-6}	1.753×10^{-6}	2.0
37	1.639×10^{-6}	1.819×10^{-6}	10.97	3.358×10^{-6}	3.572×10^{-6}	6.4
38	3.300×10^{-6}	3.578×10^{-6}	8.42	6.658×10^{-6}	7.150×10^{-6}	7.4
39	6.821×10^{-6}	7.352×10^{-6}	7.78	1.348×10^{-5}	1.450×10^{-5}	7.6
40	1.464×10^{-5}	1.584×10^{-5}	8.14	2.812×10^{-5}	3.034×10^{-5}	7.9
41	3.326×10^{-5}	3.596×10^{-5}	8.12	6.138×10^{-5}	6.630×10^{-5}	8.0
42	8.264×10^{-5}	8.964×10^{-5}	8.47	1.440×10^{-4}	1.559×10^{-4}	8.3
43	2.406×10^{-4}	2.616×10^{-4}	8.75	3.846×10^{-4}	4.176×10^{-4}	8.6
44	9.899×10^{-4}	1.081×10^{-3}	9.22	1.374×10^{-3}	1.499×10^{-3}	9.0
45	2.265×10^{-2}	2.402×10^{-2}	6.08	2.402×10^{-2}	2.552×10^{-2}	6.3
46	2.385×10^{-1}	2.577×10^{-1}	8.06	2.625×10^{-1}	2.832×10^{-1}	7.9
47	3.283×10^{-3}	3.460×10^{-3}	5.40	2.658×10^{-1}	2.867×10^{-1}	7.9
48	1.394×10^{-3}	1.476×10^{-3}	5.88	2.672×10^{-1}	2.881×10^{-1}	7.9
49	6.189×10^{-4}	6.330×10^{-4}	2.28	2.678×10^{-1}	2.888×10^{-1}	7.8
50	3.415×10^{-4}	3.700×10^{-4}	8.36	2.681×10^{-1}	2.892×10^{-1}	7.8
51	3.178×10^{-4}	3.405×10^{-4}	7.13	2.685×10^{-1}	2.894×10^{-1}	7.8
52	3.586×10^{-4}	3.222×10^{-4}	-10.16	2.688×10^{-1}	2.898×10^{-1}	7.8
53	2.859×10^{-4}	3.098×10^{-4}	8.35	2.690×10^{-1}	2.901×10^{-1}	7.8
54	2.782×10^{-4}	3.008×10^{-4}	8.11	2.694×10^{-1}	2.904×10^{-1}	7.8
55	2.730×10^{-4}	2.956×10^{-4}	8.29	2.696×10^{-1}	2.907×10^{-1}	7.8
56	3.237×10^{-4}	2.919×10^{-4}	-9.83	2.700×10^{-1}	2.910×10^{-1}	7.8
57	2.688×10^{-4}	2.922×10^{-4}	8.70	2.702×10^{-1}	2.913×10^{-1}	7.8
58	2.697×10^{-4}	2.930×10^{-4}	8.64	2.705×10^{-1}	2.916×10^{-1}	7.8
59	2.717×10^{-4}	2.952×10^{-4}	8.65	2.708×10^{-1}	2.919×10^{-1}	7.8
60	2.751×10^{-4}	3.002×10^{-4}	9.13	2.711×10^{-1}	2.922×10^{-1}	7.8
61	3.359×10^{-4}	3.054×10^{-4}	-9.07	2.714×10^{-1}	2.925×10^{-1}	7.8
62	2.860×10^{-4}	3.120×10^{-4}	9.08	2.717×10^{-1}	2.928×10^{-1}	7.8
63	2.926×10^{-4}	3.214×10^{-4}	9.86	2.720×10^{-1}	2.931×10^{-1}	7.8
64	3.000×10^{-4}	3.288×10^{-4}	9.61	2.723×10^{-1}	2.935×10^{-1}	7.8

TABLE 4: Th232 RESULTS FOR $N=6 \times 10^{-4}$, $T=0°K$

GROUP	GROUP REACTION RATES		% DIFFERENCE	CAPTURE PROBABILITY		%
	PEAS	GYMEA		PEAS	GYMEA	
33	1.151×10^{-8}	1.592×10^{-8}	38.27	2.411×10^{-8}	1.592×10^{-8}	-34.0
34	2.201×10^{-8}	2.157×10^{-8}	-2.02	4.612×10^{-8}	3.749×10^{-8}	-18.7
35	4.697×10^{-8}	4.719×10^{-8}	0.46	9.309×10^{-8}	8.467×10^{-8}	-9.0
36	8.689×10^{-8}	9.064×10^{-8}	4.32	1.800×10^{-7}	1.753×10^{-7}	-2.6
37	1.716×10^{-7}	1.819×10^{-7}	5.97	3.516×10^{-7}	3.572×10^{-7}	1.6
38	3.455×10^{-7}	3.577×10^{-7}	3.54	6.971×10^{-7}	7.149×10^{-7}	2.6
39	7.142×10^{-7}	7.351×10^{-7}	2.93	1.411×10^{-6}	1.450×10^{-6}	2.7
40	1.533×10^{-6}	1.583×10^{-6}	3.59	2.945×10^{-6}	3.033×10^{-6}	3.0
41	3.483×10^{-6}	3.596×10^{-6}	3.24	6.427×10^{-6}	6.629×10^{-6}	3.1
42	8.654×10^{-6}	8.964×10^{-6}	3.58	1.508×10^{-5}	1.459×10^{-5}	-3.2
43	2.520×10^{-5}	2.617×10^{-5}	3.47	4.028×10^{-5}	4.076×10^{-5}	1.2
44	1.038×10^{-4}	1.083×10^{-4}	4.36	1.440×10^{-4}	1.490×10^{-4}	3.5
45	2.422×10^{-3}	2.470×10^{-3}	2.00	2.657×10^{-3}	2.619×10^{-3}	2.1
46	6.913×10^{-2}	7.128×10^{-2}	3.11	7.170×10^{-2}	7.390×10^{-2}	3.1
47	4.304×10^{-4}	4.437×10^{-4}	3.11	7.213×10^{-2}	7.435×10^{-2}	3.1
48	1.837×10^{-4}	1.925×10^{-4}	4.77	7.231×10^{-2}	7.454×10^{-2}	3.1
49	8.227×10^{-5}	8.226×10^{-4}	0.13	7.240×10^{-2}	7.462×10^{-2}	3.1
50	4.529×10^{-5}	4.820×10^{-5}	6.45	7.244×10^{-2}	7.467×10^{-2}	3.1
51	4.212×10^{-5}	4.437×10^{-5}	5.33	7.248×10^{-2}	7.471×10^{-2}	3.1
52	4.761×10^{-5}	4.198×10^{-5}	-11.83	7.253×10^{-2}	7.475×10^{-2}	3.1
53	3.799×10^{-5}	4.038×10^{-5}	6.28	7.257×10^{-2}	7.479×10^{-2}	3.1
54	3.695×10^{-5}	3.922×10^{-5}	6.15	7.261×10^{-2}	7.483×10^{-2}	3.1
55	3.627×10^{-5}	3.857×10^{-5}	6.35	7.264×10^{-2}	7.487×10^{-2}	3.1
56	4.305×10^{-5}	3.809×10^{-5}	-11.52	7.269×10^{-2}	7.491×10^{-2}	3.1
57	3.578×10^{-5}	3.815×10^{-5}	6.62	7.272×10^{-2}	7.495×10^{-2}	3.1
58	3.586×10^{-5}	3.827×10^{-5}	6.71	7.276×10^{-2}	7.499×10^{-2}	3.1
59	3.617×10^{-5}	3.857×10^{-5}	6.63	7.279×10^{-2}	7.503×10^{-2}	3.1
60	3.661×10^{-5}	3.924×10^{-5}	7.18	7.283×10^{-2}	7.506×10^{-2}	3.1
61	4.474×10^{-5}	3.994×10^{-5}	-10.73	7.287×10^{-2}	7.510×10^{-2}	3.1
62	3.811×10^{-5}	4.081×10^{-5}	7.08	7.291×10^{-2}	7.515×10^{-2}	3.1
63	3.900×10^{-5}	4.207×10^{-5}	7.86	7.295×10^{-2}	7.519×10^{-2}	3.1
64	4.001×10^{-5}	4.305×10^{-5}	7.60	7.299×10^{-2}	7.523×10^{-2}	3.1

TABLE 5: Th232 RESULTS FOR $N=6 \times 10^{-5}$, $T=0°K$

GROUP	GROUP REACTION RATES		% DIFFERENCE	CAPTURE PROBABILITY		%
	PEAS	GYMEA		PEAS	GYMEA	
33	1.157×10^{-9}	1.590×10^{-9}	37.43	2.423×10^{-9}	1.590×10^{-9}	-34.4
34	2.211×10^{-9}	2.154×10^{-9}	-2.62	4.634×10^{-9}	3.743×10^{-9}	-19.2
35	4.719×10^{-9}	4.712×10^{-9}	-0.16	9.353×10^{-9}	8.455×10^{-9}	- 9.6
36	8.730×10^{-9}	9.052×10^{-9}	3.69	1.808×10^{-8}	1.751×10^{-8}	- 3.2
37	1.724×10^{-8}	1.816×10^{-8}	5.32	3.533×10^{-8}	3.567×10^{-8}	1.0
38	3.471×10^{-8}	3.572×10^{-8}	2.90	7.004×10^{-8}	7.139×10^{-8}	1.9
39	7.176×10^{-8}	7.340×10^{-8}	2.30	1.418×10^{-7}	1.448×10^{-7}	2.1
40	1.541×10^{-7}	1.581×10^{-7}	2.64	2.958×10^{-7}	3.029×10^{-7}	2.4
41	3.499×10^{-7}	3.591×10^{-7}	2.61	6.458×10^{-7}	6.620×10^{-7}	2.5
42	8.695×10^{-7}	8.952×10^{-7}	2.95	1.515×10^{-6}	1.557×10^{-6}	2.8
43	2.532×10^{-6}	2.613×10^{-6}	3.23	4.047×10^{-6}	4.171×10^{-6}	3.1
44	1.043×10^{-5}	1.081×10^{-5}	3.72	1.447×10^{-5}	1.498×10^{-5}	3.5
45	2.450×10^{-4}	2.474×10^{-4}	0.99	2.594×10^{-4}	2.624×10^{-4}	1.1
46	2.127×10^{-2}	2.198×10^{-2}	3.32	2.153×10^{-2}	2.224×10^{-2}	3.3
47	4.554×10^{-5}	4.669×10^{-5}	2.53	2.157×10^{-2}	2.229×10^{-2}	3.3
48	1.941×10^{-5}	2.032×10^{-5}	4.67	2.159×10^{-2}	2.231×10^{-2}	3.3
49	8.710×10^{-6}	8.676×10^{-6}	-0.39	2.160×10^{-2}	2.231×10^{-2}	3.3
50	4.780×10^{-6}	5.086×10^{-6}	6.40	2.161×10^{-2}	2.232×10^{-2}	3.3
51	4.460×10^{-6}	4.682×10^{-6}	4.97	2.161×10^{-2}	2.232×10^{-2}	3.3
52	5.030×10^{-6}	4.430×10^{-6}	11.93	2.162×10^{-2}	2.233×10^{-2}	3.3
53	4.020×10^{-6}	4.261×10^{-6}	5.99	2.162×10^{-2}	2.233×10^{-2}	3.3
54	3.900×10^{-6}	4.139×10^{-6}	6.13	2.162×10^{-2}	2.234×10^{-2}	3.3
55	3.840×10^{-6}	4.070×10^{-6}	5.99	2.163×10^{-2}	2.234×10^{-2}	3.3
56	4.550×10^{-6}	4.020×10^{-6}	-11.65	2.163×10^{-2}	2.234×10^{-2}	3.3
57	3.780×10^{-6}	4.026×10^{-6}	6.51	2.164×10^{-2}	2.235×10^{-2}	3.3
58	3.790×10^{-6}	4.039×10^{-6}	6.57	2.164×10^{-2}	2.235×10^{-2}	3.3
59	3.830×10^{-6}	4.071×10^{-6}	6.29	2.164×10^{-2}	2.236×10^{-2}	3.3
60	3.870×10^{-6}	4.142×10^{-6}	7.03	2.165×10^{-2}	2.236×10^{-2}	3.3
61	4.730×10^{-6}	4.216×10^{-6}	-10.87	2.165×10^{-2}	2.237×10^{-2}	3.3
62	4.030×10^{-6}	4.308×10^{-6}	6.90	2.166×10^{-2}	2.237×10^{-2}	3.3
63	4.130×10^{-6}	4.441×10^{-6}	7.52	2.166×10^{-2}	2.237×10^{-2}	3.3
64	4.230×10^{-6}	4.545×10^{-6}	7.45	2.167×10^{-2}	2.238×10^{-2}	3.3

TABLE 6: Th232 RESULTS FOR $N=6 \times 10^{-6}$, T=0°K

GROUP	GROUP REACTION RATES		% DIFFERENCE	CAPTURE PROBABILITY		%
	PEAS	GYMEA		PEAS	GYMEA	
33	1.157×10^{-10}	1.592×10^{-10}	37.59	2.424×10^{-10}	1.592×10^{-10}	-34.3
34	2.209×10^{-10}	2.157×10^{-10}	-2.37	4.636×10^{-10}	3.749×10^{-10}	-19.1
35	4.722×10^{-10}	4.719×10^{-10}	0.05	9.358×10^{-10}	8.469×10^{-10}	-9.5
36	8.734×10^{-10}	9.065×10^{-10}	3.79	1.809×10^{-9}	1.753×10^{-9}	-3.1
37	1.725×10^{-9}	1.819×10^{-9}	5.44	3.534×10^{-9}	3.572×10^{-9}	1.1
38	3.473×10^{-9}	3.578×10^{-9}	3.01	7.007×10^{-9}	7.150×10^{-9}	2.0
39	7.179×10^{-9}	7.352×10^{-9}	2.41	1.419×10^{-8}	1.450×10^{-8}	2.2
40	1.541×10^{-8}	1.584×10^{-9}	2.74	2.960×10^{-8}	3.034×10^{-8}	2.5
41	3.501×10^{-8}	3.596×10^{-8}	2.72	6.461×10^{-8}	6.630×10^{-8}	2.6
42	8.699×10^{-8}	8.965×10^{-8}	3.06	1.516×10^{-7}	1.560×10^{-7}	2.9
43	2.533×10^{-7}	2.618×10^{-7}	3.34	4.049×10^{-7}	4.177×10^{-7}	3.2
44	1.043×10^{-6}	1.083×10^{-6}	3.83	1.448×10^{-6}	1.501×10^{-6}	3.6
45	2.453×10^{-5}	2.478×10^{-5}	1.06	2.597×10^{-5}	2.628×10^{-5}	1.2
46	4.901×10^{-3}	5.318×10^{-3}	8.51	4.927×10^{-3}	5.345×10^{-3}	8.5
47	4.625×10^{-6}	4.754×10^{-4}	2.78	4.932×10^{-3}	5.349×10^{-3}	8.5
48	1.967×10^{-6}	2.070×10^{-6}	5.26	4.934×10^{-3}	5.352×10^{-3}	8.5
49	8.810×10^{-7}	8.840×10^{-7}	0.34	4.935×10^{-3}	5.352×10^{-3}	8.5
50	4.850×10^{-7}	5.183×10^{-7}	6.86	4.935×10^{-3}	5.353×10^{-3}	8.5
51	4.500×10^{-7}	4.770×10^{-7}	6.01	4.936×10^{-3}	5.353×10^{-3}	8.5
52	5.100×10^{-7}	4.514×10^{-7}	-11.50	4.936×10^{-3}	5.354×10^{-3}	8.5
53	4.050×10^{-7}	4.342×10^{-7}	7.20	4.937×10^{-3}	5.354×10^{-3}	8.5
54	3.940×10^{-7}	4.218×10^{-7}	7.05	4.937×10^{-3}	5.355×10^{-3}	8.5
55	3.880×10^{-7}	4.147×10^{-7}	6.89	4.937×10^{-3}	5.355×10^{-3}	8.5
56	4.620×10^{-7}	4.096×10^{-7}	-11.33	4.938×10^{-3}	5.356×10^{-3}	8.5
57	3.840×10^{-7}	4.103×10^{-7}	6.84	4.938×10^{-3}	5.356×10^{-3}	8.5
58	3.850×10^{-7}	4.116×10^{-7}	6.90	4.939×10^{-3}	5.356×10^{-3}	8.5
59	3.870×10^{-7}	4.148×10^{-7}	7.19	4.938×10^{-3}	5.357×10^{-3}	8.5
60	3.900×10^{-7}	4.221×10^{-7}	8.22	4.939×10^{-3}	5.357×10^{-3}	8.5
61	4.790×10^{-7}	4.296×10^{-7}	-10.32	4.940×10^{-3}	5.358×10^{-3}	8.5
62	4.070×10^{-7}	4.390×10^{-7}	7.86	4.940×10^{-3}	5.358×10^{-3}	8.5
63	4.180×10^{-7}	4.525×10^{-7}	8.26	4.941×10^{-3}	5.359×10^{-3}	8.5
64	4.270×10^{-7}	4.613×10^{-7}	8.04	4.941×10^{-3}	5.359×10^{-3}	8.5

TABLE 7: Th232 RESULTS FOR $N=6 \times 10^{-7}$, T=0°K

GROUP	GROUP REACTION RATES		% DIFFERENCE	CAPTURE PROBABILITY		%
	PEAS	GYMEA		PEAS	GYMEA	
33	1.157×10^{-11}	1.592×10^{-11}	37.58	2.424×10^{-11}	1.592×10^{-11}	-34.3
34	2.213×10^{-11}	2.157×10^{-11}	-2.51	4.636×10^{-11}	3.749×10^{-11}	-19.1
35	4.722×10^{-11}	4.719×10^{-11}	-0.06	9.358×10^{-11}	8.469×10^{-11}	- 9.5
36	8.734×10^{-11}	9.065×10^{-11}	3.79	1.809×10^{-10}	1.753×10^{-10}	- 3.1
37	1.725×10^{-10}	1.819×10^{-10}	5.43	3.534×10^{-10}	3.572×10^{-10}	1.1
38	3.473×10^{-10}	3.578×10^{-10}	3.01	7.008×10^{-10}	7.150×10^{-10}	2.0
39	7.179×10^{-10}	7.352×10^{-10}	2.40	1.419×10^{-9}	1.450×10^{-9}	2.2
40	1.541×10^{-9}	1.584×10^{-9}	2.74	2.960×10^{-9}	3.034×10^{-9}	2.5
41	3.501×10^{-9}	3.596×10^{-9}	2.72	6.461×10^{-9}	6.630×10^{-9}	2.6
42	8.700×10^{-9}	8.965×10^{-9}	3.06	1.516×10^{-8}	1.560×10^{-8}	2.9
43	2.533×10^{-8}	2.618×10^{-8}	3.34	4.049×10^{-8}	4.177×10^{-8}	3.2
44	1.043×10^{-7}	1.083×10^{-7}	3.83	1.448×10^{-7}	1.501×10^{-7}	3.6
45	2.453×10^{-6}	2.476×10^{-6}	1.05	2.598×10^{-6}	2.629×10^{-6}	1.9
46	6.726×10^{-4}	7.379×10^{-4}	9.70	6.752×10^{-4}	7.405×10^{-4}	9.7
47	4.644×10^{-7}	4.775×10^{-7}	2.82	6.757×10^{-4}	7.410×10^{-4}	9.7
48	1.972×10^{-7}	2.080×10^{-7}	5.48	6.759×10^{-4}	7.412×10^{-4}	9.7
49	8.850×10^{-8}	8.881×10^{-8}	0.35	6.760×10^{-4}	7.413×10^{-4}	9.7
50	4.850×10^{-8}	5.207×10^{-8}	7.35	6.760×10^{-4}	7.413×10^{-4}	9.7
51	4.520×10^{-8}	4.796×10^{-8}	6.03	6.761×10^{-4}	7.414×10^{-4}	9.7
52	5.100×10^{-8}	4.535×10^{-8}	-11.08	6.761×10^{-4}	7.414×10^{-4}	9.7
53	4.060×10^{-8}	4.362×10^{-8}	7.43	6.762×10^{-4}	7.415×10^{-4}	9.7
54	3.960×10^{-8}	4.237×10^{-8}	7.00	6.762×10^{-4}	7.415×10^{-4}	9.7
55	3.890×10^{-8}	4.167×10^{-8}	7.11	6.763×10^{-4}	7.415×10^{-4}	9.7
56	4.590×10^{-8}	4.115×10^{-8}	-10.34	6.763×10^{-4}	7.416×10^{-4}	9.7
57	3.820×10^{-8}	4.122×10^{-8}	7.89	6.763×10^{-4}	7.416×10^{-4}	9.7
58	3.820×10^{-8}	4.135×10^{-8}	8.24	6.764×10^{-4}	7.417×10^{-4}	9.7
59	3.860×10^{-8}	4.167×10^{-8}	7.96	6.764×10^{-4}	7.417×10^{-4}	9.7
60	3.940×10^{-8}	4.240×10^{-8}	7.62	6.765×10^{-4}	7.418×10^{-4}	9.7
61	4.790×10^{-8}	4.316×10^{-8}	-9.09	6.765×10^{-4}	7.418×10^{-4}	9.7
62	4.080×10^{-8}	4.410×10^{-8}	8.09	6.765×10^{-4}	7.418×10^{-4}	9.7
63	4.180×10^{-8}	4.546×10^{-8}	8.76	6.766×10^{-4}	7.419×10^{-4}	9.7
64	4.280×10^{-8}	4.653×10^{-8}	8.71	6.766×10^{-4}	7.419×10^{-4}	9.7

TABLE 8: Th232 RESULTS FOR $N=6 \times 10^{-10}$, $T=0°K$

GROUP	GROUP REACTION RATES		% DIFFERENCE	CAPTURE PROBABILITY		%
	PEAS	GYMEA		PEAS	GYMEA	
33	1.157×10^{-14}	1.592×10^{-14}	37.58	2.424×10^{-14}	1.592×10^{-14}	-34.3
34	2.213×10^{-14}	2.157×10^{-14}	-2.51	4.636×10^{-14}	3.749×10^{-14}	-19.1
35	4.722×10^{-14}	4.719×10^{-14}	-0.06	9.358×10^{-14}	8.469×10^{-14}	- 9.5
36	8.734×10^{-14}	9.065×10^{-14}	3.79	1.809×10^{-13}	1.753×10^{-13}	- 3.1
37	1.725×10^{-13}	1.819×10^{-13}	5.43	3.534×10^{-13}	3.572×10^{-13}	1.1
38	3.473×10^{-13}	3.578×10^{-13}	3.04	7.008×10^{-13}	7.150×10^{-13}	2.0
39	7.179×10^{-13}	7.352×10^{-13}	2.40	1.419×10^{-12}	1.450×10^{-12}	2.2
40	1.541×10^{-12}	1.584×10^{-12}	2.74	2.960×10^{-12}	3.034×10^{-12}	2.5
41	3.501×10^{-12}	3.596×10^{-12}	2.72	6.461×10^{-12}	6.630×10^{-12}	2.6
42	8.700×10^{-12}	8.965×10^{-12}	3.05	1.516×10^{-11}	1.560×10^{-11}	2.9
43	2.533×10^{-11}	2.618×10^{-11}	3.33	4.049×10^{-11}	4.177×10^{-11}	3.2
44	1.043×10^{-10}	1.083×10^{-10}	3.83	1.448×10^{-10}	1.501×10^{-10}	3.6
45	2.453×10^{-9}	2.479×10^{-9}	1.04	2.598×10^{-9}	2.629×10^{-9}	1.2
46	7.113×10^{-7}	7.789×10^{-7}	9.50	7.139×10^{-7}	7.815×10^{-7}	9.5
47	4.648×10^{-10}	4.778×10^{-10}	2.80	7.144×10^{-7}	7.820×10^{-7}	9.5
48	1.974×10^{-10}	2.082×10^{-10}	5.45	7.146×10^{-7}	7.822×10^{-7}	9.5
49	8.850×10^{-11}	8.887×10^{-11}	0.42	7.147×10^{-7}	7.822×10^{-7}	9.5
50	4.860×10^{-11}	5.210×10^{-11}	7.21	7.147×10^{-7}	7.823×10^{-7}	9.5
51	4.520×10^{-11}	4.796×10^{-11}	6.11	7.147×10^{-7}	7.824×10^{-7}	9.5
52	5.110×10^{-11}	4.538×10^{-11}	-11.19	7.148×10^{-7}	7.824×10^{-7}	9.5
53	4.080×10^{-11}	4.365×10^{-11}	6.98	7.148×10^{-7}	7.825×10^{-7}	9.5
54	3.940×10^{-11}	4.240×10^{-11}	7.62	7.149×10^{-7}	7.825×10^{-7}	9.5
55	3.890×10^{-11}	4.170×10^{-11}	7.19	7.149×10^{-7}	7.826×10^{-7}	9.5
56	4.630×10^{-11}	4.119×10^{-11}	-11.05	7.150×10^{-7}	7.826×10^{-7}	9.5
57	3.840×10^{-11}	4.125×10^{-11}	7.41	7.150×10^{-7}	7.826×10^{-7}	9.5
58	3.860×10^{-11}	4.138×10^{-11}	7.20	7.150×10^{-7}	7.827×10^{-7}	9.5
59	3.880×10^{-11}	4.171×10^{-11}	7.49	7.151×10^{-7}	7.827×10^{-7}	9.5
60	3.920×10^{-11}	4.243×10^{-11}	8.25	7.151×10^{-7}	7.828×10^{-7}	9.5
61	4.790×10^{-11}	4.319×10^{-11}	-9.84	7.152×10^{-7}	7.828×10^{-7}	9.5
62	4.100×10^{-11}	4.414×10^{-11}	7.65	7.152×10^{-7}	7.829×10^{-7}	9.5
63	4.170×10^{-11}	4.550×10^{-11}	9.10	7.152×10^{-7}	7.829×10^{-7}	9.5
64	4.300×10^{-11}	4.656×10^{-11}	8.29	7.153×10^{-7}	7.829×10^{-7}	9.5

TABLE 9A: Th232 COMPARISON OF REACTION RATES. $N=6 \times 10^{-4}$, $T=300°K$

GROUP	GROUP REACTION RATES			% DIFFERENCE	
	PEAS	GYMEA		RES.ADJUSTED	RES.REMOVED
		RES.ADJUSTED	RES.REMOVED		
33	1.151×10^{-8}	1.585×10^{-8}	-4.588×10^{-8}	37.67	-498.5
34	2.201×10^{-8}	2.147×10^{-8}	-7.491×10^{-8}	-2.45	-440.3
35	4.697×10^{-8}	4.698×10^{-8}	-1.225×10^{-7}	0.01	-360.7
36	8.689×10^{-8}	9.024×10^{-8}	-2.006×10^{-7}	3.86	-330.9
37	1.716×10^{-7}	1.811×10^{-7}	-3.302×10^{-7}	5.50	-292.4
38	3.455×10^{-7}	3.561×10^{-7}	-5.467×10^{-7}	3.08	-258.2
39	7.142×10^{-7}	7.318×10^{-7}	-9.141×10^{-7}	2.47	-228.0
40	1.533×10^{-6}	1.576×10^{-6}	-1.551×10^{-6}	2.81	-201.1
41	3.483×10^{-6}	3.580×10^{-6}	-2.694×10^{-6}	2.79	-177.3
42	8.654×10^{-6}	8.925×10^{-6}	-4.860×10^{-6}	3.13	-156.2
43	2.520×10^{-5}	2.606×10^{-5}	-9.386×10^{-6}	3.41	-137.3
44	1.038×10^{-4}	1.078×10^{-4}	-2.088×10^{-5}	3.89	-120.1
45	2.443×10^{-3}	2.460×10^{-3}	-7.129×10^{-5}	0.67	-102.9
46	9.301×10^{-2}	9.580×10^{-2}	9.940×10^{-2}	3.00	6.9
47	4.195×10^{-4}	4.305×10^{-4}	6.131×10^{-5}	2.61	- 85.4
48	1.792×10^{-4}	1.864×10^{-4}	4.667×10^{-5}	4.03	- 74.0
49	8.012×10^{-5}	7.970×10^{-5}	2.598×10^{-5}	-0.52	- 67.6
50	4.413×10^{-5}	4.669×10^{-5}	1.716×10^{-5}	5.81	- 61.1
51	4.104×10^{-5}	4.298×10^{-5}	1.714×10^{-5}	4.72	- 58.2
52	4.638×10^{-5}	4.067×10^{-5}	1.742×10^{-5}	-12.31	- 62.4
53	3.700×10^{-5}	3.912×10^{-5}	1.786×10^{-5}	5.72	- 51.7
54	3.600×10^{-5}	3.800×10^{-5}	1.836×10^{-5}	5.55	- 49.0
55	3.534×10^{-5}	3.736×10^{-5}	1.901×10^{-5}	5.73	- 46.2
56	4.194×10^{-5}	3.690×10^{-5}	1.966×10^{-5}	-12.01	- 53.1
57	3.479×10^{-5}	3.696×10^{-5}	2.054×10^{-5}	6.23	- 41.0
58	3.496×10^{-5}	3.707×10^{-5}	2.141×10^{-5}	6.04	- 38.8
59	3.522×10^{-5}	3.737×10^{-5}	2.236×10^{-5}	6.09	- 36.5
60	3.568×10^{-5}	3.802×10^{-5}	2.350×10^{-5}	6.54	- 34.1
61	4.358×10^{-5}	3.869×10^{-5}	2.465×10^{-5}	-11.22	- 43.4
62	3.713×10^{-5}	3.954×10^{-5}	2.590×10^{-5}	6.48	- 30.3
63	2.800×10^{-5}	4.075×10^{-5}	2.739×10^{-5}	45.55	- 2.2
64	3.897×10^{-5}	4.171×10^{-5}	2.870×10^{-5}	7.03	- 28.7
33-64	9.686×10^{-2}	9.970×10^{-2}	9.974×10^{-2}	2.9	3.0

TABLE 9B: Th232 CAPTURE PROBABILITIES. N=6 × 10^{-4}, T=300°K

GROUP	CAPTURE PROBABILITY			% DIFFERENCE	
	PEAS	GYMEA			
		RES.ADJUSTED	RES.REMOVED	RES.ADJUSTED	RES.REMOVED
33	2.411×10^{-8}	1.585×10^{-8}	-4.588×10^{-8}	-34.3	-290.3
34	4.612×10^{-8}	3.732×10^{-8}	-1.208×10^{-7}	-19.1	-361.9
35	9.309×10^{-8}	8.430×10^{-8}	-2.433×10^{-7}	- 9.4	-361.3
36	1.800×10^{-7}	1.745×10^{-7}	-4.439×10^{-7}	- 3.0	-346.6
37	3.516×10^{-7}	3.556×10^{-7}	-7.741×10^{-7}	1.1	-320.2
38	6.971×10^{-7}	7.117×10^{-7}	-1.321×10^{-6}	2.1	-289.5
39	1.411×10^{-6}	1.444×10^{-6}	-2.235×10^{-6}	2.3	-258.4
40	2.945×10^{-6}	3.020×10^{-6}	-3.786×10^{-6}	2.6	-228.6
41	6.427×10^{-6}	6.600×10^{-6}	-6.479×10^{-6}	2.7	-200.8
42	1.508×10^{-5}	1.552×10^{-5}	-1.134×10^{-5}	2.9	-175.2
43	4.028×10^{-5}	4.158×10^{-5}	-2.073×10^{-5}	3.2	-151.5
44	1.440×10^{-4}	1.494×10^{-4}	-4.160×10^{-5}	3.7	-128.9
45	2.587×10^{-3}	2.609×10^{-3}	-1.129×10^{-4}	0.8	-104.4
46	9.560×10^{-2}	9.841×10^{-2}	9.928×10^{-2}	2.9	3.9
47	9.602×10^{-2}	9.884×10^{-2}	9.934×10^{-2}	2.9	3.5
48	9.620×10^{-2}	9.903×10^{-2}	9.939×10^{-2}	2.9	3.3
49	9.628×10^{-2}	9.911×10^{-2}	9.942×10^{-2}	2.9	3.3
50	9.632×10^{-2}	9.915×10^{-2}	9.943×10^{-2}	2.9	3.2
51	9.636×10^{-2}	9.920×10^{-2}	9.945×10^{-2}	2.9	3.2
52	9.641×10^{-2}	9.924×10^{-2}	9.947×10^{-2}	2.9	3.2
53	9.645×10^{-2}	9.928×10^{-2}	9.949×10^{-2}	2.9	3.2
54	9.648×10^{-2}	9.931×10^{-2}	9.951×10^{-2}	2.9	3.1
55	9.652×10^{-2}	9.935×10^{-2}	9.952×10^{-2}	2.9	3.1
56	9.656×10^{-2}	9.939×10^{-2}	9.954×10^{-2}	2.9	3.1
57	9.659×10^{-2}	9.943×10^{-2}	9.956×10^{-2}	2.9	3.1
58	9.663×10^{-2}	9.946×10^{-2}	9.959×10^{-2}	2.9	3.1
59	9.666×10^{-2}	9.950×10^{-2}	9.961×10^{-2}	2.9	3.0
60	9.670×10^{-2}	9.954×10^{-2}	9.963×10^{-2}	2.9	3.0
61	9.674×10^{-2}	9.958×10^{-2}	9.966×10^{-2}	2.9	3.0
62	9.678×10^{-2}	9.962×10^{-2}	9.968×10^{-2}	2.9	3.0
63	9.682×10^{-2}	9.966×10^{-2}	9.971×10^{-2}	2.9	3.0
64	9.686×10^{-2}	9.970×10^{-2}	9.974×10^{-2}	2.9	3.0

TABLE 10A: Th232 COMPARISON OF REACTION RATES. N=6 × 10^{-5}, T=300°K

GROUP	GROUP REACTION RATES			% DIFFERENCE	
	PEAS	GYMEA			
		RES.ADJUSTED	RES.REMOVED	RES.ADJUSTED	RES.REMOVED
33	1.157×10^{-9}	1.589×10^{-9}	-4.582×10^{-9}	37.36	-496.1
34	2.211×10^{-9}	2.152×10^{-9}	-7.480×10^{-9}	-2.67	-438.3
35	4.719×10^{-9}	4.709×10^{-9}	-1.223×10^{-8}	-0.21	-359.1
36	8.730×10^{-9}	9.047×10^{-9}	-2.003×10^{-8}	3.63	-329.5
37	1.724×10^{-8}	1.815×10^{-8}	-3.297×10^{-8}	5.27	-291.2
38	3.471×10^{-8}	3.570×10^{-8}	-5.459×10^{-8}	2.85	-257.3
39	7.156×10^{-8}	7.336×10^{-8}	-9.127×10^{-8}	2.25	-227.2
40	1.541×10^{-7}	1.580×10^{-7}	-1.549×10^{-7}	2.58	-200.5
41	3.499×10^{-7}	3.589×10^{-7}	-2.690×10^{-7}	2.56	-176.9
42	8.695×10^{-7}	8.947×10^{-7}	-4.853×10^{-7}	2.89	-155.8
43	2.532×10^{-6}	2.612×10^{-6}	-9.372×10^{-7}	3.17	-137.0
44	1.043×10^{-5}	1.081×10^{-5}	-2.085×10^{-6}	3.65	-120.0
45	2.472×10^{-4}	2.473×10^{-4}	-7.118×10^{-6}	0.04	-102.9
46	3.605×10^{-2}	3.575×10^{-2}	3.612×10^{-2}	-0.82	0.2
47	4.484×10^{-5}	4.604×10^{-5}	6.530×10^{-6}	2.67	- 85.4
48	1.908×10^{-5}	2.002×10^{-5}	4.991×10^{-6}	4.90	- 73.8
49	8.550×10^{-6}	8.550×10^{-6}	2.776×10^{-6}	0.00	- 67.5
50	4.700×10^{-6}	5.001×10^{-6}	1.834×10^{-6}	6.41	- 61.0
51	4.370×10^{-6}	4.613×10^{-6}	1.832×10^{-6}	5.56	- 58.1
52	4.940×10^{-6}	4.365×10^{-6}	1.862×10^{-6}	11.64	- 62.3
53	3.940×10^{-6}	4.198×10^{-6}	1.908×10^{-6}	6.55	- 51.6
54	3.820×10^{-6}	4.078×10^{-6}	1.962×10^{-6}	6.76	- 48.6
55	3.780×10^{-6}	4.011×10^{-6}	2.031×10^{-6}	6.10	- 46.3
56	4.440×10^{-6}	3.961×10^{-6}	2.102×10^{-6}	10.78	- 52.7
57	3.700×10^{-6}	3.967×10^{-6}	2.196×10^{-6}	7.22	- 40.7
58	3.700×10^{-6}	3.980×10^{-6}	2.289×10^{-6}	7.56	- 38.1
59	3.760×10^{-6}	4.011×10^{-6}	2.391×10^{-6}	6.68	- 36.4
60	3.800×10^{-6}	4.081×10^{-6}	2.512×10^{-6}	7.40	- 33.9
61	4.640×10^{-6}	4.154×10^{-6}	2.635×10^{-6}	10.48	- 43.2
62	3.950×10^{-6}	4.245×10^{-6}	2.768×10^{-6}	7.46	- 29.9
63	4.050×10^{-6}	4.376×10^{-6}	2.928×10^{-6}	8.04	- 27.7
64	4.150×10^{-6}	4.478×10^{-6}	3.069×10^{-6}	7.91	- 26.1
33-64	3.644×10^{-2}	3.615×10^{-2}	3.616×10^{-2}	-0.80	- 0.80

TABLE 10B: Th232 CAPTURE PROBABILITIES. $N=6 \times 10^{-5}$, T=300°K

GROUP	CAPTURE PROBABILITY			% DIFFERENCE	
	PEAS	GYMEA		RES.ADJUSTED	RES.REMOVED
		RES.ADJUSTED	RES.REMOVED		
33	2.423×10^{-9}	1.589×10^{-9}	-4.582×10^{-9}	-52.5	-289.1
34	4.634×10^{-9}	3.741×10^{-9}	-1.206×10^{-8}	-19.2	-360.3
35	8.451×10^{-9}	9.353×10^{-9}	-2.429×10^{-8}	- 9.6	-359.7
36	1.808×10^{-8}	1.750×10^{-8}	-4.432×10^{-8}	- 3.2	-345.1
37	3.533×10^{-8}	3.565×10^{-8}	-7.730×10^{-8}	0.9	-318.8
38	7.004×10^{-8}	7.135×10^{-8}	-1.319×10^{-7}	1.9	-288.3
39	1.418×10^{-7}	1.447×10^{-7}	-2.232×10^{-7}	2.1	-257.4
40	2.958×10^{-7}	3.027×10^{-7}	-3.780×10^{-7}	2.3	-227.8
41	6.458×10^{-7}	6.616×10^{-7}	-6.470×10^{-7}	2.5	-200.2
42	1.515×10^{-6}	1.556×10^{-6}	-1.132×10^{-6}	2.7	-174.7
43	4.047×10^{-6}	4.168×10^{-6}	-2.070×10^{-6}	3.0	-151.1
44	1.447×10^{-5}	1.498×10^{-5}	-4.154×10^{-6}	3.5	-128.7
45	2.616×10^{-4}	2.622×10^{-4}	-1.127×10^{-5}	0.2	-104.3
46	3.631×10^{-2}	3.601×10^{-2}	3.611×10^{-2}	-0.8	- 0.5
47	3.635×10^{-2}	3.606×10^{-2}	3.611×10^{-2}	-0.8	- 0.7
48	3.637×10^{-2}	3.608×10^{-2}	3.612×10^{-2}	-0.8	- 0.7
49	3.638×10^{-2}	3.608×10^{-2}	3.612×10^{-2}	-0.8	- 0.7
50	3.638×10^{-2}	3.609×10^{-2}	3.612×10^{-2}	-0.8	- 0.7
51	3.639×10^{-2}	3.609×10^{-2}	3.613×10^{-2}	-0.8	- 0.7
52	3.639×10^{-2}	3.610×10^{-2}	3.613×10^{-2}	-0.8	- 0.7
53	3.640×10^{-2}	3.610×10^{-2}	3.613×10^{-2}	-0.8	- 0.7
54	3.640×10^{-2}	3.611×10^{-2}	3.613×10^{-2}	-0.8	- 0.7
55	3.640×10^{-2}	3.611×10^{-2}	3.613×10^{-2}	-0.8	- 0.7
56	3.641×10^{-2}	3.612×10^{-2}	3.614×10^{-2}	-0.8	- 0.8
57	3.641×10^{-2}	3.612×10^{-2}	3.614×10^{-2}	-0.8	- 0.8
58	3.642×10^{-2}	3.612×10^{-2}	3.614×10^{-2}	-0.8	- 0.8
59	3.642×10^{-2}	3.613×10^{-2}	3.614×10^{-2}	-0.8	- 0.8
60	3.642×10^{-2}	3.613×10^{-2}	3.614×10^{-2}	-0.8	- 0.8
61	3.643×10^{-2}	3.614×10^{-2}	3.615×10^{-2}	-0.8	- 0.8
62	3.643×10^{-2}	3.614×10^{-2}	3.615×10^{-2}	-0.8	- 0.8
63	3.644×10^{-2}	3.614×10^{-2}	3.615×10^{-2}	-0.8	- 0.8
64	3.644×10^{-2}	3.615×10^{-2}	3.616×10^{-2}	-0.8	- 0.8

TABLE 11A: Th232 COMPARISON OF REACTION RATES. $N=6 \times 10^{-6}$. T=300°K

GROUP	GROUP REACTION RATES			% DIFFERENCE	
	PEAS	GYMEA		RES.ADJUSTED	RES.REMOVED
		RES.ADJUSTED	RES.REMOVED		
33	1.157×10^{-10}	1.592×10^{-10}	-4.589×10^{-10}	37.59	-496.5
34	2.212×10^{-10}	2.157×10^{-10}	-7.492×10^{-10}	-2.51	-438.6
35	4.722×10^{-10}	4.719×10^{-10}	-1.225×10^{-9}	-0.06	-359.4
36	8.734×10^{-10}	9.065×10^{-10}	-2.007×10^{-9}	3.79	-329.7
37	1.715×10^{-9}	1.819×10^{-9}	-3.302×10^{-9}	6.05	-292.5
38	3.473×10^{-9}	3.578×10^{-9}	-5.468×10^{-9}	3.01	-257.4
39	7.179×10^{-9}	7.352×10^{-9}	-9.142×10^{-9}	2.41	-227.3
40	1.541×10^{-8}	1.534×10^{-8}	-1.551×10^{-8}	2.74	-200.6
41	3.501×10^{-8}	3.596×10^{-8}	-2.694×10^{-8}	2.72	-176.9
42	8.699×10^{-8}	8.965×10^{-8}	-4.861×10^{-8}	3.06	-155.9
43	2.533×10^{-7}	2.618×10^{-7}	-9.378×10^{-8}	3.34	-137.0
44	1.043×10^{-6}	1.083×10^{-6}	-2.088×10^{-7}	3.82	-120.0
45	2.475×10^{-5}	2.478×10^{-5}	-7.129×10^{-7}	0.16	-102.9
46	6.650×10^{-3}	6.948×10^{-3}	6.985×10^{-3}	4.47	5.0
47	4.688×10^{-6}	4.746×10^{-6}	6.729×10^{-7}	1.24	- 85.6
48	1.964×10^{-6}	2.067×10^{-6}	5.152×10^{-7}	5.24	- 73.8
49	8.800×10^{-7}	8.826×10^{-7}	2.864×10^{-7}	0.29	- 67.5
50	4.840×10^{-7}	5.174×10^{-7}	1.893×10^{-7}	6.90	- 60.9
51	4.500×10^{-7}	4.763×10^{-7}	1.890×10^{-7}	5.84	- 58.0
52	5.080×10^{-7}	4.506×10^{-7}	1.922×10^{-7}	11.29	- 62.2
53	4.060×10^{-7}	4.334×10^{-7}	1.969×10^{-7}	6.76	- 51.5
54	3.930×10^{-7}	4.211×10^{-7}	2.025×10^{-7}	7.15	- 48.5
55	3.880×10^{-7}	4.141×10^{-7}	2.096×10^{-7}	6.72	- 46.0
56	4.610×10^{-7}	4.090×10^{-7}	2.169×10^{-7}	-11.29	- 53.0
57	3.840×10^{-7}	4.096×10^{-7}	2.266×10^{-7}	6.66	- 41.0
58	3.840×10^{-7}	4.109×10^{-7}	2.362×10^{-7}	7.00	- 38.5
59	3.870×10^{-7}	4.141×10^{-7}	2.467×10^{-7}	7.01	- 36.3
60	3.900×10^{-7}	4.214×10^{-7}	2.592×10^{-7}	8.04	- 33.5
61	4.780×10^{-7}	4.289×10^{-7}	2.719×10^{-7}	-10.28	- 43.1
62	4.070×10^{-7}	4.383×10^{-7}	2.857×10^{-7}	7.68	- 29.8
63	4.170×10^{-7}	4.518×10^{-7}	3.021×10^{-7}	8.34	- 27.5
64	4.260×10^{-7}	4.624×10^{-7}	3.167×10^{-7}	8.54	- 25.6
33-64	6.691×10^{-3}	6.988×10^{-3}	6.989×10^{-3}	4.4	4.5

TABLE 11B: Th232 CAPTURE PROBABILITIES. $N=6 \times 10^{-6}$. T=300°K

GROUP	CAPTURE PROBABILITIES			% DIFFERENCE	
	PEAS	GYMEA			
		RES.ADJUSTED	RES.REMOVED	RES.ADJUSTED	RES.REMOVED
33	2.424×10^{-10}	1.592×10^{-10}	-4.589×10^{-10}	-34.3	-289.3
34	4.636×10^{-10}	3.749×10^{-10}	-1.208×10^{-9}	-19.1	-360.6
35	9.358×10^{-10}	8.469×10^{-10}	-2.433×10^{-9}	- 9.5	-360.0
36	1.089×10^{-9}	1.753×10^{-9}	-4.440×10^{-9}	- 3.1	-345.4
37	3.534×10^{-9}	3.572×10^{-9}	-7.742×10^{-9}	1.1	-319.0
38	7.007×10^{-9}	7.150×10^{-9}	-1.321×10^{-8}	2.0	-288.5
39	1.419×10^{-8}	1.450×10^{-8}	-2.235×10^{-8}	2.2	-257.6
40	2.960×10^{-8}	3.034×10^{-8}	-3.786×10^{-8}	2.5	-227.9
41	6.461×10^{-8}	6.630×10^{-8}	-6.480×10^{-8}	2.6	-200.3
42	1.516×10^{-7}	1.560×10^{-7}	-1.134×10^{-7}	2.9	-174.8
43	4.049×10^{-7}	4.177×10^{-7}	-2.073×10^{-7}	3.7	-151.2
44	1.448×10^{-6}	1.501×10^{-6}	-4.161×10^{-7}	3.6	-128.7
45	2.619×10^{-5}	2.628×10^{-5}	-1.129×10^{-6}	0.3	-104.3
46	6.677×10^{-3}	6.974×10^{-3}	6.984×10^{-3}	4.5	4.6
47	6.681×10^{-3}	6.979×10^{-3}	6.984×10^{-3}	4.5	4.5
48	6.683×10^{-3}	6.981×10^{-3}	6.985×10^{-3}	4.5	4.5
49	6.684×10^{-3}	6.982×10^{-3}	6.985×10^{-3}	4.4	4.5
50	6.685×10^{-3}	6.982×10^{-3}	6.985×10^{-3}	4.4	4.5
51	6.685×10^{-3}	6.983×10^{-3}	6.985×10^{-3}	4.4	4.5
52	6.686×10^{-3}	6.983×10^{-3}	6.986×10^{-3}	4.4	4.5
53	6.686×10^{-3}	6.983×10^{-3}	6.986×10^{-3}	4.4	4.5
54	6.686×10^{-3}	6.984×10^{-3}	6.986×10^{-3}	4.4	4.5
55	6.687×10^{-3}	6.984×10^{-3}	6.986×10^{-3}	4.4	4.5
56	6.687×10^{-3}	6.985×10^{-3}	6.986×10^{-3}	4.4	4.5
57	6.688×10^{-3}	6.985×10^{-3}	6.987×10^{-3}	4.4	4.5
58	6.688×10^{-3}	6.986×10^{-3}	6.987×10^{-3}	4.4	4.5
59	6.688×10^{-3}	6.986×10^{-3}	6.987×10^{-3}	4.4	4.5
60	6.689×10^{-3}	6.986×10^{-3}	6.987×10^{-3}	4.4	4.5
61	6.689×10^{-3}	6.987×10^{-3}	6.988×10^{-3}	4.4	4.5
62	6.690×10^{-3}	6.987×10^{-3}	6.988×10^{-3}	4.4	4.5
63	6.690×10^{-3}	6.988×10^{-3}	6.988×10^{-3}	4.4	4.5
64	6.691×10^{-3}	6.988×10^{-3}	6.989×10^{-3}	4.4	4.5

TABLE 12A: Th232 COMPARISON OF REACTION RATES. $N=6 \times 10^{-7}$. T=300°K

GROUP	GROUP REACTION RATES			% DIFFERENCE	
	PEAS	GYMEA			
		RES.ADJUSTED	RES.REMOVED	RES.ADJUSTED	RES.REMOVED
33	1.157×10^{-11}	1.592×10^{-11}	-4.589×10^{-11}	37.59	-496.5
34	2.213×10^{-11}	2.157×10^{-11}	-7.492×10^{-11}	-2.54	-316.5
35	4.722×10^{-11}	4.719×10^{-11}	-1.225×10^{-10}	-0.06	-359.4
36	8.734×10^{-11}	9.065×10^{-11}	-2.007×10^{-10}	3.79	-329.7
37	1.725×10^{-10}	1.819×10^{-10}	-3.302×10^{-10}	5.43	-291.4
38	3.473×10^{-10}	3.578×10^{-10}	-5.468×10^{-10}	3.01	-257.4
39	7.179×10^{-10}	7.352×10^{-10}	-9.142×10^{-10}	2.40	-227.3
40	1.541×10^{-9}	1.584×10^{-9}	-1.551×10^{-9}	2.74	-200.6
41	3.501×10^{-9}	3.596×10^{-9}	-2.694×10^{-9}	2.76	-176.9
42	8.700×10^{-9}	8.965×10^{-9}	-4.861×10^{-9}	3.06	-155.9
43	2.533×10^{-8}	2.618×10^{-8}	-9.387×10^{-9}	3.34	-137.1
44	1.043×10^{-7}	1.083×10^{-7}	-2.088×10^{-8}	3.81	-120.0
45	2.475×10^{-6}	2.479×10^{-6}	-7.129×10^{-8}	0.15	-102.9
46	7.383×10^{-4}	7.675×10^{-4}	7.713×10^{-4}	3.96	4.5
47	4.647×10^{-7}	4.775×10^{-7}	6.769×10^{-8}	2.75	- 85.4
48	1.972×10^{-7}	2.080×10^{-7}	5.185×10^{-8}	5.48	- 73.7
49	8.840×10^{-8}	8.881×10^{-8}	2.882×10^{-8}	0.46	- 67.4
50	4.860×10^{-8}	5.206×10^{-8}	1.905×10^{-8}	7.13	- 60.8
51	4.510×10^{-8}	4.792×10^{-8}	1.902×10^{-8}	6.26	- 57.8
52	5.110×10^{-8}	4.535×10^{-8}	1.934×10^{-8}	-11.26	- 62.2
53	4.060×10^{-8}	4.362×10^{-8}	1.982×10^{-8}	7.43	- 51.2
54	3.960×10^{-8}	4.237×10^{-8}	2.038×10^{-8}	7.00	- 48.5
55	3.890×10^{-8}	4.167×10^{-8}	2.109×10^{-8}	7.11	- 45.8
56	4.580×10^{-8}	4.115×10^{-8}	2.183×10^{-8}	-10.15	- 52.3
57	3.820×10^{-8}	4.121×10^{-8}	2.280×10^{-8}	7.89	- 40.3
58	3.820×10^{-8}	4.135×10^{-8}	2.377×10^{-8}	8.24	- 37.8
59	3.870×10^{-8}	4.167×10^{-8}	2.482×10^{-8}	7.68	- 35.9
60	3.940×10^{-8}	4.240×10^{-8}	2.609×10^{-8}	7.61	- 33.8
61	4.780×10^{-8}	4.316×10^{-8}	2.736×10^{-8}	-9.72	- 42.8
62	4.080×10^{-8}	4.410×10^{-8}	2.875×10^{-8}	8.09	- 29.5
63	4.190×10^{-8}	4.546×10^{-8}	3.040×10^{-8}	8.50	- 27.4
64	4.280×10^{-8}	4.653×10^{-8}	3.187×10^{-8}	8.71	- 25.5
33-64	7.423×10^{-4}	7.716×10^{-4}	7.717×10^{-4}	3.9	4.0

TABLE 12B: Th232 CAPTURE PROBABILITIES. N=6 × 10^{-7}, T=300°K

GROUP	CAPTURE PROBABILITY			% DIFFERENCE	
	PEAS	GYMEA		RES.ADJUSTED	RES.REMOVED
		RES.ADJUSTED	RES.REMOVED		
33	2.424×10^{-11}	1.592×10^{-11}	-4.589×10^{-11}	-34.3	-492.5
34	4.636×10^{-11}	3.749×10^{-11}	-1.208×10^{-10}	-19.1	-360.6
35	9.358×10^{-11}	8.469×10^{-11}	-2.433×10^{-10}	- 9.5	-360.1
36	1.809×10^{-10}	1.753×10^{-10}	-4.440×10^{-10}	- 3.1	-345.4
37	3.534×10^{-10}	3.572×10^{-10}	-7.742×10^{-10}	1.1	-319.0
38	7.008×10^{-10}	7.150×10^{-10}	-1.321×10^{-9}	2.0	-288.5
39	1.419×10^{-9}	1.450×10^{-9}	-2.235×10^{-9}	2.2	-257.6
40	2.960×10^{-9}	3.034×10^{-9}	-3.786×10^{-9}	2.5	-227.9
41	6.461×10^{-9}	6.630×10^{-9}	-6.480×10^{-9}	2.6	-200.3
42	1.516×10^{-8}	1.560×10^{-8}	-1.134×10^{-8}	2.9	-174.8
43	4.049×10^{-8}	4.177×10^{-8}	-2.073×10^{-3}	3.2	-151.2
44	1.448×10^{-7}	1.501×10^{-7}	-4.161×10^{-8}	3.6	-128.7
45	2.620×10^{-6}	2.629×10^{-6}	-1.129×10^{-7}	0.3	-104.3
46	7.409×10^{-4}	7.701×10^{-4}	7.711×10^{-4}	3.9	4.1
47	7.414×10^{-4}	7.706×10^{-4}	7.712×10^{-4}	3.9	4.0
48	7.416×10^{-4}	7.708×10^{-4}	7.713×10^{-4}	3.9	4.0
49	7.416×10^{-4}	7.709×10^{-4}	7.713×10^{-4}	3.9	4.0
50	7.417×10^{-4}	7.710×10^{-4}	7.713×10^{-4}	3.9	4.0
51	7.417×10^{-4}	7.710×10^{-4}	7.713×10^{-4}	3.9	4.0
52	7.418×10^{-4}	7.710×10^{-4}	7.714×10^{-4}	3.9	4.0
53	7.418×10^{-4}	7.711×10^{-4}	7.714×10^{-4}	3.9	4.0
54	7.419×10^{-4}	7.711×10^{-4}	7.714×10^{-4}	3.9	4.0
55	7.419×10^{-4}	7.712×10^{-4}	7.714×10^{-4}	3.9	4.0
56	7.420×10^{-4}	7.712×10^{-4}	7.714×10^{-4}	3.9	4.0
57	7.420×10^{-4}	7.713×10^{-4}	7.715×10^{-4}	3.9	4.0
58	7.420×10^{-4}	7.713×10^{-4}	7.715×10^{-4}	3.9	4.0
59	7.421×10^{-4}	7.713×10^{-4}	7.715×10^{-4}	3.9	4.0
60	7.421×10^{-4}	7.714×10^{-4}	7.715×10^{-4}	3.9	4.0
61	7.422×10^{-4}	7.714×10^{-4}	7.716×10^{-4}	3.9	4.0
62	7.422×10^{-4}	7.715×10^{-4}	7.716×10^{-4}	3.9	4.0
63	7.422×10^{-4}	7.715×10^{-4}	7.716×10^{-4}	3.9	4.0
64	7.423×10^{-4}	7.716×10^{-4}	7.717×10^{-4}	3.9	4.0

TABLE 13: Th232 INTEGRATED REACTION RATES (2.05 to 583eV)
[% PEAS IS QUOTED ERROR IN J-FUNCTION]

N_{Th}	PEAS	'THRA'	'THRR'	% PEAS	%.RA	%.RR	TEMP.
6×10^{-3}	0.2722696	0.2934614	-	-	+7.8	-	1000°K
6×10^{-4}	9.685826×10^{-2}	9.969827×10^{-2}	9.973813×10^{-2}	-	+2.9	+3.0	300°K
6×10^{-5}	3.644067×10^{-2}	3.614837×10^{-2}	3.615634×10^{-2}	-	-0.8	-0.8	300°K
6×10^{-6}	6.690512×10^{-2}	6.988140×10^{-3}	6.988587×10^{-3}	-	+4.4	+4.5	300°K
6×10^{-7}	7.422795×10^{-4}	7.715629×10^{-4}	7.716518×10^{-4}	-	+3.9	+4.0	300°K
6×10^{-4}	7.299128×10^{-2}	7.523069×10^{-2}	-	-5.1×10^{-3}	+3.1	-	0°K
6×10^{-5}	2.166553×10^{-2}	2.237843×10^{-2}	-	-0.3	+3.3	-	0°K
6×10^{-6}	4.941092×10^{-3}	5.358963×10^{-3}	-	-5.0	+8.5	-	0°K
6×10^{-7}	6.766277×10^{-4}	7.419329×10^{-4}	-	-6.0	+9.7	-	0°K
6×10^{-10}	7.152903×10^{-7}	7.829440×10^{-7}	-	-5.8	+9.5	-	0°K

TABLE 14: COMPARISON OF FITS TO PEAS FOR Th232

CONCENTRATION	TEMP.	PERCENTAGE ERROR IN RESONANCE GROUP		χ^2 BACKGROUND	
		RA	RR	RA	RR
6×10^{-4}	300°K	3.0 %	6.9%	1.47×10^{-2}	4.77
6×10^{-5}	300°K	-0.82%	0.2%	5.98×10^{-3}	4.69
6×10^{-6}	300°K	4.47%	5.0%	6.92×10^{-3}	4.70
6×10^{-7}	300°K	3.96%	4.5%	7.48×10^{-3}	4.69

TABLE 15: U235 RESULTS FOR $N=6 \times 10^{-3}$, T=0°K

GROUP	GROUP REACTION RATES		% DIFFERENCE	CAPTURE PROBABILITY		%
	PEAS	GYMEA		PEAS	GYMEA	
33	3.448×10^{-7}	4.762×10^{-7}	38.10	7.254×10^{-7}	4.762×10^{-7}	-34.36
34	6.596×10^{-7}	8.489×10^{-7}	28.70	1.385×10^{-6}	1.325×10^{-6}	- 4.33
35	1.266×10^{-6}	1.461×10^{-6}	15.46	2.650×10^{-6}	2.786×10^{-6}	5.12
36	2.081×10^{-6}	2.705×10^{-6}	29.96	4.732×10^{-6}	5.491×10^{-6}	16.04
37	4.386×10^{-6}	4.916×10^{-6}	12.09	9.117×10^{-6}	1.041×10^{-5}	14.14
38	8.546×10^{-6}	9.222×10^{-6}	7.91	1.766×10^{-5}	1.963×10^{-5}	8.49
39	1.680×10^{-5}	1.794×10^{-5}	6.77	3.446×10^{-5}	3.757×10^{-5}	9.00
40	3.344×10^{-5}	3.470×10^{-5}	3.77	6.790×10^{-5}	7.226×10^{-5}	6.43
41	5.752×10^{-5}	6.908×10^{-5}	20.09	1.254×10^{-4}	1.413×10^{-4}	12.69
42	1.289×10^{-4}	1.403×10^{-4}	8.80	2.544×10^{-4}	2.816×10^{-4}	10.72
43	2.744×10^{-4}	2.939×10^{-4}	7.11	5.287×10^{-4}	5.755×10^{-4}	8.85
44	6.107×10^{-4}	6.429×10^{-4}	5.28	1.139×10^{-3}	1.218×10^{-3}	6.94
45	1.456×10^{-3}	1.503×10^{-3}	3.21	2.595×10^{-3}	2.721×10^{-3}	4.85
46	3.544×10^{-3}	3.907×10^{-3}	10.22	6.140×10^{-3}	6.628×10^{-3}	7.95
47	1.166×10^{-2}	1.228×10^{-2}	5.33	1.780×10^{-2}	1.891×10^{-2}	6.24
48	5.650×10^{-2}	6.162×10^{-2}	9.05	7.430×10^{-2}	8.053×10^{-2}	8.38
49	2.209×10^{-1}	2.602×10^{-1}	17.79	2.952×10^{-1}	3.407×10^{-1}	15.42
50	2.922×10^{-1}	2.640×10^{-1}	-9.65	5.873×10^{-1}	6.047×10^{-1}	2.95
51	1.081×10^{-1}	1.100×10^{-1}	1.77	6.954×10^{-1}	7.147×10^{-1}	2.77
52	3.470×10^{-2}	3.248×10^{-2}	-6.40	7.301×10^{-1}	7.472×10^{-1}	2.33
53	1.474×10^{-2}	1.443×10^{-2}	-3.48	7.449×10^{-1}	7.614×10^{-1}	2.22
54	8.297×10^{-3}	8.438×10^{-3}	1.70	7.532×10^{-1}	7.698×10^{-1}	2.21
55	6.493×10^{-3}	6.347×10^{-3}	-2.25	7.597×10^{-1}	7.762×10^{-1}	2.17
56	5.236×10^{-3}	5.073×10^{-3}	-3.11	7.649×10^{-1}	7.812×10^{-1}	2.14
57	4.663×10^{-3}	4.195×10^{-3}	-10.04	7.696×10^{-1}	7.854×10^{-1}	2.06
58	3.093×10^{-3}	3.616×10^{-3}	16.92	7.727×10^{-1}	7.891×10^{-1}	2.12
59	3.748×10^{-3}	3.236×10^{-3}	-13.65	7.764×10^{-1}	7.923×10^{-1}	2.05
60	2.578×10^{-3}	2.977×10^{-3}	15.48	7.790×10^{-1}	7.953×10^{-1}	2.09
61	3.195×10^{-3}	2.775×10^{-3}	-13.15	7.822×10^{-1}	7.980×10^{-1}	2.03
62	2.269×10^{-3}	2.628×10^{-3}	15.81	7.845×10^{-1}	8.007×10^{-1}	2.07
63	2.909×10^{-3}	2.535×10^{-3}	-12.87	7.874×10^{-1}	8.032×10^{-1}	2.01
64	2.115×10^{-3}	2.446×10^{-3}	15.68	7.895×10^{-1}	8.056×10^{-1}	2.05

TABLE 16: U235 RESULTS FOR $N=6 \times 10^{-4}$. T=0°K

GROUP	GROUP REACTION RATES		% DIFFERENCE	CAPTURE PROBABILITY		%
	PEAS	GYMEA		PEAS	GYMEA	
33	3.575×10^{-8}	4.762×10^{-8}	33.19	7.522×10^{-8}	4.762×10^{-8}	-36.69
34	6.839×10^{-8}	8.489×10^{-8}	24.12	1.436×10^{-7}	1.325×10^{-7}	- 7.73
35	1.312×10^{-7}	1.461×10^{-7}	11.35	2.748×10^{-7}	2.786×10^{-7}	1.38
36	2.158×10^{-7}	2.705×10^{-7}	25.33	4.906×10^{-7}	5.491×10^{-7}	11.91
37	4.548×10^{-7}	4.916×10^{-7}	8.10	9.454×10^{-7}	1.041×10^{-7}	10.08
38	8.861×10^{-7}	9.222×10^{-7}	4.07	1.832×10^{-6}	1.963×10^{-6}	7.17
39	1.742×10^{-6}	1.794×10^{-6}	2.96	3.574×10^{-6}	3.757×10^{-6}	5.12
40	3.467×10^{-6}	3.470×10^{-6}	0.08	7.041×10^{-6}	7.227×10^{-6}	2.64
41	5.965×10^{-6}	6.909×10^{-6}	15.81	1.301×10^{-5}	1.414×10^{-5}	8.68
42	1.337×10^{-5}	1.403×10^{-5}	4.95	2.638×10^{-5}	2.817×10^{-5}	6.78
43	2.847×10^{-5}	2.941×10^{-5}	3.30	5.484×10^{-5}	5.757×10^{-5}	4.97
44	6.340×10^{-5}	6.437×10^{-5}	1.54	1.182×10^{-4}	1.219×10^{-4}	3.13
45	1.513×10^{-4}	1.507×10^{-4}	-0.41	2.696×10^{-4}	2.726×10^{-4}	1.12
46	3.698×10^{-4}	3.933×10^{-4}	6.35	6.394×10^{-4}	6.659×10^{-4}	4.15
47	1.231×10^{-3}	1.252×10^{-3}	1.71	1.871×10^{-3}	1.918×10^{-3}	2.55
48	6.396×10^{-3}	6.726×10^{-3}	5.16	8.267×10^{-3}	8.644×10^{-3}	4.57
49	4.463×10^{-2}	4.909×10^{-2}	10.00	5.290×10^{-2}	5.774×10^{-2}	9.16
50	2.367×10^{-1}	1.995×10^{-2}	-15.72	2.895×10^{-1}	2.572×10^{-1}	-11.17
51	3.339×10^{-2}	3.374×10^{-2}	10.69	3.229×10^{-1}	2.909×10^{-1}	- 9.91
52	8.301×10^{-3}	8.688×10^{-3}	4.67	3.312×10^{-1}	2.996×10^{-1}	- 9.54
53	3.985×10^{-3}	4.234×10^{-3}	6.27	3.352×10^{-1}	3.039×10^{-1}	- 9.36
54	2.512×10^{-3}	2.687×10^{-3}	6.95	3.377×10^{-1}	3.065×10^{-1}	- 9.23
55	1.900×10^{-3}	2.019×10^{-3}	6.28	3.396×10^{-1}	3.086×10^{-1}	- 9.15
56	1.515×10^{-3}	1.618×10^{-3}	6.79	3.411×10^{-1}	3.102×10^{-1}	- 9.08
57	1.400×10^{-3}	1.366×10^{-3}	-2.41	3.425×10^{-1}	3.115×10^{-1}	- 9.05
58	9.472×10^{-4}	1.198×10^{-3}	26.48	3.435×10^{-1}	3.127×10^{-1}	- 8.95
59	1.152×10^{-3}	1.084×10^{-3}	-5.88	3.446×10^{-1}	3.138×10^{-1}	- 8.94
60	7.995×10^{-4}	1.009×10^{-3}	26.18	3.454×10^{-1}	3.148×10^{-1}	- 8.86
61	1.005×10^{-3}	9.517×10^{-4}	-5.32	3.464×10^{-1}	3.158×10^{-1}	- 8.85
62	7.220×10^{-4}	9.119×10^{-4}	26.31	3.472×10^{-1}	3.167×10^{-1}	- 8.78
63	9.343×10^{-4}	8.896×10^{-4}	-4.79	3.481×10^{-1}	3.176×10^{-1}	- 8.77
64	6.859×10^{-4}	8.681×10^{-4}	26.56	3.488×10^{-1}	3.185×10^{-1}	- 8.70

TABLE 17A: U235 COMPARISON OF REACTION RATES. $N=6 \times 10^{-5}$, $T=0°K$

GROUP	GROUP REACTION RATES			% DIFFERENCE	
	PEAS	GYMEA			
		RES.ADJUSTED	RES.REMOVED	RES.ADJUSTED	RES.REMOVED
33	3.589×10^{-9}	4.762×10^{-9}	-2.349×10^{-8}	32.69	-754.7
34	6.864×10^{-9}	8.489×10^{-9}	-3.833×10^{-8}	23.66	-658.4
35	1.315×10^{-8}	1.461×10^{-8}	-6.254×10^{-8}	11.15	-575.7
36	2.166×10^{-8}	2.705×10^{-8}	-1.020×10^{-7}	24.87	-570.9
37	4.565×10^{-8}	4.916×10^{-8}	-1.664×10^{-7}	7.70	-464.6
38	8.894×10^{-8}	9.222×10^{-8}	-2.718×10^{-7}	3.69	-405.6
39	1.749×10^{-7}	1.794×10^{-7}	-4.447×10^{-7}	2.58	-354.3
40	3.480×10^{-7}	3.470×10^{-7}	-7.297×10^{-7}	-0.29	-309.7
41	5.988×10^{-7}	6.909×10^{-7}	-1.203×10^{-6}	15.38	-300.9
42	1.342×10^{-6}	1.403×10^{-6}	-1.998×10^{-6}	4.54	-248.9
43	2.857×10^{-6}	2.941×10^{-6}	-3.356×10^{-6}	2.92	-217.5
44	6.364×10^{-6}	6.438×10^{-6}	-5.738×10^{-6}	1.16	-190.2
45	1.520×10^{-5}	1.507×10^{-5}	-1.008×10^{-5}	-0.64	-166.3
46	3.714×10^{-5}	3.935×10^{-5}	-1.857×10^{-5}	5.96	-150.0
47	1.238×10^{-4}	1.255×10^{-4}	-3.709×10^{-5}	1.34	-130.0
48	6.484×10^{-4}	6.788×10^{-4}	-9.097×10^{-5}	4.68	-114.0
49	5.084×10^{-3}	5.353×10^{-3}	-1.877×10^{-4}	5.28	-103.7
50	8.200×10^{-2}	7.661×10^{-2}	8.693×10^{-2}	-6.58	- 6.0
51	4.460×10^{-3}	4.322×10^{-3}	1.806×10^{-4}	-3.11	- 96.0
52	1.079×10^{-3}	1.103×10^{-3}	1.033×10^{-4}	2.16	- 90.4
53	5.432×10^{-4}	5.464×10^{-4}	7.736×10^{-5}	0.60	- 85.8
54	3.567×10^{-4}	3.581×10^{-4}	6.526×10^{-5}	0.40	- 81.7
55	2.599×10^{-4}	2.667×10^{-4}	5.944×10^{-5}	2.60	- 77.1
56	2.079×10^{-4}	2.133×10^{-4}	5.571×10^{-5}	2.59	- 73.2
57	1.940×10^{-4}	1.809×10^{-4}	5.381×10^{-5}	-6.79	- 72.2
58	1.316×10^{-4}	1.590×10^{-4}	5.279×10^{-5}	20.80	- 59.9
59	1.596×10^{-4}	1.440×10^{-4}	5.255×10^{-5}	-9.76	- 67.1
60	1.110×10^{-4}	1.341×10^{-4}	5.310×10^{-5}	20.85	- 52.1
61	1.398×10^{-4}	1.267×10^{-4}	5.392×10^{-5}	-9.40	- 61.4
62	1.005×10^{-4}	1.215×10^{-4}	5.515×10^{-5}	20.90	- 45.1
63	1.302×10^{-4}	1.187×10^{-4}	5.705×10^{-5}	-8.81	- 56.2
64	9.569×10^{-5}	1.160×10^{-4}	5.870×10^{-5}	21.17	- 38.7
34-64	9.589×10^{-2}	9.075×10^{-2}	8.755×10^{-2}	-5.36	- 8.67

TABLE 17B: U235 CAPTURE PROBABILITIES. $N=6 \times 10^{-5}$, $T=0°K$

GROUP	CAPTURE PROBABILITY			% DIFFERENCE	
	PEAS	GYMEA			
		RES.ADJUSTED	RES.REMOVED	RES.ADJUSTED	RES.REMOVED
33	7.550×10^{-9}	4.762×10^{-9}	-2.349×10^{-8}	-36.93	-411.2
34	1.441×10^{-8}	1.325×10^{-8}	-6.182×10^{-8}	- 8.08	-528.9
35	2.758×10^{-8}	2.786×10^{-8}	-1.244×10^{-7}	1.00	-550.8
36	4.925×10^{-8}	5.491×10^{-8}	-2.264×10^{-7}	20.22	-559.6
37	9.489×10^{-8}	1.041×10^{-7}	-3.928×10^{-7}	9.67	-513.9
38	1.838×10^{-7}	1.963×10^{-7}	-6.646×10^{-7}	6.77	-461.5
39	3.587×10^{-7}	3.757×10^{-7}	-1.109×10^{-6}	4.73	-409.3
40	7.067×10^{-7}	7.227×10^{-7}	-1.839×10^{-6}	2.26	-360.2
41	1.305×10^{-6}	1.414×10^{-6}	-3.042×10^{-6}	8.28	-333.0
42	2.648×10^{-6}	2.817×10^{-6}	-5.040×10^{-6}	6.39	-290.4
43	5.505×10^{-6}	5.758×10^{-6}	-8.396×10^{-6}	4.59	-252.5
44	1.187×10^{-5}	1.220×10^{-5}	-1.413×10^{-5}	2.75	-219.1
45	2.706×10^{-5}	2.727×10^{-5}	-2.422×10^{-5}	0.75	-189.5
46	6.420×10^{-5}	6.662×10^{-5}	-4.279×10^{-5}	3.77	-166.6
47	1.880×10^{-4}	1.921×10^{-4}	-7.988×10^{-5}	2.17	-142.5
48	8.364×10^{-4}	8.708×10^{-4}	-1.709×10^{-4}	4.11	-120.4
49	5.921×10^{-3}	6.223×10^{-3}	-3.585×10^{-4}	5.11	-106.1
50	8.792×10^{-2}	8.283×10^{-2}	8.657×10^{-2}	-5.79	- 1.5
51	9.238×10^{-2}	8.715×10^{-2}	8.675×10^{-2}	-5.66	- 6.1
52	9.346×10^{-2}	8.825×10^{-2}	8.686×10^{-2}	-5.57	- 7.1
53	9.400×10^{-2}	8.881×10^{-2}	8.693×10^{-2}	-5.53	- 7.5
54	9.436×10^{-2}	8.917×10^{-2}	8.700×10^{-2}	-5.51	- 7.8
55	9.462×10^{-2}	8.943×10^{-2}	8.706×10^{-2}	-5.48	- 8.0
56	9.483×10^{-2}	8.965×10^{-2}	8.712×10^{-2}	-5.46	- 8.1
57	9.502×10^{-2}	8.983×10^{-2}	8.717×10^{-2}	-5.47	- 8.3
58	9.515×10^{-2}	8.999×10^{-2}	8.722×10^{-2}	-5.43	- 8.3
59	9.531×10^{-2}	9.013×10^{-2}	8.727×10^{-2}	-5.44	- 8.4
60	9.543×10^{-2}	9.027×10^{-2}	8.733×10^{-2}	-5.41	- 8.5
61	9.557×10^{-2}	9.039×10^{-2}	8.738×10^{-2}	-5.41	- 8.6
62	9.567×10^{-2}	9.051×10^{-2}	8.744×10^{-2}	-5.39	- 8.6
63	9.580×10^{-2}	9.063×10^{-2}	8.749×10^{-2}	-5.39	- 8.7
64	9.589×10^{-2}	9.075×10^{-2}	8.755×10^{-2}	-5.36	- 8.7

TABLE 18A: U235 COMPARISON OF REACTION RATES FOR N=6 × 10^{-6}, T=0°K

GROUP	GROUP REACTION RATES			% DIFFERENCE	
	PEAS	GYMEA			
		RES.ADJUSTED	RES.REMOVED	RES.ADJUSTED	RES.REMOVED
33	3.590×10^{-10}	4.762×10^{-10}	-2.348×10^{-9}	32.64	-753.9
34	6.867×10^{-10}	8.489×10^{-10}	-3.830×10^{-9}	23.62	-657.7
35	1.318×10^{-9}	1.461×10^{-9}	-6.249×10^{-9}	10.90	-574.3
36	2.167×10^{-9}	2.705×10^{-9}	-1.019×10^{-8}	24.82	-570.3
37	4.566×10^{-9}	4.916×10^{-9}	-1.663×10^{-8}	7.66	-464.2
38	8.897×10^{-9}	9.222×10^{-9}	-2.716×10^{-8}	3.65	-405.2
39	1.749×10^{-9}	1.794×10^{-8}	-4.444×10^{-8}	2.54	-354.0
40	3.482×10^{-8}	3.470×10^{-8}	-7.292×10^{-8}	-0.33	-309.4
41	5.990×10^{-8}	6.909×10^{-8}	-1.202×10^{-7}	15.33	-300.7
42	1.343×10^{-7}	1.403×10^{-7}	-1.997×10^{-7}	4.51	-248.7
43	2.858×10^{-7}	2.941×10^{-7}	-3.353×10^{-7}	2.88	-217.3
44	6.366×10^{-7}	6.438×10^{-7}	-5.733×10^{-7}	1.13	-190.1
45	1.520×10^{-6}	1.507×10^{-6}	-1.007×10^{-6}	-0.85	-166.3
46	3.716×10^{-6}	3.936×10^{-6}	-1.856×10^{-6}	5.92	-149.9
47	1.239×10^{-5}	1.255×10^{-5}	-3.706×10^{-6}	1.31	-129.9
48	6.493×10^{-5}	6.794×10^{-5}	-9.089×10^{-6}	4.63	-114.0
49	5.160×10^{-4}	5.401×10^{-4}	-1.874×10^{-5}	4.67	-103.6
50	1.273×10^{-2}	1.277×10^{-2}	1.420×10^{-2}	0.35	11.6
51	4.766×10^{-4}	4.597×10^{-4}	1.903×10^{-5}	-3.53	- 96.0
52	1.158×10^{-4}	1.180×10^{-4}	1.101×10^{-5}	1.87	- 90.5
53	5.905×10^{-5}	6.002×10^{-5}	8.347×10^{-6}	1.65	- 85.9
54	3.925×10^{-5}	3.895×10^{-5}	7.080×10^{-6}	-0.76	- 82.0
55	2.821×10^{-5}	2.887×10^{-5}	6.411×10^{-6}	2.34	- 77.3
56	2.262×10^{-5}	2.307×10^{-5}	6.004×10^{-6}	2.01	- 73.5
57	2.116×10^{-5}	1.959×10^{-5}	5.807×10^{-6}	-7.41	- 72.6
58	1.436×10^{-5}	1.723×10^{-5}	5.699×10^{-6}	19.99	- 60.3
59	1.739×10^{-5}	1.561×10^{-5}	5.672×10^{-6}	-10.26	- 67.4
60	1.209×10^{-5}	1.453×10^{-5}	5.731×10^{-6}	20.21	- 52.6
61	1.525×10^{-5}	1.373×10^{-5}	5.820×10^{-6}	- 9.96	- 61.8
62	1.097×10^{-5}	1.318×10^{-5}	5.953×10^{-6}	20.10	- 45.7
63	1.419×10^{-5}	1.287×10^{-5}	6.159×10^{-6}	- 9.32	- 56.6
64	1.044×10^{-5}	1.257×10^{-5}	6.336×10^{-6}	20.42	- 39.3
33-64	1.419×10^{-2}	1.425×10^{-2}	1.427×10^{-2}	0.44	0.71

TABLE 18B: U235 CAPTURE PROBABILITIES FOR N=6 × 10^{-6}, T=0°K

GROUP	CAPTURE PROBABILITY			% DIFFERENCE	
	PEAS	GYMEA			
		RES.ADJUSTED	RES.REMOVED	RES.ADJUSTED	RES.REMOVED
33	7.553×10^{-10}	4.762×10^{-10}	-2.348×10^{-9}	-36.95	-410.9
34	1.442×10^{-9}	1.325×10^{-9}	-6.177×10^{-9}	- 8.11	-528.4
35	2.759×10^{-9}	2.786×10^{-9}	-1.243×10^{-8}	0.97	-550.3
36	4.926×10^{-9}	5.491×10^{-9}	-2.262×10^{-8}	11.46	-559.1
37	9.493×10^{-9}	1.041×10^{-8}	-3.925×10^{-8}	9.63	-513.5
38	1.839×10^{-8}	1.963×10^{-8}	-6.641×10^{-8}	6.74	-461.1
39	3.588×10^{-8}	3.757×10^{-8}	-1.108×10^{-7}	4.69	-408.9
40	7.070×10^{-8}	7.227×10^{-8}	-1.838×10^{-7}	2.22	-359.9
41	1.306×10^{-7}	1.414×10^{-7}	-3.040×10^{-7}	8.24	-332.8
42	2.649×10^{-7}	2.817×10^{-7}	-5.037×10^{-7}	6.35	-290.1
43	5.507×10^{-7}	5.758×10^{-7}	-8.390×10^{-7}	4.55	-252.3
44	1.187×10^{-6}	1.220×10^{-6}	-1.412×10^{-6}	2.71	-218.9
45	2.707×10^{-6}	2.727×10^{-6}	-2.420×10^{-6}	0.72	-189.4
46	6.423×10^{-6}	6.662×10^{-6}	-4.275×10^{-6}	3.73	-166.6
47	1.881×10^{-5}	1.921×10^{-5}	-7.981×10^{-6}	2.13	-142.4
48	6.374×10^{-5}	8.715×10^{-5}	-1.707×10^{-5}	4.07	-120.4
49	5.997×10^{-4}	6.272×10^{-4}	-3.581×10^{-5}	4.59	-106.0
50	1.333×10^{-2}	1.340×10^{-2}	1.417×10^{-2}	0.54	6.3
51	1.381×10^{-2}	1.386×10^{-2}	1.419×10^{-2}	0.40	2.8
52	1.392×10^{-2}	1.398×10^{-2}	1.420×10^{-2}	0.41	2.0
53	1.398×10^{-2}	1.404×10^{-2}	1.421×10^{-2}	0.42	1.6
54	1.402×10^{-2}	1.408×10^{-2}	1.421×10^{-2}	0.41	1.4
55	1.405×10^{-2}	1.411×10^{-2}	1.422×10^{-2}	0.42	1.2
56	1.407×10^{-2}	1.413×10^{-2}	1.423×10^{-2}	0.42	1.1
57	1.409×10^{-2}	1.415×10^{-2}	1.423×10^{-2}	0.41	1.0
58	1.411×10^{-2}	1.417×10^{-2}	1.424×10^{-2}	0.43	0.9
59	1.412×10^{-2}	1.418×10^{-2}	1.424×10^{-2}	0.41	0.8
60	1.414×10^{-2}	1.420×10^{-2}	1.425×10^{-2}	0.43	0.8
61	1.415×10^{-2}	1.421×10^{-2}	1.425×10^{-2}	0.42	0.7
62	1.416×10^{-2}	1.422×10^{-2}	1.426×10^{-2}	0.43	0.7
63	1.418×10^{-2}	1.424×10^{-2}	1.427×10^{-2}	0.42	0.6
64	1.419×10^{-2}	1.425×10^{-2}	1.427×10^{-2}	0.44	0.6

TABLE 19A: U235 COMPARISON OF REACTION RATES. $N=6 \times 10^{-7}$. T=0°K

GROUP	GROUP REACTION RATES			% DIFFERENCE	
	PEAS	GYMEA			
		RES.ADJUSTED	RES.REMOVED	RES.ADJUSTED	RES.REMOVED
33	3.590×10^{-11}	4.762×10^{-11}	-2.329×10^{-10}	32.64	-748.7
34	6.867×10^{-11}	8.489×10^{-11}	-3.799×10^{-10}	23.61	-167.3
35	1.318×10^{-10}	1.461×10^{-10}	-6.199×10^{-10}	10.89	-570.5
36	2.167×10^{-10}	2.705×10^{-10}	-1.011×10^{-9}	24.82	-566.6
37	4.566×10^{-10}	4.916×10^{-10}	-1.650×10^{-9}	7.65	-261.3
38	8.898×10^{-10}	9.222×10^{-10}	-2.694×10^{-9}	3.64	-402.8
39	1.750×10^{-9}	1.794×10^{-9}	-4.408×10^{-9}	2.74	-352.0
40	3.482×10^{-9}	3.470×10^{-9}	-7.234×10^{-9}	-0.33	-307.8
41	5.990×10^{-9}	6.909×10^{-9}	-1.193×10^{-8}	15.34	-299.1
42	1.343×10^{-8}	1.403×10^{-8}	-1.981×10^{-8}	4.51	-247.5
43	2.858×10^{-8}	2.941×10^{-8}	-3.326×10^{-8}	2.88	-216.4
44	6.366×10^{-8}	6.438×10^{-8}	-5.688×10^{-8}	1.12	-189.3
45	1.520×10^{-7}	1.507×10^{-7}	-9.993×10^{-8}	-0.85	-165.7
46	3.716×10^{-7}	3.936×10^{-7}	-1.841×10^{-7}	5.92	-149.5
47	1.239×10^{-6}	1.255×10^{-6}	-3.677×10^{-7}	1.30	-129.7
48	6.494×10^{-6}	6.794×10^{-6}	$-9\ 016 \times 10^{-7}$	4.62	-113.9
49	5.167×10^{-5}	5.406×10^{-5}	-1.859×10^{-6}	4.61	-103.6
50	1.361×10^{-3}	1.384×10^{-3}	1.522×10^{-3}	1.64	11.8
51	4.811×10^{-5}	4.641×10^{-5}	1.905×10^{-6}	-3.52	- 96.0
52	1.170×10^{-5}	1.193×10^{-5}	1.104×10^{-6}	1.91	- 90.6
53	5.979×10^{-6}	6.079×10^{-6}	8.387×10^{-7}	13.51	- 86.0
54	3.982×10^{-6}	3.948×10^{-6}	7.120×10^{-7}	-0.85	- 82.1
55	2.854×10^{-6}	2.924×10^{-6}	6.441×10^{-7}	2.45	- 77.4
56	2.290×10^{-6}	2.337×10^{-6}	6.031×10^{-7}	2.03	- 73.7
57	2.144×10^{-6}	1.985×10^{-6}	5.835×10^{-7}	-7.44	- 72.8
58	1.454×10^{-6}	1.745×10^{-6}	5.727×10^{-7}	20.03	- 60.6
59	1.761×10^{-6}	1.581×10^{-6}	5.699×10^{-7}	-10.24	- 67.6
60	1.225×10^{-6}	1.472×10^{-6}	5.759×10^{-7}	20.16	- 53.0
61	1.545×10^{-6}	1.391×10^{-6}	5.848×10^{-7}	-9.99	- 62.1
62	1.110×10^{-6}	1.335×10^{-6}	5.982×10^{-7}	20.23	- 46.1
63	1.438×10^{-6}	1.303×10^{-6}	6.188×10^{-7}	-9.37	- 57.0
64	1.057×10^{-6}	1.274×10^{-6}	6.367×10^{-7}	20.48	- 39.8
33-64	1.508×10^{-3}	1.532×10^{-3}	1.529×10^{-3}	1.60	1.41

TABLE 19B: U235 CAPTURE PROBABILITIES. $N=6 \times 10^{-7}$. T=0°K

GROUP	CAPTURE PROBABILITY			% DIFFERENCE	
	PEAS	GYMEA			
		RES.ADJUSTED	RES.REMOVED	RES.ADJUSTED	RES.REMOVED
33	7.553×10^{-11}	4.762×10^{-11}	-2.329×10^{-10}	-36.95	-408.4
34	1.442×10^{-10}	1.325×10^{-10}	-6.128×10^{-10}	- 8.11	-525.0
35	2.760×10^{-10}	2.786×10^{-10}	-1.233×10^{-9}	0.96	-546.7
36	4.927×10^{-10}	5.491×10^{-10}	-2.244×10^{-9}	11.45	-555.4
37	9.493×10^{-10}	1.041×10^{-9}	-3.894×10^{-9}	9.63	-510.2
38	1.839×10^{-9}	1.963×10^{-9}	-6.588×10^{-9}	6.73	-458.2
39	3.589×10^{-9}	3.757×10^{-9}	-1.100×10^{-8}	4.69	-406.4
40	7.070×10^{-9}	7.227×10^{-9}	-1.823×10^{-8}	2.21	-357.8
41	1.306×10^{-8}	1.414×10^{-8}	-3.016×10^{-8}	8.23	-330.9
42	2.649×10^{-8}	2.817×10^{-8}	-4.996×10^{-8}	6.34	-288.6
43	5.507×10^{-8}	5.758×10^{-8}	-8.323×10^{-8}	4.55	-251.1
44	1.187×10^{-7}	1.220×10^{-7}	-1.401×10^{-7}	2.71	-218.0
45	2.708×10^{-7}	2.727×10^{-7}	-2.400×10^{-7}	0.71	-188.7
46	6.423×10^{-7}	6.662×10^{-7}	-4.241×10^{-7}	3.72	-166.0
47	1.881×10^{-6}	1.921×10^{-6}	-7.918×10^{-7}	2.13	-142.1
48	8.375×10^{-6}	8.715×10^{-6}	-1.693×10^{-6}	4.06	-120.2
49	6.005×10^{-5}	6.277×10^{-5}	-3.553×10^{-6}	4.54	-105.9
50	1.421×10^{-3}	1.446×10^{-3}	1.519×10^{-3}	1.76	6.8
51	1.469×10^{-3}	1.493×10^{-3}	1.521×10^{-3}	1.59	3.5
52	1.481×10^{-3}	1.505×10^{-3}	1.522×10^{-3}	1.59	2.7
53	1.487×10^{-3}	1.511×10^{-3}	1.522×10^{-3}	1.59	2.4
54	1.491×10^{-3}	1.515×10^{-3}	1.523×10^{-3}	1.58	2.2
55	1.494×10^{-3}	1.518×10^{-3}	1.524×10^{-3}	1.59	2.0
56	1.496×10^{-3}	1.520×10^{-3}	1.524×10^{-3}	1.59	1.9
57	1.498×10^{-3}	1.522×10^{-3}	1.525×10^{-3}	1.57	1.8
58	1.500×10^{-3}	1.524×10^{-3}	1.526×10^{-3}	1.59	1.7
59	1.502×10^{-3}	1.525×10^{-3}	1.526×10^{-3}	1.58	1.6
60	1.503×10^{-3}	1.527×10^{-3}	1.527×10^{-3}	1.59	1.6
61	1.504×10^{-3}	1.528×10^{-3}	1.527×10^{-3}	1.58	1.5
62	1.505×10^{-3}	1.530×10^{-3}	1.528×10^{-3}	1.60	1.5
63	1.507×10^{-3}	1.531×10^{-3}	1.529×10^{-3}	1.59	1.4
64	1.508×10^{-3}	1.532×10^{-3}	1.529×10^{-3}	1.60	1.4

TABLE 20A: U235 COMPARISON OF REACTION RATES. $N=6 \times 10^{-8}$, $T=0°K$

GROUP	GROUP REACTION RATES			% DIFFERENCE	
	PEAS	GYMEA			
		RES.ADJUSTED	RES.REMOVED	RES.ADJUSTED	RES.REMOVED
33	3.602×10^{-12}	4.762×10^{-12}	-2.350×10^{-11}	32.19	-752.2
34	6.891×10^{-12}	8.489×10^{-12}	-3.833×10^{-11}	23.19	-656.3
35	1.322×10^{-11}	1.461×10^{-11}	-6.254×10^{-11}	10.51	-573.8
36	2.174×10^{-11}	2.705×10^{-11}	-1.020×10^{-10}	24.39	-569.1
37	4.582×10^{-11}	4.916×10^{-11}	-1.665×10^{-10}	7.29	-463.3
38	8.928×10^{-11}	9.222×10^{-11}	-2.718×10^{-10}	3.29	-404.4
39	1.756×10^{-10}	1.794×10^{-10}	-4.448×10^{-10}	2.19	-353.4
40	3.494×10^{-10}	3.470×10^{-10}	-7.298×10^{-10}	-0.68	-308.9
41	6.011×10^{-10}	6.909×10^{-10}	-1.203×10^{-9}	14.94	-300.2
42	1.347×10^{-9}	1.403×10^{-9}	-1.998×10^{-9}	4.15	-248.3
43	2.868×10^{-9}	2.941×10^{-9}	-3.356×10^{-9}	2.53	-217.0
44	6.388×10^{-9}	6.438×10^{-9}	-5.738×10^{-9}	0.78	-189.8
45	1.525×10^{-8}	1.507×10^{-8}	-1.008×10^{-8}	-1.19	-166.1
46	3.728×10^{-8}	3.936×10^{-8}	-1.857×10^{-8}	5.56	-149.8
47	1.218×10^{-7}	1.255×10^{-7}	-3.709×10^{-8}	3.08	-130.5
48	6.352×10^{-7}	6.794×10^{-7}	-9.097×10^{-8}	6.97	-114.3
49	5.205×10^{-6}	5.406×10^{-6}	-1.876×10^{-7}	3.87	-103.6
50	1.374×10^{-4}	1.396×10^{-4}	1.549×10^{-4}	1.56	12.7
51	4.832×10^{-6}	4.646×10^{-6}	1.923×10^{-7}	-3.85	- 96.0
52	1.176×10^{-6}	1.194×10^{-6}	1.150×10^{-7}	1.57	- 90.2
53	6.007×10^{-7}	6.087×10^{-7}	8.473×10^{-8}	1.33	- 85.9
54	3.908×10^{-7}	3.954×10^{-7}	7.194×10^{-8}	1.17	- 81.6
55	2.961×10^{-7}	2.928×10^{-7}	6.507×10^{-8}	-1.12	- 78.0
56	2.000×10^{-7}	2.340×10^{-7}	6.093×10^{-8}	16.98	- 69.5
57	2.153×10^{-7}	1.987×10^{-7}	5.895×10^{-8}	-7.70	- 72.6
58	1.462×10^{-7}	1.748×10^{-7}	5.786×10^{-8}	19.55	- 60.4
59	1.769×10^{-7}	1.583×10^{-7}	5.758×10^{-8}	-10.53	- 67.5
60	1.231×10^{-7}	1.474×10^{-7}	5.818×10^{-8}	19.74	- 52.7
61	1.551×10^{-7}	1.393×10^{-7}	5.909×10^{-8}	-10.21	- 61.9
62	1.116×10^{-7}	1.336×10^{-7}	6.044×10^{-8}	19.74	- 45.8
63	1.444×10^{-7}	1.305×10^{-7}	6.252×10^{-8}	-9.62	- 56.7
64	1.062×10^{-7}	1.275×10^{-7}	6.433×10^{-8}	20.08	- 39.4
33-64	1.521×10^{-4}	1.546×10^{-4}	1.556×10^{-4}	1.60	2.25

TABLE 20B: U235 CAPTURE PROBABILITIES. $N=6 \times 10^{-8}$, $T=0°K$

GROUP	CAPTURE PROBABILITY			% DIFFERENCE	
	PEAS	GYMEA			
		RES.ADJUSTED	RES.REMOVED	RES.ADJUSTED	RES.REMOVED
33	7.579×10^{-12}	4.762×10^{-12}	-2.350×10^{-11}	-37.17	-410.0
34	1.447×10^{-11}	1.325×10^{-11}	-6.183×10^{-11}	- 8.42	-527.3
35	2.769×10^{-11}	2.786×10^{-10}	-1.244×10^{-10}	0.62	-549.1
36	4.943×10^{-11}	5.491×10^{-11}	-2.264×10^{-10}	11.07	-557.9
37	9.525×10^{-11}	1.041×10^{-10}	-3.928×10^{-10}	9.25	-512.4
38	1.845×10^{-10}	1.963×10^{-10}	-6.646×10^{-10}	6.37	-460.2
39	3.601×10^{-10}	3.757×10^{-10}	-1.109×10^{-9}	4.33	-408.1
40	7.094×10^{-10}	7.227×10^{-10}	-1.839×10^{-9}	1.87	-359.2
41	1.310×10^{-9}	1.414×10^{-9}	-3.042×10^{-9}	7.86	-332.2
42	2.658×10^{-9}	2.817×10^{-9}	-5.041×10^{-9}	5.98	-289.7
43	5.526×10^{-9}	5.757×10^{-9}	-8.397×10^{-9}	4.19	-251.9
44	1.191×10^{-8}	1.220×10^{-8}	-1.413×10^{-8}	2.36	-218.6
45	2.717×10^{-8}	2.727×10^{-8}	-2.422×10^{-8}	0.37	-189.1
46	6.445×10^{-8}	6.663×10^{-8}	-4.279×10^{-8}	3.37	-166.4
47	1.862×10^{-7}	1.921×10^{-7}	-7.988×10^{-8}	3.18	-142.9
48	8.213×10^{-7}	8.716×10^{-7}	-1.708×10^{-7}	6.11	-120.8
49	6.026×10^{-6}	6.278×10^{-6}	-3.584×10^{-7}	3.35	-105.9
50	1.434×10^{-4}	1.458×10^{-4}	1.545×10^{-4}	1.67	7.7
51	1.483×10^{-4}	1.505×10^{-4}	1.547×10^{-4}	1.49	4.3
52	1.494×10^{-4}	1.517×10^{-4}	1.548×10^{-4}	1.50	3.6
53	1.500×10^{-4}	1.523×10^{-4}	1.549×10^{-4}	1.49	3.2
54	1.504×10^{-4}	1.527×10^{-4}	1.550×10^{-4}	1.49	3.0
55	1.507×10^{-4}	1.530×10^{-4}	1.550×10^{-4}	1.49	2.9
56	1.510×10^{-4}	1.532×10^{-4}	1.551×10^{-4}	1.49	2.7
57	1.512×10^{-4}	1.534×10^{-4}	1.551×10^{-4}	1.48	2.6
58	1.513×10^{-4}	1.536×10^{-4}	1.552×10^{-4}	1.49	2.6
59	1.515×10^{-4}	1.537×10^{-4}	1.553×10^{-4}	1.48	2.5
60	1.516×10^{-4}	1.540×10^{-4}	1.553×10^{-4}	1.59	2.4
61	1.518×10^{-4}	1.542×10^{-4}	1.554×10^{-4}	1.58	2.4
62	1.519×10^{-4}	1.543×10^{-4}	1.554×10^{-4}	1.59	2.3
63	1.520×10^{-4}	1.544×10^{-4}	1.555×10^{-4}	1.58	2.3
64	1.521×10^{-4}	1.546×10^{-4}	1.556×10^{-4}	1.60	2.3

TABLE 21A: U235 COMPARISON OF REACTION RATES. $N=6 \times 10^{-10}$. T=0°K

GROUP	GROUP REACTION RATES			% DIFFERENCE	
	PEAS	GYMEA			
		RES.ADJUSTED	RES.REMOVED	RES.ADJUSTED	RES.REMOVED
33	3.590×10^{-14}	4.762×10^{-14}	-2.350×10^{-13}	32.64	-754.4
34	6.867×10^{-14}	8.489×10^{-14}	-3.833×10^{-13}	23.61	-658.2
35	1.318×10^{-13}	1.461×10^{-13}	-6.254×10^{-13}	10.89	-574.7
36	2.167×10^{-13}	2.705×10^{-13}	-1.020×10^{-12}	24.82	-570.7
37	4.566×10^{-13}	4.916×10^{-13}	-1.665×10^{-12}	7.65	-464.5
38	8.898×10^{-13}	9.222×10^{-13}	-2.718×10^{-12}	3.64	-405.5
39	1.750×10^{-12}	1.794×10^{-12}	-4.448×10^{-12}	2.54	-354.2
40	3.482×10^{-12}	3.470×10^{-12}	-7.298×10^{-12}	-0.33	-309.6
41	5.990×10^{-12}	6.909×10^{-12}	-1.203×10^{-11}	15.34	-300.9
42	1.343×10^{-11}	1.403×10^{-11}	-1.998×10^{-11}	4.51	-248.8
43	2.858×10^{-11}	2.941×10^{-11}	-3.356×10^{-11}	2.88	-217.4
44	6.367×10^{-11}	6.438×10^{-11}	-5.738×10^{-11}	1.12	-190.1
45	1.520×10^{-10}	1.507×10^{-10}	-1.008×10^{-10}	-0.85	-166.3
46	3.716×10^{-10}	3.936×10^{-10}	-1.857×10^{-10}	5.92	-150.0
47	1.239×10^{-9}	1.255×10^{-9}	-3.709×10^{-10}	1.30	-129.9
48	6.494×10^{-9}	6.794×10^{-9}	-9.097×10^{-10}	4.62	-114.0
49	5.168×10^{-8}	5.406×10^{-8}	-1.876×10^{-9}	4.61	-103.6
50	1.372×10^{-6}	1.397×10^{-6}	1.550×10^{-6}	1.80	13.0
51	4.816×10^{-8}	4.647×10^{-8}	1.924×10^{-9}	-3.52	- 96.0
52	1.172×10^{-8}	1.194×10^{-8}	1.115×10^{-9}	1.91	- 90.5
53	5.988×10^{-9}	6.088×10^{-9}	8.475×10^{-10}	1.67	- 85.8
54	3.988×10^{-9}	3.954×10^{-9}	7.195×10^{-10}	-0.85	- 82.0
55	2.859×10^{-9}	2.928×10^{-9}	6.508×10^{-10}	2.42	- 77.2
56	2.293×10^{-9}	2.340×10^{-9}	6.094×10^{-10}	2.05	- 73.4
57	2.147×10^{-9}	1.988×10^{-9}	5.896×10^{-10}	-7.43	- 72.5
58	1.456×10^{-9}	1.748×10^{-9}	5.786×10^{-10}	20.05	- 60.3
59	1.764×10^{-9}	1.538×10^{-9}	5.759×10^{-10}	-12.81	- 67.4
60	1.227×10^{-9}	1.474×10^{-9}	5.819×10^{-10}	20.15	- 52.6
61	1.547×10^{-9}	1.393×10^{-9}	5.909×10^{-10}	- 9.96	- 61.8
62	1.112×10^{-9}	1.337×10^{-9}	6.045×10^{-10}	20.19	- 45.6
63	1.440×10^{-9}	1.305×10^{-9}	6.253×10^{-10}	- 9.35	- 56.6
64	1.059×10^{-9}	1.275×10^{-9}	6.434×10^{-10}	20.43	- 39.2
33-64	1.519×10^{-6}	1.545×10^{-6}	1.557×10^{-6}	1.74	2.50

TABLE 21B: U235 CAPTURE PROBABILITIES. $N=6 \times 10^{-10}$, T=0°K

GROUP	CAPTURE PROBABILITY			% DIFFERENCE	
	PEAS	GYMEA			
		RES.ADJUSTED	RES.REMOVED	RES.ADJUSTED	RES.REMOVED
33	7.553×10^{-14}	4.762×10^{-14}	-2.350×10^{-13}	-36.95	-411.1
34	1.442×10^{-13}	1.325×10^{-13}	-6.183×10^{-13}	- 8.11	-528.8
35	2.760×10^{-13}	2.786×10^{-13}	-1.244×10^{-12}	0.96	-550.7
36	4.927×10^{-13}	5.491×10^{-13}	-2.264×10^{-12}	11.45	-559.5
37	9.493×10^{-13}	1.041×10^{-12}	-3.928×10^{-12}	9.63	-513.8
38	1.839×10^{-12}	1.963×10^{-12}	-6.646×10^{-12}	6.73	-461.4
39	3.589×10^{-12}	3.757×10^{-12}	-1.109×10^{-11}	4.69	-409.1
40	7.070×10^{-12}	7.227×10^{-12}	-1.839×10^{-11}	2.21	-360.1
41	1.306×10^{-11}	1.414×10^{-11}	-3.042×10^{-11}	8.23	-333.0
42	2.649×10^{-11}	2.817×10^{-11}	-5.041×10^{-11}	6.34	-290.3
43	5.507×10^{-11}	5.758×10^{-11}	-8.397×10^{-11}	4.55	-252.5
44	1.187×10^{-10}	1.220×10^{-10}	-1.413×10^{-10}	2.71	-219.0
45	2.708×10^{-10}	2.727×10^{-10}	-2.422×10^{-10}	0.71	-189.4
46	6.423×10^{-10}	6.663×10^{-10}	$-4 279 \times 10^{-10}$	3.72	-166.6
47	1.881×10^{-9}	1.921×10^{-9}	-7.988×10^{-10}	2.13	-142.5
48	8.375×10^{-9}	8.716×10^{-9}	-1.708×10^{-9}	4.06	-120.4
49	6.006×10^{-8}	6.278×10^{-8}	-3.584×10^{-9}	4.53	-106.0
50	1.432×10^{-6}	1.460×10^{-6}	1.546×10^{-6}	1.91	8.0
51	1.480×10^{-6}	1.506×10^{-6}	1.548×10^{-6}	1.74	4.6
52	1.492×10^{-6}	1.518×10^{-6}	1.549×10^{-6}	1.74	3.8
53	1.498×10^{-6}	1.524×10^{-6}	1.550×10^{-6}	1.74	3.5
54	1.502×10^{-6}	1.528×10^{-6}	1.551×10^{-6}	1.73	3.3
55	1.505×10^{-6}	1.531×10^{-6}	1.552×10^{-6}	1.73	3.1
56	1.507×10^{-6}	1.533×10^{-6}	1.552×10^{-6}	1.73	2.9
57	1.509×10^{-6}	1.535×10^{-6}	1.553×10^{-6}	1.72	2.9
58	1.511×10^{-6}	1.537×10^{-6}	1.553×10^{-6}	1.74	2.8
59	1.513×10^{-6}	1.539×10^{-6}	1.554×10^{-6}	1.72	2.7
60	1.514×10^{-6}	1.540×10^{-6}	1.555×10^{-6}	1.74	2.7
61	1.515×10^{-6}	1.541×10^{-6}	1.555×10^{-6}	1.73	2.6
62	1.516×10^{-6}	1.543×10^{-6}	1.556×10^{-6}	1.74	2.6
63	1.518×10^{-6}	1.544×10^{-6}	1.556×10^{-6}	1.73	2.5
64	1.519×10^{-6}	1.545×10^{-6}	1.557×10^{-6}	1.74	2.5

TABLE 22: U235 INTEGRATED REACTION RATES (2.05 TO 583eV)
[% PEAS IS QUOTED ERROR IN J-FUNCTION]

N_{U235}	PEAS	'U5RA'	'U5RR'	% PEAS	% RA	% RR
6×10^{-3}	0.7894738	0.8056467	-	-5.3×10^{-3}	2.0	-
6×10^{-4}	0.3487907	0.3184577	-	-4.9×10^{-3}	-8.7	-
6×10^{-5}	9.589167×10^{-2}	9.074810×10^{-2}	8.755221×10^{-2}	-4.9×10^{-3}	5.4	-8.7
6×10^{-6}	1.418680×10^{-2}	1.424917×10^{-2}	1.427324×10^{-2}	-4.6×10^{-3}	0.4	0.7
6×10^{-7}	1.507989×10^{-3}	1.532086×10^{-3}	1.529194×10^{-3}	-4.9×10^{-3}	1.6	1.4
6×10^{-8}	1.521299×10^{-4}	1.545564×10^{-4}	1.555570×10^{-4}	-5.5×10^{-3}	1.6	2.3
6×10^{-10}	1.518937×10^{-6}	1.545402×10^{-6}	1.556972×10^{-6}	-4.9×10^{-3}	1.7	2.5

TABLE 23: COMPARISON OF FITS TO PEAS FOR U235

CONC.	TEMP.	PERCENTAGE ERROR IN RESONANCE GROUP		χ^2 BACKGROUND	
		R.A.	R.R.	R.A.	R.R.
6×10^{-5}	0°K	-6.58%	-6.0%	1.79×10^{-2}	5.17
6×10^{-6}	0°K	0.35%	11.6%	1.71×10^{-2}	5.15
6×10^{-7}	0°K	1.64%	11.8%	2.11×10^{-2}	5.15
6×10^{-8}	0°K	1.56%	12.7%	1.87×10^{-2}	5.46
6×10^{-10}	0°K	1.80%	13.0%	1.82×10^{-2}	5.15

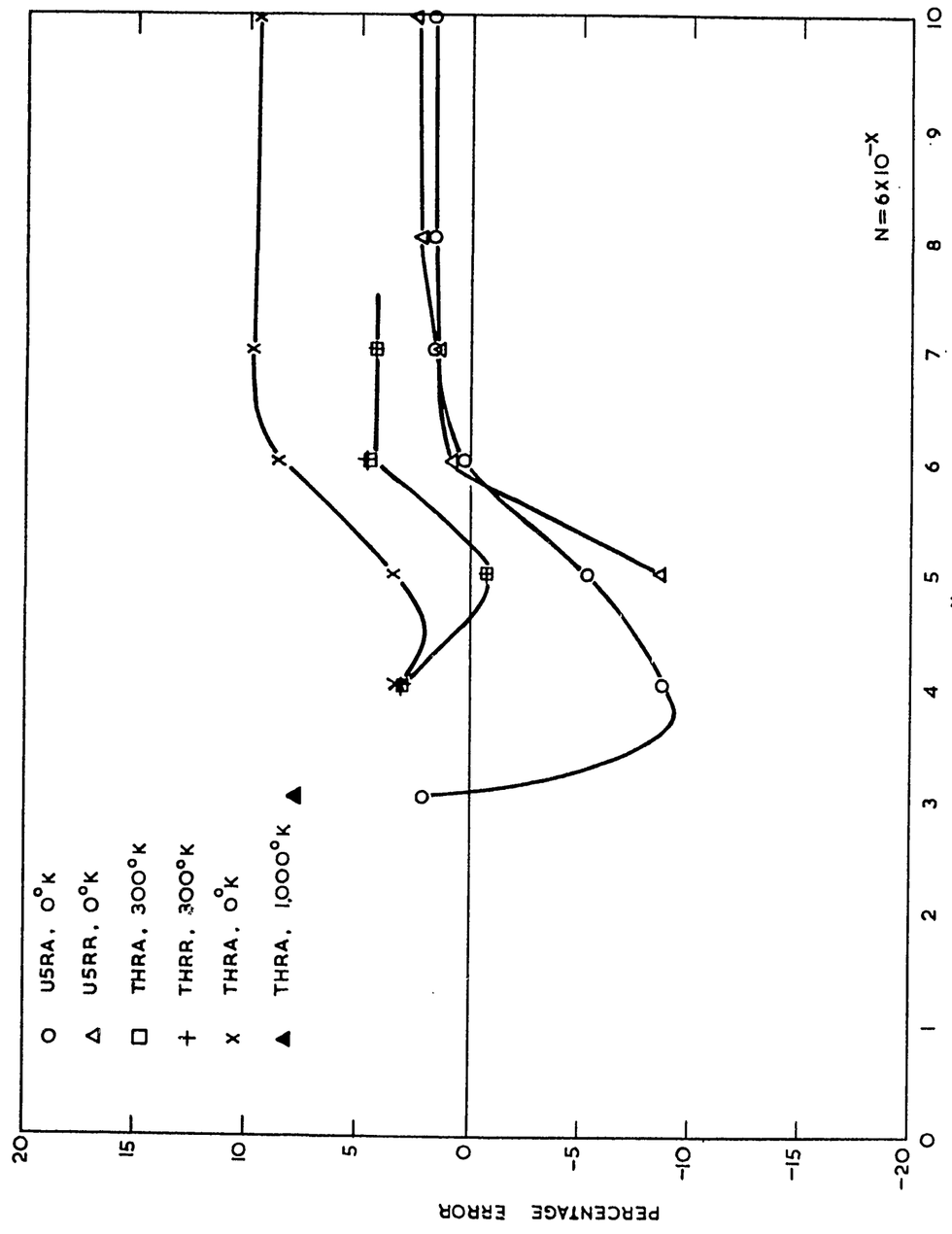

FIGURE 1. PERCENTAGE ERROR IN CUMULATIVE REACTION RATES (GYMEA v. PEAS)

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