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Centre d'Etudes de Bruyères-le-Châtel

CALCULS DANS LE CADRE DU MODELE OPTIQUE EN VOIES COUPLEES DE SECTIONS EFFICACES NEUTRONIQUES POUR ^{236}Pu, ^{238}Pu, ^{240}Pu, ^{242}Pu, ^{244}Pu DANS LE DOMAINE D'ENERGIE 1 keV - 20 MeV

par

Christian LAGRANGE

- Juin 1977 -

Note CEA-N-1970

DESCRIPTION-MATIERE *(mots clefs extraits du thesaurus SIDON/INIS)*

en français	*en anglais*
DOMAINE DU keV	keV RANGE
DOMAINE 01-10 meV	meV RANGE 01-10
DOMAINE 10-100 meV	meV RANGE 10-100
MODELES OPTIQUES	OPTICAL MODELS
SECTIONS EFFICACES	CROSS SECTIONS
THEORIE DES CANAUX COUPLES	COUPLED CHANNEL THEORY
CIBLE PLUTONIUM 236	PLUTONIUM 236 TARGET
CIBLE PLUTONIUM 238	PLUTONIUM 238 TARGET
CIBLE PLUTONIUM 240	PLUTONIUM 240 TARGET
CIBLE PLUTONIUM 242	PLUTONIUM 242 TARGET
CIBLE PLUTONIUM 244	PLUTONIUM 244 TARGET
DIFFUSION ELASTIQUE	ELASTIC SCATTERING
DIFFUSION INELASTIQUE	INELASTIC SCATTERING
REACTIONS DE NOYAU COMPOSE	COMPOUND-NUCLEUS REACTIONS

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Sommaire.- Cette note décrit, pour les isotopes pair-pair du plutonium, le calcul par modèle optique en voies couplées et dans le domaine d'énergie 1 keV - 20 MeV des sections efficaces neutroniques suivantes : totale, diffusions élastique et inélastiques, formation du noyau composé. Des tabulations de ces diverses grandeurs ainsi que des coefficients de transmission généralisés relatifs à l'état fondamental sont présentées en Annexe.

1977 102 p.

Commissariat à l'Energie Atomique.

CEA-N-1970 - LAGRANGE Christian

COUPLED CHANNEL CALCULATIONS OF NEUTRON CROSS-SECTIONS FOR $^{236, 238, 240, 242, 244}Pu$ FROM 1 keV TO 20 MeV

Summary.- This report describes the calculations from 1 keV to 20 MeV for even-even plutonium isotopes of neutron total, elastic, inelastic, and compound nucleus formation cross sections by means of a coupled channel optical model. Tables of numerical values of these cross sections and of the generalized transmission coefficients for the ground state are given in the Appendix.

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CALCULS DANS LE CADRE DU MODELE OPTIQUE EN VOIES COUPLEES DE SECTIONS EFFICACES NEUTRONIQUES POUR $^{236,238,240,242,244}Pu$ DANS LE DOMAINE D'ENERGIE 1 keV - 20 MeV

I - INTRODUCTION

Pour les isotopes pairs du Plutonium, les données expérimentales relatives aux sections efficaces neutroniques, à quelques exceptions près, sont rares ou inexistantes. Les évaluations qui servent à la constitution des bandes de données neutroniques nécessaires pour les calculs de réacteurs (bandes ENDF par exemple) sont donc basées en grande partie sur des calculs théoriques. La comparaison des données expérimentales et des calculs théoriques pour la diffusion inélastique de neutrons d'énergie supérieure à 1 MeV a montré pour ^{238}U [1,2,3] et ^{232}Th [3] que la contribution du processus d'interaction directe était grande pour les deux premiers états excités de ces noyaux. On est donc fondé de penser qu'il en est de même pour les isotopes pairs du Plutonium. Ce processus d'interaction directe dans la diffusion inélastique ne peut être prédit que par des calculs tenant compte explicitement de la déformation du noyau.

Le but de ce travail est donc de fournir un jeu cohérent de sections efficaces neutroniques calculées dans le cadre du modèle optique en voies couplées pour les isotopes pairs du Plutonium. Après un bref rappel du formalisme utilisé et la présentation de la paramétrisation adoptée, une tabulation des différents résultats obtenus est donnée. Cette tabulation est limitée aux valeurs des sections efficaces totales, de formation du noyau composé et de diffusions directes élastique et inélastiques sur les deux premiers états excités du noyau cible, et ce dans le domaine d'énergie 1 keV - 20 MeV. Cependant les coefficients de transmission généralisés nécessaires aux calculs par modèle statistique de diverses sections efficaces sont aussi tabulés, mais dans le domaine d'énergie plus restreint 1 keV - 8 MeV.

II - PRESENTATION DE LA PARAMETRISATION ADOPTEE

Les cibles considérées ici ($^{236,238,240,242,244}Pu$) sont des noyaux déformés, comme en témoigne l'existence de bandes rotationnelles bien établies dans leurs spectres d'états excités. Il nous est donc apparu nécessaire d'employer la méthode du modèle optique en voies couplées [4] dans laquelle le potentiel d'interaction neutron-noyau tient compte d'une déformation permanente de la cible. Nous avons donc adopté le potentiel effectif couramment utilisé [4], qui s'exprime dans le système d'axes lié au noyau par :

$$V(r,\theta) = -Vf(r,a_o,R_o) + 4iWa_D \cdot \frac{d}{dr} f(r,a_D,R_D) + \left(\frac{\hbar}{m_\pi c}\right)^2 \frac{1}{r} V_s \, \vec{\ell}.\vec{\sigma} \, \frac{d}{dr} f(r,a_s,R_s)$$

avec $$f(r,a_x,R_x) = \left[1 + \exp\left(\frac{r - R_x}{a_x}\right)\right]^{-1}$$

et $$R_x = r_x \; A^{1/3} \left[1 + \beta_2 \, Y_2^o(\theta) + \beta_4 \, Y_4^o(\theta)\right]$$

Les paramètres β_2 et β_4 sont une mesure des déformations respectivement quadrupolaire et hexadécapolaire du noyau. Ce potentiel est développé en polynômes de Legendre jusqu'au terme de multipolarité λ égale à huit, et les termes de couplage entre les différentes voies sont pris réels. Les calculs ont été effectués en couplant le fondamental du noyau cible aux deux premiers états excités (base 0^+, 2^+, 4^+). Les raisons du choix de cette base ont été présentées [5] pour le noyau ^{238}U qui a servi à tester la paramétrisation adoptée. Les paramètres du potentiel optique (rappelés en table 1) ont été pris identiques, pour tous les isotopes étudiés ici, à ceux qui avaient été précédemment utilisés pour décrire l'interaction des neutrons avec ^{238}U et ^{232}Th dans le même domaine d'énergie [5,6].

En vue d'obtenir un jeu cohérent de sections efficaces calculées pour un ensemble de noyaux dans cette région de masse (isotopes pairs de l'Uranium et ^{232}Th), nous avions utilisé [6] des paramètres de déformation calculés par Möller [7]. Or de nouveaux paramètres de déformation ont été calculés depuis par cet auteur et ses collaborateurs [8]. Le problème du choix des paramètres de déformation était donc posé. La comparaison de nos calculs aux données expérimentales de section efficace totale obtenues par SMITH [9]

nous a permis d'effectuer ce choix. Il apparaît en effet (cf figure 1) que pour ^{240}Pu un accord calcul-expérience plus satisfaisant est obtenu en adoptant le nouveau jeu de paramètres de déformations calculé en [8] (à savoir : β_2 = 0,220 et β_4 = 0,077). Pour ce noyau, la comparaison de nos calculs, utilisant les deux jeux de paramètres de déformation, aux valeurs recommandées [10] des fonctions densité et du rayon de diffusion, fait apparaître un accord satisfaisant dans les deux cas (cf table 2). Nous avons donc adopté pour tous les isotopes du Plutonium le jeu le plus récent [8] de paramètres de déformation calculés par Möller. Nous les présentons en table 3 avec les valeurs calculées correspondantes des fonctions densité et du rayon de diffusion.

Remarque

Pour les énergies du neutron supérieures à 8 MeV, en vue de réduire les temps prohibitifs de calcul, nous avons adopté une valeur nulle du potentiel spin-orbite. Des tests nous ont montré que l'influence du potentiel spin-orbite sur les grandeurs calculées ici devenait négligeable à ces énergies.

Commentaire

La comparaison des prévisions de nos calculs [5,6] aux mesures expérimentales [3] des distributions angulaires de diffusion élastique et inélastique de neutrons de 2,5 MeV par ^{238}U et ^{232}Th a été présentée à la Conférence de Lowell (Juillet 1976) [3]. En ce qui concerne la diffusion élastique et inélastique par le premier état excité, nos calculs semblent en assez bon accord avec l'expérience. Cependant, pour le deuxième état excité il apparaît clairement que nous surestimons la diffusion inélastique d'un facteur presque égal à 2. On est donc amené à penser qu'il en est probablement de même pour les isotopes du Plutonium. Dans le cadre d'une évaluation qui serait basée sur nos calculs, il nous paraît ainsi souhaitable de suggérer une diminution d'un facteur 2 des sections efficaces inélastiques calculées pour le deuxième état excité et, par compensation, une augmentation égale des sections efficaces de diffusion élastique calculées.

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TABLE 1

$V = 47{,}5 - 0{,}3\ E_n$	$a_o = 0{,}620$ fm	$r_o = 1{,}240$ fm
$V_s = 7{,}50$	$a_s = 0{,}620$ fm	$r_s = 1{,}240$ fm
$W_D =$ $2{,}7 + 0{,}4\ E_n$ pour $E_n < 10$ MeV $6{,}7$ pour $E_n > 10$ MeV	$a_D = 0{,}58$,	$r_D = 1{,}26$ fm

Paramètres du potentiel optique
(les énergies sont en MeV et les longueurs en fermis)

TABLE 2

TYPE	$S_0 \times 10^{+4}$	$S_1 \times 10^{+4}$	R' (fm)
Calcul avec $\beta_2 = 0{,}227$ $\beta_4 = 0{,}062$ [7]	1,02	2,49 *	9,16
Calcul avec $\beta_2 = 0{,}220$ $\beta_4 = 0{,}077$ [8]	0,942	2,18 *	9,20
Valeurs recommandées	1,05	2,50	9,18

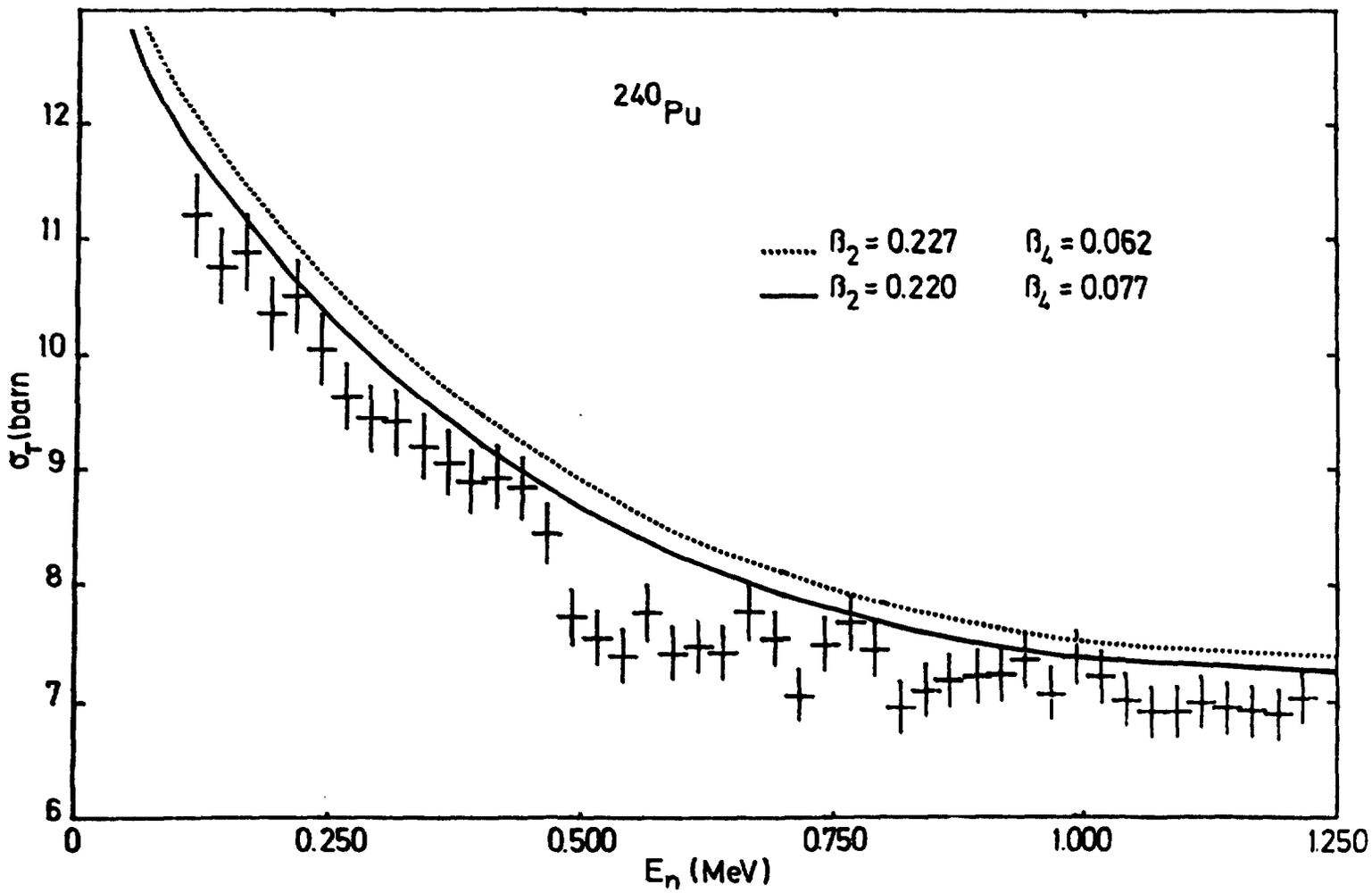
Fonctions densité et rayon de diffusion pour ^{240}Pu : comparaison entre les valeurs calculées à 10 keV et les valeurs recommandées [10].

* pour un rayon nucléaire de $1{,}24\ A^{1/3}$ fm

TABLE 3

A	β_2	β_4	$S_0 \times 10^4$	$S_1 \times 10^4$	R' fm
236	0,217	0,097	0,992	1,74	9,33
238	0,216	0,089	0,944	1,90	9,26
240	0,220	0,077	0,942	2,18	9,20
242	0,224	0,065	0,942	2,57	9,15
244	0,233	0,046	0,985	3,29	9,14

Présentation, pour les différents isotopes du Plutonium, des paramètres de déformation adoptés [8] et des valeurs des fonctions densités (S_0, S_1) et rayon de diffusion R' calculés à basse énergie.



Comparaison de nos calculs aux valeurs experimentales [9] de la section efficace totale.

ANNEXE 1A

SECTIONS EFFICACES CALCULEES PAR MODELE

OPTIQUE EN VOIES COUPLEES SUR ^{236}Pu

REMARQUES

1) E = Energies laboratoire en eV

2) S(E) = Sections efficaces correspondantes en barn

3) $\sigma(\theta) = \sum_{L=0}^{Lmax} B_L P_L (\cos\theta)$, où les B_L sont les coefficients de Legendre tabulés, avec $\sigma(\theta)$ résultant en barn/stéradian

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 236 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

NEUTRON TOTAL CROSS SECTIONS

E	S(E)	E	S(E)	E	S(E)
1.0000D 03	2.4903D 01	5.0000D 03	1.7459D 01	1.0000D 04	1.5671D 01
2.0000D 04	1.4344D 01	3.0000D 04	1.3693D 01	4.0000D 04	1.3258D 01
5.0000D 04	1.2817D 01	6.0000D 04	1.2540D 01	7.0000D 04	1.2300D 01
8.0000D 04	1.2086D 01	9.0000D 04	1.1891D 01	1.0000D 05	1.1711D 01
2.0000D 05	1.0365D 01	3.0000D 05	9.4142D 00	4.0000D 05	8.6907D 00
5.0000D 05	8.1413D 00	6.0000D 05	7.7326D 00	7.0000D 05	7.4297D 00
8.0000D 05	7.2132D 00	9.0000D 05	7.0662D 00	1.0000D 06	6.9787D 00
1.2500D 06	6.9389D 00	1.5000D 06	7.0696D 00	2.0000D 06	7.5083D 00
2.5000D 06	7.8696D 00	3.0000D 06	8.0410D 00	4.0000D 06	7.9665D 00
5.0000D 06	7.4223D 00	6.0000D 06	7.1799D 00	8.0000D 06	6.3946D 00
1.0000D 07	6.0595D 00	1.2000D 07	5.8849D 00	1.4000D 07	5.8939D 00
1.7000D 07	6.2220D 00	2.0000D 07	6.5343D 00	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 236 (CH,LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL,PHYS,A229-311)

NEUTRON COMPOUND NUCLEUS FORMATION CROSS SECTIONS

E	S(E)	E	S(E)	E	S(E)
1.0000D 03	1.3551D 01	5.0000D 03	4.3187D 00	1.0000D 04	4.7195D 00
2.0000D 04	3.6999D 00	3.0000D 04	3.3144D 00	4.0000D 04	3.1191D 00
5.0000D 04	3.0346D 00	6.0000D 04	2.9638D 00	7.0000D 04	2.9187D 00
8.0000D 04	2.8895D 00	9.0000D 04	2.8707D 00	1.0000D 05	2.8587D 00
2.0000D 05	2.9106D 00	3.0000D 05	2.9776D 00	4.0000D 05	3.0319D 00
5.0000D 05	3.0804D 00	6.0000D 05	3.1258D 00	7.0000D 05	3.1603D 00
8.0000D 05	3.1864D 00	9.0000D 05	3.2058D 00	1.0000D 06	3.2244D 00
1.2500D 06	3.2644D 00	1.5000D 06	3.3085D 00	2.0000D 06	3.3495D 00
2.5000D 06	3.2818D 00	3.0000D 06	3.1600D 00	4.0000D 06	2.9751D 00
5.0000D 06	2.9240D 00	6.0000D 06	2.9276D 00	8.0000D 06	2.9661D 00
1.0000D 07	3.0607D 00	1.2000D 07	2.9348D 00	1.4000D 07	2.8224D 00
1.7000D 07	2.7691D 00	2.0000D 07	2.7375D 00	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 236 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS,A229-311)

NEUTRON SHAPE ELASTIC SCATTERING CROSS SECTIONS

E	S(E)	E	S(E)	E	S(E)
1.0000D 03	1.1352D 01	5.0000D 03	1.1141D 01	1.0000D 04	1.0952D 01
2.0000D 04	1.0644D 01	3.0000D 04	1.0379D 01	4.0000D 04	1.0139D 01
5.0000D 04	9.7817D 00	6.0000D 04	9.5741D 00	7.0000D 04	9.3777D 00
8.0000D 04	9.1909D 00	9.0000D 04	9.0125D 00	1.0000D 05	8.8415D 00
2.0000D 05	7.4098D 00	3.0000D 05	6.3527D 00	4.0000D 05	5.5310D 00
5.0000D 05	4.8849D 00	6.0000D 05	4.3798D 00	7.0000D 05	3.9916D 00
8.0000D 05	3.7012D 00	9.0000D 05	3.4920D 00	1.0000D 06	3.3490D 00
1.2500D 06	3.2012D 00	1.5000D 06	3.2456D 00	2.0000D 06	3.5976D 00
2.5000D 06	4.0100D 00	3.0000D 06	4.3106D 00	4.0000D 06	4.4709D 00
5.0000D 06	4.2308D 00	6.0000D 06	3.8271D 00	8.0000D 06	3.0663D 00
1.0000D 07	2.6667D 00	1.2000D 07	2.6295D 00	1.4000D 07	2.7762D 00
1.7000D 07	3.1716D 00	2.0000D 07	3.3188D 00	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 236 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

NEUTRON DIRECT INELASTIC FIRST EXCITED LEVEL

E	S(E)	E	S(E)	E	S(E)
5.0000D 04	4.6935D-04	6.0000D 04	1.7341D-03	7.0000D 04	3.4938D-03
8.0000D 04	5.6498D-03	9.0000D 04	8.1290D-03	1.0000D 05	1.0872D-02
2.0000D 05	4.4131D-02	3.0000D 05	8.2318D-02	4.0000D 05	1.2167D-01
5.0000D 05	1.6117D-01	6.0000D 05	1.9913D-01	7.0000D 05	2.3338D-01
8.0000D 05	2.6250D-01	9.0000D 05	2.8598D-01	1.0000D 06	3.0421D-01
1.2500D 06	3.3244D-01	1.5000D 06	3.4723D-01	2.0000D 06	3.6250D-01
2.5000D 06	3.6858D-01	3.0000D 06	3.6318D-01	4.0000D 06	3.3300D-01
5.0000D 06	3.0179D-01	6.0000D 06	2.7851D-01	8.0000D 06	2.4713D-01
1.0000D 07	2.3581D-01	1.2000D 07	2.3343D-01	1.4000D 07	2.1985D-01
1.7000D 07	2.1612D-01	2.0000D 07	2.1739D-01	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 236 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A279-311)

NEUTRON DIRECT INELASTIC SECOND EXCITED LEVEL

E	S(E)	E	S(E)	E	S(E)
2.0000D 05	8.9906D-05	3.0000D 05	1.3660D-03	4.0000D 05	6.0875D-03
5.0000D 05	1.4809D-02	6.0000D 05	2.7933D-02	7.0000D 05	4.4496D-02
8.0000D 05	6.3140D-02	9.0000D 05	8.2380D-02	1.0000D 06	1.0112D-01
1.2500D 06	1.4058D-01	1.5000D 06	1.6823D-01	2.0000D 06	1.9871D-01
2.5000D 06	2.0932D-01	3.0000D 06	2.0717D-01	4.0000D 06	1.8749D-01
5.0000D 06	1.6566D-01	6.0000D 06	1.4669D-01	8.0000D 06	1.1505D-01
1.0000D 07	9.6318D-02	1.2000D 07	8.7171D-02	1.4000D 07	7.5419D-02
1.7000D 07	6.5145D-02	2.0000D 07	6.0646D-02	0.0	0.0

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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 236 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A279-311)

LEGENDRE COEFFICIENTS FOR SHAPE ELASTIC
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1..5, AND NEXT LINE 6,7......... 11

ELAB= 1.0000E 03  LMAX=    3
                   9.0337D-01  2.8270D-03  8.7855D-06 -2.3438D-07  0.0          0.0

ELAB= 5.0000E 03  LMAX=    3
                   8.8655D-01  1.4511D-02  1.1421D-04 -2.4410D-06  0.0          0.0

ELAB= 1.0000E 04  LMAX=    3
                   8.7130D-01  2.9285D-02  4.5247D-04  3.0280D-06  0.0          0.0

ELAB= 2.0000E 04  LMAX=    3
                   8.4699D-01  5.8493D-02  1.7616D-03  2.2830D-05  0.0          0.0

ELAB= 3.0000E 04  LMAX=    3
                   8.2593D-01  8.6666D-02  3.8482D-03  7.2074D-05  0.0          0.0

ELAB= 4.0000E 04  LMAX=    3
                   8.0886D-01  1.1354D-01  6.6465D-03  1.7218D-04  0.0          0.0

ELAB= 5.0000E 04  LMAX=    3
                   7.7840D-01  1.3483D-01  9.7743D-03  3.0661D-04  0.0          0.0

ELAB= 6.0000E 04  LMAX=    3
                   7.6188D-01  1.5824D-01  1.3693D-02  5.0939D-04  0.0          0.0

ELAB= 7.0000E 04  LMAX=    3
                   7.4026D-01  1.8032D-01  1.8112D-02  7.8730D-04  0.0          0.0

ELAB= 8.0000E 04  LMAX=    3
                   7.3138D-01  2.0112D-01  2.2993D-02  1.1398D-03  0.0          0.0

ELAB= 9.0000E 04  LMAX=    3
                   7.1718D-01  2.2067D-01  2.8277D-02  1.5879D-03  0.0          0.0

ELAB= 1.0000E 05  LMAX=    3
                   7.0358D-01  2.3904D-01  3.3914D-02  2.1149D-03  0.0          0.0

ELAB= 2.0000E 05  LMAX=    3
                   5.8953D-01  3.6846D-01  1.0180D-01  1.3068D-02  0.0          0.0

ELAB= 3.0000E 05  LMAX=    5
                   5.0553D-01  4.3209D-01  1.7006D-01  3.6904D-02  4.3528D-03  2.7809D-06

ELAB= 4.0000E 05  LMAX=    5
                   4.4014D-01  4.5928D-01  2.3219D-01  7.1561D-02  1.1538D-02  1.2224D-04

ELAB= 5.0000E 05  LMAX=    5
                   3.8873D-01  4.6703D-01  2.8203D-01  1.1371D-01  2.3883D-02  4.9785D-04
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 236 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR SHAPE ELASTIC
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,,5, AND NEXT LINE 6,7,........, 11

ELAB= 6.0000E 05  LMAX=    6
                  3.4853D-01  4.6704D-01  3.2278D-01  1.6723D-01  4.2761D-02  1.6782D-03
                  3.6956D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 7.0000E 05  LMAX=    6
                  3.1704D-01  4.6296D-01  3.5452D-01  2.2343D-01  6.8409D-02  4.0625D-03
                  8.9738D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 8.0000E 05  LMAX=    6
                  2.9454D-01  4.5830D-01  3.8029D-01  2.8198D-01  1.0120D-01  8.4279D-03
                  1.8902D-03  0.0         0.0         0.0         0.0         0.0

ELAB= 9.0000E 05  LMAX=    6
                  2.7789D-01  4.5409D-01  4.0200D-01  3.4065D-01  1.4085D-01  1.5628D-02
                  3.5954D-03  0.0         0.0         0.0         0.0         0.0

ELAB= 1.0000E 06  LMAX=    8
                  2.6650D-01  4.5309D-01  4.2379D-01  3.9794D-01  1.8698D-01  2.6272D-02
                  6.6123D-03  8.1175D-04  8.2008D-05  0.0         0.0         0.0

ELAB= 1.2500E 06  LMAX=    8
                  2.5474D-01  4.6137D-01  4.8212D-01  5.2801D-01  3.2333D-01  7.4029D-02
                  2.0915D-02  3.3368D-03  4.0842D-04  0.0         0.0         0.0

ELAB= 1.5000E 06  LMAX=    8
                  2.5828D-01  4.9051D-01  5.5708D-01  6.3861D-01  4.7696D-01  1.5707D-01
                  5.0094D-02  9.9024D-03  1.4070D-03  0.0         0.0         0.0

ELAB= 2.0000E 06  LMAX=    9
                  2.8629D-01  5.9974D-01  7.4657D-01  8.3208D-01  7.7716D-01  4.1004D-01
                  1.6587D-01  4.5197D-02  8.9443D-03  1.3539D-03  0.0         0.0

ELAB= 2.5000E 06  LMAX=   11
                  3.1911D-01  7.2657D-01  9.3905D-01  1.0194D 00  1.0199D 00  6.8905D-01
                  3.4033D-01  1.1886D-01  3.0453D-02  6.2534D-03  8.3454D-04  1.0915D-04

ELAB= 3.0000E 06  LMAX=   12
                  3.4303D-01  8.2509D-01  1.0947D 00  1.1857D 00  1.1987D 00  9.1591D-01
                  5.2147D-01  2.2017D-01  7.2018D-02  1.8637D-02  2.9393D-03  4.5486D-04
                  5.0940D-05  0.0         0.0         0.0         0.0         0.0

ELAB= 4.0000E 06  LMAX=   14
                  3.5578D-01  9.0339D-01  1.2418D 00  1.3921D 00  1.4020D 00  1.1876D 00
                  7.9679D-01  4.4177D-01  2.1261D-01  7.8580D-02  1.8597D-02  4.3758D-03
                  7.1442D-04  6.6415D-05  4.0198D-06  0.0         0.0         0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 236 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR SHAPE ELASTIC
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1..5, AND NEXT LINE 6,7,........ 11

ELAB= 5.0000E 06  LMAX=   15
   3.3608D-01  8.7423D-01  1.2368D 00  1.4376D 00  1.4624D 00  1.3075D 00
   9.6875D-01  6.3389D-01  3.9391D-01  1.9349D-01  6.5677D-02  2.0176D-02
   4.2471D-03  6.7161D-04  1.2958D-04  1.6970D-05  0.0         0.0

ELAB= 6.0000E 06  LMAX=   15
   3.0436D-01  7.9830D-01  1.1496D 00  1.3725D 00  1.4309D 00  1.3322D 00
   1.0720D 00  7.7387D-01  5.6013D-01  3.4770D-01  1.5892D-01  6.0747D-02
   1.6146D-02  3.3318D-03  7.6497D-04  1.1537D-04  0.0         0.0

ELAB= 8.0000E 06  LMAX=   17
   2.4401D-01  6.6083D-01  9.2708D-01  1.1334D 00  1.2470D 00  1.2469D 00
   1.1395D 00  9.5832D-01  7.9927D-01  6.6152D-01  4.6193D-01  2.5461D-01
   1.0126D-01  3.1898D-02  9.6708D-03  2.1905D-03  4.7570D-04  8.3474D-05

ELAB= 1.0000E 07  LMAX=   18
   2.1221D-01  5.6062D-01  8.0272D-01  9.8159D-01  1.1068D 00  1.1732D 00
   1.1724D 00  1.1133D 00  1.0271D 00  9.5127D-01  8.1746D-01  5.7743D-01
   3.3638D-01  1.6326D-01  6.3114D-02  2.0523D-02  5.9139D-03  1.4179D-03
   3.1268D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 1.2000E 07  LMAX=   20
   2.0925D-01  5.5852D-01  7.9488D-01  9.5286D-01  1.0685D 00  1.1526D 00
   1.1983D 00  1.2100D 00  1.1897D 00  1.1526D 00  1.0779D 00  8.8926D-01
   6.1701D-01  3.5584D-01  1.6870D-01  6.9090D-02  2.4151D-02  7.0452D-03
   1.9930D-03  5.0229D-04  1.2489D-04  0.0         0.0         0.0

ELAB= 1.4000E 07  LMAX=   21
   2.2092D-01  5.9966D-01  8.6538D-01  1.0417D 00  1.1645D 00  1.2530D 00
   1.3107D 00  1.3557D 00  1.3679D 00  1.3478D 00  1.2878D 00  1.1333D 00
   8.6658D-01  5.6603D-01  3.1848D-01  1.5833D-01  6.7513D-02  2.4649D-02
   8.3744D-03  2.3888D-03  7.5097D-04  1.7953D-04  0.0         0.0

ELAB= 1.7000E 07  LMAX=   22
   2.5239D-01  7.0531D-01  1.0597D 00  1.3202D 00  1.4982D 00  1.6139D 00
   1.6892D 00  1.7316D 00  1.7435D 00  1.7161D 00  1.6383D 00  1.4910D 00
   1.2402D 00  9.3428D-01  6.3834D-01  4.0125D-01  2.2454D-01  1.0974D-01
   4.8277D-02  1.8151D-02  6.6518D-03  2.0612D-03  5.4931D-04  0.0

ELAB= 2.0000E 07  LMAX=   24
   2.8002D-01  7.9529D-01  1.2284D 00  1.5798D 00  1.8426D 00  2.0181D 00
   2.1226D 00  2.1689D 00  2.1677D 00  2.1168D 00  2.0132D 00  1.8457D 00
   1.6082D 00  1.3004D 00  9.7983D-01  7.0113D-01  4.7106D-01  2.8568D-01
   1.5516D-01  7.3040D-02  3.0831D-02  1.0462D-02  3.6162D-03  1.1708D-03
   3.1785D-04  0.0         0.0         0.0         0.0         0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 236 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (1 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1..5, AND NEXT LINE 6,7,........ 11

ELAB= 5.0000E 04  LMAX=    3
                   3.7350D-05  3.6638D-05  6.7467D-06 -1.7202D-07  0.0          0.0

ELAB= 6.0000E 04  LMAX=    3
                   1.3799D-04  1.3754D-04  3.4379D-05 -1.7096D-06  0.0          0.0

ELAB= 7.0000E 04  LMAX=    3
                   2.7891D-04  2.7151D-04  7.3642D-05 -5.2835D-06  0.0          0.0

ELAB= 8.0000E 04  LMAX=    3
                   4.4955D-04  4.3159D-04  1.2070D-04 -1.1348D-05  0.0          0.0

ELAB= 9.0000E 04  LMAX=    3
                   6.4679D-04  6.1200D-04  1.7305D-04 -2.0234D-05  0.0          0.0

ELAB= 1.0000E 05  LMAX=    3
                   8.6304D-04  8.0790D-04  2.2879D-04 -3.2238D-05  0.0          0.0

ELAB= 2.0000E 05  LMAX=    3
                   3.5071D-03  3.0444D-03  8.0176D-04 -3.3480D-04  0.0          0.0

ELAB= 3.0000E 05  LMAX=    5
                   6.5507D-03  4.7776D-03  6.9995D-04 -1.0622D-03  2.3858D-04 -8.8659D-06

ELAB= 4.0000E 05  LMAX=    5
                   9.6824D-03  6.0733D-03  9.2591D-04 -2.0352D-03  5.6907D-04 -2.4266D-05

ELAB= 5.0000E 05  LMAX=    5
                   1.2825D-02  6.9063D-03  1.4907D-03 -3.2018D-03  9.6487D-04 -3.9587D-05

ELAB= 6.0000E 05  LMAX=    6
                   1.5846D-02  7.2678D-03  2.3685D-03 -4.4719D-03  8.5681D-04 -7.4033D-05
                   1.2600D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 7.0000E 05  LMAX=    6
                   1.8572D-02  7.1397D-03  3.3810D-03 -6.1458D-03  6.0257D-04 -3.9397D-05
                   2.7373D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 8.0000E 05  LMAX=    6
                   2.0888D-02  6.5167D-03  4.2957D-03 -8.0052D-03 -8.4829D-05  7.0845D-05
                   5.1458D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 9.0000E 05  LMAX=    6
                   2.2757D-02  5.4779D-03  4.9340D-03 -9.9175D-03 -1.2318D-03  2.7414D-04
                   8.6895D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 1.0000E 06  LMAX=    8
                   2.4208D-02  4.1448D-03  5.2052D-03 -1.1064D-02 -2.8140D-03  7.3547D-04
                   1.3144D-03 -4.1500D-05  2.3299D-05  0.0         0.0         0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 236 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (1 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,.5, AND NEXT LINE 6,7,........ 11

ELAB= 1.2500E 00  LMAX=    8
                   2.6472D-02  6.6628D-04  4.3860D-03 -1.4871D-02 -8.1383D-03  2.0480D-03
                   2.9332D-03 -1.2193D-04  1.0424D-04  0.0          0.0          0.0

ELAB= 1.5000E 00  LMAX=    8
                   2.7032D-02 -1.7596D-03  2.1987D-03 -1.6009D-02 -1.4058D-02  3.8514D-03
                   4.8431D-03 -2.5166D-04  3.3211D-04  0.0          0.0          0.0

ELAB= 2.0000E 00  LMAX=    9
                   2.8847D-02 -1.8916D-03 -1.5003D-03 -1.4506D-02 -2.0690D-02  8.1573D-03
                   6.1496D-03  2.9108D-04  1.8936D-03 -1.5407D-04  0.0          0.0

ELAB= 2.5000E 00  LMAX=   11
                   2.9330D-02  2.8298D-03 -1.4943D-04 -9.1779D-03 -1.6495D-02  1.2301D-02
                   3.3159D-03  2.6948D-03  4.1740D-03 -4.1650D-04  3.3844D-04 -2.9821D-06

ELAB= 3.0000E 00  LMAX=   12
                   2.8901D-02  8.3703D-03  4.6874D-03 -1.2934D-03 -7.4047D-03  1.6262D-02
                  -1.0705D-04  5.0916D-03  5.4778D-03 -4.3505D-04  1.0702D-03 -1.2866D-05
                   2.3851D-05  0.0          0.0          0.0          0.0          0.0

ELAB= 4.0000E 00  LMAX=   14
                   2.6499D-02  1.3010D-02  1.0642D-02  7.7913D-03  5.1091D-03  1.9419D-02
                  -2.0005D-03  1.8140D-04  8.1349D-04  1.6277D-03  3.8757D-03 -1.0356D-04
                   2.6083D-04  1.1964D-05  3.4500D-06  0.0          0.0          0.0

ELAB= 5.0000E 00  LMAX=   15
                   2.4016D-02  1.3658D-02  1.0445D-02  5.1558D-03  6.7334D-03  1.2537D-02
                  -5.8735D-04 -6.8206D-03 -8.7083D-03  4.1628D-03  5.9329D-03 -3.3445D-04
                   1.1933D-03  2.2552D-05  3.2482D-05  5.3709D-06  0.0          0.0

ELAB= 6.0000E 00  LMAX=   15
                   2.2103D-02  1.3227D-02  8.4184D-03  1.0852D-03  4.1376D-03  5.2785D-03
                  -6.7583D-04 -6.8209D-03 -1.3914D-02  4.1620D-03  3.6406D-03 -4.0709D-04
                   3.0872D-03 -1.0837D-05  1.6361D-04  3.2054D-05  0.0          0.0

ELAB= 8.0000E 00  LMAX=   17
                   1.9006D-02  1.4720D-02  7.0380D-03 -7.6007D-04 -4.2697D-04 -3.3402D-04
                  -3.2200D-03 -3.4891D-03 -1.3185D-02 -4.7204D-03 -6.6273D-03  2.6310D-03
                   6.5251D-03 -1.2892D-04  1.2021D-03 -4.4783D-04  8.1959D-05  2.9836D-05

ELAB= 1.0000E 07  LMAX=   18
                   1.8705D-02  1.9599D-02  9.3651D-03  2.1969D-03 -1.7727D-03 -4.3540D-03
                  -8.3520D-03 -1.0082D-02 -1.7239D-02 -1.4119D-02 -9.4030D-03  7.4202D-04
                   1.6992D-03  6.6807D-03  6.8720D-03  5.9623D-04  1.8235D-03  1.9170D-04
                   1.1076D-04  0.0          0.0          0.0          0.0          0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 236 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (1 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,..5, AND NEXT LINE 6,7......... 11

ELAB= 1.2000E 07  LMAX=   20
   1.85770D-02  2.25030D-02  1.23340D-02  5.00320D-03  2.45600D-04 -3.62610D-03
  -8.01310D-03 -1.09190D-02 -1.38440D-02 -1.21200D-02 -6.84870D-03  2.11770D-03
   1.65320D-03  9.00260D-03  4.14850D-03  1.32360D-03  4.92360D-03  1.24270D-04
   5.52040D-04  8.17510D-05  3.31440D-05  0.0          0.0          0.0

ELAB= 1.4000E 07  LMAX=   21
   1.74950D-02  2.29120D-02  1.46200D-02  6.93280D-03  3.86860D-03  2.91580D-04
  -2.31250D-03 -4.91880D-03 -6.56050D-03 -5.02960D-03 -2.21420D-03  4.79500D-03
   1.57030D-03  3.41740D-03 -2.52150D-03  3.75830D-03  6.94380D-03 -4.94140D-04
   1.83920D-03  2.20730D-04  1.98840D-04  4.64150D-05  0.0          0.0

ELAB= 1.7000E 07  LMAX=   22
   1.71980D-02  2.41490D-02  1.97040D-02  1.07730D-02  9.31020D-03  4.75210D-03
   4.00320D-03  1.33540D-03 -4.55850D-04  5.57590D-04 -4.77400D-04  5.13200D-03
   1.36120D-03  3.63240D-03 -2.14590D-03  6.90800D-03  3.44720D-03  1.03010D-04
   7.21300D-03  9.06730D-04  1.59850D-03  4.99960D-04  1.89940D-04  0.0

ELAB= 2.0000E 07  LMAX=   24
   1.72990D-02  2.51310D-02  2.34760D-02  1.37060D-02  1.36120D-02  9.19520D-03
   1.08320D-02  9.50170D-03  8.95080D-03  1.04090D-02  7.90020D-03  1.22520D-02
   6.36800D-03  8.03530D-03 -3.26480D-03 -6.80100D-03 -5.14840D-03  3.37150D-03
   1.07640D-02  1.78030D-03  5.89810D-03  1.61130D-03  9.82010D-04  3.37740D-04
   1.11580D-04  0.0          0.0          0.0          0.0          0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 236 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (2 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*80
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,..5, AND NEXT LINE 6,7,........ 11

ELAB= 2.0000E 05  LMAX=    3
                   7.1409D-06  7.0884D-06  3.3639D-06  8.7049D-07  0.0         0.0

ELAB= 3.0000E 05  LMAX=    5
                   1.2402D-04  1.8908D-04  9.3049D-05  1.8063D-05  8.7760D-07 -2.7995D-07

ELAB= 4.0000E 05  LMAX=    5
                   4.8441D-04  7.2723D-04  3.4251D-04  5.6980D-05 -1.8670D-07 -1.3861D-06

ELAB= 5.0000E 05  LMAX=    5
                   1.1784D-03  1.7059D-03  7.0441D-04  1.0070D-04 -9.5354D-06 -3.4531D-06

ELAB= 6.0000E 05  LMAX=    6
                   2.2229D-03  3.0988D-03  1.2174D-03  8.3577D-05 -4.4042D-05 -6.9238D-06
                   2.1307D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 7.0000E 05  LMAX=    6
                   3.3409D-03  4.6944D-03  1.6273D-03 -4.6193D-06 -8.4287D-05 -5.6117D-06
                   4.2699D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 8.0000E 05  LMAX=    6
                   5.0245D-03  6.3283D-03  1.8476D-03 -1.9665D-04 -1.2544D-04  3.7886D-06
                   6.7154D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 9.0000E 05  LMAX=    6
                   6.5557D-03  7.8411D-03  1.7828D-03 -4.9354D-04 -1.4815D-04  2.6334D-05
                   8.4576D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 1.0000E 06  LMAX=    8
                   8.0473D-03  9.1711D-03  1.4102D-03 -1.1375D-03 -1.4200D-04  1.4431D-04
                   5.6036D-06 -6.9822D-06  4.6634D-07  0.0         0.0         0.0

ELAB= 1.2500E 06  LMAX=    8
                   1.1187D-02  1.1178D-02 -8.6004D-04 -2.3223D-03  2.2919D-04  3.7813D-04
                  -2.5106D-05 -1.8796D-05  1.7659D-06  0.0         0.0         0.0

ELAB= 1.5000E 06  LMAX=    8
                   1.3347D-02  1.1683D-02 -4.0453D-03 -2.9364D-03  1.2503D-03  6.4173D-04
                  -1.2384D-04 -3.3271D-05  4.9928D-06  0.0         0.0         0.0

ELAB= 2.0000E 06  LMAX=    9
                   1.5813D-02  1.1128D-02 -7.9807D-03 -4.9435D-04  4.7808D-03  6.0449D-04
                  -5.9895D-04  1.5743D-05  1.5627D-05 -9.8310D-06  0.0         0.0

ELAB= 2.5000E 06  LMAX=   11
                   1.6057D-02  1.0912D-02 -6.8033D-03  4.1485D-03  6.7183D-03 -6.1045D-04
                  -9.8034D-04  1.7678D-04 -6.2097D-05 -3.1831D-05  2.4070D-05  4.6299D-07
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 236 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (2 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,,5, AND NEXT LINE 6,7......... 11

ELAB= 3.0000E 06  LMAX=   12
   1.6486D-02  1.0788D-02 -4.0228D-03  6.7208D-03  5.3502D-03 -2.4337D-03
  -6.3827D-04  4.1209D-04 -3.6202D-04 -6.2688D-05  7.5586D-05  1.1800D-06
   2.2470D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 4.0000E 06  LMAX=   14
   1.4920D-02  1.0030D-02 -6.1500D-04  3.5537D-03 -6.7255D-04 -3.9961D-03
   1.0204D-03  7.8332D-05 -1.2405D-03  4.4351D-05  2.0262D-04 -1.0628D-05
   2.6522D-05  6.9847D-07  2.8881D-07  0.0         0.0         0.0

ELAB= 5.0000E 06  LMAX=   15
   1.3185D-02  9.2116D-03  9.1848D-04  3.8095D-03 -3.6855D-03 -2.1631D-03
   4.3379D-04 -1.9112D-03 -5.6328D-04  6.7080D-04 -6.7192D-05 -5.5235D-05
   1.1696D-04 -2.0657D-06  3.3656D-06  8.2553D-07  0.0         0.0

ELAB= 6.0000E 06  LMAX=   15
   1.1673D-02  8.6037D-03  2.0800D-03  3.0791D-03 -3.9854D-03 -4.4794D-04
  -1.3545D-03 -2.7592D-03  1.8848D-03  9.4288D-04 -8.2906D-04  3.8605D-05
   2.4225D-04 -2.8231D-05  1.3735D-05  3.6715D-06  0.0         0.0

ELAB= 8.0000E 06  LMAX=   17
   9.1555D-03  8.0158D-03  3.9388D-03  2.8922D-03 -1.6576D-03  9.7339D-04
  -1.3919D-03 -1.3864D-03  1.5468D-03 -4.0689D-04 -1.3582D-04  7.9893D-04
   3.5630D-05 -1.9995D-04  6.2005D-05  4.3923D-05  9.1491D-06  4.6687D-04

ELAB= 1.0000E 07  LMAX=   18
   7.6647D-03  8.0553D-03  4.4503D-03  2.6387D-03 -9.9102D-04 -1.4212D-04
  -2.0608D-03 -1.1251D-03  1.4730D-04  1.1592D-03  2.8145D-03 -2.2696D-06
  -6.6305D-04  4.6817D-04 -2.4593D-04 -7.8035D-05  1.9733D-04  1.8204D-05
   1.9418D-05  0.0         0.0         0.0         0.0         0.0

ELAB= 1.2000E 07  LMAX=   20
   6.9309D-03  8.5231D-03  5.5108D-03  3.3441D-03  5.7060D-04  5.8872D-04
  -9.9196D-04  4.5220D-04  4.3808D-04  1.9486D-03  3.2322D-03  4.5058D-04
   1.3061D-03  1.3763D-04 -1.5779D-03  1.0757D-04  3.8510D-04 -1.2901D-05
   8.7810D-05  9.1882D-06  5.5764D-06  0.0         0.0         0.0

ELAB= 1.4000E 07  LMAX=   21
   6.0016D-03  7.8905D-03  5.9804D-03  4.1282D-03  1.8820D-03  1.6706D-03
   1.3339D-04  1.3731D-03  6.6258D-04  1.7294D-03  2.3371D-03  7.7549D-04
   2.1696D-03 -1.1315D-03 -1.7650D-03  7.8830D-04  1.5757D-03 -1.3919D-04
   2.1861D-04 -5.3426D-06  2.7707D-05  6.2029D-06  0.0         0.0

ELAB= 1.7000E 07  LMAX=   22
   5.1841D-03  6.8301D-03  6.4596D-03  4.6817D-03  2.7611D-03  2.5684D-03
   4.3726D-04  1.7420D-03  1.1600D-05  1.1990D-03  9.0411D-04  1.6489D-04
   1.9008D-03 -9.7453D-04  1.0116D-03  7.7623D-04 -1.9737D-03  5.4769D-06
   3.4773D-04 -1.7190D-04  1.7701D-04  5.4874D-05  3.0226D-05  0.0
```

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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 236 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (2 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,,5, AND NEXT LINE 6,7,......... 11

ELAB= 2.0000E 07  LMAX=   24
 4.8201D-03  6.6284D-03  7.1888D-03  4.7948D-03  3.0144D-03  2.5478D-03
 2.7891D-05  1.3685D-03 -8.9266D-04  7.1465D-04  7.5789D-05  1.4523D-04
 1.8438D-03 -2.5226D-04  1.6571D-03 -1.0375D-03 -2.1266D-03  6.3417D-04
-8.5809D-04 -4.8878D-04  5.6215D-04  1.2239D-04  1.4288D-04  5.1084D-05
 2.0059D-05  0.0         0.0         0.0         0.0         0.0
```

A N N E X E 1B

COEFFICIENTS DE TRANSMISSION GENERALISES
CALCULES POUR ^{236}Pu

NEUTRON TRANSMISSION COEFFICIENTS FOR PLUTONIUM; 236.000

THE COEFFICIENTS ARE IN THE ORDER (L,J): (0,1/2),(1,1/2),(1,3/2),(2,3/2),(2,5/2),(3,5/2),(3,7/2), ...

```
            E= 0.10000E-02(MEV)      LMAX=    3      JMAX=    5/2
0.20172E-01 0.75371E-04 0.10524E-03 0.47403E-07 0.26519E-07 0.34697E-11

            E= 0.50000E-02(MEV)      LMAX=    3      JMAX=    5/2
0.44519E-01 0.83536E-03 0.11668E-02 0.26297E-05 0.14780E-05 0.96900E-09

            E= 0.10000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.62332E-01 0.23368E-02 0.32648E-02 0.14734E-04 0.83301E-05 0.10952E-07

            E= 0.20000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.86883E-01 0.66634E-02 0.90337E-02 0.81754E-04 0.46796E-04 0.12366E-06

            E= 0.30000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.10521E 00 0.11611E-01 0.16231E-01 0.22095E-03 0.12817E-03 0.51018E-06

            E= 0.40000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.12033E 00 0.17482E-01 0.24438E-01 0.44480E-03 0.26194E-03 0.13938E-05

            E= 0.50000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.13607E 00 0.23657E-01 0.33205E-01 0.75509E-03 0.47274E-03 0.30179E-05

            E= 0.60000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.14803E 00 0.30421E-01 0.42726E-01 0.11691E-02 0.73899E-03 0.57053E-05

            E= 0.70000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.15890E 00 0.37509E-01 0.52708E-01 0.16868E-02 0.10769E-02 0.97746E-05

            E= 0.80000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.16891E 00 0.44849E-01 0.63050E-01 0.23114E-02 0.14905E-02 0.15582E-04

            E= 0.90000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.17821E 00 0.52387E-01 0.73672E-01 0.30449E-02 0.19835E-02 0.23511E-04

            E= 0.10000E 00(MEV)      LMAX=    3      JMAX=    5/2
0.18694E 00 0.60076E-01 0.84507E-01 0.38875E-02 0.25588E-02 0.33970E-04

            E= 0.20000E 00(MEV)      LMAX=    3      JMAX=    5/2
0.25851E 00 0.14084E 00 0.20006E 00 0.18400E-01 0.13781E-01 0.41100E-03

            E= 0.30000E 00(MEV)      LMAX=    4      JMAX=    7/2
0.31126E 00 0.41763E 00 0.30742E 00 0.42048E-01 0.34961E-01 0.16890E-02 0.26809E-02 0.27902E-04

            E= 0.40000E 00(MEV)      LMAX=    4      JMAX=    7/2
0.35574E 00 0.28732E 00 0.40208E 00 0.71901E-01 0.65675E-01 0.45332E-02 0.72055E-02 0.98479E-04

            E= 0.50000E 00(MEV)      LMAX=    4      JMAX=    7/2
0.39410E 00 0.34908E 00 0.48301E 00 0.10547E 00 0.10392E 00 0.96275E-02 0.13397E-01 0.26087E-03

            E= 0.60000E 00(MEV)      LMAX=    5      JMAX=    9/2
0.42675E 00 0.40520E 00 0.55287E 00 0.14054E 00 0.14657E 00 0.17017E-01 0.28411E-01 0.57651E-03 0.81935E-05 0.15758E-06
```

NEUTRON TRANSMISSION COEFFICIENTS FOR PLUTONIUM: 236.000

THE COEFFICIENTS ARE IN THE ORDER (L,J): (0,1/2),(1,1/2),(1,3/2),(2,3/2),(2,5/2),(3,5/2),(3,7/2), ...

```
            E= 0.70000E 00(MEV)      LMAX=    5     JMAX=    9/2
0.45335E 00 0.45470E 00 0.61082E 00 0.17546E 00 0.19009E 00 0.29060E-01 0.47287E-01 0.11243E-02 0.16034E-02 0.36487E-04

            E= 0.80000E 00(MEV)      LMAX=    5     JMAX=    9/2
0.47398E 00 0.49801E 00 0.65330E 00 0.20901E 00 0.23136E 00 0.44387E-01 0.72836E-01 0.20006E-02 0.28563E-02 0.75404E-04

            E= 0.90000E 00(MEV)      LMAX=    5     JMAX=    9/2
0.48910E 00 0.53751E 00 [illegible]29615E 00 0.24040E 00 0.28823E 00 0.63873E-01 0.10553E 00 0.33183E-02 0.47334E-02 0.14285E-03

            E= 0.10000E 01(MEV)      LMAX=    6     JMAX=   11/2
0.49944E 00 0.57190E 00 0.72536E 00 0.26929E 00 0.29964E 00 0.87616E-01 0.14542E 00 0.52050E-02 0.74055E-02 0.25265E-03
0.80169E-03 0.74865E-05

            E= 0.12500E 01(MEV)      LMAX=    6     JMAX=   11/2
0.51014E 00 0.64099E 00 0.76883E 00 0.32904E 00 0.35437E 00 0.16451E 00 0.27252E 00 0.13339E-01 0.18738E-01 0.84036E-03
0.24911E-02 0.32899E-04

            E= 0.15000E 01(MEV)      LMAX=    6     JMAX=   11/2
0.50844E 00 0.69104E 00 0.78693E 00 0.37251E 00 0.38371E 00 0.26035E 00 0.42198E 00 0.28118E-01 0.38707E-01 0.22243E-02
0.60497E-02 0.11101E-03

            E= 0.20000E 01(MEV)      LMAX=    7     JMAX=   13/2
0.49464E 00 0.75399E 00 0.79986E 00 0.42403E 00 0.40552E 00 0.46283E 00 0.68740E 00 0.82299E-01 0.10739E 00 0.10094E-01
0.22403E-01 0.75993E-03 0.99827E-03 0.21664E-04

            E= 0.25000E 01(MEV)      LMAX=    8     JMAX=   15/2
0.48434E 00 0.78755E 00 0.80642E 00 0.44820E 00 0.41752E 00 0.62655E 00 0.82776E 00 0.15924E 00 0.19819E 00 0.31712E-01
0.54549E-01 0.32501E-02 0.38902E-02 0.10641E-03 0.77196E-04 0.59183E-05

            E= 0.30000E 01(MEV)      LMAX=    9     JMAX=   17/2
0.48317E 00 0.80428E 00 0.81012E 00 0.46137E 00 0.43587E 00 0.73934E 00 0.86887E 00 0.23517E 00 0.28580E 00 0.77760E-01
0.97353E-01 0.96493E-02 0.10692E-01 0.37242E-03 0.28173E-03 0.28694E-04 0.28227E-04 0.67172E-06

            E= 0.40000E 01(MEV)      LMAX=   10     JMAX=   19/2
0.49933E 00 0.81433E 00 0.81168E 00 0.48467E 00 0.48911E 00 0.85894E 00 0.84476E 00 0.35655E 00 0.43302E 00 0.26553E 00
0.18574E 00 0.39879E-01 0.46590E-01 0.23675E-02 0.21800E-02 0.31356E-03 0.26887E-03 0.79989E-05 0.17688E-04 0.49927E-06

            E= 0.50000E 01(MEV)      LMAX=   11     JMAX=   21/2
0.52682E 00 0.81791E 00 0.80997E 00 0.51513E 00 0.54265E 00 0.90341E 00 0.80332E 00 0.45301E 00 0.55977E 00 0.50274E 00
0.27617E 00 0.98484E-01 0.13984E 00 0.88747E-02 0.10696E-01 0.15213E-02 0.13679E-02 0.55343E-04 0.14519E-03 0.46327E-05
0.45833E-05 0.23131E-06

            E= 0.60000E 01(MEV)      LMAX=   11     JMAX=   21/2
0.53794E 00 0.82213E 00 0.80700E 00 0.55137E 00 0.58566E 00 0.91040E 00 0.77428E 00 0.53526E 00 0.66528E 00 0.65604E 00
0.37081E 00 0.18790E 00 0.31038E 00 0.24080E-01 0.37825E-01 0.47117E-02 0.46991E-02 0.26198E-03 0.74272E-03 0.26202E-04
0.26209E-04 0.15575E-05

            E= 0.80000E 01(MEV)      LMAX=   13     JMAX=   25/2
0.62107E 00 0.82694E 00 0.79920E 00 0.62631E 00 0.65710E 00 0.88741E 00 0.74484E 00 0.67501E 00 0.79395E 00 0.73294E 00
0.53415E 00 0.44103E 00 0.68459E 00 0.11010E 00 0.20040E 00 0.27132E-01 0.27062E-01 0.29261E-02 0.65250E-02 0.31752E-03
0.38813E-03 0.29033E-04 0.36527E-04 0.27165E-05 0.28782E-05 0.22793E-06
```

ANNEXE 2A

SECTIONS EFFICACES CALCULEES PAR MODELE OPTIQUE EN VOIES COUPLEES SUR ^{238}Pu

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REMARQUES

1) E = Energies laboratoire en eV

2) S(E) = Sections efficaces correspondantes en barn

3) $\sigma(\theta) = \sum_{L=0}^{Lmax} B_L P_L(\cos\theta)$, où les B_L sont les coefficients de Legendre tabulés, avec $\sigma(\theta)$ résultant en barn/stéradian

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 238 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

NEUTRON TOTAL CROSS SECTIONS

E	S(E)	E	S(E)	E	S(E)
1.0000D 03	2.4041D 01	5.0000D 03	1.7025D 01	1.0000D 04	1.5352D 01
2.0000D 04	1.4126D 01	3.0000D 04	1.3532D 01	4.0000D 04	1.3137D 01
5.0000D 04	1.2733D 01	6.0000D 04	1.2482D 01	7.0000D 04	1.2265D 01
8.0000D 04	1.2071D 01	9.0000D 04	1.1893D 01	1.0000D 05	1.1728D 01
2.0000D 05	1.0487D 01	3.0000D 05	9.5779D 00	4.0000D 05	8.8701D 00
5.0000D 05	8.3238D 00	6.0000D 05	7.9113D 00	7.0000D 05	7.6008D 00
8.0000D 05	7.3745D 00	9.0000D 05	7.2166D 00	1.0000D 06	7.1181D 00
1.2500D 06	7.0515D 00	1.5000D 06	7.1569D 00	2.0000D 06	7.5435D 00
2.5000D 06	7.8628D 00	3.0000D 06	8.0150D 00	4.0000D 06	7.9535D 00
5.0000D 06	7.6370D 00	6.0000D 06	7.2145D 00	8.0000D 06	6.4341D 00
1.0000D 07	6.0921D 00	1.2000D 07	5.8894D 00	1.4000D 07	5.8919D 00
1.7000D 07	6.2290D 00	2.0000D 07	6.5429D 00	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 238 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

NEUTRON COMPOUND NUCLEUS FORMATION CROSS SECTIONS

E	S(E)	E	S'E)	E	S(E)
1.0000D 03	1.2910D 01	5.0000D 03	6.0740D 00	1.0000D 04	4.5804D 00
2.0000D 04	3.6467D 00	3.0000D 04	3.3059D 00	4.0000D 04	3.1407D 00
5.0000D 04	3.0863D 00	6.0000D 04	3.0333D 00	7.0000D 04	3.0027D 00
8.0000D 04	2.9856D 00	9.0000D 04	2.9768D 00	1.0000D 05	2.9735D 00
2.0000D 05	3.0748D 00	3.0000D 05	3.1447D 00	4.0000D 05	3.1884D 00
5.0000D 05	3.2228D 00	6.0000D 05	3.2542D 00	7.0000D 05	3.2765D 00
8.0000D 05	3.2928D 00	9.0000D 05	3.3049D 00	1.0000D 06	3.3186D 00
1.2500D 06	3.3528D 00	1.5000D 06	3.3912D 00	2.0000D 06	3.4025D 00
2.5000D 06	3.3027D 00	3.0000D 06	3.1643D 00	4.0000D 06	2.9773D 00
5.0000D 06	2.9284D 00	6.0000D 06	2.9331D 00	8.0000D 06	2.9697D 00
1.0000D 07	3.0664D 00	1.2000D 07	2.9352D 00	1.4000D 07	2.8269D 00
1.7000D 07	2.7787D 00	2.0000D 07	2.7419D 00	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 238 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A279-311)

NEUTRON SHAPE ELASTIC SCATTERING CROSS SECTIONS

E	S(E)	E	S(E)	E	S(E)
1.0000D 03	1.1151D 01	5.0000D 03	1.0951D 01	1.0000D 04	1.0772D 01
2.0000D 04	1.0479D 01	3.0000D 04	1.0226D 01	4.0000D 04	9.9968D 00
5.0000D 04	9.6463D 00	6.0000D 04	9.4472D 00	7.0000D 04	9.2587D 00
8.0000D 04	9.0794D 00	9.0000D 04	8.9079D 00	1.0000D 05	8.7436D 00
2.0000D 05	7.3672D 00	3.0000D 05	6.3480D 00	4.0000D 05	5.5523D 00
5.0000D 05	4.9230D 00	6.0000D 05	4.4270D 00	7.0000D 05	4.0417D 00
8.0000D 05	3.7492D 00	9.0000D 05	3.5339D 00	1.0000D 06	3.3820D 00
1.2500D 06	3.2073D 00	1.5000D 06	3.2288D 00	2.0000D 06	3.5595D 00
2.5000D 06	3.9674D 00	3.0000D 06	4.2707D 00	4.0000D 06	4.4514D 00
5.0000D 06	4.2394D 00	6.0000D 06	3.8559D 00	8.0000D 06	3.1036D 00
1.0000D 07	2.6952D 00	1.2000D 07	2.6377D 00	1.4000D 07	2.7735D 00
1.7000D 07	3.1720D 00	2.0000D 07	3.3275D 00	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 238 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

NEUTRON DIRECT INELASTIC FIRST EXCITED LEVEL

E	S(E)	E	S(E)	E	S(E)
5.0000D 04	5.3641D-04	6.0000D 04	1.8556D-03	7.0000D 04	3.6736D-03
8.0000D 04	5.8921D-03	9.0000D 04	8.4369D-03	1.0000D 05	1.1248D-02
2.0000D 05	4.5562D-02	3.0000D 05	8.3513D-02	4.0000D 05	1.2300D-01
5.0000D 05	1.6286D-01	6.0000D 05	2.0169D-01	7.0000D 05	2.3744D-01
8.0000D 05	2.4846D-01	9.0000D 05	2.9469D-01	1.0000D 06	3.1566D-01
1.2500D 06	3.5026D-01	1.5000D 06	3.6845D-01	2.0000D 06	3.8429D-01
2.5000D 06	3.8672D-01	3.0000D 06	3.7723D-01	4.0000D 06	3.4183D-01
5.0000D 06	3.0819D-01	6.0000D 06	2.8380D-01	8.0000D 06	2.5083D-01
1.0000D 07	2.3912D-01	1.2000D 07	2.3455D-01	1.4000D 07	2.2087D-01
1.7000D 07	2.1730D-01	2.0000D 07	2.1709D-01	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 238 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

NEUTRON DIRECT INELASTIC SECOND EXCITED LEVEL

E	S(E)	E	S(E)	E	S(E)
2.0000D 05	9.3022D-05	3.0000D 05	1.6435D-03	4.0000D 05	6.2953D-03
5.0000D 05	1.5173D-02	6.0000D 05	2.8449D-02	7.0000D 05	4.5135D-02
8.0000D 05	6.3845D-02	9.0000D 05	8.3144D-02	1.0000D 06	1.0187D-01
1.2500D 06	1.4114D-01	1.5000D 06	1.6843D-01	2.0000D 06	1.9725D-01
2.5000D 06	2.0589D-01	3.0000D 06	2.0272D-01	4.0000D 06	1.8292D-01
5.0000D 06	1.6094D-01	6.0000D 06	1.4173D-01	8.0000D 06	1.1001D-01
1.0000D 07	9.1399D-02	1.2000D 07	8.1995D-02	1.4000D 07	7.0640D-02
1.7000D 07	6.0899D-02	2.0000D 07	5.6415D-02	0.0	0.0

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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 238 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR SHAPE ELASTIC
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,,5, AND NEXT LINE 6,7,.........11

ELAB= 1.0000E 03  LMAX=    3
                   8.8736D-01  2.6652D-03  8.7855D-06  1.4549D-06  0.0         0.0

ELAB= 5.0000E 03  LMAX=    3
                   8.7149D-01  1.3809D-02  1.0982D-04 -4.3073D-07  0.0         0.0

ELAB= 1.0000E 04  LMAX=    3
                   8.5721D-01  2.8054D-02  4.3490D-04  7.8910D-06  0.0         0.0

ELAB= 2.0000E 04  LMAX=    3
                   8.3388D-01  5.6550D-02  1.7045D-03  1.9154D-05  0.0         0.0

ELAB= 3.0000E 04  LMAX=    3
                   8.1376D-01  8.4365D-02  3.7340D-03  6.6819D-05  0.0         0.0

ELAB= 4.0000E 04  LMAX=    3
                   7.9552D-01  1.1114D-01  6.4488D-03  1.5732D-04  0.0         0.0

ELAB= 5.0000E 04  LMAX=    3
                   7.6703D-01  1.3271D-01  9.5063D-03  2.8880D-04  0.0         0.0

ELAB= 6.0000E 04  LMAX=    3
                   7.5178D-01  1.5645D-01  1.3328D-02  4.7744D-04  0.0         0.0

ELAB= 7.0000E 04  LMAX=    3
                   7.3678D-01  1.7902D-01  1.7642D-02  7.4226D-04  0.0         0.0

ELAB= 8.0000E 04  LMAX=    3
                   7.2251D-01  2.0042D-01  2.2408D-02  1.0779D-03  0.0         0.0

ELAB= 9.0000E 04  LMAX=    3
                   7.0887D-01  2.2067D-01  2.7579D-02  1.5000D-03  0.0         0.0

ELAB= 1.0000E 05  LMAX=    3
                   6.9579D-01  2.3981D-01  3.3105D-02  2.0003D-03  0.0         0.0

ELAB= 2.0000E 05  LMAX=    3
                   5.8615D-01  3.7962D-01  1.0039D-01  1.2494D-02  0.0         0.0

ELAB= 3.0000E 05  LMAX=    5
                   5.0516D-01  4.3134D-01  1.6970D-01  3.5878D-02  4.2513D-03  2.2678D-05

ELAB= 4.0000E 05  LMAX=    5
                   4.4104D-01  4.8343D-01  2.3239D-01  7.0101D-02  1.1335D-02  1.4811D-04

ELAB= 5.0000E 05  LMAX=    5
                   3.9176D-01  4.9389D-01  2.8453D-01  1.1403D-01  2.3671D-02  5.9808D-04
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 238 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR SHAPE ELASTIC
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,..5, AND NEXT LINE 6,7,........, 11

ELAB= 6.0000E 05  LMAX=    6
                  3.5229D-01  4.9337D-01  3.2662D-01  1.6556D-01  4.2619D-02  1.9150D-03
                  4.1216D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 7.0000E 05  LMAX=    6
                  3.2103D-01  4.8786D-01  3.6021D-01  2.2194D-01  6.8597D-02  4.5976D-03
                  1.0025D-03  0.0         0.0         0.0         0.0         0.0

ELAB= 8.0000E 05  LMAX=    6
                  2.9835D-01  4.8087D-01  3.8766D-01  2.8073D-01  1.0196D-01  9.4033D-03
                  2.1235D-03  0.0         0.0         0.0         0.0         0.0

ELAB= 9.0000E 05  LMAX=    6
                  2.8122D-01  4.7443D-01  4.1131D-01  3.3965D-01  1.4248D-01  1.7433D-02
                  4.0379D-03  0.0         0.0         0.0         0.0         0.0

ELAB= 1.0000E 06  LMAX=    8
                  2.6913D-01  4.6982D-01  4.3341D-01  3.9709D-01  1.8972D-01  2.9001D-02
                  7.3346D-03  8.7088D-04  8.1316D-05  0.0         0.0         0.0

ELAB= 1.2500E 06  LMAX=    8
                  2.5523D-01  4.7132D-01  4.9219D-01  5.2672D-01  3.2951D-01  8.0620D-02
                  2.2959D-02  3.6132D-03  4.4007D-04   .0         0.0         0.0

ELAB= 1.5000E 06  LMAX=    8
                  2.5694D-01  4.9571D-01  5.6537D-01  6.3576D-01  4.8597D-01  1.6886D-01
                  5.4190D-02  1.0556D-02  1.4949D-03  0.0         0.0         0.0

ELAB= 2.0000E 06  LMAX=    9
                  2.8326D-01  5.9927D-01  7.4688D-01  8.2527D-01  7.8487D-01  4.2952D-01
                  1.7444D-01  4.7184D-02  9.3092D-03  1.3770D-03  0.0         0.0

ELAB= 2.5000E 06  LMAX=   11
                  3.1572D-01  7.2177D-01  9.3105D-01  1.0091D 00  1.0202D 00  7.0734D-01
                  3.5084D-01  1.2236D-01  3.1282D-02  6.3021D-03  8.2044D-04  9.0186D-05

ELAB= 3.0000E 06  LMAX=   12
                  3.3986D-01  8.1782D-01  1.0794D 00  1.1734D 00  1.1930D 00  9.2917D-01
                  5.3107D-01  2.2477D-01  7.3346D-02  1.8782D-02  2.9941D-03  4.4812D-04
                  4.6457D-05  0.0         0.0         0.0         0.0         0.0

ELAB= 4.0000E 06  LMAX=   14
                  3.5423D-01  8.9838D-01  1.2325D 00  1.3842D 00  1.3971D 00  1.1970D 00
                  8.0800D-01  4.4864D-01  2.1545D-01  7.9413D-02  1.9044D-02  4.4454D-03
                  7.3495D-04  6.4136D-05  1.0653D-06  0.0         0.0         0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 238 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR SHAPE ELASTIC
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0.1..5. AND NEXT LINE 6.7......... 11

ELAB= 5.0000E 06  LMAX=   15
   3.37370-01  8.75750-01  1.23830 00  1.44010 00  1.46700 00  1.31990 00
   9.83710-01  6.41870-01  3.97010-01  1.95330-01  6.69920-02  2.04560-02
   4.34570-03  6.89810-04  1.50110-04  2.81680-05  0.0         0.0

ELAB= 6.0000E 06  LMAX=   15
   3.00840-01  8.04680-01  1.15940 00  1.38470 00  1.44500 00  1.34900 00
   1.09050 00  7.83500-01  5.62860-01  3.50290-01  1.61530-01  6.17640-02
   1.65280-02  3.38530-03  7.92640-04  1.25300-04  0.0         0.0

ELAB= 8.0000E 06  LMAX=   17
   2.46970-01  6.49030-01  9.40530-01  1.15110 00  1.26720 00  1.26690 00
   1.15720 00  9.69570-01  8.01000-01  6.62150-01  4.65640-01  2.57760-01
   1.02530-01  3.21720-02  9.82250-03  2.22520-03  4.87880-04  8.82280-05

ELAB= 1.0000E 07  LMAX=   18
   2.14480-01  5.66520-01  8.12230-01  9.94620-01  1.12270 00  1.18980 00
   1.18080 00  1.12400 00  1.03130 00  9.52340-01  8.22900-01  5.85780-01
   3.42810-01  1.66160-01  6.40850-02  2.00950-02  5.91890-03  1.36020-03
   2.80300-04  0.0         0.0         0.0         0.0         0.0

ELAB= 1.2000E 07  LMAX=   20
   2.09900-01  5.59120-01  7.96590-01  9.52960-01  1.0701D 00  1.15470 00
   1.20010 00  1.20950 00  1.18670 00  1.14760 00  1.07690 00  8.94090-01
   6.22980-01  3.58870-01  1.69800-01  6.93870-02  2.42710-02  7.03350-03
   1.96220-03  4.54170-04  9.88100-05  0.0         0.0         0.0

ELAB= 1.4000E 07  LMAX=   21
   2.20710-01  5.97670-01  8.60550-01  1.03510 00  1.15740 00  1.24630 00
   1.31050 00  1.34960 00  1.36210 00  1.34290 00  1.28640 00  1.13890 00
   8.75340-01  5.73310-01  3.23000-01  1.60860-01  6.88560-02  2.51680-02
   8.60030-03  2.44770-03  7.59200-04  1.77830-04  0.0         0.0

ELAB= 1.7000E 07  LMAX=   22
   2.52420-01  7.04340-01  1.03670 00  1.31490 00  1.49110 00  1.60630 00
   1.68230 00  1.72640 00  1.74100 00  1.71730 00  1.64400 00  1.50300 00
   1.26380 00  9.52000-01  6.52260-01  4.10940-01  2.30690-01  1.13110-01
   5.00530-02  1.88020-02  6.94930-03  2.22180-03  6.17230-04  0.0

ELAB= 2.0000E 07  LMAX=   24
   2.80710-01  7.96410-01  1.22880 00  1.57830 00  1.83960 00  2.01410 00
   2.11870 00  2.16630 00  2.16770 00  2.12030 00  2.02110 00  1.85810 00
   1.62500 00  1.31820 00  9.93880-01  7.10340-01  4.77430-01  2.90170-01
   1.37910-01  7.41410-02  3.13310-02  1.06090-02  3.65760-03  1.17120-03
   3.12970-04  0.0         0.0         0.0         0.0         0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 238 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (1 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,..5, AND NEXT LINE 6,7,........ 11

ELAB= 5.0000E 04  LMAX=    3
                   4.2085D-05  4.2232D-05  8.1984D-06 -2.1674D-07  0.0          0.0

ELAB= 6.0000E 04  LMAX=    3
                   1.4706D-04  1.4690D-04  3.7581D-05 -1.8784D-06  0.0          0.0

ELAB= 7.0000E 04  LMAX=    3
                   2.9232D-04  2.8472D-04  7.8739D-05 -5.6378D-06  0.0          0.0

ELAB= 8.0000E 04  LMAX=    3
                   4.6883D-04  4.4864D-04  1.2786D-04 -1.1968D-05  0.0          0.0

ELAB= 9.0000E 04  LMAX=    3
                   6.7130D-04  6.3279D-04  1.8246D-04 -2.1209D-05  0.0          0.0

ELAB= 1.0000E 05  LMAX=    3
                   8.9495D-04  8.3219D-04  2.4056D-04 -3.3677D-05  0.0          0.0

ELAB= 2.0000E 05  LMAX=    3
                   3.5811D-03  3.0638D-03  8.2996D-04 -3.5161D-04  0.0          0.0

ELAB= 3.0000E 05  LMAX=    5
                   6.6458D-03  4.6640D-03  8.8321D-04 -1.1021D-03  2.5063D-04 -8.1745D-06

ELAB= 4.0000E 05  LMAX=    5
                   9.7883D-03  5.7380D-03  8.6027D-04 -2.2575D-03  6.0652D-04 -2.2290D-05

ELAB= 5.0000E 05  LMAX=    5
                   1.2900D-02  6.2857D-03  1.3784D-03 -3.6348D-03  1.0476D-03 -3.6764D-05

ELAB= 6.0000E 05  LMAX=    6
                   1.6050D-02  6.3449D-03  2.2558D-03 -4.9445D-03  9.9095D-04 -8.3797D-05
                   1.3276D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 7.0000E 05  LMAX=    6
                   1.8895D-02  5.9577D-03  3.3103D-03 -6.6933D-03  7.8232D-04 -6.9371D-05
                   2.9078D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 8.0000E 05  LMAX=    6
                   2.1379D-02  5.1411D-03  4.3202D-03 -8.5464D-03  1.1158D-04  3.7522D-06
                   5.4936D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 9.0000E 05  LMAX=    6
                   2.3451D-02  4.0573D-03  5.1146D-03 -1.0355D-02 -1.0700D-03  1.4840D-04
                   9.3111D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 1.0000E 06  LMAX=    8
                   2.5120D-02  2.7714D-03  5.5629D-03 -1.1928D-02 -2.7646D-03  5.1670D-04
                   1.4204D-03 -4.3317D-05  2.3726D-05  0.0         0.0         0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 238 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (1 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,..5, AND NEXT LINE 6,7,......... 11

ELAB= 1.2500E 06  LMAX=    8
   2.7873D-02 -2.9107D-04  5.0866D-03 -1.4545D-02 -8.6341D-03  1.6033D-03
   3.1934D-03 -1.3878D-04  1.0736D-04  0.0          0.0          0.0

ELAB= 1.5000E 06  LMAX=    8
   2.9320D-02 -2.2610D-03  2.8933D-03 -1.5409D-02 -1.5179D-02  3.3160D-03
   5.2831D-03 -3.0433D-04  3.3867D-04  0.0          0.0          0.0

ELAB= 2.0000E 06  LMAX=    9
   3.0540D-02 -1.8502D-03 -1.1592D-03 -1.4393D-02 -2.1818D-02  8.1655D-03
   6.7142D-03  1.7310D-04  1.9198D-03 -1.5424D-04  0.0          0.0

ELAB= 2.5000E 06  LMAX=   11
   3.0774D-02  3.3558D-03  2.2941D-04 -9.1931D-03 -1.6496D-02  1.3171D-02
   3.7130D-03  2.4852D-03  4.1772D-03 -3.8442D-04  3.4443D-04 -1.6192D-06

ELAB= 3.0000E 06  LMAX=   12
   3.0019D-02  9.1018D-03  4.8877D-03 -1.0695D-03 -6.7864D-03  1.7544D-02
  -1.5107D-05  4.6203D-03  5.4346D-03 -3.3730D-04  1.0747D-03 -7.6152D-06
   2.4689D-05  0.0          0.0          0.0          0.0          0.0

ELAB= 4.0000E 06  LMAX=   14
   2.7202D-02  1.4240D-02  1.0672D-02  7.8175D-03  5.3026D-03  2.0006D-02
  -1.9317D-03 -2.8134D-04  6.5982D-04  1.6620D-03  3.8215D-03 -9.3451D-05
   2.6001D-04  1.0523D-05  3.1583D-06  0.0          0.0          0.0

ELAB= 5.0000E 06  LMAX=   15
   2.4523D-02  1.4130D-02  1.0278D-02  4.9585D-03  6.6950D-03  1.2659D-02
   1.6163D-05 -6.4626D-03 -8.9226D-03  3.9860D-03  5.7020D-03 -3.7412D-04
   1.1785D-03  1.8246D-05  3.1961D-05  5.2852D-06  0.0          0.0

ELAB= 6.0000E 06  LMAX=   15
   2.2584D-02  1.3804D-02  8.3279D-03  9.8984D-04  4.1155D-03  5.4509D-03
  -1.0246D-05 -8.0338D-03 -1.3654D-02  3.9229D-03  3.1494D-03 -4.5597D-04
   3.0205D-03 -2.4582D-05  1.5804D-04  3.1851D-05  0.0          0.0

ELAB= 8.0000E 06  LMAX=   17
   1.9960D-02  1.5403D-02  7.3105D-03 -6.4259D-04 -2.8386D-04 -7.1384D-05
  -2.6690D-03 -2.9031D-03 -1.2683D-02 -4.9972D-03 -6.8861D-03  2.7057D-03
   6.2058D-03 -2.5008D-04  1.1727D-03  4.3453D-04  7.6204D-05  2.8724D-05

ELAB= 1.0000E 07  LMAX=   18
   1.9029D-02  2.0094D-02  9.6576D-03  2.2097D-03 -1.7888D-03 -4.3264D-03
  -8.5048D-03 -9.8773D-03 -1.7167D-02 -1.4180D-02 -9.6983D-03  5.2441D-04
   1.9146D-03  6.6079D-03  6.5695D-03  5.6803D-04  1.7799D-03  1.7907D-04
   1.0712D-04  0.0          0.0          0.0          0.0          0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 238 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (1 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0.1..5. AND NEXT LINE 6.7......... 11

ELAB= 1.2000E 07  LMAX=   20
   1.8605D-02  2.2880D-02  1.2584D-02  5.1287D-03  2.0845D-04 -3.5655D-03
  -7.9353D-03 -1.0696D-02 -1.3610D-02 -1.2037D-02 -6.7766D-03  2.0623D-03
   1.9019D-03  8.5622D-03  3.6315D-03  1.3007D-03  4.7231D-03  8.1666D-05
   5.3347D-04  7.7534D-05  3.1738D-05  0.0         0.0         0.0

ELAB= 1.4000E 07  LMAX=   21
   1.7577D-02  2.3356D-02  1.4978D-02  7.2228D-03  3.8321D-03  2.0985D-04
  -2.6747D-03 -5.0656D-03 -6.6748D-03 -5.3350D-03 -2.4789D-03  4.3743D-03
   1.3626D-03  3.1379D-03 -2.5422D-03  3.8794D-03  6.6149D-03 -5.2936D-04
   1.8094D-03  2.1269D-04  1.9634D-04  4.6068D-05  0.0         0.0

ELAB= 1.7000E 07  LMAX=   22
   1.7292D-02  2.4622D-02  2.0162D-02  1.1361D-02  9.5897D-03  4.9322D-03
   3.9799D-03  1.1838D-03 -6.1438D-04  2.5123D-04 -6.1638D-04  4.9432D-03
   1.8692D-03  3.9698D-03 -1.6121D-03  6.9428D-03  3.0880D-03  2.4138D-04
   7.1873D-03  8.7799D-04  1.5987D-03  4.9520D-04  1.8731D-04  0.0

ELAB= 2.0000E 07  LMAX=   24
   1.7276D-02  2.5418D-02  2.3746D-02  1.4164D-02  1.3833D-02  9.3939D-03
   1.0870D-02  9.4518D-03  8.9192D-03  1.0265D-02  7.9238D-03  1.2127D-02
   6.5757D-03  8.0852D-03 -2.9489D-03 -6.1931D-05 -5.0805D-03  3.5208D-03
   1.0352D-02  1.5907D-03  5.7974D-03  1.5362D-03  9.4791D-04  3.2608D-04
   1.0833D-04  0.0         0.0         0.0         0.0         0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 238 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (2 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1..5, AND NEXT LINE 6,7,........ 11

ELAB= 2.0000E 05  LMAX=    3
                   7.3948D-06  7.0871D-06  3.5521D-06  8.7096D-07  0.0         0.0

ELAB= 3.0000E 05  LMAX=    5
                   1.3079D-04  1.9718D-04  1.0331D-04  1.8763D-05  1.0165D-06 -2.8813D-07

ELAB= 4.0000E 05  LMAX=    5
                   5.0096D-04  7.6610D-04  3.8004D-04  5.9096D-05 -4.4826D-08 -1.4809D-06

ELAB= 5.0000E 05  LMAX=    5
                   1.2074D-03  1.8099D-03  8.4623D-04  1.0236D-04 -1.0216D-05 -3.7340D-06

ELAB= 6.0000E 05  LMAX=    6
                   2.2639D-03  3.3034D-03  1.3478D-03  6.0287D-05 -4.7752D-05 -7.2824D-06
                   2.0796D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 7.0000E 05  LMAX=    6
                   3.5917D-03  5.0230D-03  1.8048D-03 -6.7092D-05 -9.4391D-05 -5.5840D-06
                   4.2005D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 8.0000E 05  LMAX=    6
                   5.0822D-03  6.7840D-03  2.0525D-03 -3.2525D-04 -1.4550D-04  6.0820D-06
                   6.9443D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 9.0000E 05  LMAX=    6
                   6.6105D-03  8.4029D-03  1.9829D-03 -7.1773D-04 -1.8141D-04  3.3192D-05
                   9.1677D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 1.0000E 06  LMAX=    8
                   8.1066D-03  9.8014D-03  1.5839D-03 -1.4174D-03 -1.9588D-04  1.5037D-04
                   8.8073D-06 -7.1805D-06  2.3632D-07  0.0         0.0         0.0

ELAB= 1.2500E 06  LMAX=    8
                   1.1232D-02  1.1763D-02 -9.3121D-04 -2.9002D-03  1.4646D-04  4.2193D-04
                  -1.1376D-05 -2.0452D-05  9.2013D-07  0.0         0.0         0.0

ELAB= 1.5000E 06  LMAX=    8
                   1.3403D-02  1.2017D-02 -4.3519D-03 -3.6868D-03  1.2041D-03  7.5354D-04
                  -9.8144D-05 -4.1933D-05  3.2942D-06  )          0.0         0.0

ELAB= 2.0000E 06  LMAX=    9
                   1.5697D-02  1.0959D-02 -8.1900D-03 -8.3358D-04  4.9008D-03  7.9021D-04
                  -5.8072D-04 -1.8305D-05  1.3610D-05 -7.9331D-06  0.0         0.0

ELAB= 2.5000E 06  LMAX=   11
                   1.6384D-02  1.0472D-02 -6.7299D-03  4.1563D-03  6.7423D-03 -6.0433D-04
                  -1.0037D-03  1.5257D-04 -6.0638D-05 -3.0587D-05  2.4328D-05  7.9474D-07
```

```
COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 238 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (2 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0.1..5. AND NEXT LINE 6.7.........11

ELAB= 3.0000E 06  LMAX=   12
   1.6132D-02  1.0247D-02 -3.9513D-03  6.6337D-03  5.1163D-03 -2.6214D-03
  -6.5733D-04  4.5997D-04 -3.4981D-04 -6.9055D-05  7.5375D-05  1.5846D-06
   2.1803D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 4.0000E 06  LMAX=   14
   1.4556D-02  9.5600D-03 -6.9810D-04  5.3344D-03 -8.8682D-04 -3.8386D-03
   1.1608D-03  1.8493D-04 -1.2229D-03  2.3126D-05  2.0014D-04 -1.2923D-05
   2.5559D-05  7.1650D-07  1.9775D-07  0.0         0.0         0.0

ELAB= 5.0000E 06  LMAX=   15
   1.2807D-02  8.7782D-03  8.0427D-04  3.6968D-03 -3.5765D-03 -1.6929D-03
   4.9102D-04 -1.9891D-03 -5.2728D-04  6.8260D-04 -7.0965D-05 -6.5793D-05
   1.1224D-04 -2.8954D-06  2.6368D-06  5.3796D-07  0.0         0.0

ELAB= 6.0000E 06  LMAX=   15
   1.1279D-02  8.1851D-03  1.9627D-03  2.9429D-03 -3.7438D-03 -1.3464D-04
  -1.3194D-03 -2.7482D-03  1.8818D-03  9.1740D-04 -8.1167D-04  2.6563D-05
   2.2925D-04 -3.0336D-05  1.1737D-05  3.6574D-06  0.0         0.0

ELAB= 8.0000E 06  LMAX=   17
   8.7545D-03  7.5946D-03  3.7471D-03  2.7141D-03 -1.4801D-03  1.0429D-03
  -1.2736D-03 -1.3490D-03  1.2648D-03 -4.8792D-04 -8.2090D-05  7.7050D-04
   2.6308D-05 -1.9749D-04  5.5536D-05  3.9724D-05  7.5788D-06  4.2145D-06

ELAB= 1.0000E 07  LMAX=   18
   7.2733D-03  7.5777D-03  4.1968D-03  2.4350D-03 -9.2401D-04 -9.1047D-05
  -1.9594D-03 -1.1508D-03  4.4633D-05  9.6919D-04  2.5798D-03  8.3412D-05
  -5.5962D-04  4.0393D-04 -2.5458D-04 -6.7978D-05  1.8740D-04  1.5271D-05
   1.7798D-05  0.0         0.0         0.0         0.0         0.0

ELAB= 1.2000E 07  LMAX=   20
   6.5249D-03  7.9538D-03  5.1074D-03  3.0907D-03  5.4155D-04  5.7467D-04
  -9.2236D-04  3.7286D-04  3.4185D-04  1.7239D-03  2.9543D-03  4.5924D-04
   1.2413D-03  8.3876D-05 -1.4775D-03  1.2613D-04  3.5690D-04 -2.0309D-05
   8.0124D-05  6.9905D-06  4.9209D-06  0.0         0.0         0.0

ELAB= 1.4000E 07  LMAX=   21
   5.6213D-03  7.3036D-03  5.4952D-03  3.8208D-03  1.7307D-03  1.5455D-03
   1.1493D-04  1.2467D-03  5.6235D-04  1.5511D-03  2.0921D-03  6.4584D-04
   1.9518D-03 -1.1010D-03 -1.5603D-03  8.1155D-04 -7.3310D-06 -1.4603D-04
   2.0257D-04 -1.0806D-05  2.5140D-05  5.5423D-06  0.0         0.0

ELAB= 1.7000E 07  LMAX=   22
   4.8401D-03  6.3168D-03  5.9594D-03  4.3197D-03  2.5183D-03  2.3532D-03
   4.0004D-04  1.6156D-03  2.4092D-05  1.1606D-03  8.8802D-04  2.2125D-04
   1.7921D-03 -8.7127D-04  1.0756D-03  7.2109D-04 -1.9049D-03  5.3326D-05
   3.2355D-04 -1.8030D-04  1.6899D-04  5.0322D-05  2.8119D-05  0.0
```

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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 238 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (2 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1..5, AND NEXT LINE 6,7......... 11

ELAB= 2.0000E 07  LMAX=   24
  4.4879D-03  0.1232D-03  0.6508D-03  4.4082D-03  2.7694D-03  2.3127D-03
 -8.3253D-06  1.2507D-03 -8.1159D-04  7.2451D-04  1.2859D-04  2.1948D-04
  1.4882D-03 -2.7964D-04  1.4999D-03 -1.0057D-03 -1.8598D-03  6.7231D-04
 -8.4467D-04 -4.7177D-04  5.4084D-04  1.0287D-04  1.2922D-04  4.5076D-05
  1.7907D-05  0.0         0.0         0.0         0.0         0.0
```

A N N E X E 2B

COEFFICIENTS DE TRANSMISSION GENERALISES
CALCULES POUR ^{238}Pu

NEUTRON TRANSMISSION COEFFICIENTS FOR PLUTONIUM; 238.000

THE COEFFICIENTS ARE IN THE ORDER (L,J): (0,1/2),(1,1/2),(1,3/2),(2,3/2),(2,5/2),(3,5/2),(3,7/2), ...

```
            E= 0.10000E-02(MEV)      LMAX=    3      JMAX=    5/2
0.19178E-01 0.82085E-04 0.11622E-03 0.42578E-07 0.25694E-07 0.38075E-11

            E= 0.50000E-02(MEV)      LMAX=    3      JMAX=    5/2
0.42350E-01 0.91007E-03 0.12892E-02 0.13628E-05 0.14323E-05 0.10637E-08

            E= 0.10000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.59340E-01 0.45467E-02 0.36096E-02 0.13243E-04 0.80768E-05 0.12027E-07

            E= 0.20000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.82790E-01 0.70486E-02 0.99989E-02 0.73542E-04 0.45389E-04 0.13591E-06

            E= 0.30000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.10034E 00 0.12670E-01 0.17982E-01 0.19893E-03 0.12440E-03 0.56121E-06

            E= 0.40000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.11483E 00 0.19083E-01 0.27098E-01 0.40083E-03 0.25447E-03 0.15346E-05

            E= 0.50000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.13029E 00 0.45244E-01 0.37050E-01 0.68197E-03 0.46016E-03 0.33332E-05

            E= 0.60000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.14104E 00 0.33246E-01 0.47707E-01 0.10367E-02 0.71963E-03 0.63066E-05

            E= 0.70000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.15234E 00 0.41003E-01 0.58888E-01 0.15259E-02 0.10491E-02 0.10813E-04

            E= 0.80000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.16202E 00 0.49044E-01 0.70477E-01 0.20923E-02 0.14526E-02 0.17252E-04

            E= 0.90000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.17105E 00 0.57301E-01 0.82383E-01 0.27583E-02 0.19338E-02 0.26052E-04

            E= 0.10000E 00(MEV)      LMAX=    3      JMAX=    5/2
0.17952E 00 0.65725E-01 0.94529E-01 0.35251E-02 0.24956E-02 0.37671E-04

            E= 0.20000E 00(MEV)      LMAX=    3      JMAX=    5/2
0.24940E 00 0.15441E 00 0.22461E 00 0.16828E-01 0.13468E-01 0.44402E-03

            E= 0.30000E 00(MEV)      LMAX=    4      JMAX=    7/2
0.30142E 00 0.43835E 00 0.34335E 00 0.38771E-01 0.34266E-01 0.19070E-02 0.29399E-02 0.26702E-04

            E= 0.40000E 00(MEV)      LMAX=    4      JMAX=    7/2
0.34557E 00 0.51403E 00 0.44577E 00 0.66804E-01 0.64527E-01 0.51013E-02 0.78688E-02 0.94665E-04

            E= 0.50000E 00(MEV)      LMAX=    4      JMAX=    7/2
0.38388E 00 0.58113E 00 0.53158E 00 0.98709E-01 0.10234E 00 0.10785E-01 0.16748E-01 0.25178E-03

            E= 0.60000E 00(MEV)      LMAX=    5      JMAX=    9/2
0.41636E 00 0.44020E 00 0.60204E 00 0.13231E 00 0.14468E 00 0.19640E-01 0.30790E-01 0.55643E-03 0.81653E-03 0.17200E-04
```

NEUTRON TRANSMISSION COEFFICIENTS FOR PLUTONIUM: 238.000

THE COEFFICIENTS ARE IN THE ORDER (L,J): (0,1/2),(1,1/2),(1,3/2),(2,3/2),(2,5/2),(3,5/2),(3,7/2), ...

```
            E= 0.70000E 00(MEV)      LMAX=    5      JMAX=    9/2
0.44342E 00 0.49214E 00 0.65863E 00 0.16609E 00 0.18810E 00 0.32243E-01 0.51075E-01 0.10926E-02 0.16016E-02 0.39889E-04

            E= 0.80000E 00(MEV)      LMAX=    5      JMAX=    9/2
0.46440E 00 0.53749E 00 0.70281E 00 0.19887E 00 0.22953E 00 0.49030E-01 0.78425E-01 0.19497E-02 0.28658E-02 0.82523E-04

            E= 0.90000E 00(MEV)      LMAX=    5      JMAX=    9/2
0.48010E 00 0.57697E 00 0.73612E 00 0.22980E 00 0.26681E 00 0.70262E-01 0.11328E 00 0.32422E-02 0.47685E-02 0.15642E-03

            E= 0.10000E 01(MEV)      LMAX=    6      JMAX=   11/2
0.49105E 00 0.61120E 00 0.76025E 00 0.25840E 00 0.29883E 00 0.96003E-01 0.15559E 00 0.50972E-02 0.74875E-02 0.27662E-03
0.82251E-03 0.76160E-05

            E= 0.12500E 01(MEV)      LMAX=    6      JMAX=   11/2
0.50331E 00 0.67766E 00 0.79244E 00 0.31847E 00 0.35560E 00 0.17846E 00 0.28880E 00 0.13125E-01 0.19079E-01 0.91784E-03
0.24868E-02 0.33411E-04

            E= 0.15000E 01(MEV)      LMAX=    6      JMAX=   11/2
0.50293E 00 0.72341E 00 0.80374E 00 0.36311E 00 0.38629E 00 0.27901E 00 0.44176E 00 0.27776E-01 0.39564E-01 0.24189E-02
0.59235E-02 0.11264E-03

            E= 0.20000E 01(MEV)      LMAX=    7      JMAX=   13/2
0.49075E 00 0.77717E 00 0.81098E 00 0.41779E 00 0.40943E 00 0.48287E 00 0.70004E 00 0.81881E-01 0.10971E 00 0.10887E-01
0.21546E-01 0.77143E-03 0.10452E-02 0.22934E-04

            E= 0.25000E 01(MEV)      LMAX=    8      JMAX=   15/2
0.48137E 00 0.80299E 00 0.81427E 00 0.44453E 00 0.42159E 00 0.64148E 00 0.82516E 00 0.15958E 00 0.20135E 00 0.53970E-01
0.51682E-01 0.32989E-02 0.40647E-02 0.10980E-03 0.78415E-04 0.60833E-05

            E= 0.30000E 01(MEV)      LMAX=    9      JMAX=   17/2
0.48048E 00 0.81381E 00 0.81514E 00 0.45923E 00 0.44010E 00 0.74911E 00 0.85609E 00 0.23722E 00 0.28944E 00 0.82501E-01
0.91203E-01 0.97663E-02 0.11128E-01 0.37336E-03 0.28765E-03 0.29508E-04 0.29403E-04 0.62802E-06

            E= 0.40000E 01(MEV)      LMAX=   10      JMAX=   19/2
0.49770E 00 0.81738E 00 0.81264E 00 0.48403E 00 0.49378E 00 0.86360E 00 0.82674E 00 0.36278E 00 0.44008E 00 0.27314E 00
0.17586E 00 0.40237E-01 0.48624E-01 0.23123E-02 0.22438E-02 0.31792E-03 0.27476E-03 0.80834E-05 0.18746E-04 0.50459E-06

            E= 0.50000E 01(MEV)      LMAX=   11      JMAX=   21/2
0.52632E 00 0.81864E 00 0.80858E 00 0.51574E 00 0.54710E 00 0.90455E 00 0.78696E 00 0.46197E 00 0.57174E 00 0.50093E 00
0.26700E 00 0.99773E-01 0.14621E 00 0.86114E-02 0.11037E-01 0.15229E-02 0.13650E-02 0.56050E-04 0.15274E-03 0.46568E-05
0.46546E-05 0.23392E-06

            E= 0.60000E 01(MEV)      LMAX=   11      JMAX=   21/2
0.55847E 00 0.82158E 00 0.80417E 00 0.55320E 00 0.58991E 00 0.90751E 00 0.76037E 00 0.54569E 00 0.67936E 00 0.64208E 00
0.36387E 00 0.19126E 00 0.32241E 00 0.23523E-01 0.38766E-01 0.47357E-02 0.46447E-02 0.26611E-03 0.76426E-03 0.26111E-04
0.26676E-04 0.15757E-05

            E= 0.80000E 01(MEV)      LMAX=   13      JMAX=   25/2
0.62310E 00 0.82453E 00 0.79498E 00 0.62990E 00 0.66187E 00 0.88043E 00 0.73488E 00 0.68630E 00 0.80417E 00 0.71326E 00
0.53100E 00 0.45202E 00 0.68725E 00 0.11042E 00 0.20365E 00 0.27652E-01 0.26741E-01 0.29833E-02 0.65279E-02 0.31788E-03
0.39909E-03 0.29378E-04 0.38654E-04 0.27451E-05 0.29192E-05 0.23049E-06
```

ANNEXE 3A

SECTIONS EFFICACES CALCULEES PAR MODELE OPTIQUE EN VOIES COUPLEES SUR ^{240}Pu

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REMARQUES

1) E = Energies laboratoire en eV

2) S(E) = Sections efficaces correspondantes en barn

3) $\sigma(\theta) = \sum_{L=0}^{Lmax} B_L P_L(\cos\theta)$, où les B_L sont les coefficients de Legendre tabulés, avec $\sigma(\theta)$ résultant en barn/stéradian

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 240 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A279-311)

NEUTRON TOTAL CROSS SECTIONS

E	S(E)	E	S(E)	E	S(E)
1.0000D 03	2.3909D 01	5.0000D 03	1.6938D 01	1.0000D 04	1.5303D 01
2.0000D 04	1.4125D 01	3.0000D 04	1.3568D 01	4.0000D 04	1.3202D 01
5.0000D 04	1.2823D 01	6.0000D 04	1.2595D 01	7.0000D 04	1.2397D 01
8.0000D 04	1.2220D 01	9.0000D 04	1.2058D 01	1.0000D 05	1.1907D 01
2.0000D 05	1.0774D 01	3.0000D 05	9.9000D 00	4.0000D 05	9.2027D 00
5.0000D 05	8.6544D 00	6.0000D 05	8.2325D 00	7.0000D 05	7.9075D 00
8.0000D 05	7.6636D 00	9.0000D 05	7.4866D 00	1.0000D 06	7.3685D 00
1.2500D 06	7.2547D 00	1.5000D 06	7.3147D 00	2.0000D 06	7.6100D 00
2.5000D 06	7.8632D 00	3.0000D 06	7.9838D 00	4.0000D 06	7.9234D 00
5.0000D 06	7.6323D 00	6.0000D 06	7.2368D 00	8.0000D 06	6.4753D 00
1.0000D 07	6.1356D 00	1.2000D 07	5.9060D 00	1.4000D 07	5.9039D 00
1.7000D 07	6.2451D 00	2.0000D 07	6.5535D 00	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 240 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

NEUTRON COMPOUND NUCLEUS FORMATION CROSS SECTIONS

E	S(E)	E	S(E)	E	S(E)
1.0000D 03	1.2902D 01	5.0000D 03	6.1271D 00	1.0000D 04	4.6675D 00
2.0000D 04	3.7771D 00	3.0000D 04	3.4668D 00	4.0000D 04	3.3255D 00
5.0000D 04	3.3034D 00	6.0000D 04	3.2672D 00	7.0000D 04	3.2509D 00
8.0000D 04	3.2460D 00	9.0000D 04	3.2477D 00	1.0000D 05	3.2533D 00
2.0000D 05	3.4080D 00	3.0000D 05	3.4660D 00	4.0000D 05	3.4808D 00
5.0000D 05	3.4824D 00	6.0000D 05	3.4818D 00	7.0000D 05	3.4747D 00
8.0000D 05	3.4657D 00	9.0000D 05	3.4571D 00	1.0000D 06	3.4546D 00
1.2500D 06	3.4618D 00	1.5000D 06	3.4792D 00	2.0000D 06	3.4422D 00
2.5000D 06	3.3103D 00	3.0000D 06	3.1611D 00	4.0000D 06	2.9790D 00
5.0000D 06	2.9342D 00	6.0000D 06	2.9434D 00	8.0000D 06	2.9785D 00
1.0000D 07	3.0745D 00	1.2000D 07	2.9389D 00	1.4000D 07	2.8371D 00
1.7000D 07	2.7924D 00	2.0000D 07	2.7490D 00	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 240 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

NEUTRON SHAPE ELASTIC SCATTERING CROSS SECTIONS

E	S(E)	E	S(E)	E	S(E)
1.0000D 03	1.1007D 01	5.0000D 03	1.0811D 01	1.0000D 04	1.0635D 01
2.0000D 04	1.0348D 01	3.0000D 04	1.0101D 01	4.0000D 04	9.8770D 00
5.0000D 04	9.5194D 00	6.0000D 04	9.3255D 00	7.0000D 04	9.1421D 00
8.0000D 04	8.9678D 00	9.0000D 04	8.8015D 00	1.0000D 05	8.6422D 00
2.0000D 05	7.3194D 00	3.0000D 05	6.3464D 00	4.0000D 05	5.5877D 00
5.0000D 05	4.9858D 00	6.0000D 05	4.5084D 00	7.0000D 05	4.1338D 00
8.0000D 05	3.8452D 00	9.0000D 05	3.6281D 00	1.0000D 06	3.4701D 00
1.2500D 06	3.2713D 00	1.5000D 06	3.2676D 00	2.0000D 06	3.5584D 00
2.5000D 06	3.9385D 00	3.0000D 06	4.2264D 00	4.0000D 06	4.4086D 00
5.0000D 06	4.2204D 00	6.0000D 06	3.8604D 00	8.0000D 06	3.1305D 00
1.0000D 07	2.7258D 00	1.2000D 07	2.6489D 00	1.4000D 07	2.7731D 00
1.7000D 07	3.1710D 00	2.0000D 07	3.5293D 00	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 240 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS,A229-311)

NEUTRON DIRECT INELASTIC FIRST EXCITED LEVEL

E	S(E)	E	S(E)	E	S(E)
5.0000D 04	6.7889D-04	6.0000D 04	2.0710D-03	7.0000D 04	3.9511D-03
8.0000D 04	6.2271D-03	9.0000D 04	8.8270D-03	1.0000D 05	1.1692D-02
2.0000D 05	4.6166D-02	3.0000D 05	8.5659D-02	4.0000D 05	1.2696D-01
5.0000D 05	1.6945D-01	6.0000D 05	2.1150D-01	7.0000D 05	2.5069D-01
8.0000D 05	2.8527D-01	9.0000D 05	3.1435D-01	1.0000D 06	3.3792D-01
1.2500D 06	3.7674D-01	1.5000D 06	3.9642D-01	2.0000D 06	4.1089D-01
2.5000D 06	4.0920D-01	3.0000D 06	3.9537D-01	4.0000D 06	3.5492D-01
5.0000D 06	3.1908D-01	6.0000D 06	2.9383D-01	8.0000D 06	2.5954D-01
1.0000D 07	2.4783D-01	1.2000D 07	2.4074D-01	1.4000D 07	2.2726D-01
1.7000D 07	2.2457D-01	2.0000D 07	2.2269D-01	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 240 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

NEUTRON DIRECT INELASTIC SECOND EXCITED LEVEL

E	S(E)	E	S(E)	E	S(E)
2.0000D 05	1.2033D-04	3.0000D 05	1.9431D-03	4.0000D 05	7.1375D-03
5.0000D 05	1.6773D-02	6.0000D 05	3.0879D-02	7.0000D 05	4.8294D-02
8.0000D 05	6.7543D-02	9.0000D 05	8.7095D-02	1.0000D 06	1.0587D-01
1.2500D 06	1.4478D-01	1.5000D 06	1.7148D-01	2.0000D 06	1.9851D-01
2.5000D 06	2.0523D-01	3.0000D 06	2.0102D-01	4.0000D 06	1.8094D-01
5.0000D 06	1.5855D-01	6.0000D 06	1.3903D-01	8.0000D 06	1.0680D-01
1.0000D 07	8.7590D-02	1.2000D 07	7.7555D-02	1.4000D 07	6.6462D-02
1.7000D 07	5.7204D-02	2.0000D 07	5.2530D-02	0.0	0.0

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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 240 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR SHAPE ELASTIC
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,..5, AND NEXT LINE 6,7,........ 11

ELAB= 1.0000E 03  LMAX=    3
                   8.7592D-01  2.5010D-03  4.3925D-06  5.0679D-07  0.0         0.0

ELAB= 5.0000E 03  LMAX=    3
                   8.6034D-01  1.3137D-02  1.0982D-04  1.2628D-06  0.0         0.0

ELAB= 1.0000E 04  LMAX=    3
                   8.4634D-01  2.6966D-02  4.3929D-04  6.2081D-07  0.0         0.0

ELAB= 2.0000E 04  LMAX=    3
                   8.2349D-01  3.5085D-02  1.7045D-03  2.3808D-05  0.0         0.0

ELAB= 3.0000E 04  LMAX=    3
                   8.0381D-01  8.2991D-02  3.7428D-03  5.9867D-05  0.0         0.0

ELAB= 4.0000E 04  LMAX=    3
                   7.8599D-01  1.1022D-01  6.4708D-03  1.4562D-04  0.0         0.0

ELAB= 5.0000E 04  LMAX=    3
                   7.5753D-01  1.3304D-01  9.5986D-03  2.7730D-04  0.0         0.0

ELAB= 6.0000E 04  LMAX=    3
                   7.4210D-01  1.5784D-01  1.3473D-02  4.6298D-04  0.0         0.0

ELAB= 7.0000E 04  LMAX=    3
                   7.2751D-01  1.8163D-01  1.7862D-02  7.1502D-04  0.0         0.0

ELAB= 8.0000E 04  LMAX=    3
                   7.1303D-01  2.0438D-01  2.2720D-02  1.0499D-03  0.0         0.0

ELAB= 9.0000E 04  LMAX=    3
                   7.0039D-01  2.2607D-01  2.7987D-02  1.4623D-03  0.0         0.0

ELAB= 1.0000E 05  LMAX=    3
                   6.8772D-01  2.4672D-01  3.3632D-02  1.9602D-03  0.0         0.0

ELAB= 2.0000E 05  LMAX=    3
                   5.8235D-01  4.0444D-01  1.0395D-01  1.2551D-02  0.0         0.0

ELAB= 3.0000E 05  LMAX=    5
                   5.0503D-01  4.8772D-01  1.7704D-01  3.6694D-02  4.3603D-03  4.2217D-05

ELAB= 4.0000E 05  LMAX=    5
                   4.4406D-01  5.2590D-01  2.4531D-01  7.2236D-02  1.1754D-02  2.4344D-04

ELAB= 5.0000E 05  LMAX=    5
                   3.9676D-01  5.3840D-01  3.0231D-01  1.1804D-01  2.4773D-02  8.8396D-04
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 240 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR SHAPE ELASTIC
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,..5, AND NEXT LINE 6,7,........ 11

ELAB= 6.0000E 05  LMAX=    6
                   3.5876D-01  5.3721D-01  3.4858D-01  1.7175D-01  4.4785D-02  2.6057D-03
                   4.9099D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 7.0000E 05  LMAX=    6
                   3.2895D-01  5.2943D-01  3.8542D-01  2.3031D-01  7.2296D-02  5.8952D-03
                   1.1653D-03  0.0         0.0         0.0         0.0         0.0

ELAB= 8.0000E 05  LMAX=    6
                   3.0599D-01  5.1922D-01  4.1504D-01  2.9095D-01  1.0760D-01  1.1685D-02
                   2.4309D-03  0.0         0.0         0.0         0.0         0.0

ELAB= 9.0000E 05  LMAX=    6
                   2.8871D-01  5.0915D-01  4.3988D-01  3.5115D-01  1.5034D-01  2.0937D-02
                   4.5837D-03  0.0         0.0         0.0         0.0         0.0

ELAB= 1.0000E 06  LMAX=    8
                   2.7014D-01  5.0089D-01  4.6238D-01  4.0928D-01  2.0000D-01  3.4140D-02
                   8.3113D-03  9.7292D-04  8.3685D-05  0.0         0.0         0.0

ELAB= 1.2500E 06  LMAX=    8
                   2.6032D-01  4.9452D-01  5.1986D-01  5.3806D-01  3.4524D-01  9.1467D-02
                   2.5535D-02  3.9547D-03  4.7877D-04  0.0         0.0         0.0

ELAB= 1.5000E 06  LMAX=    9
                   2.6003D-01  5.1311D-01  5.8937D-01  6.4420D-01  5.0434D-01  1.8631D-01
                   5.9268D-02  1.1217D-02  1.5887D-03  1.5843D-04  0.0         0.0

ELAB= 2.0000E 06  LMAX=    9
                   2.8317D-01  6.0669D-01  7.5701D-01  8.2625D-01  7.9685D-01  4.5271D-01
                   1.8391D-01  4.9344D-02  9.7347D-03  1.4157D-03  0.0         0.0

ELAB= 2.5000E 06  LMAX=   11
                   3.1341D-01  7.1972D-01  9.2749D-01  1.0024D 00  1.0201D 00  7.2481D-01
                   3.6113D-01  1.2584D-01  3.2283D-02  6.4209D-03  8.5500D-04  9.3690D-05

ELAB= 3.0000E 06  LMAX=   12
                   3.3032D-01  8.0942D-01  1.0685D 00  1.1408D 00  1.1841D 00  9.3843D-01
                   5.4038D-01  2.2935D-01  7.5198D-02  1.9098D-02  3.1268D-03  4.6862D-04
                   4.9184D-05  0.0         0.0         0.0         0.0         0.0

ELAB= 4.0000E 06  LMAX=   14
                   3.5082D-01  8.8847D-01  1.2180D 00  1.3704D 00  1.3851D 00  1.1996D 00
                   8.1590D-01  4.5512D-01  2.1870D-01  8.0425D-02  1.9700D-02  4.5580D-03
                   7.6926D-04  9.2403D-05  1.6465D-05  0.0         0.0         0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 240 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR SHAPE ELASTIC
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,.5, AND NEXT LINE 6,7......... 11

ELAB= 5.0000E 06  LMAX=   15
                  3.35850-01  8.71690-01  1.23450 00  1.43430 00  1.46290 00  1.32480 00
                  9.94760-01  6.49050-01  3.99980-01  1.97220-01  6.86020-02  2.08210-02
                  4.43870-03  6.69330-04  9.88710-05 -1.85380-06  0.0        0.0

ELAB= 6.0000E 06  LMAX=   16
                  3.07200-01  8.06550-01  1.16360 00  1.38990 00  1.45230 00  1.36020 00
                  1.10060 00  7.93960-01  5.66730-01  3.53560-01  1.64790-01  6.31410-02
                  1.70170-02  3.46020-03  7.83130-04  1.21150-04  1.61970-05  0.0

ELAB= 8.0000E 06  LMAX=   17
                  2.49120-01  6.50020-01  9.52830-01  1.16760 00  1.28620 00  1.28650 00
                  1.17620 00  9.84190-01  8.06550-01  6.65050-01  4.70670-01  2.61780-01
                  1.04410-01  3.28030-02  1.00980-02  2.28800-03  5.04860-04  9.25900-05

ELAB= 1.0000E 07  LMAX=   18
                  2.16910-01  5.73940-01  8.24740-01  1.01150 00  1.14290 00  1.21110 00
                  1.20060 00  1.14010 00  1.04100 00  9.56950-01  8.30460-01  5.96580-01
                  3.50910-01  1.69780-01  6.53660-02  2.10640-02  6.03780-03  1.40160-03
                  2.97040-04  0.0         0.0         0.0         0.0         0.0

ELAB= 1.2000E 07  LMAX=   20
                  2.30720-01  5.61270-01  7.97650-01  9.58230-01  1.07790 00  1.16350 00
                  1.20460 00  1.21530 00  1.18930 00  1.14660 00  1.07760 00  9.00090-01
                  6.29470-01  3.62810-01  1.71830-01  7.02640-02  2.46460-02  7.16320-03
                  2.00200-03  4.51630-04  9.27840-05  0.0         0.0         0.0

ELAB= 1.4000E 07  LMAX=   21
                  2.20080-01  5.97050-01  8.59110-01  1.03390 00  1.15720 00  1.24710 00
                  1.31190 00  1.35080 00  1.36260 00  1.34290 00  1.28790 00  1.14630 00
                  8.86450-01  5.83360-01  3.30150-01  1.65040-01  7.10370-02  2.61170-02
                  8.99240-03  2.55750-03  7.85230-04  1.80110-04  0.0         0.0

ELAB= 1.7000E 07  LMAX=   22
                  2.52340-01  7.03780-01  1.05530 00  1.31250 00  1.48820 00  1.60380 00
                  1.68090 00  1.72660 00  1.74320 00  1.72230 00  1.65280 00  1.51720 00
                  1.28410 00  9.73310-01  6.69740-01  4.23180-01  2.38580-01  1.17540-01
                  5.21370-02  1.94190-02  7.05480-03  2.09380-03  5.28170-04  0.0

ELAB= 2.0000E 07  LMAX=   24
                  2.80850-01  7.96510-01  1.22820 00  1.57640 00  1.83630 00  2.01020 00
                  2.11530 00  2.16430 00  2.16840 00  2.12440 00  2.02940 00  1.87100 00
                  1.64250 00  1.33800 00  1.01060 00  7.21970-01  4.85930-01  2.96400-01
                  1.61720-01  7.60400-02  3.22880-02  1.09820-02  3.85650-03  1.29650-03
                  3.67980-04  0.0         0.0         0.0         0.0         0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 240 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (1 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*BO
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,..5, AND NEXT LINE 6,7,........ 11

ELAB= 5.0000E 04  LMAX=    3
                   5.4024D-03  5.3291D-03  1.1427D-03 -3.2112D-07  0.0          0.0

ELAB= 6.0000E 04  LMAX=    3
                   1.6480D-04  1.6355D-04  4.4089D-03 -2.2266D-06  0.0          0.0

ELAB= 7.0000E 04  LMAX=    3
                   3.1440D-04  3.0641D-04  8.8630D-03 -6.3568D-06  0.0          0.0

ELAB= 8.0000E 04  LMAX=    3
                   4.9549D-04  4.7473D-04  1.4139D-04 -1.3204D-05  0.0          0.0

ELAB= 9.0000E 04  LMAX=    3
                   7.0232D-04  6.6244D-04  1.9970D-04 -2.3180D-05  0.0          0.0

ELAB= 1.0000E 05  LMAX=    3
                   9.3024D-04  8.6459D-04  2.6104D-04 -3.6603D-05  0.0          0.0

ELAB= 2.0000E 05  LMAX=    3
                   3.6684D-03  3.0353D-03  8.7600D-04 -3.8451D-04  0.0          0.0

ELAB= 3.0000E 05  LMAX=    5
                   6.8105D-03  4.4650D-03  7.4032D-04 -1.3279D-03  2.7956D-04 -6.6231D-06

ELAB= 4.0000E 05  LMAX=    5
                   1.0103D-02  5.2831D-03  9.3842D-04 -2.6209D-03  6.8219D-04 -1.7114D-05

ELAB= 5.0000E 05  LMAX=    5
                   1.3484D-02  5.5470D-03  1.5735D-03 -4.2389D-03  1.1847D-03 -2.7404D-05

ELAB= 6.0000E 05  LMAX=    6
                   1.6831D-02  5.3430D-03  2.6270D-03 -5.7669D-03  1.1478D-03 -7.7585D-05
                   1.4914D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 7.0000E 05  LMAX=    6
                   1.9949D-02  4.7685D-03  3.8783D-03 -7.6895D-03  9.3463D-04 -7.0868D-05
                   3.2456D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 8.0000E 05  LMAX=    6
                   2.2701D-02  3.8941D-03  5.0951D-03 -9.6151D-03  1.9537D-04 -1.8367D-05
                   6.1258D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 9.0000E 05  LMAX=    6
                   2.5013D-02  2.8358D-03  6.0348D-03 -1.1384D-02 -1.1291D-03  8.9123D-05
                   1.0369D-03  0.0         0.0         0.0         0.0         0.0

ELAB= 1.0000E 06  LMAX=    8
                   2.6891D-02  1.7024D-03  6.6243D-03 -1.2849D-02 -3.0471D-03  3.9101D-04
                   1.5869D-03 -4.4360D-05  2.5048D-05  0.0         0.0         0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 240 (CM.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (1 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,..5, AND NEXT LINE 6,7......... 11

ELAB= 1.2500E 06  LMAX=    8
                  2.9980D-02 -7.6318D-04  6.0831D-03 -1.5065D-02 -9.6352D-03  1.3495D-03
                  3.5437D-03 -1.4748D-04  1.1478D-04  0.0         0.0         0.0

ELAB= 1.5000E 06  LMAX=    9
                  3.1546D-02 -2.2104D-03  3.5117D-03 -1.5773D-02 -1.6809D-02  2.9906D-03
                  5.6240D-03 -2.4680D-04  4.2768D-04 -2.2689D-05  0.0         0.0

ELAB= 2.0000E 06  LMAX=    9
                  3.2697D-02 -9.2967D-04 -1.0935D-03 -1.4927D-02 -2.2705D-02  8.3979D-03
                  7.2369D-03  1.7274D-04  2.0053D-03 -1.5118D-04  0.0         0.0

ELAB= 2.5000E 06  LMAX=   11
                  3.2503D-02  5.0249D-03  6.2860D-04 -9.1977D-03 -1.5810D-02  1.4059D-02
                  4.0080D-03  2.4691D-03  4.2547D-03 -3.5042D-04  3.5857D-04 -1.0704D-06

ELAB= 3.0000E 06  LMAX=   12
                  3.1402D-02  1.1042D-02  5.4570D-03 -5.4155D-04 -5.4134D-03  1.8721D-02
                  1.5638D-04  4.3505D-03  5.3817D-03 -2.5038D-04  1.0941D-03 -8.2939D-06
                  2.5342D-05  0.0         0.0         0.0         0.0         0.0

ELAB= 4.0000E 06  LMAX=   14
                  2.8244D-02  1.5723D-02  1.0827D-02  7.9841D-03  5.9281D-03  2.0381D-02
                 -1.5125D-03 -8.0708D-04  3.0520D-04  1.7484D-03  3.7455D-03 -1.0567D-04
                  2.6235D-04  1.0273D-05  3.6573D-06  0.0         0.0         0.0

ELAB= 5.0000E 06  LMAX=   15
                  2.5372D-02  1.3465D-02  1.0293D-02  4.7490D-03  6.7948D-03  1.2478D-02
                  7.7483D-04 -6.5210D-03 -9.2148D-03  3.9736D-03  5.3557D-03 -3.9705D-04
                  1.1737D-03  1.5705D-05  3.2199D-05  5.2948D-06  0.0         0.0

ELAB= 6.0000E 06  LMAX=   16
                  2.3383D-02  1.5257D-02  8.5422D-03  9.4827D-04  4.1475D-03  5.4150D-03
                  7.1905D-04 -5.5035D-03 -1.3327D-02  3.6702D-03  2.4799D-03 -4.3169D-04
                  2.9802D-03 -3.2693D-05  1.5078D-04  3.4062D-05  4.7371D-06  0.0

ELAB= 8.0000E 06  LMAX=   17
                  2.0634D-02  1.6949D-02  8.0437D-03 -3.2466D-04 -9.7870D-05  1.8129D-04
                 -2.1994D-03 -2.4342D-03 -1.2384D-02 -5.7266D-03 -7.3281D-03  2.9439D-03
                  5.9752D-03 -3.3780D-04  1.1846D-03  4.2760D-04  7.2218D-05  2.8331D-05

ELAB= 1.0000E 07  LMAX=   18
                  1.9722D-02  2.1570D-02  1.0501D-02  2.5667D-03 -1.8508D-03 -4.4899D-03
                 -8.7681D-03 -1.0138D-02 -1.7505D-02 -1.4805D-02 -9.9848D-03  2.0671D-04
                  2.1978D-03  6.8442D-03  6.3853D-03  6.0709D-04  1.7633D-03  1.6823D-04
                  1.0544D-04  0.0         0.0         0.0         0.0         0.0
```

```
COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 240 (CH,LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL,PHYS,A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (1 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,.5, AND NEXT LINE 6,7,........ 11

ELAB= 1.2000E 07  LMAX=   20
   1.91570-02  2.41550-02  1.34950-02  5.65880-03  2.98860-04 -3.54250-03
  -7.99800-03 -1.07290-02 -1.35520-02 -1.21940-02 -6.77750-03  1.92270-03
   2.32180-03  8.33440-03  3.19080-03  1.35280-03  4.54180-03  3.68750-05
   5.20100-04  7.45130-05  3.20130-05  0.0         0.0         0.0

ELAB= 1.4000E 07  LMAX=   21
   1.80850-02  2.46780-02  1.61080-02  8.05980-03  4.10930-03  2.57640-04
  -2.81690-03 -5.30530-03 -6.87970-03 -5.77660-03 -2.79900-03  3.85130-03
   1.65430-03  3.00070-03 -2.45850-03  4.11360-03  6.34450-03 -5.37490-04
   1.82340-03  2.17700-04  2.02050-04  4.74930-05  0.0         0.0

ELAB= 1.7000E 07  LMAX=   22
   1.78710-02  2.61220-02  2.16450-02  1.26930-02  1.04420-02  5.47370-03
   4.23690-03  1.17750-03 -6.59880-04 -5.03170-06 -6.82970-04  4.78210-03
   2.23740-03  4.38240-03 -1.06580-03  7.00340-03  2.86270-03  5.87290-04
   7.35260-03  9.35250-04  1.66210-03  5.09300-04  1.91740-04  0.0

ELAB= 2.0000E 07  LMAX=   24
   1.77210-02  2.66890-02  2.50330-02  1.54570-02  1.48130-02  1.01500-02
   1.13890-02  9.79650-03  9.26280-03  1.04600-02  8.23030-03  1.22840-02
   6.91490-03  8.27410-03 -2.54030-03  1.30660-05 -4.92690-03  3.75380-03
   1.00560-02  1.56710-03  5.81720-03  1.48840-03  9.38510-04  3.23460-04
   1.08210-04  0.0         0.0         0.0         0.0         0.0
```

```
COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 240 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (2 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1..5, AND NEXT LINE 6,7,........ 11

ELAB= 2.0000E 05  LMAX=    3
                   9.5630D-06  9.0286D-06  4.8789D-06  1.1020D-06  0.0         0.0

ELAB= 3.0000E 05  LMAX=    5
                   1.5403D-04  2.2896D-04  1.2972D-04  2.1416D-05  1.3192D-06 -3.3542D-07

ELAB= 4.0000E 05  LMAX=    5
                   5.6798D-04  8.7083D-04  4.6026D-04  6.4337D-05  7.1207D-08 -1.6923D-06

ELAB= 5.0000E 05  LMAX=    5
                   1.3348D-03  2.0349D-03  9.9986D-04  1.0466D-04 -1.2166D-05 -4.2670D-06

ELAB= 6.0000E 05  LMAX=    6
                   2.4573D-03  3.6749D-03  1.5597D-03  1.5475D-05 -5.5924D-05 -7.6290D-06
                   2.1222D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 7.0000E 05  LMAX=    6
                   3.8431D-03  5.5389D-03  2.0494D-03 -1.7781D-04 -1.1193D-04 -4.3494D-06
                   4.4172D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 8.0000E 05  LMAX=    6
                   5.3749D-03  7.4111D-03  2.2803D-03 -5.3392D-04 -1.7588D-04  1.0986D-05
                   7.3235D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 9.0000E 05  LMAX=    6
                   6.9309D-03  9.0864D-03  2.1375D-03 -1.0571D-03 -2.2554D-04  4.5623D-05
                   9.9725D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 1.0000E 06  LMAX=    8
                   8.4246D-03  1.0480D-02  1.6149D-03 -1.8642D-03 -2.6361D-04  1.7050D-04
                   1.3848D-05 -8.0988D-06 -1.3775D-07  0.0         0.0         0.0

ELAB= 1.2500E 06  LMAX=    8
                   1.1522D-02  1.2216D-02 -1.3234D-03 -3.6508D-03  8.9679D-05  4.9470D-04
                   2.0442D-07 -2.4972D-05  6.9490D-07  0.0         0.0         0.0

ELAB= 1.5000E 06  LMAX=    9
                   1.3646D-02  1.2137D-02 -3.0248D-03 -4.3441D-03  1.3592D-03  8.9752D-04
                  -9.9634D-05 -4.5596D-05  4.4505D-06 -1.0919D-06  0.0         0.0

ELAB= 2.0000E 06  LMAX=    9
                   1.3797D-02  1.0706D-02 -8.4986D-03 -9.6363D-04  5.1363D-03  9.2621D-04
                  -5.8499D-04 -4.3867D-05  1.4015D-05 -7.9024D-06  0.0         0.0

ELAB= 2.5000E 06  LMAX=   11
                   1.6331D-02  1.0113D-02 -6.6020D-03  4.2795D-03  6.7491D-03 -6.7427D-04
                  -1.0209D-03  1.5139D-04 -5.8814D-05 -3.3845D-05  2.4953D-05  8.8375D-07
```

```
COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 240 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (2 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,..5, AND NEXT LINE 6,7,........ 11

ELAB= 3.0000E 06  LMAX=   12
   1.59960-02  9.8608D-03 -3.8513D-03  6.4962D-03  4.7884D-03 -2.8237D-03
  -6.5023D-04  5.2808D-04 -3.3930D-04 -8.2029D-05  7.5427D-05  1.0598D-04
   2.0535D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 4.0000E 06  LMAX=   14
   1.4399D-02  9.2364D-03 -8.2507D-04  5.0673D-03 -1.1786D-03 -3.5895D-03
   1.2905D-03  2.5488D-04 -1.1854D-03  9.7922D-07  1.9535D-04 -1.7114D-05
   2.4963D-05  5.5614D-07  9.4905D-08  0.0         0.0         0.0

ELAB= 5.0000E 06  LMAX=   15
   1.2617D-02  8.4302D-03  6.5101D-04  3.5777D-03 -3.5435D-03 -1.1755D-03
   5.2893D-04 -2.1134D-03 -4.2306D-04  7.0515D-04 -8.6767D-05 -8.1489D-05
   1.0797D-04 -4.1156D-06  2.0296D-06  4.3239D-07  0.0         0.0

ELAB= 6.0000E 06  LMAX=   16
   1.1003D-02  7.8219D-03  1.8289D-03  2.8270D-03 -3.5391D-03  2.4628D-04
  -1.2290D-03 -2.7356D-03  1.9258D-03  8.8444D-04 -8.0932D-04  6.2079D-06
   2.1678D-04 -3.0773D-05  8.7823D-06  3.4957D-06  4.9311D-07  0.0

ELAB= 8.0000E 06  LMAX=   17
   8.4987D-03  7.1991D-03  5.5304D-03  2.5373D-03 -1.3005D-03  1.1971D-03
  -1.0870D-03 -1.2948D-03  9.5106D-04 -6.1282D-04 -3.0052D-05  7.3972D-04
   2.1820D-03 -1.9992D-04  4.6692D-05  3.6042D-05  5.4954D-06  3.8269D-06

ELAB= 1.0000E 07  LMAX=   18
   6.9701D-03  7.0977D-03  3.8766D-03  2.2029D-03 -8.5381D-04  4.1266D-06
  -1.8403D-03 -1.1755D-03 -1.3341D-04  7.1163D-04  2.3683D-03  1.4773D-04
  -4.7357D-04  3.6194D-04 -2.6883D-04 -6.4211D-05  1.8023D-04  1.1027D-05
   1.6500D-05  0.0         0.0         0.0         0.0         0.0

ELAB= 1.2000E 07  LMAX=   20
   6.1716D-03  7.3511D-03  4.6227D-03  2.7884D-03  4.7109D-04  5.6849D-04
  -8.6554D-04  2.9168D-04  1.8249D-04  1.4554D-03  2.6774D-03  4.1132D-04
   1.1657D-03  5.2968D-05  1.3932D-03  1.4745D-04  3.3247D-04 -3.5241D-05
   7.3125D-05  4.8351D-06  4.4773D-06  0.0         0.0         0.0

ELAB= 1.4000E 07  LMAX=   21
   5.2889D-03  6.6790D-03  4.9398D-03  3.4388D-03  1.4865D-03  1.3770D-03
   3.0878D-05  1.0945D-03  3.9177D-04  1.3225D-03  1.8436D-03  4.5621D-04
   1.7067D-03 -1.0829D-03 -1.3396D-03  8.6642D-04 -3.2581D-05 -1.6621D-04
   1.8966D-04 -1.8702D-05  2.2407D-05  4.7465D-06  0.0         0.0

ELAB= 1.7000E 07  LMAX=   22
   4.5521D-03  5.7510D-03  5.4111D-03  3.8727D-03  2.1756D-03  2.0714D-03
   2.5712D-04  1.4433D-03 -4.6072D-05  1.0793D-03  8.6502D-04  2.7383D-04
   1.6981D-03 -8.0754D-04  1.1626D-03  7.0808D-04 -1.8666D-03  6.0118D-05
   3.1498D-04 -2.0136D-04  1.6166D-04  4.4132D-05  2.5712D-05  0.0
```

```
COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 240 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (2 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,..5, AND NEXT LINE 6,7,........ 11

ELAB= 2.0000E 07  LMAX=   24
 4.1802D-03  5.5105D-03  6.0608D-03  3.9213D-03  2.4625D-03  2.0379D-03
-1.0529D-04  1.1532D-03 -7.5809D-04  7.7751D-04  2.0262D-04  3.3152D-04
 1.5023D-03 -3.9155D-04  1.3132D-03 -9.8317D-04 -1.6485D-03  7.7077D-04
-8.1451D-04 -4.7839D-04  5.2352D-04  7.6095D-05  1.1489D-04  3.8557D-05
 1.5889D-05  0.0         0.0         0.0         0.0         0.0
```

A N N E X E 3B

COEFFICIENTS DE TRANSMISSION GENERALISES
CALCULES POUR ^{240}Pu

NEUTRON TRANSMISSION COEFFICIENTS FOR PLUTONIUM; 240.000

THE COEFFICIENTS ARE IN THE ORDER (L,J); (0,1/2),(1,1/2),(1,3/2),(2,3/2),(2,5/2),(3,5/2),(3,7/2), ...

```
            E= 0.10000E-02(MEV)      LMAX=    3      JMAX=    5/2
0.19119E-01 0.92288E-04 0.13494E-03 0.40724E-07 0.26072E-07 0.43663E-11

            E= 0.50000E-02(MEV)      LMAX=    3      JMAX=    5/2
0.42229E-01 0.10236E-02 0.14979E-02 0.22601E-05 0.14538E-05 0.12204E-08

            E= 0.10000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.59167E-01 0.28659E-02 0.41971E-02 0.12670E-04 0.81993E-05 0.13807E-07

            E= 0.20000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.82563E-01 0.79395E-02 0.11641E-01 0.70389E-04 0.46128E-04 0.15621E-06

            E= 0.30000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.10008E 00 0.14282E-01 0.20959E-01 0.19048E-03 0.12655E-03 0.64580E-06

            E= 0.40000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.11455E 00 0.21528E-01 0.31613E-01 0.38400E-03 0.25926E-03 0.17680E-05

            E= 0.50000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.13033E 00 0.29199E-01 0.43569E-01 0.65340E-03 0.47040E-03 0.38560E-05

            E= 0.60000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.14191E 00 0.37580E-01 0.56128E-01 0.10129E-02 0.73602E-03 0.73041E-05

            E= 0.70000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.15245E 00 0.46369E-01 0.69304E-01 0.14634E-02 0.10735E-02 0.12538E-04

            E= 0.80000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.16218E 00 0.55478E-01 0.82955E-01 0.20078E-02 0.14873E-02 0.20025E-04

            E= 0.90000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.17125E 00 0.64835E-01 0.96968E-01 0.26484E-02 0.19809E-02 0.30273E-04

            E= 0.10000E 00(MEV)      LMAX=    3      JMAX=    5/2
0.17977E 00 0.74383E-01 0.11125E 00 0.33858E-02 0.25579E-02 0.43825E-04

            E= 0.20000E 00(MEV)      LMAX=    3      JMAX=    5/2
0.25037E 00 0.17519E 00 0.26392E 00 0.16259E-01 0.13868E-01 0.55126E-03

            E= 0.30000E 00(MEV)      LMAX=    4      JMAX=    7/2
0.30326E 00 0.26964E 00 0.39795E 00 0.37663E-01 0.35413E-01 0.22495E-02 0.32054E-02 0.26700E-04

            E= 0.40000E 00(MEV)      LMAX=    4      JMAX=    7/2
0.34828E 00 0.35368E 00 0.50848E 00 0.65283E-01 0.66825E-01 0.59572E-02 0.85301E-02 0.95039E-04

            E= 0.50000E 00(MEV)      LMAX=    4      JMAX=    7/2
0.38732E 00 0.42693E 00 0.59627E 00 0.96803E-01 0.10601E 00 0.12470E-01 0.18062E-01 0.25372E-03

            E= 0.60000E 00(MEV)      LMAX=    5      JMAX=    9/2
0.42046E 00 0.49012E 00 0.66402E 00 0.13024E 00 0.14967E 00 0.22508E-01 0.33056E-01 0.56468E-03 0.83366E-03 0.19307E-04
```

NEUTRON TRANSMISSION COEFFICIENTS FOR PLUTONIUM; 240.000

THE COEFFICIENTS ARE IN THE ORDER (L,J): (0,1/2),(1,1/2),(1,3/2),(2,3/2),(2,5/2),(3,5/2),(3,7/2), ...

```
            E= 0.70000E 00(MEV)      LMAX=    5     JMAX=    9/2
0.44749E 00 0.54422E 00 0.71465E 00 0.16399E 00 0.19412E 00 0.36677E-01 0.54605E-01 0.11083E-02 0.16458E-02 0.44759E-04

            E= 0.80000E 00(MEV)      LMAX=    5     JMAX=    9/2
0.46846E 00 0.59019E 00 0.75107E 00 0.19681E 00 0.23617E 00 0.53429E-01 0.83504E-01 0.19832E-02 0.29550E-02 0.92485E-04

            E= 0.90000E 00(MEV)      LMAX=    5     JMAX=    9/2
0.48388E 00 0.62899E 00 0.77609E 00 0.22784E 00 0.27369E 00 0.79010E-01 0.12011E 00 0.33058E-02 0.49306E-02 0.17494E-03

            E= 0.10000E 01(MEV)      LMAX=    6     JMAX=   11/2
0.49452E 00 0.66153E 00 0.79244E 00 0.25650E 00 0.30567E 00 0.10742E 00 0.16423E 00 0.52081E-02 0.77587E-02 0.30853E-03
0.79986E-03 0.80160E-05

            E= 0.12500E 01(MEV)      LMAX=    6     JMAX=   11/2
0.50607E 00 0.72117E 00 0.81040E 00 0.31707E 00 0.36184E 00 0.19679E 00 0.30090E 00 0.13460E-01 0.19816E-01 0.10151E-02
0.23562E-02 0.35217E-04

            E= 0.15000E 01(MEV)      LMAX=    7     JMAX=   13/2
0.50529E 00 0.75893E 00 0.81460E 00 0.36253E 00 0.39197E 00 0.30160E 00 0.45337E 00 0.28529E-01 0.41017E-01 0.26528E-02
0.55500E-02 0.11900E-03 0.17352E-03 0.30687E-05

            E= 0.20000E 01(MEV)      LMAX=    7     JMAX=   13/2
0.49291E 00 0.79876E 00 0.81649E 00 0.41870E 00 0.41483E 00 0.50128E 00 0.69856E 00 0.83910E-01 0.11237E 00 0.11789E-01
0.20203E-01 0.81723E-03 0.11131E-02 0.23930E-04

            E= 0.25000E 01(MEV)      LMAX=    8     JMAX=   15/2
0.48359E 00 0.81452E 00 0.81672E 00 0.44690E 00 0.42748E 00 0.64983E 00 0.81065E 00 0.16276E 00 0.20376E 00 0.36341E-01
0.48724E-01 0.34704E-02 0.42799E-02 0.11010E-03 0.81156E-04 0.64730E-05

            E= 0.30000E 01(MEV)      LMAX=    9     JMAX=   17/2
0.48284E 00 0.81847E 00 0.81518E 00 0.46244E 00 0.44679E 00 0.75004E 00 0.83634E 00 0.24155E 00 0.29188E 00 0.86887E-01
0.86583E-01 0.10103E-01 0.11599E-01 0.36403E-03 0.29968E-03 0.31390E-04 0.30938E-04 0.64016E-06

            E= 0.40000E 01(MEV)      LMAX=   10     JMAX=   19/2
0.50031E 00 0.81570E 00 0.80984E 00 0.48789E 00 0.50140E 00 0.86033E 00 0.80783E 00 0.37082E 00 0.44757E 00 0.27651E 00
0.17027E 00 0.40703E-01 0.50790E-01 0.22454E-02 0.23634E-02 0.32797E-03 0.27412E-03 0.82479E-05 0.20368E-04 0.51812E-06

            E= 0.50000E 01(MEV)      LMAX=   11     JMAX=   21/2
0.52967E 00 0.81549E 00 0.80459E 00 0.52020E 00 0.55419E 00 0.90002E 00 0.77193E 00 0.47251E 00 0.58577E 00 0.49076E 00
0.26314E 00 0.10094E 00 0.15307E 00 0.84631E-02 0.11647E-01 0.15288E-02 0.13434E-02 0.57414E-04 0.16372E-03 0.47485E-05
0.47689E-05 0.23906E-06

            E= 0.60000E 01(MEV)      LMAX=   12     JMAX=   23/2
0.56231E 00 0.81802E 00 0.79965E 00 0.55853E 00 0.59633E 00 0.90122E 00 0.74858E 00 0.55777E 00 0.69495E 00 0.62318E 00
0.36285E 00 0.19454E 00 0.33418E 00 0.23470E-01 0.40394E-01 0.47648E-02 0.45742E-02 0.27372E-03 0.79255E-03 0.26272E-04
0.27414E-04 0.16110E-05 0.21712E-05 0.11254E-06

            E= 0.30000E 01(MEV)      LMAX=   13     JMAX=   25/2
0.62745E 00 0.82052E 00 0.79021E 00 0.63604E 00 0.66793E 00 0.87312E 00 0.72728E 00 0.69907E 00 0.81372E 00 0.69708E 00
0.53206E 00 0.46404E 00 0.68451E 00 0.11287E 00 0.20858E 00 0.28308E-01 0.26743E-01 0.30876E-02 0.65308E-02 0.32107E-03
0.41532E-03 0.30050E-04 0.39177E-04 0.28021E-05 0.29930E-05 0.23546E-06
```

ANNEXE 4A

SECTIONS EFFICACES CALCULEES PAR MODELE

OPTIQUE EN VOIES COUPLEES SUR ^{242}Pu

REMARQUES

1) E = Energies laboratoire en eV

2) S(E) = Sections efficaces correspondantes en barn

3) $\sigma(\theta) = \sum_{L=0}^{Lmax} B_L P_L(\cos\theta)$, où les B_L sont les coefficients de Legendre tabulés, avec $\sigma(\theta)$ résultant en barn/stéradian

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 242 (CH,LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

NEUTRON TOTAL CROSS SECTIONS

E	S(E)	E	S(E)	E	S(E)
1.0000D 03	2.3826D 01	5.0000D 03	1.6912D 01	1.0000D 04	1.5320D 01
2.0000D 04	1.4202D 01	3.0000D 04	1.3689D 01	4.0000D 04	1.3359D 01
5.0000D 04	1.3012D 01	6.0000D 04	1.2810D 01	7.0000D 04	1.2635D 01
8.0000D 04	1.2478D 01	9.0000D 04	1.2334D 01	1.0000D 05	1.2199D 01
2.0000D 05	1.1170D 01	3.0000D 05	1.0313D 01	4.0000D 05	9.6057D 00
5.0000D 05	9.0380D 00	6.0000D 05	8.5930D 00	7.0000D 05	8.2436D 00
8.0000D 05	7.9758D 00	9.0000D 05	7.7759D 00	1.0000D 06	7.6361D 00
1.2500D 06	7.4711D 00	1.5000D 06	7.4775D 00	2.0000D 06	7.6688D 00
2.5000D 06	7.8543D 00	3.0000D 06	7.9455D 00	4.0000D 06	7.8893D 00
5.0000D 06	7.6254D 00	6.0000D 06	7.2585D 00	8.0000D 06	6.5176D 00
1.0000D 07	6.1789D 00	1.2000D 07	5.9259D 00	1.4000D 07	5.9201D 00
1.7000D 07	6.2617D 00	2.0000D 07	6.5636D 00	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 242 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

NEUTRON COMPOUND NUCLEUS FORMATION CROSS SECTIONS

E	S(E)	E	S(E)	E	S(E)
1.00000D 03	1.29490D 01	5.00000D 03	6.22740D 00	1.00000D 04	4.80770D 00
2.00000D 04	3.97170D 00	3.00000D 04	3.70060D 00	4.00000D 04	3.59000D 00
5.00000D 04	3.60520D 00	6.00000D 04	3.58950D 00	7.00000D 04	3.59020D 00
8.00000D 04	3.59910D 00	9.00000D 04	3.61220D 00	1.00000D 05	3.62690D 00
2.00000D 05	3.91220D 00	3.00000D 05	3.82330D 00	4.00000D 05	3.78040D 00
5.00000D 05	3.72940D 00	6.00000D 05	3.68560D 00	7.00000D 05	3.64490D 00
8.00000D 05	3.61090D 00	9.00000D 05	3.58460D 00	1.00000D 06	3.56950D 00
1.25000D 06	3.55550D 00	1.50000D 06	3.55000D 00	2.00000D 06	3.46400D 00
2.50000D 06	3.30710D 00	3.00000D 06	3.15410D 00	4.00000D 06	2.98160D 00
5.00000D 06	2.94180D 00	6.00000D 06	2.95560D 00	8.00000D 06	2.98820D 00
1.00000D 07	3.08180D 00	1.20000D 07	2.94410D 00	1.40000D 07	2.84910D 00
1.70000D 07	2.80590D 00	2.00000D 07	2.75650D 00	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 242 (CH,LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL,PHYS,A229-311)

NEUTRON SHAPE ELASTIC SCATTERING CROSS SECTIONS

E	S(E)	E	S(E)	E	S(E)
1.0000D 03	1.0878D 01	5.0000D 03	1.0685D 01	1.0000D 04	1.0512D 01
2.0000D 04	1.0230D 01	3.0000D 04	9.9881D 00	4.0000D 04	9.7695D 00
5.0000D 04	9.4064D 00	6.0000D 04	9.2184D 00	7.0000D 04	9.0411D 00
8.0000D 04	8.8731D 00	9.0000D 04	8.7131D 00	1.0000D 05	8.5604D 00
2.0000D 05	7.3117D 00	3.0000D 05	6.4009D 00	4.0000D 05	5.6880D 00
5.0000D 05	5.1155D 00	6.0000D 05	4.6534D 00	7.0000D 05	4.2834D 00
8.0000D 05	3.9913D 00	9.0000D 05	3.7655D 00	1.0000D 06	3.5957D 00
1.2500D 06	3.3636D 00	1.5000D 06	3.3291D 00	2.0000D 06	3.5690D 00
2.5000D 06	3.9122D 00	3.0000D 06	4.1791D 00	4.0000D 06	4.3601D 00
5.0000D 06	4.1965D 00	6.0000D 06	3.8615D 00	8.0000D 06	3.1562D 00
1.0000D 07	2.7562D 00	1.2000D 07	2.6607D 00	1.4000D 07	2.7739D 00
1.7000D 07	3.1696D 00	2.0000D 07	3.5296D 00	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 242 (CH,LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

NEUTRON DIRECT INELASTIC FIRST EXCITED LEVEL

E	S(E)	E	S(E)	E	S(E)
5.0000D 04	5.4078D-04	6.0000D 04	1.8829D-03	7.0000D 04	3.7282D-03
8.0000D 04	5.7807D-03	9.0000D 04	8.5651D-03	1.0000D 05	1.1420D-02
2.0000D 05	4.6131D-02	3.0000D 05	8.6411D-02	4.0000D 05	1.2977D-01
5.0000D 05	1.7566D-01	6.0000D 05	2.2198D-01	7.0000D 05	2.6568D-01
8.0000D 05	3.0445D-01	9.0000D 05	3.3709D-01	1.0000D 06	3.6342D-01
1.2500D 06	4.0593D-01	1.5000D 06	4.2625D-01	2.0000D 06	4.3815D-01
2.5000D 06	4.3185D-01	3.0000D 06	4.1377D-01	4.0000D 06	3.6877D-01
5.0000D 06	3.3089D-01	6.0000D 06	3.0492D-01	8.0000D 06	2.6925D-01
1.0000D 07	2.5683D-01	1.2000D 07	2.4744D-01	1.4000D 07	2.3424D-01
1.7000D 07	2.3219D-01	2.0000D 07	2.2838D-01	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 242 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

NEUTRON DIRECT INELASTIC SECOND EXCITED LEVEL

E	S(E)	E	S(E)	E	S(E)
2.0000D 05	1.1419D-04	3.0000D 05	2.0063D-03	4.0000D 05	7.5446D-03
5.0000D 05	1.7553D-02	6.0000D 05	3.2025D-02	7.0000D 05	4.9710D-02
8.0000D 05	6.9101D-02	9.0000D 05	8.2680D-02	1.0000D 06	1.0738D-01
1.2500D 06	1.4598D-01	1.5000D 06	1.7215D-01	2.0000D 06	1.9768D-01
2.5000D 06	2.0316D-01	3.0000D 06	1.9861D-01	4.0000D 06	1.7885D-01
5.0000D 06	1.5617D-01	6.0000D 06	1.3647D-01	8.0000D 06	1.0392D-01
1.0000D 07	8.4068D-02	1.2000D 07	7.3635D-02	1.4000D 07	6.2863D-02
1.7000D 07	5.4086D-02	2.0000D 07	4.9206D-02	0.0	0.0

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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 242 (CH,LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL,PHYS,A229-311)

LEGENDRE COEFFICIENTS FOR SHAPE ELASTIC
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,,5, AND NEXT LINE 6,7,,,,,,,,, 11

ELAB= 1.0000E 03  LMAX=    3
                   8.6501D-01  2.3999D-03  4.3926D-06  1.5026D-06  0.0         0.0

ELAB= 5.0000E 03  LMAX=    3
                   8.5027D-01  1.2819D-02  1.1421D-04 -7.3903D-07  0.0         0.0

ELAB= 1.0000E 04  LMAX=    3
                   8.3650D-01  2.6024D-02  4.6126D-04  0.8479D-06  0.0         0.0

ELAB= 2.0000E 04  LMAX=    3
                   8.1406D-01  5.5297D-02  1.7907D-03  2.1591D-05  0.0         0.0

ELAB= 3.0000E 04  LMAX=    3
                   7.9483D-01  8.4292D-02  3.9536D-03  6.4920D-05  0.0         0.0

ELAB= 4.0000E 04  LMAX=    3
                   7.7743D-01  1.1299D-01  6.8310D-03  1.5129D-04  0.0         0.0

ELAB= 5.0000E 04  LMAX=    3
                   7.4854D-01  1.3847D-01  1.0218D-02  2.7652D-04  0.0         0.0

ELAB= 6.0000E 04  LMAX=    3
                   7.3358D-01  1.6539D-01  1.4301D-02  4.7199D-04  0.0         0.0

ELAB= 7.0000E 04  LMAX=    3
                   7.1947D-01  1.9144D-01  1.9070D-02  7.3509D-04  0.0         0.0

ELAB= 8.0000E 04  LMAX=    3
                   7.0009D-01  2.1054D-01  2.4275D-02  1.0747D-03  0.0         0.0

ELAB= 9.0000E 04  LMAX=    3
                   6.9337D-01  2.4002D-01  2.9942D-02  1.4994D-03  0.0         0.0

ELAB= 1.0000E 05  LMAX=    3
                   6.8160D-01  2.6307D-01  3.6013D-02  2.0121D-03  0.0         0.0

ELAB= 2.0000E 05  LMAX=    3
                   5.8174D-01  4.4567D-01  1.1305D-01  1.3265D-02  0.0         0.0

ELAB= 3.0000E 05  LMAX=    5
                   5.0936D-01  5.4055D-01  1.9403D-01  3.9134D-02  4.6015D-03  8.0372D-05

ELAB= 4.0000E 05  LMAX=    5
                   4.5204D-01  5.8228D-01  2.6836D-01  7.7154D-02  1.2412D-02  3.5081D-04

ELAB= 5.0000E 05  LMAX=    5
                   4.0707D-01  5.9306D-01  3.3076D-01  1.2392D-01  2.6284D-02  1.2065D-03
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 242 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR SHAPE ELASTIC
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,..5, AND NEXT LINE 6,7,........ 11

ELAB= 6.0000E 05  LMAX=    6
                  3.7030D-01  5.8900D-01  5.8094D-01  1.8268D-01  6.7550D-02  3.3820D-03
                  5.6685D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 7.0000E 05  LMAX=    6
                  3.4085D-01  5.7679D-01  4.2024D-01  2.4394D-01  7.6822D-02  7.3032D-03
                  1.3539D-03  0.0         0.0         0.0         0.0         0.0

ELAB= 8.0000E 05  LMAX=    6
                  3.1702D-01  5.6199D-01  4.5110D-01  3.0666D-01  1.1431D-01  1.4189D-02
                  2.7800D-03  0.0         0.0         0.0         0.0         0.0

ELAB= 9.0000E 05  LMAX=    6
                  2.9906D-01  5.4759D-01  4.7630D-01  3.6317D-01  1.5956D-01  2.4927D-02
                  5.2179D-03  0.0         0.0         0.0         0.0         0.0

ELAB= 1.0000E 06  LMAX=    8
                  2.8014D-01  5.5344D-01  4.9832D-01  4.2082D-01  2.1169D-01  3.9998D-02
                  9.4098D-03  1.0830D-03  9.8581D-05  0.0         0.0         0.0

ELAB= 1.2500E 06  LMAX=    8
                  2.6767D-01  5.2145D-01  5.5345D-01  5.5389D-01  3.6270D-01  1.0359D-01
                  2.8334D-02  4.2523D-03  5.0540D-04  0.0         0.0         0.0

ELAB= 1.5000E 06  LMAX=    9
                  2.6492D-01  5.3412D-01  6.1770D-01  6.5580D-01  5.2319D-01  2.0464D-01
                  6.4248D-02  1.1895D-02  1.6871D-03  1.6814D-04  0.0         0.0

ELAB= 2.0000E 06  LMAX=    9
                  2.8401D-01  6.1559D-01  7.6927D-01  8.2814D-01  8.0598D-01  4.7375D-01
                  1.9207D-01  5.1116D-02  1.0124D-02  1.4483D-03  0.0         0.0

ELAB= 2.5000E 06  LMAX=   11
                  3.1132D-01  7.1725D-01  9.2523D-01  9.9326D-01  1.0161D 00  7.3813D-01
                  3.6915D-01  1.2873D-01  3.3227D-02  6.5520D-03  9.1455D-04  1.0796D-04

ELAB= 3.0000E 06  LMAX=   12
                  3.5256D-01  7.9978D-01  1.0525D 00  1.1470D 00  1.1717D 00  9.4345D-01
                  5.4975D-01  2.3331D-01  7.6937D-02  1.9414D-02  3.2903D-03  5.3182D-04
                  7.7480D-05  0.0         0.0         0.0         0.0         0.0

ELAB= 4.0000E 06  LMAX=   14
                  3.4097D-01  8.7743D-01  1.2023D 00  1.3549D 00  1.3709D 00  1.1995D 00
                  8.2205D-01  4.6122D-01  2.2108D-01  8.1448D-02  2.0388D-02  4.6454D-03
                  7.6256D-04  6.0707D-05 -1.2274D-06  0.0         0.0         0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 242 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR SHAPE ELASTIC
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1..5, AND NEXT LINE 6,7......... 11

ELAB= 5.0000E 00  LMAX=  15
   3.3395D-01  8.6077D-01  1.2237D 00  1.4269D 00  1.4576D 00  1.3280D 00
   1.0035D 00  6.5646D-01  4.0291D-01  1.9916D-01  7.0276D-02  2.1218D-02
   4.5833D-03  7.1132D-04  1.3382D-0   1.5300D-05  0.0         0.0

ELAB= 6.0000E 00  LMAX=  16
   3.0726D-01  8.0789D-01  1.1667D 00  1.3942D 00  1.4587D 00  1.3707D 00
   1.1226D 00  8.0556D-01  5.7132D-01  3.5714D-01  1.6823D-01  6.4630D-02
   1.7545D-02  3.5375D-03  8.0299D-04  1.2461D-04  1.7382D-05  0.0

ELAB= 8.0000E 00  LMAX=  17
   2.5117D-01  6.6293D-01  9.6507D-01  1.1836D 00  1.3051D 00  1.3063D 00
   1.1957D 00  1.0001D 00  8.1338D-01  6.6847D-01  4.7594D-01  2.6606D-01
   1.0657D-01  3.3614D-02  1.0490D-02  2.4248D-03  5.8309D-04  1.2653D-04

ELAB= 1.0000E 07  LMAX=  18
   2.1953D-01  5.8141D-01  8.5737D-01  1.0286D 00  1.1634D 00  1.2327D 00
   1.2204D 00  1.1568D 00  1.0512D 00  9.6142D-01  8.3738D-01  6.0691D-01
   3.5869D-01  1.7325D-01  6.6886D-02  2.1504D-02  6.2301D-03  1.5067D-03
   3.4305D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 1.2000E 07  LMAX=  20
   2.1173D-01  5.6368D-01  8.0190D-01  9.6465D-01  1.0870D 00  1.1738D 00
   1.2182D 00  1.2227D 00  1.1933D 00  1.1466D 00  1.0786D 00  9.0632D-01
   6.3631D-01  3.6742D-01  1.7441D-01  7.1442D-02  2.5169D-02  7.3545D-03
   2.0812D-03  4.8670D-04  1.0681D-04  0.0         0.0         0.0

ELAB= 1.4000E 07  LMAX=  21
   2.2074D-01  5.9062D-01  8.5637D-01  1.0341D 00  1.1586D 00  1.2498D 00
   1.3154D 00  1.3539D 00  1.3548D 00  1.3444D 00  1.2733D 00  1.1546D 00
   8.9481D-01  5.0490D-01  3.3856D-01  1.7000D-01  7.3431D-02  2.7233D-02
   9.4541D-03  2.6990D-03  8.3532D-04  1.9380D-04  0.0         0.0

ELAB= 1.7000E 07  LMAX=  22
   2.3222D-01  6.0314D-01  1.0538D 00  1.3101D 00  1.4854D 00  1.6016D 00
   1.6800D 00  1.7272D 00  1.7457D 00  1.7273D 00  1.6614D 00  1.5310D 00
   1.3044D 00  9.9506D-01  6.8779D-01  4.3585D-01  2.4685D-01  1.2234D-01
   5.4542D-02  2.0325D-02  7.4694D-03  2.2772D-03  5.9797D-04  0.0

ELAB= 2.0000E 07  LMAX=  24
   2.4087D-01  6.9629D-01  1.2271D 00  1.5738D 00  1.8324D 00  2.0058D 00
   2.1114D 00  2.1022D 00  2.1685D 00  2.1478D 00  2.0370D 00  1.8831D 00
   1.6595D 00  1.3578D 00  1.0277D 00  7.3403D-01  4.9471D-01  3.0284D-01
   1.6504D-01  7.8003D-02  3.3273D-02  1.3112D-02  3.9815D-03  1.3312D-03
   3.7441D-04  0.0         0.0         0.0         0.0         0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 242 (CH,LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-80) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (1 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,,5, AND NEXT LINE 6,7,........ 11

ELAB= 5.0000E 04  LMAX=    3
                   4.3033D-05  3.9929D-05  7.9117D-06 -1.8932D-07  0.0          0.0

ELAB= 6.0000E 04  LMAX=    3
                   1.4983D-04  1.4388D-04  3.9592D-05 -1.8048D-06  0.0          0.0

ELAB= 7.0000E 04  LMAX=    3
                   2.9005D-04  2.8444D-04  8.4560D-05 -5.8239D-06  0.0          0.0

ELAB= 8.0000E 04  LMAX=    3
                   4.7569D-04  4.4807D-04  1.3833D-04 -1.2001D-05  0.0          0.0

ELAB= 9.0000E 04  LMAX=    3
                   6.8148D-04  6.3047D-04  1.9809D-04 -2.2079D-05  0.0          0.0

ELAB= 1.0000E 05  LMAX=    3
                   9.0857D-04  8.2037D-04  2.6108D-04 -3.0371D-05  0.0          0.0

ELAB= 2.0000E 05  LMAX=    3
                   3.6650D-03  2.8982D-03  8.0344D-04 -4.0743D-04  0.0          0.0

ELAB= 3.0000E 05  LMAX=    5
                   6.8704D-03  4.1064D-03  7.2377D-04 -1.4533D-03  3.0817D-04 -6.1077D-06

ELAB= 4.0000E 05  LMAX=    5
                   1.0326D-02  4.7526D-03  9.6079D-04 -2.8812D-03  7.6214D-04 -1.7192D-05

ELAB= 5.0000E 05  LMAX=    5
                   1.3978D-02  4.9202D-03  1.6754D-03 -4.6284D-03  1.3314D-03 -3.3524D-05

ELAB= 6.0000E 05  LMAX=    6
                   1.7005D-02  4.7133D-03  2.9106D-03 -6.2670D-03  1.3114D-03 -1.0429D-04
                   1.6442D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 7.0000E 05  LMAX=    6
                   2.1142D-02  4.2410D-03  4.3827D-03 -8.2247D-03  1.0746D-03 -1.2893D-04
                   3.5703D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 8.0000E 05  LMAX=    6
                   2.4228D-02  3.5550D-03  5.7991D-03 -1.0116D-02  2.3858D-04 -1.2338D-04
                   6.7490D-04  0.0         0.0         0.0         0.0         0.0

ELAB= 9.0000E 05  LMAX=    6
                   2.6824D-02  2.7302D-03  6.8909D-03 -1.1804D-02 -1.2647D-03 -7.4312D-05
                   1.1414D-03  0.0         0.0         0.0         0.0         0.0

ELAB= 1.0000E 06  LMAX=    8
                   2.8920D-02  1.8367D-03  7.5243D-03 -1.3183D-02 -3.4210D-03  1.6640D-04
                   1.7436D-03 -3.0549D-05  2.6647D-05  0.0         0.0         0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 242 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (1 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,..S, AND NEXT LINE 6,7,........ 11

ELAB= 1.2500E 00  LMAX=   8
   3.2303D-02 -1.9200D-04  6.7390D-03 -1.5309D-02 -1.0707D-02  1.0355D-03
   3.8649D-03 -1.7305D-04  1.2182D-04  0.0         0.0         0.0

ELAB= 1.5000E 00  LMAX=   9
   3.3920D-02 -1.4292D-03  3.7194D-03 -1.6227D-02 -1.8274D-02  2.7435D-03
   6.0635D-03 -2.9679D-04  4.5213D-04 -2.2421D-05  0.0         0.0

ELAB= 2.0000E 00  LMAX=   9
   3.4667D-02  4.5850D-04 -1.0998D-03 -1.5620D-02 -2.3288D-02  8.7378D-03
   7.6049D-03  1.0177D-04  2.0830D-03 -1.4649D-04  0.0         0.0

ELAB= 2.5000E 00  LMAX=  11
   3.4305D-02  7.0152D-03  1.0316D-03 -9.2227D-03 -4.4994D-02  1.4946D-02
   4.1184D-03  2.3518D-03  4.3178D-03 -3.2115D-04  3.7088D-04 -3.1029D-07

ELAB= 3.0000E 00  LMAX=  12
   3.2927D-02  1.3084D-02  3.9476D-03 -6.6127D-05 -4.2198D-03  1.9074D-02
   2.0693D-04  4.0321D-03  3.3192D-03 -1.8794D-04  1.1068D-03 -9.9467D-06
   2.5547D-05  0.0         0.0         0.0         0.0         0.0

ELAB= 4.0000E 00  LMAX=  14
   2.9346D-02  1.7296D-02  1.0917D-02  8.0491D-03  6.3001D-03  2.0499D-02
  -9.5122D-04 -1.1763D-03 -7.4537D-05  1.7757D-03  3.6686D-03 -1.1974D-04
   2.6380D-04  9.3803D-06  3.1829D-06  0.0         0.0         0.0

ELAB= 5.0000E 00  LMAX=  15
   2.0332D-02  1.6942D-02  1.0336D-02  4.5041D-03  6.8285D-03  1.2229D-02
   1.6669D-03 -6.4464D-03 -9.4935D-03  3.9193D-03  5.0163D-03 -4.2345D-04
   1.1001D-03  1.3633D-05  3.2513D-05  5.5526D-06  0.0         0.0

ELAB= 6.0000E 00  LMAX=  16
   2.4205D-02  1.6601D-02  8.8320D-03  9.9177D-04  4.1913D-03  5.3915D-03
   1.5125D-03 -4.8590D-03 -1.2941D-02  3.3754D-03  1.8265D-03 -4.0791D-04
   2.9372D-03 -4.1623D-05  1.4942D-04  3.4629D-05  4.0934D-06  0.0

ELAB= 8.0000E 00  LMAX=  17
   2.1426D-02  1.8395D-02  9.6772D-03  7.7033D-05  1.5607D-04  6.6040D-04
  -1.7068D-03 -1.9257D-03 -1.2079D-02 -6.4745D-03 -7.7387D-03  3.1793D-03
   5.7314D-03 -4.1560D-04  1.2025D-03  4.2051D-04  7.0079D-05  2.8611D-05

ELAB= 1.0000E 07  LMAX=  18
   2.0438D-02  2.3078D-02  1.1338D-02  2.8659D-03 -1.8850D-03 -4.6233D-03
  -8.9379D-03 -1.0319D-02 -1.7746D-02 -1.5331D-02 -4.0295D-02 -1.2423D-04
   2.4906D-03  7.0151D-03  6.1899D-03  6.3420D-04  1.7392D-03  1.5713D-04
   1.0337D-04  0.0         0.0         0.0         0.0         0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 242 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-80) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (1 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,2,3, AND NEXT LIKE 6,7......... 11

ELAB= 1.2000E 07  LMAX=   20
   1.9090D-02  2.5484D-02  1.4490D-02  6.2302D-03  4.2465D-04 -3.5057D-03
  -8.0478D-03 -1.0736D-02 -1.3467D-02 -1.2342D-02 -6.8687D-03  1.7042D-03
   2.6725D-03  8.1099D-03  2.8075D-03  1.3974D-03  6.3704D-03 -4.4500D-06
   5.1060D-04  7.2222D-05  3.1702D-05  0.0         0.0         0.0

ELAB= 1.4000E 07  LMAX=   21
   1.8040D-02  2.6073D-02  1.7332D-02  8.9516D-03  4.4322D-03  3.2408D-04
  -2.9591D-03 -5.5524D-03 -7.1113D-03 -6.2441D-03 -3.1974D-03  3.2682D-03
   1.7031D-03  2.9131D-03 -2.3231D-03  4.3464D-03  6.1111D-03 -5.2796D-04
   1.8497D-03  2.2305D-04  2.6895D-04  4.9436D-05  0.0         0.0

ELAB= 1.7000E 07  LMAX=   22
   1.8477D-02  2.7080D-02  2.3195D-02  1.4057D-02  8.1318D-02  6.0246D-03
   4.5142D-03  1.1955D-03 -6.7077D-04 -2.2549D-04 -7.2866D-04  4.6071D-03
   2.5714D-03  4.7551D-03 -5.7411D-04  7.0175D-03  2.6831D-03  9.4368D-04
   7.5044D-03  9.9327D-04  1.7256D-03  5.2243D-04  1.9587D-04  0.0

ELAB= 2.0000E 07  LMAX=   24
   1.4174D-02  2.7993D-02  2.6372D-02  1.6802D-02  1.5834D-02  1.0928D-02
   1.1910D-02  1.0131D-02  9.5510D-03  1.0633D-02  8.5063D-03  1.2397D-02
   7.2089D-03  8.4473D-03 -2.0906D-03  1.5759D-04 -4.7047D-03  3.9360D-03
   9.7156D-03  1.5457D-03  5.8232D-03  1.4354D-03  9.2751D-04  3.2049D-04
   1.0798D-04  0.0         0.0         0.0         0.0         0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 242 (CH,LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE ANUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (2 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,,5, AND NEXT LINE 6,7,........, 11

ELAB= 2.0000E 05  LMAX=    3
   9.0772D-06  7.4857D-06  4.6849D-06  9.1269D-07  0.0         0.0

ELAB= 3.0000E 05  LMAX=    5
   1.0443D-04  2.2832D-04  1.4240D-04  2.0910D-05  1.5018D-06 -3.3149D-07

ELAB= 4.0000E 05  LMAX=    5
   6.0038D-04  8.9169D-04  5.1015D-04  6.2295D-05  2.7309D-07 -1.7976D-06

ELAB= 5.0000E 05  LMAX=    5
   1.3908D-03  2.1033D-03  1.1004D-03  9.4431D-05 -1.3341D-05 -4.6088D-06

ELAB= 6.0000E 05  LMAX=    6
   2.3485D-03  3.8002D-03  1.6999D-03 -4.5717D-05 -6.2848D-05 -7.3115D-06
   2.0823D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 7.0000E 05  LMAX=    6
   3.9558D-03  5.7199D-03  2.2007D-03 -5.0489D-04 -1.2824D-04 -2.2410D-06
   4.6739D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 8.0000E 05  LMAX=    6
   5.4989D-03  7.6244D-03  2.3992D-03 -7.5590D-04 -2.0522D-04  1.6908D-05
   8.0152D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 9.0000E 05  LMAX=    6
   7.0569D-03  9.2957D-03  2.1772D-03 -1.3887D-03 -2.6921D-04  5.8377D-05
   1.1378D-05  0.0         0.0         0.0         0.0         0.0

ELAB= 1.0000E 06  LMAX=    8
   8.3453D-03  1.0946D-02  1.5235D-03 -2.2689D-03 -3.2517D-04  1.8875D-04
   1.8200D-05 -9.1143D-06  5.2179D-08  0.0         0.0         0.0

ELAB= 1.2500E 06  LMAX=    8
   1.1017D-02  1.2159D-02 -1.7702D-03 -4.2700D-03  5.1431D-05  5.6088D-04
   1.2810D-05 -3.0262D-05  1.6634D-07  0.0         0.0         0.0

ELAB= 1.5000E 06  LMAX=    9
   1.3099D-02  1.1832D-02 -3.6078D-03 -4.8481D-03  1.4326D-03  1.0033D-03
  -8.6894D-05 -3.7438D-05  4.9841D-06 -9.7493D-07  0.0         0.0

ELAB= 2.0000E 06  LMAX=    9
   1.5730D-02  1.0282D-02 -8.5815D-03 -9.4020D-04  5.3116D-03  9.9672D-04
  -5.9472D-04 -6.7961D-05  1.7249D-05 -8.1578D-06  0.0         0.0

ELAB= 2.5000E 06  LMAX=   11
   1.0107D-02  9.7133D-03 -9.3547D-03  4.2043D-03  6.0473D-03 -7.5217D-04
  -1.0327D-03  1.5852D-04 -5.1088D-05 -3.8282D-05  2.4205D-05  6.5942D-07
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 242 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (2 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,,5, AND NEXT LINE 6,7,........, 11

ELAB= 3.0000E 06  LMAX=   12
   1.5805D-02  9.4920D-03 -3.7335D-03  6.1439D-03  4.4069D-03 -2.9327D-03
  -6.3223D-04  3.9255D-04 -3.2174D-04 -9.6077D-05  7.4021D-05  1.2760D-06
   2.3343D-06  0.0         0.0         0.0         0.0         0.0

ELAB= 4.0000E 06  LMAX=   14
   1.4252D-02  8.9387D-03 -9.6256D-04  4.7314D-03 -1.4434D-03 -3.2409D-03
   1.4025D-03  2.8749D-04 -1.1369D-03 -1.3558D-05  1.8811D-04 -2.1101D-05
   2.3470D-05  2.2771D-08  7.0518D-08  0.0         0.0         0.0

ELAB= 5.0000E 06  LMAX=   15
   1.2428D-02  8.1066D-03  4.9758D-04  3.3965D-03 -3.5212D-03 -7.0288D-04
   3.3473D-04 -2.2159D-03 -3.0118D-04  7.2701D-04 -1.0398D-04 -9.6537D-05
   1.0279D-04 -4.7106D-06  2.0441D-06  7.9666D-07  0.0         0.0

ELAB= 6.0000E 06  LMAX=   16
   1.0809D-02  7.4905D-03  1.6966D-03  2.6754D-03 -3.3482D-03  5.6608D-04
  -1.1145D-03 -2.6455D-03  1.9591D-03  8.3966D-04 -7.9709D-04 -9.2531D-06
   2.0232D-04 -3.3039D-05  6.3650D-06  3.3958D-06  8.5549D-07  0.0

ELAB= 8.0000E 06  LMAX=   17
   8.2097D-03  6.8339D-03  3.3082D-03  2.3529D-03 -4.1365D-03  1.3267D-03
  -8.8920D-04 -1.2033D-03  6.6848D-04 -7.2890D-04  1.7264D-05  7.0508D-04
   2.1491D-05 -1.9900D-04  3.8264D-05  3.2224D-05  3.3280D-06  3.3249D-06

ELAB= 1.0000E 07  LMAX=   18
   6.0899D-03  6.6363D-03  3.5534D-03  1.9800D-03 -7.7777D-04  1.1550D-04
  -1.6965D-03 -1.1463D-03 -2.7827D-04  4.2622D-04  2.1514D-03  2.1290D-04
  -4.0634D-04  3.2274D-04 -2.7559D-04 -6.1272D-05  1.7206D-04  6.9201D-06
   1.5079D-05  0.0         0.0         0.0         0.0         0.0

ELAB= 1.2000E 07  LMAX=   20
   5.6597D-03  6.7634D-03  4.1408D-03  2.4952D-03  3.9539D-04  5.7133D-04
  -6.0388D-04  2.3925D-04  4.4558D-05  1.1735D-03  2.4081D-03  3.5908D-04
   1.0815D-03  3.4025D-05 -1.3074D-03  1.6600D-04  3.1008D-04 -4.9360D-05
   6.5976D-05  1.9626D-06  3.5632D-06  0.0         0.0         0.0

ELAB= 1.4000E 07  LMAX=   21
   5.0025D-03  6.1060D-03  4.4086D-03  3.0631D-03  1.2366D-03  1.2176D-03
  -4.9749D-05  9.5693D-04  2.3421D-04  1.0875D-03  1.6064D-03  2.9293D-04
   1.4782D-03 -1.0651D-03 -1.1787D-03  9.1382D-04 -5.4083D-05 -1.8532D-04
   1.7888D-04 -2.5614D-05  1.9869D-05  4.0328D-06  0.0         0.0

ELAB= 1.6000E 07  LMAX=   22
   4.3040D-03  5.2488D-03  4.8908D-03  3.4271D-03  1.8344D-03  1.7861D-03
   1.0438D-04  1.2530D-03 -1.3447D-04  9.6669D-04  8.1137D-04  3.2593D-04
   1.0193D-03 -7.4534D-04  1.2204D-03  6.8394D-04 -1.8241D-03  8.1389D-05
   3.1065D-04 -2.1836D-04  1.5476D-04  3.8211D-05  2.3316D-05  0.0
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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 242 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

LEGENDRE COEFFICIENTS FOR DIRECT INELASTIC (2 LEVEL)
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*B0
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,,5, AND NEXT LINE 6,7,........ 11

ELAB= 2.00000 07  LMAX=   24
 3.97570D-03  4.95550D-03  3.48090D-03  3.43530D-03  2.1645D-03  1.7652D-03
-1.94060D-04  1.05190D-03 -7.20920D-04  8.02880D-04  2.41590D-04  4.17810D-04
 1.45170D-03 -4.87060D-04  1.13570D-03 -9.69790D-04 -1.43100D-03  8.73780D-04
-7.66270D-04 -4.84140D-04  5.05730D-04  4.94610D-05  1.00320D-04  3.16800D-05
 1.34320D-05  0.0          0.0          0.0          0.0          0.0
```

A N N E X E 4B

COEFFICIENTS DE TRANSMISSION GENERALISES
CALCULES POUR ^{242}Pu

NEUTRON TRANSMISSION COEFFICIENTS FOR PLUTONIUM: 242.000

THE COEFFICIENTS ARE IN THE ORDER (L,J): (0,1/2),(1,1/2),(1,3/2),(2,3/2),(2,5/2),(3,5/2),(3,7/2), ...

```
            E= 0.10000E-02(MEV)      LMAX=    3      JMAX=    5/2
0.19124E-01 0.10598E-03 0.10171E-03 0.39231E-07 0.28536E-07 0.51280E-11

            E= 0.50000E-02(MEV)      LMAX=    3      JMAX=    5/2
0.42242E-01 0.11761E-02 0.17958E-02 0.21777E-05 0.14800E-05 0.14338E-08

            E= 0.10000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.59188E-01 0.32945E-02 0.50336E-02 0.12210E-04 0.83490E-05 0.16230E-07

            E= 0.20000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.82601E-01 0.91350E-02 0.13968E-01 0.67860E-04 0.46996E-04 0.18380E-06

            E= 0.30000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.10013E 00 0.16445E-01 0.25153E-01 0.18371E-03 0.12900E-03 0.76059E-06

            E= 0.40000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.11463E 00 0.24804E-01 0.37935E-01 0.37053E-03 0.26475E-03 0.20843E-05

            E= 0.50000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.13074E 00 0.33712E-01 0.52512E-01 0.63058E-03 0.48244E-03 0.45587E-05

            E= 0.60000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.14238E 00 0.43404E-01 0.67597E-01 0.97798E-03 0.75512E-03 0.86425E-05

            E= 0.70000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.15298E 00 0.53568E-01 0.83384E-01 0.14133E-02 0.11018E-02 0.14848E-04

            E= 0.80000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.16277E 00 0.64099E-01 0.99694E-01 0.19406E-02 0.15271E-02 0.23735E-04

            E= 0.90000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.17190E 00 0.74914E-01 0.11638E 00 0.25603E-02 0.20350E-02 0.35911E-04

            E= 0.10000E 00(MEV)      LMAX=    3      JMAX=    5/2
0.18049E 00 0.85945E-01 0.13333E 00 0.32749E-02 0.26288E-02 0.52027E-04

            E= 0.20000E 00(MEV)      LMAX=    3      JMAX=    5/2
0.25180E 00 0.20234E 00 0.31036E 00 0.15803E-01 0.14294E-01 0.66281E-03

            E= 0.30000E 00(MEV)      LMAX=    4      JMAX=    7/2
0.30551E 00 0.30931E 00 0.45596E 00 0.36782E-01 0.36615E-01 0.26692E-02 0.34407E-02 0.26850E-04

            E= 0.40000E 00(MEV)      LMAX=    4      JMAX=    7/2
0.35134E 00 0.40232E 00 0.50810E 00 0.64045E-01 0.69217E-01 0.69615E-02 0.91396E-02 0.95923E-04

            E= 0.50000E 00(MEV)      LMAX=    4      JMAX=    7/2
0.39104E 00 0.48110E 00 0.65097E 00 0.95347E-01 0.10983E 00 0.14385E-01 0.19312E-01 0.25696E-03

            E= 0.60000E 00(MEV)      LMAX=    5      JMAX=    9/2
0.42600E 00 0.54702E 00 0.71028E 00 0.12874E 00 0.15491E 00 0.25712E-01 0.35262E-01 0.57370E-03 0.85998E-03 0.21680E-06
```

NEUTRON TRANSMISSION COEFFICIENTS FOR PLUTONIUM: 242.000

THE COEFFICIENTS ARE IN THE ORDER (L,J): (0,1/2),(1,1/2),(1,3/2),(2,3/2),(2,5/2),(3,5/2),(3,7/2), ...

```
            E= 0.70000E 00(MEV)      LMAX=    5      JMAX=    9/2
0.45179E 00 0.60140E 00 0.75127E 00 0.16251E 00 0.20052E 00 0.41595E-01 0.58094E-01 0.11292E-02 0.17036E-02 0.50080E-04

            E= 0.80000E 00(MEV)      LMAX=    5      JMAX=    9/2
0.47273E 00 0.64582E 00 0.77841E 00 0.19540E 00 0.24336E 00 0.62499E-01 0.88558E-01 0.20257E-02 0.30673E-02 0.10305E-03

            E= 0.90000E 00(MEV)      LMAX=    5      JMAX=    9/2
0.48797E 00 0.68175E 00 0.79552E 00 0.22660E 00 0.28131E 00 0.88618E-01 0.12689E 00 0.33841E-02 0.51289E-02 0.19406E-03

            E= 0.10000E 01(MEV)      LMAX=    6      JMAX=   11/2
0.49839E 00 0.71058E 00 0.80572E 00 0.25560E 00 0.31345E 00 0.11978E 00 0.17271E 00 0.53413E-02 0.80822E-02 0.34077E-03
0.74724E-03 0.84321E-05

            E= 0.12500E 01(MEV)      LMAX=    6      JMAX=   11/2
0.50946E 00 0.75961E 00 0.81535E 00 0.31674E 00 0.36942E 00 0.21500E 00 0.31181E 00 0.13849E-01 0.20653E-01 0.11105E-02
0.21806E-02 0.37154E-04

            E= 0.15000E 01(MEV)      LMAX=    7      JMAX=   13/2
0.50847E 00 0.78749E 00 0.81723E 00 0.36284E 00 0.39920E 00 0.32091E 00 0.46165E 00 0.29390E-01 0.42609E-01 0.28827E-02
0.51491E-02 0.12595E-03 0.18559E-03 0.32324E-05

            E= 0.20000E 01(MEV)      LMAX=    7      JMAX=   13/2
0.49615E 00 0.81295E 00 0.81805E 00 0.42114E 00 0.42175E 00 0.51120E 00 0.69078E 00 0.86264E-01 0.11522E 00 0.12687E-01
0.18969E-01 0.86719E-03 0.11890E-02 0.24080E-04

            E= 0.25000E 01(MEV)      LMAX=    8      JMAX=   15/2
0.48696E 00 0.81982E 00 0.81645E 00 0.45093E 00 0.43468E 00 0.64957E 00 0.79128E 00 0.16667E 00 0.20676E 00 0.38634E-01
0.46151E-01 0.36497E-02 0.45117E-02 0.10705E-03 0.84387E-04 0.69034E-05

            E= 0.30000E 01(MEV)      LMAX=    9      JMAX=   17/2
0.48634E 00 0.81846E 00 0.81311E 00 0.46727E 00 0.45462E 00 0.74459E 00 0.81384E 00 0.24711E 00 0.29564E 00 0.90773E-01
0.82737E-01 0.10441E-01 0.12111E-01 0.35045E-03 0.31354E-03 0.33376E-04 0.31947E-04 0.65446E-06

            E= 0.40000E 01(MEV)      LMAX=   10      JMAX=   19/2
0.50433E 00 0.81187E 00 0.80579E 00 0.49305E 00 0.50990E 00 0.85479E 00 0.78838E 00 0.38043E 00 0.45754E 00 0.27658E 00
0.16587E 00 0.41268E-01 0.53146E-01 0.21930E-02 0.24961E-02 0.33698E-03 0.27382E-03 0.84405E-05 0.22115E-04 0.53253E-06

            E= 0.50000E 01(MEV)      LMAX=   11      JMAX=   21/2
0.53386E 00 0.81133E 00 0.79986E 00 0.52571E 00 0.56203E 00 0.89388E 00 0.75708E 00 0.48424E 00 0.60201E 00 0.47759E 00
0.26068E 00 0.10245E 00 0.16030E 00 0.83791E-02 0.12282E-01 0.15362E-02 0.13172E-02 0.58975E-04 0.17441E-03 0.48389E-05
0.49013E-05 0.24484E-06

            E= 0.60000E 01(MEV)      LMAX=   12      JMAX=   23/2
0.56686E 00 0.81391E 00 0.79470E 00 0.56473E 00 0.60341E 00 0.89375E 00 0.73713E 00 0.57088E 00 0.71122E 00 0.60370E 00
0.36336E 00 0.19855E 00 0.34544E 00 0.23574E-01 0.41983E-01 0.48111E-02 0.45127E-02 0.28220E-03 0.81571E-03 0.26458E-04
0.28277E-04 0.16504E-05 0.22275E-05 0.11519E-06

            E= 0.80000E 01(MEV)      LMAX=   13      JMAX=   25/2
0.63222E 00 0.81636E 00 0.78536E 00 0.64264E 00 0.67428E 00 0.86536E 00 0.72012E 00 0.71224E 00 0.82262E 00 0.68208E 00
0.53413E 00 0.47717E 00 0.67890E 00 0.11579E 00 0.21431E 00 0.29063E-01 0.26848E-01 0.32003E-02 0.65533E-02 0.32541E-03
0.43344E-03 0.30794E-04 0.39798E-04 0.28652E-05 0.30752E-05 0.24103E-06
```

A N N E X E 5A

SECTIONS EFFICACES CALCULEES PAR MODELE OPTIQUE EN VOIES COUPLEES SUR ^{244}Pu

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REMARQUES

1) E = Energies laboratoire en eV

2) S(E) = Sections efficaces correspondantes en barn

3) $\sigma(\theta) = \sum_{L=0}^{Lmax} B_L P_L (\cos\theta)$, où les B_L sont les coefficients de Legendre tabulés, avec $\sigma(\theta)$ résultant en barn/stéradian

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 244 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A299-311)

NEUTRON TOTAL CROSS SECTIONS

E	S(E)	E	S(E)	E	S(E)
1.0000D 03	2.4520D 01	5.0000D 03	1.7359D 01	1.0000D 04	1.5753D 01
2.0000D 04	1.4669D 01	3.0000D 04	1.4195D 01	4.0000D 04	1.3901D 01
5.0000D 04	1.3536D 01	6.0000D 04	1.3359D 01	7.0000D 04	1.3206D 01
8.0000D 04	1.3084D 01	9.0000D 04	1.2937D 01	1.0000D 05	1.2814D 01
2.0000D 05	1.1837D 01	3.0000D 05	1.0933D 01	4.0000D 05	1.0173D 01
5.0000D 05	9.5602D 00	6.0000D 05	9.0775D 00	7.0000D 05	8.6963D 00
8.0000D 05	8.4008D 00	9.0000D 05	8.1754D 00	1.0000D 06	8.0099D 00
1.2500D 06	7.7735D 00	1.5000D 06	7.6965D 00	2.0000D 06	7.7389D 00
2.5000D 06	7.8388D 00	3.0000D 06	7.8942D 00	4.0000D 06	7.8356D 00
5.0000D 06	7.5998D 00	6.0000D 06	7.2688D 00	8.0000D 06	6.5629D 00
1.0000D 07	6.2324D 00	1.2000D 07	5.9621D 00	1.4000D 07	5.9543D 00
1.7000D 07	6.2856D 00	2.0000D 07	6.5746D 00	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 244 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS,A279-311)

NEUTRON COMPOUND NUCLEUS FORMATION CROSS SECTIONS

E	S(E)	E	S(E)	E	S(E)
1.0000D 03	1.3630D 01	5.0000D 03	6.6680D 00	1.0000D 04	5.2391D 00
2.0000D 04	4.4404D 00	3.0000D 04	4.2090D 00	4.0000D 04	4.1317D 00
5.0000D 04	4.1923D 00	6.0000D 04	4.1973D 00	7.0000D 04	4.2130D 00
8.0000D 04	4.2498D 00	9.0000D 04	4.2519D 00	1.0000D 05	4.2697D 00
2.0000D 05	4.3942D 00	3.0000D 05	4.2678D 00	4.0000D 05	4.1095D 00
5.0000D 05	3.9748D 00	6.0000D 05	3.8738D 00	7.0000D 05	3.7956D 00
8.0000D 05	3.7378D 00	9.0000D 05	3.6963D 00	1.0000D 06	3.6700D 00
1.2500D 06	3.6288D 00	1.5000D 06	3.5877D 00	2.0000D 06	3.4464D 00
2.5000D 06	3.2793D 00	3.0000D 06	3.1377D 00	4.0000D 06	2.9870D 00
5.0000D 06	2.9555D 00	6.0000D 06	2.9748D 00	8.0000D 06	3.0029D 00
1.0000D 07	3.0896D 00	1.2000D 07	2.9538D 00	1.4000D 07	2.8676D 00
1.7000D 07	2.8216D 00	2.0000D 07	2.7664D 00	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 244 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A279-311)

NEUTRON SHAPE ELASTIC SCATTERING CROSS SECTIONS

E	S(E)	E	S(E)	E	S(E)
1.0000D 03	1.0890D 01	5.0000D 03	1.0691D 01	1.0000D 04	1.0514D 01
2.0000D 04	1.0229D 01	3.0000D 04	9.9864D 00	4.0000D 04	9.7693D 00
5.0000D 04	9.3429D 00	6.0000D 04	9.1603D 00	7.0000D 04	8.9896D 00
8.0000D 04	8.8282D 00	9.0000D 04	8.6770D 00	1.0000D 05	8.5328D 00
2.0000D 05	7.3965D 00	3.0000D 05	6.5741D 00	4.0000D 05	5.9186D 00
5.0000D 05	5.3769D 00	6.0000D 05	4.9265D 00	7.0000D 05	4.5551D 00
8.0000D 05	4.2536D 00	9.0000D 05	4.0134D 00	1.0000D 06	3.8266D 00
1.2500D 06	3.5483D 00	1.5000D 06	3.4671D 00	2.0000D 06	3.6181D 00
2.5000D 0[illegible]	[illegible]913D 00	3.0000D 06	4.1149D 00	4.0000D 06	4.2759D 00
5.0000D 06	4.1355D 00	6.0000D 06	3.8324D 00	8.0000D 06	3.1703D 00
1.0000D 07	2.7889D 00	1.2000D 07	2.6770D 00	1.4000D 07	2.7788D 00
1.7000D 07	3.1661D 00	2.0000D 07	3.5214D 00	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 244 (CH,LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL,PHYS,A229-311)

NEUTRON DIRECT INELASTIC FIRST EXCITED LEVEL

E	S(E)	E	S(E)	E	S(E)
5.0000D 04	5.2340D-04	6.0000D 04	1.8557D-03	7.0000D 04	3.6786D-03
8.0000D 04	5.8807D-03	9.0000D 04	8.4401D-03	1.0000D 05	1.1242D-02
2.0000D 05	4.6194D-02	3.0000D 05	8.8710D-02	4.0000D 05	1.3715D-01
5.0000D 05	1.9007D-01	6.0000D 05	2.4398D-01	7.0000D 05	2.9461D-01
8.0000D 05	3.3901D-01	9.0000D 05	3.7573D-01	1.0000D 06	4.0473D-01
1.2500D 06	4.4950D-01	1.5000D 06	4.6905D-01	2.0000D 06	4.7689D-01
2.5000D 06	4.6544D-01	3.0000D 06	4.4310D-01	4.0000D 06	3.9322D-01
5.0000D 06	3.5272D-01	6.0000D 06	3.2561D-01	8.0000D 06	2.8723D-01
1.0000D 07	2.7291D-01	1.2000D 07	2.6095D-01	1.4000D 07	2.4797D-01
1.7000D 07	2.4637D-01	2.0000D 07	2.3993D-01	0.0	0.0

COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 244 (CH.LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL.PHYS.A229-311)

NEUTRON DIRECT INELASTIC SECOND EXCITED LEVEL

E	S(E)	E	S(E)	E	S(E)
2.0000D 05	1.2622D-04	3.0000D 05	2.3157D-03	4.0000D 05	8.1460D-03
5.0000D 05	1.8489D-02	6.0000D 05	3.3190D-02	7.0000D 05	5.0974D-02
8.0000D 05	7.0370D-02	9.0000D 05	8.9906D-02	1.0000D 06	1.0854D-01
1.2500D 06	1.4691D-01	1.5000D 06	1.7272D-01	2.0000D 06	1.9751D-01
2.5000D 06	2.0271D-01	3.0000D 06	1.9857D-01	4.0000D 06	1.7936D-01
5.0000D 06	1.5610D-01	6.0000D 06	1.3599D-01	8.0000D 06	1.0249D-01
1.0000D 07	8.1043D-02	1.2000D 07	7.0285D-02	1.4000D 07	5.9875D-02
1.7000D 07	5.1498D-02	2.0000D 07	4.6307D-02	0.0	0.0

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COUPLED CHANNEL CALCULATIONS (0+,2+,4+) FOR PLUTONIUM 244 (CH,LAGRANGE)
OPTICAL PARAMETERS SEE(JAERI-M-5984-60) DEFORMATIONS SEE (NUCL,PHYS,A229-311)

LEGENDRE COEFFICIENTS FOR SHAPE ELASTIC
THE INTEGRATED CROSS SECTIONS ARE EQUAL TO 4*PI*BO
THE LEGENDRE COEFFICIENTS ARE IN THE ORDER 0,1,,5, AND NEXT LINE 6,7,,,,,,,,, 11

ELAB= 1.0000E 03  LMAX=    3
                   8.0000D-01  2.5004D-03  4.3925D-06  3.1481D-06  0.0         0.0

ELAB= 3.0000E 03  LMAX=    3
                   8.5077D-01  1.4006D-02  1.4037D-04  2.8380D-06  0.0         0.0

ELAB= 1.0000E 04  LMAX=    3
                   8.3070D-01  2.9492D-02  3.0609D-04  6.1912D-06  0.0         0.0

ELAB= 2.0000E 04  LMAX=    3
                   8.1400D-01  6.2280D-02  2.2184D-03  2.3221D-05  0.0         0.0

ELAB= 3.0000E 04  LMAX=    3
                   7.9409D-01  9.6008D-02  4.8806D-03  7.3089D-05  0.0         0.0

ELAB= 4.0000E 04  LMAX=    3
                   7.7742D-01  1.2979D-01  8.4476D-03  1.7816D-04  0.0         0.0

ELAB= 5.0000E 04  LMAX=    3
                   7.4349D-01  1.6125D-01  1.2555D-02  3.2887D-04  0.0         0.0

ELAB= 6.0000E 04  LMAX=    3
                   7.2896D-01  1.9353D-01  1.7629D-02  5.5889D-04  0.0         0.0

ELAB= 7.0000E 04  LMAX=    3
                   7.1536D-01  2.2485D-01  2.3384D-02  8.7069D-04  0.0         0.0

ELAB= 8.0000E 04  LMAX=    3
                   7.0252D-01  2.5615D-01  2.9912D-02  1.2840D-03  0.0         0.0

ELAB= 9.0000E 04  LMAX=    3
                   6.9049D-01  2.8405D-01  3.6624D-02  1.7806D-03  0.0         0.0

ELAB= 1.0000E 05  LMAX=    3
                   6.7902D-01  3.1176D-01  4.4004D-02  2.3938D-03  0.0         0.0

ELAB= 2.0000E 05  LMAX=    3
                   5.8849D-01  5.3135D-01  1.3799D-01  1.6007D-02  0.0         0.0

ELAB= 3.0000E 05  LMAX=    5
                   5.2516D-01  6.3325D-01  2.3280D-01  4.6277D-02  3.1154D-03  1.1307D-04

ELAB= 4.0000E 05  LMAX=    5
                   4.7099D-01  6.7070D-01  3.1709D-01  8.9689D-02  1.3872D-02  5.6777D-04

ELAB= 5.0000E 05  LMAX=    5
                   4.2788D-01  6.7431D-01  3.8600D-01  1.4412D-01  2.9268D-02  1.7638D-03
```

A N N E X E 5B

COEFFICIENTS DE TRANSMISSION GENERALISES
CALCULES POUR ^{244}Pu

NEUTRON TRANSMISSION COEFFICIENTS FOR PLUTONIUM: 244.000

THE COEFFICIENTS ARE IN THE ORDER (L,J): (0,1/2),(1,1/2),(1,3/2),(2,3/2),(2,5/2),(3,5/2),(3,7/2), ...

```
            E= 0.10000E-02(MEV)      LMAX=    3      JMAX=    5/2
0.20031E-01 0.13160E-03 0.21027E-03 0.41120E-07 0.26934E-07 0.63409E-11

            E= 0.50000E-02(MEV)      LMAX=    3      JMAX=    5/2
0.44211E-01 0.14612E-02 0.23337E-02 0.22823E-05 0.15004E-05 0.17728E-08

            E= 0.10000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.61902E-01 0.40957E-02 0.65347E-02 0.12790E-04 0.84506E-05 0.20063E-07

            E= 0.20000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.86289E-01 0.11367E-01 0.18087E-01 0.71100E-04 0.47386E-04 0.22712E-06

            E= 0.30000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.10450E 00 0.20477E-01 0.32469E-01 0.19243E-03 0.12943E-03 0.93940E-06

            E= 0.40000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.11951E 00 0.30899E-01 0.48798E-01 0.38791E-03 0.26335E-03 0.25728E-05

            E= 0.50000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.13656E 00 0.42120E-01 0.67531E-01 0.65134E-03 0.50875E-03 0.56353E-05

            E= 0.60000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.14864E 00 0.54233E-01 0.86571E-01 0.10154E-02 0.80211E-03 0.10680E-04

            E= 0.70000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.15963E 00 0.66925E-01 0.10633E 00 0.14727E-02 0.11762E-02 0.18341E-04

            E= 0.80000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.16995E 00 0.80330E-01 0.12713E 00 0.19934E-02 0.16042E-02 0.30687E-04

            E= 0.90000E-01(MEV)      LMAX=    3      JMAX=    5/2
0.17925E 00 0.93538E-01 0.14710E 00 0.26813E-02 0.21885E-02 0.44316E-04

            E= 0.10000E 00(MEV)      LMAX=    3      JMAX=    5/2
0.18817E 00 0.10729E 00 0.16774E 00 0.34374E-02 0.28356E-02 0.64162E-04

            E= 0.20000E 00(MEV)      LMAX=    3      JMAX=    5/2
0.26380E 00 0.25258E 00 0.37031E 00 0.16951E-01 0.15899E-01 0.86020E-03

            E= 0.30000E 00(MEV)      LMAX=    4      JMAX=    7/2
0.32549E 00 0.38121E 00 0.51848E 00 0.40191E-01 0.41663E-01 0.34515E-02 0.38101E-02 0.28259E-04

            E= 0.40000E 00(MEV)      LMAX=    4      JMAX=    7/2
0.38464E 00 0.48938E 00 0.62171E 00 0.71428E-01 0.80551E-01 0.89559E-02 0.10247E-01 0.10258E-03

            E= 0.50000E 00(MEV)      LMAX=    4      JMAX=    7/2
0.44278E 00 0.57[illegible]E 00 0.69245E 00 0.10869E 00 0.13061E 00 0.18428E-01 0.21806E-01 0.27989E-03

            E= 0.60000E 00(MEV)      LMAX=    5      JMAX=    9/2
0.49838E 00 0.65057E 00 0.74134E 00 0.15001E 00 0.18790E 00 0.32820E-01 0.39983E-01 0.63737E-03 0.94874E-03 0.26027E-04
```

NEUTRON TRANSMISSION COEFFICIENTS FOR PLUTONIUM, 244.000

THE COEFFICIENTS ARE IN THE ORDER (L,J): (0,1/2),(1,1/2),(1,3/2),(2,3/2),(2,5/2),(3,5/2),(3,7/2), ...

```
            E= 0.70000E 00(MEV)      LMAX=    5      JMAX=    9/2
0.54907E 00 0.70923E 00 0.77616E 00 0.19355E 00 0.24748E 00 0.52879E-01 0.65967E-01 0.12801E-02 0.19157E-02 0.60151E-04

            E= 0.80000E 00(MEV)      LMAX=    5      JMAX=    9/2
0.59290E 00 0.75684E 00 0.80228E 00 0.23757E 00 0.30481E 00 0.79003E-01 0.10046E 00 0.23429E-02 0.35135E-02 0.12375E-03

            E= 0.90000E 00(MEV)      LMAX=    5      JMAX=    9/2
0.62892E 00 0.79550E 00 0.82332E 00 0.28074E 00 0.35660E 00 0.11108E 00 0.14353E 00 0.39899E-02 0.59777E-02 0.23295E-03

            E= 0.10000E 01(MEV)      LMAX=    6      JMAX=   11/2
0.65713E 00 0.82700E 00 0.84153E 00 0.32200E 00 0.40109E 00 0.14842E 00 0.19446E 00 0.64126E-02 0.95704E-02 0.40892E-03
0.67494E-03 0.91588E-05

            E= 0.12500E 01(MEV)      LMAX=    6      JMAX=   11/2
0.52108E 00 0.79034E 00 0.79849E 00 0.42270E 00 0.38339E 00 0.23443E 00 0.31684E 00 0.14430E-01 0.21548E-01 0.12281E-02
0.19139E-02 0.39736E-04

            E= 0.15000E 01(MEV)      LMAX=    7      JMAX=   13/2
0.71090E 00 0.92031E 00 0.91675E 00 0.48720E 00 0.51838E 00 0.36823E 00 0.50381E 00 0.37875E-01 0.53315E-01 0.34592E-02
0.47627E-02 0.14179E-03 0.21027E-03 0.32670E-05

            E= 0.20000E 01(MEV)      LMAX=    7      JMAX=   13/2
0.69797E 00 0.96174E 00 0.96635E 00 0.58680E 00 0.53946E 00 0.56003E 00 0.74507E 00 0.11570E 00 0.14766E 00 0.15129E-01
0.15071E-01 0.10149E-02 0.13898E-02 0.23100E-04

            E= 0.25000E 01(MEV)      LMAX=    8      JMAX=   15/2
0.67790E 00 0.98153E 00 0.98906E 00 0.63980E 00 0.54780E 00 0.69692E 00 0.86010E 00 0.22743E 00 0.26739E 00 0.45158E-01
0.45537E-01 0.43936E-02 0.53997E-02 0.10093E-03 0.89425E-04 0.76190E-05

            E= 0.30000E 01(MEV)      LMAX=    9      JMAX=   17/2
0.66989E 00 0.99066E 00 0.99530E 00 0.66520E 00 0.57003E 00 0.79405E 00 0.89420E 00 0.33817E 00 0.38233E 00 0.10284E 00
0.84574E-01 0.12745E-01 0.14792E-01 0.33283E-03 0.33562E-03 0.37132E-04 0.32193E-04 0.67411E-06

            E= 0.40000E 01(MEV)      LMAX=   10      JMAX=   19/2
0.68551E 00 0.99440E 00 0.98660E 00 0.68640E 00 0.64345E 00 0.92580E 00 0.88052E 00 0.50621E 00 0.57678E 00 0.29302E 00
0.17759E 00 0.50630E-01 0.45812E-01 0.21612E-02 0.27270E-02 0.37016E-03 0.26623E-03 0.87215E-05 0.24365E-04 0.55175E-06

            E= 0.50000E 01(MEV)      LMAX=   11      JMAX=   21/2
0.71604E 00 0.98842E 00 0.96831E 00 0.70408E 00 0.71851E 00 0.98271E 00 0.85448E 00 0.61384E 00 0.73197E 00 0.49067E 00
0.28842E 00 0.12312E 00 0.19323E 00 0.85958E-02 0.13520E-01 0.16777E-02 0.12760E-02 0.61394E-04 0.18724E-03 0.49832E-05
0.50800E-05 0.25234E-06

            E= 0.60000E 01(MEV)      LMAX=   12      JMAX=   23/2
0.74769E 00 0.97712E 00 0.94818E 00 0.73120E 00 0.77581E 00 0.98712E 00 0.83650E 00 0.69988E 00 0.84644E 00 0.62242E 00
0.41086E 00 0.23204E 00 0.39722E 00 0.24975E-01 0.45952E-01 0.52735E-02 0.44424E-02 0.29692E-03 0.84385E-03 0.27057E-04
0.29460E-04 0.17033E-05 0.22978E-05 0.11854E-06

            E= 0.80000E 01(MEV)      LMAX=   13      JMAX=   25/2
0.80263E 00 0.94888E 00 0.97201E 00 0.79908E 00 0.84665E 00 0.95199E 00 0.81721E 00 0.84615E 00 0.95812E 00 0.72244E 00
0.60953E 00 0.53529E 00 0.72453E 00 0.12940E 00 0.23854E 00 0.31445E-01 0.27432E-01 0.34838E-02 0.66939E-02 0.33600E-03
0.45823E-03 0.31973E-04 0.40811E-04 0.29470E-05 0.31827E-05 0.24811E-06
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