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Version 4.34.14 ** 11:56 ** 21-08-2024

P A C E 4

modified JULIAN

projection angular-momentum coupled evaporation Monte Carlo code

angular distributions obtained using M-states of angular momentum

********** *Fusion xsection taken from Bass model*

Bass fusion xsection for E = 303 *MeV is* 590.373 *mb*

Fusion radius = 10 *fm. Barrier height is* 60.3074 *MeV*

Transmission probability for a one-dimens. barrier: **Classical**

Starting conditions

	Z	N	A	Spin
Projectile	36	48	84	0
Target	13	14	27	0
Compound nucleus	49	62	111	

Bombarding energy (MeV)	303.00
Center of mass energy (MeV)	73.70
Compound nucleus excitation energy (MeV)	62.459
Q-value of reaction (MeV)	-11.244
Compound nucleus recoil energy (MeV)	229.297
Compound nucleus recoil velocity (cm/ns)	1.998e+00
Compound nucleus velocity/c	6.660e-02
Beam velocity (cm/ns)	2.640e+00
Beam velocity/c	8.800e-02

*** Input transmission coefficients determined by input value of TL diffuseness.

*** diffuseness = 2.00

*** Optical model input calculation bypasses. *********

Experimental fusion cross section (mb)	5.90e+02
Fusion L-grazing	36.11
Fusion L-diffuseness	2.00
Yrast spin at maximum excitation energy	68
Compound nucleus formation cross section (mb)	5.90e+02

Partial cross sections (mb)									
J	**SIG(J)**	**J**	**SIG(J)**	**J**	**SIG(J)**	**J**	**SIG(J)**	**J**	**SIG(J)**
0	0.44	10	9.2	20	18	30	25	40	4.4
1	1.3	11	10	21	19	31	25	41	2.9
2	2.2	12	11	22	20	32	25	42	1.9
3	3.1	13	12	23	20	33	24	43	1.2
4	3.9	14	13	24	21	34	22	44	0.74
5	4.8	15	14	25	22	35	20	45	0.46
6	5.7	16	14	26	23	36	16	46	0.29
7	6.5	17	15	27	24	37	13	47	0.18
8	7.4	18	16	28	24	38	9.4	48	0.11
9	8.3	19	17	29	25	39	6.6	49	0.069

***Spherical nucleus level density

*** Input fission barrier = 48.72 MeV at L=0 taken from Sierk

*** G.S. little A multiplied by factor 1 to obtain saddle level density

*** No fission calculation for barrier above 30 MeV

*** Little-A = MASS / 10

Energy range for	**neutron**	**proton**	**alpha**	**gamma**
minimal	0.01	1.10	2.19	0.00
minimal	40.00	30.74	55.84	20.00

*** Internal probability discriminator of program set to 0.002

Number of cascades is 1000

Optical model parameters for light emitted particles

V	*E	*E**2	R0R	ARD	R0C	W0	*E	*E**2	R01	AID	RMCHD	NPD	IMAG	IRAD
47.010	-0.267	-0.002	1.276	0.660	0.000	9.520	-0.053	0.000	1. 26874	0.48	0.000	250.000	SURF	1.000
55.299	-0.550	0.000	1.250	0.650	1.250	13.500	0.000	0.000	1.25	0.47	0.000	250.000	SURF	1.000
50.000	0.000	0.000	7.392	0.576	5.622	14.655	0.000	0.000	7. 39202	0.576	0.000	250.000	VOL	0.000

E.M.Transition strengths in Weisskopf units

E1 = 0.000014 M1 = 0.010000 E2 = 5.900000 M2 = 0.000880

*** Gilbert - Cameron spin cutoff parameter used

Output results for compound nucleus decay

1. Yields of residual nuclei

Z	N	A		events	percent	x-section(mb)
49	59	**108**	**In**	23	2.3%	13.6
48	60	**108**	**Cd**	7	0.7%	4.13
49	58	**107**	**In**	423	42.3%	250
48	59	**107**	**Cd**	216	21.6%	127
47	60	**107**	**Ag**	11	1.1%	6.49
49	57	**106**	**In**	58	5.8%	34.2
48	58	**106**	**Cd**	51	5.1%	30.1
47	59	**106**	**Ag**	2	0.2%	1.18
47	58	**105**	**Ag**	15	1.5%	8.85
46	59	**105**	**Pd**	4	0.4%	2.36
47	57	**104**	**Ag**	133	13.3%	78.5
46	58	**104**	**Pd**	36	3.6%	21.2
47	56	**103**	**Ag**	11	1.1%	6.49

46	57	**103 Pd**	4	0.4%	2.36
45	57	**102 Rh**	2	0.2%	1.18
45	56	**101 Rh**	4	0.4%	2.36
TOTAL			1000	100	590.221

2. Angular distribution results

*** Spin alignment perpendicular to recoil axis - standard compound nucleus angular distribution

2.1 Energy and angular distribution of residual nucleus Z = 49 and N = 59 (108In)

Residual velocity/c Vz = 6.97e-02(sig = 1.18e-03) rms Vxy = 1.42e-03

Energy Range	**Angular range (deg)**																	
(MeV)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Below 175																		
214 - 217	1	3																
217 - 220	1	3																
220 - 223	1	2																
223 - 226	2	2																
226 - 229	2																	
229 - 232		2																
232 - 235	1																	
235 - 238		1																
241 - 244	1	1																
Above 262																		
Total	9	14																

dSig/dOmeg	5.6e+03	2.9e+03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0 - 175																		
175 - 226	5	10																
226 - 277	4	4																
Above 277																		

2.2 Energy and angular distribution of residual nucleus Z = 49 and N = 58 (107In)

Residual velocity/c Vz = 6.88e-02(sig = 9.89e-04) rms Vxy = 1.37e-03

Energy Range	**Angular range (deg)**																	
(MeV)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Below 175																		
205 - 208	1	3																
208 - 211	7	2																
211 - 214	11	10																
214 - 217	21	21																
217 - 220	25	29	2															
220 - 223	37	34	1															
223 - 226	38	34	4															
226 - 229	27	35	1															
229 - 232	25	13	3															
232 - 235	11	12																

235 - 238	6	4	1															
238 - 241	2	2																
241 - 244		1																
Above 262																		
Total	211	200	12															
dSig/dOmeg	1.3e+05	4.1e+04	1.5e+03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0 - 175																		
175 - 226	140	133	7															
226 - 277	71	67	5															
Above 277																		

2.3 Energy and angular distribution of residual nucleus Z = 48 and N = 59 (107Cd)

Residual velocity/c Vz = 6.84e-02(sig = 1.25e-03) rms Vxy = 1.55e-03

Energy Range	**Angular range (deg)**																	
(MeV)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Below 175																		
199 - 202	1																	
202 - 205		1																
205 - 208	3	2																
208 - 211	7	9																
211 - 214	6	7	3															
214 -	7	5	2															

217																		
217 - 220	13	17	4															
220 - 223	9	18	3															
223 - 226	6	16	1															
226 - 229	13	15	2															
229 - 232	8	8	1															
232 - 235	6	8	1															
235 - 238	2	4																
238 - 241	4	4																
Above 262																		
Total	85	114	17															
dSig/dOmeg	5.2e+04	2.3e+04	2.1e+03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0 - 175																		
175 - 226	52	75	13															
226 - 277	33	39	4															
Above 277																		

2.4 Energy and angular distribution of residual nucleus Z = 49 and N = 57 (106In)

Residual velocity/c Vz = 6.80e-02(sig = 9.92e-04) rms Vxy = 1.15e-03

Energy Range	**Angular range (deg)**																	
(MeV)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Below 175																		

208 - 211	3																	
211 - 214	5	5																
214 - 217	2	1																
217 - 220	7	2																
220 - 223	7	5																
223 - 226	4	4																
226 - 229	6	2																
229 - 232		2																
232 - 235	1																	
235 - 238	2																	
Above 262																		
Total	37	21																
dSig/dOmeg	2.3e+04	4.3e+03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0 - 175																		
175 - 226	28	17																
226 - 277	9	4																
Above 277																		

2.5 Energy and angular distribution of residual nucleus Z = 48 and N = 58 (106Cd)

Residual velocity/c Vz = 6.66e-02(sig = 1.14e-03) rms Vxy = 1.40e-03

Energy Range	**Angular range (deg)**																	
(MeV)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Below 175																		
205 - 208	1																	
208 - 211		4																
211 - 214		3																
214 - 217	1	4	1															
217 - 220	7	3																
220 - 223	3	2	1															
223 - 226	3	3																
226 - 229	3	1																
229 - 232	2	4																
232 - 235	2	1																
235 - 238	2																	
Above 262																		
Total	24	25	2															
dSig/dOmeg	1.5e+04	5.1e+03	2.5e+02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0 - 175																		
175 - 226	15	19	2															
226 - 277	9	6																
Above 277																		

2.6 Energy and angular distribution of residual nucleus Z = 47 and N = 57 (104Ag)

Residual velocity/c Vz = 6.60e-02(sig = 2.12e-03) rms Vxy = 2.75e-03

Energ	Angular range (deg)

y Range																		
(MeV)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Below 175																		
187 - 190		1																
190 - 193		3																
193 - 196	2	1																
196 - 199	1		2															
199 - 202		2	3															
202 - 205		3	3	1														
205 - 208		4	3															
208 - 211		3	3	4														
211 - 214			2	2														
214 - 217		2	5	2														
217 - 220		2	3		1													
220 - 223		1	1	4														
223 - 226		4	4	4														
226 - 229	2	2	1	4														
229 - 232	2	2	9	4														
232 - 235	1	4	4	1														
235 - 238	1	3	4															
238 - 241	1	6	1															
241 - 244	1	2																
244 - 247		2																
Above 262																		

Total	11	47	48	26	1													
dSig/dOmeg	6.8e+03	9.7e+03	5.9e+03	2.3e+03	69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0 - 175																		
175 - 226	3	26	29	17	1													
226 - 277	8	21	19	9														
Above 277																		

2.7 Energy and angular distribution of residual nucleus Z = 46 and N = 58 (104Pd)

Residual velocity/c Vz = 6.65e-02(sig = 2.08e-03) rms Vxy = 2.71e-03

Energy Range	**Angular range (deg)**																	
(MeV)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Below 175																		
196 - 199			1															
199 - 202	1	2	1	1														
205 - 208			1		1													
208 - 211				1														
211 - 214	2	2		1														
214 - 217				1														
217 - 220		2																
220 - 223				1	1													
223 - 226			3															
226 -		1	1															

229																		
229 - 232		1	1															
232 - 235	1	1	1	1														
235 - 238	1																	
238 - 241	1	2																
241 - 244	1	1																
Above 262																		
Total	7	12	9	6	2													
dSig/dOmeg	4.3e+03	2.5e+03	1.1e+03	5.3e+02	1.4e+02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0 - 175																		
175 - 226	3	6	6	5	2													
226 - 277	4	6	3	1														
Above 277																		

2.8 Energy and angular distribution of ALL residual nuclei

Energy Range	**Angular range (deg)**																	
(MeV)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Below 175																		
187 - 190		1																
190 - 193		3																
193 - 196	3	1																
196 - 199	2		3															
199 -	2	4	4	3														

202																		
202 - 205		5	5	3														
205 - 208	5	9	5	1	1													
208 - 211	17	21	4	8														
211 - 214	24	27	6	3														
214 - 217	33	40	10	5														
217 - 220	54	58	11		1													
220 - 223	59	64	8	6	1													
223 - 226	55	65	13	4														
226 - 229	54	58	6	4														
229 - 232	39	33	14	4														
232 - 235	26	28	7	2	1													
235 - 238	15	12	5	1														
238 - 241	8	15	1															
241 - 244	3	5																
244 - 247		2																
Above 262																		
Total	399	451	102	44	4													
dSig/dOmeg	2.5e+05	9.3e+04	1.3e+04	3.9e+03	2.7e+02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0 - 175																		
175 - 226	254	298	69	33	3													
226 - 277	145	153	33	11	1													
Above 277																		

Neutron spectra in laboratory coordinates 3516 events

Energy range	Angular range (deg)																	
(MeV)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0-1	2	5	4	9	4	43	57	58	39	41	24	27	19	12	5	6	2	
1 - 2	2		9	3	17	58	73	59	47	36	17	16	9	16	5	2	3	1
2 - 3	2	1	12	18	39	76	60	34	34	20	11	7	8	2	1	2	2	
3 - 4	1	3	6	21	103	74	62	41	19	21	9	4	5	3	1	1		
4 - 5	1	7	20	69	71	56	39	28	17	8	5	3	1		1			
5 - 6	3	16	62	70	66	48	29	13	7	7	3	1	3					
6 - 7	6	44	84	57	42	33	15	17	9	1	3	3	1					
7 - 8	16	73	49	47	42	27	15	11	3		1	2						
8 - 9	14	38	49	40	50	19	10	7	3	4								
9 - 10	18	33	39	22	24	16	6	1	2			1						
10 - 11	4	23	28	29	18	11	2	4	1		1							
11 - 12	4	12	18	11	13	4	2			1								
12 - 13	6	18	20	12	12	2	3											
13 - 14	2	11	12	15	9	2	2	1										
14 - 15	5	8	9	2	4			1										
15 - 16	1	8	5	1	5	1												
16 - 17	5	1	6	4	1	2												
17 - 18		6	5	3	1													
18 - 19	1	2	3	4	2	1												
19 - 20		2	3	1		3												
20 - 21		1		1		1												
21 - 22	1	1			1													
22 - 23		1		2														
23 - 24		1																
24 - 25			1															

25 - 26		1																
26 - 27				1														
Above 30																		
Total	94	316	444	442	524	477	375	275	181	139	74	64	46	33	13	11	7	1
dSig/dOmega	580.7	657.369	565.652	414.897	398.978	313.507	222.76	153.269	97.81	75.1098	41.2369	38.0072	30.2208	25.1116	12.1925	13.9961	14.5298	6.13608
0 - 5	8	16	51	120	234	307	291	220	156	126	66	57	42	33	13	11	7	1
5 - 10	57	204	283	236	224	143	75	49	24	12	7	7	4					
10 - 20	28	91	109	82	65	26	9	6	1	1	1							
Above 20	1	5	1	4	1	1												

Proton spectra in laboratory coordinates 344 events

Energy range	**Angular range (deg)**																	
(MeV)	**0**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**	**120**	**130**	**140**	**150**	**160**	**170**
	10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**	**120**	**130**	**140**	**150**	**160**	**170**	**180**
0 - 1															1			
1 - 2												4	4	2	1	1	1	
2 - 3										2	2	1	5	2		1	2	1
3 - 4								1	2	1	2	4	3		1			
4 - 5							1	4	2	2	2	5	1	1		1		
5 - 6								2	5	3	6		2				1	
6 - 7						2	7	2	7	2	3		2	1				1
7 - 8						2	3	2	2	2	1			3				
8 - 9					2	5	6	4	1	3	1		1					
9 - 10				1	3	2	4	4	2	1								
10 - 11				2	3	5	5	1	2									
11 - 12			1	1	6	5	4	2										
12 - 13			3	1	6	7		3		1			1	1				
13 - 14		1	3	2	5	1	1	1										
14 - 15		1	1	7	4	2	1											
15 - 16	1	3	2	4	6	1												

16 - 17		4	6	2	5	4	1											
17 - 18	1	1	3	2	1	1												
18 - 19	2	3	3	2		1												
19 - 20	1	1	1	1	1	1												
20 - 21		1		1														
21 - 22		5	2															
22 - 23		3	2	1														
24 - 25		1	1			1												
25 - 26		2																
27 - 28				2														
28 - 29			1	1														
29 - 30		1																
Above 30																		
Total	5	27	29	30	42	40	33	26	23	17	17	14	19	10	3	3	4	2
dSig/dOmega	30.8883	56.1676	36.9457	28.1604	31.9791	26.2899	19.6029	14.4909	12.4289	9.18609	9.47334	8.31407	12.4825	7.60957	2.81366	3.81712	8.30276	12.2722
0 - 5							1	5	4	5	6	14	13	5	3	3	3	1
5 - 10				1	5	11	20	14	17	11	11		5	4			1	1
10 - 20	5	14	23	24	37	28	12	7	2	1			1	1				
Above 20		13	6	5		1												

Alpha spectra in laboratory coordinates 215 events

Energy range	**Angular range (deg)**																	
(MeV)	**0**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**	**120**	**130**	**140**	**150**	**160**	**170**
	10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**	**120**	**130**	**140**	**150**	**160**	**170**	**180**
0 - 1													1		1			
1 - 2											1	1					2	
2 - 3										2	4	4	2	1				

3 - 4									1	2	3	1	1					
4 - 5										1			1					
5 - 6									4	2		2	1					
6 - 7							1	2	3	2	1			1				
7 - 8								2	1		1							
8 - 9								2	2	1								
9 - 10								2	3	2								
10 - 11							3	2	1	1								
11 - 12							1	2	1	1								
12 - 13						1	6		2									
13 - 14								1										
14 - 15						1	3	1										
15 - 16						1	5											
16 - 17							1	1										
17 - 18						2	1											
18 - 19						4												
19 - 20					2	2	4											
20 - 21					1	3												
21 - 22					1	2	1											
22 - 23					2	2												
23 - 24				1	3	2		1										
24 - 25						1	1											
25 - 26					1		1											
26 - 27					4													
27 - 28					2	1												
28 - 29				2	3													
29 -				2	1													

30																		
Above 30	7	12	21	15	8													
Total	7	12	21	20	28	22	28	16	18	14	10	8	6	2	1		2	
dSig/dOmega	43.2436	24.9634	26.7538	18.7736	21.3194	14.4594	16.6327	8.9175	9.72696	7.56502	5.57255	4.7509	3.94185	1.52191	0.937888	0	4.15138	0
0 - 5									1	5	8	6	5	1	1		2	
5 - 10							1	8	13	7	2	2	1	1				
10 - 20					2	11	24	7	4	2								
Above 20	7	12	21	20	26	11	3	1										

Gamma ray spectrum 8501 events

Emission from unbound and bound states(*), and total gamma ray spectrum

(*) note that emission of a particle from an unbound state is not allowed in the code if Ecm is less than Emin

==========

Energy range (MeV)	Unbound	Bound	TOTAL
0 - 1	0	602	602
1 - 2	5438	2461	7899
Total	5438	3063	8501

5.1 percent of cascades trapped before reaching ground state due to spin inhibition

Average energy at which cascades were trapped is ***0.5*** MeV, average spin = ***5.03922*** hbar

**** successive decays through single yrast cascade assumed

-------- C.M. spectra of emitted particles ------

Ex(MeV)	Neut	Prot	Alpha	Gamma
0 - 1	115			602
1 - 2	874			7899
2 - 3	875			
3 - 4	609			

4 - 5	389	13		
5 - 6	243	35		
6 - 7	167	45		
7 - 8	90	60		
8 - 9	57	62		
9 - 10	39	39	3	
10 - 11	21	31	4	
11 - 12	12	25	19	
12 - 13	11	7	28	
13 - 14	7	10	31	
14 - 15	5	6	24	
15 - 16	1	3	37	
16 - 17	1	4	21	
17 - 18			14	
18 - 19		2	12	
19 - 20			6	
20 - 21		1	4	
21 - 22		1	6	
22 - 23			1	
23 - 24			2	
24 - 25			1	
25 - 26			2	
Total	3516	344	215	8501
Average Energy	3.43714	8.73547	15.1884	1.42918

Track down of decay modes at **62.3585 , 31.7293 , 10** MeV excitation

Ex = 62.3585	**Gamma = 0.14 MeV**	**Lifetime = 4.72e-21 sec**	**Average J = 14.081**	**Stand.dev. = 4.743**

	Part	**Num**	**DelJ**	**RMS-dJ**
Neut	4930	-0.351116	2.52754	14.7992
Prot	648	-0.378086	2.29701	15.5506
Alph	421	-3.44418	5.60878	19.3669
Gamm	1	2	2	10.3099

Ex = 31.7293	Gamma = 0.0224 MeV	Lifetime = 3.57e-20 sec	Average J = 12.162	Stand.dev. = 4.324

	Part	Num	DelJ	RMS-dJ
Neut	4818	-0.900166	2.27139	13.3667
Prot	634	-0.88959	2.04677	14.6877
Alph	543	-3.42357	5.28157	18.4273

Ex = 10	Gamma = 0.000228 MeV	Lifetime = 1.34e-11 sec	Average J = 8.740	Stand.dev. = 3.622

	Part	Num	DelJ	RMS-dJ
Neut	3725	-1.25315	2.08272	11.8617
Prot	280	-1.18929	1.96669	11.6357
Alph	97	-3.17526	4.35535	15.4845
Gamm	1889	-1.81313	1.92927	1

---- end of evaporation calculation ----

***** Complete traceback diagnostic of particle and gamma emission *****

Components of gamma spectrum

Energy	E1-spec	E2-spec
0.05 - 0.15		32
0.15 - 0.25		37
0.25 - 0.35		6
0.35 - 0.45		31
0.45 - 0.55		14
0.55 - 0.65	160	322
1.05 - 1.15	532	7367
Above 3.05	0	0

M states at final J vs Ex

0 - 3	0.24	1.69	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3 - 6	0.23	2.19	1.55	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6 - 9	0.46	2.06	2.60	4.00	..	..	..	..	..	..	..	..	..	..	..	..	..
9 - 12	0.86	1.97	2.25	2.39	..	..	..	..	..	..	..	..	..	..	..	..	..
12 - 15	1.35	1.90	2.12	2.11	..	..	..	..	..	..	..	..	..	..	..	..	..
15 - 18	1.00	2.29	2.40	2.15	1.50	..	..	..	..	..	..	..	..	..	..	..	..
18 - 21	1.14	2.12	2.28	2.60	3.00	..	..	..	..	..	..	..	..	..	..	..	..
21 - 24	1.14	2.02	2.15	2.25	5.67	..	..	..	..	..	..	..	..	..	..	..	..
24 - 27	1.67	1.45	2.03	1.88	1.00	..	..	..	..	..	..	..	..	..	..	..	..
27 - 30	1.14	1.93	1.95	2.06	3.00	..	..	..	..	..	..	..	..	..	..	..	..
30 - 33	0.86	2.13	2.07	2.11	3.20	..	..	..	..	..	..	..	..	..	..	..	..
33 - 36	1.43	1.70	1.98	2.14	1.63	..	..	..	..	..	..	..	..	..	..	..	..
36 - 39	1.11	1.72	1.85	1.62	1.64	..	..	..	..	..	..	..	..	..	..	..	..
39 - 42	0.80	0.91	1.65	1.53	1.50	..	..	..	..	..	..	..	..	..	..	..	..
42 - 45	1.00	1.38	1.54	1.45	3.50	..	..	..	..	..	..	..	..	..	..	..	..
45 - 48	1.00	1.41	1.47	1.90	1.22	..	..	..	..	..	..	..	..	..	..	..	..
48 - 51	1.36	1.19	1.25	1.51	1.57	1.00	..	..	..	..	..	..	..	..	..	..	..
51 - 54	0.33	1.03	0.76	0.88	1.37	..	..	..	..	..	..	..	..	..	..	..	..
54 - 57	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
57 - 60	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
60 - 63	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
63 - 66	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
66 - 69	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
69 - 72	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

72 - 75	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
75 - 78	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
78 - 81	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
81 - 84	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
84 - 87	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
87 - 90	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ex / J	-4.00	-9.00	-14.00	-19.00	-24.00	-29.00	-34.00	-39.00	-44.00	-49.00	-54.00	-59.00	-64.00	-69.00	-74.00	-79.00	

Decay summary. Mode = NEUT Total = 3516 Out of = 1000 events Multiplicity = 3.516

Average Ecm = 3.4 Average spin removed = 1.2

9 - 12	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	0
12 - 15	16	42	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	70	6.71429	3.14934
15 - 18	15	72	71	..	..	..	..	..	..	..	..	..	..	..	..	..	..	158	8.77215	3.23529
18 - 21	13	63	81	15	..	..	..	..	..	..	..	..	..	..	..	..	..	172	9.84884	3.77728
21 - 24	18	97	129	42	3	..	..	..	..	..	..	..	..	..	..	..	..	289	10.5294	4.1386
24 - 27	15	72	81	44	6	..	..	..	..	..	..	..	..	..	..	..	..	218	10.945	4.67147
27 - 30	7	48	80	43	1	..	..	..	..	..	..	..	..	..	..	..	..	179	11.5251	4.11744
30 - 33	6	40	48	25	4	..	..	..	..	..	..	..	..	..	..	..	..	123	11.2276	4.55466
33 - 36	7	60	98	54	7	..	..	..	..	..	..	..	..	..	..	..	..	226	11.8673	4.33448
36 - 39	18	63	122	73	9	..	..	..	..	..	..	..	..	..	..	..	..	285	11.8596	4.62426
39 - 42	5	38	72	42	10	..	..	..	..	..	..	..	..	..	..	..	..	167	12.4192	4.55877
42 - 45	3	22	27	19	2	..	..	..	..	..	..	..	..	..	..	..	..	73	11.6575	4.55775
45 - 48	3	49	78	55	19	..	..	..	..	..	..	..	..	..	..	..	..	204	12.9314	4.76046
48 - 51	9	70	151	111	28	1	..	..	..	..	..	..	..	..	..	..	..	370	13.1081	4.64865
51 - 54	2	29	67	42	15	..	..	..	..	..	..	..	..	..	..	..	..	155	13.2581	4.56472
63 - 66	13	121	306	273	103	10	..	..	..	..	..	..	..	..	..	..	..	826	14.1913	4.88782
Ex / J	-4	-9	-14	-19	-24	-29	-34	-39	-44	-49	-54	-59	-64	-69	-74	-79		**sum**	**avrg**	**stdv**
Sum	151	886	1423	838	207	11	..	..	..	..	..	..	..	..	..	..				

Decay summary. Mode = PROT Total = 344 Out of = 1000 events Multiplicity = 0.344

Average Ecm = 8.7 Average spin removed = 0.96

15 - 18	..	3	2	..	..	..	..	..	..	..	..	..	..	..	..	..	5	9	2.44949
18 - 21	..	2	7	1	..	..	..	..	..	..	..	..	..	..	..	..	10	11.5	2.69258
21 - 24	3	8	10	3	..	..	..	..	..	..	..	..	..	..	..	..	24	9.70833	4.32511
24 - 27	..	9	6	4	..	..	..	..	..	..	..	..	..	..	..	..	19	10.6842	3.92096
27 - 30	..	9	4	2	..	..	..	..	..	..	..	..	..	..	..	..	15	9.66667	3.59011
30 - 33	1	5	6	2	1	..	..	..	..	..	..	..	..	..	..	..	15	11	4.89898
33 - 36	..	10	12	6	..	..	..	..	..	..	..	..	..	..	..	..	28	11.2857	3.71154
36 - 39	..	8	8	2	1	..	..	..	..	..	..	..	..	..	..	..	19	10.9474	4.16089
39 - 42	..	4	5	7	2	..	..	..	..	..	..	..	..	..	..	..	18	13.9444	4.75479
42 - 45	..	..	6	1	..	..	..	..	..	..	..	..	..	..	..	..	7	12.7143	1.74964
45 - 48	1	2	10	3	1	..	..	..	..	..	..	..	..	..	..	..	17	12.2941	4.36247
48 - 51	1	7	16	16	3	..	..	..	..	..	..	..	..	..	..	..	43	13.5116	4.51546
51 - 54	..	7	2	7	3	..	..	..	..	..	..	..	..	..	..	..	19	13.5789	5.63182
63 - 66	4	26	40	23	12	..	..	..	..	..	..	..	..	..	..	..	105	12.619	5.14991
Ex / J	-4	-9	-14	-19	-24	-29	-34	-39	-44	-49	-54	-59	-64	-69	-74	-79	**sum**	**avrg**	**stdv**
Sum	10	100	134	77	23	..	..	..	..	..	..	..	..	..	..	..			

Decay summary. Mode = ALPH Total = 215 Out of = 1000 events Multiplicity = 0.215

Average Ecm = 15 Average spin removed = 3.2

18 - 21	1	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	5	7	3.16228
21 - 24	..	1	1	3	..	..	..	..	..	..	..	..	..	..	..	..	5	14	4
24 - 27	..	4	6	..	..	..	..	..	..	..	..	..	..	..	..	..	10	10	2.44949
27 - 30	..	..	2	4	..	..	..	..	..	..	..	..	..	..	..	..	6	15.3333	2.35702
30 - 33	..	3	2	..	..	..	..	..	..	..	..	..	..	..	..	..	5	9	2.44949
33 - 36	..	4	6	3	1	..	..	..	..	..	..	..	..	..	..	..	14	12.3571	4.41761
36 - 39	..	3	11	1	1	..	..	..	..	..	..	..	..	..	..	..	16	12	3.53553
39 - 42	..	4	4	4	..	1	..	..	..	..	..	..	..	..	..	..	13	13.1538	5.60008
42 - 45	..	2	4	..	..	..	..	..	..	..	..	..	..	..	..	..	6	10.3333	2.35702
45 - 48	..	3	5	3	3	..	..	..	..	..	..	..	..	..	..	..	14	14.1429	5.24891
48 - 51	1	8	9	9	4	..	..	..	..	..	..	..	..	..	..	..	31	13.129	5.34453
51 - 54	1	2	7	10	1	..	..	..	..	..	..	..	..	..	..	..	21	13.9048	4.49237
63 - 66	1	7	23	26	10	2	..	..	..	..	..	..	..	..	..	..	69	15.1159	4.97104
Ex / J	-4	-9	-14	-19	-24	-29	-34	-39	-44	-49	-54	-59	-64	-69	-74	-79	**sum**	**avrg**	**stdv**
Sum	4	44	81	63	20	3	..	..	..	..	..	..	..	..	..	..			

Decay summary. Mode = G-E1 Total = 692 Out of = 1000 events Multiplicity = 0.692

Average Ecm = 1.3 Average spin removed = 0.28

0 - 3	266	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	266	2	0
3 - 6	246	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	246	2	0
6 - 9	141	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	141	2	0
9 - 12	39	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	39	2	0
Ex / J	-4	-9	-14	-19	-24	-29	-34	-39	-44	-49	-54	-59	-64	-69	-74	-79	**sum**	**avrg**	**stdv**
Sum	692	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			

Decay summary. Mode = G-E2 Total = 7809 Out of = 1000 events Multiplicity = 7.809

Average Ecm = 1.4 Average spin removed = 1

0 - 3	1212	111	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1323	2.4195	1.38619
3 - 6	2037	373	20	..	..	..	..	..	..	..	..	..	..	..	..	..	2430	2.84979	1.98453
6 - 9	1316	576	137	1	..	..	..	..	..	..	..	..	..	..	..	..	2030	4.10099	3.08854
9 - 12	458	639	264	23	..	..	..	..	..	..	..	..	..	..	..	..	1384	6.46532	3.79709
12 - 15	18	208	240	46	..	..	..	..	..	..	..	..	..	..	..	..	512	10.0664	3.48987
15 - 18	..	..	71	41	2	..	..	..	..	..	..	..	..	..	..	..	114	13.9737	2.61729
18 - 21	..	..	1	14	1	..	..	..	..	..	..	..	..	..	..	..	16	17	1.76777
Ex / J	-4	-9	-14	-19	-24	-29	-34	-39	-44	-49	-54	-59	-64	-69	-74	-79	**sum**	**avrg**	**stdv**
Sum	5041	1907	733	125	3	..	..	..	..	..	..	..	..	..	..	..			

Fission probability as function of excitation

Ex.Energy	**Probability**
63 - 66	0.00e+00
51 - 54	0.00e+00
48 - 51	0.00e+00
45 - 48	0.00e+00
42 - 45	0.00e+00
39 - 42	0.00e+00
36 - 39	0.00e+00
33 - 36	0.00e+00
30 - 33	0.00e+00
27 - 30	0.00e+00
24 - 27	0.00e+00
21 - 24	0.00e+00

18 - 21	0.00e+00
15 - 18	0.00e+00
12 - 15	0.00e+00
9 - 12	0.00e+00
6 - 9	0.00e+00
3 - 6	0.00e+00
0 - 3	0.00e+00

Total sum of fission probabilities 0.000e+00

Excitation energy window - average = 0 FWHM = 0

Spin window - average = 0 FWHM = 0

Average fabs projection 0 Average rms proj 0