^{148}Sm(p,2nγ) 1981Lo06,1985JuZY

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	N. Nica and B. Singh	NDS 181, 1 (2022)	9-Mar-2022

1981Lo06: ^{148}Sm(p,2nγ), E=18-26 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma$ delayed, pγ delay. Used Ge(Li) and HPGe detectors. Used 96% enriched ^{148}Sm target (10 mg/cm^2 thick sandwich).

1985JuZY: ^{148}Sm(p,2nγ), E not reported (also used (p,n) reaction). Measured $\gamma\gamma$, excit. function, $\gamma(\theta)$, α. No details are given about the experimental condition and detection technique. No support data are given, except for the level scheme.

^{147}Eu Levels

E(level)[†]	J$^\pi$[‡]	Comments
0.0	5/2$^+$	
229.3	7/2$^+$	
625.3	11/2$^-$	
755.0	(3/2)$^+$	
776.4	9/2$^+$	
778.0	7/2$^+$#	
827.8@	(3/2)$^+$	
861.7	(7/2)$^+$	
995.4	9/2$^-$	
995.5@	(1/2)$^+$	
1011.8@	9/2$^+$	
1033.8	11/2$^+$	
1069.4	7/2$^-$	
1122.9	(9/2)$^+$	
1213.6@	5/2$^-$	
1235.9	(7/2$^-$)#	
1244.4	(11/2)$^-$	
1289	(11/2$^-$)	
1339.4	11/2$^-$	
1346.3	15/2$^-$	
1360.1	9/2$^-$	
1389.4@	7/2$^-$	
1414.6	13/2$^-$	J$^\pi$: 1981Lo06 interpret this level as an unfavored member of an h(11/2) decoupled band and use systematics to decide J=13/2$^-$.
1421.3	13/2$^+$	
1465.5@	9/2$^-$	
1554.4	9/2$^-$#	
1646.9	(15/2)$^+$	
1756.6	(15/2)&	
1774		
1828?		
1832.7@	(17/2)$^+$	
1926.5	19/2$^-$	
2001.7?		
2013.9	(17/2)$^-$	J$^\pi$: 1981Lo06 interpret this level as an unfavored member of an h(11/2) decoupled band and use systematics to decide J=(17/2$^-$).
2293.3@	23/2$^-$	
2348.1@	(21/2)$^-$	

[†] From 1981Lo06.
[‡] From 1985JuZY; the (fewer) assignments from 1981Lo06 are noted separately.

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^{148}Sm(p,2nγ) 1981Lo06,1985JuZY (continued)

^{147}Eu Levels (continued)

From 1981Lo06.
@ From 1985JuZY, not reported by 1981Lo06.
& (D) γ to 13/2$^+$, 1421 level.

γ(^{147}Eu)

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	Comments
107		861.7	(7/2)$^+$	755.0	(3/2)$^+$		Iγ<Iγ(632).
132.1 *4*	2.5	1421.3	13/2$^+$	1289	(11/2$^-$)	D	Mult.: A_2=−0.19 12, A_4=0.02 *3* (1981Lo06).
177.1@		1421.3	13/2$^+$	1244.4	(11/2)$^-$		I_γ: Iγ<Iγ(644.8γ).
217.1 *4*	1.0	995.4	9/2$^-$	778.0	7/2$^+$	D(+Q)	E_γ: this transition not observed by 1985JuZY. Mult.: A_2=−0.13 *5*, A_4=−0.07 *7* (1981Lo06).
225.6 *4*	3.0	1646.9	(15/2)$^+$	1421.3	13/2$^+$	(D)	Mult.: from A_2=−0.16 *6*, A_4=0.03 *8* (1981Lo06). I_γ: weak component of a multiplet (1981Lo06).
229.3 *2*	100	229.3	7/2$^+$	0.0	5/2$^+$	M1+E2	Mult.: A_2=−0.02 *1*, A_4=−0.01 *1* (1981Lo06).
240.6 *4*	1.7	1235.9	(7/2$^-$)	995.4	9/2$^-$	(M1+E2)	Mult.: A_2=−0.10 *3*, A_4=0.02 *5*, (D+Q) most likely (M1+E2).
249.2 *5*	0.6	1244.4	(11/2)$^-$	995.4	9/2$^-$	(M1+E2)	A_2=0.03 *8*, A_4=0.17 *11* (1981Lo06).
257.5		1033.8	11/2$^+$	776.4	9/2$^+$		I_γ: weak, much less than Iγ(804).
261.1 *5*	0.7	1122.9	(9/2)$^+$	861.7	(7/2)$^+$	(M1+E2)	Mult.: A_2=−0.10 *7*, A_4=0.27 *10* (1981Lo06).
294.5@		1289	(11/2$^-$)	995.4	9/2$^-$	(M1)	I_γ: weak, much less than Iγ(513γ).
327.9@		1339.4	11/2$^-$	1011.8	9/2$^+$	(E1)&	
335.3 *4*	1.6	1756.6	(15/2)	1421.3	13/2$^+$	(D)	Mult.: from A_2=−0.20 *4*, A_4=0.07 *6* (1981Lo06).
344.2 *4*	1.4	1339.4	11/2$^-$	995.4	9/2$^-$	M1	Mult.: A_2=−0.29 *4*, A_4=−0.01 *6* (1981Lo06).
346.5 *5*	0.6	1122.9	(9/2)$^+$	776.4	9/2$^+$		Mult.: A_2=−0.18 *7*, A_4=0.11 *9* (1981Lo06).
354.8[a] *4*	1.0	2001.7?		1646.9	(15/2)$^+$	D	Mult.: A_2=−0.21 *6*, A_4=−0.07 *9* (1981Lo06).
366.4@		2293.3	23/2$^-$	1926.5	19/2$^-$	(E2)	
370.0 *3*	8.3	995.4	9/2$^-$	625.3	11/2$^-$	M1+E2	Mult.: A_2=−0.29 *1*, A_4=0.01 *2* (1981Lo06).
387.5 *4*	1.8	1421.3	13/2$^+$	1033.8	11/2$^+$	M1+E2	Mult.: A_2=−0.07 *4*, A_4=0.02 *5* (1981Lo06).
396.0	43	625.3	11/2$^-$	229.3	7/2$^+$		Mult.: A_2=−0.01 *1*, A_4=−0.00 *1* (1981Lo06).
411.4@		1832.7	(17/2)$^+$	1421.3	13/2$^+$	(E2)&	
421.2@		2348.1	(21/2)$^-$	1926.5	19/2$^-$	(M1)	
513		1289	(11/2$^-$)	776.4	9/2$^+$		γ seen only in coincidence.
547.2 *4*	2.3	776.4	9/2$^+$	229.3	7/2$^+$		I_γ: weak component of a multiplet (1981Lo06). Mult.: A_2=−0.05 *4*, A_4=0.01 *5* (1981Lo06).
580.2 *4*	2.4	1926.5	19/2$^-$	1346.3	15/2$^-$	E2	Mult.: A_2=0.21 *3*, A_4=−0.01 *5* (1981Lo06).
613.2@		1646.9	(15/2)$^+$	1033.8	11/2$^+$	E2	I_γ: Iγ(613γ)<Iγ(225γ).
619.0 *3*	5.9	1244.4	(11/2)$^-$	625.3	11/2$^-$	D	Mult.: A_2=−0.18 *2*, A_4=−0.03 *2* (1981Lo06).
625.3 *3*	4.9	625.3	11/2$^-$	0.0	5/2$^+$		Mult.: A_2=−0.02 *2*, A_4=0.03 *3* (1981Lo06).
632.3 *4*	3.7	861.7	(7/2)$^+$	229.3	7/2$^+$		I_γ: weak component of a multiplet (1981Lo06). Mult.: A_2=0.05 *2*, A_4=−0.08 *4* (1981Lo06).
644.8 *4*	2.4	1421.3	13/2$^+$	776.4	9/2$^+$	E2	Mult.: A_2=0.24 *4*, A_4=0.01 *5* (1981Lo06).
667.6 *5*	0.8	2013.9	(17/2)$^-$	1346.3	15/2$^-$	(M1)	Mult.: A_2=−0.66 *14*, A_4=0.28 *19* (1981Lo06).
705		1774		1069.4	7/2$^-$		γ seen only in coincidence.
714@		1339.4	11/2$^-$	625.3	11/2$^-$		
721.0 *2*	11	1346.3	15/2$^-$	625.3	11/2$^-$	E2	Mult.: A_2=0.27 *1*, A_4=0.07 *2* (1981Lo06).
755.0 *3*	5.9	755.0	(3/2)$^+$	0.0	5/2$^+$	(M1)	Mult.: A_2=−0.09 *2*, A_4=0.01 *3* (1981Lo06).
765.9 *3*	6.3	995.4	9/2$^-$	229.3	7/2$^+$	E1	Mult.: A_2=−0.13 *2*, A_4=−0.01 *2* (1981Lo06).
776.4 *2*	<37	776.4	9/2$^+$	0.0	5/2$^+$	E2	I_γ: 37 for 776.4γ+778.0γ.
776.4 *5*	0.07	1554.4	9/2$^-$	778.0	7/2$^+$		I_γ: from Iγ(776γ)/Iγ(929γ)=0.055 in adopted gammas.
778.0 *2*	<37	778.0	7/2$^+$	0.0	5/2$^+$	M1+E2	I_γ: 37 for 776.4γ+778.0γ.
782.4@		1011.8	9/2$^+$	229.3	7/2$^+$	M1+E2	
789.3 *3*	4.4	1414.6	13/2$^-$	625.3	11/2$^-$	M1+E2	Mult.: A_2=−0.68 *3*, A_4=0.06 *3* (1981Lo06).

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^{148}Sm(p,2nγ) 1981Lo06,1985JuZY (continued)

γ(^{147}Eu) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	Comments
796.1 [@]		1421.3	$13/2^+$	625.3	$11/2^-$		I_γ: Iγ<Iγ(644.8).
804.5 *2*	12	1033.8	$11/2^+$	229.3	$7/2^+$	E2	Mult.: A_2=0.18 *1*, A_4=−0.04 *2* (1981Lo06).
827.8 [@]		827.8	$(3/2)^+$	0.0	$5/2^+$	(M1) [&]	
833 [a]		1828?		995.4	$9/2^-$		γ seen only in coincidence.
861.7 *4*	3.0	861.7	$(7/2)^+$	0.0	$5/2^+$	(M1)	Mult.: A_2=−0.18 *3*, A_4=0.02 *4* (1981Lo06).
893.6 *4*	2.5	1122.9	$(9/2)^+$	229.3	$7/2^+$	(M1)	Mult.: A_2=−0.20 *3*, A_4=0.02 *5* (1981Lo06).
929.1 *4*	1.2	1554.4	$9/2^-$	625.3	$11/2^-$		I_γ: weak component of a multiplet (1981Lo06). Mult.: A_2=−0.46 *7*, A_4=0.05 *9* (1981Lo06).
995.5 [@]		995.5	$(1/2)^+$	0.0	$5/2^+$	(E2)	
1069.4 *3*	6.6	1069.4	$7/2^-$	0.0	$5/2^+$	E1	Mult.: A_2=−0.20 *2*, A_4=0.02 *2* (1981Lo06).
1130.8 *4*	2.6	1360.1	$9/2^-$	229.3	$7/2^+$	(E1)	Mult.: A_2=−0.11 *4*, A_4=0.04 *5* (1981Lo06).
1160.1 [@]		1389.4	$7/2^-$	229.3	$7/2^+$	(E1) [&]	
1213.6 [@]		1213.6	$5/2^-$	0.0	$5/2^+$	(E1) [&]	
1236.1 [@]		1465.5	$9/2^-$	229.3	$7/2^+$	(E1) [&]	

[†] From 1981Lo06. ΔEγ values are 0.2-0.5 keV (1981Lo06) depending on the line strength and complexity of the the spectrum. The values given in each case are assumed by evaluator.
[‡] From 1981Lo06 relative to 229.3γ. ΔIγ values vary from 10% to 30% depending on line strength (1981Lo06).
[#] From 1985JuZY (γ(θ)(aligned) and ce(K) measurements); few values from 1981Lo06 (from γ(θ)(aligned)) are noted separately.
[@] From 1985JuZY, not reported by 1981Lo06.
[&] From α(K)exp (1985JuZY, values not given).
[a] Placement of transition in the level scheme is uncertain.

^{148}**Sm(p,2nγ)** **1981Lo06,1985JuZY**

Level Scheme

Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

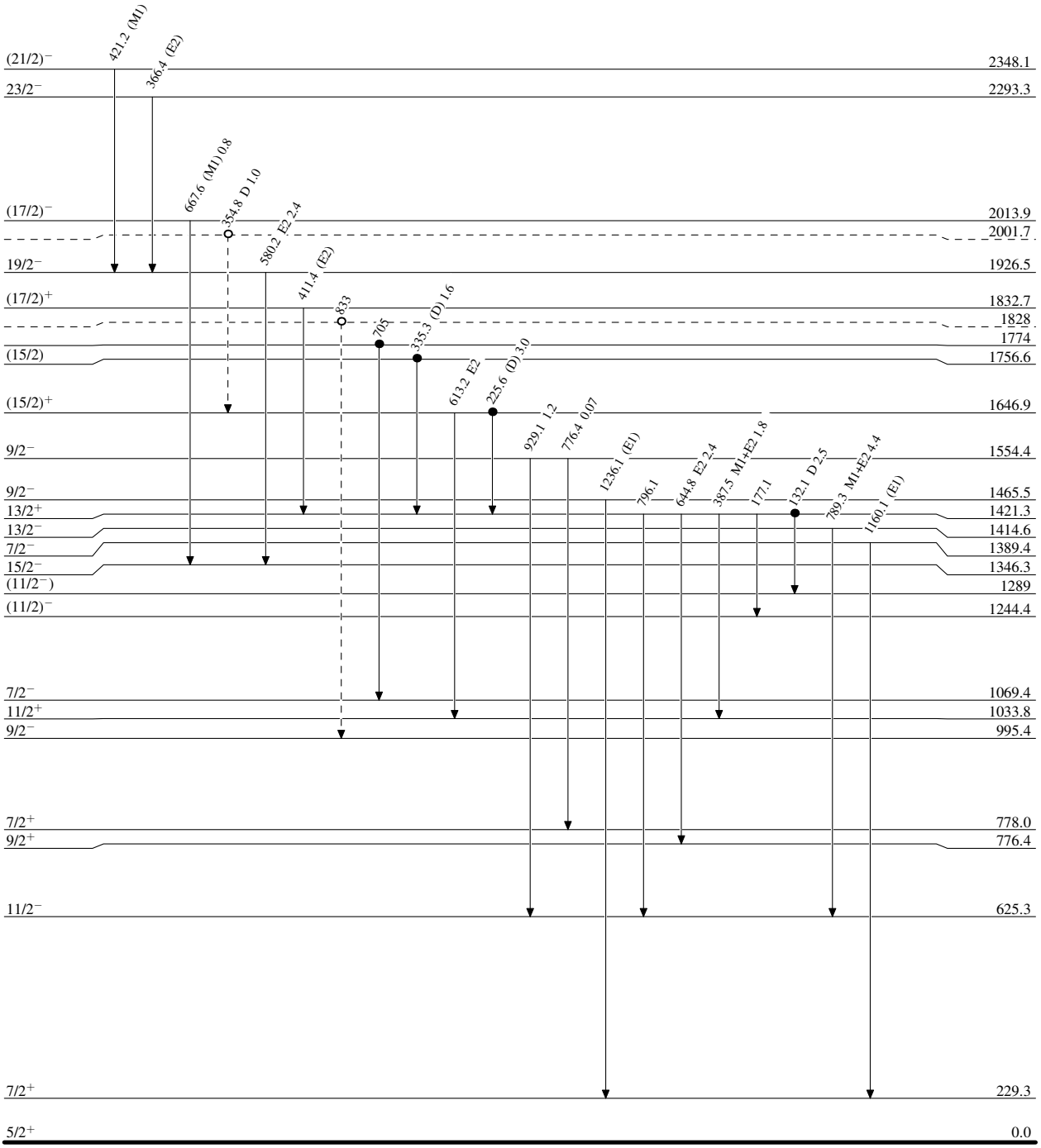
$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)

Coincidence

Coincidence (Uncertain)



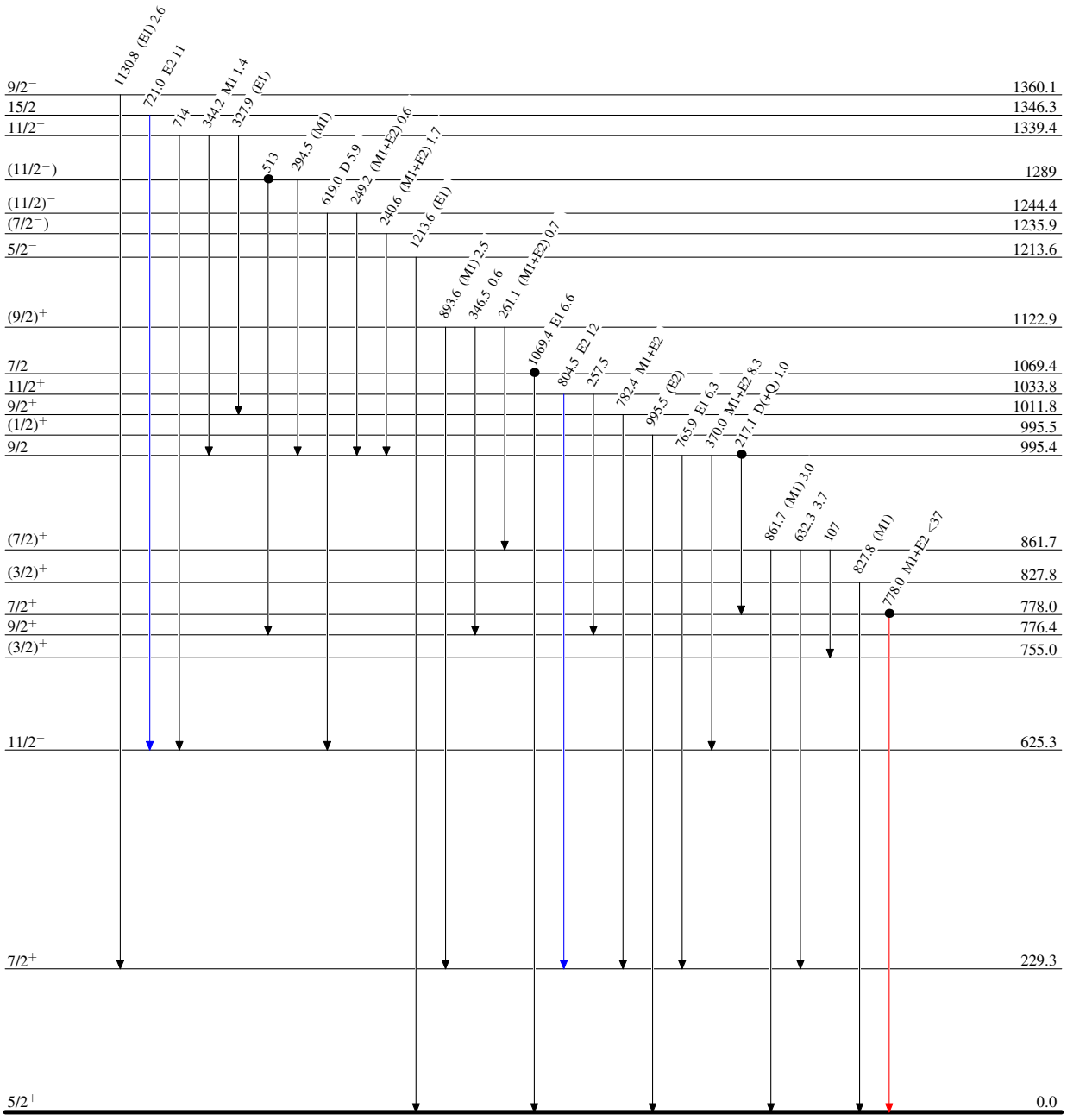
$^{147}_{63}Eu_{84}$

^{148}Sm(p,2nγ) 1981Lo06,1985JuZY

Level Scheme (continued)

Intensities: Relative I_γ

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- Coincidence



$^{147}_{63}Eu_{84}$

^{148}Sm(p,2nγ) 1981Lo06,1985JuZY

Level Scheme (continued)

Intensities: Relative I_γ

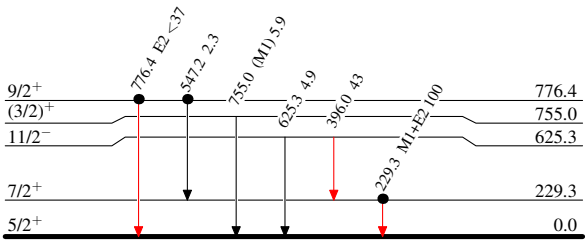
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

Coincidence



$^{147}_{63}Eu_{84}$