^{151}Eu(n,γ) E=th: primary γ's 1985Vo15,1978VoZP

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. J. Martin	NDS 114, 1497 (2013)	31-Aug-2013

$J^{\pi}(^{151}Eu)=5/2^+$.
Measured: γ, Iγ, σ.
Other: 2007ChZX (Eγ, σ).

^{152}Eu Levels

E(level)†	J$^{\pi}$‡	Comments
0.0	3^-	
65.4 *20*	1^-	
77.25 *5*	3^-	
89.69 *10*		E(level): The primary γ feeds the 4^- 89.61 and/or the 4^+ 89.85 levels.
108.7 *4*		E(level): The primary γ feeds the 5^+ 108.11 and/or the $(1)^-$ 109.09 levels.
114.1 *5*	3^+	
118.63 *21*	2^-	
124.3	4^+	
141.87 *4*	4^-	
150.58 *5*	4^-	
161.9 *8*	$3^+,4^+$	
174.90 *9*	$2^-,3^-$	
179.9 *4*	$(3,4)^+$	
196.43 *26*	$3^+,4^+$	
202.46 *22*		E(level): The primary γ feeds one or more of the 3^+ 201.13, 1^- 203.11, and 4^- 203.18 levels.
213.75 *27*		E(level): The primary γ feeds the 2^- 214.36 and/or the 4^+ 214.43 levels.
221.22 *6*		E(level): The primary γ feeds one or more of the 3^- 220.80, 3^+ 221.21, and 2^- 221.45 levels.
226.6 *4*		E(level): The primary γ feeds the 3^- 224.50 and/or the 3^+ 227.72 levels.
237.39 *5*		E(level): The primary γ feeds the 2^- 237.35 and/or the 4^- 237.49 levels.
246.58 *14*	$3^-,4^-$	
253.2 *7*	3^+	
257.0 *5*	$3^+,4^+$	
264.64 *14*		E(level): This is probably the 3^- 265.72 level.
272.1 *5*	2^+	
282.69 *7*	3^+	
286.30 *8*	2^-	
294.29 *7*	$3^-,4^-$	
300.67 *14*	$3^+,4^+$	
308.4 *5*		E(level): The primary γ feeds the $2^+,3^+$ 307.46 and/or the 3^- 309.37 levels.
321.35 *10*	$3^{(+)}$	
333.69 *13*	(4^-)	E(level): The primary γ feeds the 3^+ 332.79 and/or the $(4)^-$ 334.39 levels.
340.65 *10*		E(level): The primary γ feeds the (3^-) 340.72 and/or the 2^- 341.24 levels.
345.9 *5*	$(1^+,2^+)$	
351.28 *9*	$2^-,3^-$	
359.83 *25*	2^-	
366.8 *3*	$2^-,3^+$	
374.1 *5*	(3^-)	
377.5 *12*		
384.76 *6*	$3^-,4^-$	
390.96 *6*	3^-	
396.9 *4*	$(3^+,4^+)$	
401.5 *6*		
412.89 *7*	3^+	
417.2 *4*		
435.73 *7*		E(level): The primary γ feeds the J=4 434.7 and/or the $2^+,3^+$ 436.2 levels.
440.44 *25*	$3,4^-$	

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^{151}Eu(n,γ) E=th: primary γ's 1985Vo15,1978VoZP (continued)

^{152}Eu Levels (continued)

E(level)†	Jπ‡
446.20 *8*	3,4$^-$
454.91 *18*	
462.32 *24*	4
467.1 *4*	
470.79 *10*	
476.50 *18*	
485.1 *3*	
489.62 *12*	
492.65 *23*	3$^-$,4$^-$
501.09 *8*	
510.24 *7*	3
517.9 *5*	
520.8 *7*	
536.76 *7*	
543.07 *10*	
550.79 *13*	
558.9 *5*	
563.25 *11*	
569.04 *23*	
573.71 *15*	
581.01 *8*	
593.5 *6*	
599.9 *3*	
611.9 *5*	
620.9 *6*	
625.6 *6*	
635.4 *6*	
644.4 *6*	
648.8 *6*	
658.6 *5*	
673.5 *6*	
683.0 *7*	
687.5 *7*	
693.0 *6*	
711.9 *5*	
718.3 *7*	
723.8 *7*	
739.3 *6*	
745.1 *10*	
756.4 *5*	
767.8 *5*	
777.6 *6*	
787.8 *7*	
796.9 *6*	
806.4 *5*	
812.5 *7*	
822.8 *6*	
843.8 *6*	
851.9 *13*	
857.0 *7*	
879.1 *6*	
884.6 *5*	
893.4 *7*	
900.0 *19*	
903.0 *10*	
916.9 *6*	
927.5 *5*	

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^{151}Eu(n,γ) E=th: primary γ's 1985Vo15,1978VoZP (continued)

^{152}Eu Levels (continued)

E(level)†	Jπ‡	Comments
941.8 *6*		
(6306.71 *10*)	$2^+,3^+$	Jπ: s-wave capture on $J^\pi=5/2^+$ target.

† From primary γ's, corrected for recoil, and S(n)=6306.71 *10*.
‡ From Adopted Levels.

γ(^{152}Eu)

Iγ normalization: From comparison with ^{35}Cl(n,γ) data.

E_γ†‡#	I_γ†@&	E_i(level)	J_i^π	E_f	Comments
5364.8 *3*	1.0 *3*	(6306.71)	$2^+,3^+$	941.8	
5379.1 *1*	10.4 *21*	(6306.71)	$2^+,3^+$	927.5	2007ChZX report Eγ=5379.7 *4* with σ =9.2 b *19*.
5389.7 *4*	1.3 *3*	(6306.71)	$2^+,3^+$	916.9	
5403.6 *8*	1.3 *4*	(6306.71)	$2^+,3^+$	903.0	
5406.6 *18*	0.7 *4*	(6306.71)	$2^+,3^+$	900.0	
5413.2 *4*	2.5 *6*	(6306.71)	$2^+,3^+$	893.4	
5422.0 *1*	2.5 *5*	(6306.71)	$2^+,3^+$	884.6	
5427.5 *2*	3.3 *7*	(6306.71)	$2^+,3^+$	879.1	
5449.6 *4*	4.4 *11*	(6306.71)	$2^+,3^+$	857.0	
5454.7 *12*	1.4 *7*	(6306.71)	$2^+,3^+$	851.9	
5462.8 *3*	5.7 *11*	(6306.71)	$2^+,3^+$	843.8	
5483.8 *3*	1.3 *3*	(6306.71)	$2^+,3^+$	822.8	
5494.1 *5*	1.2 *3*	(6306.71)	$2^+,3^+$	812.5	
5500.2 *1*	11.2 *22*	(6306.71)	$2^+,3^+$	806.4	2007ChZX report Eγ=5500.68 *18* with σ =7.0 b *4*.
5509.7 *2*	2.3 *5*	(6306.71)	$2^+,3^+$	796.9	
5518.8 *5*	0.7 *2*	(6306.71)	$2^+,3^+$	787.8	
5529.0 *2*	2.1 *4*	(6306.71)	$2^+,3^+$	777.6	
5538.8 *1*	2.1 *4*	(6306.71)	$2^+,3^+$	767.8	
5550.2 *1*	3.8 *8*	(6306.71)	$2^+,3^+$	756.4	
5561.5 *8*	0.4 *1*	(6306.71)	$2^+,3^+$	745.1	
5567.3 *3*	1.1 *3*	(6306.71)	$2^+,3^+$	739.3	
5582.8 *4*	1.0 *3*	(6306.71)	$2^+,3^+$	723.8	
5588.3 *5*	0.9 *2*	(6306.71)	$2^+,3^+$	718.3	
5594.7 *1*	5.4 *11*	(6306.71)	$2^+,3^+$	711.9	2007ChZX report Eγ=5595.20 *20* with σ =5.3 b *4*.
5613.6 *2*	3.0 *6*	(6306.71)	$2^+,3^+$	693.0	
5619.1 *4*	2.4 *6*	(6306.71)	$2^+,3^+$	687.5	
5623.6 *4*	1.5 *4*	(6306.71)	$2^+,3^+$	683.0	
5633.1 *2*	0.9 *2*	(6306.71)	$2^+,3^+$	673.5	
5648.0 *1*	2.4 *6*	(6306.71)	$2^+,3^+$	658.6	
5657.8 *2*	1.9 *4*	(6306.71)	$2^+,3^+$	648.8	
5662.2 *3*	1.0 *2*	(6306.71)	$2^+,3^+$	644.4	
5671.2 *2*	1.1 *2*	(6306.71)	$2^+,3^+$	635.4	
5681.0 *2*	1.6 *3*	(6306.71)	$2^+,3^+$	625.6	
5685.7 *2*	2.4 *5*	(6306.71)	$2^+,3^+$	620.9	
5694.7 *1*	1.6 *3*	(6306.71)	$2^+,3^+$	611.9	
5706.7 *3*	0.73 *7*	(6306.71)	$2^+,3^+$	599.9	
5713.1 *6*	0.31 *6*	(6306.71)	$2^+,3^+$	593.5	
5725.60 *8*	4.81 *11*	(6306.71)	$2^+,3^+$	581.01	
5732.90 *15*	2.14 *10*	(6306.71)	$2^+,3^+$	573.71	
5737.57 *23*	1.43 *9*	(6306.71)	$2^+,3^+$	569.04	

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^{151}Eu(n,γ) E=th: primary γ's 1985Vo15,1978VoZP (continued)

$\gamma(^{152}Eu)$ (continued)

E_γ †‡#	I_γ †@&	E_i(level)	J_i^π	E_f	J_f^π	Comments
5743.36 *11*	3.81 *12*	(6306.71)	$2^+,3^+$	563.25		
5747.7 *5*	0.61 *10*	(6306.71)	$2^+,3^+$	558.9		
5755.82 *13*	1.05 *5*	(6306.71)	$2^+,3^+$	550.79		
5763.54 *10*	1.90 *6*	(6306.71)	$2^+,3^+$	543.07		
5769.85 *7*	3.95 *8*	(6306.71)	$2^+,3^+$	536.76		
5785.8 *7*	0.49 *20*	(6306.71)	$2^+,3^+$	520.8		
5788.7 *5*	0.76 *20*	(6306.71)	$2^+,3^+$	517.9		
5796.37 *7*	4.90 *9*	(6306.71)	$2^+,3^+$	510.24	3	
5805.52 *8*	2.86 *8*	(6306.71)	$2^+,3^+$	501.09		
5813.96 *23*	2.6 *4*	(6306.71)	$2^+,3^+$	492.65	$3^-,4^-$	
5816.99 *12*	7.7 *3*	(6306.71)	$2^+,3^+$	489.62		E_γ: Authors' value of 5817.99 seems to be a misprint. They quote a final level energy of 489.62, which would require Eγ=5816.99. this corrected energy agrees with Eγ=5816.5 *8* from 2007ChZX who also report σ =3.7 b *12*.
5821.5 *3*	0.93 *12*	(6306.71)	$2^+,3^+$	485.1		
5830.11 *18*	0.66 *4*	(6306.71)	$2^+,3^+$	476.50		
5835.82 *10*	3.27 *11*	(6306.71)	$2^+,3^+$	470.79		
5839.5 *4*	0.82 *9*	(6306.71)	$2^+,3^+$	467.1		
5844.29 *24*	0.57 *5*	(6306.71)	$2^+,3^+$	462.32	4	
5851.70 *18*	0.51 *3*	(6306.71)	$2^+,3^+$	454.91		
5860.41 *8*	1.70 *4*	(6306.71)	$2^+,3^+$	446.20	$3,4^-$	
5866.17 *25*	0.61 *5*	(6306.71)	$2^+,3^+$	440.44	$3,4^-$	
5870.88 *7*	2.58 *6*	(6306.71)	$2^+,3^+$	435.73		
5889.4 *4*	0.49 *7*	(6306.71)	$2^+,3^+$	417.2		
5893.72 *7*	3.77 *9*	(6306.71)	$2^+,3^+$	412.89	3^+	
5905.1 *6*	0.31 *6*	(6306.71)	$2^+,3^+$	401.5		
5909.7 *4*	0.68 *7*	(6306.71)	$2^+,3^+$	396.9	$(3^+,4^+)$	
5915.65 *6*	6.34 *11*	(6306.71)	$2^+,3^+$	390.96	3^-	
5921.85 *6*	4.64 *10*	(6306.71)	$2^+,3^+$	384.76	$3^-,4^-$	
5929.1 *12*	0.23 *9*	(6306.71)	$2^+,3^+$	377.5		
5932.5 *5*	0.51 *10*	(6306.71)	$2^+,3^+$	374.1	(3^-)	
5939.8 *3*	0.46 *5*	(6306.71)	$2^+,3^+$	366.8	$2^-,3^+$	
5946.78 *25*	0.54 *5*	(6306.71)	$2^+,3^+$	359.83	2^-	
5955.32 *9*	1.76 *6*	(6306.71)	$2^+,3^+$	351.28	$2^-,3^-$	
5960.7 *5*	0.31 *5*	(6306.71)	$2^+,3^+$	345.9	$(1^+,2^+)$	
5965.95 *10*	1.64 *6*	(6306.71)	$2^+,3^+$	340.65		
5972.91 *13*	0.98 *5*	(6306.71)	$2^+,3^+$	333.69	(4^-)	
5985.25 *10*	1.48 *6*	(6306.71)	$2^+,3^+$	321.35	$3^{(+)}$	
5998.2 *5*	0.18 *4*	(6306.71)	$2^+,3^+$	308.4		
6005.93 *14*	0.68 *4*	(6306.71)	$2^+,3^+$	300.67	$3^+,4^+$	
6012.31 *7*	1.87 *5*	(6306.71)	$2^+,3^+$	294.29	$3^-,4^-$	
6020.30 *8*	3.06 *11*	(6306.71)	$2^+,3^+$	286.30	2^-	
6023.91 *7*	4.01 *11*	(6306.71)	$2^+,3^+$	282.69	3^+	
6034.5 *5*	0.50 *9*	(6306.71)	$2^+,3^+$	272.1	2^+	
6041.96 *15*	2.00 *12*	(6306.71)	$2^+,3^+$	264.64		
6049.6 *5*	0.78 *16*	(6306.71)	$2^+,3^+$	257.0	$3^+,4^+$	
6053.4 *7*	0.64 *16*	(6306.71)	$2^+,3^+$	253.2	3^+	
6060.02 *14*	2.27 *13*	(6306.71)	$2^+,3^+$	246.58	$3^-,4^-$	
6069.21 *5*	12.61 *24*	(6306.71)	$2^+,3^+$	237.39		2007ChZX report Eγ=6069.29 *18* with σ =8.2 b *7*.
6080.0 *4*	0.48 *6*	(6306.71)	$2^+,3^+$	226.6		
6085.38 *6*	4.98 *9*	(6306.71)	$2^+,3^+$	221.22		
6092.85 *27*	0.47 *5*	(6306.71)	$2^+,3^+$	213.75		
6104.14 *22*	0.95 *7*	(6306.71)	$2^+,3^+$	202.46		
6110.17 *26*	0.77 *6*	(6306.71)	$2^+,3^+$	196.43	$3^+,4^+$	
6126.7 *4*	0.25 *4*	(6306.71)	$2^+,3^+$	179.9	$(3,4)^+$	
6131.70 *9*	1.42 *5*	(6306.71)	$2^+,3^+$	174.90	$2^-,3^-$	

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^{151}Eu(n,γ) E=th: primary γ's 1985Vo15,1978VoZP (continued)

$\gamma(^{152}Eu)$ (continued)

E_γ †‡#	I_γ †@&	E_i(level)	J_i^π	E_f	J_f^π	Comments
6144.7 *8*	0.13 *3*	(6306.71)	$2^+,3^+$	161.9	$3^+,4^+$	
6156.02 *5*	4.04 *7*	(6306.71)	$2^+,3^+$	150.58	4^-	
6164.73 *8*	1.53 *5*	(6306.71)	$2^+,3^+$	141.87	4^-	
6182.3 *4*	0.18 *3*	(6306.71)	$2^+,3^+$	124.3	4^+	
6187.96 *21*	0.60 *4*	(6306.71)	$2^+,3^+$	118.63	2^-	
6192.5 *5*	0.25 *4*	(6306.71)	$2^+,3^+$	114.1	3^+	
6197.9 *4*	0.23 *3*	(6306.71)	$2^+,3^+$	108.7		
6216.90 *10*	2.14 *10*	(6306.71)	$2^+,3^+$	89.69		
6229.34 *5*	9.15 *25*	(6306.71)	$2^+,3^+$	77.25	3^-	2007ChZX report Eγ=6229.7 *7* with σ =4.1 b *8*.
6241.2 *20*	0.06 *5*	(6306.71)	$2^+,3^+$	65.4	1^-	
6306.59 *7*	2.64 *12*	(6306.71)	$2^+,3^+$	0.0	3^-	

† γ with E>5700 are from 1985Vo15, γ with E<5700 are from 1978VoZP. For a few levels, Eγ and σ are given by 2007ChZX. These data are given in comments.

‡ The Eγ from 1978VoZP have been recalculated by the evaluator on the basis of the comment by 1985Vo15 that the quoted values are probably 1.2 keV too low. The evaluator has also subtracted the recoil correction included in Eγ by 1978VoZP.

The ΔE are relative uncertainties and do not include systematic uncertainties which are 0.1 keV for Eγ>5700 (1985Vo15), 0.5 keV for Eγ<5700 (1978VoZP).

@ Relative ΔIγ, does not include systematic ΔIγ=7%.

& For intensity per 100 neutron captures, multiply by 0.01.

^{151}Eu(n,γ) E=th: primary γ's 1985Vo15,1978VoZP

Level Scheme

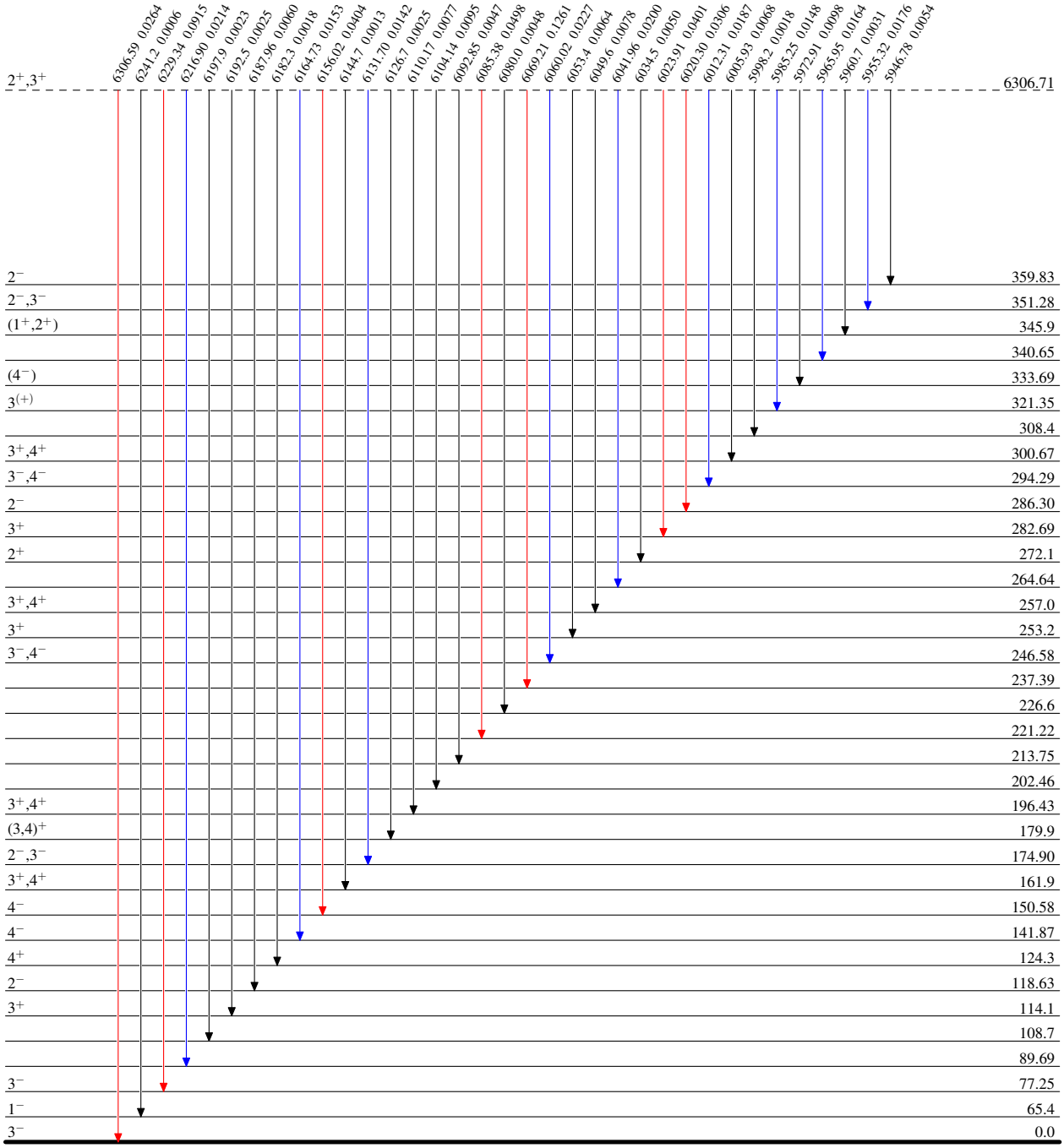
Intensities: I_γ per 100 neutron captures

Legend

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

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

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

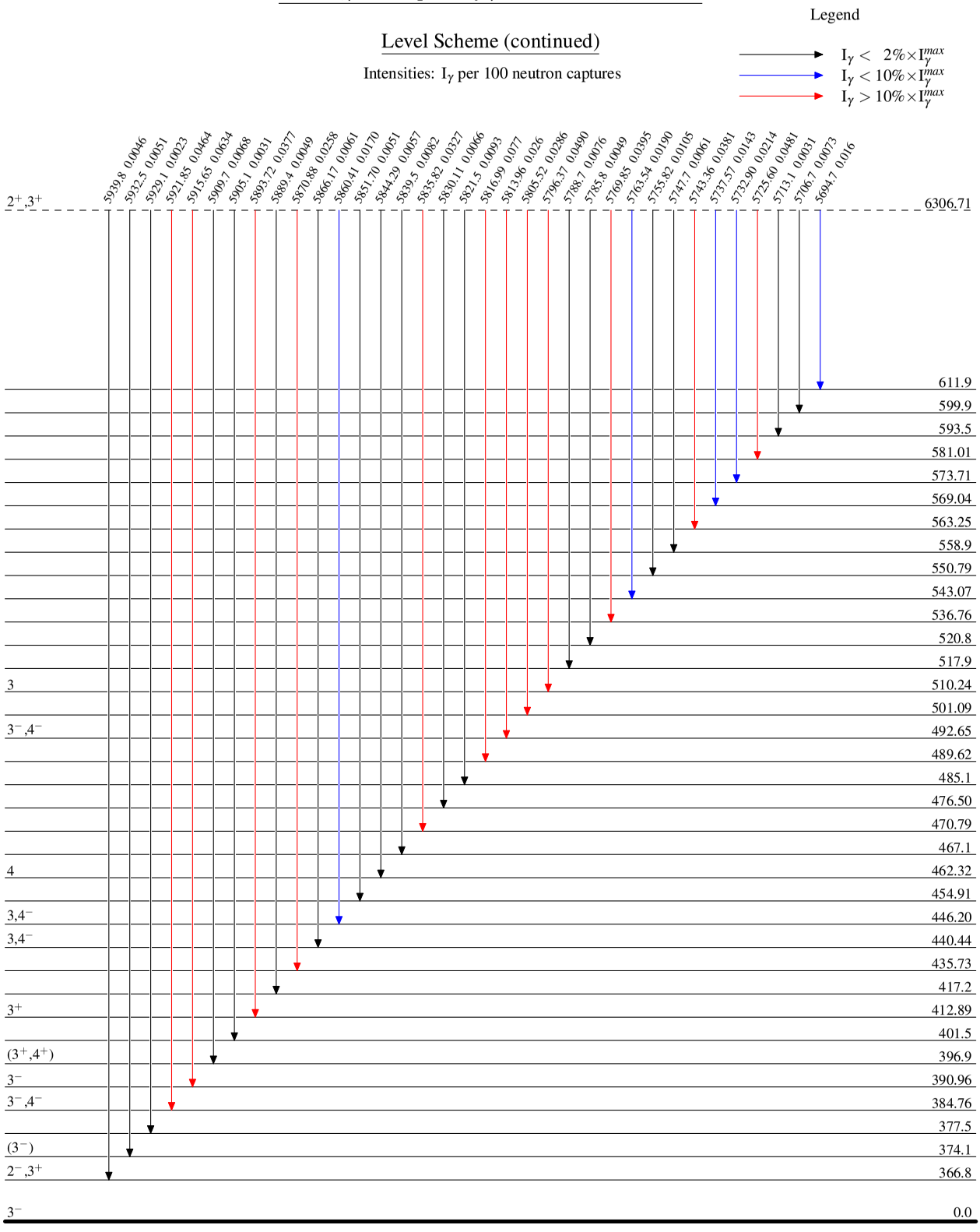


$^{152}_{63}Eu_{89}$

^{151}Eu(n,γ) E=th: primary γ's 1985Vo15,1978VoZP

Level Scheme (continued)

Intensities: I_γ per 100 neutron captures

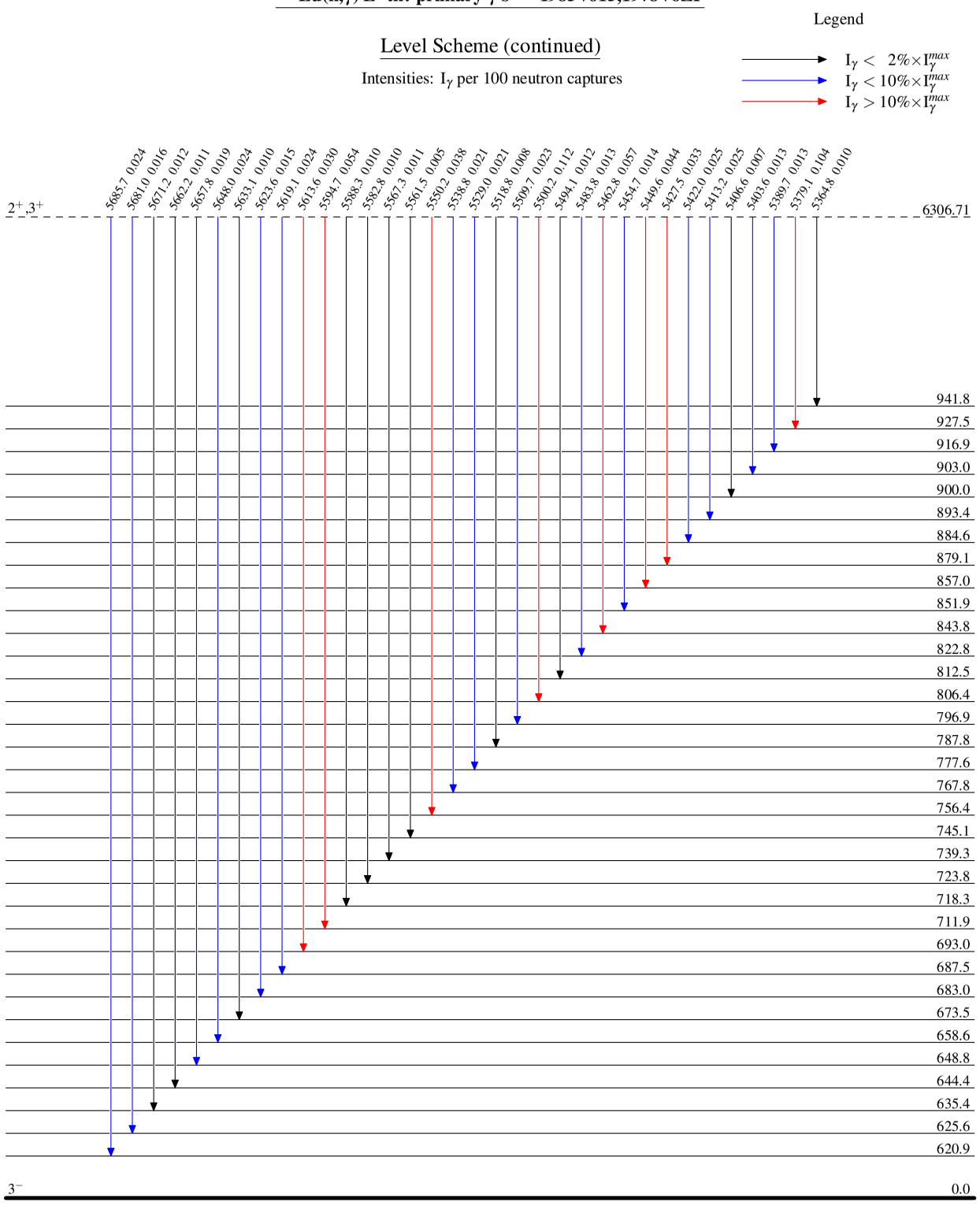


$^{152}_{63}Eu_{89}$

^{151}Eu(n,γ) E=th: primary γ's 1985Vo15,1978VoZP

Level Scheme (continued)

Intensities: I_γ per 100 neutron captures



$^{152}_{63}Eu_{89}$