^{153}Gd(n,γ) E=th 1996SpZZ

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 200,2 (2025)	22-Aug-2022

Additional information 1.

Data are from the ^{152}Gd(n,γ)^{153}Gd(n,γ) reaction. Since 3- and 4-fold capture occurs, γ's are observed in four nuclides, as well as a few from isotopic and chemical impurities in the sample.

In a study of the β^- decay of ^{154}Eu and based on a combination of criteria, 2004Ku13 conclude that the following ^{154}Gd levels, previously reported in (n,γ), do not exist: 1276.99; 1294.19; 1295.09; 1698.51; 1702.04; 1838.61; and 1861.55. Thus, these levels are generally decayed by very weak γ rays (below estimated detection limits), or with unknown primary γ's, or later placed elsewhere in the level scheme, or undetected by other authors, etc. These levels, as well as their deexciting γ's, are not included here. For a listing of this information see 1996SpZZ or the previous Nuclear Data Sheets evaluation (1998Re22). Elimination of these data has led to revised band assignments for some of the levels.

^{154}Gd Levels

E(level)[†]	J$^\pi$[‡]	Comments
0[#]	0^+	
123.074[#] *4*	2^+	
371.008[#] *5*	4^+	
680.666[@] *4*	0^+	
717.666[#] *5*	6^+	
815.490[@] *4*	2^+	
996.257[&] *5*	2^+	
1047.593[@] *5*	4^+	
1127.792[&] *5*	3^+	
1182.091[d] *5*	0^+	
1241.290[a] *5*	1^-	
1251.641[a] *5*	3^-	
1263.787[&] *7*	4^+	
1365.884[@] *9*	6^+	
1397.572[b] *11*	2^-	
1404.083[a] *7*	5^-	
1414.433[b] *6*	1^-	
1418.159[d] *4*	2^+	
1432.598[&] *8*	5^+	
1531.301[e] *5*	2^+	
1560.002[b] *7*	4^-	
1573.973[f] *9*	0^+	
1617.087[b] *14*	3^-	
1645.823[g] *6*	4^+	
1650.33[h] *3*	0^+	
1660.905[e] *9*	3^+	
1716.044[f] *7*	$(1,2^+)$	J$^\pi$: In ^{154}Gd Adopted Levels, J$^\pi$=2^+.
1719.557[c] *6*	2^-	
1770.195[g] *7*	5^+	
1775.429[h] *14*	2^+	
1796.947[c] *7*	3^-	
1836.365 *14*	(0,1,2)	J$^\pi$: E0 to the 0^+ level at 680 indicates J$^\pi$=0^+. However, γ to g.s. suggests that J$^\pi$ is not 0^+.

Continued on next page (footnotes at end of table)

^{153}Gd(n,γ) E=th 1996SpZZ (continued)

^{154}Gd Levels (continued)

E(level)[†]	Jπ[‡]	Comments
1900.097 *14*	(0,1,2)	Jπ: In ^{154}Gd Adopted Levels, Jπ=(2+).
1911.536[g] *7*	6+	
1912.19 *12*	(0,1,2)	
1943.95 *3*	(0,1,2)	Jπ: Assigned (1,2+) in ^{154}Gd Adopted Levels.
1948.546 *10*	5−	Assigned as belonging to either the Kπ=1− or the Kπ=2− octupole bands. Jπ: As discussed in the ^{154}Gd Adopted Levels Jπ can be 2+, 3±, 4± or 5−.
1963.804 *19*	(1,2+)	Jπ: In ^{154}Gd Adopted Levels, Jπ=(2)+.
1973.11 *17*	(1,2+)	Jπ: In ^{154}Gd Adopted Levels, Jπ=2+.
2023.87 *7*	(1,2+)	
2041.04 *9*	(0,1,2)	Jπ: Assigned (1,2)+ in ^{154}Gd Adopted Levels.
2080.230[f] *20*	(3,4+)	Jπ: In ^{154}Gd Adopted Levels, Jπ=4+.
2080.780 *10*	(2+,3)	Jπ: In ^{154}Gd Adopted Levels, Jπ=3−.
2101.53 *16*	(1,2)	
2113.70 *3*	(2+)	Jπ: Assigned 2+ in ^{154}Gd Adopted Levels.
2119.525 *23*	1+	Jπ: Assigned 1+,2+ in ^{154}Gd Adopted Levels.
2148.80 *6*	(1,2)+	
2176.00 *3*	(1,2)	Jπ: Assigned (1+) in ^{154}Gd Adopted Levels.
2185.852 *13*	4−	
2186.97 *3*	1+	
2222.49 *3*	(2+)	
2229.73 *3*	2+	Jπ: Assigned (2+) in ^{154}Gd Adopted Levels.
2248.98 *3*	(3+)	Jπ: Assigned (3) in ^{154}Gd Adopted Levels.
2266.24 *4*	(2+,3,4+)	
2277.7 *4*	3−	Jπ: Assigned 3 in ^{154}Gd Adopted Levels.
2293.47 *3*	(2,3)	Jπ: Assigned (3)+ in ^{154}Gd Adopted Levels.
2299.42 *17*	(1,2)	
2302.38 *21*	(1,2)	
2305.75 *3*	3+	
2309.51 *12*	(0,1,2)	Jπ: Assigned (2)+ in ^{154}Gd Adopted Levels.
2336.64 *9*	3−	
2342.03 *19*	(1,2+)	
2369.4 *4*	2+,3,4+	
2381.43 *4*	1−	Jπ: Assigned 0+,1,2 in ^{154}Gd Adopted Levels.
2385.96 *3*	(4+)	
2401.38 *15*	(1,2+)	
2403.1 *3*	(4+)	
2406.27 *21*	(2+,3)	Jπ: Assigned 2+ in ^{154}Gd Adopted Levels.
2410.82 *3*	(4+)	
2430.32 *24*	(1,2+)	
2433.75 *4*	(0,1,2)	Jπ: Assigned 0+,1,2 in ^{154}Gd Adopted Levels.
2441.99 *8*	(1,2)	
2449.23 *25*	(1,2)	
2459.76 *18*	(1,2)	Jπ: Assigned 2+ in ^{154}Gd Adopted Levels.
2468.41 *4*	(1,2+)	
2481.75 *15*	(1,2)	Jπ: Assigned 2+ in ^{154}Gd Adopted Levels.
2487.66 *15*	(1,2)	Jπ: Assigned 1,2+ in ^{154}Gd Adopted Levels.
2495.73 *4*	(1,2+)	
2499.51 *15*	(1,2+)	Jπ: Assigned 2+ in ^{154}Gd Adopted Levels.
2502.61 *13*	(1,2)	Jπ: Assigned 1,2+ in ^{154}Gd Adopted Levels.
2512.22 *12*	(0,1,2)	Jπ: Assigned 2 in ^{154}Gd Adopted Levels.
2514.97 *24*	(1,2)	Jπ: Assigned 1,2+ in ^{154}Gd Adopted Levels.
2534.03 *8*	(0,1,2)	Jπ: Assigned 0+,1,2 in ^{154}Gd Adopted Levels.

Continued on next page (footnotes at end of table)

^{153}Gd(n,γ) E=th 1996SpZZ (continued)

^{154}Gd Levels (continued)

E(level)[†]	J$^\pi$[‡]	Comments
2561.79 *16*	(0,1,2,3$^-$)	J$^\pi$: Assigned 2,3$^-$ in ^{154}Gd Adopted Levels.
2569.30 *8*	(0,1,2)	J$^\pi$: Assigned 2 in ^{154}Gd Adopted Levels.
2586.21 *14*	(0,1,2)	J$^\pi$: Assigned 0$^+$ in ^{154}Gd Adopted Levels.
2590.318 *24*	(1,2$^+$)	J$^\pi$: Assigned (1,2)$^+$ in ^{154}Gd Adopted Levels.
2633.19 *24*	2$^-$	J$^\pi$: Assigned 1,2$^+$ in ^{154}Gd Adopted Levels.
2637.42 *17*	(0,1,2)	J$^\pi$: Assigned (2)$^-$ in ^{154}Gd Adopted Levels.
2655.80 *17*	2$^+$	
2686.51 *21*	(0,1,2)	J$^\pi$: Assigned 2 in ^{154}Gd Adopted Levels.
2699.3 *4*	(0,1,2)	J$^\pi$: Assigned 0$^+$,1,2 in ^{154}Gd Adopted Levels.
2710.59 *25*	(0,1,2)	J$^\pi$: Assigned 1,2$^+$ in ^{154}Gd Adopted Levels.
2722.41 *9*	(1,2$^+$)	
2734.37 *18*	(1,2$^+$)	J$^\pi$: Assigned 1$^+$,2$^+$ in ^{154}Gd Adopted Levels.
2741.01 *24*	(0,1,2,3$^-$)	J$^\pi$: Assigned 2$^+$,3$^-$ in ^{154}Gd Adopted Levels.
2743.9 *4*	(0,1,2)	J$^\pi$: Assigned 0$^+$ in ^{154}Gd Adopted Levels.
2788.46 *6*	(1,2$^+$)	
2850.07 *17*	(1,2$^+$)	J$^\pi$: Assigned 2$^+$ in ^{154}Gd Adopted Levels.
2872.63 *20*	(1,2$^+$)	J$^\pi$: Assigned 2$^+$ in ^{154}Gd Adopted Levels.
2933.3 *4*	(1,2$^+$)	J$^\pi$: Assigned 1$^+$ in ^{154}Gd Adopted Levels.
2949.25 *4*	(1,2$^+$)	J$^\pi$: Assigned 2$^+$ in ^{154}Gd Adopted Levels.
2990.09 *19*	(1,2$^+$)	
3022.99 *17*	(1,2$^+$)	J$^\pi$: Assigned 2$^+$ in ^{154}Gd Adopted Levels.
3031.5 *3*	(1,2$^+$)	
3122.56 *24*	(1,2$^+$)	J$^\pi$: Assigned (1$^+$) in ^{154}Gd Adopted Levels.
3184.04 *17*	(1,2$^+$)	
3264.31 *14*	(1,2$^+$)	
3327.31 *20*	(1,2$^+$)	
3414.73 *17*	(1,2$^+$)	
3550.25 *22*	(2$^+$,3,4$^+$)	
8894.71 *17*	1$^-$	E(level): neutron-capture "state". Listed value is S(n). J$^\pi$: From s-wave n capture by a 3/2$^-$ state, J$^\pi$=1$^-$, 2$^-$. primary capture γ's feeding final states with J$^\pi$=0$^+$ rules out 2$^-$. thermal-neutron capture is dominated by the 0.0297-eV resonance, for which J$^\pi$ is thus 1$^-$.

[†] Calculated from a least-squares fit to the listed Eγ values. Four out of 452 Eγ values differ from the calculated ones by more than 3σ.

[‡] From the authors and based on γ multipolarities, previous assignments, and proposed band structure. If assignments differ from those in ^{154}Gd Adopted Levels, this is noted (a difference involving parentheses only is not noted).

[#] Band(A): Ground-state band.

[@] Band(B): First excited K$^\pi$=0$^+$ band. Probable β vibration.

[&] Band(C): γ-vibrational band.

[a] Band(D): K$^\pi$=0$^-$ octupole-vibrational band.

[b] Band(E): K$^\pi$=1$^-$ octupole vibrational band.

[c] Band(F): K$^\pi$=2$^-$ octupole-vibrational band.

[d] Band(G): Second excited K$^\pi$=0$^+$ band. Intruder band. Band is associated with a smaller deformation (2003Ku19) and is proposed by these authors to be α "pairing isomer".

[e] Band(H): Second excited K$^\pi$=2$^+$ band.

[f] Band(I): Excited K$^\pi$=0$^+$ band Assigned as the 0$^+$ $\gamma\gamma$-vibrational band by 1996SpZZ, but this is not supported by 2004Ku13.

[g] Band(J): K$^\pi$=4$^+$ band. Proposed hexadecapole-vibrational band. Assigned as the 4$^+$ $\gamma\gamma$-vibrational band by 1996SpZZ. However, the single-nucleon-transfer data of 2001Bu17 (and 1994Bu16) indicate that this band is not, at least predominantly, a two-phonon excitation.

[h] Band(K): Excited K$^\pi$=0$^+$ band.

^{153}Gd(n,γ) E=th 1996SpZZ (continued)

γ(^{154}Gd)

There are many unplaced γ's, but most not are listed here because the authors have not assigned any of them to particular nuclides. α subsequent study of the ^{154}Eu β^- decay has shown that the placement of several γ's in the (n,γ) reaction are likely incorrect. These cases are indicated, with appropriate comments.
Several minor discrepancies exist in the γ data between different tables in this reference. In these cases, the evaluator has chosen to use the values from their γ-ray "line list" (their table 1).

E_γ[†]	I_γ[‡][b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[c]	Comments
42.7605 *16*	2.0 *6*	2229.73	2^+	2186.97	1^+			
44.4819 *14*	1.8 *5*	2293.47	(2,3)	2248.98	(3^+)			
46.4499 *8*	3.0 *3*	2222.49	(2^+)	2176.00	(1,2)			
52.322 *2*	2.3 *8*	2433.75	(0,1,2)	2381.43	1^-			
61.9796 *12*	3.1 *3*	2495.73	($1,2^+$)	2433.75	(0,1,2)			
62.2937 *18*	1.3 *3*	2176.00	(1,2)	2113.70	(2^+)	M1,E2	12 *4*	
63.732[d] *2*	0.9[d] *3*	1900.097	(0,1,2)	1836.365	(0,1,2)			
63.732[d] *2*	0.9[d] *3*	2293.47	(2,3)	2229.73	2^+			
71.029 *5*	3.0 *3*	2293.47	(2,3)	2222.49	(2^+)			
76.015 *4*	4.6[@] *10*	2305.75	3^+	2229.73	2^+	(M1)	4.43	
92.039 *4*	0.5 *2*	2534.03	(0,1,2)	2441.99	(1,2)			
99.005	0.4	2633.19	2^-	2534.03	(0,1,2)			
105.071[d] *8*	1.6[d] *3*	2185.852	4^-	2080.780	(2^+,3)			
105.071[d] *8*	1.6[d] *3*	2410.82	(4^+)	2305.75	3^+			
[x]112.096 *2*	4.6[@] *2*					(E2)		Placed from a 1294 level by 1996SpZZ, but 2004Ku13, in ^{154}Eu β^- decay, do not confirm the existence of this level.
[x]116.868 *4*	0.7 *2*							Placed from the 1531 level by 1996SpZZ. 2004Ku13, from ^{154}Eu β^- decay, do not report this γ and, for such a placement, set a much smaller upper limit for its intensity. The evaluator thus regards this γ and/or its placement as questionable.
[x]120.2433 *18*	0.8[@] *1*							Placed from the 1414 level by 1996SpZZ. 2004Ku13, from ^{154}Eu β^- decay, do not report this γ.
[x]122.651 *5*	1.3[@] *1*							Placed from the 1418 level by 1996SpZZ. 2004Ku13, from ^{154}Eu β^- decay, do not report this γ and, for such a placement, set a smaller upper limit for its intensity. The evaluator thus regards this γ and/or its placement as questionable.
123.068 *4*	275×10[1] *11*	123.074	2^+	0	0^+	E2	1.187	
[x]123.964 *4*	1.2 *2*							Placed from the 1418 level by 1996SpZZ. 2004Ku13, from ^{154}Eu β^- decay, do not report this γ.
124.371 *3*	2.0 *1*	1770.195	5^+	1645.823	4^+			
127.305 *3*	0.7[&] *1*	2569.30	(0,1,2)	2441.99	(1,2)	(E2,E1)		

From ENSDF

$^{154}_{64}Gd_{90}$-4

^{153}Gd(n,γ) E=th 1996SpZZ (continued)

γ(^{154}Gd) (continued)

E_γ[†]	I_γ[‡b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[c]	Comments
127.439 *4*	0.6[&] *1*	1963.804	(1,2$^+$)	1836.365	(0,1,2)	(E2,E1)		
131.544 *5*	0.8 *1*	1127.792	3$^+$	996.257	2$^+$			
132.235 *4*	0.6 *1*	2080.780	(2$^+$,3)	1948.546	5$^-$			
134.8236 *12*	4.1 *1*	815.490	2$^+$	680.666	0$^+$	E2	0.859	
135.271 *6*	0.3 *1*	2248.98	(3$^+$)	2113.70	(2$^+$)			
136.979 *10*	0.3 *1*	2385.96	(4$^+$)	2248.98	(3$^+$)			
141.341 *3*	1.7 *1*	1911.536	6$^+$	1770.195	5$^+$	E2,M1	0.740 *16*	
151.614 *10*	0.6 *1*	1948.546	5$^-$	1796.947	3$^-$			
[x]159.555 *4*	0.6 *1*							Placed from the 1719 level by 1996SpZZ. 2004Ku13, from ^{154}Eu β$^-$ decay, do not report this γ and, for such a placement, set a smaller upper limit for its intensity. The evaluator thus regards this γ and/or its placement as questionable.
[x]162.58 *12*	0.4 *1*							Doubly placed (from the 1414 and 1560 levels) by 1996SpZZ. however, 2004Ku13 report both levels in ^{154}Eu β$^-$ decay but set α much smaller upper limit on the Iγ value than is given here. The evaluator regards this γ and/or its placement(s) as questionable.
166.520 *3*	1.5 *1*	1418.159	2$^+$	1251.641	3$^-$			
168.810 *4*	0.7[@] *1*	1432.598	5$^+$	1263.787	4$^+$	(M1,E2)	0.43 *4*	
176.868 *3*	1.4 *2*	1418.159	2$^+$	1241.290	1$^-$			
188.254 *4*	1.1 *1*	1719.557	2$^-$	1531.301	2$^+$			
[x]227.644 *14*	0.6 *2*							Placed from the 1645 level by 1996SpZZ. 2004Ku13, from ^{154}Eu β$^-$ decay, do not report this γ and, for such a placement, set a much smaller upper limit for its intensity. The evaluator thus regards this γ and/or its placement as questionable.
232.101 *3*	17.5 *14*	1047.593	4$^+$	815.490	2$^+$	E2	0.1359	
236.064 *3*	2.7 *3*	1418.159	2$^+$	1182.091	0$^+$			
241.750 *7*	2.2[@] *3*	1645.823	4$^+$	1404.083	5$^-$			
245.97 *2*	2.0 *2*	2468.41	(1,2$^+$)	2222.49	(2$^+$)	(M1)	0.1628	
247.920 *8*	1269 *25*	371.008	4$^+$	123.074	2$^+$	E2	0.1098	
257.751 *18*	1.1 *3*	2433.75	(0,1,2)	2176.00	(1,2)			
[x]258.912 *13*	2.2 *2*							Placed from a 1790, (4$^+$), level by 1996SpZZ, possibly in light of such a level previously reported in the ^{154}Eu β$^-$ decay (albeit with different decay γ′s). However, 2004Ku13 place the (4$^+$) level at 1788 keV and list quite different deexciting γ′s for IT. The evaluator does not adopt this "1790" level and thus show this γ as unplaced.
267.499[d] *16*	3.5[d] *2*	1263.787	4$^+$	996.257	2$^+$	(E2)	0.0862	
267.499[d] *16*	3.5[d] *2*	1531.301	2$^+$	1263.787	4$^+$	(E2)	0.0862	
279.640 *15*	1.2 *2*	1531.301	2$^+$	1251.641	3$^-$			
[x]283.007 *6*	1.9 *4*							Placed from the 1559 level by 1996SpZZ. 2004Ku13, from ^{154}Eu β$^-$

From ENSDF

$^{154}_{64}Gd_{90}$-5

^{153}Gd(n,γ) E=th 1996SpZZ (continued)

γ(^{154}Gd) (continued)

E_γ [†]	I_γ [‡b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[c]	$I_{(\gamma+ce)}$[b]	Comments
									decay, do not report this γ and, for such a placement, set a much smaller upper limit for its intensity. The evaluator thus regards this γ and/or its placement as questionable.
290.365 *6*	2.0[@] *1*	1418.159	2^+	1127.792	3^+				
318.306 *11*	3.3 *5*	1365.884	6^+	1047.593	4^+				
329.920 *4*	7.8 *2*	1047.593	4^+	717.666	6^+	E2	0.0451		
331.47 *2*	1.5 *2*	1948.546	5^-	1617.087	3^-				
332.692 *8*	10.8 *4*	1573.973	0^+	1241.290	1^-				
346.643 *5*	49.3 *15*	717.666	6^+	371.008	4^+	E2	0.0389		
[x]351.650 *14*	2.4[@] *3*					(E2)			Placed from the 1645 level by 1996SpZZ. 2004Ku13, from ^{154}Eu β^- decay, do not report this γ and, for such a placement, set a much smaller upper limit for its intensity. The evaluator thus regards this γ and/or its placement as questionable.
364.32 *6*	0.7 *2*	2080.230	$(3,4^+)$	1716.044	$(1,2^+)$				
366.581 *6*	21.9 *7*	1182.091	0^+	815.490	2^+	E2	0.0330		
370.568 *19*	9.0 *6*	1418.159	2^+	1047.593	4^+	E2	0.0320		
382.025 *7*	2.9 *2*	1645.823	4^+	1263.787	4^+	M1,E2	0.040 *11*		
391.85 *4*		1573.973	0^+	1182.091	0^+	E0		0.1	I_γ: <0.5.
[x]392.863 *2*	4.3 *16*								Placed from the 1796 level by 1996SpZZ. 2004Ku13, from ^{154}Eu β^- decay, do not report this γ and, for such a placement, set a much smaller upper limit for its intensity. The evaluator thus regards this γ and/or its placement as questionable.
[x]394.218 *18*	1.3 *3*								Placed from the 1645 level by 1996SpZZ. 2004Ku13, from ^{154}Eu β^- decay, do not report this γ and, for such a placement, set a much smaller upper limit for its intensity. The evaluator thus regards this γ and/or its placement as questionable.
397.14 *2*	3.1 *3*	1660.905	3^+	1263.787	4^+				
401.30 *4*	3.7 *3*	1397.572	2^-	996.257	2^+	E1,E3			
403.506 *5*	6.2 *2*	1531.301	2^+	1127.792	3^+				
404.321[f] *9*	3.0 *3*	1770.195	5^+	1365.884	6^+				I_γ: Originally placed from this level and a 1698 level by 1996SpZZ, but 2004Ku13 do not confirm this latter level. Also, peak contains a contribution from a ^{153}Gd impurity.
415.53 *8*	1.1 *3*	2185.852	4^-	1770.195	5^+				
419.28 *3*	2.0 *10*	2080.230	$(3,4^+)$	1660.905	3^+	(M1)	0.0397		
[x]419.55 *5*	0.7 *4*					M2	0.1383		Placed from the 1660 level, but this placement is not confirmed in ^{154}Eu β^- decay. Mult.: From α(K)exp=0.11 *6* (1996SpZZ).

From ENSDF

^{153}Gd(n,γ) E=th 1996SpZZ (continued)

γ(^{154}Gd) (continued)

E_γ [†]	I_γ [‡b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[c]	$I_{(\gamma+ce)}$[b]	Comments
421.893 *13*	2.4 *3*	1418.159	2^+	996.257	2^+	E0+E2,M1			
425.778 *13*	1.9 *2*	1241.290	1^-	815.490	2^+				
434.42 *4*	1.5 *5*	2080.230	$(3,4^+)$	1645.823	4^+				
444.480 *6*	184 *4*	815.490	2^+	371.008	4^+	E2	0.0191		
463.80 *4*	1.2 *3*	2080.780	$(2^+,3)$	1617.087	3^-				
464.391 *13*	2.7 *2*	1716.044	$(1,2^+)$	1251.641	3^-				
470.793 *7*	4.9 *2*	2590.318	$(1,2^+)$	2119.525	1^+	M1	0.0295		
474.753 *13*	3.7 *3*	1716.044	$(1,2^+)$	1241.290	1^-				
476.04[f] *4*	1.3 *3*	2266.24	$(2^+,3,4^+)$						As placed, this γ feeds a 1790 level. However, from the ^{154}Eu β^- decay, that level is actually at 1788 keV. The evaluator concludes that the placement of this γ is questionable. It is not included in the Adopted Gammas.
478.89 *5*	0.7 *2*	1911.536	6^+	1432.598	5^+				
483.68 *2*	4.4 *7*	1531.301	2^+	1047.593	4^+				
501.419 *8*		1182.091	0^+	680.666	0^+	E0		1.2	I_γ: <1.0.
506.44 *4*	2.0 *5*	1770.195	5^+	1263.787	4^+				
518.012 *16*	15.6 *5*	1645.823	4^+	1127.792	3^+				
520.76 *3*	2.3 *3*	2080.780	$(2^+,3)$	1560.002	4^-				
[x]526.35 *10*	1.6 *6*								See the comment on the 258.912 γ above.
533.13[e] *3*	0.8[e] *3*	1660.905	3^+	1127.792	3^+	(E0+E2,M1)			I_γ: For the doublet, Iγ=5.1 *2*. Evaluator deduced split in intensity from Iγ(533)/Iγ(845)=0.012 *4* from ^{154}Gd Adopted γ radiations.
533.13[e] *3*	4.5[e]	1796.947	3^-	1263.787	4^+	(E1)	0.00408		I_γ: Evaluator's decomposition of doublet with Iγ=5.1 *2*, based Iγ(533)/Iγ(800)=0.194 from ^{154}Gd Adopted γ's.
535.050 *11*	14.4 *6*	1531.301	2^+	996.257	2^+	E0+E2,M1			
540.15 *6*	7.5 *7*	2185.852	4^-	1645.823	4^+				
[x]542.24 *6*	2.4 *4*								Placed from the 1836.365 level by 1996SpZZ. However, with this placement, the final state is a 1294.1 level, whose existence 2004Ku13 do not confirm.
546.083 *14*	3.6[@] *3*	1263.787	4^+	717.666	6^+	(E2)	0.01110		
[x]555.685 *17*	2.7 *3*								Placed from the 1796 level by 1996SpZZ. 2004Ku13, from ^{154}Eu β^- decay, do not report this γ and, for such a placement, set a much smaller upper limit for its intensity. The evaluator thus regards this γ and/or its placement as questionable.
557.582 *7*	330 *7*	680.666	0^+	123.074	2^+	E2	0.01053		
560.83 *10*	3.8 *13*	1241.290	1^-	680.666	0^+				
577.704 *12*	16.2 *3*	1573.973	0^+	996.257	2^+	E2	0.00963		
582.097 *12*	14.5 *6*	1397.572	2^-	815.490	2^+	E1	0.00337		
588.254 *7*	8.8 *4*	1716.044	$(1,2^+)$	1127.792	3^+	E2	0.00920		
591.769 *10*	22.9 *14*	1719.557	2^-	1127.792	3^+	E1,E3,M2			

From ENSDF

$^{154}_{64}Gd_{90}$-7

^{153}Gd(n,γ) E=th 1996SpZZ (continued)

γ(^{154}Gd) (continued)

E_γ [†]	I_γ [‡b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[c]	$I_{(\gamma+ce)}$[b]	Comments
595.070 *13*	23.6 *5*	1836.365	(0,1,2)	1241.290	1^-	E1	0.00321		
598.22 *2*	3.5[@] *1*	1645.823	4^+	1047.593	4^+	(E0,E2,M1)			
598.96 *4*	9.9[@] *6*	1414.433	1^-	815.490	2^+				
602.688 *9*	50.9 *10*	1418.159	2^+	815.490	2^+	E0+E2,M1			
613.289 *10*	11.4 *8*	1660.905	3^+	1047.593	4^+	E2,M1	0.012 *4*		
625.263 *9*	9.6 *4*	996.257	2^+	371.008	4^+	E2	0.00792		
642.40 *2*	9.6 *5*	1770.195	5^+	1127.792	3^+	E2	0.00742 *11*		Mult.: Reported M1,E2 incompatible with J^π's.
647.7[d] *2*	1.8[d] *7*	1775.429	2^+	1127.792	3^+				
647.7[d] *2*	1.8[d] *7*	1911.536	6^+	1263.787	4^+				
648.3 *3*	1.8 *7*	1365.884	6^+	717.666	6^+				
649.565 *11*	27.3 *8*	1645.823	4^+	996.257	2^+	E2	0.00722		
669.154 *16*	19.0 *10*	1796.947	3^-	1127.792	3^+	E1	0.00251		
[x]669.62 *6*	5.1 *12*								Placed from the 1963.804 level by 1996SpZZ. However, with this placement, the final state is a 1294.1 level, whose existence 2004Ku13 do not confirm.
676.593 *7*	123.1 *25*	1047.593	4^+	371.008	4^+	E0+E2+M1		128 *26*	
680.654 *7*		680.666	0^+	0	0^+	E0		7.2	I_γ: <2.0.
683.13 *4*	5.6 *4*	2080.780	$(2^+,3)$	1397.572	2^-	M1	0.01156		
692.410 *7*	545 *11*	815.490	2^+	123.074	2^+	E0+E2+M1		567 *12*	
696.82 *3*	3.2 *3*	1948.546	5^-	1251.641	3^-				
705.05 *3*	7.7 *4*	2119.525	1^+	1414.433	1^-				
714.94 *5*	6.9 *13*	1432.598	5^+	717.666	6^+	E2,M1	0.0080 *23*		
715.819 *9*	50.0 *15*	1531.301	2^+	815.490	2^+	E0+E2,M1			
719.80 *3*	5.4 *7*	1716.044	$(1,2^+)$	996.257	2^+				
721.97 *4*	12.5 *11*	2119.525	1^+	1397.572	2^-				
722.59 *8*	2.5 *9*	1770.195	5^+	1047.593	4^+				
723.300 *13*	89.8 *18*	1719.557	2^-	996.257	2^+				
727.821 *16*	9.3[@] *5*	1775.429	2^+	1047.593	4^+				
730.71 *6*	1.6 *6*	2148.80	$(1,2)^+$	1418.159	2^+	M1,E2	0.0076 *22*		
737.49 *14*	2.2 *4*	1418.159	2^+	680.666	0^+				
756.765 *6*	106 *4*	1127.792	3^+	371.008	4^+	E2+M1	0.0070 *20*		
758.462 *14*	19.0 *10*	1573.973	0^+	815.490	2^+				
761.86 *3*	32.2[@] *16*	1943.95	(0,1,2)	1182.091	0^+	(E1)	0.00192		
800.731 *15*	23.2 *9*	1796.947	3^-	996.257	2^+	E1	1.74×10^{-3}		
815.509 *9*	164 *7*	815.490	2^+	0	0^+	E2	0.00427		
817.05 *7*	4.2[@] *10*	2080.780	$(2^+,3)$	1263.787	4^+				
834.88 *5*	5.2[&] *15*	1650.33	0^+	815.490	2^+				
835.54 *3*	26.0[@] *16*	2949.25	$(1,2^+)$	2113.70	(2^+)	(M1)	0.00705		

From ENSDF

$^{154}_{64}Gd_{90}$-8

^{153}Gd(n,γ) E=th 1996SpZZ (continued)

γ(^{154}Gd) (continued)

E_γ [†]	I_γ [‡b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[c]	$I_{(\gamma+ce)}$[b]	Comments
845.46 *2*	68.1 *27*	1660.905	3^+	815.490	2^+	E2	0.00394		
850.64 *3*	67 *5*	1531.301	2^+	680.666	0^+	E2	0.00389		
872.46 *5*	33 *4*	2113.70	(2^+)	1241.290	1^-				
873.18 *2*	419 *8*	996.257	2^+	123.074	2^+	E0+E2+M1		420	
880.640 *10*	89.6 *27*	1251.641	3^-	371.008	4^+	E1,E3,M2			
892.782 *11*	85.3 *26*	1263.787	4^+	371.008	4^+	E0+E2+M1		85.6	
904.1 *2*	4.7 *9*	1719.557	2^-	815.490	2^+	(E1,E3)			
924.55 *3*	47.0 *19*	1047.593	4^+	123.074	2^+	E2	0.00325		
952.39 *4*	21.6 *15*	2080.230	$(3,4^+)$	1127.792	3^+	M1,E2	0.0041 *11*		
960.05 *9*	5.2 *20*	1775.429	2^+	815.490	2^+				
969.67 *9*		1650.33	0^+	680.666	0^+	E0		0.2	I_γ: <7.
981.59 *6*	14.5 *23*	1796.947	3^-	815.490	2^+				
985.43 *13*	8.7 *22*	2248.98	(3^+)	1263.787	4^+				
986.21 *16*	6.3 *19*	2113.70	(2^+)	1127.792	3^+				
991.88 *6*	17[@] *4*	2119.525	1^+	1127.792	3^+				Mult.: Reported as (E1), but J^π requires E2.
996.264 *8*	383 *11*	996.257	2^+	0	0^+	E2	0.00277		
1004.729 *12*	367 *18*	1127.792	3^+	123.074	2^+	E2+M1	0.0036 *9*		
1006.9 *4*	21 *5*	2248.98	(3^+)	1241.290	1^-				
1020.26 *17*	10.3 *20*	2385.96	(4^+)	1365.884	6^+				
1033.11[e] *3*	≤11[e]	1404.083	5^-	371.008	4^+				I_γ: 1996SpZZ report Iγ=30.9 *15* for the composite peak.
1033.11[e] *3*	25[e] *6*	2080.780	$(2^+,3)$	1047.593	4^+				I_γ: 1996SpZZ report Iγ=30.9 *15* for the composite peak.
1044.90 *12*	10.3 *14*	2041.04	(0,1,2)	996.257	2^+	M1	0.00412		
1047.181 *13*	113 *8*	1418.159	2^+	371.008	4^+	E2	0.00250		
1059.033 *12*	121 *6*	1182.091	0^+	123.074	2^+	E2	0.00244		
1061.6 *2*	32[@] *6*	1432.598	5^+	371.008	4^+	(E2,M1)	0.0032 *8*		
1068.78 *7*	12 *4*	2788.46	$(1,2^+)$	1719.557	2^-				
1084.29[d] *12*	16.2[d] *24*	2080.230	$(3,4^+)$	996.257	2^+				
1084.29[d] *12*	16.2[d] *24*	2080.780	$(2^+,3)$	996.257	2^+				
1094.91 *8*	12.8 *22*	1775.429	2^+	680.666	0^+	E2	0.00228		
1096.62 *17*	7.6 *17*	1912.19	(0,1,2)	815.490	2^+				
1102.00 *15*	5.8[&] *9*	2229.73	2^+	1127.792	3^+				
1118.237 *16*	261 *8*	1241.290	1^-	123.074	2^+	E1			
1120.6 *5*	15 *5*	2248.98	(3^+)	1127.792	3^+				
1123.11 *14*	19 *3*	2119.525	1^+	996.257	2^+	E2,M1	0.0028 *7*		I_γ: From branching in ^{154}Gd Adopted Levels, Gammas, Iγ=9.3 *12* is expected, so γ is probably a doublet.
1128.555 *13*	282 *6*	1251.641	3^-	123.074	2^+	E1,E3,M2			
1133.5 *4*	13.5 *28*	2385.96	(4^+)	1251.641	3^-				
1140.74 *4*	46 *5*	1263.787	4^+	123.074	2^+	E2	0.00210		
1155.75 *7*		1836.365	(0,1,2)	680.666	0^+	E0			I_γ: <5.
1160.5 *3*	17 *4*	1531.301	2^+	371.008	4^+				

From ENSDF

$^{154}_{64}Gd_{90}$-9

^{153}Gd(n,γ) E=th 1996SpZZ (continued)

γ(^{154}Gd) (continued)

E_γ †	I_γ ‡ b	E_i(level)	J_i^π	E_f	J_f^π	Mult. #	α c	$I_{(\gamma+ce)}$ b	Comments
1182.07 *2*		1182.091	0^+	0	0^+	E0		0.3	
1188.90 *12*	29 *5*	1560.002	4^-	371.008	4^+				
1201.0 *5*	6.8 *16*	2248.98	(3^+)	1047.593	4^+				
1208.83 *9*	18.8 *17*	2336.64	3^-	1127.792	3^+				
1218.58 *11*	25.2 @ *18*	2266.24	$(2^+,3,4^+)$	1047.593	4^+	(M1)	0.00287		
1233.5 *4*	12.2 *24*	2229.73	2^+	996.257	2^+				
1241.304 *14*	321 *16*	1241.290	1^-	0	0^+	E1			
1246.10 *2*	88 *6*	1617.087	3^-	371.008	4^+	E1			
x1252.0 *4*	13.7 *22*								Placed from the 1251 level by 1996SpZZ. 2004Ku13, from ^{154}Eu β^- decay, do not report this γ and, for such a placement, set a much smaller upper limit for its intensity. The evaluator thus regards this γ and/or its placement as questionable.
1262.0 *3*	16.1 *18*	2309.51	(0,1,2)	1047.593	4^+				
1274.40 *3*	308 *9*	1397.572	2^-	123.074	2^+	E1,E3,M2			
1291.332 *17*	281 *11*	1414.433	1^-	123.074	2^+	E1			
1295.08 *13*	29 *6*	1418.159	2^+	123.074	2^+	E0+E2,M1			
1297.32 *10*	9 *4*	2293.47	(2,3)	996.257	2^+	M1	0.00249		
1313.25 *17*	18 *4*	2309.51	(0,1,2)	996.257	2^+	M1	0.00242		
1324.7 *3*	10.8 *10*	2722.41	$(1,2^+)$	1397.572	2^-				
1332.4 *3*	8.8 *12*	2148.80	$(1,2)^+$	815.490	2^+				
1345.0 *5*	12 *3*	1716.044	$(1,2^+)$	371.008	4^+				
1355.6 *4*	5.5 *14*	2403.1	(4^+)	1047.593	4^+				
1359.9 *2*	9.8 @ *11*	2176.00	(1,2)	815.490	2^+	(M1)	0.00225		
1363.1 d *3*	15.3 d *12*	2080.230	$(3,4^+)$	717.666	6^+				
1363.1 d *3*	15.3 d *12*	2410.82	(4^+)	1047.593	4^+				
1371.6 *5*	5.3 *14*	2186.97	1^+	815.490	2^+				
1374.1 *3*	8.8 *12*	2788.46	$(1,2^+)$	1414.433	1^-				
1389.6 *4*	12.2 *21*	2385.96	(4^+)	996.257	2^+				
1391.04 *11*	19.4 *16*	2788.46	$(1,2^+)$	1397.572	2^-				
1397.3 *8*	2.8 *10*	1397.572	2^-	0	0^+				
1399.7 d *3*	10.5 d *9*	1770.195	5^+	371.008	4^+				
1399.7 d *3*	10.5 d *9*	2080.780	$(2^+,3)$	680.666	0^+				
1404.6 d *3*	24.2 d *27*	1775.429	2^+	371.008	4^+	(E2)	1.44×10^{-3}		
1404.6 d *3*	24.2 d *27*	2401.38	$(1,2^+)$	996.257	2^+	(M1)	0.00210		
1408.2 *2*	20 *8*	1531.301	2^+	123.074	2^+	E0+E2,M1			
1414.50 *5*	78 *9*	1414.433	1^-	0	0^+	E1			
1417.89 *11*	31 *3*	1418.159	2^+	0	0^+	E2	1.41×10^{-3}		

From ENSDF

$^{154}_{64}Gd_{90}$-10

^{153}Gd(n,γ) E=th 1996SpZZ (continued)

γ(^{154}Gd) (continued)

E_γ[†]	I_γ[‡b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[c]	$I_{(\gamma+ce)}$[b]	Comments
1426.6 *3*	10.3 *10*	1796.947	3^-	371.008	4^+				
1432.9[d] *4*	17[d] *5*	2113.70	(2^+)	680.666	0^+				
1432.9[d] *4*	17[d] *5*	2248.98	(3^+)	815.490	2^+				
1451.7[d] *5*	5.1[d] *15*	1573.973	0^+	123.074	2^+				
1451.7[d] *5*	5.1[d] *15*	2266.24	$(2^+,3,4^+)$	815.490	2^+				
1458.3 *4*	11.6 *23*	2990.09	$(1,2^+)$	1531.301	2^+				
1486.4 *4*	18.8 *24*	2302.38	(1,2)	815.490	2^+				
1490.6 *4*	11.4 *26*	2305.75	3^+	815.490	2^+				I_γ: Doubly placed by 1996SpZZ, but the level (1861.55) associated with the other placement has been shown (by 2004Ku13 in ^{154}Eu β^- decay) not to exist.
1494.07 *5*	87 *6*	1617.087	3^-	123.074	2^+	E1			
1496.6 *6*	9 *3*	2176.00	(1,2)	680.666	0^+				
1506.1 *3*	17.2 *21*	2186.97	1^+	680.666	0^+				Mult.: Reported E1,E2 incompatible with J^π's.
1509.2 *3*	25.9 *10*	2637.42	(0,1,2)	1127.792	3^+	E1			
1521.4 *4*	15.5 *26*	2336.64	3^-	815.490	2^+				
1527.1 *3*	30.8 *12*	1650.33	0^+	123.074	2^+	E2			Mult.: Reported E1,E2 incompatible with J^π's.
1529.6 *3*	21.1 *19*	1900.097	(0,1,2)	371.008	4^+	E2	1.27×10^{-3}		
1531.6 *5*	7.8 *18*	1531.301	2^+	0	0^+				
1538.0 *3*	11.9 *12*	1660.905	3^+	123.074	2^+				
1541.5 *3*	28.3 *14*	2222.49	(2^+)	680.666	0^+	E2			Mult.: Reported E1,E2 incompatible with J^π's.
1548.8 *5*	7.8 *20*	2229.73	2^+	680.666	0^+				
1554.1 *4*	8.7 *12*	2369.4	$2^+,3,4^+$	815.490	2^+				
1569.8 *4*	7.4 *12*	2385.96	(4^+)	815.490	2^+				
1574.04 *5*		1573.973	0^+	0	0^+	E0		0.1	I_γ: <10.
1577.7 *3*	12.0 *10*	1948.546	5^-	371.008	4^+				
1592.8 *2*	60 *9*	1963.804	$(1,2^+)$	371.008	4^+	M1,E2	0.00143 *23*		
1593.4[d] *5*	9[d] *4*	1716.044	$(1,2^+)$	123.074	2^+				
1593.4[d] *5*	9[d] *4*	2590.318	$(1,2^+)$	996.257	2^+				
1596.4 *3*	20.5 *16*	1719.557	2^-	123.074	2^+				
1602.06 *19*	27.7 *17*	1973.11	$(1,2^+)$	371.008	4^+				
1607.0 *5*	17 *6*	2734.37	$(1,2^+)$	1127.792	3^+				
1631.2 *3*	13.9 *13*	2872.63	$(1,2^+)$	1241.290	1^-				
1650.31 *4*		1650.33	0^+	0	0^+	E0		0.1	I_γ: <5.
1652.36 *3*	61 *7*	1775.429	2^+	123.074	2^+	E0+E2,M1			
1675.1 *3*	12.6 *10*	2722.41	$(1,2^+)$	1047.593	4^+				
1693.7 *4*	9.3 *21*	2410.82	(4^+)	717.666	6^+				
1703.1 *4*	7.4 *12*	2699.3	(0,1,2)	996.257	2^+				
1709.7[d] *4*	10.2[d] *15*	2080.230	$(3,4^+)$	371.008	4^+				

From ENSDF

$^{154}_{64}Gd_{90}$-11

^{153}Gd(n,γ) E=th 1996SpZZ (continued)

γ(^{154}Gd) (continued)

E_γ [†]	I_γ [‡b]	E_i(level)	J_i^π	E_f	J_f^π	Comments
1709.7[d] 4	10.2[d] 15	2080.780	(2$^+$,3)	371.008	4$^+$	
1713.4 3	31.8 13	1836.365	(0,1,2)	123.074	2$^+$	
1715.7 6	7.6 26	1716.044	(1,2$^+$)	0	0$^+$	
1738.0 3	22.6 7	2734.37	(1,2$^+$)	996.257	2$^+$	
1742.7 3	11.2 9	2113.70	(2$^+$)	371.008	4$^+$	
1769.4 5	8.9 17	2449.23	(1,2)	680.666	0$^+$	
1771.7 5	8.8 17	3022.99	(1,2$^+$)	1251.641	3$^-$	
1773.7 6	5.8 21	2590.318	(1,2$^+$)	815.490	2$^+$	
1775.7 3	28.2 20	1775.429	2$^+$	0	0$^+$	
1781.4 3	13.2 12	3022.99	(1,2$^+$)	1241.290	1$^-$	
1786.5 3	16.6 13	3184.04	(1,2$^+$)	1397.572	2$^-$	
1788.9 3	52.8 11	1912.19	(0,1,2)	123.074	2$^+$	
1792.6 3	8.0 10	2788.46	(1,2$^+$)	996.257	2$^+$	
[x]1796.3 3	14.5 9					Placed from the 1796 level by 1996SpZZ. 2004Ku13 do not show a 1796 γ from this level.
1802.5 3	13.0 13	2850.07	(1,2$^+$)	1047.593	4$^+$	
1808.0 3	18.2 11	2990.09	(1,2$^+$)	1182.091	0$^+$	
1820.3 6	10.7 21	1943.95	(0,1,2)	123.074	2$^+$	
1822.2 4	9.6 26	2637.42	(0,1,2)	815.490	2$^+$	
1824.7 6	11 5	2872.63	(1,2$^+$)	1047.593	4$^+$	
1836.8 3	13 4	1836.365	(0,1,2)	0	0$^+$	
1840.8 3	32.0 10	1963.804	(1,2$^+$)	123.074	2$^+$	
1849.8 7	8 3	1973.11	(1,2$^+$)	123.074	2$^+$	
1851.0 4	25 7	2222.49	(2$^+$)	371.008	4$^+$	
1871.5 3	11.7 8	2686.51	(0,1,2)	815.490	2$^+$	
1877.8 3	17.0 10	2248.98	(3$^+$)	371.008	4$^+$	
1894.5 3	14.5 16	2266.24	(2$^+$,3,4$^+$)	371.008	4$^+$	
1900.73 11	91.3 9	2023.87	(1,2$^+$)	123.074	2$^+$	
1907.0 3	18.2 15	2722.41	(1,2$^+$)	815.490	2$^+$	
1909.4 3	21.5 15	2590.318	(1,2$^+$)	680.666	0$^+$	
1917.4 3	13.3 9	2041.04	(0,1,2)	123.074	2$^+$	
1922.8 3	14.0 21	2293.47	(2,3)	371.008	4$^+$	
1934.4 3	19.9 10	2305.75	3$^+$	371.008	4$^+$	
1964.7 4	20 3	1963.804	(1,2$^+$)	0	0$^+$	
1973.1[d] 4	5.4[d] 9	1973.11	(1,2$^+$)	0	0$^+$	
1973.1[d] 4	5.4[d] 9	2788.46	(1,2$^+$)	815.490	2$^+$	
1990.4 2	45.2 9	2113.70	(2$^+$)	123.074	2$^+$	
1996.4 3	31[a] 9	2119.525	1$^+$	123.074	2$^+$	
1997.8 7	12 5	2369.4	2$^+$,3,4$^+$	371.008	4$^+$	
2014.9 2	35.7 14	2385.96	(4$^+$)	371.008	4$^+$	
2023.8 4	9.4 28	2023.87	(1,2$^+$)	0	0$^+$	
2025.1 4	15 5	2148.80	(1,2)$^+$	123.074	2$^+$	

From ENSDF

$^{154}_{64}Gd_{90}$-12

^{153}Gd(n,γ) E=th 1996SpZZ (continued)

γ(^{154}Gd) (continued)

E_γ †	I_γ ‡ b	E_i(level)	J_i^π	E_f	J_f^π	E_γ †	I_γ ‡ b	E_i(level)	J_i^π	E_f	J_f^π
2032.0 *4*	9.1 *9*	2403.1	(4$^+$)	371.008	4$^+$	2336.4 *5*	30 *7*	2459.76	(1,2)	123.074	2$^+$
2034.6 *4*	9.3 *14*	2406.27	(2$^+$,3)	371.008	4$^+$	2342.1 *3*	54.1 *16*	2342.03	(1,2$^+$)	0	0$^+$
2041.1[d] *3*	18.6[d] *11*	2041.04	(0,1,2)	0	0$^+$	2344.9 *4*	30 *4*	2468.41	(1,2$^+$)	123.074	2$^+$
2041.1[d] *3*	18.6[d] *11*	2722.41	(1,2$^+$)	680.666	0$^+$	2358.4 *4*	21.0 *27*	2481.75	(1,2)	123.074	2$^+$
2064.0 *3*	49.1 *25*	2186.97	1$^+$	123.074	2$^+$	2364.0 *6*	15 *3*	2487.66	(1,2)	123.074	2$^+$
2082.4 *3*	46.9 *28*	3264.31	(1,2$^+$)	1182.091	0$^+$	2370.5 *4*	23 *3*	2741.01	(0,1,2,3$^-$)	371.008	4$^+$
2089.0 *3*	15.7 *17*	2459.76	(1,2)	371.008	4$^+$	2376.4 *3*	32.8 *20*	2499.51	(1,2$^+$)	123.074	2$^+$
2099.1 *3*	46.6 *19*	2222.49	(2$^+$)	123.074	2$^+$	2379.3 *2*	40.7 *16*	2502.61	(1,2)	123.074	2$^+$
2101.6 *3*	22.5 *16*	2101.53	(1,2)	0	0$^+$	2388.82 *18*	63.6 *25*	2512.22	(0,1,2)	123.074	2$^+$
2108.3 *3*	15.6 *12*	2788.46	(1,2$^+$)	680.666	0$^+$	2391.5 *4*	16.7 *18*	2514.97	(1,2)	123.074	2$^+$
2111.3 *3*	17.3 *14*	2481.75	(1,2)	371.008	4$^+$	2401.5 *3*	27.6 *14*	2401.38	(1,2$^+$)	0	0$^+$
2114.0 *5*	7.4 *14*	2113.70	(2$^+$)	0	0$^+$	2406.5 *5*	11.8 *26*	2406.27	(2$^+$,3)	0	0$^+$
2126.1 *2*	33 *7*	2248.98	(3$^+$)	123.074	2$^+$	2410.0 *6*	12 *3*	2534.03	(0,1,2)	123.074	2$^+$
2128.1 *3*	19 *3*	2499.51	(1,2$^+$)	371.008	4$^+$	2422.7 *3*	16.7 *12*	3550.25	(2$^+$,3,4$^+$)	1127.792	3$^+$
2141.8 *3*	36 *4*	2512.22	(0,1,2)	371.008	4$^+$	2430.2 *3*	29 *5*	2430.32	(1,2$^+$)	0	0$^+$
2148.6 *3*	20.2 *12*	2148.80	(1,2)$^+$	0	0$^+$	2438.0 *8*	5.7 *25*	2561.79	(0,1,2,3$^-$)	123.074	2$^+$
2154.6 *4*	15.0 *28*	2277.7	3$^-$	123.074	2$^+$	2442.3[d] *3*	24.8[d] *12*	2441.99	(1,2)	0	0$^+$
2176.2[d] *2*	51[d] *7*	2176.00	(1,2)	0	0$^+$	2442.3[d] *3*	24.8[d] *12*	3122.56	(1,2$^+$)	680.666	0$^+$
2176.2[d] *2*	51[d] *7*	2299.42	(1,2)	123.074	2$^+$	2445.1 *6*	17 *5*	2569.30	(0,1,2)	123.074	2$^+$
2179.4 *3*	48.6 *15*	2302.38	(1,2)	123.074	2$^+$	2448.9[d] *3*	29[d] *8*	2449.23	(1,2)	0	0$^+$
2187.02 *18*	68 *7*	2186.97	1$^+$	0	0$^+$	2448.9[d] *3*	29[d] *8*	3264.31	(1,2$^+$)	815.490	2$^+$
2190.3 *4*	14.5 *16*	2561.79	(0,1,2,3$^-$)	371.008	4$^+$	2459.4 *4*	11.5 *13*	2459.76	(1,2)	0	0$^+$
2197.5 *3*	33 *7*	2569.30	(0,1,2)	371.008	4$^+$	2462.4 *4*	12.4 *14*	2586.21	(0,1,2)	123.074	2$^+$
2213.5 *3*	15.8 *13*	2336.64	3$^-$	123.074	2$^+$	2467.8 *3*	28.4 *23*	2468.41	(1,2$^+$)	0	0$^+$
2218.7 *3*	21.9 *15*	2342.03	(1,2$^+$)	123.074	2$^+$	2482.0 *4*	16.3 *16*	2481.75	(1,2)	0	0$^+$
2222.2 *4*	24 *4*	2222.49	(2$^+$)	0	0$^+$	2487.5 *6*	22 *5*	2487.66	(1,2)	0	0$^+$
2229.6 *8*	13 *5*	2229.73	2$^+$	0	0$^+$	2496.4 *4*	22.1 *18*	2495.73	(1,2$^+$)	0	0$^+$
2232.9 *4*	11.9 *18*	3414.73	(1,2$^+$)	1182.091	0$^+$	2499.3 *3*	42.4 *17*	2499.51	(1,2$^+$)	0	0$^+$
2257.7 *4*	18 *6*	2381.43	1$^-$	123.074	2$^+$	2503.0[d] *3*	21.0[d] *15*	2502.61	(1,2)	0	0$^+$
2263.3 *3*	21.1 *17*	2385.96	(4$^+$)	123.074	2$^+$	2503.0[d] *3*	21.0[d] *15*	3184.04	(1,2$^+$)	680.666	0$^+$
2278.4 *2*	36.3 *22*	2401.38	(1,2$^+$)	123.074	2$^+$	2509.7 *4*	13.1 *12*	2633.19	2$^-$	123.074	2$^+$
2283.7 *3*	33.4 *20*	2406.27	(2$^+$,3)	123.074	2$^+$	2515.0[d] *4*	19.6[d] *20*	2514.97	(1,2)	0	0$^+$
2287.3 *3*	16.0 *13*	2410.82	(4$^+$)	123.074	2$^+$	2515.0[d] *4*	19.6[d] *20*	2637.42	(0,1,2)	123.074	2$^+$
2299.6 *3*	28.8 *20*	2299.42	(1,2)	0	0$^+$	2532.2 *3*	24.0 *14*	2655.80	2$^+$	123.074	2$^+$
2307.4 *4*	31 *3*	2430.32	(1,2$^+$)	123.074	2$^+$	2553.7 *3*	23.0 *12*	3550.25	(2$^+$,3,4$^+$)	996.257	2$^+$
2311.3 *3*	39 *4*	2433.75	(0,1,2)	123.074	2$^+$	2578.5 *5*	14.8 *27*	2949.25	(1,2$^+$)	371.008	4$^+$
2314.3 *7*	12 *4*	2686.51	(0,1,2)	371.008	4$^+$	2587.2 *4*	27.3 *22*	2710.59	(0,1,2)	123.074	2$^+$
2318.8 *3*	35 *3*	2441.99	(1,2)	123.074	2$^+$	2598.8[e] *3*	3.6[e] *12*	2722.41	(1,2$^+$)	123.074	2$^+$

From ENSDF

$^{154}_{64}Gd_{90}$-13

^{153}Gd(n,γ) E=th 1996SpZZ (continued)

γ(^{154}Gd) (continued)

E_γ †	I_γ ‡ b	E_i(level)	J_i^π	E_f	J_f^π	E_γ †	I_γ ‡ b	E_i(level)	J_i^π	E_f	J_f^π
2598.8 e 3	29 e 3	3414.73	(1,2$^+$)	815.490	2$^+$	6045.0 3	4.1 2	8894.71	1$^-$	2850.07	(1,2$^+$)
2610.9 3	19.9 10	2734.37	(1,2$^+$)	123.074	2$^+$	6151.1 6	3.5 8	8894.71	1$^-$	2743.9	(0,1,2)
2618.3 4	17.8 14	2741.01	(0,1,2,3$^-$)	123.074	2$^+$	6154.5 4	4.5 9	8894.71	1$^-$	2741.01	(0,1,2,3$^-$)
2621.0 4	16.6 15	2743.9	(0,1,2)	123.074	2$^+$	6172.09 11	9.4 4	8894.71	1$^-$	2722.41	(1,2$^+$)
2633.4 3	18 5	2633.19	2$^-$	0	0$^+$	6183.8 4	5.7 9	8894.71	1$^-$	2710.59	(0,1,2)
2646.6 2	35 3	3327.31	(1,2$^+$)	680.666	0$^+$	6195.3 6	1.4 2	8894.71	1$^-$	2699.3	(0,1,2)
2651.0 7	10 4	3022.99	(1,2$^+$)	371.008	4$^+$	6208.2 3	8.6 3	8894.71	1$^-$	2686.51	(0,1,2)
2656.0 2	28.5 23	2655.80	2$^+$	0	0$^+$	6257.3 3	4.3 3	8894.71	1$^-$	2637.42	(0,1,2)
2710.7 5	8.4 13	2710.59	(0,1,2)	0	0$^+$	6308.29 14	3.9 10	8894.71	1$^-$	2586.21	(0,1,2)
2722.7 4	8.5 12	2722.41	(1,2$^+$)	0	0$^+$	6325.30 12	6.3 4	8894.71	1$^-$	2569.30	(0,1,2)
2727.1 4	19.7 12	2850.07	(1,2$^+$)	123.074	2$^+$	6332.69 17	5.0 6	8894.71	1$^-$	2561.79	(0,1,2,3$^-$)
2734.9 4	14.2 16	2734.37	(1,2$^+$)	0	0$^+$	6360.7 3	1.5 1	8894.71	1$^-$	2534.03	(0,1,2)
2750.2 4	28.7 29	2872.63	(1,2$^+$)	123.074	2$^+$	6379.3 4	2.2 5	8894.71	1$^-$	2514.97	(1,2)
2788.4 2	34 4	2788.46	(1,2$^+$)	0	0$^+$	6382.30 16	6.5 9	8894.71	1$^-$	2512.22	(0,1,2)
2809.8 4	16.4 13	2933.3	(1,2$^+$)	123.074	2$^+$	6390.7 13	0.3 1	8894.71	1$^-$	2502.61	(1,2)
2813.5 4	19.8 14	3184.04	(1,2$^+$)	371.008	4$^+$	6394.5 3	0.9 1	8894.71	1$^-$	2499.51	(1,2$^+$)
2825.5 4	17.8 16	2949.25	(1,2$^+$)	123.074	2$^+$	6406.88 15	2.1 1	8894.71	1$^-$	2487.66	(1,2)
2850.7 4	21 5	2850.07	(1,2$^+$)	0	0$^+$	6413.1 2	2.2 1	8894.71	1$^-$	2481.75	(1,2)
2866.4 6	6.1 15	2990.09	(1,2$^+$)	123.074	2$^+$	6434.8 3	3.8 2	8894.71	1$^-$	2459.76	(1,2)
2872.3 4	20.9 15	2872.63	(1,2$^+$)	0	0$^+$	6445.3 8	1.1 2	8894.71	1$^-$	2449.23	(1,2)
2900.7 4	15.4 22	3022.99	(1,2$^+$)	123.074	2$^+$	6452.40 12	3.3 2	8894.71	1$^-$	2441.99	(1,2)
2908.2 3	14 3	3031.5	(1,2$^+$)	123.074	2$^+$	6460.8 12	0.4 2	8894.71	1$^-$	2433.75	(0,1,2)
2934.1 6	18.8 15	2933.3	(1,2$^+$)	0	0$^+$	6489.3 6	1.1 3	8894.71	1$^-$	2406.27	(2$^+$,3)
2949.5 3	37.5 15	2949.25	(1,2$^+$)	0	0$^+$	6492.5 7	0.8 3	8894.71	1$^-$	2401.38	(1,2$^+$)
2990.6 4	21.2 15	2990.09	(1,2$^+$)	0	0$^+$	6513.1 2	2.9 2	8894.71	1$^-$	2381.43	1$^-$
2998.7 4	28.1 28	3122.56	(1,2$^+$)	123.074	2$^+$	6552.3 4	0.6 1	8894.71	1$^-$	2342.03	(1,2$^+$)
3022.7 3	27.7 11	3022.99	(1,2$^+$)	0	0$^+$	6585.1 2	3.9 2	8894.71	1$^-$	2309.51	(0,1,2)
3031.9 5	21.3 11	3031.5	(1,2$^+$)	0	0$^+$	6591.9 4	6.4 13	8894.71	1$^-$	2302.38	(1,2)
3061.0 4	8.7 12	3184.04	(1,2$^+$)	123.074	2$^+$	6593.9 11	2.1 7	8894.71	1$^-$	2299.42	(1,2)
3264.1 2	18.8 11	3264.31	(1,2$^+$)	0	0$^+$	6601.9 4	0.6 1	8894.71	1$^-$	2293.47	(2,3)
3291.6 3	13.4 12	3414.73	(1,2$^+$)	123.074	2$^+$	6672.13 8	22.2 7	8894.71	1$^-$	2222.49	(2$^+$)
5479.4 4	3.4 3	8894.71	1$^-$	3414.73	(1,2$^+$)	6707.75 14	2.7 2	8894.71	1$^-$	2186.97	1$^+$
5567.1 7	2.4 5	8894.71	1$^-$	3327.31	(1,2$^+$)	6718.5 17	0.3 1	8894.71	1$^-$	2176.00	(1,2)
5630.1 5	1.3 2	8894.71	1$^-$	3264.31	(1,2$^+$)	6746.1 3	3.4 2	8894.71	1$^-$	2148.80	(1,2)$^+$
5871.2 5	2.1 2	8894.71	1$^-$	3022.99	(1,2$^+$)	6774.83 16	1.7 1	8894.71	1$^-$	2119.525	1$^+$
5903.9 7	1.8 3	8894.71	1$^-$	2990.09	(1,2$^+$)	6781.05 10	3.5 1	8894.71	1$^-$	2113.70	(2$^+$)
5960 2	1.0 5	8894.71	1$^-$	2933.3	(1,2$^+$)	6793.07 18	1.2 1	8894.71	1$^-$	2101.53	(1,2)

From ENSDF

$^{154}_{64}Gd_{90}$-14

^{153}Gd(n,γ) E=th 1996SpZZ (continued)

γ(^{154}Gd) (continued)

E_γ †	I_γ ‡ b	E_i(level)	J_i^π	E_f	J_f^π	E_γ †	I_γ ‡ b	E_i(level)	J_i^π	E_f	J_f^π
6814.4 *10*	0.2 *1*	8894.71	1^-	2080.780	$(2^+,3)$	7320.55 *12*	5.2 *2*	8894.71	1^-	1573.973	0^+
6853.58 *15*	1.7 *1*	8894.71	1^-	2041.04	(0,1,2)	7363.28 *13*	7.5 *4*	8894.71	1^-	1531.301	2^+
6870.65 *9*	4.8 *1*	8894.71	1^-	2023.87	$(1,2^+)$	7476.32 *9*	0.8 *1*	8894.71	1^-	1418.159	2^+
6920.7 *8*	0.3 *1*	8894.71	1^-	1973.11	$(1,2^+)$	7480.0 *2*	0.3 *1*	8894.71	1^-	1414.433	1^-
6930.7 *6*	0.4 *1*	8894.71	1^-	1963.804	$(1,2^+)$	7497.08 *10*	3.2 *3*	8894.71	1^-	1397.572	2^-
6950.63 *11*	3.1 *2*	8894.71	1^-	1943.95	(0,1,2)	7642.4 *8*	0.2 *1*	8894.71	1^-	1251.641	3^-
6982.23 *17*	1.5 *3*	8894.71	1^-	1912.19	(0,1,2)	7653.18 *17*	1.7 *1*	8894.71	1^-	1241.290	1^-
6995.5 *5*	1.4 *3*	8894.71	1^-	1900.097	(0,1,2)	7712.41 *8*	24.0 *5*	8894.71	1^-	1182.091	0^+
7058.24 *8*	9.4 *7*	8894.71	1^-	1836.365	(0,1,2)	7898.29 *19*	0.8 *1*	8894.71	1^-	996.257	2^+
7119.29 *13*	2.4 *1*	8894.71	1^-	1775.429	2^+	8078.97 *9*	23.3 *5*	8894.71	1^-	815.490	2^+
7177.3 *3*	0.5 *1*	8894.71	1^-	1716.044	$(1,2^+)$	8213.86 *15*	7.0 *2*	8894.71	1^-	680.666	0^+
7244.41 *18*	1.6 *1*	8894.71	1^-	1650.33	0^+	8771.5 *2*	0.8 *1*	8894.71	1^-	123.074	2^+
7276.9 *4*	1.1 *1*	8894.71	1^-	1617.087	3^-	8894.50 *10*	24.1 *5*	8894.71	1^-	0	0^+

† Values corrected for nuclear recoil (1996SpZZ).

‡ Uncertainties are the statistical component only.

All assignments are from this reference and based on α(K)exp data. Most of the assignments in parentheses are from doublet peaks, where the combination of the two assignments is compatible with the measured data; these assignments are not included in the ^{154}Gd Adopted γ radiations.

@ Value is an upper limit, since it includes a contribution from ^{153}Gd.

& γ is doubly placed with Iγ undivided; second placement is not indicated by authors.

a From branching in ^{154}Tb ε decay (21.5 h), Iγ=12.2 *16* is expected, so γ is probably a doublet.

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

c Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with "Frozen Orbitals" approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

d Multiply placed with undivided intensity.

e Multiply placed with intensity suitably divided.

f Placement of transition in the level scheme is uncertain.

x γ ray not placed in level scheme.

From ENSDF

$^{154}_{64}Gd_{90}$-15

^{153}Gd(n,γ) E=th 1996SpZZ

Level Scheme

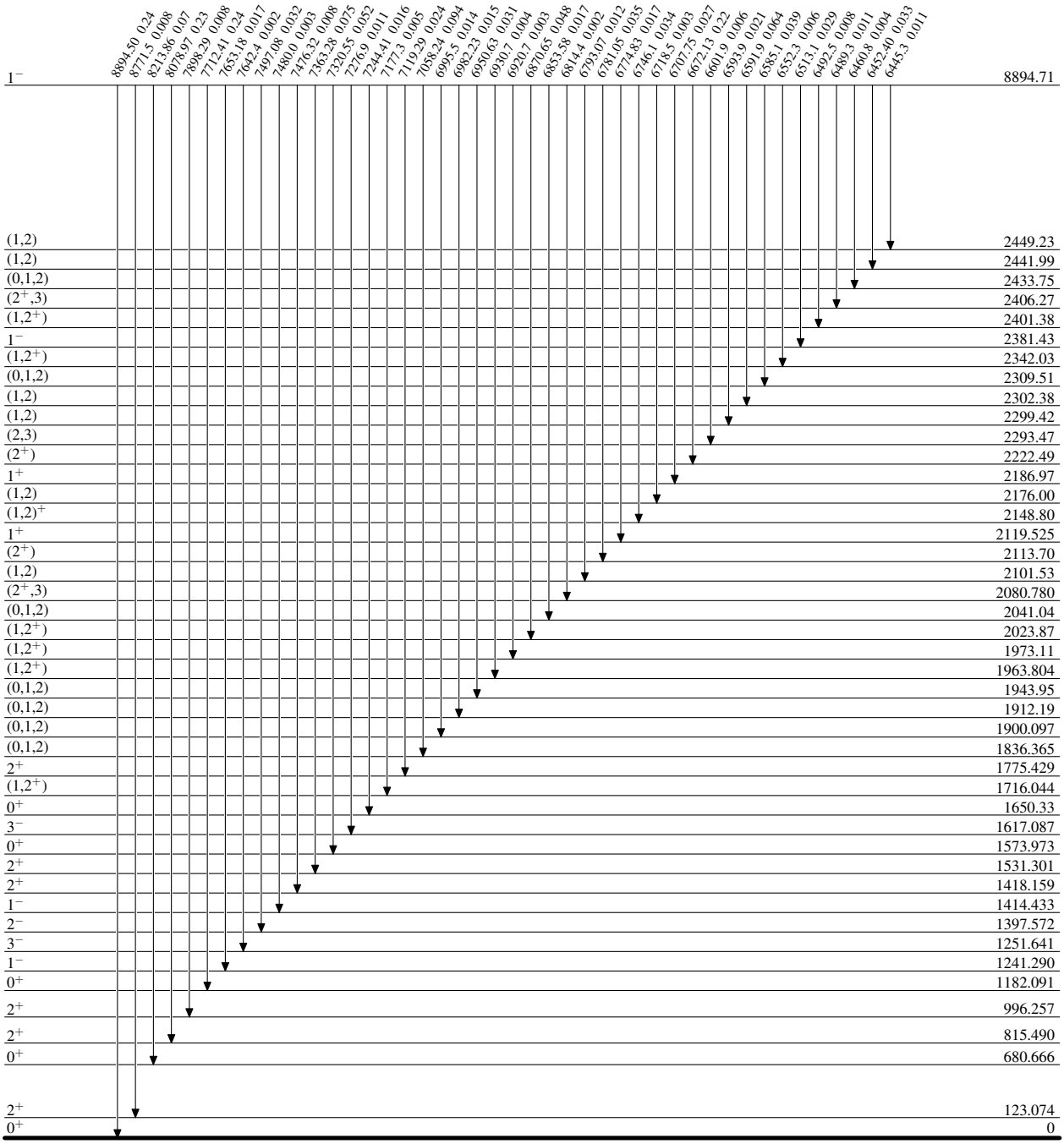
Intensities: γ's per 100 n captures

Legend

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

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

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



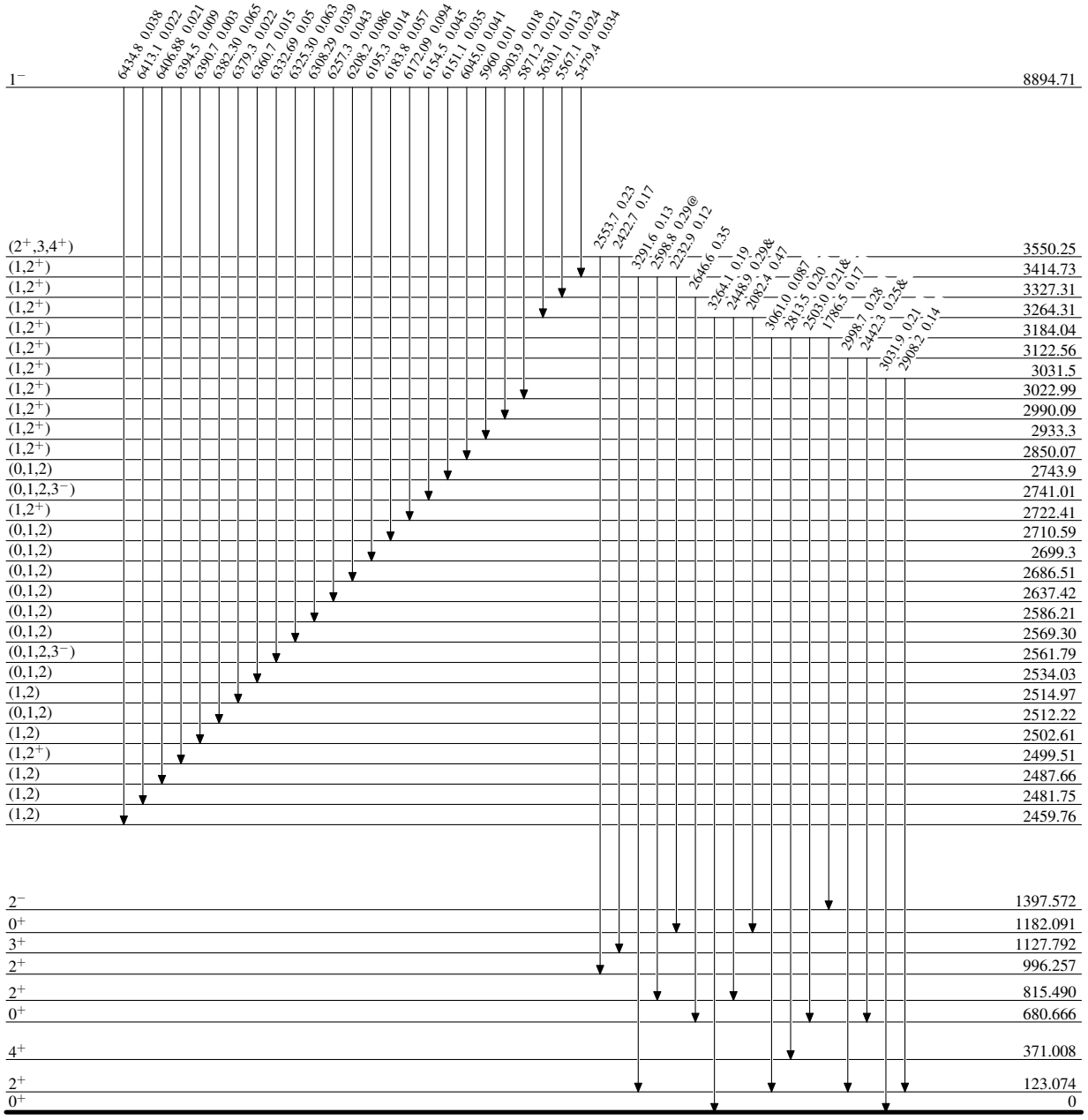
$^{154}_{64}Gd_{90}$

^{153}Gd(n,γ) E=th 1996SpZZ

Level Scheme (continued)

Intensities: γ's per 100 n captures
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

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



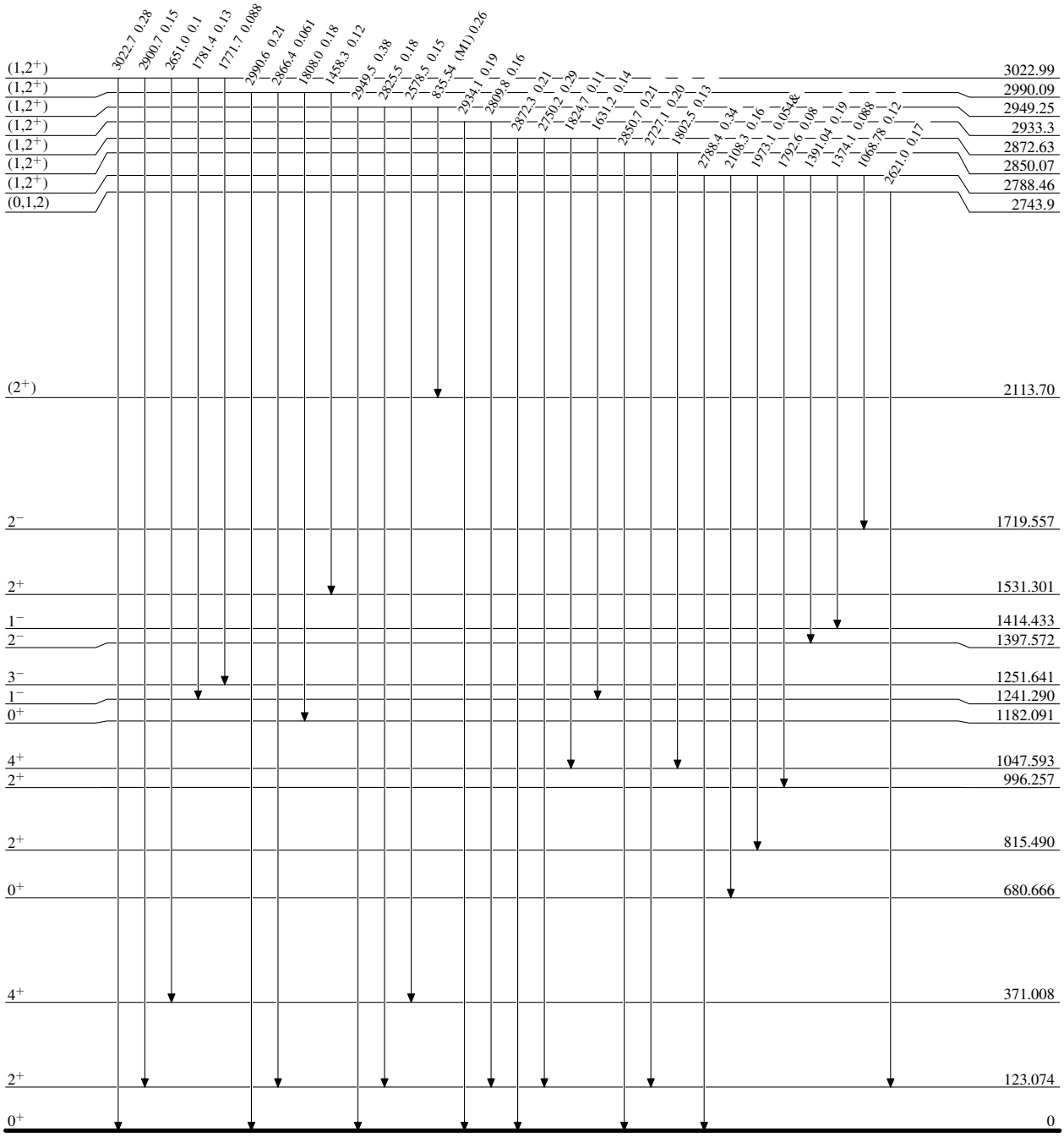
$^{154}_{64}Gd_{90}$

^{153}Gd(n,γ) E=th 1996SpZZ

Level Scheme (continued)

Intensities: γ's per 100 n captures
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

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



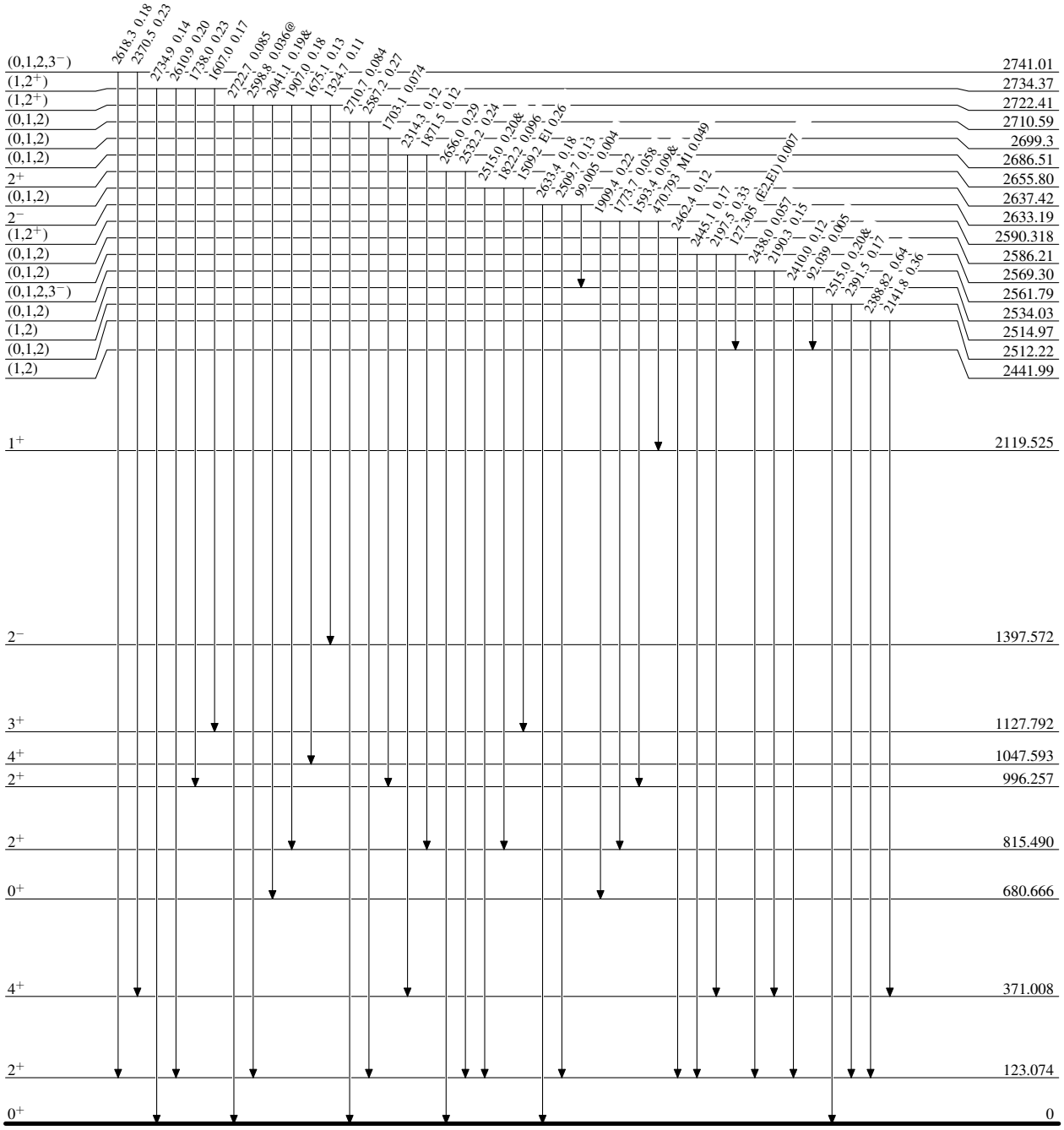
$^{154}_{64}Gd_{90}$

^{153}Gd(n,γ) E=th 1996SpZZ

Level Scheme (continued)

Intensities: γ's per 100 n captures
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

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

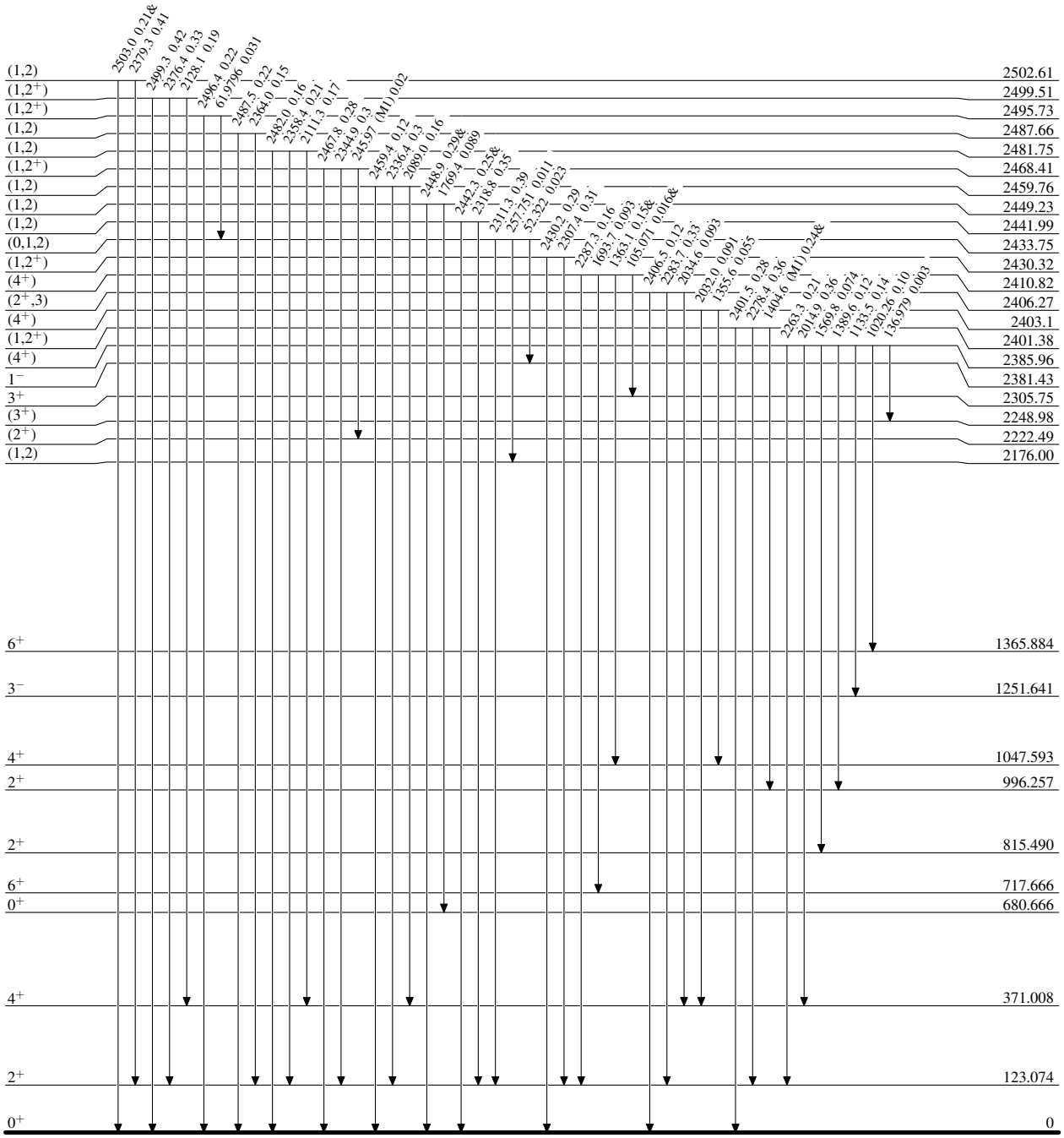


^{153}Gd(n,γ) E=th 1996SpZZ

Level Scheme (continued)

Intensities: γ's per 100 n captures
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

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



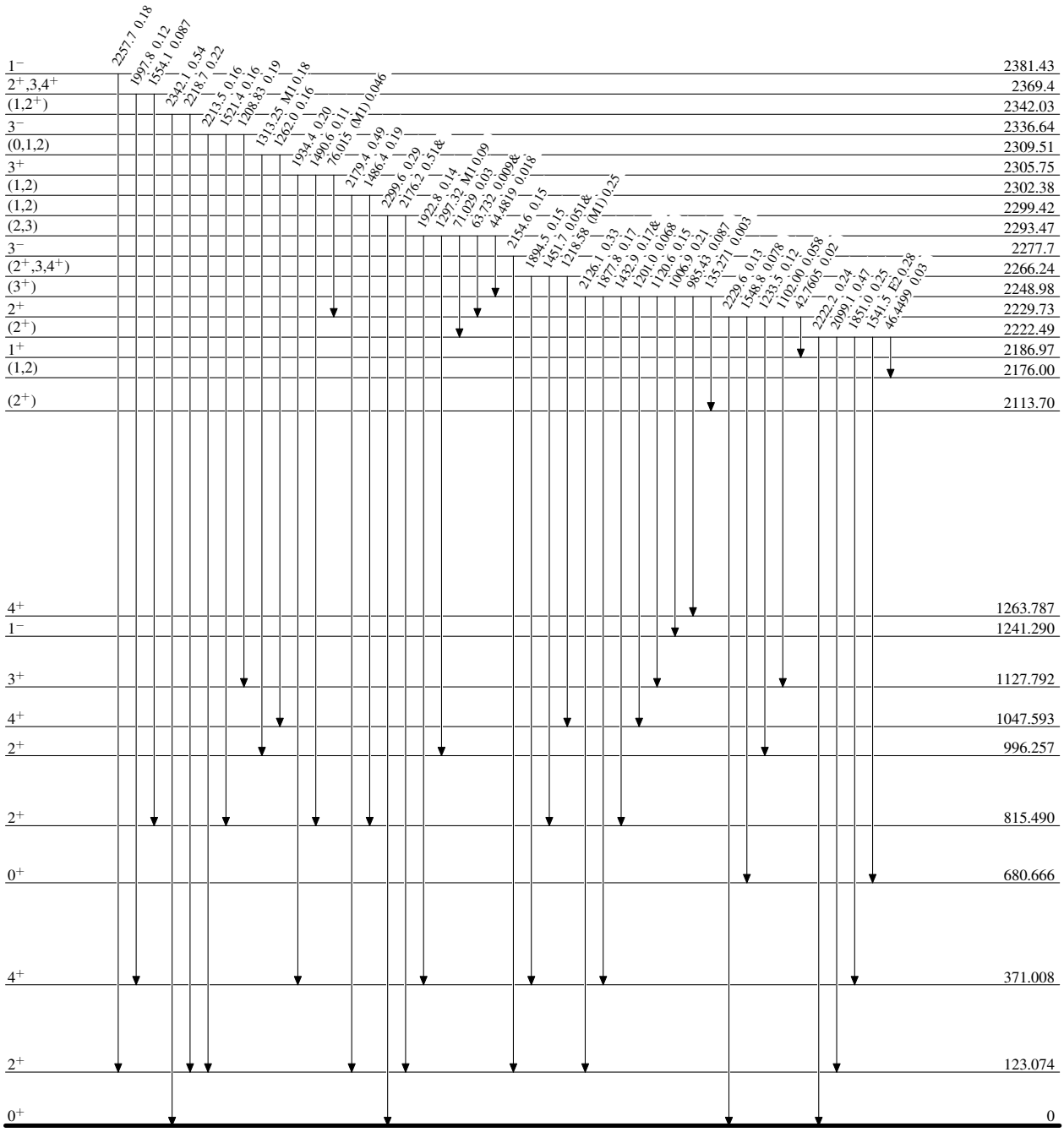
$^{154}_{64}Gd_{90}$

^{153}Gd(n,γ) E=th 1996SpZZ

Level Scheme (continued)

Intensities: γ's per 100 n captures
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

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



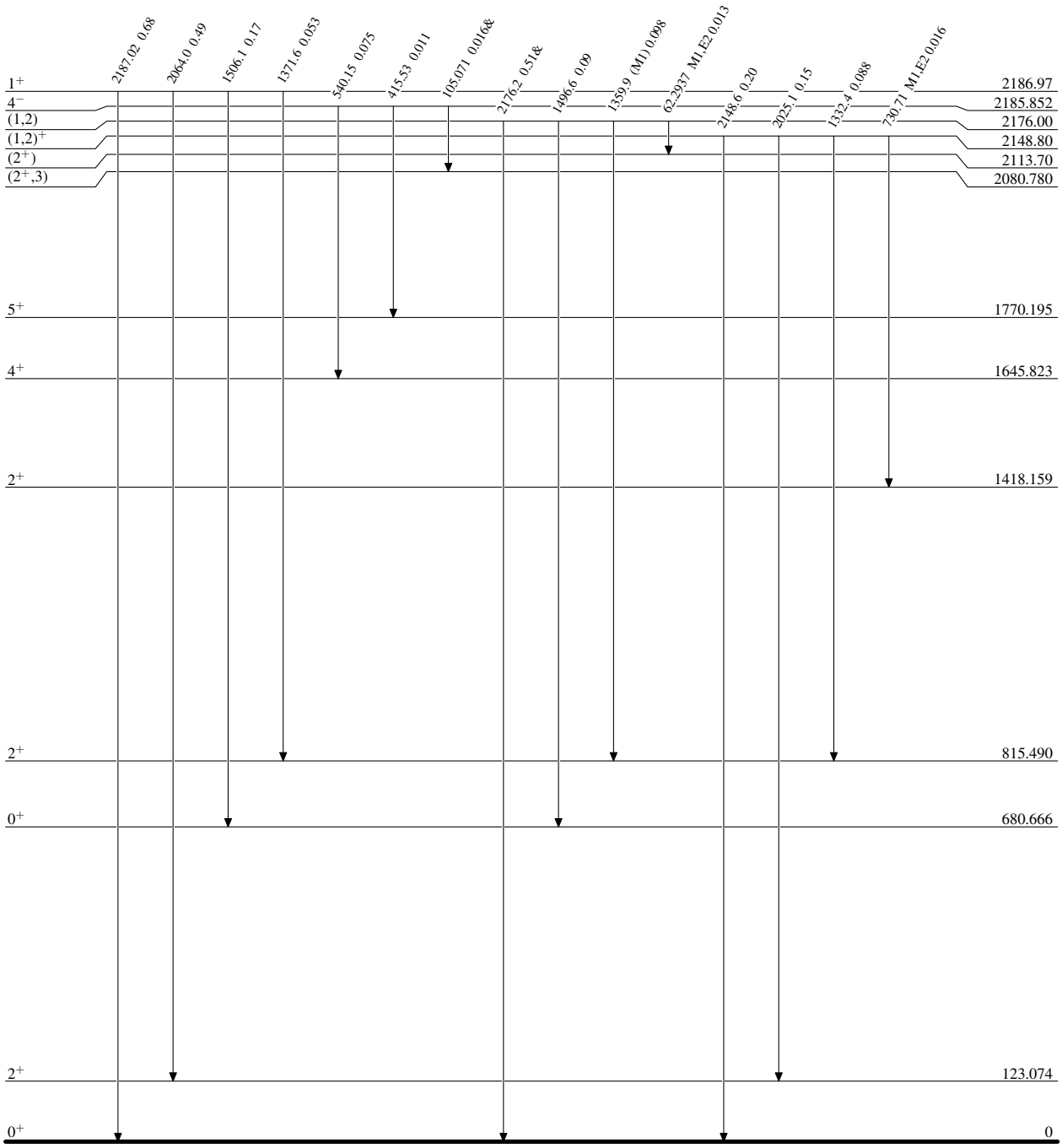
$^{154}_{64}Gd_{90}$

^{153}Gd(n,γ) E=th 1996SpZZ

Level Scheme (continued)

Intensities: γ's per 100 n captures
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

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

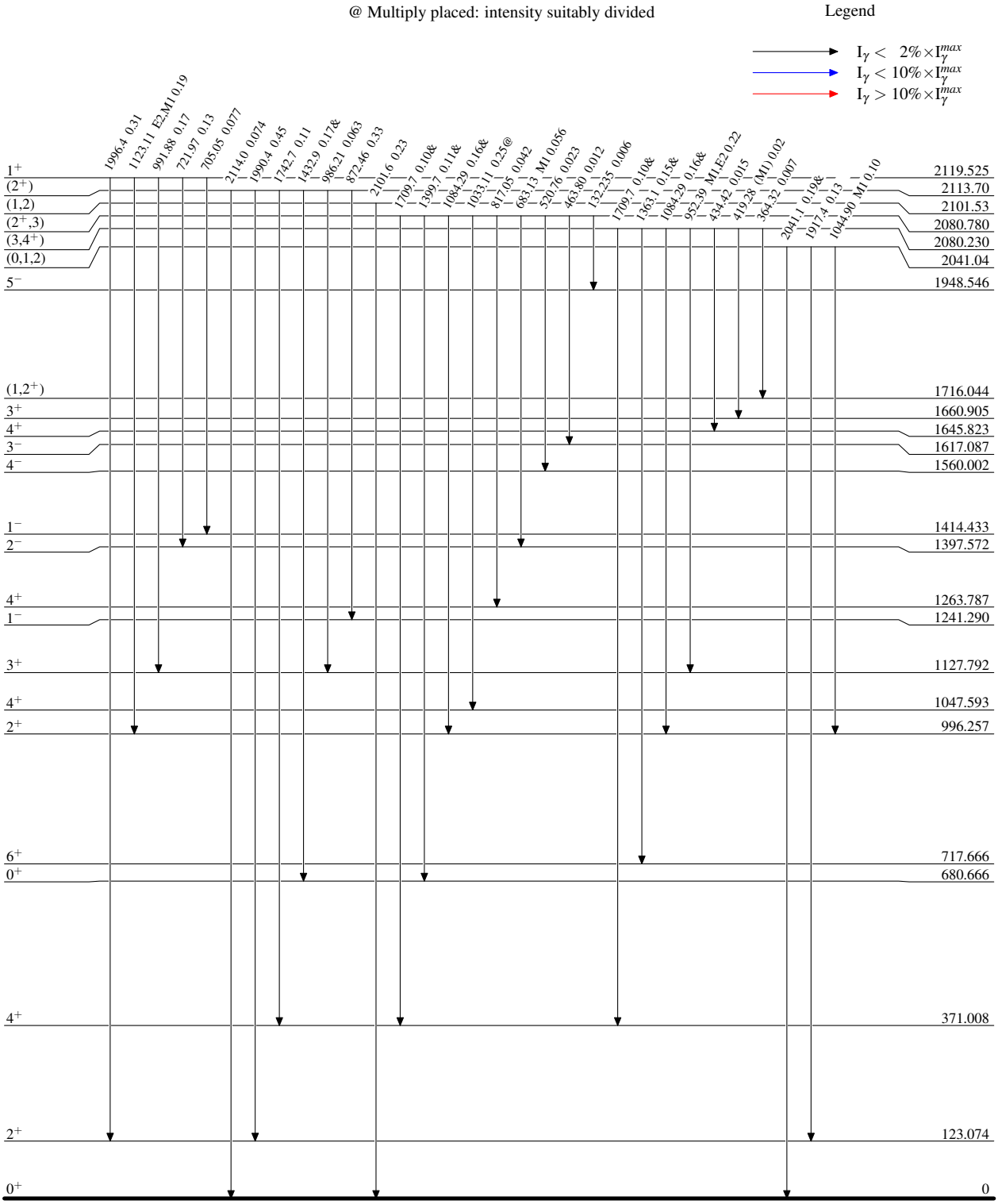


$^{154}_{64}Gd_{90}$

^{153}Gd(n,γ) E=th 1996SpZZ

Level Scheme (continued)

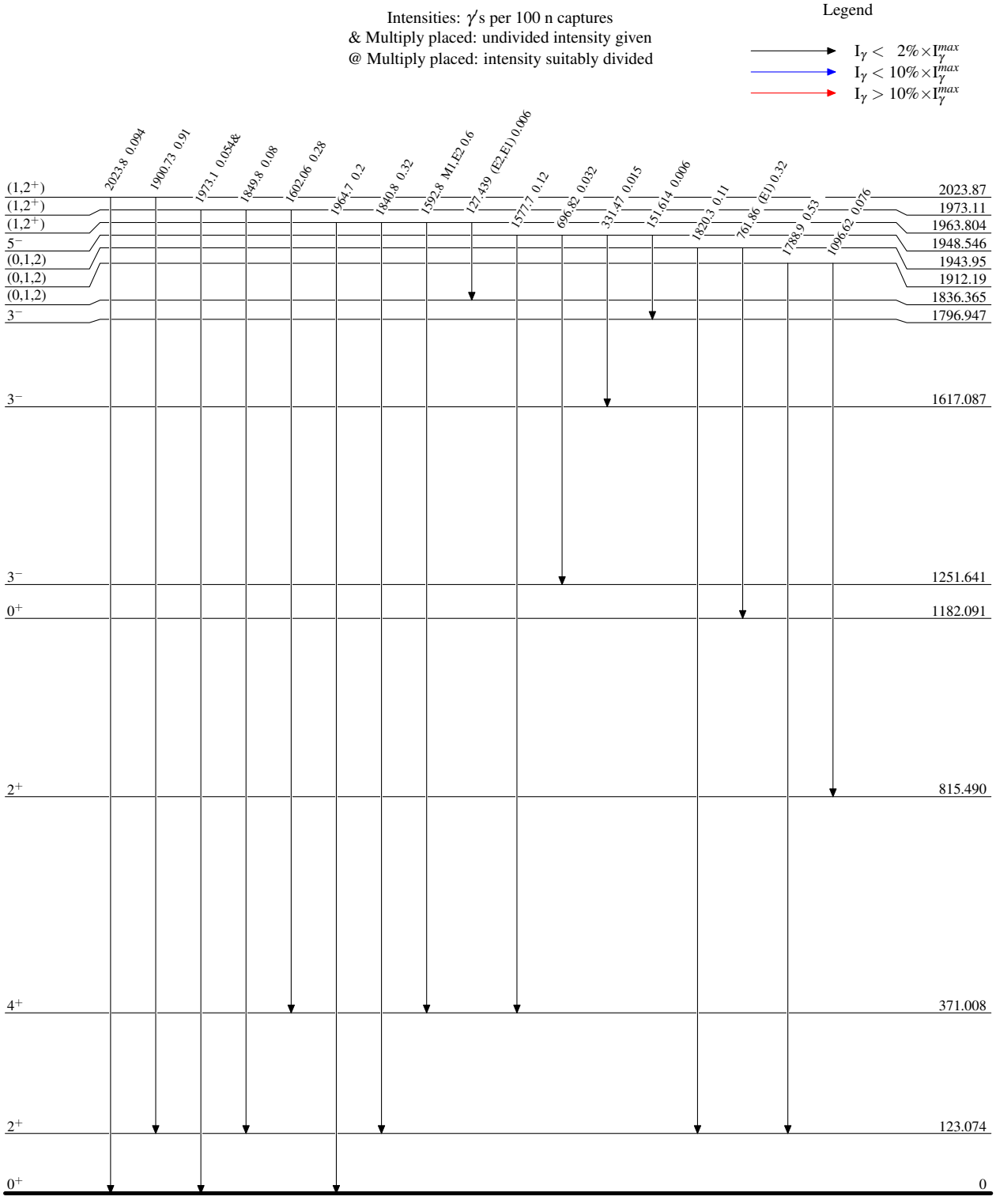
Intensities: γ's per 100 n captures
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



^{153}Gd(n,γ) E=th 1996SpZZ

Level Scheme (continued)

Intensities: γ's per 100 n captures
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

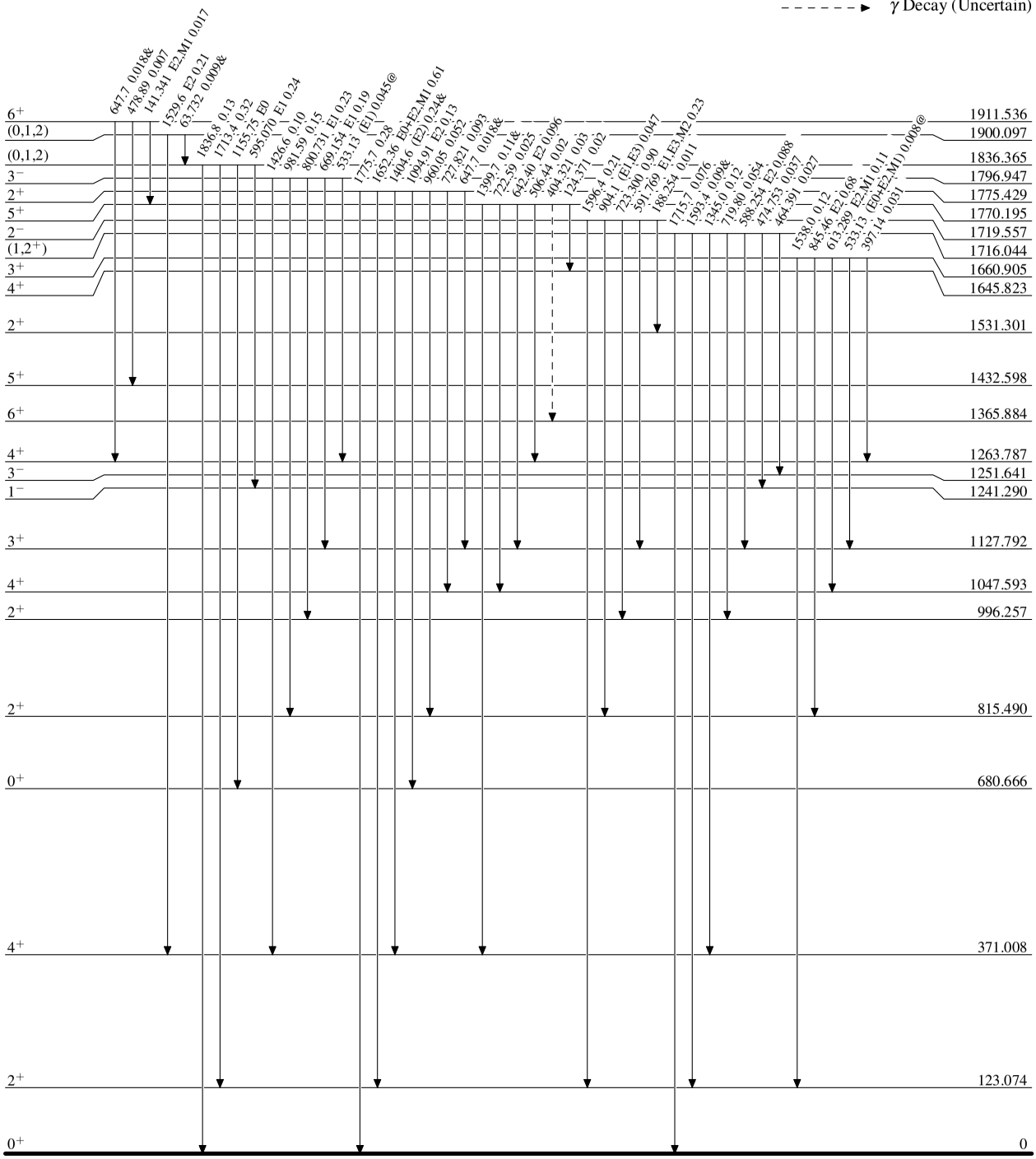


$^{154}_{64}Gd_{90}$

^{153}Gd(n,γ) E=th 1996SpZZ

Level Scheme (continued)

Intensities: γ's per 100 n captures
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



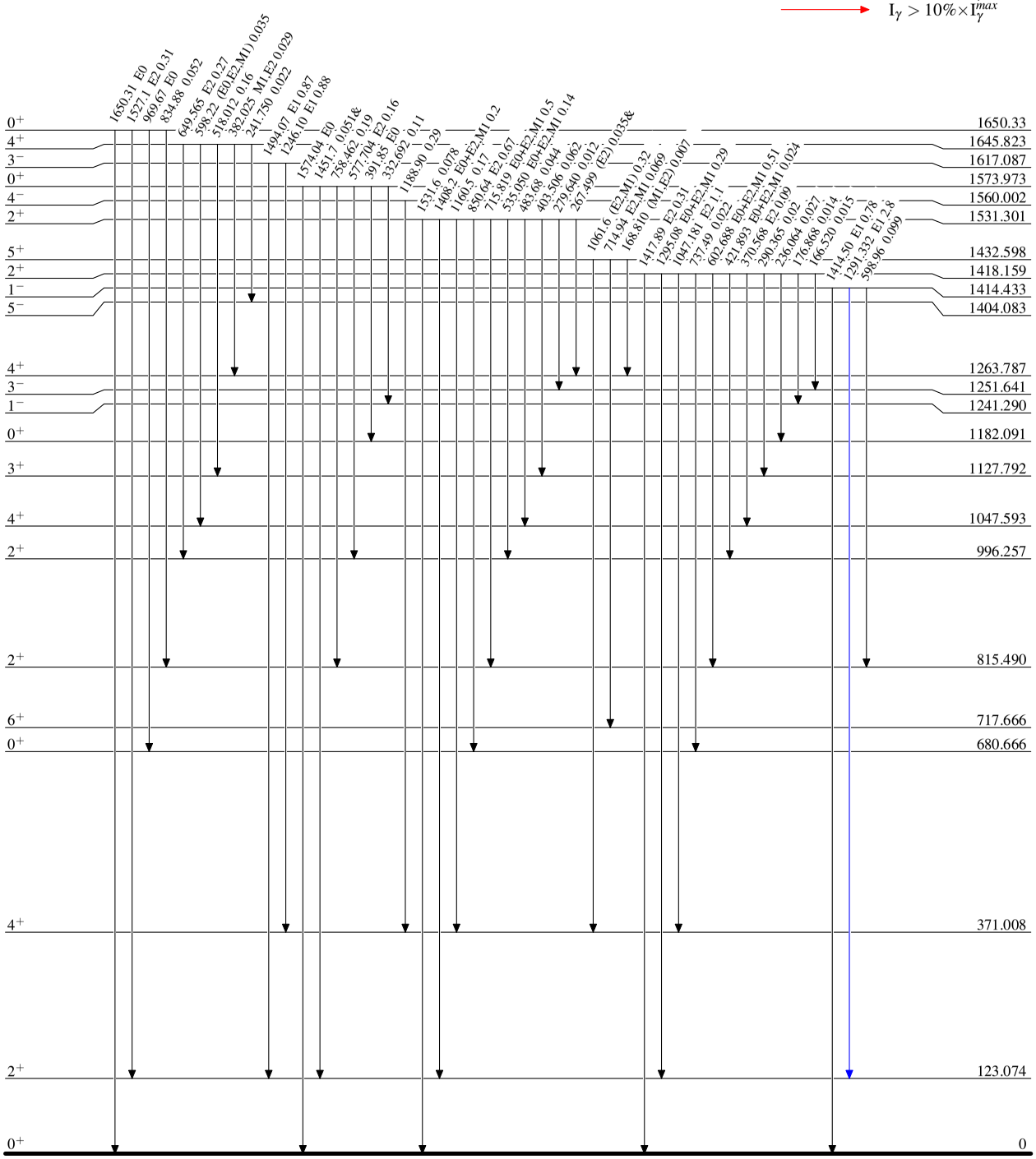
$^{154}_{64}Gd_{90}$

^{153}Gd(n,γ) E=th 1996SpZZ

Level Scheme (continued)

Intensities: γ's per 100 n captures
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

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

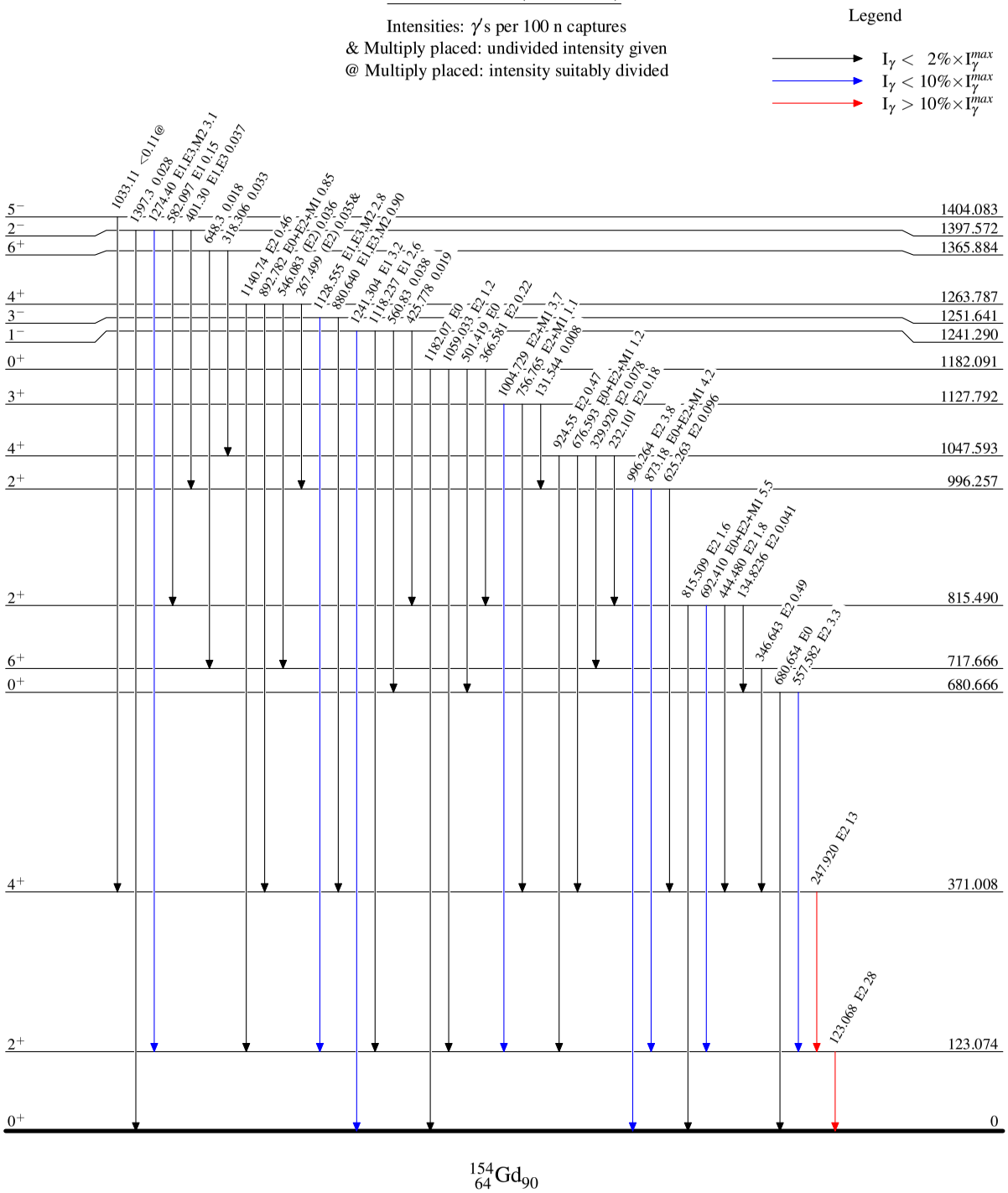


$^{154}_{64}Gd_{90}$

^{153}Gd(n,γ) E=th 1996SpZZ

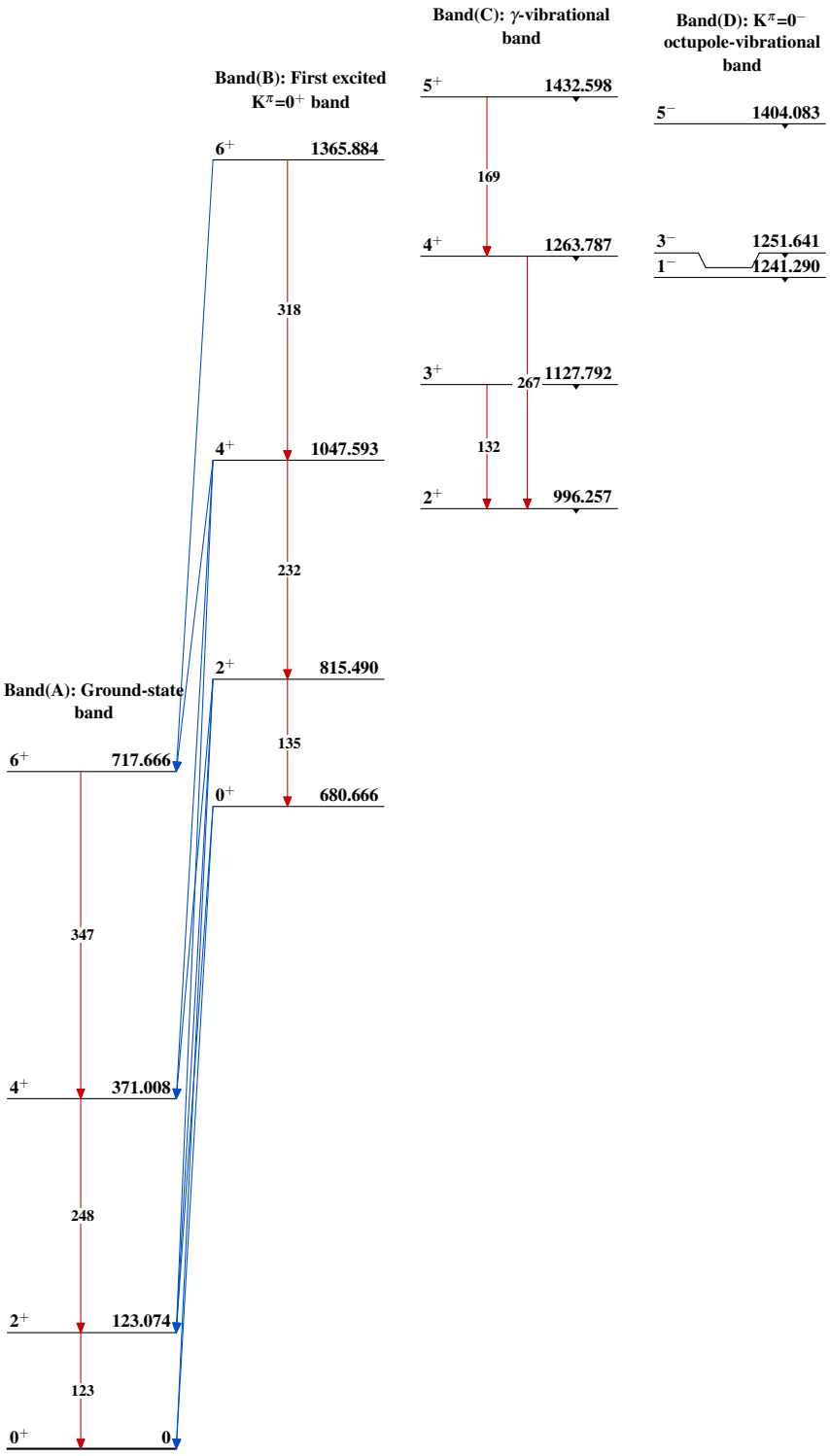
Level Scheme (continued)

Intensities: γ's per 100 n captures
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



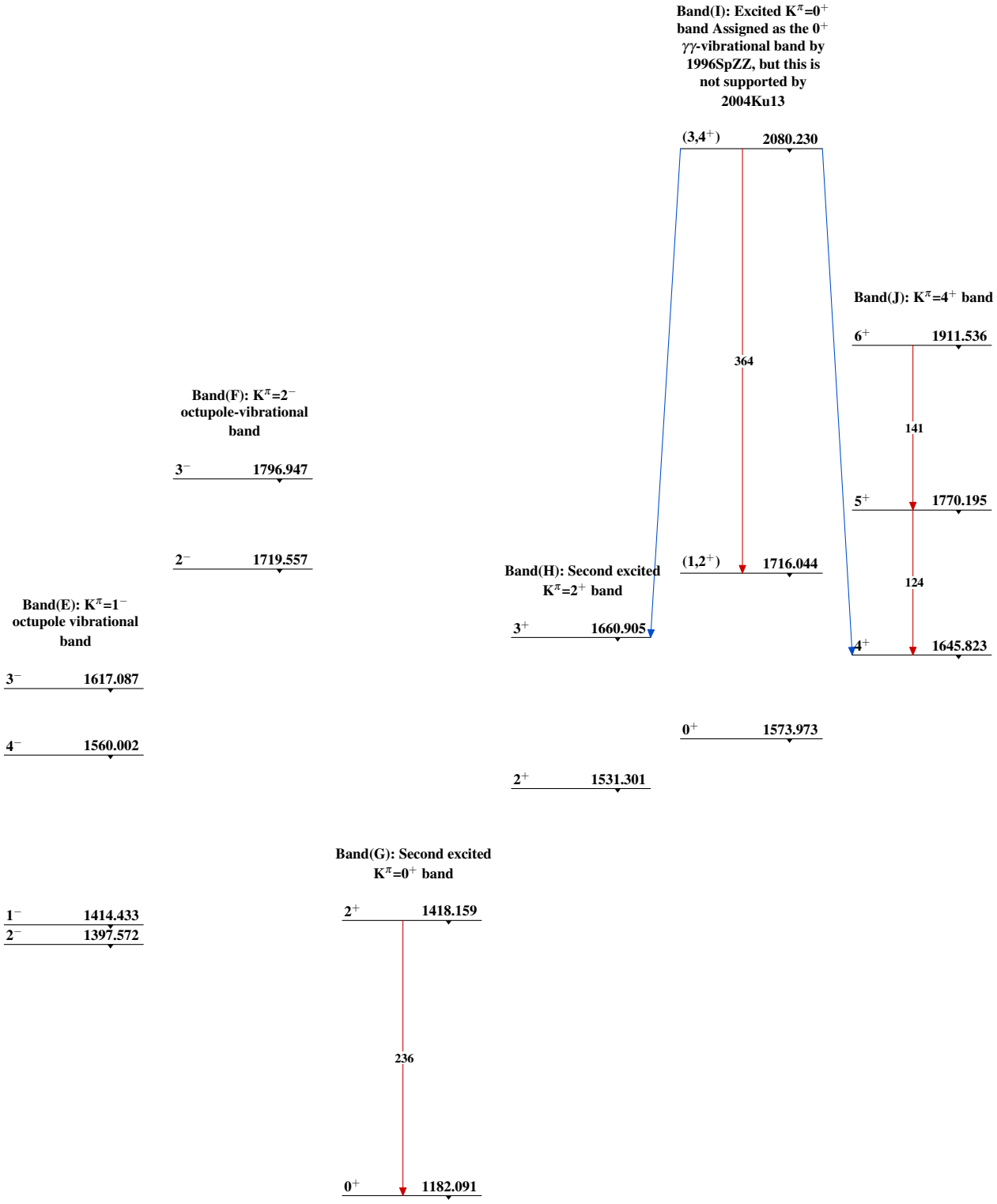
$^{154}_{64}Gd_{90}$

^{153}Gd(n,γ) E=th 1996SpZZ



$^{154}_{64}Gd_{90}$

^{153}Gd(n,γ) E=th 1996SpZZ (continued)



$^{154}_{64}Gd_{90}$

^{153}Gd(n,γ) E=th 1996SpZZ (continued)

Band(K): Excited $K^{\pi}=0^{+}$ band

2^{+} 1775.429

0^{+} 1650.33

$^{154}_{64}Gd_{90}$