Adopted Levels, Gammas

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

Q(β^-)=−3.99×10^3 *4*; S(n)=8590 *3*; S(p)=7343.0 *7*; Q(α)=2204.4 *10* 2017Wa10
S(2n)=15086 *3*; S(2p)=12233.7 *7* 2017Wa10
Additional information 1.

^{152}Gd Levels

Calculations, systematics:
Equilibrium deformation, single-quasiparticle proton bandheads: 1990Na14.
E2/M1 mixing ratios: 1988De14, 1987Li11.
g.s. band: 1994Bo21, 1990Ha22.
g.s. properties: 1996La03.
Isotope shift, hyperfine structure: 2000Bl10, 1990Wa25.
Levels, transition probabilities: 1996He01, 1995Dr06, 1995Go14, 1995Ke09, 1995Zh26, 1991De05.
Magnetic moment and g-factor: 1995St11.
Negative parity states: 1985Ha33.
Octupole bands: 1981Ko05.
Quasiparticle levels: 1986Be10.
Search of α-decay of high-spin isomers: 1981Ko21.
Very extended nuclear shape: 1995Ch67.

Cross Reference (XREF) Flags

A	^{152}Eu β^- decay (13.517 y)	E	^{150}Sm(α,2nγ), ^{152}Sm(α,4nγ)	I	^{154}Gd(p,t)
B	^{152}Eu β^- decay (9.3116 h)	F	^{152}Gd(d,d′)	J	^{148}Nd(^{9}Be,5nγ)
C	^{152}Tb ε decay (17.5 h)	G	Coulomb excitation	K	^{124}Sn(^{36}S,α4nγ)
D	^{152}Tb ε decay (4.2 min)	H	^{153}Eu(p,2nγ)		

E(level)[†]	J$^\pi$[#]	T$_{1/2}$[@]	XREF	Comments
0.0[&]	0$^+$	1.08×10^{14} y *8*	ABCDEFGHIJK	%α=100 T$_{1/2}$: from 1961Ma05, see also 1985HoZN. Others: >1.6×10^{13} y (1948Ke27), >8×10^{13} y (1956Po16), 9.5×10^{14} y (1959Ri34,1966Ka23). <r^2>$^{1/2}$=5.082 fm 3 (2000An14).
344.2790[&] *12*	2$^+$	32.0 ps *27*	ABCDEFGHIJK	μ=+0.93 *6* μ: Weighted average of +0.96 *8* (1974Ar23) and +0.90 *8* (1987Be08). see also the evaluation 2005St24. J$^\pi$: E2 γ to 0$^+$ level. T$_{1/2}$: From Doppler shift recoil distance and B(E2) in Coulomb excitation others: 36 ps *5* and 37 ps *7* in 13-y Eu β^- decay.
615.386[a] *14*	0$^+$	37 ps *8*	ABCDEFGHIJ	J$^\pi$: E0 transition to 0$^+$.
755.3961[&] *17*	4$^+$	7.3 ps *4*	A CDEFGHIJK	μ=2.0 *5* (1999Ma06,2005St24) J$^\pi$: E2 ΔJ=2 γ to 2$^+$. L(p,t) not 0.
930.545[a] *3*	2$^+$	7.3 ps *6*	ABCDEFGHIJK	J$^\pi$: E0 component in transition to 2$^+$.
1047.80[l] *3*	0$^+$		ABC F HI	J$^\pi$: E0 transition to 0$^+$.
1109.202[i] *15*	2$^+$		ABCDEF I	J$^\pi$: E2 γ to 0$^+$.
1123.1857[b] *21*	3$^-$		ABCDEF IJK	J$^\pi$: E1 γ′s to 2$^+$ and 4$^+$.

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Adopted Levels, Gammas (continued)

^{152}Gd Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[@]	XREF	Comments
1227.37[&] 7	6^+	2.5 ps 5	CDE GHIJK	μ=4.4 39 μ: From g/g(2^+) in Coulomb excitation. J^{π}: E2 ΔJ=2 γ to 4^+. No γ to J<4. Band member.
1274.27 7	1,2^+		C	J^{π}: γ to 0^+.
1282.246[a] 24	4^+		A CDEF HI K	J^{π}: E0 component in transition to 4^+.
1314.613[b] 8	1^-		ABC F	J^{π}: E1 γ to 0^+.
1318.414[l] 15	2^+		A C I	J^{π}: E0 component in transition to 2^+.
1434.020[j] 4	3^+		A CDE	J^{π}: M1+E2 γ to 2^+. E2(+M1) γ to 4^+. $\gamma\gamma(\theta)$(678γ) rules out J=2.
1460.53? 12	(1,2^+)		B	J^{π}: γ's to 0^+ and 2^+. E(level): This level is perhaps questionable. IT is seen only in 9.3-h Eu β^- decay and the transitions are weak. In particular, it is not seen in 17.5-h Tb ε decay which populates all other levels below E=2000 with J<5.
1470.43[b] 17	5^-		DEF JK	J^{π}: D+Q γ to 4^+. γ to 3^-. Band member.
1470.63 5	2^+		C	J^{π}: γ's to 0^+ and 4^+.
1533.92 9			C	J^{π}: γ to 2^+.
1550.16[i] 4	4^+		A CDEF	J^{π}: D(+Q) γ to 4^+. 1205γ to 2^+ is M1 or E2 thus π=+. Band member.
1605.609 22	2^+		A C I	J^{π}: E0 component in transition to 2^+.
1643.418[k] 8	2^-		A C	J^{π}: E1(+M2) γ to 2^+. $\gamma(\theta$,H,t)(1299γ) rules out J=1. For J=3, $\gamma(\theta$,H,t)(1299γ) requires δ=0.50 5, inconsistent with<0.06 from α(K)exp.
1668.13[a] 9	6^+		DE HIJK	J^{π}: E2 ΔJ=2 γ to 4^+. D+Q γ to 6^+.
1680.74 5	0^+		C I	J^{π}: L(p,t)=0.
1692.42 3	2^+,3^+		A C	J^{π}: M1+E2 γ to 2^+. γ to 4^+ rules out J=1.
1734.44 12			C	J^{π}: γ to 4^+.
1746.78[&] 11	8^+		DE H JK	J^{π}: E2 ΔJ=2 γ to 6^+. No γ to J<6. Band member.
1755.97[k] 4	1^-		BC	J^{π}: γ's to 0^+ and 3^-. log *ft*=6.4 from 0^-.
1771.57 4	2^+		C	J^{π}: γ's to 0^+ and 4^+.
1785.21 10	2^+		C	J^{π}: E0 component in the transition to 2^+.
1807.52 7			CDE	J^{π}: γ to 4^+.
1808.96 7			C	J^{π}: γ's to 2^+. γ from 2^-.
1839.71 3	2^+		C	J^{π}: E0 component in transition to 2^+.
1861.58[j] 9	5^+		DE	J^{π}: E2 γ to 3^+. γ to 6^+. Band member.
1861.90 3	2^+		C	J^{π}: E0 component in transition to 2^+.
1862.05 5	2^+		C	J^{π}: M1+E2 γ to 2^+. γ's to 1^- and 4^+.
1880.2[b] 3	7^-		DE JK	J^{π}: E1 γ to 6^+. γ to 5^-. Band member.
1915.17 6	$(4)^+$		C f	J^{π}: γ's to 4^+ and 6^+. Possible ε feeding from 2^-.
1915.77 5	2^+,3,4^+		C f	J^{π}: γ's to 2^+ and 4^+.
1941.177 16	2^+		C F	J^{π}: E2 γ to 0^+.
1961.9 5	(0^+)		F I	J^{π}: L(p,t)=(0).
1975.72 5	1^+,2^+		C	J^{π}: M1(+E2) γ to 2^+. γ's to 0^+.
1997.85[i] 17	6^+		DE	J^{π}: γ's to 4^+ and 6^+. γ from 7^+. Band member.
2011.67 4	1^+,2^+		C	J^{π}: M1+E2 γ to 2^+. γ to 1^-.
2069.4 10			E	J^{π}: γ to 4^+.
2121.05 7	2^+,3^-,4^+		C F	J^{π}: γ's to 2^+ and 4^+. Seen in (d,d').
2133.38 14	1^+,2^+		C	J^{π}: M1 γ to 2^+. γ to 1^-.
2138.79[a] 25	8^+		DE JK	J^{π}: E2 ΔJ=2 γ to 6^+. γ to 8^+.
2169.64 5	2^+		C	J^{π}: γ's to 0^+ and 2^+. $\gamma(\theta$,H,t) in 17,5-h Tb ε decay rules out J=1.
2173.41[c] 18	6^-		DE	J^{π}: γ to 6^+. γ from 7^+. Band member.
2190	(2^+)		F	J^{π}: From dσ(90°)/dσ(125°)(systematics) in (d,d').
2201.71 5	2^+		C	J^{π}: γ's to 0^+ and 4^+.
2234			F	
2246.81 3	2^+		C	J^{π}: γ's to 0^+ and 4^+. M1+E2 γ's to 2^+.
2258.17 6	2^+,3,4^+		C	J^{π}: γ's to 2^+ and 4^+.

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Adopted Levels, Gammas (continued)

^{152}Gd Levels (continued)

E(level)[†]	J$^{\pi}$[#]	XREF	Comments
2264.86 *7*	1^-,2,3^-	C	J$^{\pi}$: γ's to 1^- and 3^-.
2265.30 *8*	1^+,2^+,3^+	C	J$^{\pi}$: M1+E2 γ to 2^+.
2267.71? *9*		C	E(level): The proposed level has incompatible modes of decay. The 953γ feeds a 1^- level and the 1040γ feeds a 6^+ level.
2299.5[&] *6*	10^+	E JK	J$^{\pi}$: $\gamma(\theta)$. Band member.
2299.66 *3*	2,3^-	C F	J$^{\pi}$: γ's to 1^-, 3^-, and 3^+ give J$^{\pi}$=2 or 3^-. α(K)exp gives mult assignments for the 1369 and 1955γ's, but these are inconsistent. mult(1369γ) to 2^+ is consistent only with M1+E2, eliminating the 2^- alternative and giving J$^{\pi}$=2^+ with δ=−0.14 *7*. Mult(1955γ) to 2^+ is consistent only with E1, eliminating the J$^{\pi}$=2^+ alternative, with δ=<−0.24, −0.23 *+4−5*, and +0.27 *4* for J=1, 2, and 3, respectively. For the strong 1190γ, no Ice(K) is seen, suggesting mult=E1; however, even for E1, the Ice(K) expected is as large as that for the adjacent 1186γ. $\gamma(\theta$,H,t)(1190γ) gives $-0.75\leq\delta\leq-0.34$, −0.21 *3*, and +0.28 *5* for J=1, 2, and 3, respectively.
2301.82[j] *13*	7^+	DE	J$^{\pi}$: γ's to 5^+ and 6^+. Band member.
2325.69 *7*		C	J$^{\pi}$: γ to 3^-.
2330		F	
2330.72 *9*	2^+,3,4^+	C	J$^{\pi}$: γ's to 2^+ and 4^+.
2331.1[b] *5*	9^-	E JK	J$^{\pi}$: E2 ΔJ=2 γ to 7^-. Dipole γ to 8^+.
2363.2 *6*	0^+	I	J$^{\pi}$: L(p,t)=0.
2386.95 *7*	$(2)^+$	C	J$^{\pi}$: Probable E0 component in transition to 2^+.
2394.19 *10*	7^+	DE	J$^{\pi}$: M1 γ's to 6^+ and 8^+.
2395		F	
2401.52 *5*	1^+,2,3^-	C	J$^{\pi}$: γ's to 1^- and 3^+.
2414		F	
2421.5 *7*	0^+	I	J$^{\pi}$: L(p,t)=0.
2437.43 *5*	2^+	C	J$^{\pi}$: M1 γ to 2^+. E1 γ to 3^-. γ to 0^+.
2448.02 *9*	+	C	J$^{\pi}$: M1,E2 to 2^+.
2460.6[i] *8*	8^+	E	J$^{\pi}$: γ's to 6^+. Band structure.
2491.9 *7*	(0^+)	I	J$^{\pi}$: L(p,t)=(0).
2495.18 *6*		C	
2513.9 *3*	1,2^+	C	J$^{\pi}$: γ's to 0^+ and 2^+. See comment on mult 2169.6 in 17.5-h Tb ε decay that discusses the possibility of mult=E1 for the transition to 2^+. This would give J$^{\pi}$(2514)=1^-.
2523.81 *3*	2^+	C	J$^{\pi}$: M1 γ to 2^+. E1 γ to 1^-. $\gamma(\theta$,H,t) in 17.5-h Tb ε decay gives δ(1209γ)=−0.34 *5* for J=1, inconsistent with δ<0.05 from α(K)exp. γ to 3^- also suggests J$^{\pi}$ not 1^+.
2529.43 *4*	2^+,3^+	C	J$^{\pi}$: M1G to 2^+. γ to 4^+.
2536.6[c] *6*	8^-	E JK	J$^{\pi}$: γ's to 6^- and 8^+. Band member.
2540.47 *6*	2^+,3^+	C	J$^{\pi}$: M1 γ to 2^+. γ to 4^+.
2544.01 *6*		C	J$^{\pi}$: γ's to 2^+ and 3^-.
2551.14 *7*		C	J$^{\pi}$: γ's to 2^+ and 3^+.
2557.87 *5*	2^+	C	J$^{\pi}$: γ's to 0^+ and 4^+.
2579.8 *7*	0^+	I	J$^{\pi}$: L(p,t)=0.
2598.80 *5*	1^+,2^+	C	J$^{\pi}$: M1(+E2) γ to 2^+. γ to 0^+.
2604.33 *6*	1^-,2,3^-	C	J$^{\pi}$: γ's to 1^- and 3^-.
2641.58 *7*	1^-,2^-,3^-	C	J$^{\pi}$: M1,E2 γ to 3^-. γ to 2^+.
2667.55 *6*	1^-	C	J$^{\pi}$: E0 component in transition to 1^-.
2686.87 *9*	2^+	C	J$^{\pi}$: E0 component in transition to 2^+.
2691.7[a] *8*	10^+	E JK	J$^{\pi}$: $\gamma(\theta)$. Band member.
2696.8[h] *10*	8^-	E	J$^{\pi}$: γ to 8^+. Band member.
2709.42 *3*	2^+	C	J$^{\pi}$: E0 component in transition to 2^+.
2719.63 *3*	2^+	C	J$^{\pi}$: M1+E2 γ's to 2^+. γ to 0^+. γ to 3^-.
2729.17 *4*	2^+	C	J$^{\pi}$: E0 component in transition to 2^+.
2734.07 *7*		C	J$^{\pi}$: There is an inconsistency in the mults for transitions from this level. The 2118 and 2734 γ's both feed levels with J$^{\pi}$=0^+; however, mult=M1 and E1, respectively, for these transitions.

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Adopted Levels, Gammas (continued)

^{152}Gd Levels (continued)

E(level)[†]	J$^{\pi}$[#]	XREF	Comments
2744.04 *10*	1^-	C	J$^{\pi}$: E1 γ to 0^+.
2749.24 *4*	$2^+,3^+$	C	J$^{\pi}$: M1 γ to 2^+. γ to 4^+.
2767.7 *7*	0^+	I	J$^{\pi}$: L(p,t)=0.
2772.47 *5*	2^+	C	J$^{\pi}$: E0 component in transition to 2^+.
2774.5[j] *7*	9^+	E	J$^{\pi}$: γ to 7^+ and 8^+. Band member.
2810.2 *7*	0^+	I	J$^{\pi}$: L(p,t)=0.
2814.0[b] *7*	11^-	E JK	J$^{\pi}$: E2 ΔJ=2 γ to 9^-. Dipole γ to 10^+.
2862.65 *5*	$1^-,2,3^-$	C	J$^{\pi}$: γ S to 1^- and 3^-.
2869.84? *10*		C	E(level): See discussion on this level in the 17.5-h Tb ε decay dataset.
2874.7[d] *7*	8^-	E K	J$^{\pi}$: γ to 7^-. Band member.
2880.67 *3*	2^+	C	J$^{\pi}$: M1 γ's to 2^+. γ's to 0^+ and 3^-.
2883.5[&] *7*	12^+	E JK	J$^{\pi}$: $\gamma(\theta)$(583γ) to 10^+. Band member.
2889.2[c] *7*	10^-	E JK	J$^{\pi}$: $\gamma(\theta)$(γ's) to 9^+ and 10^+. Band member.
2914.19 *6*	2^+	C	J$^{\pi}$: γ's to 0^+ and 4^+.
2920.10 *10*	$1^-,2,3,4^+$	C	J$^{\pi}$: γ's to 2^+ and 3^-.
2927.86 *5*	$2^+,3^+$	C	J$^{\pi}$: M1,E2 γ to 2^+. γ to 4^+. Possible E0 component in the 1818γ to 2^+ would eliminate the 3^+ possibility.
2928.73 *16*		C	J$^{\pi}$: γ's to 2^+.
2932.71 *6*	2^+	C	J$^{\pi}$: M1,E2 γ to 2^+. γ's to 0^+ and 3^-.
2964.32 *5*	2^-	C	J$^{\pi}$: E1 γ to 2^+. γ to 3^+. From $\gamma(\theta$,H,t)(2033γ), J=3 would require δ(M2/E1)$\geq$0.25 compared with δ<0.34 from α(K)exp. J=3 is thus possible but highly unlikely.
2981.45 *8*	$2^+,3,4^+$	C	J$^{\pi}$: γ's to 2^+ and 4^+.
2989.02 *8*		C	J$^{\pi}$: γ's to 2^+.
2999.55 *5*	$1^+,2^+$	C	J$^{\pi}$: M1,E2 γ's to 2^+. γ to 0^+.
3006.77 *5*	2^+	C	J$^{\pi}$: γ's to 0^+ and 4^+. M1 γ to 2^+.
3009.28 *5*	3^-	C	J$^{\pi}$: E0 component in transition to 3^-.
3010.8[e] *6*	9^-	E K	J$^{\pi}$: γ's to 7^- and 9^-. Band member.
3012.37 *8*	$2^+,3^+,4^+$	C	J$^{\pi}$: M1,E2 γ to 2^+. γ to 4^+.
3033.0[h] *10*	(11)	E	J$^{\pi}$: γ to 10^+. Shown with J=11 by 2006ShZY.
3042.29 *5*	2^+	C	J$^{\pi}$: M1 γ to 2^+. γ to 1^-. $\gamma(\theta$,H,t)(2698γ) in 17.5-h Tb ε decay rules out J=1.
3060.1 *12*		E	J$^{\pi}$: γ to 9^-.
3067.42 *10*	3^-	C	J$^{\pi}$: E0 component in transition to 3^-.
3074.85 *12*	$2^+,3,4^+$	C	J$^{\pi}$: γ's to 2^+ and 4^+.
3079.69 *12*	$2^+,3^+,4^+$	C	J$^{\pi}$: E2 γ to 2^+. γ to 4^+. A possible E0 component in the 2324γ to 4^+ would give J$^{\pi}$(3079 level)=4^+.
3090.42 *16*		C	J$^{\pi}$: γ to 4^+.
3099.02 *8*	$1^+,2^+,3^+$	C	J$^{\pi}$: M1 γ to 2^+.
3105.52 *7*	2^+	C	J$^{\pi}$: γ's to 0^+ and 4^+.
3110.94 *10*	$1^+,2^+$	C	J$^{\pi}$: M1 or E2 γ to 0^+.
3112.52 *7*	$1^+,2^+$	C	J$^{\pi}$: M1 γ to 2^+. γ to 0^+.
3140.21 *6*	$1,2^+$	C	J$^{\pi}$: γ's to 0^+ and 2^+.
3143.97 *7*	3^-	C	J$^{\pi}$: M1,E2 γ to 3^-. γ's to 2^+ and 4^+.
3152.89 *9*	3^-	C	J$^{\pi}$: E1 γ to 2^+. γ to 4^+.
3157.0[d] *7*	10^-	E K	J$^{\pi}$: γ's to 8^- and 9^-. Band member.
3214?[‡] *1*		C	J$^{\pi}$: γ's to 3^+ and 2^+.
3226.1[h] *12*	10^-	E	J$^{\pi}$: γ to 9^-. Band member.
3232.05 *8*		C	J$^{\pi}$: The decay modes are not consistent with a single J$^{\pi}$ assignment. the 1626 and 2887γ's feed 2^+ levels, but the 2004γ feeds 6^+, and the 1917γ feeds 1^-.
3236.96 *7*	$2^+,3,4^+$	C	J$^{\pi}$: γ's to 2^+ and 4^+.
3249.3[f] *10*	12^+	E JK	J$^{\pi}$: γ to 10^+. Band member.
3285.11 *7*	2^+	C	J$^{\pi}$: M1,E2 γ to 2^+. γ's to 1^- and 3^-.
3294.1[j] *8*	11^+	E	J$^{\pi}$: γ's to 9^+ and 10^+. Band member.
3317.3[e] *6*	11^-	E K	J$^{\pi}$: γ's to 9^- and 11^-. Band member.

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Adopted Levels, Gammas (continued)

^{152}Gd Levels (continued)

E(level)[†]	J$^{\pi}$[#]	XREF	Comments
3337.8[b] 9	13^-	E JK	J$^{\pi}$: $\gamma(\theta)$. Band member.
3340.64 6	1^-,2,3,4^+	C	J$^{\pi}$: γ's to 2^+ and 3^-. The 2217γ might have an E0 component, in which case J$^{\pi}$=3^-.
3345.4[c] 9	12^-	E JK	J$^{\pi}$: $\gamma(\theta)$. Band member.
3358.27 11	2^+	C	J$^{\pi}$: γ to 1^- and mult(2603γ)=M1 or E2 to 4^+ gives J$^{\pi}$=2^+ and limits mult(2603γ) to E2.
3498.9[&] 10	14^+	E JK	J$^{\pi}$: $\gamma(\theta)$.
3507.9[d] 8	12^-	E K	
3586.5[h] 9	13^-	E	
3699.4[f] 10	14^+	E JK	
3727.6[e] 8	13^-	E K	
3829.2[j] 10	13^+	E	
3897.4[c] 14	14^-	E JK	
3938.4[b] 11	15^-	E JK	J$^{\pi}$: $\gamma(\theta)$. E2 γ to 13^-.
3974.9[d] 10	14^-	E K	
4103.5 13		E	
4141.9[&] 13	16^+	E JK	J$^{\pi}$: $\gamma(\theta)$. E2 γ to 14^+.
4195.4[f] 11	16^+	E JK	
4246.3[e] 11	15^-	E K	
4246.5[h] 13	15^-	E	
4362.9 14		E	
4526.3[c] 17	16^-	E JK	
4539.8[d] 12	16^-	E K	
4609.0[b] 15	17^-	E JK	J$^{\pi}$: E2 γ to 15^-.
4745.8[f] 13	18^+	E JK	
4835.8[&] 15	18^+	E JK	
4852.0[e] 13	17^-	E K	
5010.5[h] 17	17^-	E	
5183.9[d] 13	18^-	K	
5213.8[c] 20	18^-	E JK	
5334.0[b] 18	19^-	E JK	
5385.2[f] 15	20^+	E JK	
5529.9[e] 14	19^-	K	
5550.1[&] 18	20^+	JK	
5853.1[g] 20	21^-	K	
5888.9[d] 15	20^-	K	
5923.8[c] 22	20^-	E K	
6081.3[b] 20	21^-	E JK	
6096.2[f] 18	22^+	K	
6258.9[e] 16	21^-	K	
6302.1[&] 21	22^+	K	
6598.8[c] 25	22^-	K	
6627.2[g] 21	23^-	K	
6636.9[d] 16	22^-	K	
6835.3[b] 23	23^-	K	
6876.2[f] 21	24^+	K	
7024.9[e] 17	23^-	K	
7091.1[&] 23	24^+	K	
7265.2[g] 23	25^-	K	

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Adopted Levels, Gammas (continued)

^{152}Gd Levels (continued)

E(level)[†]	J^{π}[#]	XREF	Comments
7280[c] 3	24⁻	K	
7420.9[d] 19	24⁻	K	
7533.3[b] 25	25⁻	K	
7721.2[f] 23	26⁺	K	
7830.9[e] 20	25⁻	K	
7861.1[&] 25	26⁺	K	
7990[c] 3	26⁻	K	
8129.2[g] 25	27⁻	K	
8246?[d]	(26)⁻	K	
8292[b] 3	27⁻	K	
8620.2[f] 25	28⁺	K	
8638.2 25	28⁺	K	
8677?[e]	(27)⁻	K	
8726[c] 3	28⁻	K	
9027[g] 3	29⁻	K	
9106?[d]	(28)⁻	K	
9436.2[f] 25	30⁺	K	
9544[c] 4	30⁻	K	
9957[g] 3	31⁻	K	
10225[f] 3	32⁺	K	
10353?	(32)⁺	K	
10452[c] 4	32⁻	K	
10918[g] 3	33⁻	K	
11064[f] 3	34⁺	K	
11522?[c] 4	34⁻	K	
11889[g] 4	35⁻	K	Possible band crossing at 35⁻ level.
11931 4	35⁻	K	
11952[f] 3	36⁺	K	
12268[c] 4	36⁻	K	
12712[g] 4	37⁻	K	
13065[f] 4	38⁺	K	
13088[c] 4	38⁻	K	
13547[g] 4	39⁻	K	
13944[c] 4	40⁻	K	
14120?[f] 4	40⁺	K	
14400[g] 4	41⁻	K	
15125?[f] 4	42⁺	K	
15486[g] 4	43⁻	K	
16184[f] 4	44⁺	K	
17361[f] 4	46⁺	K	
18722[f] 4	48⁺	K	

† From a least squares fit to adopted Eγ.

‡ The three transitions from the 3214 level do not yield consistent energies. The 887, 1045, and 1521γ′s give E(level)=3213.14 *14*, 3214.89 *24*, and 3213.99 *17*, respectively. 2003Ad25 give 3214.23 *9*. The evaluator adopts E=3214 *1* and considers the level as tentative.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{152}Gd Levels (continued)

Arguments are given up to 3400. For higher levels, the assignments are based on the band structure of 2006ShZY in (α,xnγ) and of 2007Ca25 in (^{36}S,α4nγ). $\gamma(\theta)$ and mult arguments are given in the few cases where they are available.

@ From Doppler shift recoil distance in Coulomb excitation (1982Jo04), except for the g.s. and 344 levels, as noted.

& Band(A): $K^\pi=0^+$ g.s. band.

[a] Band(B): $K^\pi=0^+$ quasi-β band.

[b] Band(C): $K^\pi=1^-$ negative-parity odd-spin band.

[c] Band(D): $K^\pi=6^-$ negative-parity even-spin band.

[d] Band(E): $K^\pi=8^-$ negative-parity even-spin band,

[e] Band(F): $K^\pi=9^-$ negative-parity odd-spin band.

[f] Band(G): $K^\pi=12^+$ positive-parity even-spin band.

[g] Band(H): $K^\pi=21^-$ negative-parity odd-spin band.

[h] Band(I): $K^\pi=8^-$ possible negative-parity band.

[i] Band(J): $K^\pi=2^+$ even-spin γ vibrational band.

[j] Band(K): $K^\pi=3^+$ odd-spin γ vibrational band.

[k] Band(L): $K^\pi=1^-$ band.

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

γ(^{152}Gd)

E_i(level)	J_i^π	E_γ[†]	I_γ[@]	E_f	J_f^π	Mult.[a]	α[b]	$I_{(\gamma+ce)}$	Comments
344.2790	2^+	344.2785 *12*		0.0	0^+	E2	0.0399		B(E2)(W.u.)=73 *+7−6*
615.386	0^+	271.10 *3*	100	344.2790	2^+	E2	0.0831		B(E2)(W.u.)=178 *+53−33*
		615.41 *5*		0.0	0^+	E0		13.4 *5*	$I_{(\gamma+ce)}$: Weighted average of I(γ+ce)/Iγ(271γ)=0.140 *5* from 13-y Eu β^- decay 0.133 *6* from 17.5-h Tb ε decay, and 0.120 *9* from 9.3-h Eu β^- decay.
									ρ^2=0.066 *14* (17.5-h Tb ε decay).
755.3961	4^+	411.1165 *12*	100	344.2790	2^+	E2	0.0238		B(E2)(W.u.)=133 *+8−7*
									Mult.: Non-zero δ(M3/E2) values have been reported in 17.5-h Tb ε decay, and in 13-y Eu β^- decay; however, these values greatly exceed the RUL limit of B(M3)(W.u.)<10 which requires $\delta<4.4\times10^{-5}$.
930.545	2^+	175.09 *3*	0.27 *6*	755.3961	4^+	[E2]	0.352		B(E2)(W.u.)=23 *5*
									Mult.: α(K)exp gives mult=M1, but placement from 2^+ to 4^+ requires E2.
		315.11 *3*	8.80 *18*	615.386	0^+	E2	0.0520		α(K)= 0.0401; α(L)=0.00930; α(M)=0.00210; α(N+..)=0.000577
									B(E2)(W.u.)=36 *4*
		586.2648 *26*	100.0 *8*	344.2790	2^+	E2+M1+E0	0.0242 *11*		B(E2)(W.u.)=16.5 *14*; B(M1)(W.u.)=0.00114 *14*
									δ: δ(E2/M1)=−3.05 *14*.
									ρ^2=0.046 *4* (17.5-h Tb ε decay). Ice(K)(E0)/Ice(K)(E2)=1.73 *19* from α(K)exp and δ.
		930.50 *4*	16.0 *4*	0.0	0^+	(E2)	0.00322		B(E2)(W.u.)=0.31 *3*
									Mult.: α(K)exp is consistent with M1 or E2; however, the decay scheme requires ΔJ=2.
1047.80	0^+	117.25 *7*	3.31 *10*	930.545	2^+	E2	1.42		
		432.52 *10*		615.386	0^+	E0		31 *4*	
		703.52 *5*	100 *3*	344.2790	2^+	E2	0.00603		
		1048.1 *3*		0.0	0^+	E0		1.7 *5*	
1109.202	2^+	178.58 *11*	0.44 *4*	930.545	2^+	M1,E2			
		353.88 *17*	0.51 *6*	755.3961	4^+	[E2]			I_γ: From 13-y Eu β^- decay. Iγ=1.04 *5* is reported in 17.5-h Tb ε decay.
		493.81 *7*	5.16 *12*	615.386	0^+	[E2]	0.0145		
		764.88 *4*	100.0 *23*	344.2790	2^+	M1+E2(+E0)	0.0070 *6*		δ: δ=4.30 *+7−6*.
									α: From α(K)exp=0.0059 *5* and α/α(K)=1.18.
									Mult.: A comparison of α(K)exp=0.0059 *5* with the theory value of 0.0044 deduced from the measured δ, suggests the possibility of an E0 component.
		1109.18 *5*	94 *3*	0.0	0^+	(E2)	0.00224		Mult.: α(K)exp is consistent with mult=M1 or E2, but placement in the decay scheme requires ΔJ=2.
1123.1857	3^-	192.60 *4*	0.0526 *17*	930.545	2^+	[E1]	0.0504		
		367.7891 *20*	6.63 *8*	755.3961	4^+	E1	0.00966		δ: δ(M2/E1)=+0.015 *19*.
		778.9045 *24*	100.0 *5*	344.2790	2^+	E1	0.00185		δ: δ(M2/E1)=+0.003 *6*.
1227.37	6^+	471.98 *9*	100	755.3961	4^+	E2	0.0164		B(E2)(W.u.)=197 *+49−35*

Adopted Levels, Gammas (continued)

γ(^{152}Gd) (continued)

E_i(level)	J^π_i	E_γ [†]	I_γ [@]	E_f	J^π_f	Mult. [a]	δ	α [b]	Comments
1274.27	1,2$^+$	658.83 *11*	100	615.386	0$^+$				
1282.246	4$^+$	159.16 *16*	3.6 *4*	1123.1857	3$^-$	[E1]		0.0835	
		172.1[d] *4*	3.3 *16*	1109.202	2$^+$	[E2]		0.365	E_γ,I_γ: From 13-y Eu β^- decay. Not reported in 17.5-h Tb ε decay.
		351.69 *4*	88.4 *22*	930.545	2$^+$	E2		0.0375	
		526.88 *5*	100.0 *22*	755.3961	4$^+$	M1+E2+E0		0.094 *8*	
1314.613	1$^-$	191.6 *3*	0.08 *5*	1123.1857	3$^-$	[E2]		0.259	
		266.92 *22*	0.12 *6*	1047.80	0$^+$	[E1]		0.0215	
		699.28 *4*	7.51 *26*	615.386	0$^+$	[E1]		0.00231	
		970.321 *8*	61.6 *16*	344.2790	2$^+$	E1+M2	−0.021 *12*	0.00121	
		1314.61 *6*	100.0 *17*	0.0	0$^+$	E1		0.00069	
1318.414	2$^+$	195.17 *6*	13.3 *3*	1123.1857	3$^-$	E1		0.0487	
		209.14 *8*	1.20 *5*	1109.202	2$^+$	M1+E2(+E0)		0.50 *13*	
		387.86 *5*	12.4 *4*	930.545	2$^+$	E0+M1+E2		0.45 *11*	
		562.98 *9*	2.22 *7*	755.3961	4$^+$	[E2]		0.0104	
		703.025[‡] *22*	28.3 *11*	615.386	0$^+$	E2		0.00604	
		974.08 *4*	100.0 *21*	344.2790	2$^+$	M1+E2	+0.58 *7*	0.0041 *7*	
		1318.29 *11*	9.5 *7*	0.0	0$^+$	[E2]		0.00159	
1434.020	3$^+$	324.83 *3*	3.93 *11*	1109.202	2$^+$	[M1,E2]		0.063 *16*	I_γ: From 13-y Eu β^- decay. Iγ=4.65 *21* in 17.5-h Tb ε decay.
		503.467 *9*	8.79 *11*	930.545	2$^+$	E2		0.0139	I_γ: From 13-y Eu β^- decay. Iγ=7.18 *21* in 17.5-h Tb ε decay.
		678.623 *5*	27.25 *19*	755.3961	4$^+$	M1+E2	+4.1 *+17−11*	0.00652 *1*	I_γ: From 13-y Eu β^- decay. Iγ=24.9 *6* in 17.5-h Tb ε decay.
		1089.737 *5*	100.0 *5*	344.2790	2$^+$	M1+E2	+22 *+13−6*	0.00232	
1460.53?	(1,2$^+$)	412.0[d] *3*	7 *5*	1047.80	0$^+$				
		845.4[d] *5*	100 *15*	615.386	0$^+$				
		1116.0[d] *10*	11 *7*	344.2790	2$^+$				
		1460.65[d] *13*	17 *5*	0.0	0$^+$				
1470.43	5$^-$	345		1123.1857	3$^-$				
		715.0 *2*		755.3961	4$^+$	D+Q			Mult.: γ(θ) (α,xnγ).
1470.63	2$^+$	715.19 *8*	100.0 *25*	755.3961	4$^+$	[E2]			
		855.24[‡] *6*	45 *9*	615.386	0$^+$	[E2]			
1533.92		603.18 *14*	100	930.545	2$^+$				
1550.16	4$^+$	440.96 *8*	26.1 *7*	1109.202	2$^+$	[E2]		0.0197	I_γ: From 17.5-h Tb ε decay. Iγ=50 *6* reported in 13-y Eu β^- decay.
		794.76 *4*	100.0 *26*	755.3961	4$^+$	D(+Q)	−0.4 *+7−12*	0.0077 *21*	
		1205.91 *9*	61 *6*	344.2790	2$^+$	(E2)			
1605.609	2$^+$	287.10 *12*	2.42 *21*	1318.414	2$^+$	[M1,E2]			
		482.34 *9*	6.44 *16*	1123.1857	3$^-$	[E1]			E_γ,I_γ: From 17.5-h Tb ε decay. The transition is a doublet in 13-y Eu β^- decay.
		496.37 *7*	16.2 *4*	1109.202	2$^+$	M1+E2+E0		0.074 *5*	E_γ: From 17.5-h Tb ε decay. The transition is a doublet in 13-y Eu β^- decay.
		557.80[‡] *4*	8.0 *8*	1047.80	0$^+$	[E2]		0.0106	

$^{152}_{64}Gd_{88}$-9

Adopted Levels, Gammas (continued)

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

E_i(level)	J^π_i	E_γ[†]	I_γ[@]	E_f	J^π_f	Mult.[a]	δ	α[b]	Comments
1605.609	2^+	675.01 *7*	58.8 *12*	930.545	2^+	M1+E2	+2.2 *4*	0.0076 *4*	E_γ,I_γ: From 17.5-h Tb ε decay. The transition is a doublet in 13-y Eu β^- decay.
		850.16 *12*	2.30 *24*	755.3961	4^+	[E2]			I_γ: From 13-y Eu β^- decay. Iγ=3.3 *3* reported in 17.5-h Tb ε decay.
		990.18 *35*	80 *3*	615.386	0^+	E2			
		1261.35 *5*	100.0 *21*	344.2790	2^+	M1		0.00271	
		1605.62 *7*	23.6 *11*	0.0	0^+	E2			Mult.: From α(K)exp in 13-y Eu β^- decay. α(K)exp in 17.5-h Tb ε decay requires mult=E1, inconsistent with the placement.
1643.418	2^-	209.41 *13*	0.073 *25*	1434.020	3^+	[E1]		0.0404	
		324.914 *26*	0.305 *15*	1318.414	2^+	[E1]			
		328.764 *26*	0.212 *13*	1314.613	1^-				
		520.25 *4*	3.18 *13*	1123.1857	3^-	[M1,E2]		0.018 *5*	
		534.25 *5*	2.52 *6*	1109.202	2^+	[E1]			
		712.83 *5*	5.74 *18*	930.545	2^+	(E1)		0.00221	Mult.,δ: D(+Q) with δ(Q/D)=+0.06 *+19−15* from 13-y Eu β^- decay.
		1299.141 *8*	100.0 *5*	344.2790	2^+	E1+M2	+0.043 *17*		
1668.13	6^+	197.4 *3*	8.9 *7*	1470.43	5^-	[E1]		0.0472	
		385.9 *1*	100 *6*	1282.246	4^+	E2		0.0286	
		440.8 *2*	12 *5*	1227.37	6^+	(M1+E2)		0.021 *15*	E_γ: From the level energy difference. The transition is a doublet in 4.2-min Tb ε decay. Eγ=439.8 in (α,xnγ) and 440.7 in (^{9}Be,5nγ). Mult.: Mult=D+Q from $\gamma(\theta)$ in (α,xnγ). $\Delta\pi$=no from the level scheme.
1680.74	0^+	366.15 *9*	24.0 *16*	1314.613	1^-	[E1]			
		750.06 *9*	10.1 *10*	930.545	2^+	[E2]			
		1336.54 *8*	100.0 *21*	344.2790	2^+	[E2]			
1692.42	$2^+,3^+$	937.04 *9*	19.1 *8*	755.3961	4^+	[M1,E2]			
		1348.12 *6*	100.0 *23*	344.2790	2^+	M1+E2	15 *6*	0.00153	δ: δ=−13 *+4−7* for J=3 and +12 *+9−4* for J=2.
1734.44		979.04 *12*	100	755.3961	4^+				
1746.78	8^+	519.4 *1*	100	1227.37	6^+	E2		0.0128	Mult.: ΔJ=2.
1755.97	1^-	632.8 *3*	2.6 *16*	1123.1857	3^-				
		646.9 *3*	1.6 *10*	1109.202	2^+				
		825.5 *3*	1.6 *10*	930.545	2^+				
		1411.76 *5*	100.0 *19*	344.2790	2^+				
		1755.98 *7*	6.5 *6*	0.0	0^+				
1771.57	2^+	456.92 *7*	39.2 *18*	1314.613	1^-	[E1]			
		489.59 *13*	22.9 *18*	1282.246	4^+	[E2]		0.01475	
		648.31 *7*	100.0 *24*	1123.1857	3^-	[E1]			
		723.67 *10*	19.4 *8*	1047.80	0^+	[E2]			
		841.10 *9*	43.4 *24*	930.545	2^+	[M1,E2]			
		1427.32 *7*	99.4 *24*	344.2790	2^+	[M1,E2]			
1785.21	2^+	662.02 *10*	63 *8*	1123.1857	3^-	[E1]			

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

E_i(level)	J_i^π	E_γ[†]	I_γ[@]	E_f	J_f^π	Mult.[a]	δ	α[b]	Comments
1785.21	2^+	854.69	100 *20*	930.545	2^+	E0+M1+E2			
1807.52		1052.15 *7*	100	755.3961	4^+				
1808.96		490.66 *9*	100 *4*	1318.414	2^+				
		878.13 *19*	41 *4*	930.545	2^+				
1839.71	2^+	557.46[‡] *6*	31 *6*	1282.246	4^+	(E2)		0.01053	
		909.15 *7*	100 *3*	930.545	2^+	[M1,E2]			
		1084.30[‡] *5*	36 *8*	755.3961	4^+	[E2]			
		1495.44 *8*	84 *3*	344.2790	2^+	E0+M1+E2			
1861.58	5^+	311.4 *4*	2.8 *11*	1550.16	4^+	[M1,E2]		0.071 *17*	
		427.6 *2*	33.2 *19*	1434.020	3^+	E2		0.0214	
		579.2 *3*	7.9 *7*	1282.246	4^+	[M1,E2]		0.014 *4*	
		634.2 *2*	33.6 *26*	1227.37	6^+	[M1,E2]		0.011 *3*	
		1106.2 *2*	100 *7*	755.3961	4^+	E2			
1861.90	2^+	218.42 *9*	3.03 *16*	1643.418	2^-	[E1]		0.0360	
		427.85 *11*	4.4 *3*	1434.020	3^+	[M1,E2]		0.029 *9*	
		543.58 *7*	42.1 *10*	1318.414	2^+	E0+M1+E2		0.016 *5*	δ: (E2/M1)$−3 +*8*−*INFNT*$T_{1/2}$ (1981Fe01).
		579.63 *9*	6.5 *4*	1282.246	4^+	[E2]			
		738.69 *9*	46.7 *13*	1123.1857	3^-	[E1]			
		752.59 *9*	6.9 *6*	1109.202	2^+	[M1,E2]			
		814.09[‡] *5*	5.3 *10*	1047.80	0^+	[E2]			
		1861.94 *8*	100.0 *21*	0.0	0^+	(E2)			Mult.: α(K)exp is consistent with mult=M1 or E2; however, placement in the decay scheme requires ΔJ=2.
1862.05	2^+	547.47 *7*	13.9 *4*	1314.613	1^-	[E1]			
		1106.59 *8*	75.8 *23*	755.3961	4^+	[E2]			
		1517.76[‡] *6*	100 *8*	344.2790	2^+	M1+E2	−0.28 *5*		
1880.2	7^-	410		1470.43	5^-				
		652.9 *3*		1227.37	6^+	E1		0.00266	
1915.17	$(4)^+$	687.62 *14*	3.6 *10*	1227.37	6^+				
		1159.82 *7*	100.0 *24*	755.3961	4^+				
1915.77	$2^+,3,4^+$	597.57 *11*	6.7 *5*	1318.414	2^+				
		633.60 *9*	11.8 *5*	1282.246	4^+				
		792.56 *11*	12.6 *8*	1123.1857	3^-				
		1571.25 *8*	100.0 *20*	344.2790	2^+				
1941.177	2^+	248.75 *9*	6.8 *9*	1692.42	$2^+,3^+$	[M1,E2]		0.133 *25*	
		298.06 *21*	0.74 *11*	1643.418	2^-	[E1]		0.01619	
		335.56 *7*	6.41 *21*	1605.609	2^+	[M1,E2]		0.057 *15*	
		390.82 *15*	0.81 *13*	1550.16	4^+				
		622.79 *7*	100.0 *21*	1318.414	2^+	M1(+E2)	+0.018 *+42−18*	0.011 *4*	δ: δ=+0.018 *+42−18* or +2.1 *3*. α(K)exp rules out the large solution. δ: Other: +1.0 *5* (1981Fe01).
		817.99[‡] *3*	10.3 *17*	1123.1857	3^-	[E1]			

$^{152}_{64}Gd_{88}$-11

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

E_i(level)	J^π_i	E_γ[†]	I_γ[@]	E_f	J^π_f	Mult.[a]	δ	α[b]	Comments
1941.177	2^+	831.94 8	12.3 4	1109.202	2^+	[M1,E2]			
		893.34 7	69.6 15	1047.80	0^+	[E2]			Mult.: α(K)exp is larger than the theory values of 0.00511 for M1 and 0.00294 for E2. Placement in the decay scheme requires mult=E2. $\gamma(\theta)$ is consistent with ΔJ=2.
		1010.60 7	43.6 9	930.545	2^+	M1(+E2+E0)			δ: +0.03 +3−10 or +2.1 5.
		1185.73 7	23.2 6	755.3961	4^+	(E2)			Mult.: α(K)exp is consistent with mult=E1 or E2; however, placement in the decay scheme requires $\Delta\pi$=no. δ: δ(O/Q)=−0.3 3 (1981Fe01).
		1325.86 7	85.5 21	615.386	0^+	E2			
		1596.89[‡] 3	33.0 17	344.2790	2^+	M1+E2	−0.28 12		
		1941.23 8	76.4 16	0.0	0^+	(E2)			Mult.: α(K)exp lies between α(K)=0.000310 for E1 and 0.000647 for E2. placement in the decay scheme requires ΔJ=2.
1975.72	$1^+,2^+$	1360.43 11	39.2 18	615.386	0^+				
		1631.43[‡] 7	92 7	344.2790	2^+	M1(+E2)			
		1975.65 8	100.0 26	0.0	0^+				
1997.85	6^+	447.7 4	62 15	1550.16	4^+	[E2]		0.0189	
		770.4 3	100 15	1227.37	6^+				
		1242.6 4	65 12	755.3961	4^+				
2011.67	$1^+,2^+$	577.57 9	2.65 14	1434.020	3^+				
		693.13 16	4.1 3	1318.414	2^+				
		697.20 16	2.3 8	1314.613	1^-				
		902.46 8	21.8 6	1109.202	2^+				
		1667.38 8	100.0 23	344.2790	2^+	M1+E2		0.00134 20	Mult.,δ: α(K)exp and $\gamma(\theta)$ in 17.5-h Tb ε decay require a mixed M1+E2 mult.
2069.4		1314	100	755.3961	4^+				
2121.05	$2^+,3^-,4^+$	839.6 4	15 3	1282.246	4^+				
		1365.69 8	100.0 22	755.3961	4^+				
		1776.3 3	16.9 22	344.2790	2^+				
2133.38	$1^+,2^+$	818.76[#]	1.3 5	1314.613	1^-				
		1202.84[#]	5.7 16	930.545	2^+				
		1518.02[#]	6.6 13	615.386	0^+				
		1789.11[#]	100 3	344.2790	2^+	M1			
2138.79	8^+	258		1880.2	7^-				E_γ: Reported only in (α,xnγ).
		392		1746.78	8^+				E_γ: Reported only in (^{36}S,α4nγ).
		470.7 5		1668.13	6^+	E2		0.0165	Mult.: ΔJ=2.
2169.64	2^+	855.03[‡] 7	11 3	1314.613	1^-				
		1554.04 16	8.9 8	615.386	0^+				
		1825.37 9	100.0 21	344.2790	2^+				
2173.41	6^-	946.0 2	100	1227.37	6^+				

$^{152}_{64}$Gd$_{88}$-12

Adopted Levels, Gammas (continued)

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

E_i(level)	J^π_i	E_γ[†]	I_γ[@]	E_f	J^π_f	Mult.[a]	δ	α[b]	Comments
2201.71	2^+	1092.26 *14*	19.9 *11*	1109.202	2^+				
		1446.31[‡] *7*	48 *5*	755.3961	4^+	[E2]			
		1857.48 *8*	100.0 *22*	344.2790	2^+	M1+E2			δ: δ=−0.8 +*2*−*5* or −4 +*2*−*4*.
		2201.65 *26*	7.3 *8*	0.0	0^+				
2246.81	2^+	407.12 *21*	0.83 *12*	1839.71	2^+	[M1,E2]		0.034 *10*	
		641.20 *7*	3.50 *9*	1605.609	2^+	[M1,E2]		0.010 *3*	
		812.80 *8*	11.8 *3*	1434.020	3^+	[M1,E2]			
		928.43 *7*	21.4 *5*	1318.414	2^+	M1,E2			
		932.09 *8*	11.5 *4*	1314.613	1^-	[E1(+M2)]			
		1137.56 *7*	50.8 *11*	1109.202	2^+	M1+E2			δ: δ=−0.40 +*4*−*2* or +23 +*72*−*10*.
		1316.32 *12*	11.7 *9*	930.545	2^+				
		1491.62 *22*	1.00 *7*	755.3961	4^+				
		1631.41[‡] *4*	9.5 *6*	615.386	0^+	[E2]			
		1902.51[‡] *4*	100.0 *23*	344.2790	2^+	M1+E2	−0.97 +*15*−*36*		
2258.17	2^+,3,4^+	939.84 *9*	79 *3*	1318.414	2^+				
		1148.99 *10*	100 *5*	1109.202	2^+				
		1502.62 *10*	35.8 *12*	755.3961	4^+				
2264.86	1^-,2,3^-	947.1 *3*	19 *4*	1318.414	2^+				
		950.34 *16*	43.4 *19*	1314.613	1^-				
		1141.68 *10*	100 *5*	1123.1857	3^-				
2265.30	1^+,2^+,3^+	1921.00 *8*	100	344.2790	2^+	M1+E2			δ: δ=−0.23 +*9*−*13*, −0.27 *3*, +0.22 *3* for J=1, 2, and 3, respectively.
2267.71?		953.07[d] *9*	100.0 *25*	1314.613	1^-	M1			
		1040.6[d] *3*	10.4 *22*	1227.37	6^+				
2299.5	10^+	553.6	100	1746.78	8^+				
2299.66	2,3^-	656.42 *9*	8.9 *4*	1643.418	2^-				
		865.62 *8*	10.0 *4*	1434.020	3^+				
		984.90 *8*	15.4 *9*	1314.613	1^-				
		1176.53 *9*	7.2 *3*	1123.1857	3^-				
		1190.44 *7*	100.0 *20*	1109.202	2^+				
		1369.04 *9*	33.1 *8*	930.545	2^+				
		1955.36 *8*	90.7 *20*	344.2790	2^+				
2301.82	7^+	303.7 *4*	9 *5*	1997.85	6^+				
		440.3[c] *2*	54[c] *27*	1861.58	5^+				
		1074.5 *2*	100 *7*	1227.37	6^+				
2325.69		1202.50[‡] *9*	100	1123.1857	3^-				
2330.72	2^+,3,4^+	1575.30 *9*	100 *3*	755.3961	4^+				
		1986.8 *4*	8.0 *18*	344.2790	2^+				
2331.1	9^-	451.1	28	1880.2	7^-	E2		0.0185	Mult.: ΔJ=2.
		584.6	100	1746.78	8^+	D			
2386.95	$(2)^+$	1072.16 *15*	28 *4*	1314.613	1^-				
		1263.84 *11*	100 *4*	1123.1857	3^-				

$^{152}_{64}$Gd$_{88}$-13

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

E_i(level)	J_i^π	E_γ[†]	I_γ[@]	E_f	J_f^π	Mult.[a]	δ	α[b]	Comments
2386.95	(2)$^+$	2042.65[‡] 9	100 8	344.2790	2$^+$	M1+E2(+E0)			
2394.19	7$^+$	92.4 2	6.8 7	2301.82	7$^+$				
		220.7 3	10.1 9	2173.41	6$^-$				
		255.4 3	8.5 7	2138.79	8$^+$	M1,E2		0.125 25	
		396.4 3	3.1 7	1997.85	6$^+$				
		532.6 1	100 6	1861.58	5$^+$	E2		0.0120	
		647.4 2	100 7	1746.78	8$^+$	M1		0.0135	
		726.0 2	74 4	1668.13	6$^+$	M1		0.0102	
		1166.9 2	86 6	1227.37	6$^+$	M1		0.00325	
2401.52	1$^+$,2,3$^-$	708.98 8	27.8 10	1692.42	2$^+$,3$^+$				
		1083.12[‡] 7	25 6	1318.414	2$^+$				
		1087.12 10	100 4	1314.613	1$^-$				
2437.43	2$^+$	1314.24 8	100 4	1123.1857	3$^-$	E1			
		1506.90 8	21.7 9	930.545	2$^+$	M1(+E0)			
		2093.15[‡] 5	59 5	344.2790	2$^+$	M1+E2(+E0)			
		2437.11 21	3.7 3	0.0	0$^+$				
2448.02	$^+$	2103.73 12	100	344.2790	2$^+$	M1,E2			
2460.6	8$^+$	464		1997.85	6$^+$				
		1232		1227.37	6$^+$				
2495.18		1372.04 9	22.0 7	1123.1857	3$^-$				
		2150.85 8	100.0 20	344.2790	2$^+$				
2513.9	1,2$^+$	2169.6 4	100 28	344.2790	2$^+$				
		2513.9 4	11.1 28	0.0	0$^+$				
2523.81	2$^+$	684.12 9	6.0 7	1839.71	2$^+$				
		880.29 10	14.3 5	1643.418	2$^-$				
		1209.03 9	100.0 22	1314.613	1$^-$	E1+M2	+0.06 4		
		1400.61[‡] 4	34 3	1123.1857	3$^-$				
		1593.37 9	32.0 9	930.545	2$^+$				
		2179.42 11	20.5 6	344.2790	2$^+$	M1			
		2523.92 9	28.9 7	0.0	0$^+$	(E2)			Mult.: α(K)exp is consistent with mult=M1 or E2. Placement in the decay scheme requires ΔJ=2.
2529.43	2$^+$,3$^+$	722.00 12	5.6 4	1807.52					
		1247.07 7	58.4 17	1282.246	4$^+$				
		1406.16 8	44.7 11	1123.1857	3$^-$	(E1)			Mult.: α(K)exp has a large uncertainty and is more consistent with E2 than with E1; however, placement in the level scheme requires $\Delta\pi$=yes.
		1598.90 8	96.6 22	930.545	2$^+$				
		2185.24 9	100.0 20	344.2790	2$^+$	M1		0.00118	
2536.6	8$^-$	363		2173.41	6$^-$				
		657		1880.2	7$^-$				
		790.2		1746.78	8$^+$	(E1+M2)			
2540.47	2$^+$,3$^+$	1221.95 12	22.6 15	1318.414	2$^+$				

$^{152}_{64}Gd_{88}$-14

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

E_i(level)	J^π_i	E_γ[†]	I_γ[@]	E_f	J^π_f	Mult.[a]	δ	α[b]	Comments
2540.47	$2^+,3^+$	1417.18 *15*	21.3 *11*	1123.1857	3^-				
		1785.15 *11*	52 *3*	755.3961	4^+				
		2196.20 *10*	100.0 *21*	344.2790	2^+	M1			
2544.01		1420.76 *8*	100 *3*	1123.1857	3^-				
		1613.53 *9*	95 *4*	930.545	2^+				
2551.14		1117.15 *11*	20.3 *8*	1434.020	3^+				
		1441.91 *8*	100 *3*	1109.202	2^+				
2557.87	2^+	914.35 *7*	80.3 *24*	1643.418	2^-				
		1434.54 *11*	44.2 *22*	1123.1857	3^-				
		1802.67 *9*	100 *3*	755.3961	4^+				
		2211.7[d]		344.2790	2^+	(E0)			
		2557.91 *12*	38.1 *12*	0.0	0^+				
2598.80	$1^+,2^+$	993.14 *11*	66 *3*	1605.609	2^+				
		1489.60 *10*	68.7 *20*	1109.202	2^+	M1(+E2)			
		1983.41 *8*	76.0 *20*	615.386	0^+				
		2254.54 *9*	100.0 *20*	344.2790	2^+	M1,E2			
2604.33	$1^-,2,3^-$	1289.64 *9*	45.4 *15*	1314.613	1^-				
		1481.18 *8*	94 *5*	1123.1857	3^-				
		2260.05 *11*	100.0 *24*	344.2790	2^+				
2641.58	$1^-,2^-,3^-$	1518.38[‡] *9*	100 *8*	1123.1857	3^-	M1,E2			
		1711.02 *9*	19.2 *6*	930.545	2^+				
2667.55	1^-	1352.98 *11*	49 *5*	1314.613	1^-	E0+M1+E2			
		1544.29 *8*	100.0 *25*	1123.1857	3^-				
		1737.03 *9*	69.2 *18*	930.545	2^+				
2686.87	2^+	2342.57 *9*	100	344.2790	2^+	M1+E2(+E0)			δ: δ(E2/M1)=−0.05 +*17*−*15* or +2.1 *9*.
2691.7	10^+	361		2331.1	9^-				
		552.4		2138.79	8^+	E2		0.0109	
2696.8	8^-	950	100	1746.78	8^+				
2709.42	2^+	1066.2 *3*	1.18 *9*	1643.418	2^-				
		1586.22 *7*	100.0 *21*	1123.1857	3^-	E1+M2	+0.19 +*3*−*14*		
		1778.78 *9*	11.4 *4*	930.545	2^+	M1+E2			δ: δ=−0.26 *10* or +5.9 +*70*−*22*.
		2094.02[‡] *5*	8.4 *8*	615.386	0^+	[E2]			
		2365.13 *9*	39.3 *10*	344.2790	2^+	E0+M1+E2			δ: δ(E2/M1)≤0.25 or +1.8 +*6*−*5*.
		2709.47 *9*	18.9 *4*	0.0	0^+	E2			
2719.63	2^+	454.8 *3*	0.64 *15*	2264.86	$1^-,2,3^-$				
		1027.16 *21*	1.36 *16*	1692.42	$2^+,3^+$				
		1401.22[‡] *5*	7.3 *3*	1318.414	2^+				
		1596.45[‡] *5*	19.8 *15*	1123.1857	3^-	[E1]			
		1789.08[‡] *5*	11.8 *9*	930.545	2^+	M1+E2	+0.26 +*9*−*6*		
		2104.24[‡] *5*	4.4 *10*	615.386	0^+	[E2]			
		2375.34 *9*	100.0 *21*	344.2790	2^+	M1+E2	+0.15 *8*		

$^{152}_{64}Gd_{88}$-15

Adopted Levels, Gammas (continued)

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

E_i(level)	J_i^π	E_γ[†]	I_γ[@]	E_f	J_f^π	Mult.[a]	δ	α[b]	Comments
2719.63	2^+	2719.61 *8*	32.7 *8*	0.0	0^+	(E2)			Mult.: α(K)exp allows mult=M1 or E2; however, placement in the decay scheme requires $\Delta J=2$.
2729.17	2^+	813.40[‡] *6*	5.2 *24*	1915.77	$2^+,3,4^+$				
		1036.74 *7*	52.1 *12*	1692.42	$2^+,3^+$				
		1085.68 *11*	65.2 *21*	1643.418	2^-	D+Q	−0.18 *14*		
		1258.45 *10*	22.7 *9*	1470.63	2^+				
		1410.75[‡] *4*	100 *6*	1318.414	2^+	M1+E2	+4.3 *+9−13*		
		1605.98[‡] *4*	73 *9*	1123.1857	3^-	(E1)			
		1681.53 *8*	19.9 *5*	1047.80	0^+				
		1798.45 *9*	47.9 *18*	930.545	2^+	E2(+M1)	≥14.3		
		2113.70 *9*	41.2 *9*	615.386	0^+	(E2)			Mult.: α(K)exp allows mult=M1 or E2; however, placement in the decay scheme requires $\Delta J=2$.
		2384.94 *9*	43.9 *9*	344.2790	2^+	E0+M1+E2			δ: δ(E2/M1)=−0.22 *8* or 4.8 *+28−13*.
		2729.25 *11*	7.9 *3*	0.0	0^+				
2734.07		2118.66 *9*	61.5 *16*	615.386	0^+	M1			
		2734.06 *10*	100.0 *21*	0.0	0^+				
2744.04	1^-	1634.0 *3*	8.9 *21*	1109.202	2^+				
		2744.10 *10*	100.0 *25*	0.0	0^+	E1			
2749.24	$2^+,3^+$	301.8 *3*	0.38 *11*	2448.02	$^+$				
		1056.79 *7*	1.72 *6*	1692.42	$2^+,3^+$				
		1215.20 *11*	0.80 *9*	1533.92					
		1430.76 *7*	7.2 *3*	1318.414	2^+				
		1475.04 *14*	0.72 *24*	1274.27	$1,2^+$				
		1640.08 *9*	3.30 *11*	1109.202	2^+	M1			
		1993.87 *8*	6.96 *15*	755.3961	4^+				
		2405.00 *9*	100.0 *20*	344.2790	2^+	(E2)			Mult.: α(K)exp is consistent with mult=E1 or E2; however, the decay scheme requires $\Delta\pi$=no.
2772.47	2^+	857.33 *11*	100 *7*	1915.17	$(4)^+$				
		1016.60 *9*	88.9 *24*	1755.97	1^-				
		1128.65 *10*	34 *4*	1643.418	2^-				
		1338.5 *4*	15.1 *24*	1434.020	3^+				
		1454.08 *12*	28.1 *16*	1318.414	2^+				
		1663.67 *14*	53 *3*	1109.202	2^+	E0+M1+E2			
		1841.91[‡] *5*	33 *4*	930.545	2^+	M1,E2			
		2772.44 *18*	6.3 *4*	0.0	0^+				
2774.5	9^+	476		2299.5	10^+				
		1025		1746.78	8^+				
2814.0	11^-	483.1	54	2331.1	9^-	E2		0.0154	Mult.: $\Delta J=2$.
		514.3	100	2299.5	10^+	D			
2862.65	$1^-,2,3^-$	1547.95 *9*	36.1 *10*	1314.613	1^-				
		1739.46 *8*	67.6 *17*	1123.1857	3^-				
		2518.42 *9*	100.0 *23*	344.2790	2^+				

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

E$_i$(level)	J^π_i	E$_\gamma$[†]	I$_\gamma$[@]	E$_f$	J^π_f	Mult.[a]	α[b]	Comments
2869.84?		2254.44[d]		615.386	0^+			
		2525.43[d]		344.2790	2^+			
2874.7	8^-	995		1880.2	7^-			
2880.67	2^+	747.29 *14*	1.55 *11*	2133.38	$1^+,2^+$			
		868.94 *11*	4.06 *15*	2011.67	$1^+,2^+$			
		1188.37 *11*	5.53 *23*	1692.42	$2^+,3^+$			
		1275.04 *7*	15.3 *4*	1605.609	2^+			
		1446.64[‡] *3*	25.2 *26*	1434.020	3^+	M1,E2		
		1562.45 *8*	12.7 *3*	1318.414	2^+	M1		
		1565.97 *8*	15.6 *4*	1314.613	1^-			
		1757.42 *7*	100.0 *23*	1123.1857	3^-	(E1)		Mult.: α(K)exp lies between the theoretical values for E1 and M1 or E2. The placement in the decay scheme requires $\Delta\pi$=yes.
		1771.43 *8*	51.0 *11*	1109.202	2^+	M1		
		2265.33 *9*	13.0 *3*	615.386	0^+			
		2536.30 *7*	38.9 *11*	344.2790	2^+	M1		
2883.5	12^+	583.4	100	2299.5	10^+		0.00948	
2889.2	10^-	353.6	62	2536.6	8^-		0.0370	
		558		2331.1	9^-			
		589.9	100	2299.5	10^+		0.00922	
2914.19	2^+	998.37 *11*	8.1 *5*	1915.77	$2^+,3,4^+$			
		2158.72 *10*	43.5 *12*	755.3961	4^+	(E2)		Mult.: α(K)exp gives mult=M1 or E2. Placement in the decay scheme requires ΔJ=2.
		2569.85 *10*	100.0 *24*	344.2790	2^+	(M1,E2)		Mult.: α(K)exp lies between the theoretical values for E1 and M1 or E2. placement in the decay scheme requires $\Delta\pi$=no.
		2914.42 *14*	4.78 *24*	0.0	0^+			Mult.: α(K)exp is slightly larger than the theoretical values for M1 or E2. placement in the decay scheme requires ΔJ=2.
2920.10	$1^-,2,3,4^+$	1004.2 *3*	11.9 *18*	1915.77	$2^+,3,4^+$			
		1796.83 *14*	100 *6*	1123.1857	3^-			
		1811.3 *3*	30 *4*	1109.202	2^+			
		2575.82 *17*	53.7 *23*	344.2790	2^+			
2927.86	$2^+,3^+$	1235.57 *10*	57.1 *20*	1692.42	$2^+,3^+$			
		1284.42 *9*	100.0 *24*	1643.418	2^-			
		1457.25 *11*	22.8 *18*	1470.63	2^+			
		1818.56 *9*	73.2 *24*	1109.202	2^+	M1,E2		
		2172.45 *11*	38.9 *14*	755.3961	4^+			
		2583.0 *4*	37 *7*	344.2790	2^+			
2928.73		1610.11 *19*	28.5 *24*	1318.414	2^+			
		2584.9 *3*	100 *9*	344.2790	2^+			
2932.71	2^+	1809.53 *10*	22.2 *7*	1123.1857	3^-			
		2317.61 *24*	1.80 *18*	615.386	0^+			
		2588.36 *8*	100.0 *21*	344.2790	2^+	M1,E2(+E0)		Mult.: α(K)exp in 17.5-h Tb ε decay suggests a possible E0 component, consistent with its placement as a 2^+ to 2^+ transition.

$^{152}_{64}Gd_{88}$-17

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

E_i(level)	J^π_i	E_γ[†]	I_γ[@]	E_f	J^π_f	Mult.[a]	Comments
2964.32	2^-	638.35 *10*	7.9 *10*	2325.69			
		1155.48 *13*	15.3 *19*	1808.96			
		1414.40 *14*	27.4 *10*	1550.16	4^+		
		1530.07 *15*	7.2 *6*	1434.020	3^+		
		1645.92 *8*	48.6 *14*	1318.414	2^+		
		1841.13[‡] *5*	38 *5*	1123.1857	3^-	M1,E2	
		2033.89 *9*	100.0 *23*	930.545	2^+	E1	δ: δ(M2/E1)$\leq$0.37.
2981.45	2^+,3,4^+	860.84 *14*	38 *4*	2121.05	2^+,3^-,4^+		
		2226.01 *23*	64 *4*	755.3961	4^+		
		2636.93 *10*	100.0 *24*	344.2790	2^+		
2989.02		1047.9[d]	<48	1941.177	2^+		
		1714.65 *25*	24 *4*	1274.27	1,2^+		
		2058.47 *9*	55 *5*	930.545	2^+		
		2644.74 *16*	100 *6*	344.2790	2^+		
2999.55	1^+,2^+	829.6 *3*	9 *3*	2169.64	2^+		
		1393.86 *9*	50.1 *13*	1605.609	2^+		
		2069.00 *8*	100.0 *21*	930.545	2^+	M1,E2	
		2655.29 *10*	60.1 *17*	344.2790	2^+	M1,E2	
		2999.69 *16*	34.4 *6*	0.0	0^+		
3006.77	2^+	837.08 *11*	12.0 *7*	2169.64	2^+		
		1167.0 *3*	7.1 *15*	1839.71	2^+		
		1363.39 *14*	15.3 *10*	1643.418	2^-		
		1732.42 *11*	6.8 *6*	1274.27	1,2^+		
		2076.21 *10*	22.0 *9*	930.545	2^+	M1	Mult.: α(K)exp in 17.5-h Tb ε decay suggests a possible E0 component, consistent with its placement as a 2^+ to 2^+ transition.
		2251.41 *9*	46.8 *11*	755.3961	4^+		
		2662.55 *10*	100.0 *19*	344.2790	2^+	M1+E2	δ: δ=−0.74 +*11*−*50* or −4.6 +*18*−*24*.
		3006.63 *14*	4.39 *15*	0.0	0^+		
3009.28	3^-	1253.48 *9*	32.1 *17*	1755.97	1^-		
		1690.68 *9*	28.6 *12*	1318.414	2^+		
		1694.60 *13*	24.7 *11*	1314.613	1^-		
		1886.08 *13*	43 *3*	1123.1857	3^-	E0+M1+E2	
		2078.63 *9*	48.7 *23*	930.545	2^+	[E1]	
		2665.18 *12*	100 *3*	344.2790	2^+		
3010.8	9^-	137[d]		2874.7	8^-		E_γ: Reported only in (^{36}S,α4nγ).
		679		2331.1	9^-		E_γ: Reported only in (α,xnγ).
		1131		1880.2	7^-		E_γ: Reported only in (α,xnγ).
3012.37	2^+,3^+,4^+	810.44 *23*	7.6 *9*	2201.71	2^+		
		1000.41 *20*	6.0 *6*	2011.67	1^+,2^+		
		1096.60 *19*	15.1 *15*	1915.77	2^+,3,4^+		
		1903.16[‡] *8*	10.0 *20*	1109.202	2^+		
		2257.22 *22*	11.5 *7*	755.3961	4^+		

Adopted Levels, Gammas (continued)

γ(^{152}Gd) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[@]	E_f	J^π_f	Mult.[a]	δ	Comments
3012.37	$2^+,3^+,4^+$	2668.13 *10*	100.0 *20*	344.2790	2^+	M1,E2		
3033.0	(11)	733	100	2299.5	10^+			
3042.29	2^+	1436.67 *9*	23.8 *7*	1605.609	2^+			
		1727.72 *8*	41.4 *11*	1314.613	1^-			
		1932.94 *12*	20.4 *11*	1109.202	2^+	M1,E2		
		2697.99 *10*	100.0 *22*	344.2790	2^+	M1(+E2)	≤0.22	
3060.1		729	100	2331.1	9^-			
3067.42	3^-	1944.22[‡] *10*	<6.2	1123.1857	3^-	E0(+M1,E2)		
		2312.00 *10*	100 *3*	755.3961	4^+			
3074.85	$2^+,3,4^+$	1792.71 *14*	100 *8*	1282.246	4^+			
		1965.42 *19*	30.1 *18*	1109.202	2^+			
3079.69	$2^+,3^+,4^+$	1761.22 *16*	100 *6*	1318.414	2^+	E2		
		2324.32 *17*	62 *4*	755.3961	4^+			Mult.: The 2324γ is part of a doublet with the other component unplaced. From α(K)exp for the doublet, one or both components must have an E0 component. If partly E0, the 2324γ to 4^+ would give J^π(3079)=4^+.
3090.42		2335.00 *16*	100	755.3961	4^+			
3099.02	$1^+,2^+,3^+$	500.23 *12*	6.6 *11*	2598.80	$1^+,2^+$			
		2168.46[‡] *8*	53 *13*	930.545	2^+			
		2754.70 *10*	100.0 *20*	344.2790	2^+	M1,E2		
3105.52	2^+	805.84 *9*	100 *5*	2299.66	$2,3^-$			
		2350.30 *15*	71 *5*	755.3961	4^+			
		2761.15 *12*	53.7 *22*	344.2790	2^+			
		3105.45 *16*	53.1 *22*	0.0	0^+			
3110.94	$1^+,2^+$	2495.53 *9*		615.386	0^+	M1,E2		
3112.52	$1^+,2^+$	583.00 *11*	76 *7*	2529.43	$2^+,3^+$			
		1171.2 *3*	100 *19*	1941.177	2^+			
		2182.10 *15*	67 *3*	930.545	2^+	M1		
		2768.27 *10*	70.0 *17*	344.2790	2^+			
		3112.3 *3*	6.8 *5*	0.0	0^+			
3140.21	$1,2^+$	874.8 *3*	6.4 *20*	2265.30	$1^+,2^+,3^+$			
		1198.97 *11*	35 *3*	1941.177	2^+			
		2209.71 *13*	48 *3*	930.545	2^+			
		2795.92 *11*	100.0 *22*	344.2790	2^+			
		3140.20 *12*	27.7 *7*	0.0	0^+			
3143.97	3^-	1022.73 *11*	53 *4*	2121.05	$2^+,3^-,4^+$			
		2020.67 *14*	50 *3*	1123.1857	3^-	M1,E2		
		2388.72 *11*	100 *3*	755.3961	4^+			
		2799.81 *14*	46.8 *19*	344.2790	2^+			
3152.89	3^-	1870.55 *18*	17.1 *23*	1282.246	4^+			
		2043.79	43 *6*	1109.202	2^+	[E1]		
		2808.61 *10*	100.0 *23*	344.2790	2^+	E1		
3157.0	10^-	146		3010.8	9^-			

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

E_i(level)	J^{π}_i	E_γ[†]	I_γ[@]	E_f	J^{π}_f	Mult.[a]	α[b]	Comments
3157.0	10⁻	282		2874.7	8⁻			
		826		2331.1	9⁻			
3214?		887.32[&d] *10*	100 *4*	2325.69				
		1045.31[&d] *23*	22 *3*	2169.64	2⁺			
		1521.57[&d] *16*	56 *6*	1692.42	2⁺,3⁺			
3226.1	10⁻	895		2331.1	9⁻			
3232.05		1626.39 *19*	42 *4*	1605.609	2⁺			
		1917.55 *15*	100.0 *25*	1314.613	1⁻			
		2004.93 *17*	21.2 *18*	1227.37	6⁺			
		2887.52 *13*	47.3 *16*	344.2790	2⁺			
3236.96	2⁺,3,4⁺	788.88 *10*	100 *4*	2448.02	+			
		911.73 *13*	43.0 *24*	2325.69				
		2306.15 *10*	93 *3*	930.545	2⁺			
		2481.8 *3*	16.8 *24*	755.3961	4⁺			
3249.3	12⁺	557.5		2691.7	10⁺			
3285.11	2⁺	1342.0		1941.177	2⁺	E0		
		1970.49 *9*	68.5 *19*	1314.613	1⁻			
		2162.05 *15*	44.8 *21*	1123.1857	3⁻			
		2940.75 *11*	100.0 *21*	344.2790	2⁺	M1,E2		
3294.1	11⁺	518		2774.5	9⁺			
		995		2299.5	10⁺			
3317.3	11⁻	160		3157.0	10⁻			
		307		3010.8	9⁻			
		503		2814.0	11⁻			
		987		2331.1	9⁻			
		1018		2299.5	10⁺			
3337.8	13⁻	454.5	23	2883.5	12⁺	D		
		523.6	100	2814.0	11⁻		0.0125	
3340.64	1⁻,2,3,4⁺	1075.87 *9*	65 *8*	2264.86	1⁻,2,3⁻			
		1424.76 *19*	25.6 *24*	1915.77	2⁺,3,4⁺			
		2217.40 *9*	100.0 *26*	1123.1857	3⁻			Mult.: Possible E0 component. See comment in 17.5-h Tb ε decay.
		2996.26 *12*	57.7 *14*	344.2790	2⁺			
3345.4	12⁻	456.0		2889.2	10⁻			
		462		2883.5	12⁺			
3358.27	2⁺	2043.64[‡] *11*	16 *4*	1314.613	1⁻	[E1]		
		2602.85 *11*	100 *3*	755.3961	4⁺	(E2)		
3498.9	14⁺	615.4		2883.5	12⁺			
3507.9	12⁻	191		3317.3	11⁻			
		351		3157.0	10⁻			
3586.5	13⁻	553		3033.0	(11)			
		703		2883.5	12⁺			
		773		2814.0	11⁻			

$^{152}_{64}Gd_{88}$-20

Adopted Levels, Gammas (continued)

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

E_i(level)	J^π_i	E_γ[†]	E_f	J^π_f	Mult.[a]	α[b]	E_i(level)	J^π_i	E_γ[†]	E_f	J^π_f
3699.4	14^+	450	3249.3	12^+			5923.8	20^-	710	5213.8	18^-
		816	2883.5	12^+			6081.3	21^-	747.5	5334.0	19^-
3727.6	13^-	220	3507.9	12^-			6096.2	22^+	711	5385.2	20^+
		411	3317.3	11^-			6258.9	21^-	370	5888.9	20^-
		843	2883.5	12^+					729	5529.9	19^-
3829.2	13^+	534	3294.1	11^+			6302.1	22^+	752	5550.1	20^+
		941	2889.2	10^-			6598.8	22^-	675	5923.8	20^-
3897.4	14^-	552	3345.4	12^-			6627.2	23^-	546	6081.3	21^-
3938.4	15^-	439.5	3498.9	14^+					774	5853.1	21^-
		600.5	3337.8	13^-	E2	0.00882	6636.9	22^-	378	6258.9	21^-
3974.9	14^-	247	3727.6	13^-					748	5888.9	20^-
		467	3507.9	12^-			6835.3	23^-	754	6081.3	21^-
4103.5		1220	2883.5	12^+			6876.2	24^+	780	6096.2	22^+
4141.9	16^+	643.5	3498.9	14^+	E2	0.00745	7024.9	23^-	388	6636.9	22^-
4195.4	16^+	495.9	3699.4	14^+					766	6258.9	21^-
		696	3498.9	14^+			7091.1	24^+	789	6302.1	22^+
4246.3	15^-	271	3974.9	14^-			7265.2	25^-	638	6627.2	23^-
		519	3727.6	13^-			7280	24^-	681	6598.8	22^-
4246.5	15^-	660	3586.5	13^-			7420.9	24^-	784	6636.9	22^-
		909[d]	3337.8	13^-			7533.3	25^-	698	6835.3	23^-
4362.9		864	3498.9	14^+					906[d]	6627.2	23^-
4526.3	16^-	628.9	3897.4	14^-			7721.2	26^+	845	6876.2	24^+
4539.8	16^-	293	4246.3	15^-			7830.9	25^-	806	7024.9	23^-
		565	3974.9	14^-			7861.1	26^+	770	7091.1	24^+
4609.0	17^-	670.6	3938.4	15^-	E2	0.00675	7990	26^-	710	7280	24^-
4745.8	18^+	550	4195.4	16^+			8129.2	27^-	864	7265.2	25^-
		604.8	4141.9	16^+			8246?	$(26)^-$	826[d]	7420.9	24^-
4835.8	18^+	693.5	4141.9	16^+			8292	27^-	759	7533.3	25^-
4852.0	17^-	312	4539.8	16^-			8620.2	28^+	899	7721.2	26^+
		606	4246.3	15^-			8638.2	28^+	917	7721.2	26^+
5010.5	17^-	764	4246.5	15^-			8677?	$(27)^-$	847[d]	7830.9	25^-
5183.9	18^-	332	4852.0	17^-			8726	28^-	736	7990	26^-
		644	4539.8	16^-			9027	29^-	734[d]	8292	27^-
5213.8	18^-	687.5	4526.3	16^-					898	8129.2	27^-
5334.0	19^-	725.0	4609.0	17^-			9106?	$(28)^-$	860[d]	8246?	$(26)^-$
5385.2	20^+	549	4835.8	18^+			9436.2	30^+	798	8638.2	28^+
		639.7	4745.8	18^+					816.0	8620.2	28^+
5529.9	19^-	346	5183.9	18^-			9544	30^-	818	8726	28^-
		678	4852.0	17^-			9957	31^-	930	9027	29^-
5550.1	20^+	714.3	4835.8	18^+			10225	32^+	789	9436.2	30^+
5853.1	21^-	519	5334.0	19^-			10353?	$(32)^+$	918[d]	9436.2	30^+
5888.9	20^-	359	5529.9	19^-			10452	32^-	908	9544	30^-
		705	5183.9	18^-			10918	33^-	961	9957	31^-

$^{152}_{64}Gd_{88}$-21

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

E_i(level)	J^π_i	E_γ[†]	E_f	J^π_f	E_i(level)	J^π_i	E_γ[†]	E_f	J^π_f	E_i(level)	J^π_i	E_γ[†]	E_f	J^π_f
11064	34^+	839	10225	32^+	12712	37^-	823	11889	35^-	15125?	42^+	1005	14120?	40^+
11522?	34^-	1070	10452	32^-	13065	38^+	1113	11952	36^+	15486	43^-	1086	14400	41^-
11889	35^-	971	10918	33^-	13088	38^-	820	12268	36^-	16184	44^+	1059	15125?	42^+
11931	35^-	1013	10918	33^-	13547	39^-	835	12712	37^-	17361	46^+	1177	16184	44^+
11952	36^+	888	11064	34^+	13944	40^-	856	13088	38^-	18722	48^+	1361	17361	46^+
12268	36^-	746	11522?	34^-	14120?	40^+	1055	13065	38^+					
12712	37^-	781[d]	11931	35^-	14400	41^-	853	13547	39^-					

[†] Weighted average from all available source data, except that energies from 13-y Eu β^- decay are adopted where available, unless noted otherwise.

[‡] From the level energy difference. The transition is doubly placed in the source dataset(S).

[#] Rounded-off value from table 15 of 2004AdZZ. All the transitions from this level are doublets.

[@] Weighted average from all available source data, except that intensities from 13-y Eu decay are adopted where available, unless noted otherwise.

[&] Poor fit. See comment on the 3214 level.

[a] From α data in Eu and Tb decays and from $\gamma(\theta)$ and DCO ratios in the in-beam works.

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

[c] Multiply placed with intensity suitably divided.

[d] Placement of transition in the level scheme is uncertain.

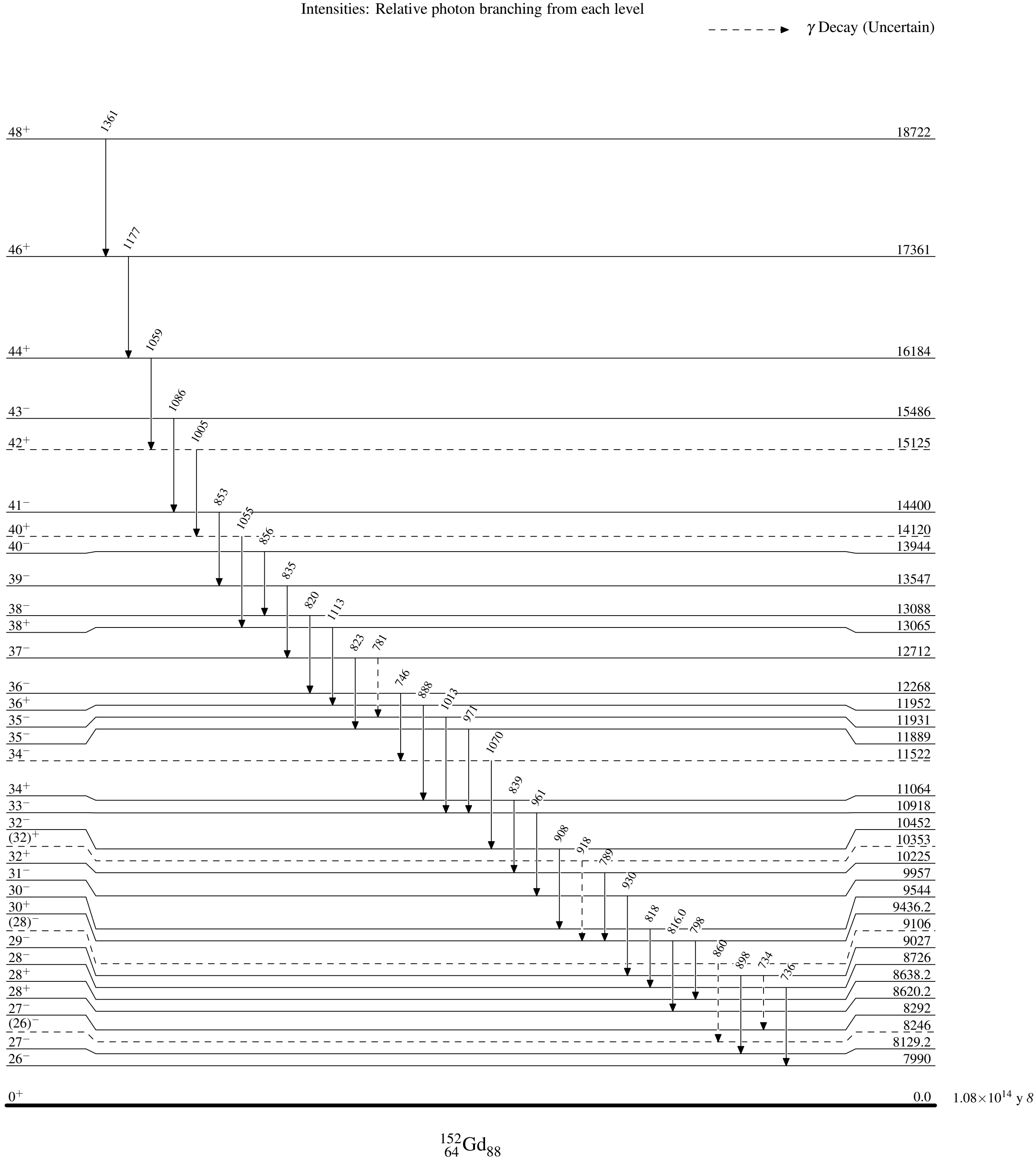
$^{152}_{64}Gd_{88}$-22

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level



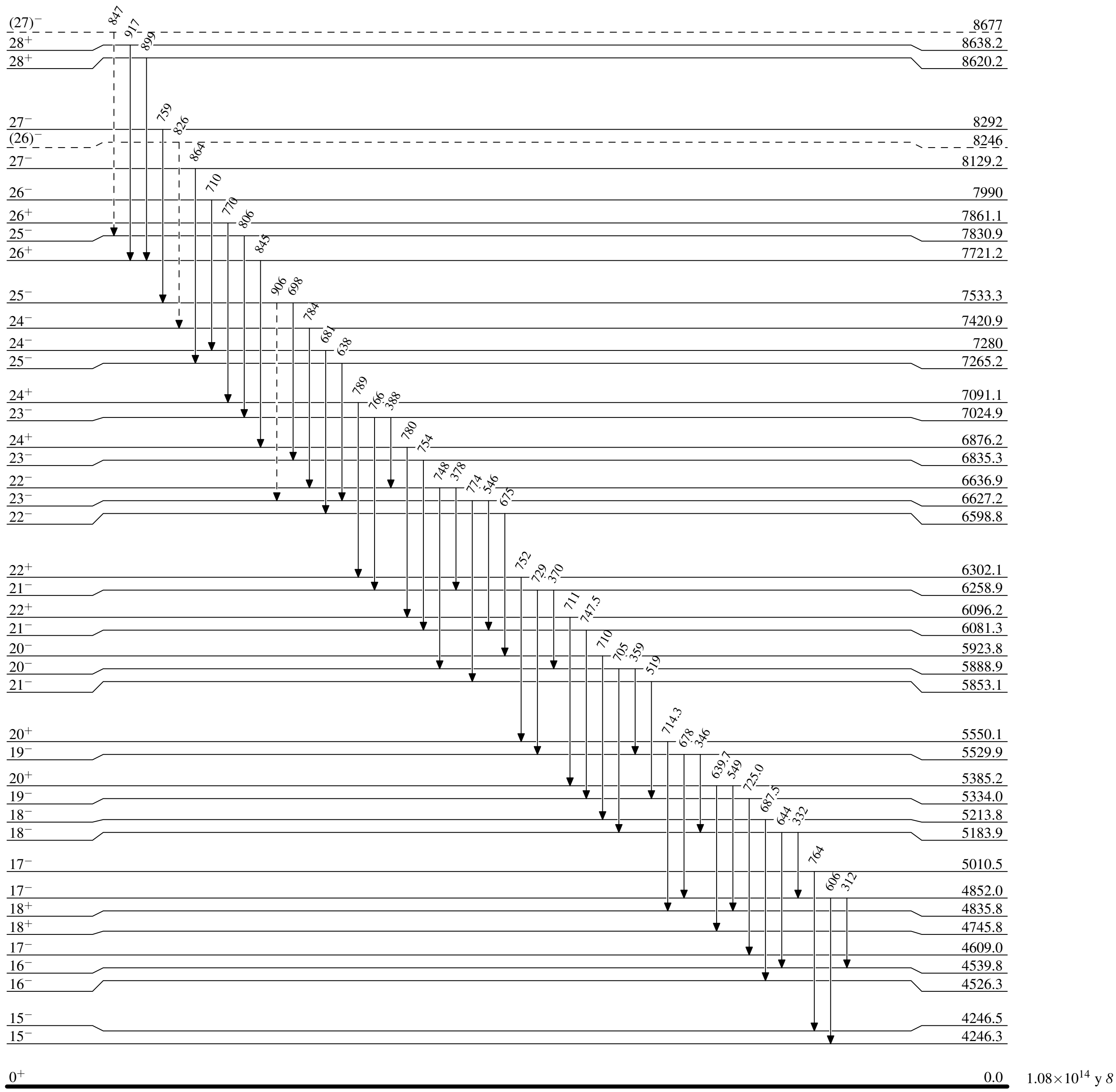
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

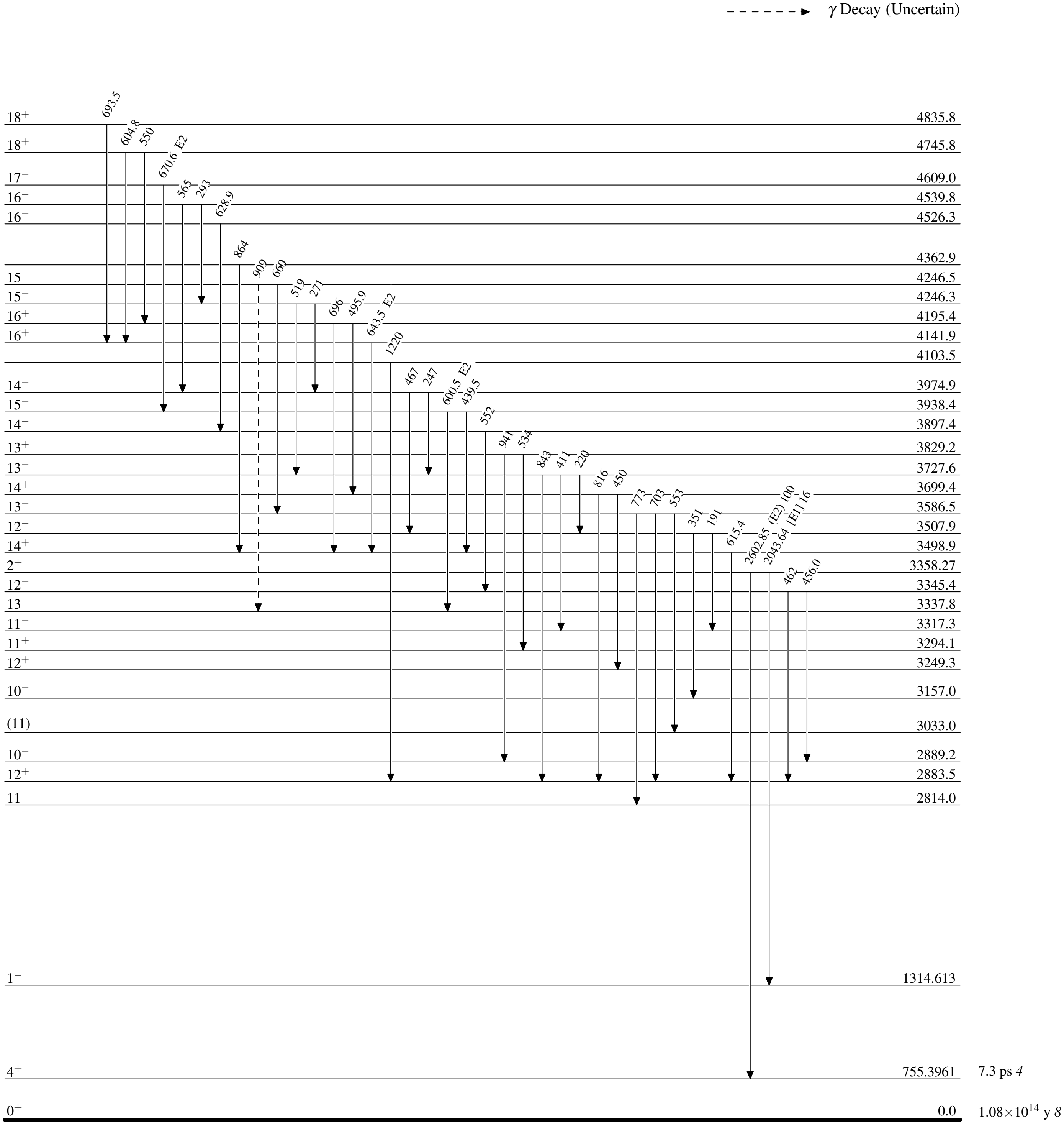


$^{152}_{64}Gd_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

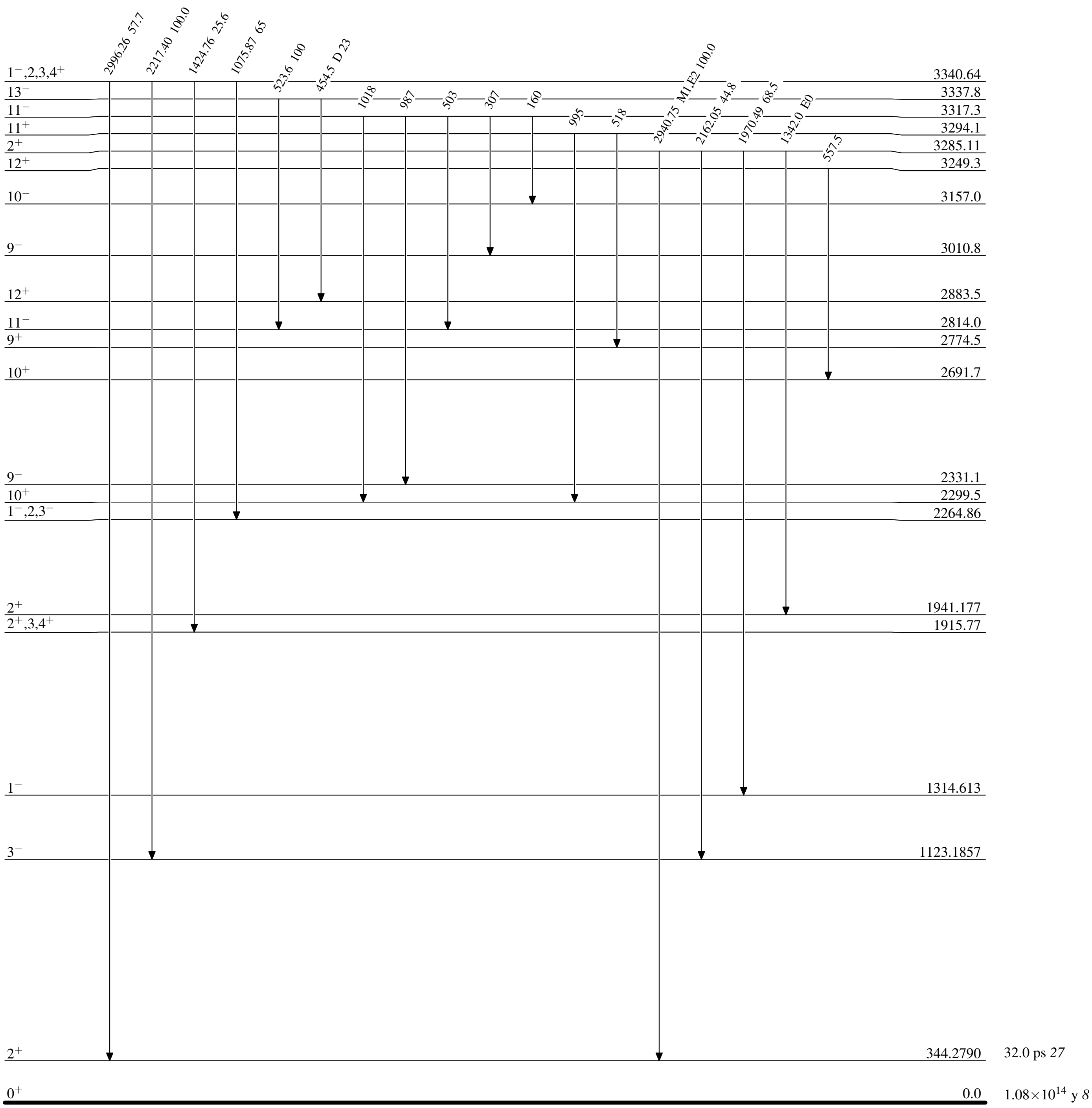


$^{152}_{64}Gd_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

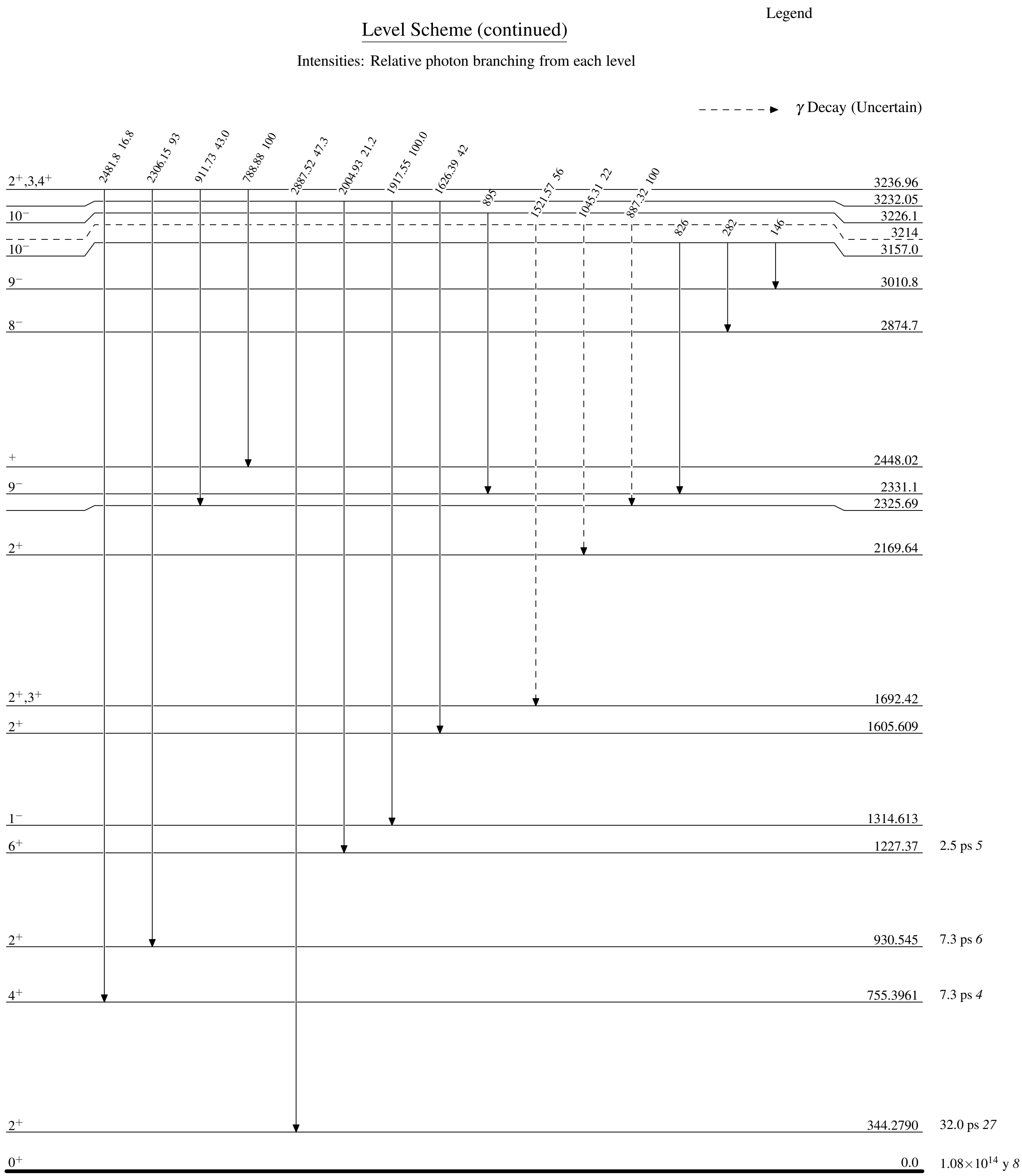


$^{152}_{64}Gd_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

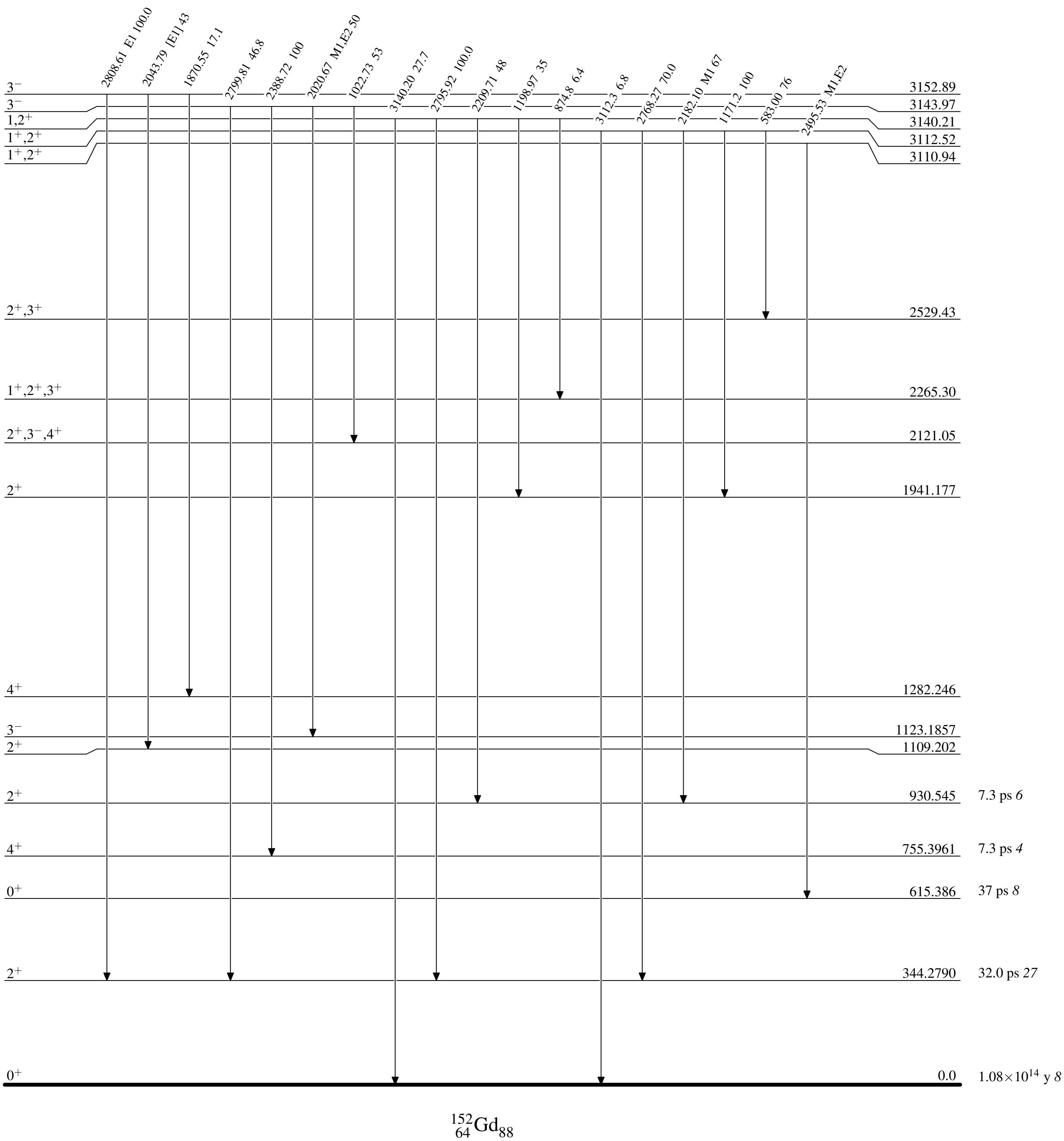


$^{152}_{64}Gd_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

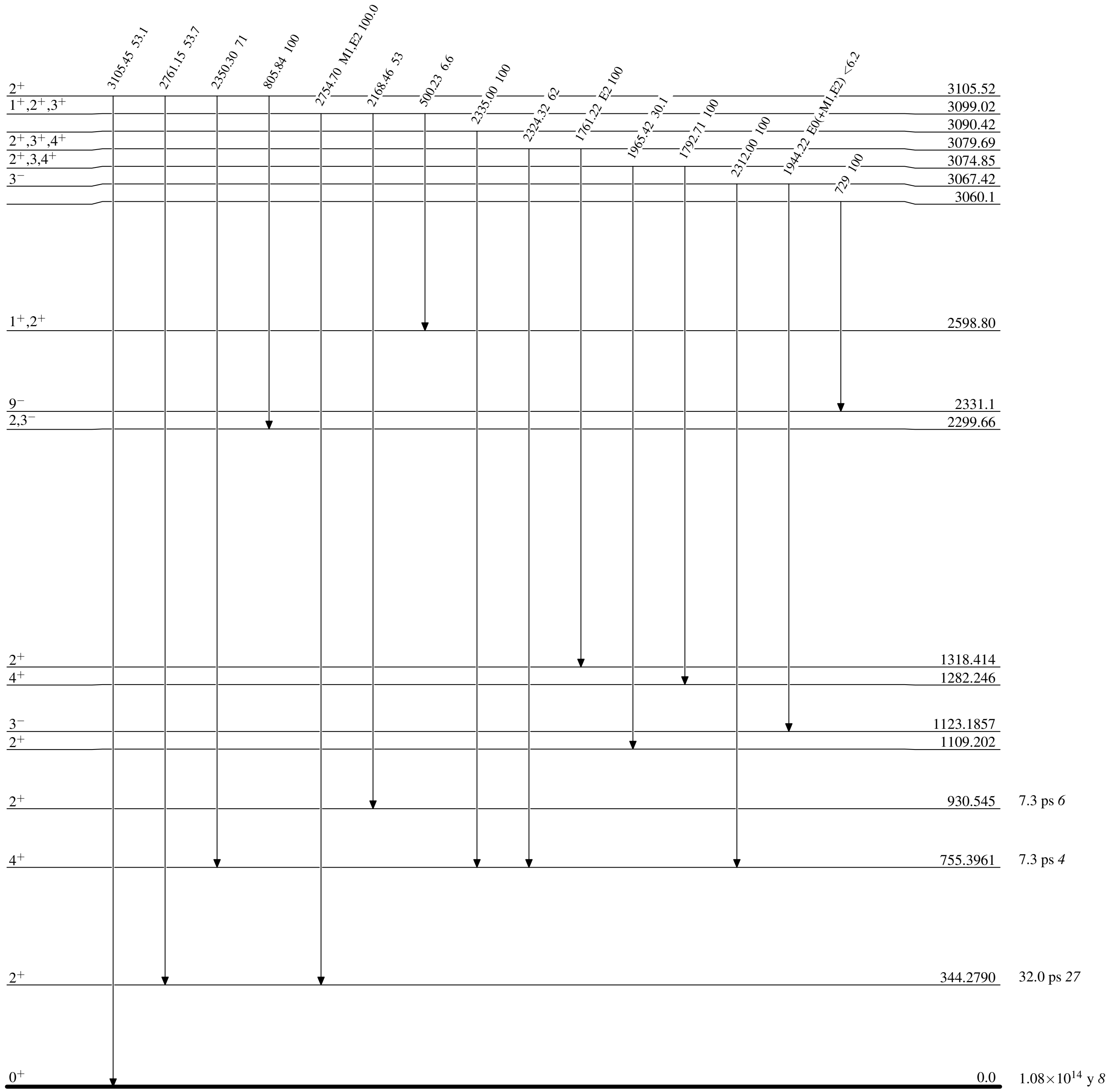
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



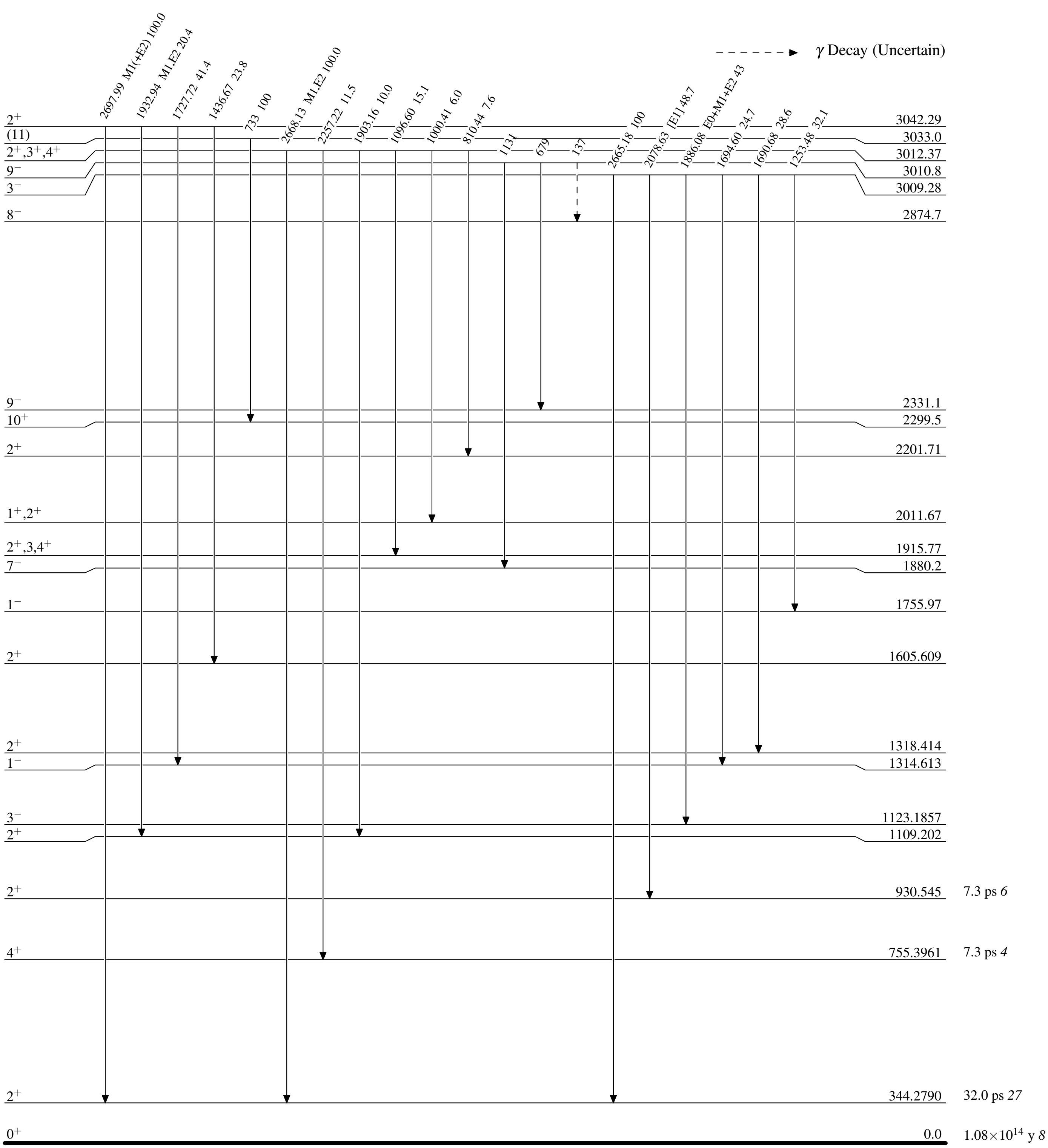
$^{152}_{64}Gd_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

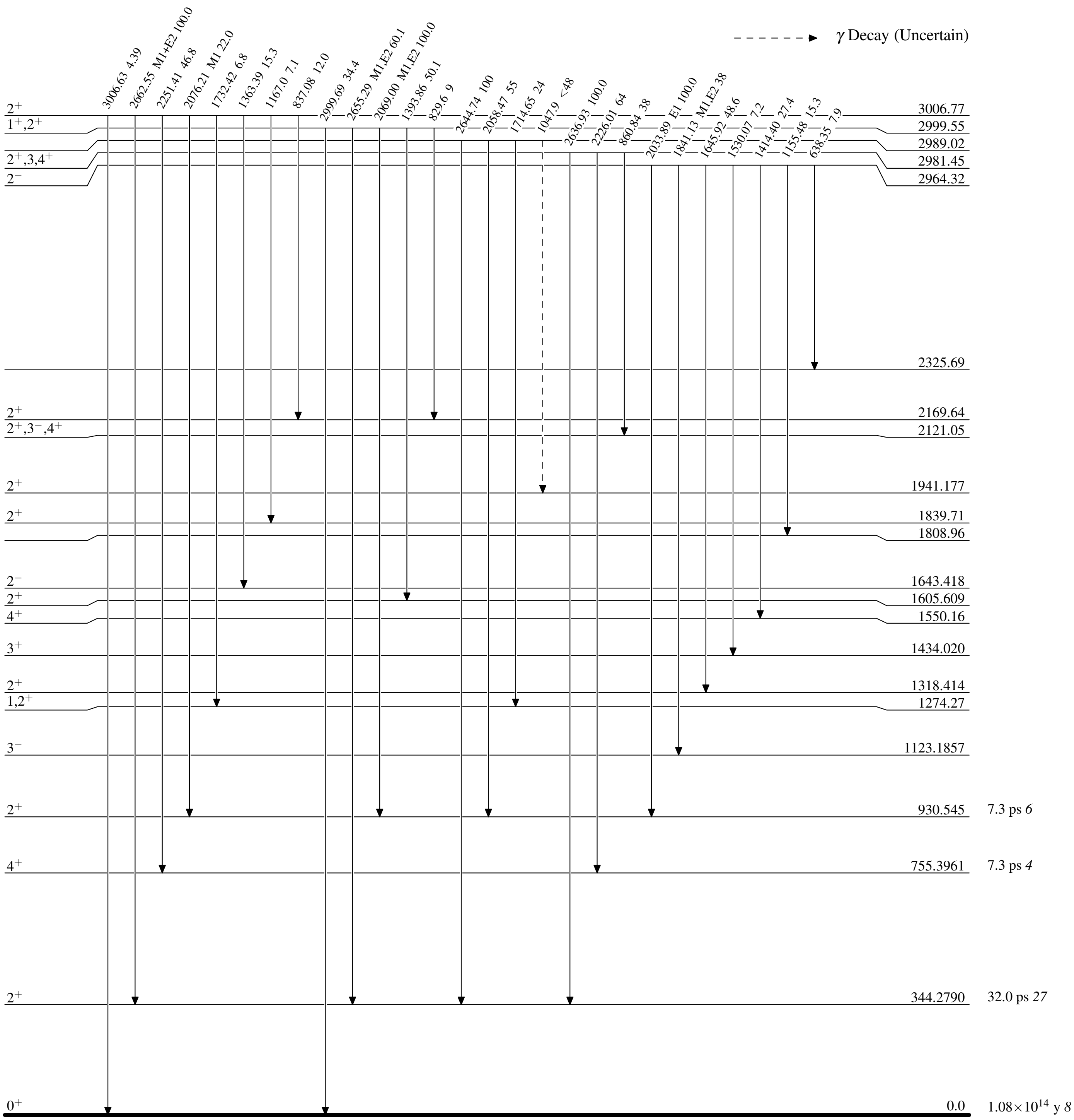
Legend



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

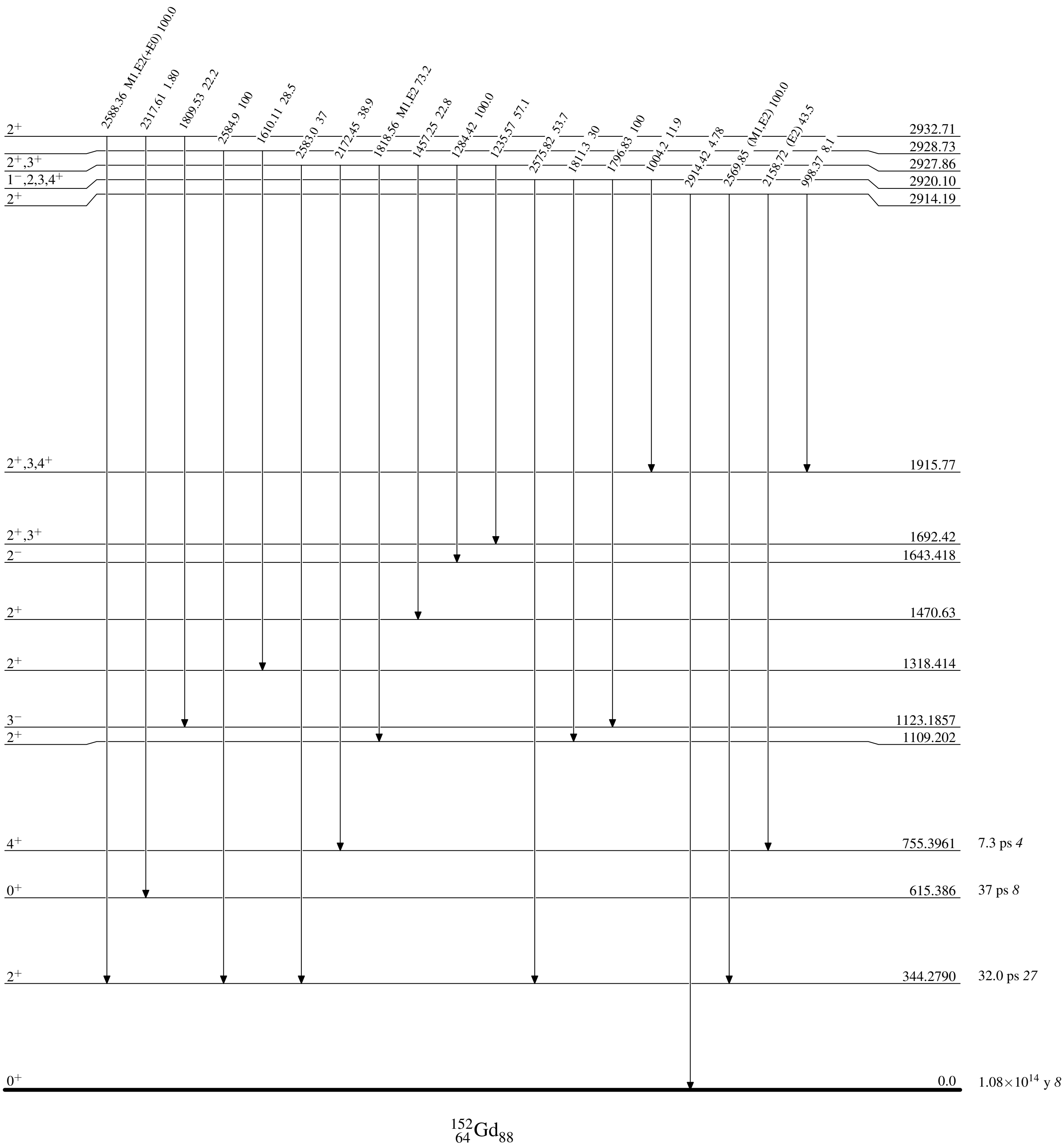


$^{152}_{64}Gd_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

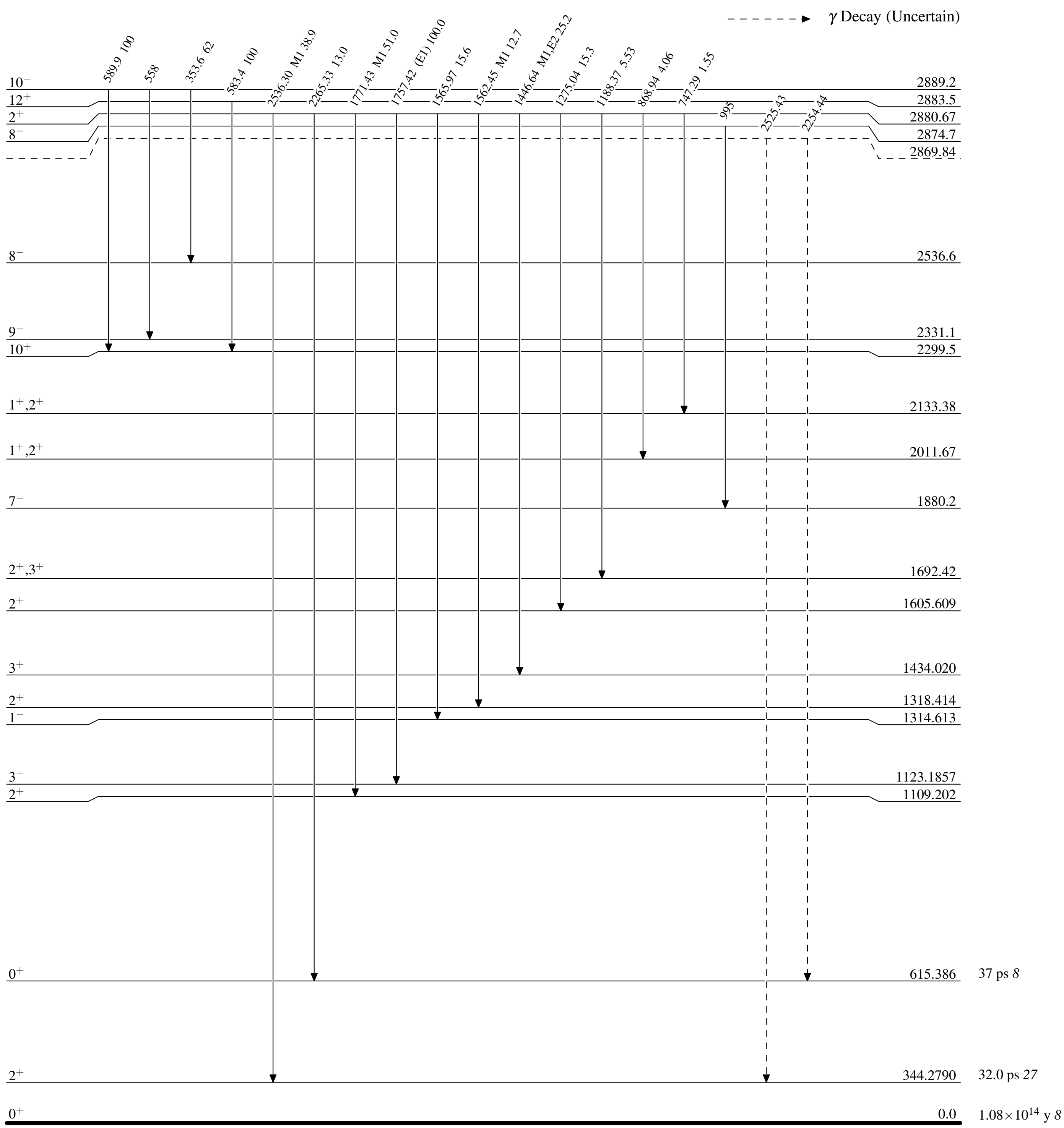
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

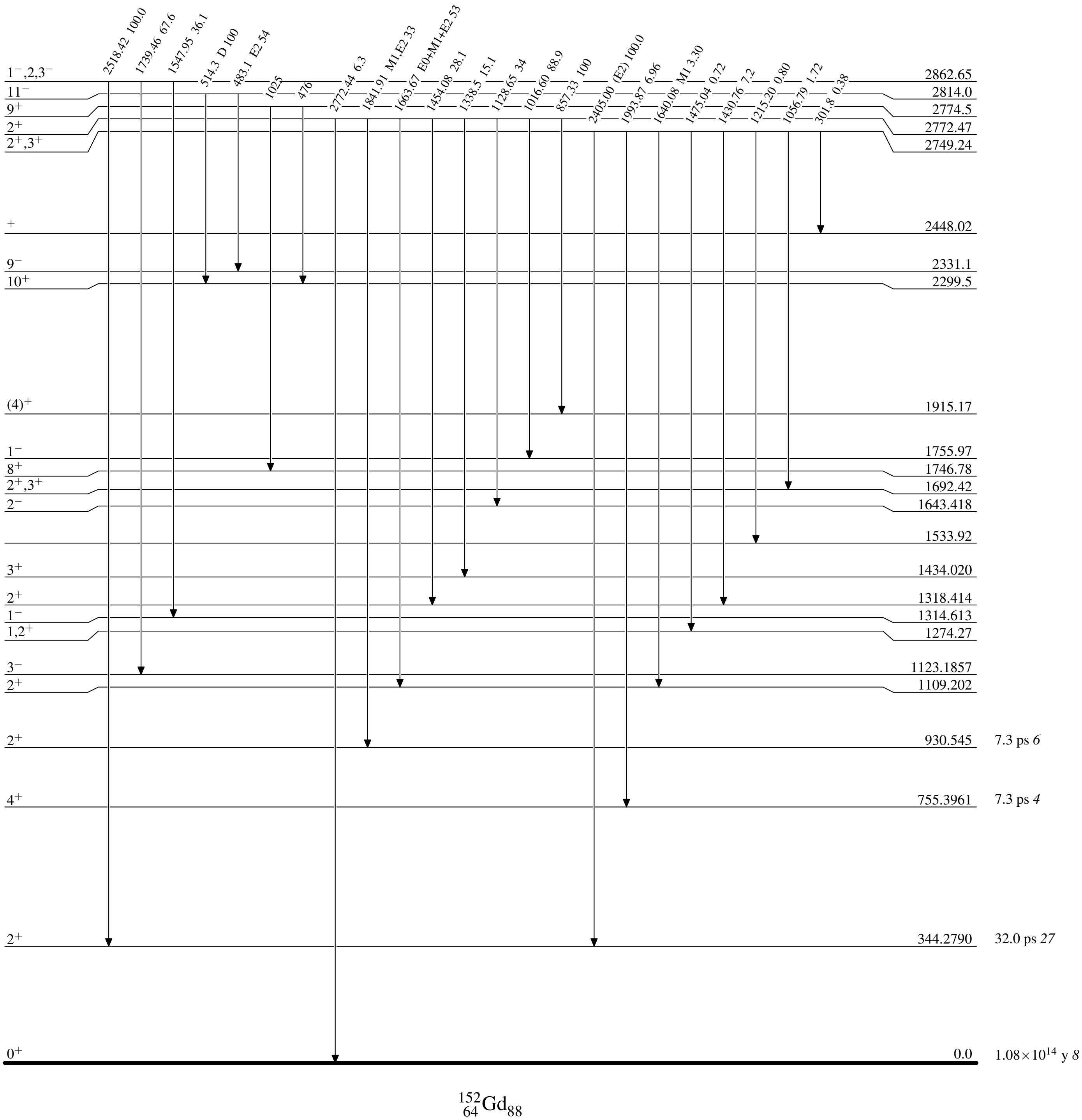


$^{152}_{64}Gd_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

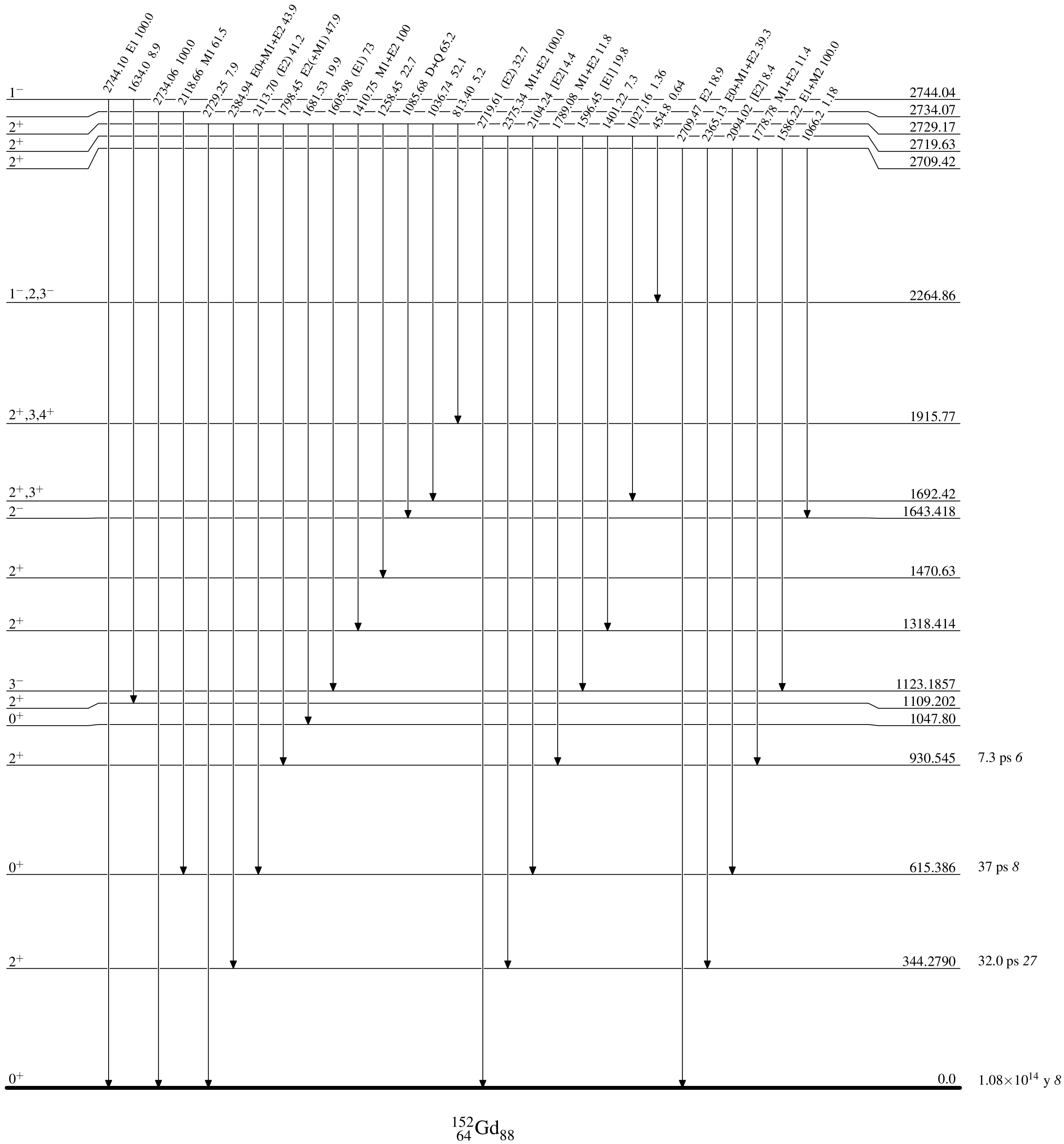
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

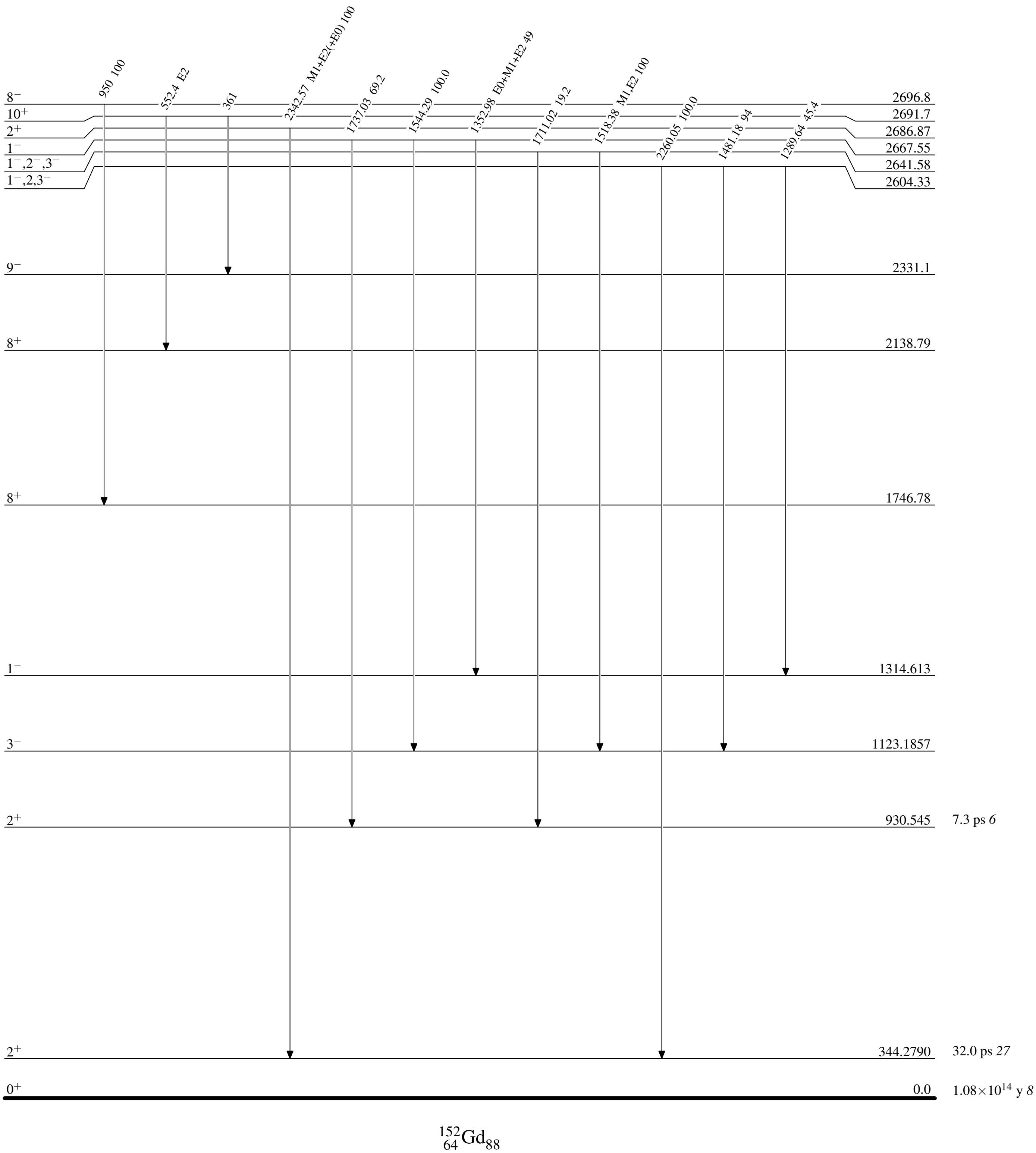
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

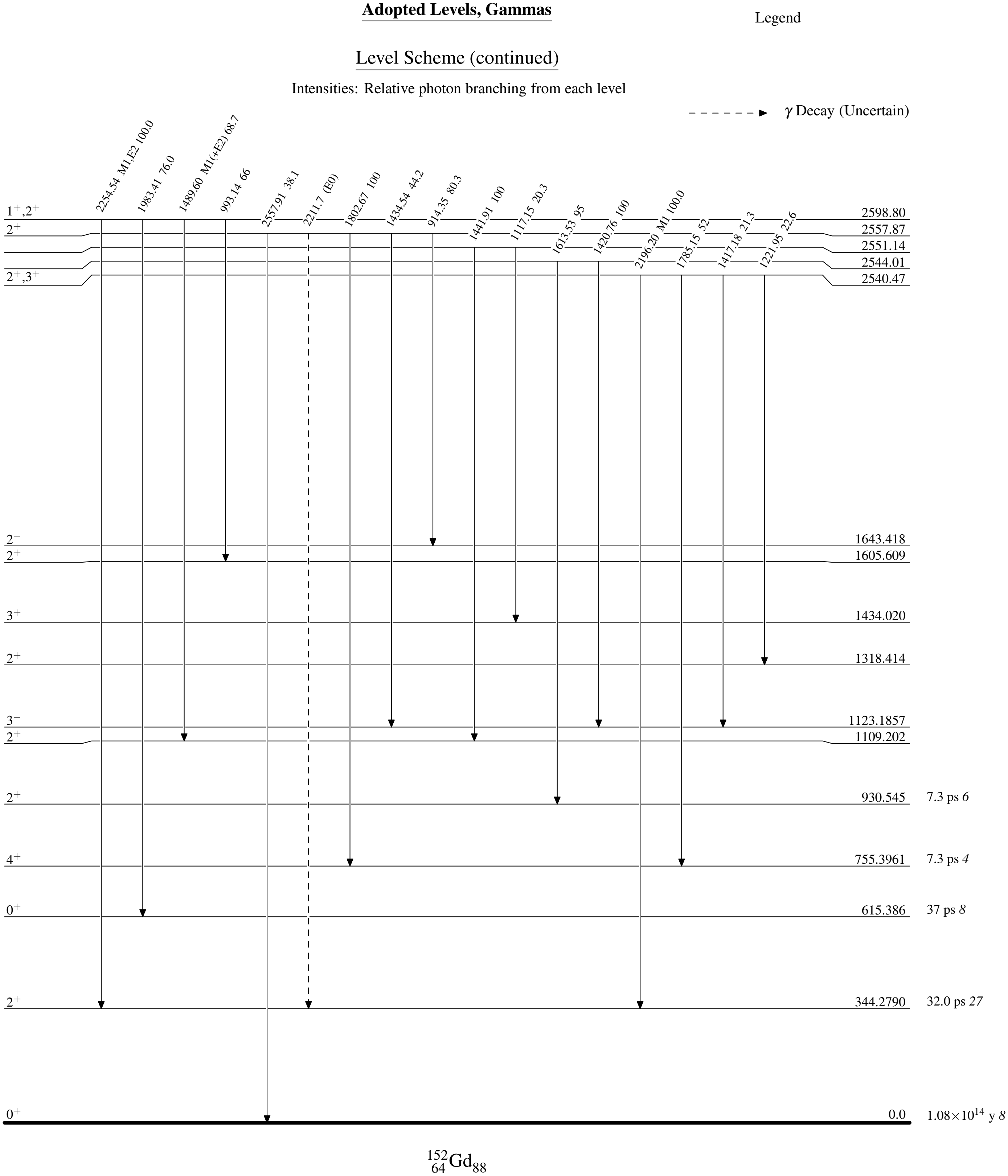
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

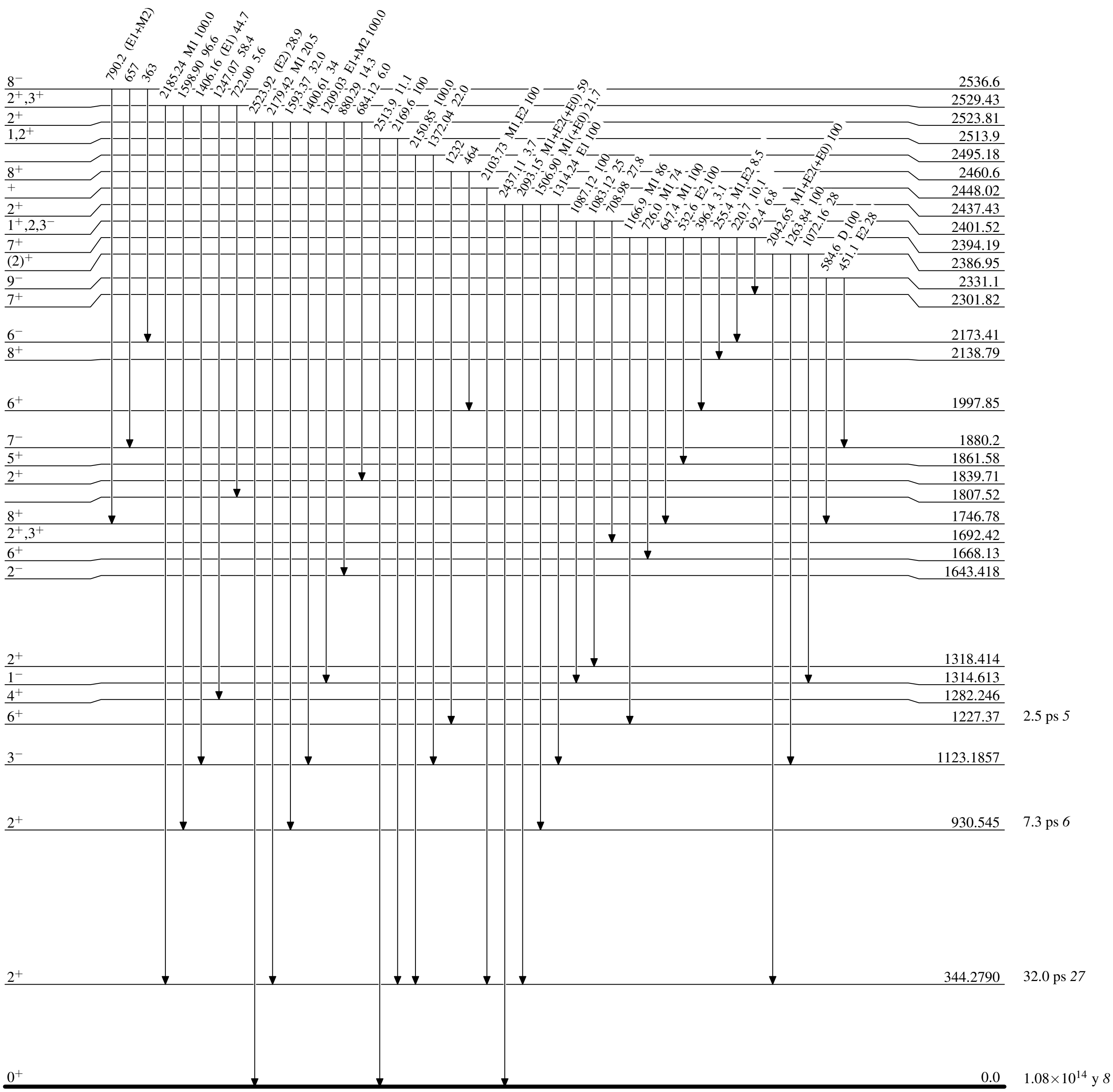
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



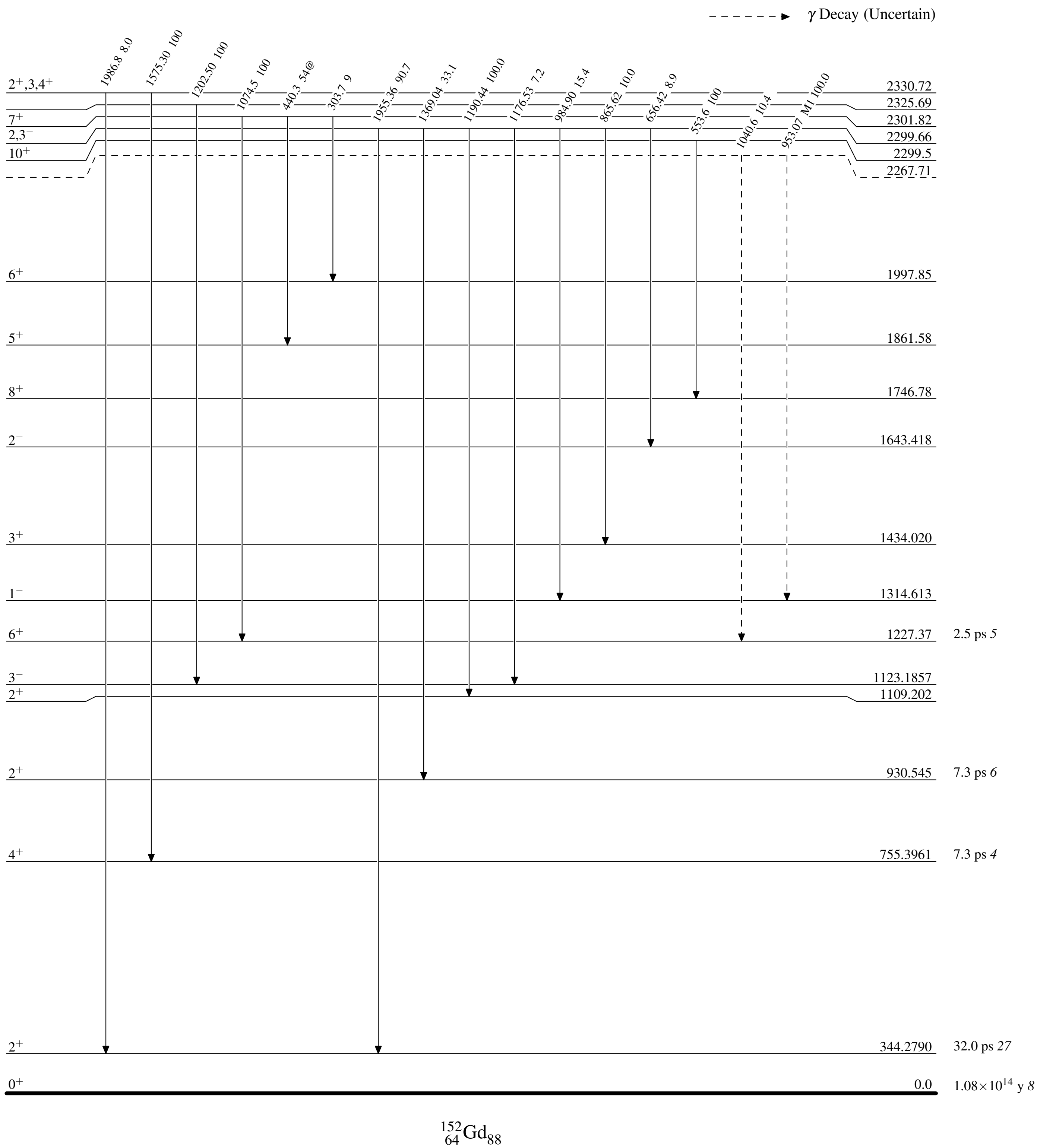
$^{152}_{64}Gd_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

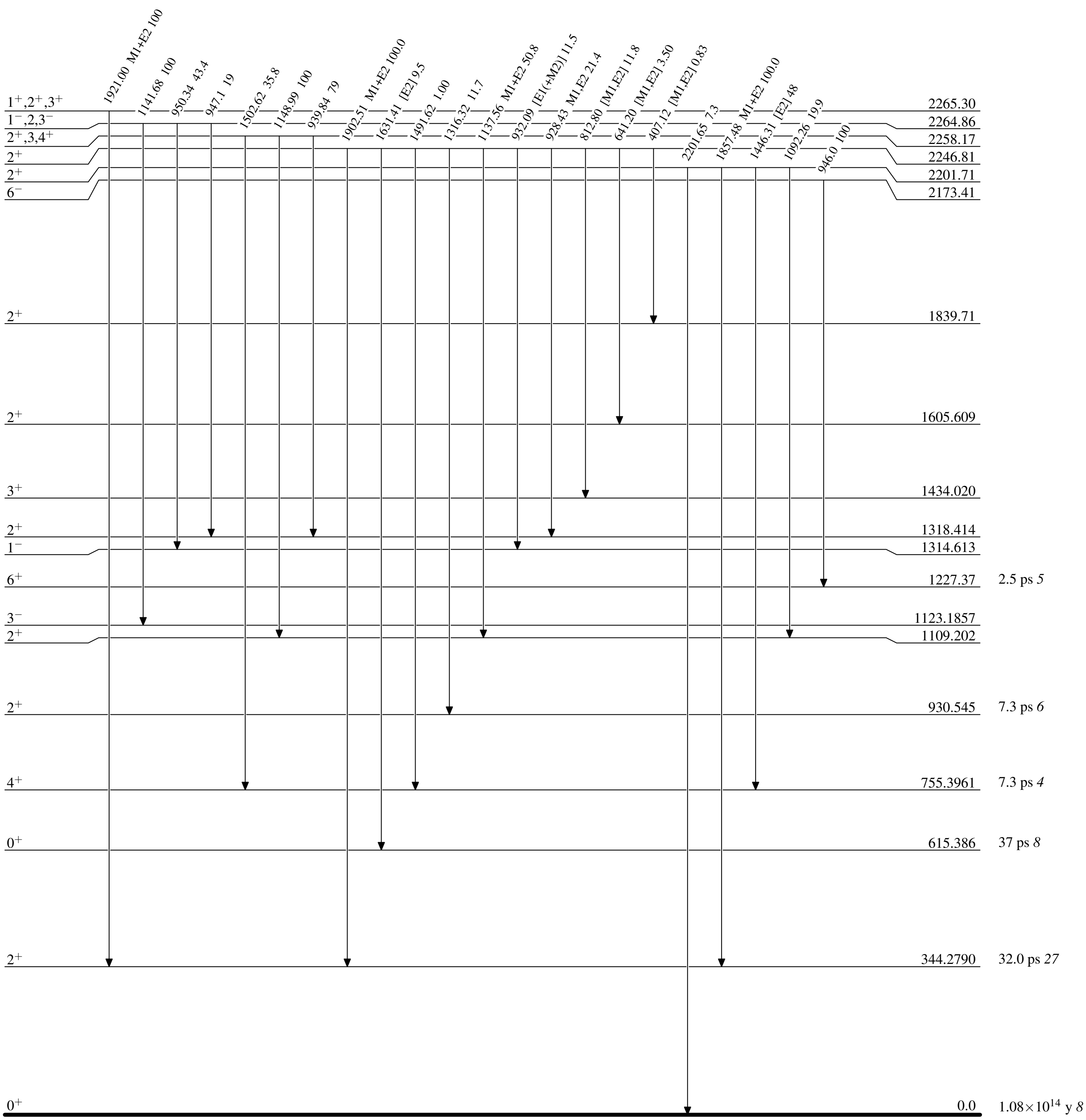
Legend



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

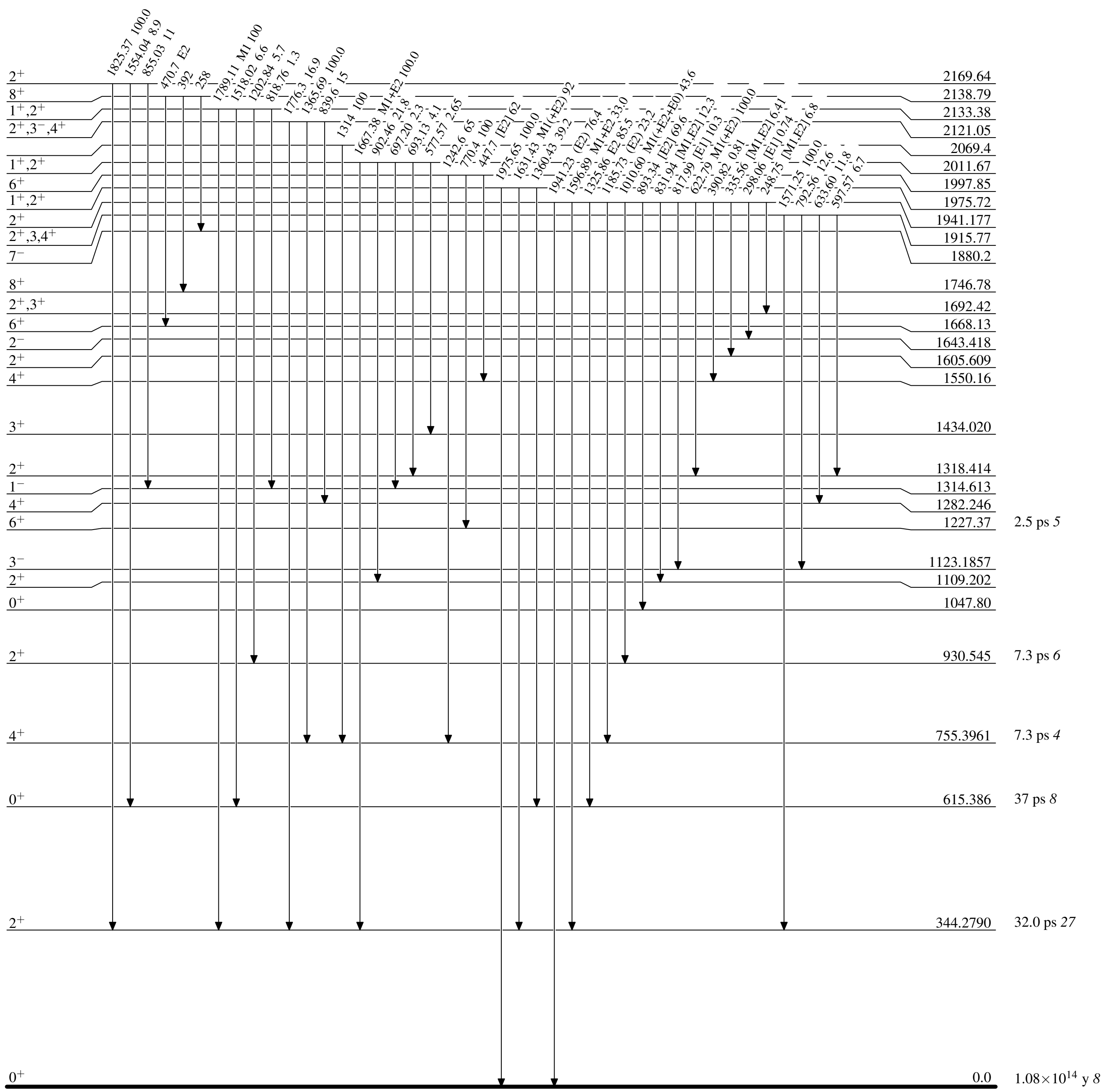


$^{152}_{64}Gd_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

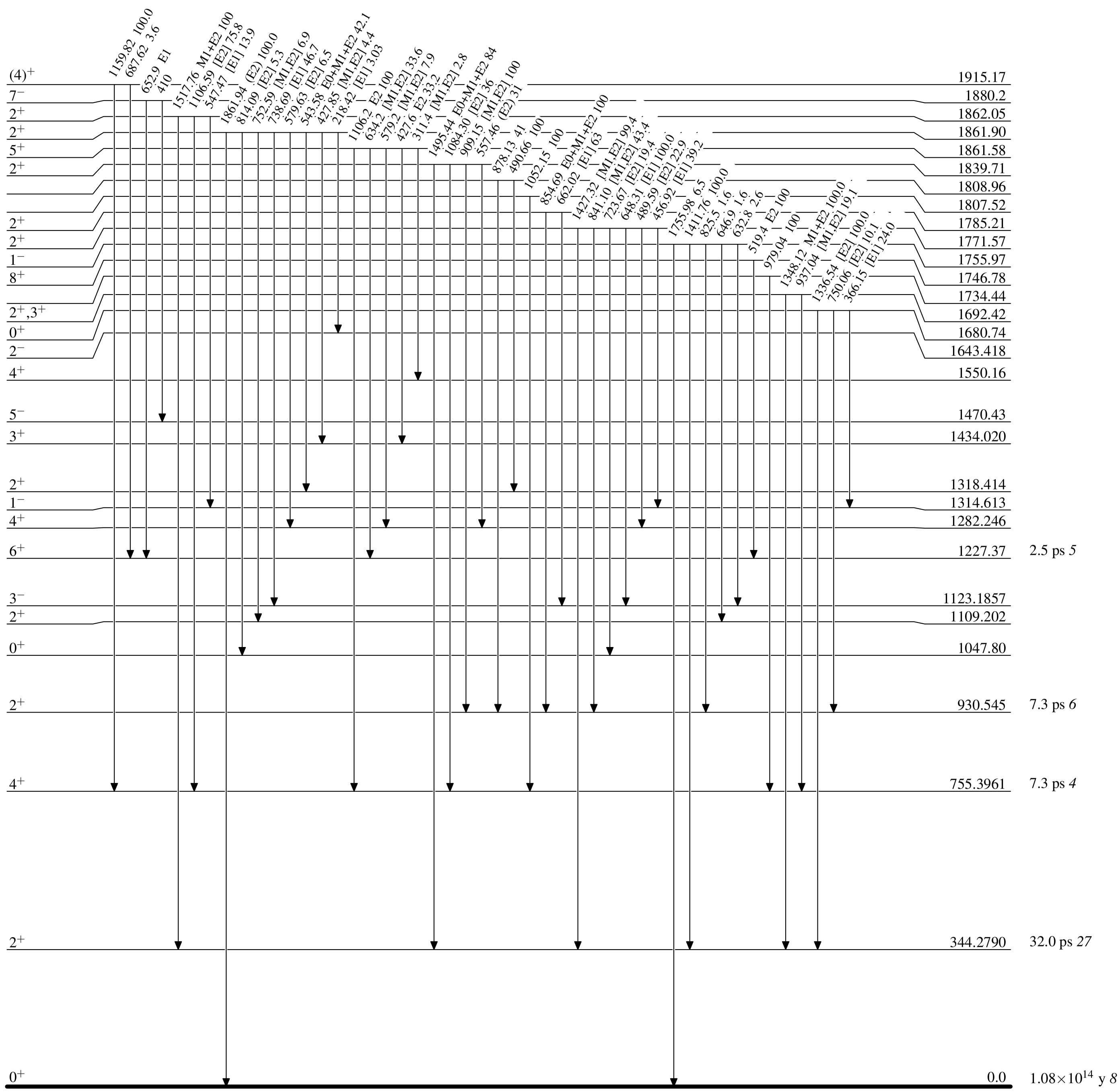


$^{152}_{64}Gd_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided



$^{152}_{64}Gd_{88}$

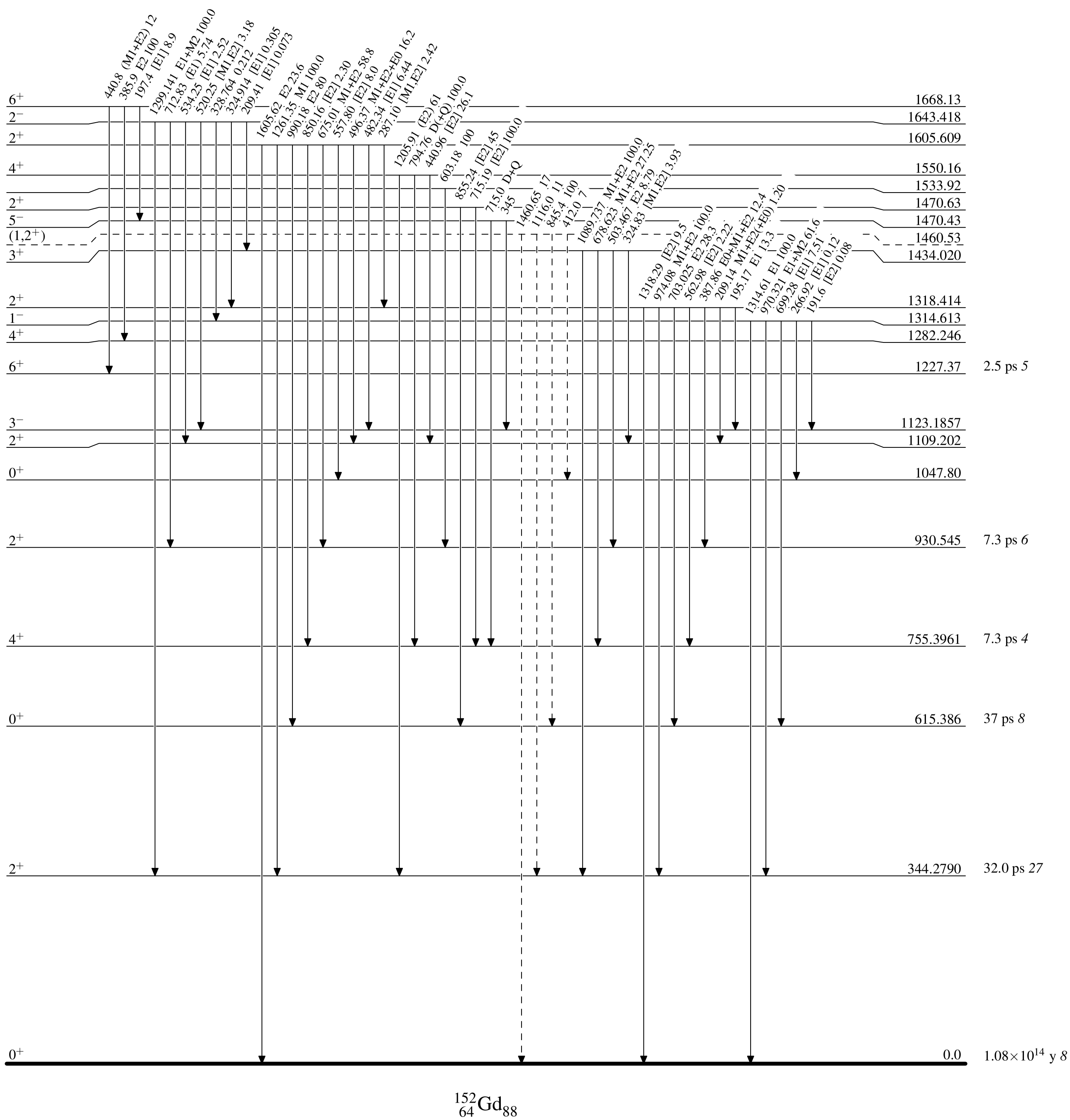
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

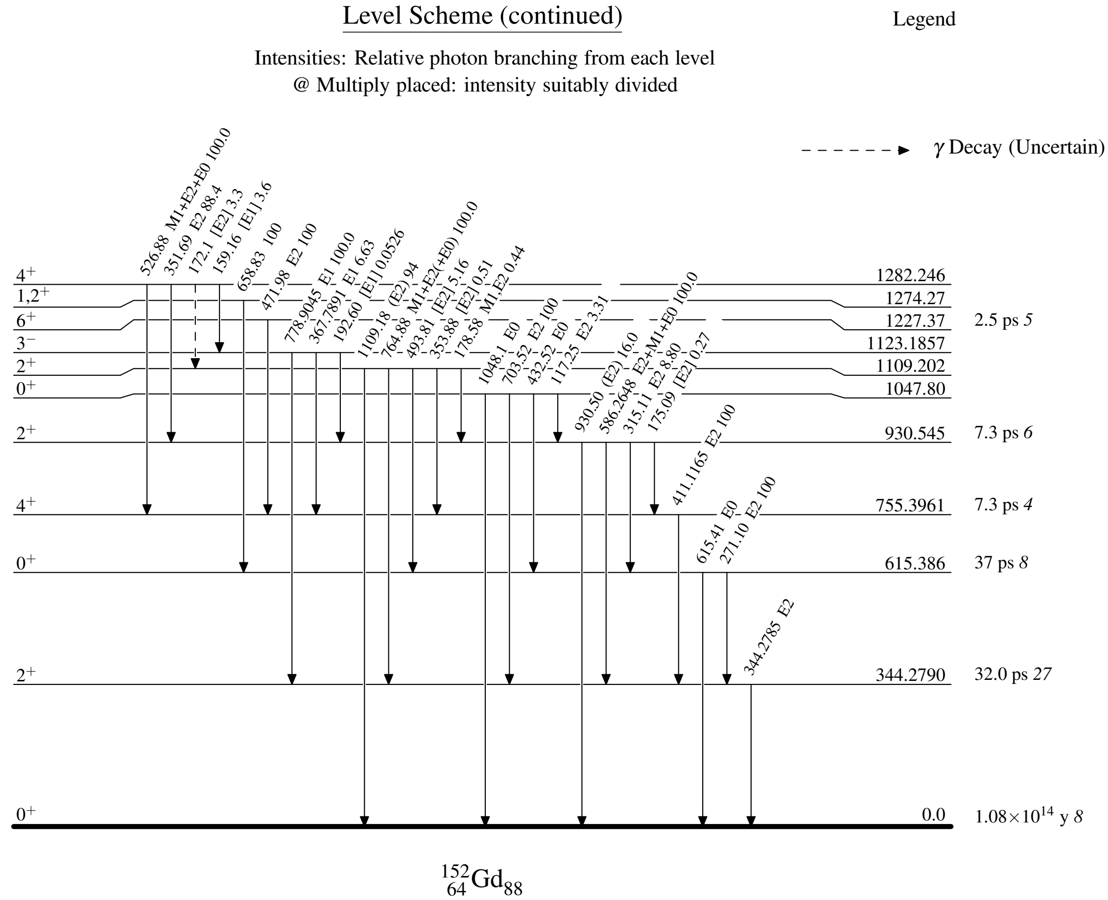
γ Decay (Uncertain)



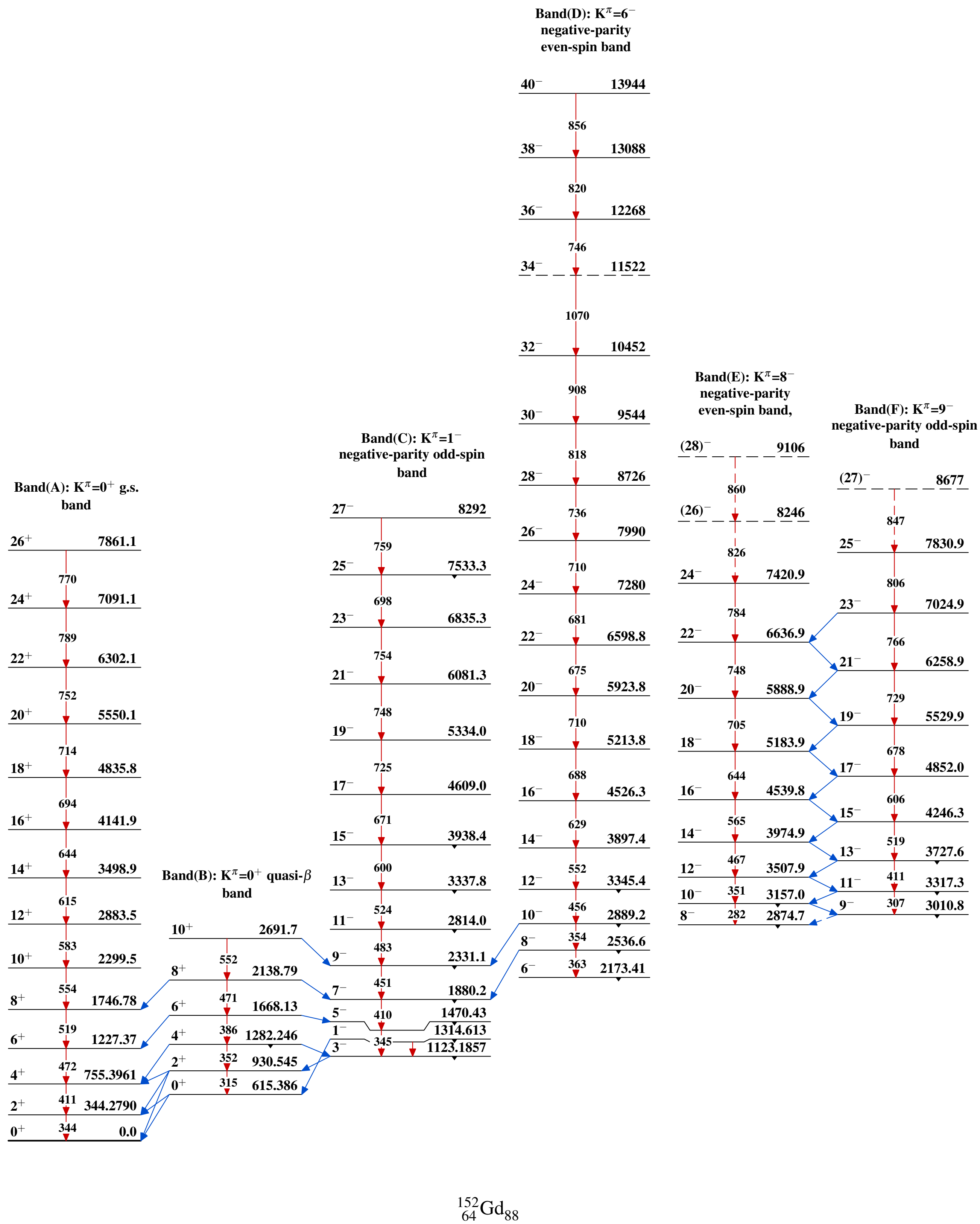
Adopted Levels, Gammas

Level Scheme (continued)

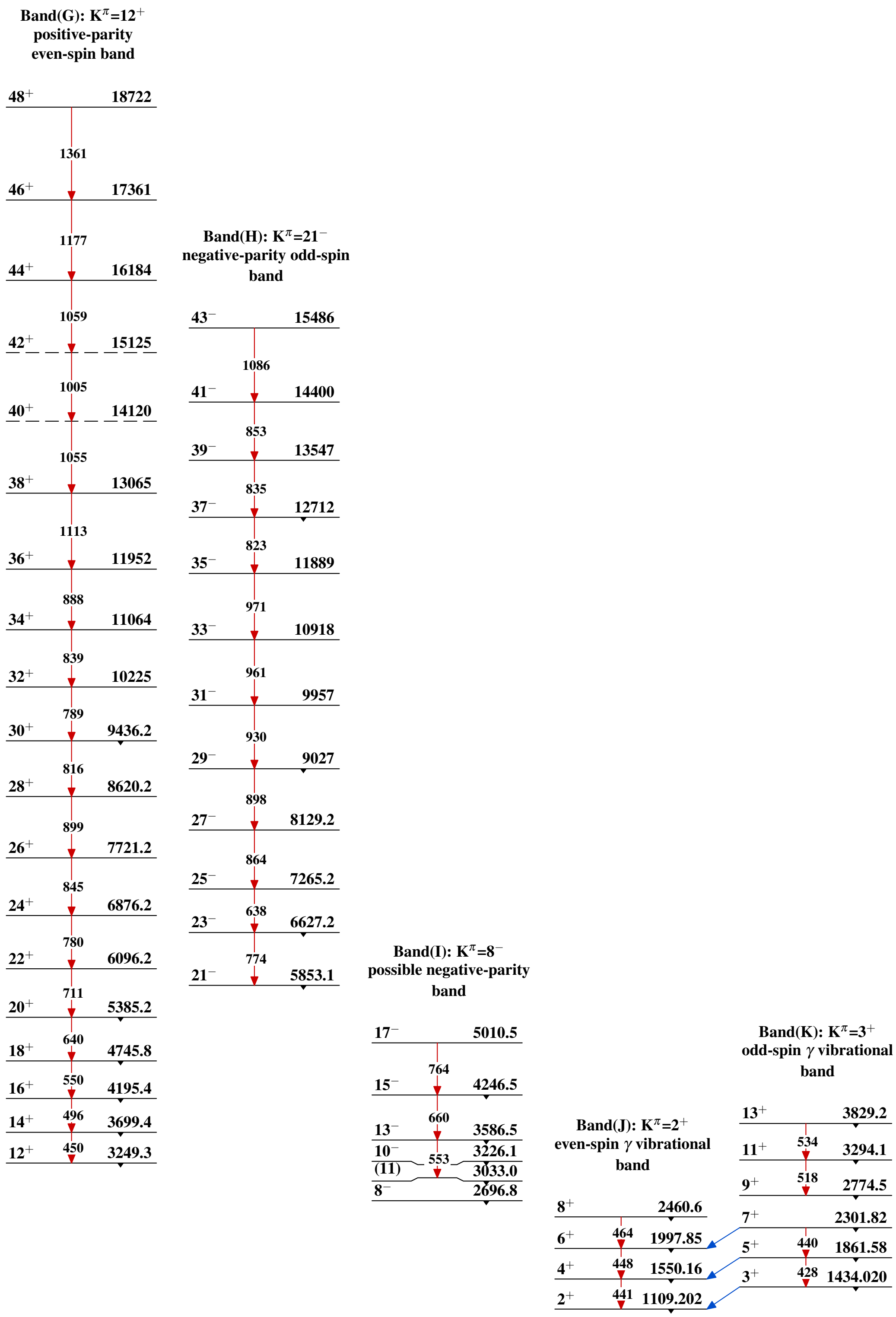
Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided



Adopted Levels, Gammas



Adopted Levels, Gammas (continued)



$^{152}_{64}Gd_{88}$

Adopted Levels, Gammas (continued)

$^{152}_{64}Gd_{88}$