^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

History

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

Parent: ^{152}Tb: E=0.0; J$^{\pi}$=2^{-}; T$_{1/2}$=17.5 h *1*; Q(ε)=3990 *40*; %ε+%β^{+} decay=100.0

^{152}Tb-%ε+%β^{+} decay: From I($\gamma^{\pm}$)/I(γ) for each level and theoretical ε/β^{+} ratios. the sum of the authors′ values for all levels, excluding the g.s., is 75.0% 18, leaving 25.0% 18 for feeding to the g.s. the γ normalization then follows from ΣI(γ+ce to g.s.)=75.0 *18*.

^{152}Tb isotope prepared by irradiation of a tantalum target by a proton beam at E=660 MeV, followed by chromatographic isolation and electromagnetic separation.

Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$, Iβ, I(ceK)/I(β+) with a planar HPGe detector and a coaxial HPGe detector for the energy range from 5-1500 keV. Another coaxial HPGe detector ORTEC was used to measure the aforementioned quantities in the high energy range of 300-4000 keV. The $\gamma\gamma$ coincidences were recorded by the two HPGe detectors. A 7 mm thick Pb filter was placed between the detectors to avoid registration of Compton-scattered photons.

^{152}Gd Levels

E(level)†	J$^{\pi}$
0	0^{+}
344.2790 *13*	2^{+}
615.38 *3*	0^{+}
755.3960 *19*	4^{+}
930.560 *18*	2^{+}
1047.78 *4*	0^{+}
1109.203 *20*	2^{+}
1123.186 *3*	3^{-}
1227.36 *7*	6^{+}
1274.26 *7*	1,2^{+}
1282.25 *4*	4^{+}
1314.638 *25*	1^{-}
1318.355 *22*	2^{+}
1434.021 *6*	3^{+}
1470.63 *6*	2^{+}
1533.92 *9*	
1550.15 *5*	4^{+}
1605.60 *3*	2^{+}
1643.428 *9*	2^{-}
1680.75 *5*	0^{+}
1692.43 *4*	2^{+},3^{+}
1734.44 *12*	
1755.77 *8*	1^{-}
1771.58 *4*	2^{+}
1785.21 *10*	2^{+}
1807.52 *7*	
1808.92 *8*	
1839.71 *5*	2^{+}
1861.89 *4*	2^{+}
1862.06 *6*	2^{+}
1915.15 *6*	(4)$^{+}$
1915.76 *5*	2^{+},3,4^{+}
1941.17 *3*	2^{+}
1975.72 *7*	1^{+},2^{+}
2011.67 *4*	1^{+},2^{+}
2121.05 *7*	2^{+},3^{-},4^{+}
2133.38 *14*	1^{+},2^{+}
2169.65 *7*	2^{+}

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^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05 (continued)

^{152}Gd Levels (continued)

E(level)[†]	J^π	Comments
2201.71 *7*	2^+	
2246.80 *4*	2^+	
2258.14 *6*	$2^+,3,4^+$	
2264.88 *7*	$1^-,2,3^-$	
2265.29 *8*	$1^+,2^+,3^+$	
2267.73 *9*		
2299.66 *3*	$2,3^-$[#]	
2325.68 *10*		
2330.72 *9*	$2^+,3,4^+$	
2386.95 *9*	$(2)^+$	
2401.55 *7*	$1^+,2,3^-$	
2437.43 *8*	2^+	
2448.01 *12*	$^+$	
2495.18 *6*	[&]	
2513.9 *4*	$1,2^+$	
2523.81 *4*	2^+	
2529.43 *4*	$2^+,3,4^+$	
2540.45 *6*	$2^+,3^+$	
2544.02 *6*		
2551.14 *7*		
2557.87 *5*	2^+	
2598.80 *5*	$1^+,2^+$	
2604.34 *6*	$1^-,2,3^-$	
2641.59 *10*	$1^-,2^-,3^-$	
2667.56 *6*	1^-	
2686.87 *9*	2^+	
2709.43 *5*	2^+	
2719.64 *6*	2^+	
2729.17 *4*	2^+	
2734.07 *7*		J^π: The mults for the two deexciting transitions to 2^+ are inconsistent.
2744.04 *10*	1^-	
2749.23 *4*	$2^+,3^+$	
2772.40 *6*	2^+	
2862.66 *5*	$1^-,2,3^-$	
2869.84?[@] *10*		
2880.67 *3*	2^+	
2914.19 *6*	2^+	
2920.10 *10*		
2927.86 *5*	$2^+,3^+$	
2928.68 *17*		
2932.71 *6*	2^+	
2964.30 *5*	2^-	
2981.45 *8*	$2^+,3,4^+$	
2989.03 *8*		
2999.55 *5*	$1^+,2^+$	
3006.78 *5*	2^+	
3009.23 *5*	3^-	
3012.37 *8*	$2^+,3^+,4^+$	
3042.29 *5*	2^+	
3067.42 *10*	3^-	
3074.85 *12*	$2^+,3,4^+$	
3079.66 *12*	$2^+,3,4^+$	
3090.42 *16*		
3099.02 *8*	$1^+,2^+,3^+$	
3105.52 *7*	2^+	

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^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05 (continued)

^{152}Gd Levels (continued)

E(level)†	Jπ	Comments
3110.93 *10*	$1^+,2^+$	
3112.53 *7*	$1^+,2^+$	
3140.21 *6*	$1,2^+$	
3143.97 *7*	3^-	
3152.89 *9*	3^-	
3214?‡ *1*		
3232.06 *8*		
3236.96 *9*	$2^+,3,4^+$	
3285.17 *8*	2^+	E(level): Deduced by evaluator based on the 1970 and 2162γ′s. The authors give 3285.12 *7*.
3340.65 *6*	$1^-,2,3,4^+$	
3358.27 *11*	2^+	

† From a least-squares fit to the Eγ values.

‡ The three transitions from the 3214 level do not yield consistent energies. The 887, 1045, and 1521γ′s give E(level)=3213.00 *14*, 3214.96 *24*, and 3214.00 *17*, respectively. 2003Ad25 give 3214.23 *9*. The evaluator adopts E=3214 *1* and considers the level as tentative.

α(K)exp gives mult=M1 and E1 for the 1369 and 1955γ′s, respectively; however, both transitions feed levels with $J^\pi=2^+$. mult(1369γ)=M1, along with other branchings, give $J^\pi=2^+$, while mult(1955γ)=E1 would allow $J^\pi=2^-$ or 3^-. Observation of the 2299 level in (d,d′) rules out the 2^- alternative. 2003Ad25 (and 2004AdZZ) adopt 2^+, while 1971Zo05 , who give the same inconsistent mults, adopt $J^\pi=3^-$. 1990Ta19, in their γ(θ) analysis use J=3.

@ 2003Ad25 list a level at 2869.76 with transitions Eγ=2525.43 and Eγ=2254.44. The 2525.43γ is shown as having a branching of 0.0, and neither transition is given in the tables of 2004AdZZ. there is a transition with Eγ=2254.54 listed in both works and placed from the 2598 level. In table 2 of 2004AdZZ, which gives transition multipolarities, the 2254.54γ is indicated as being a doublet, but no further information is given. The evaluator has chosen to show the 2869 level as questionable.

& The mults for the transitions deexciting the 2495 level are not consistent. From α(K)exp, the 1372 and 2150γ′s are both M1(+E2); however, the 1372γ feeds a 3^- level and the 2140γ feeds a 2^+ level.

ε,β^+ radiations

Relative I(β+) measured from annihilation radiation in coin with γ rays are given under comments. The values are from table 1 of 2003Ad25.

E(decay)	E(level)	Iε†‡	Log *ft*	I(ε+β⁺)‡	Comments
(6.3×10^2 *4*)	3358.27	0.074 *4*	8.42 *7*	0.074 *4*	εK=0.8235 *15*; εL=0.1363 *11*; εM+=0.0401 *4*
(6.5×10^2 *4*)	3340.65	0.118 *5*	8.24 *7*	0.118 *5*	εK=0.8241 *14*; εL=0.1359 *11*; εM+=0.0400 *4*
(7.0×10^2 *4*)	3285.17	0.154 *3*	8.21 *6*	0.154 *3*	εK=0.8258 *12*; εL=0.1347 *9*; εM+=0.0395 *3*
(7.5×10^2 *4*)	3236.96	0.0728 *19*	8.59 *6*	0.0728 *19*	εK=0.8270 *10*; εL=0.1338 *8*; εM+=0.0392 *3*
(7.6×10^2 *4*)	3232.06	0.0686 *18*	8.62 *6*	0.0686 *18*	εK=0.8271 *10*; εL=0.1337 *8*; εM+=0.0392 *3*
(8.4×10^2 *4*)	3152.89	0.071 *3*	8.70 *5*	0.071 *3*	εK=0.8288 *8*; εL=0.1324 *6*; εM+=0.03876 *21*
(8.5×10^2 *4*)	3143.97	0.0603 *15*	8.78 *5*	0.0603 *15*	εK=0.8290 *8*; εL=0.1323 *6*; εM+=0.03872 *20*
(8.5×10^2 *4*)	3140.21	0.14 *3*	8.4 *1*	0.14 *3*	εK=0.8290 *8*; εL=0.1323 *6*; εM+=0.03870 *20*
(8.8×10^2 *4*)	3112.53	0.120 *8*	8.51 *6*	0.120 *8*	εK=0.8295 *8*; εL=0.1319 *6*; εM+=0.03858 *19*
(8.8×10^2 *4*)	3110.93	0.0876 *21*	8.65 *5*	0.0876 *21*	εK=0.8295 *8*; εL=0.1319 *6*; εM+=0.03857 *19*
(8.8×10^2 *4*)	3105.52	0.0572 *15*	8.84 *5*	0.0572 *15*	εK=0.8296 *7*; εL=0.1318 *6*; εM+=0.03855 *18*
(8.9×10^2 *4*)	3099.02	0.157 *13*	8.41 *6*	0.157 *13*	εK=0.8297 *7*; εL=0.1317 *6*; εM+=0.03852 *18*
(9.0×10^2 *4*)	3090.42	0.0090 *6*	9.66 *5*	0.0090 *6*	εK=0.8299 *7*; εL=0.1316 *5*; εM+=0.03849 *18*
(9.1×10^2 *4*)	3079.66	0.091 *4*	8.67 *5*	0.091 *4*	εK=0.8301 *7*; εL=0.1315 *5*; εM+=0.03844 *17*
(9.2×10^2 *4*)	3074.85	0.066 *4*	8.81 *5*	0.066 *4*	εK=0.8301 *7*; εL=0.1314 *5*; εM+=0.03842 *17*

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^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05 (continued)

ε,β$^+$ radiations (continued)

E(decay)	E(level)	Iβ$^+$ ‡	Iε†‡	Log *ft*	I(ε+β$^+$)‡	Comments
(9.2×10^2 4)	3067.42		0.0319 11	9.14 5	0.0319 11	εK=0.8302 7; εL=0.1314 5; εM+=0.03839 17
(9.5×10^2 4)	3042.29		0.330 6	8.15 4	0.330 6	εK=0.8306 6; εL=0.1311 5; εM+=0.03830 16
(9.8×10^2 4)	3012.37		0.196 5	8.40 4	0.196 5	εK=0.8310 6; εL=0.1308 5; εM+=0.03819 15
(9.8×10^2 4)	3009.23		0.188 4	8.42 4	0.188 4	εK=0.8311 6; εL=0.1307 5; εM+=0.03818 15
(9.8×10^2 4)	3006.78		0.366 7	8.13 4	0.366 7	εK=0.8311 6; εL=0.1307 5; εM+=0.03817 15
(9.9×10^2 4)	2999.55		0.233 5	8.34 4	0.233 5	εK=0.8312 6; εL=0.1306 4; εM+=0.03815 14
(1.00×10^3 4)	2989.03		0.0308 15	9.23 5	0.0308 15	εK=0.8313 6; εL=0.1305 4; εM+=0.03811 14
(1.01×10^3 4)	2981.45		0.0545 18	8.98 4	0.0545 18	εK=0.8314 6; εL=0.1305 4; εM+=0.03809 14
(1.03×10^3 4)	2964.30		0.335 9	8.21 4	0.335 9	εK=0.8317 5; εL=0.1303 4; εM+=0.03803 13
(1.06×10^3 4)	2932.71		0.450 10	8.11 4	0.450 10	εK=0.8320 5; εL=0.1300 4; εM+=0.03794 13
(1.06×10^3 4)	2928.68		0.071 6	8.92 5	0.071 6	εK=0.8321 5; εL=0.1300 4; εM+=0.03792 13
(1.06×10^3 4)	2927.86		0.265 7	8.34 4	0.265 7	εK=0.8321 5; εL=0.1300 4; εM+=0.03792 12
(1.07×10^3 4)	2920.10		0.103 5	8.76 4	0.103 5	εK=0.8322 5; εL=0.1299 4; εM+=0.03790 12
(1.08×10^3 4)	2914.19		0.251 5	8.38 4	0.251 5	εK=0.8322 5; εL=0.1299 4; εM+=0.03788 12
(1.11×10^3 4)	2880.67		1.82 3	7.55 4	1.82 3	εK=0.8326 5; εL=0.1296 4; εM+=0.03779 11
(1.13×10^3 4)	2862.66		0.232 4	8.46 4	0.232 4	εK=0.8328 5; εL=0.1295 3; εM+=0.03774 11
(1.22×10^3 4)	2772.40		0.287 9	8.43 4	0.287 9	εK=0.8336 4; εL=0.1288 3; εM+=0.03753 10
(1.24×10^3 4)	2749.23		1.59 3	7.71 3	1.59 3	εK=0.8337 3; εL=0.1287 3; εM+=0.03748 9
(1.25×10^3 4)	2744.04		0.084 3	8.99 4	0.084 3	εK=0.8338 3; εL=0.1287 3; εM+=0.03747 9
(1.26×10^3 4)	2734.07		0.146 3	8.75 3	0.146 3	εK=0.8338 3; εL=0.1286 3; εM+=0.03745 9
(1.26×10^3 4)	2729.17		1.00 3	7.92 4	1.00 3	εK=0.8339 3; εL=0.1286 3; εM+=0.03744 9
(1.27×10^3 4)	2719.64		1.39 3	7.79 3	1.39 3	εK=0.8339 3; εL=0.1285 3; εM+=0.03742 9
(1.28×10^3 4)	2709.43		1.65 3	7.72 3	1.65 3	εK=0.8340 3; εL=0.12845 25; εM+=0.03740 9
(1.30×10^3 4)	2686.87		0.129 3	8.84 3	0.129 3	εK=0.8341 2; εL=0.12832 25; εM+=0.03735 9
(1.32×10^3 4)	2667.56		0.132 4	8.84 3	0.132 4	εK=0.8341 2; εL=0.12820 24; εM+=0.03731 9
(1.35×10^3 4)	2641.59		0.132 9	8.86 4	0.132 9	εK=0.8342 1; εL=0.12805 24; εM+=0.03726 8
(1.39×10^3 4)	2604.34		0.159 4	8.81 3	0.159 4	εK=0.8342 1; εL=0.12783 25; εM+=0.03718 8
(1.39×10^3 4)	2598.80		0.289 5	8.55 3	0.289 5	εK=0.8342 2; εL=0.12779 25; εM+=0.03717 8
(1.43×10^3 4)	2557.87	0.00022 10	0.170 4	8.81 3	0.170 4	av Eβ=198 18; εK=0.8341 3; εL=0.1275 3; εM+=0.03709 9
(1.44×10^3 4)	2551.14	0.00019 9	0.139 4	8.90 3	0.139 4	av Eβ=201 18; εK=0.8340 3; εL=0.1275 3; εM+=0.03708 9
(1.45×10^3 4)	2544.02	0.00016 7	0.107 3	9.02 3	0.107 3	av Eβ=204 18; εK=0.8340 4; εL=0.1275 3; εM+=0.03706 9
(1.45×10^3 4)	2540.45	0.00028 12	0.183 4	8.79 3	0.183 4	av Eβ=206 18; εK=0.8340 4; εL=0.1274 3; εM+=0.03705 9
(1.46×10^3 4)	2529.43	0.0011 5	0.665 11	8.23 3	0.666 11	av Eβ=211 18; εK=0.8339 4; εL=0.1274 3; εM+=0.03703 9
(1.47×10^3 4)	2523.81	0.0012 5	0.677 13	8.23 3	0.678 13	av Eβ=213 18; εK=0.8338 4; εL=0.1273 3; εM+=0.03702 9
(1.48×10^3 4)	2513.9	9.×10^{-5} 4	0.045 12	9.4 2	0.045 12	av Eβ=218 18; εK=0.8338 5; εL=0.1273 3; εM+=0.03700 9
(1.49×10^3 4)	2495.18	0.00063 24	0.272 6	8.64 3	0.273 6	av Eβ=226 18; εK=0.8336 6; εL=0.1271 3; εM+=0.03696 9
(1.54×10^3# 4)	2448.01	<1.×10^{-5}	<0.003	>10.6	<0.003	av Eβ=247 18; εK=0.8329 8; εL=0.1268 3; εM+=0.03686 10
(1.55×10^3 4)	2437.43	0.0015 5	0.42 4	8.49 5	0.42 4	av Eβ=252 18; εK=0.8328 8; εL=0.1267 3; εM+=0.03683 10
(1.59×10^3 4)	2401.55	0.0010 3	0.200 10	8.83 4	0.201 10	av Eβ=267 18; εK=0.8320 10; εL=0.1265 4;

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^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05 (continued)

ϵ,β^+ radiations (continued)

E(decay)	E(level)	Iβ^+ ‡	Iε†‡	Log *ft*	I($\varepsilon+\beta^+$)‡	Comments
						εM+=0.03675 *10*
(1.60×10^3 *4*)	2386.95	0.00083 *24*	0.158 *7*	8.94 *3*	0.159 *7*	av Eβ=274 *18*; εK=0.8317 *11*; εL=0.1264 *4*; εM+=0.03671 *11*
(1.66×10^3 *4*)	2330.72	0.00048 *12*	0.0640 *20*	9.36 *3*	0.0645 *20*	av Eβ=298 *18*; εK=0.8301 *15*; εL=0.1259 *4*; εM+=0.03656 *12*
(1.66×10^3# *4*)	2325.68	<9.9×10^{-5}	<0.013	>10.1	<0.013	av Eβ=301 *18*; εK=0.8300 *15*; εL=0.1258 *4*; εM+=0.03655 *12*
(1.69×10^3 *4*)	2299.66	0.0089 *21*	0.988 *16*	8.19 *3*	0.997 *16*	av Eβ=312 *18*; εK=0.8290 *17*; εL=0.1256 *4*; εM+=0.03648 *12* Iβ^+: <0.0056.
(1.72×10^3 *4*)	2267.73	0.00071 *16*	0.0664 *22*	9.38 *3*	0.0671 *22*	av Eβ=326 *18*; εK=0.8278 *19*; εL=0.1253 *5*; εM+=0.03638 *13* Iβ^+: <0.0005.
(1.72×10^3 *4*)	2265.29	0.0045 *10*	0.416 *10*	8.58 *3*	0.420 *10*	av Eβ=327 *18*; εK=0.8277 *19*; εL=0.1253 *5*; εM+=0.03637 *13* Iβ^+: <0.0004.
(1.73×10^3 *4*)	2264.88	<0.0004	<0.04	>9.6	<0.04	av Eβ=327 *18*; εK=0.8276 *19*; εL=0.1253 *5*; εM+=0.03637 *13* Iβ^+: <0.0003.
(1.73×10^3 *4*)	2258.14	0.00101 *23*	0.0904 *25*	9.25 *3*	0.0914 *25*	av Eβ=330 *18*; εK=0.8274 *19*; εL=0.1252 *5*; εM+=0.03635 *13* Iβ^+: <0.0009.
(1.74×10^3 *4*)	2246.80	0.044 *10*	3.71 *6*	7.64 *3*	3.75 *6*	av Eβ=335 *18*; εK=0.8268 *20*; εL=0.1251 *5*; εM+=0.03631 *14* Iβ^+: <0.045.
(1.79×10^3 *4*)	2201.71	0.0043 *9*	0.289 *10*	8.77 *3*	0.293 *10*	av Eβ=355 *18*; εK=0.8246 *24*; εL=0.1246 *5*; εM+=0.03616 *15* Iβ^+: <0.0032.
(1.82×10^3 *4*)	2169.65	0.0026 *5*	0.149 *7*	9.08 *3*	0.152 *7*	av Eβ=369 *18*; εK=0.823 *3*; εL=0.1242 *6*; εM+=0.03605 *16* Iβ^+: <0.0017.
(1.86×10^3 *4*)	2133.38	0.0107 *19*	0.524 *17*	8.55 *3*	0.535 *17*	av Eβ=385 *18*; εK=0.820 *3*; εL=0.1237 *6*; εM+=0.03591 *17* Iβ^+: <0.010.
(1.87×10^3 *4*)	2121.05	0.0019 *3*	0.089 *4*	9.32 *3*	0.091 *4*	av Eβ=390 *18*; εK=0.820 *3*; εL=0.1236 *6*; εM+=0.03586 *17* Iβ^+: <0.0016.
(1.98×10^3 *4*)	2011.67	0.026 *4*	0.800 *19*	8.42 *3*	0.826 *19*	av Eβ=438 *18*; εK=0.811 *4*; εL=0.1219 *7*; εM+=0.03537 *21* Iβ^+: <0.019.
(2.01×10^3 *4*)	1975.72	0.0063 *9*	0.168 *6*	9.12 *3*	0.174 *6*	av Eβ=454 *18*; εK=0.807 *5*; εL=0.1213 *8*; εM+=0.03518 *22* Iβ^+: <0.0077.
(2.05×10^3 *4*)	1941.17	0.174 *24*	4.11 *6*	7.74 *2*	4.28 *6*	av Eβ=469 *18*; εK=0.804 *5*; εL=0.1207 *8*; εM+=0.03500 *23* Iβ^+: 0.21 *4*.
(2.07×10^3 *4*)	1915.76	0.0064 *9*	0.139 *7*	9.23 *3*	0.145 *7*	av Eβ=481 *18*; εK=0.801 *5*; εL=0.1202 *8*; εM+=0.03486 *24* Iβ^+: <0.0066.
(2.07×10^3 *4*)	1915.15	0.0020 *3*	0.189 *9*	10.29^{1u} *4*	0.191 *9*	av Eβ=498 *18*; εK=0.8224 *12*; εL=0.1292 *4*; εM+=0.03773 *13* Iβ^+: <0.0073.
(2.13×10^3 *4*)	1862.06	0.050 *6*	0.91 *4*	8.43 *3*	0.96 *4*	av Eβ=504 *18*; εK=0.795 *6*; εL=0.1191 *9*; εM+=0.0345 *3* Iβ^+: 0.070 *10*.
(2.13×10^3 *4*)	1861.89	0.051 *6*	0.936 *17*	8.42 *2*	0.987 *17*	av Eβ=504 *18*; εK=0.795 *6*; εL=0.1191 *9*;

Continued on next page (footnotes at end of table)

^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05 (continued)

ϵ,β^+ radiations (continued)

E(decay)	E(level)	Iβ$^+$ ‡	Iε†‡	Log *ft*	I(ε+β$^+$)‡	Comments
						εM+=0.0345 *3* Iβ$^+$: <0.037.
(2.15×10^3 *4*)	1839.71	0.0148 *19*	0.253 *14*	9.00 *4*	0.268 *15*	av Eβ=514 *18*; εK=0.792 *6*; εL=0.1186 *9*; εM+=0.0344 *3* Iβ$^+$: 0.054 *14*.
(2.18×10^3 *4*)	1808.92	0.0037 *5*	0.058 *4*	9.65 *4*	0.062 *4*	av Eβ=528 *18*; εK=0.788 *6*; εL=0.1180 *10*; εM+=0.0342 *3* Iβ$^+$: 0.043 *13*.
(2.18×10^3 *4*)	1807.52	0.0063 *7*	0.099 *3*	9.42 *3*	0.105 *3*	av Eβ=528 *18*; εK=0.787 *6*; εL=0.1179 *10*; εM+=0.0342 *3* Iβ$^+$: <0.0062.
(2.20×10^3 *4*)	1785.21	0.0028 *5*	0.040 *6*	9.82 *7*	0.043 *6*	av Eβ=538 *18*; εK=0.784 *6*; εL=0.1174 *10*; εM+=0.0340 *3* Iβ$^+$: 0.029 *4*.
(2.22×10^3 *4*)	1771.58	0.0228 *25*	0.319 *7*	8.92 *3*	0.342 *7*	av Eβ=544 *18*; εK=0.782 *6*; εL=0.1171 *10*; εM+=0.0339 *3* Iβ$^+$: 0.039 *11*.
(2.23×10^3 *4*)	1755.77	0.024 *3*	0.32 *3*	8.93 *5*	0.34 *3*	av Eβ=551 *18*; εK=0.780 *7*; εL=0.1167 *10*; εM+=0.0338 *3* Iβ$^+$: 0.044 *7*.
(2.26×10^3 *4*)	1734.44	0.00194 *23*	0.0245 *15*	10.05 *4*	0.0264 *16*	av Eβ=561 *18*; εK=0.777 *7*; εL=0.1162 *11*; εM+=0.0337 *3* Iβ$^+$: <0.0020.
(2.30×10^3 *4*)	1692.43	0.056 *6*	0.627 *23*	8.66 *3*	0.683 *24*	av Eβ=579 *18*; εK=0.770 *7*; εL=0.1151 *11*; εM+=0.0334 *4* Iβ$^+$: 0.078 *8*.
(2.31×10^3 *4*)	1680.75	0.0039 *5*	0.163 *4*	10.54^{1u} *4*	0.167 *4*	av Eβ=600 *18*; εK=0.8134 *22*; εL=0.1266 *5*; εM+=0.03692 *16* Iβ$^+$: <0.019.
(2.35×10^3 *4*)	1643.428	0.170 *17*	1.69 *5*	8.25 *3*	1.86 *5*	av Eβ=601 *18*; εK=0.762 *7*; εL=0.1138 *12*; εM+=0.0330 *4* Iβ$^+$: 0.317 *23*.
(2.38×10^3 *4*)	1605.60	0.228 *21*	2.07 *5*	8.17 *3*	2.30 *5*	av Eβ=618 *18*; εK=0.755 *8*; εL=0.1127 *12*; εM+=0.0327 *4* Iβ$^+$: 0.41 *7*.
(2.44×10^3 *4*)	1550.15	0.032 *3*	0.254 *8*	9.11 *3*	0.286 *8*	av Eβ=642 *18*; εK=0.745 *8*; εL=0.1111 *13*; εM+=0.0322 *4* Iβ$^+$: <0.038.
(2.52×10^3 *4*)	1470.63	<0.0017	<0.011	>10.5	<0.013	av Eβ=678 *18*; εK=0.729 *9*; εL=0.1087 *13*; εM+=0.0315 *4* Iβ$^+$: 0.084 *7*.
(2.56×10^3 *4*)	1434.021	0.10 *1*	0.65 *3*	8.74 *3*	0.75 *3*	av Eβ=694 *18*; εK=0.722 *9*; εL=0.1075 *14*; εM+=0.0311 *4* Iβ$^+$: 0.041 *10*.
(2.67×10^3 *4*)	1318.355	0.47 *3*	2.26 *8*	8.24 *3*	2.73 *9*	av Eβ=745 *18*; εK=0.696 *10*; εL=0.1035 *15*; εM+=0.0300 *5* Iβ$^+$: 0.76 *10*.
(2.68×10^3 *4*)	1314.638	0.12 *1*	0.56 *4*	8.84 *4*	0.68 *5*	av Eβ=747 *18*; εK=0.695 *10*; εL=0.1034 *15*; εM+=0.0299 *5* Iβ$^+$: 0.047 *10*.
(2.71×10^3 *4*)	1282.25	0.0136 *14*	0.208 *13*	10.72^{1u} *4*	0.222 *14*	av Eβ=773 *18*; εK=0.783 *5*; εL=0.1204 *8*; εM+=0.03506 *23* Iβ$^+$: 0.013 *10*.
(2.72×10^3 *4*)	1274.26	<0.0009	<0.004	>11.0	<0.005	av Eβ=765 *18*; εK=0.686 *10*; εL=0.1019 *15*; εM+=0.0295 *5* Iβ$^+$: <0.011.

Continued on next page (footnotes at end of table)

^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05 (continued)

ϵ,β^+ radiations (continued)

E(decay)	E(level)	$I\beta^+$ ‡	$I\varepsilon$ †‡	Log *ft*	$I(\varepsilon+\beta^+)$ ‡	Comments
(2.87×10^3 *4*)	1123.186	0.38 *4*	1.29 *10*	8.54 *4*	1.67 *13*	av Eβ=833 *18*; εK=0.649 *10*; εL=0.0963 *16*; εM+=0.0279 *5* Iβ$^+$: 0.60 *4*.
(2.88×10^3 *4*)	1109.203	0.64 *4*	2.15 *8*	8.33 *3*	2.79 *10*	av Eβ=839 *18*; εK=0.646 *11*; εL=0.0958 *16*; εM+=0.0277 *5* Iβ$^+$: 1.09 *6*.
(2.94×10^3 *4*)	1047.78	0.128 *11*	1.22 *6*	10.10^{1u} *4*	1.35 *7*	av Eβ=875 *18*; εK=0.756 *6*; εL=0.1157 *9*; εM+=0.0336 *3* Iβ$^+$: 0.36 *5*.
(3.06×10^3 *4*)	930.560	2.30 *12*	5.76 *19*	7.95 *3*	8.06 *22*	av Eβ=920 *18*; εK=0.600 *11*; εL=0.0888 *16*; εM+=0.0257 *5* Iβ$^+$: 3.59 *20*.
(3.23×10^3 *4*)	755.3960	0.051 *15*	0.30 *9*	10.9^{1u} *2*	0.35 *10*	av Eβ=1003 *18*; εK=0.713 *7*; εL=0.1085 *11*; εM+=0.0315 *4* Iβ$^+$: <0.016.
(3.37×10^3 *4*)	615.38	1.20 *7*	5.65 *21*	9.67^{1u} *3*	6.85 *24*	av Eβ=1065 *18*; εK=0.690 *7*; εL=0.1046 *12*; εM+=0.0304 *4* Iβ$^+$: 1.90 *11*.
(3.65×10^3 *4*)	344.2790	5.9 *8*	6.8 *9*	8.03 *7*	12.7 *17*	av Eβ=1186 *19*; εK=0.449 *10*; εL=0.0662 *15*; εM+=0.0192 *5* Iβ$^+$: 11.9 *11*.
(3.99×10^3 *4*)	0	8.0 *13*	17 *3*	9.49^{1u} *8*	25 *4*	av Eβ=1337 *18*; εK=0.571 *8*; εL=0.0859 *13*; εM+=0.0249 *4*

† From an intensity balance at each level.
‡ Absolute intensity per 100 decays.
# Existence of this branch is questionable.

γ(^{152}Gd)

Iγ normalization: From I($\gamma^{\pm}$)/I(γ) for each level and theoretical ε/β^+ ratios. the sum of the authors′ values for all levels, excluding the g.s., is 75.0% 18, leaving 25.0% 18 for feeding to the g.s. the γ normalization then follows from ΣI(γ+ce to g.s.)=75.0 *18*.

E_γ[†]	I_γ[t>]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[v]	α[α]	Comments
^{x}113.5[u]								α(K)exp>0.64 *17*
^{x}115.3[u]								α(K)exp>0.71 *17*
117.25 *7*	0.0785 *22*	1047.78	0^+	930.560	2^+	E2	1.412	α(K)exp=0.64 *10* α(K)=0.752 *11*; α(L)=0.509 *8*; α(M)=0.1196 *17*; α(N+..)=0.0303 *5* α(N)=0.0267 *4*; α(O)=0.00353 *5*; α(P)=3.82×10^{-5} *6*
^{x}143.8[u]								α(K)exp>0.52 *16*
^{x}155.1[u]								α(K)exp>0.71 *20*
159.16 *16*	0.0147 *16*	1282.25	4^+	1123.186	3^-	[E1]	0.0835	α(K)=0.0705 *10*; α(L)=0.01016 *15*; α(M)=0.00220 *4*; α(N+..)=0.000578 *9* α(N)=0.000499 *8*; α(O)=7.45×10^{-5} *11*; α(P)=4.20×10^{-6} *6*
^{x}160.77 *9*	0.0252 *15*							
^{x}169.50 *12*	0.032 *3*							
175.14 *9*	0.038 *4*	930.560	2^+	755.3960	4^+	[E2]	0.347	α(K)exp=0.43 *9* α(K)=0.231 *4*; α(L)=0.0901 *13*; α(M)=0.0209 *3*; α(N+..)=0.00533 *8* α(N)=0.00468 *7*; α(O)=0.000636 *9*; α(P)=1.286×10^{-5} *19* Mult.: α(K)exp gives mult=M1, but placement from 2^+ to 4^+ requires E2.
178.58 *11*	0.0189 *16*	1109.203	2^+	930.560	2^+	M1,E2	0.36 *4*	α(K)exp=1.8 *11* α(K)=0.27 *6*; α(L)=0.065 *18*; α(M)=0.015 *5*; α(N+..)=0.0038 *11* α(N)=0.0033 *10*; α(O)=0.00048 *11*; α(P)=1.8×10^{-5} *7*
^{x}181.3 *3*	0.0103 *23*							
^{x}185.07 *16*	0.012 *3*							
^{x}195.17 *7*	0.624 *14*	1318.355	2^+	1123.186	3^-	E1	0.0484	α(K)=0.0410 *6*; α(L)=0.00582 *9*; α(M)=0.001259 *18*; α(N+..)=0.000332 *5* α(N)=0.000287 *4*; α(O)=4.30×10^{-5} *6*; α(P)=2.50×10^{-6} *4*
^{x}196.34 *17*	0.047 *5*							
209.14 *8*	0.0568 *21*	1318.355	2^+	1109.203	2^+	M1+E2(+E0)	0.22 *4*	α(K)exp=0.30 *5* α(K)=0.17 *4*; α(L)=0.037 *7*; α(M)=0.0083 *18*; α(N+..)=0.0022 *4* α(N)=0.0019 *4*; α(O)=0.00027 *4*; α(P)=1.2×10^{-5} *4* Mult.: α(K)=0.214 (M1), 0.135 (E2). For large δ, α(K)exp gives mult=E0+E2. for small δ, an E0 component is still suggested.
218.42 *9*	0.0218 *11*	1861.89	2^+	1643.428	2^-	[E1]	0.0360	α(K)=0.0305 *5*; α(L)=0.00430 *6*; α(M)=0.000930 *13*; α(N+..)=0.000246 *4* α(N)=0.000212 *3*; α(O)=3.19×10^{-5} *5*; α(P)=1.89×10^{-6} *3*
248.75 *9*	0.099 *12*	1941.17	2^+	1692.43	2^+,3^+	[M1,E2]	0.133 *25*	α(K)=0.11 *3*; α(L)=0.0206 *17*; α(M)=0.0046 *5*; α(N+..)=0.00121 *11* α(N)=0.00104 *10*; α(O)=0.000153 *7*; α(P)=7.E−6 *3*

γ(^{152}Gd) (continued)

E_γ †	I_γ ‡>	E_i(level)	J_i^π	E_f	J_f^π	Mult. ν	α α	Comments
271.09 *7*	15.0 *3*	615.38	0+	344.2790	2+	E2	0.0826	α(K)=0.0620 *9*; α(L)=0.01601 *23*; α(M)=0.00364 *6*; α(N+..)=0.000942 *14* α(N)=0.000823 *12*; α(O)=0.0001159 *17*; α(P)=3.80×10^{-6} *6* Mult.: α(K)exp=0.060 *9*.
x296.31 *21*	0.0105 *21*							
298.06 *21*	0.0108 *16*	1941.17	2+	1643.428	2−	[E1]	0.01619	α(K)=0.01376 *20*; α(L)=0.00191 *3*; α(M)=0.000412 *6*; α(N+..)=0.0001092 *16* α(N)=9.40×10^{-5} *14*; α(O)=1.428×10^{-5} *21*; α(P)=8.76×10^{-7} *13*
301.8 *3*	0.0078 *22*	2749.23	2+,3+	2448.01	+			
315.16 *7*	1.28 *3*	930.560	2+	615.38	0+	E2	0.0518	α(K)exp=0.052 *18* α(K)=0.0399 *6*; α(L)=0.00924 *13*; α(M)=0.00209 *3*; α(N+..)=0.000543 *8* α(N)=0.000473 *7*; α(O)=6.75×10^{-5} *10*; α(P)=2.52×10^{-6} *4* Mult.: α(K)exp allows some M1 admixture but the placement requires ΔJ=2.
x322.18 *13*	0.0137 *14*							
324.90 *7*	0.066 *3*	1434.021	3+	1109.203	2+	[M1,E2]	0.062 *15*	α(K)=0.051 *15*; α(L)=0.0088 *5*; α(M)=0.00194 *7*; α(N+..)=0.00051 *3* α(N)=0.000443 *20*; α(O)=6.6×10^{-5} *6*; α(P)=3.6×10^{-6} *13*
x334.02 *11*	0.0374 *21*							
335.56 *7*	0.093 *3*	1941.17	2+	1605.60	2+	[M1,E2]	0.057 *15*	α(K)=0.047 *14*; α(L)=0.0079 *6*; α(M)=0.00175 *9*; α(N+..)=0.00046 *3* α(N)=0.000401 *23*; α(O)=6.0×10^{-5} *6*; α(P)=3.3×10^{-6} *12*
344.2785s *13*	100.0 *25*	344.2790	2+	0	0+	E2	0.0397	α(K)=0.0310 *5*; α(L)=0.00678 *10*; α(M)=0.001527 *22*; α(N+..)=0.000398 *6* α(N)=0.000346 *5*; α(O)=4.97×10^{-5} *7*; α(P)=1.99×10^{-6} *3* Mult.: α(K)exp=0.031 *30*.
351.73 *7*	0.366 *9*	1282.25	4+	930.560	2+	E2	0.0373	α(K)exp=0.030 *10* α(K)=0.0292 *4*; α(L)=0.00630 *9*; α(M)=0.001417 *20*; α(N+..)=0.000369 *6* α(N)=0.000321 *5*; α(O)=4.62×10^{-5} *7*; α(P)=1.88×10^{-6} *3*
353.78 *9*	0.0448 *20*	1109.203	2+	755.3960	4+	[E2]	0.0367	α(K)=0.0287 *4*; α(L)=0.00617 *9*; α(M)=0.001389 *20*; α(N+..)=0.000362 *5* α(N)=0.000315 *5*; α(O)=4.53×10^{-5} *7*; α(P)=1.85×10^{-6} *3*
x362.33 *9*	0.0309 *14*							
x364.84 *16*	0.0142 *17*							
366.15 *9*	0.047 *3*	1680.75	0+	1314.638	1−			
367.80 *7*	0.550 *14*	1123.186	3−	755.3960	4+	E1	0.00964 *14*	α(K)exp=0.012 *4* α=0.00964 *14*; α(K)=0.00821 *12*; α(L)=0.001125 *16*; α(M)=0.000243 *4*; α(N+..)=6.45×10^{-5} *9* α(N)=5.55×10^{-5} *8*; α(O)=8.47×10^{-6} *12*; α(P)=5.31×10^{-7} *8* δ: δ=+0.015 *19* (1985KrZU), +0.1 *2* (1983Bl07), −0.03 *2* (1975He13), −0.04 *4* (1970Ba32).

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

γ(^{152}Gd) (continued)

E_γ [†]	I_γ [t>]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [ν]	α [α]	$I_{(\gamma+ce)}$ [>]	Comments
[x]368.66 *21*	0.042 *10*								
[x]381.7 *3*	0.0088 *22*								
[x]385.5 *3*	0.019 *6*								
387.80 *7*	0.586 *20*	1318.355	2^+	930.560	2^+	E0+M1+E2	0.038 *11*		α(K)exp=0.42 *11* α(K)=0.032 *10*; α(L)=0.0052 *7*; α(M)=0.00113 *12*; α(N+..)=0.00030 *4* α(N)=0.00026 *3*; α(O)=3.9×10^{-5} *6*; α(P)=2.2×10^{-6} *8* X(E0/E2)=36 *8*. Mult.: The large α(K)exp requires a mult=E0 component, but δ(E2/M1) is not known.
390.82 *15*	0.0117 *19*	1941.17	2^+	1550.15	4^+				
407.12 *21*	0.022 *3*	2246.80	2^+	1839.71	2^+	[M1,E2]	0.034 *10*		α(K)=0.028 *9*; α(L)=0.0045 *7*; α(M)=0.00098 *12*; α(N+..)=0.00026 *4* α(N)=0.00023 *3*; α(O)=3.4×10^{-5} *6*; α(P)=2.0×10^{-6} *7*
411.1165[s] *13*	5.67 *14*	755.3960	4^+	344.2790	2^+	E2	0.0238		α(K)exp=0.0192 *23* α(K)=0.0195 *4*; α(L)=0.0040 *4*; α(M)=0.00090 *8*; α(N+..)=0.000235 *20* α(N)=0.000204 *18*; α(O)=3.0×10^{-5} *3*; α(P)=1.37×10^{-6} *15* δ: $-0.30\le\delta$(M3/E2)≤-0.032 from $\gamma(\theta)$, and <0.05 from α(K)exp. other: +0.04 *20* (1981Fe01). From the RUL limit of B(M3)(W.u.)<10 one expects $\delta<4.4\times10^{-5}$.
[x]421.40 *18*	0.0122 *12*								
427.85 *11*	0.0315 *21*	1861.89	2^+	1434.021	3^+	[M1,E2]	0.029 *9*		α(K)=0.025 *8*; α(L)=0.0039 *6*; α(M)=0.00085 *12*; α(N+..)=0.00023 *4* α(N)=0.00019 *3*; α(O)=3.0×10^{-5} *6*; α(P)=1.7×10^{-6} *7*
432.5[u]		1047.78	0^+	615.38	0^+	E0		0.81 *8*	α(K)exp>237 *24* I_γ: <0.003. $I_{(\gamma+ce)}$: From Ice(K)=0.710 *75* and Ice(K)/Ice=0.876 (E0 theory). X(E0/E2)=2.25 *23*.
441.02 *8*	0.0715 *19*	1550.15	4^+	1109.203	2^+				
[x]453.26 *24*	0.0088 *20*								
454.8 *3*	0.0079 *18*	2719.64	2^+	2264.88	$1^-,2,3^-$				
456.92 *7*	0.065 *3*	1771.58	2^+	1314.638	1^-	[E1]	0.00578 *8*		α=0.00578 *8*; α(K)=0.00493 *7*; α(L)=0.000668 *10*; α(M)=0.0001440 *21*; α(N+..)=3.84×10^{-5} *6* α(N)=3.30×10^{-5} *5*; α(O)=5.06×10^{-6} *7*; α(P)=3.23×10^{-7} *5*
[x]460.29 *22*	0.0096 *21*								
[x]465.68 *10*	0.0427 *21*								
471.98 *9*	0.0338 *14*	1227.36	6^+	755.3960	4^+	E2	0.0163		α(K)=0.01316 *19*; α(L)=0.00242 *4*; α(M)=0.000539 *8*; α(N+..)=0.0001416 *20*

γ(^{152}Gd) (continued)

E_γ †	I_γ ‡>	E_i(level)	J^π_i	E_f	J^π_f	Mult. ν	α α	Comments
								α(N)=0.0001226 *18*; α(O)=1.81×10^{-5} *3*; α(P)=8.78×10^{-7} *13*
482.34 *9*	0.0914 *23*	1605.60	2$^+$	1123.186	3$^-$	[E1]	0.00511 *8*	α=0.00511 *8*; α(K)=0.00436 *7*; α(L)=0.000589 *9*; α(M)=0.0001270 *18*; α(N+..)=3.38×10^{-5} *5* α(N)=2.91×10^{-5} *4*; α(O)=4.46×10^{-6} *7*; α(P)=2.86×10^{-7} *4*
489.59 *13*	0.038 *3*	1771.58	2$^+$	1282.25	4$^+$	[E2]	0.01475	α(K)=0.01197 *17*; α(L)=0.00217 *3*; α(M)=0.000481 *7*; α(N+..)=0.0001266 *18* α(N)=0.0001096 *16*; α(O)=1.618×10^{-5} *23*; α(P)=8.01×10^{-7} *12*
490.66 *9*	0.092 *3*	1808.92		1318.355	2$^+$			
^{x}491.84 *27*	0.015 *3*							
493.81 *7*	0.223 *6*	1109.203	2$^+$	615.38	0$^+$	[E2] 9	0.01442	α(K)=0.01171 *17*; α(L)=0.00211 *3*; α(M)=0.000469 *7*; α(N+..)=0.0001233 *18* α(N)=0.0001068 *15*; α(O)=1.577×10^{-5} *22*; α(P)=7.85×10^{-7} *11*
496.37 *7*	0.230 *5*	1605.60	2$^+$	1109.203	2$^+$	E0+M1+E2 9	0.074 *5*	
500.23 *12*	0.0102 *16*	3099.02	1$^+$,2$^+$,3$^+$	2598.80	1$^+$,2$^+$			
503.43 *7*	0.102 *3*	1434.021	3$^+$	930.560	2$^+$	[M1,E2]	0.019 *6*	α(K)=0.016 *5*; α(L)=0.0025 *5*; α(M)=0.00054 *10*; α(N+..)=0.00014 *3* α(N)=0.000123 *23*; α(O)=1.9×10^{-5} *4*; α(P)=1.1×10^{-6} *4*
520.30 *8*	0.097 *4*	1643.428	2$^-$	1123.186	3$^-$	[M1,E2]	0.018 *6*	α(K)=0.015 *5*; α(L)=0.0023 *5*; α(M)=0.00049 *10*; α(N+..)=0.00013 *3* α(N)=0.000113 *22*; α(O)=1.7×10^{-5} *4*; α(P)=1.1×10^{-6} *4*
^{x}522.03 *18*	0.0146 *19*							
526.85 *9*	0.414 *9*	1282.25	4$^+$	755.3960	4$^+$	E0+M1+E2	0.094 *10*	α(K)exp=0.082 *9* X(E0/E2)=24.2 *19*.
534.21 *9*	0.0825 *20*	1643.428	2$^-$	1109.203	2$^+$	[E1]	0.00407 *6*	α=0.00407 *6*; α(K)=0.00347 *5*; α(L)=0.000467 *7*; α(M)=0.0001005 *14*; α(N+..)=2.68×10^{-5} *4* α(N)=2.30×10^{-5} *4*; α(O)=3.54×10^{-6} *5*; α(P)=2.29×10^{-7} *4*
543.58 *7*	0.303 *7*	1861.89	2$^+$	1318.355	2$^+$	E0+M1+E2 !	0.016 *5*	α(K)exp=0.035 *6* α(K)=0.013 *5*; α(L)=0.0020 *4*; α(M)=0.00044 *9*; α(N+..)=0.000116 *24* α(N)=0.000100 *20*; α(O)=1.5×10^{-5} *4*; α(P)=9.E−7 *4* δ: −3 +8−∞ (1981Fe01).
547.47 *7*	0.111 *3*	1862.06	2$^+$	1314.638	1$^-$	[E1] !	0.00385 *6*	α=0.00385 *6*; α(K)=0.00329 *5*; α(L)=0.000442 *7*; α(M)=9.51×10^{-5} *14*; α(N+..)=2.54×10^{-5} *4* α(N)=2.18×10^{-5} *3*; α(O)=3.35×10^{-6} *5*; α(P)=2.17×10^{-7} *3*
^{x}554.24 *21*	0.0171 *16*							
557.43 @	0.061 @ *12*	1839.71	2$^+$	1282.25	4$^+$	(E2) @	0.01053	α(K)=0.00864 *12*; α(L)=0.001480 *21*; α(M)=0.000327 *5*; α(N+..)=8.63×10^{-5} *12* α(N)=7.46×10^{-5} *11*; α(O)=1.111×10^{-5} *16*; α(P)=5.85×10^{-7} *9*
557.81 @	0.114 @ *11*	1605.60	2$^+$	1047.78	0$^+$	[E2] @	0.01052	α(K)=0.00863 *12*; α(L)=0.001478 *21*; α(M)=0.000327 *5*; α(N+..)=8.62×10^{-5} *12* α(N)=7.45×10^{-5} *11*; α(O)=1.109×10^{-5} *16*; α(P)=5.84×10^{-7} *9*

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

γ(^{152}Gd) (continued)

E_γ†	I_γ t>	E_i(level)	J_i^π	E_f	J_f^π	Mult.ν	δν	α α	$I_{(\gamma+ce)}$>	Comments
562.98 *9*	0.105 *3*	1318.355	2+	755.3960	4+	[E2]		0.01027		α(K)=0.00843 *12*; α(L)=0.001439 *21*; α(M)=0.000318 *5*; α(N+..)=8.39×10^{-5} *12* α(N)=7.25×10^{-5} *11*; α(O)=1.081×10^{-5} *16*; α(P)=5.71×10^{-7} *8*
x569.04 *20*	0.0122 *16*									
x571.54 *10*	0.0248 *15*									
x575.40 *14*	0.0129 *13*									
577.57 *9*	0.0274 *14*	2011.67	1+,2+	1434.021	3+					
579.63 *9*	0.0470 *24*	1861.89	2+	1282.25	4+	[E2]		0.00955 *14*		α=0.00955 *14*; α(K)=0.00785 *11*; α(L)=0.001325 *19*; α(M)=0.000293 *4*; α(N+..)=7.72×10^{-5} *11* α(N)=6.67×10^{-5} *10*; α(O)=9.96×10^{-6} *14*; α(P)=5.33×10^{-7} *8*
583.00 *11*	0.045 *4*	3112.53	1+,2+	2529.43	2+,3,4+					
586.27 *7*	14.5 *3*	930.560	2+	344.2790	2+	E0+M1+E2		0.0236 *19*		α(K)=0.0202 *21*; α(L)=0.00300 *22*; α(M)=0.000297 *1*; α(N+..)=7.9×10^{-5} α(N)=6.8×10^{-5}; α(O)=1.0×10^{-5} *3*; α(P)=5.7×10^{-7} α: From α(K)exp, δ=−3.05 *14*, and Ice(E0)/Ice(M1+E2)=2.43 *16*. ρ^2=0.046 *4* (2004AdZZ, 2003Ad25). α(K)exp=0.0202 *21*. δ: δ(E2/M1)=−3.05 *14* (1972Kr16). Others: −5.4 *+15−26* (1990Ta19), −4.9 *12* (1981Fe01).
x595.83 *11*	0.024 *3*									
597.57 *11*	0.0168 *11*	1915.76	2+,3,4+	1318.355	2+					
603.18 *14*	0.0175 *12*	1533.92		930.560	2+					
615.6		615.38	0+	0	0+	E0			2.00 *8*	E_γ: From 1970Ad05. I_γ: <0.004. $I_{(\gamma+ce)}$: From Ice(K)=1.75 *7* and Ice(K)/Ice=0.877 (E0 theory). ρ^2=0.066 *14* (2004AdZZ, 2003Ad25). Mult.: α(K)exp>437 *25*.

From ENSDF

γ(^{152}Gd) (continued)

E_γ[†]	I_γ[t>]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[ν]	δ[ν]	α[α]	Comments
622.79 *7*	1.45 *3*	1941.17	2^+	1318.355	2^+	M1(+E2)	+0.018 *+42−18*	0.011 *4*	α(K)exp=0.0109 *17* α(K)=0.009 *3*; α(L)=0.0014 *3*; α(M)=0.00030 *7*; α(N+..)=8.1×10^{-5} *18* α(N)=7.0×10^{-5} *16*; α(O)=1.1×10^{-5} *3*; α(P)=6.8×10^{-7} *23* δ: δ=+0.018 *+42−18* or +2.1 *3* (1990Ta19), +1.0 *5* (1981Fe01), <1.1 from α(K)exp.
633.60 *9*	0.0293 *11*	1915.76	$2^+,3,4^+$	1282.25	4^+				
638.35 *10*	0.0171 *22*	2964.30	2^-	2325.68					
641.20 *7*	0.0932 *22*	2246.80	2^+	1605.60	2^+	[M1,E2]		0.010 *3*	α(K)=0.009 *3*; α(L)=0.0013 *3*; α(M)=0.00028 *6*; α(N+..)=7.5×10^{-5} *17* α(N)=6.5×10^{-5} *15*; α(O)=9.9×10^{-6} *24*; α(P)=6.3×10^{-7} *21*
^{x}645.83 *14*	1.0141 *14*								
648.31 *7*	0.166 *4*	1771.58	2^+	1123.186	3^-	[E1]		0.00268 *4*	α=0.00268 *4*; α(K)=0.00229 *4*; α(L)=0.000305 *5*; α(M)=6.57×10^{-5} *10*; α(N+..)=1.753×10^{-5} *25* α(N)=1.505×10^{-5} *21*; α(O)=2.32×10^{-6} *4*; α(P)=1.524×10^{-7} *22*
^{x}651.06 *19*	0.0127 *12*								
656.42 *9*	0.0537 *24*	2299.66	$2,3^-$	1643.428	2^-				
658.83 *11*	0.042 *3*	1274.26	$1,2^+$	615.38	0^+				
662.02 *10*	0.026 *3*	1785.21	2^+	1123.186	3^-	[E1]		0.00257 *4*	α=0.00257 *4*; α(K)=0.00219 *3*; α(L)=0.000292 *4*; α(M)=6.28×10^{-5} *9*; α(N+..)=1.676×10^{-5} *24* α(N)=1.440×10^{-5} *21*; α(O)=2.22×10^{-6} *4*; α(P)=1.460×10^{-7} *21*
^{x}667.46 *12*	0.0218 *13*								
675.01 *7*	0.835 *17*	1605.60	2^+	930.560	2^+	M1+E2	2.2 *4*		α(K)exp=0.0060 *15* δ: δ≤0.10 or 2.2 *4* (1990Ta19). Other 1.8 *7* (1981Fe01). α(K)exp gives δ>1.2 which rules out the small solution of 1990Ta19.
678.61 *7*	0.353 *8*	1434.021	3^+	755.3960	4^+	M1+E2	+1.4 *+17−11*	0.009 *3*	α(K)exp=0.0074 *29* α=0.009 *3*; α(K)=0.0077 *23*; α(L)=0.0011 *3*; α(M)=0.00024 *6*; α(N+..)=6.5×10^{-5} *15* α(N)=5.6×10^{-5} *13*; α(O)=8.6×10^{-6} *21*; α(P)=5.5×10^{-7} *18* δ: −19 *16* (1981Fe01).
^{x}681.3 *3*	0.017 *6*								
684.12 *9*	0.027 *3*	2523.81	2^+	1839.71	2^+				
687.62 *14*	0.015 *4*	1915.15	$(4)^+$	1227.36	6^+				
693.13 *16*	0.042 *3*	2011.67	$1^+,2^+$	1318.355	2^+				
697.20 *16*	0.024 *8*	2011.67	$1^+,2^+$	1314.638	1^-				
699.25 *10*	0.126 *9*	1314.638	1^-	615.38	0^+	[E1]		0.00229 *4*	α=0.00229 *4*; α(K)=0.00196 *3*; α(L)=0.000260 *4*;

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

E_γ †	I_γ t>	E_i(level)	J^π_i	E_f	J^π_f	Mult. ν	α α	Comments
								α(M)=5.59×10^{-5} *8*; α(N+..)=1.493×10^{-5} *21* α(N)=1.282×10^{-5} *18*; α(O)=1.98×10^{-6} *3*; α(P)=1.306×10^{-7} *19*
702.98‡	1.34‡ *5*	1318.355	2$^+$	615.38	0$^+$	E2‡	0.00599 *9*	α=0.00599 *9*; α(K)=0.00499 *7*; α(L)=0.000788 *11*; α(M)=0.0001727 *25*; α(N+..)=4.58×10^{-5} *7* α(N)=3.95×10^{-5} *6*; α(O)=5.96×10^{-6} *9*; α(P)=3.42×10^{-7} *5*
703.49‡ *7*	2.37‡ *7*	1047.78	0$^+$	344.2790	2$^+$	E2‡	0.00598 *9*	α=0.00598 *9*; α(K)=0.00498 *7*; α(L)=0.000786 *11*; α(M)=0.0001724 *25*; α(N+..)=4.57×10^{-5} *7* α(N)=3.94×10^{-5} *6*; α(O)=5.95×10^{-6} *9*; α(P)=3.41×10^{-7} *5*
708.98 *8*	0.0576 *21*	2401.55	1$^+$,2,3$^-$	1692.43	2$^+$,3$^+$			
712.82 *8*	0.177 *6*	1643.428	2$^-$	930.560	2$^+$	[E1]	0.00220 *3*	α=0.00220 *3*; α(K)=0.00188 *3*; α(L)=0.000250 *4*; α(M)=5.37×10^{-5} *8*; α(N+..)=1.434×10^{-5} *20* α(N)=1.232×10^{-5} *18*; α(O)=1.90×10^{-6} *3*; α(P)=1.257×10^{-7} *18*
715.19 *8*	0.0794 *20*	1470.63	2$^+$	755.3960	4$^+$	[E2]	0.00576 *8*	α=0.00576 *8*; α(K)=0.00479 *7*; α(L)=0.000753 *11*; α(M)=0.0001652 *24*; α(N+..)=4.38×10^{-5} *7* α(N)=3.78×10^{-5} *6*; α(O)=5.70×10^{-6} *8*; α(P)=3.29×10^{-7} *5*
722.00 *12*	0.0200 *14*	2529.43	2$^+$,3,4$^+$	1807.52				
723.67 *10*	0.0322 *13*	1771.58	2$^+$	1047.78	0$^+$	[E2]	0.00560 *8*	α=0.00560 *8*; α(K)=0.00467 *7*; α(L)=0.000731 *11*; α(M)=0.0001602 *23*; α(N+..)=4.25×10^{-5} *6* α(N)=3.66×10^{-5} *6*; α(O)=5.54×10^{-6} *8*; α(P)=3.21×10^{-7} *5*
^{x}730.95 *11*	0.047 *9*							
738.69 *9*	0.336 *9*	1861.89	2$^+$	1123.186	3$^-$	[E1]	0.00205 *3*	α=0.00205 *3*; α(K)=0.001753 *25*; α(L)=0.000232 *4*; α(M)=4.99×10^{-5} *7*; α(N+..)=1.332×10^{-5} *19* α(N)=1.144×10^{-5} *16*; α(O)=1.766×10^{-6} *25*; α(P)=1.170×10^{-7} *17*
747.29 *14*	0.0157 *11*	2880.67	2$^+$	2133.38	1$^+$,2$^+$			
750.06 *9*	0.0197 *20*	1680.75	0$^+$	930.560	2$^+$			
752.59 *9*	0.050 *4*	1861.89	2$^+$	1109.203	2$^+$	[M1,E2]	0.0071 *20*	α=0.0071 *20*; α(K)=0.0060 *18*; α(L)=0.00086 *20*; α(M)=0.00019 *5*; α(N+..)=5.0×10^{-5} *12* α(N)=4.3×10^{-5} *10*; α(O)=6.6×10^{-6} *16*; α(P)=4.3×10^{-7} *14*
^{x}758.01 *11*	0.0361 *24*							
^{x}758.8 *4*	0.028 *6*							
764.89 *7*	4.32 *10*	1109.203	2$^+$	344.2790	2$^+$	M1+E2(+E0)	0.0070 *6*	α(K)exp=0.0057 *13* α(K)=0.00429 *6*; α(L)=0.000655 *10*; α(M)=0.0001432 *20*; α(N+..)=3.81×10^{-5} *6* α(N)=3.28×10^{-5} *5*; α(O)=4.98×10^{-6} *7*; α(P)=2.97×10^{-7} *5* Mult.: 1970Ad05 report a doublet in their ce spectrum, with energies 764.3 and 766.3. Only a single line is seen in the photon spectrum. 2004AdZZ assume there is only a single transition, and deduce α(K)exp by combining the Ice(K) values for the two ce lines. This yields α(K)exp=0.0057 *13*. If one takes Ice(K) for just the 764.3 ce line, one gets α(K)exp=0.0039 *8*, with the 766.3 line presumably

γ(^{152}Gd) (continued)

E_γ [†]	I_γ [t>]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [ν]	δ [ν]	α [α]	Comments
									corresponding to an E0 transition. From 13-y Eu β^- decay, one has α(K)exp=0.0052 *8*, and from δ=+4.30 *+7−6* one expects α(K)=0.00435 *7*. δ: +4.30 *+7−6*. Others: +3.8 *6* (1990Ta19),+3.5 *+17−9* (1981Fe01), +4.3 *7* (1975Kr16).
778.9045[s] *24*	8.72 *18*	1123.186	3^-	344.2790	2^+	E1		0.00184	α(K)=0.001576 *22*; α(L)=0.000208 *3*; α(M)=4.47×10^{-5} *7*; α(N+..)=1.195×10^{-5} *17* α(N)=1.026×10^{-5} *15*; α(O)=1.585×10^{-6} *23*; α(P)=1.054×10^{-7} *15* α(K)exp=0.00148 *24* δ: 0.01 *1* (1970Ba32), +0.050 *+9−8* (1985KrZU), −0.02 *2* (1983Bl07).
[x]787.18 *12*	0.0333 *15*								
788.88 *10*	0.0453 *18*	3236.96	2^+,3,4^+	2448.01	+				
792.56 *11*	0.0315 *20*	1915.76	2^+,3,4^+	1123.186	3^-				
794.73 *7*	0.274 *7*	1550.15	4^+	755.3960	4^+	D(+Q)	−0.4 *+7−12*		δ: From 1981Fe01.
805.84 *9*	0.0324 *14*	3105.52	2^+	2299.66	2,3^-				
810.44 *23*	0.0155 *18*	3012.37	2^+,3^+,4^+	2201.71	2^+				
812.80 *8*	0.314 *8*	2246.80	2^+	1434.021	3^+	[M1,E2]		0.0059 *17*	α=0.0059 *17*; α(K)=0.0050 *15*; α(L)=0.00071 *17*; α(M)=0.00015 *4*; α(N+..)=4.1×10^{-5} *10* α(N)=3.5×10^{-5} *9*; α(O)=5.5×10^{-6} *14*; α(P)=3.6×10^{-7} *11*
813.48[b]	0.017[b] *8*	2729.17	2^+	1915.76	2^+,3,4^+				
814.12[b]	0.038[b] *7*	1861.89	2^+	1047.78	0^+	[E2]		0.00429 *6*	α=0.00429 *6*; α(K)=0.00359 *5*; α(L)=0.000545 *8*; α(M)=0.0001190 *17*; α(N+..)=3.16×10^{-5} *5* α(N)=2.72×10^{-5} *4*; α(O)=4.14×10^{-6} *6*; α(P)=2.48×10^{-7} *4*
817.97[d]	0.150[d] *25*	1941.17	2^+	1123.186	3^-	[E1]		0.001670 *24*	α=0.001670 *24*; α(K)=0.001431 *20*; α(L)=0.000188 *3*; α(M)=4.05×10^{-5} *6*; α(N+..)=1.082×10^{-5} *1* α(N)=9.29×10^{-6} *13*; α(O)=1.437×10^{-6} *21*; α(P)=9.58×10^{-8} *14*
818.76[d]	0.010[d] *4*	2133.38	1^+,2^+	1314.638	1^-				
[x]824.70 *13*	0.0169 *11*								
829.57 *26*	0.013 *4*	2999.55	1^+,2^+	2169.65	2^+				
831.94 *8*	0.179 *5*	1941.17	2^+	1109.203	2^+	[M1,E2]		0.0056 *16*	α=0.0056 *16*; α(K)=0.0048 *14*; α(L)=0.00067 *16*; α(M)=0.00015 *4*; α(N+..)=3.9×10^{-5} *9* α(N)=3.4×10^{-5} *8*; α(O)=5.2×10^{-6} *13*; α(P)=3.4×10^{-7} *11*

γ(^{152}Gd) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[ν]	α[α]	Comments
[x]834.73 *18*	0.0365 *17*							
837.08 *11*	0.0323 *17*	3006.78	2^+	2169.65	2^+			
839.6 *4*	0.021 *4*	2121.05	$2^+,3^-,4^+$	1282.25	4^+			
841.10 *9*	0.072 *4*	1771.58	2^+	930.560	2^+	[M1,E2]	0.0055 *15*	α=0.0055 *15*; α(K)=0.0046 *13*; α(L)=0.00065 *16*; α(M)=0.00014 *4*; α(N+..)=3.8×10^{-5} *9* α(N)=3.3×10^{-5} *8*; α(O)=5.0×10^{-6} *13*; α(P)=3.3×10^{-7} *10*
[x]847.62 *24*	0.0140 *20*							
850.5 *3*	0.047 *4*	1605.60	2^+	755.3960	4^+	[E2]	0.00389 *6*	α=0.00389 *6*; α(K)=0.00327 *5*; α(L)=0.000490 *7*; α(M)=0.0001069 *15*; α(N+..)=2.84×10^{-5} *4* α(N)=2.45×10^{-5} *4*; α(O)=3.73×10^{-6} *6*; α(P)=2.26×10^{-7} *4*
[x]852.1 *5*	0.038 *8*							
854.69[#]	0.041[#] *8*	1785.21	2^+	930.560	2^+	E0+M1+E2[#]	0.0053 *15*	α=0.0053 *15*; α(K)=0.0045 *13*; α(L)=0.00063 *15*; α(M)=0.00014 *3*; α(N+..)=3.7×10^{-5} *9* α(N)=3.1×10^{-5} *8*; α(O)=4.8×10^{-6} *12*; α(P)=3.2×10^{-7} *10*
854.95[#]	0.026[#] *7*	2169.65	2^+	1314.638	1^-	[#]		
855.24[#]	0.036[#] *7*	1470.63	2^+	615.38	0^+	[E2][#]	0.00385 *6*	α=0.00385 *6*; α(K)=0.00323 *5*; α(L)=0.000484 *7*; α(M)=0.0001055 *15*; α(N+..)=2.81×10^{-5} *4* α(N)=2.42×10^{-5} *4*; α(O)=3.68×10^{-6} *6*; α(P)=2.23×10^{-7} *4*
857.33 *11*	0.126 *9*	2772.40	2^+	1915.15	$(4)^+$			
860.84 *14*	0.0163 *16*	2981.45	$2^+,3,4^+$	2121.05	$2^+,3^-,4^+$			
865.62 *8*	0.0603 *24*	2299.66	$2,3^-$	1434.021	3^+			
868.94 *11*	0.0413 *15*	2880.67	2^+	2011.67	$1^+,2^+$			
874.8 *3*	0.0067 *20*	3140.21	$1,2^+$	2264.88	$1^-,2,3^-$			
[x]874.85 *26*	0.0067 *20*							
878.13 *19*	0.038 *3*	1808.92		930.560	2^+			
880.29 *10*	0.0649 *21*	2523.81	2^+	1643.428	2^-			
[x]883.30 *11*	0.0211 *20*							
887.32[β] *10*	0.0515 *19*	3214?		2325.68				E_γ: Poor fit. See comment on the 3214 level.
893.34 *7*	1.009 *21*	1941.17	2^+	1047.78	0^+	[E2]	0.00350 *5*	α(K)exp=0.0073 *11* α=0.00350 *5*; α(K)=0.00294 *5*; α(L)=0.000436 *7*; α(M)=9.50×10^{-5} *14*; α(N+..)=2.53×10^{-5} *4* α(N)=2.18×10^{-5} *3*; α(O)=3.32×10^{-6} *5*; α(P)=2.03×10^{-7} *3* 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=pure E2. $\gamma(\theta)$ is consistent with ΔJ=2.
902.46 *8*	0.225 *6*	2011.67	$1^+,2^+$	1109.203	2^+			
909.15 *7*	0.195 *6*	1839.71	2^+	930.560	2^+	[M1,E2]	0.0046 *12*	α=0.0046 *12*; α(K)=0.0039 *11*; α(L)=0.00054 *13*; α(M)=0.00012 *3*; α(N+..)=3.1×10^{-5} *8* α(N)=2.7×10^{-5} *7*; α(O)=4.2×10^{-6} *10*; α(P)=2.8×10^{-7} *8*
911.73 *13*	0.0195 *11*	3236.96	$2^+,3,4^+$	2325.68				E_γ: Poor fit. The level scheme gives 911.10 *13*.
914.35 *7*	0.0819 *24*	2557.87	2^+	1643.428	2^-			

$^{152}_{64}$Gd$_{88}$-16

γ(^{152}Gd) (continued)

E_γ †	I_γ t>	E_i(level)	J_i^π	E_f	J_f^π	Mult. ν	δ ν	α α	Comments
x919.20 *9*	0.0177 *12*								
x923.98 *15*	0.0172 *18*								
928.43 *7*	0.568 *12*	2246.80	2+	1318.355	2+	M1,E2		0.0043 *12*	α(K)exp=0.0037 *18* α=0.0043 *12*; α(K)=0.0037 *10*; α(L)=0.00052 *12*; α(M)=0.00011 *3*; α(N+..)=3.0×10^{-5} *7* α(N)=2.6×10^{-5} *6*; α(O)=4.0×10^{-6} *10*; α(P)=2.6×10^{-7} *8*
930.58 *7*	2.31 *8*	930.560	2+	0	0+	(E2)/		0.00320 *5*	α(K)exp=0.0040 *8* α=0.00320 *5*; α(K)=0.00270 *4*; α(L)=0.000396 *6*; α(M)=8.63×10^{-5} *12*; α(N+..)=2.30×10^{-5} *4* α(N)=1.98×10^{-5} *3*; α(O)=3.02×10^{-6} *5*; α(P)=1.87×10^{-7} *3*
932.09 *8*	0.305 *11*	2246.80	2+	1314.638	1−	[E1(+M2)]/		0.001297 *19*	α=0.001297 *19*; α(K)=0.001112 *16*; α(L)=0.0001456 *21*; α(M)=3.13×10^{-5} *5*; α(N+..)=8.36×10^{-6} α(N)=7.18×10^{-6} *10*; α(O)=1.111×10^{-6} *16*; α(P)=7.46×10^{-8} *11*
937.04 *9*	0.256 *10*	1692.43	2+,3+	755.3960	4+	[M1,E2]		0.0043 *11*	α=0.0043 *11*; α(K)=0.0036 *10*; α(L)=0.00050 *12*; α(M)=0.000109 *25*; α(N+..)=2.9×10^{-5} *7* α(N)=2.5×10^{-5} *6*; α(O)=3.9×10^{-6} *10*; α(P)=2.6×10^{-7} *8*
939.84 *9*	0.0530 *18*	2258.14	2+,3,4+	1318.355	2+				
x945.26 *13*	0.0225 *19*								
947.1 *3*	0.0099 *18*	2264.88	1−,2,3−	1318.355	2+				
950.34 *16*	0.0227 *10*	2264.88	1−,2,3−	1314.638	1−				
953.07 *9*	0.0957 *24*	2267.73		1314.638	1−	M1		0.00513 *8*	α(K)exp=0.0056 *8* α=0.00513 *8*; α(K)=0.00437 *7*; α(L)=0.000594 *9*; α(M)=0.0001283 *18*; α(N+..)=3.44×10^{-5} *5* α(N)=2.95×10^{-5} *5*; α(O)=4.60×10^{-6} *7*; α(P)=3.16×10^{-7} *5*
970.32 *7*	1.189 *25*	1314.638	1−	344.2790	2+	E1+M2	−0.021 *12*	0.001202 *17*	α(K)exp=0.0014 *5* α=0.001202 *17*; α(K)=0.001031 *15*; α(L)=0.0001347 *19*; α(M)=2.89×10^{-5} *4*; α(N+..)=7.74×10^{-6} α(N)=6.64×10^{-6} *10*; α(O)=1.029×10^{-6} *15*; α(P)=6.92×10^{-8} *10* δ: +0.18 +*17*−*21* (1981Fe01).
974.05 *9*	4.72 *10*	1318.355	2+	344.2790	2+	M1+E2	+0.58 *7*	0.0041 *7*	α(K)exp=0.0050 *6* α=0.0041 *7*; α(K)=0.0035 *6*; α(L)=0.00048 *8*; α(M)=0.000104 *16*; α(N+..)=2.8×10^{-5} *5* α(N)=2.4×10^{-5} *4*; α(O)=3.7×10^{-6} *6*; α(P)=2.5×10^{-7} *5* δ: From 1975Kr16. Others: 0.23≤δ≤1.41 (1990Ta19), +1.5 *6* (1981Fe01).

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

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

E_γ[†]	I_γ[t>]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[ν]	α[α]	$I_{(\gamma+ce)}$[>]	Comments
979.04 *12*	0.0416 *24*	1734.44		755.3960	4^+				
[x]981.18 *24*	0.011 *4*								
984.90 *8*	0.093 *5*	2299.66	$2,3^-$	1314.638	1^-				
990.19 *7*	1.124 *23*	1605.60	2^+	615.38	0^+	E2	0.00281 *4*		α(K)exp=0.0019 *5* α=0.00281 *4*; α(K)=0.00237 *4*; α(L)=0.000344 *5*; α(M)=7.48×10^{-5} *11*; α(N+..)=1.99×10^{-5} *3* α(N)=1.714×10^{-5} *24*; α(O)=2.62×10^{-6} *4*; α(P)=1.642×10^{-7} *23*
993.14 *11*	0.099 *4*	2598.80	$1^+,2^+$	1605.60	2^+				
998.37 *11*	0.0205 *11*	2914.19	2^+	1915.76	$2^+,3,4^+$				
1000.41 *20*	0.0122 *12*	3012.37	$2^+,3^+,4^+$	2011.67	$1^+,2^+$				
1004.2 *3*	0.0099 *15*	2920.10		1915.76	$2^+,3,4^+$				
1010.60 *7*	0.632 *13*	1941.17	2^+	930.560	2^+	M1(+E2+E0)	0.0066 *16*		α(K)exp=0.0057 *14* Mult.: α(K)exp=0.0057 *14* compared with α(K)(M1)=0.00380 suggests the possibility of an E0 admixture, especially if the large δ solution of 1990Ta19 is the correct alternative. δ: +0.03 *+3−10* or +2.1 *5* (1990Ta19),+1.9 *+19−11* (1981Fe01).
1016.60 *9*	0.112 *3*	2772.40	2^+	1755.77	1^-				
1022.73 *11*	0.0201 *13*	3143.97	3^-	2121.05	$2^+,3^-,4^+$				
1027.16 *21*	0.0167 *19*	2719.64	2^+	1692.43	$2^+,3^+$				
[x]1030.71 *11*	0.031 *4*								
1036.74 *7*	0.172 *4*	2729.17	2^+	1692.43	$2^+,3^+$				
1040.6 *3*	0.0100 *21*	2267.73		1227.36	6^+				
1045.31[β] *23*	0.0113 *15*	3214?		2169.65	2^+				E_γ: Poor fit. See comment on the 3214 level.
1047.9[u]		1047.78	0^+	0	0^+	E0		≤0.040	α(K)exp>2.06 *20* I_γ: <0.013. $I_{(\gamma+ce)}$: I(γ+ce)=0.036 *4* from Ice(K)=0.0314 *34* and Ice(K)/Ice=0.878. A limit is given since the authors show a second placement from the 2989 level, based just on an energy fit; however; from branching in 13-y Eu β^- decay, one deduces I(γ+ce)=0.040 *12*, suggesting that most, if not all of the intensity belongs with placement from the 1048 level. X(E0/E2)=6.9 *7*.
1047.9[β]	<0.013	2989.03		1941.17	2^+				E_γ: See comment on placement from the 1047 level.
1052.15 *7*	0.185 *4*	1807.52		755.3960	4^+				
1056.79 *9*	0.0356 *13*	2749.23	$2^+,3^+$	1692.43	$2^+,3^+$				
[x]1061.15 *9*	0.095 *3*								

γ(^{152}Gd) (continued)

E_γ [†]	I_γ [t>]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [v]	δ [v]	α [α]	Comments
[x]1061.6[u]	<0.016					E0(+M1,E2)			α(K)exp>0.084 *9*
1066.2 *3*	0.0171 *13*	2709.43	2^+	1643.428	2^-				
[x]1069.15 *9*	0.095 *3*								
1072.16 *15*	0.031 *4*	2386.95	$(2)^+$	1314.638	1^-				
1075.87 *9*	0.049 *6*	3340.65	$1^-,2,3,4^+$	2264.88	$1^-,2,3^-$				
1083.14[a]	0.052[a] *12*	2401.55	$1^+,2,3^-$	1318.355	2^+				
1084.31[a]	0.070[a] *16*	1839.71	2^+	755.3960	4^+	[E2]		0.00233 *4*	α=0.00233 *4*; α(K)=0.00197 *3*; α(L)=0.000281 *4*; α(M)=6.09×10^{-5} *9*; α(N+..)=1.626×10^{-5} *23* α(N)=1.398×10^{-5} *20*; α(O)=2.15×10^{-6} *3*; α(P)=1.365×10^{-7} *20*
1085.68 *11*	0.215 *7*	2729.17	2^+	1643.428	2^-	D+Q	−0.18 *14*		δ: From 1981Fe01.
1087.12 *10*	0.207 *8*	2401.55	$1^+,2,3^-$	1314.638	1^-				
1089.737[s] *5*	1.42 *3*	1434.021	3^+	344.2790	2^+	E2(+M1)	+22 *+13−6*		α(K)exp=0.0027 *5* δ: δ<−16, >47 (1990Ta19), >+44, <−7.1 (1981Fe01). The value from 1990Ta19 has been calculated by the evaluator from the data of the authors. They give only the small δ solution which is ruled out by α(K)exp. 1975Kr16 also give only the small solution.
1092.26 *14*	0.054 *3*	2201.71	2^+	1109.203	2^+				
1096.60 *19*	0.031 *3*	3012.37	$2^+,3^+,4^+$	1915.76	$2^+,3,4^+$				
[x]1098.3 *3*	0.018 *3*								
1106.59 *8*	0.606 *18*	1862.06	2^+	755.3960	4^+	[E2]		0.00223 *4*	α=0.00223 *4*; α(K)=0.00189 *3*; α(L)=0.000269 *4*; α(M)=5.83×10^{-5} *9*; α(N+..)=1.593×10^{-5} *23* α(N)=1.337×10^{-5} *19*; α(O)=2.05×10^{-6} *3*; α(P)=1.311×10^{-7} *19*; α(IPF)=3.81×10^{-7} *6*
1109.20 *7*	4.01 *9*	1109.203	2^+	0	0^+	(E2)		0.00222 *4*	α(K)exp=0.0023 *4* α=0.00222 *4*; α(K)=0.00188 *3*; α(L)=0.000267 *4*; α(M)=5.80×10^{-5} *9*; α(N+..)=1.589×10^{-5} *23* α(N)=1.330×10^{-5} *19*; α(O)=2.04×10^{-6} *3*; α(P)=1.304×10^{-7} *19*; α(IPF)=4.22×10^{-7} *6* Mult.: α(K)exp is consistent with mult=M1 or E2, but placement in the decay scheme requires ΔJ=2.
1117.15 *11*	0.0369 *14*	2551.14		1434.021	3^+				
[x]1119.42 *17*	0.0165 *15*								
1128.65 *10*	0.043 *5*	2772.40	2^+	1643.428	2^-				
[x]1130.98 *7*	0.223 *5*								

$^{152}_{64}Gd_{88}$-19

γ(^{152}Gd) (continued)

E_γ[†]	I_γ[t>]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[v]	δ[v]	α[α]	Comments
1137.56 *7*	1.35 *3*	2246.80	2^+	1109.203	2^+	M1+E2			α(K)=0.0023 *6*; α(L)=0.00032 *7*; α(M)=6.9×10^{-5} *15*; α(N+..)=2.0×10^{-5} *4* α(N)=1.6×10^{-5} *4*; α(O)=2.5×10^{-6} *6*; α(P)=1.7×10^{-7} *5*; α(IPF)=1.20×10^{-6} *7* α(K)exp=0.0030 *6* δ: δ=−0.40 *+4−2* or +23 *+72−10* (1990Ta19) as calculated from the authors′ data for J(2246)=2. The authors give a value for J=3.
1141.68 *10*	0.0523 *24*	2264.88	1^-,2,3^-	1123.186	3^-				
^{x}1144.94 *16*	0.0238 *20*								
1148.99 *10*	0.067 *3*	2258.14	2^+,3,4^+	1109.203	2^+				
1155.48 *13*	0.033 *4*	2964.30	2^-	1808.92					
^{x}1157.18 *16*	0.024 *4*								
1159.82 *7*	0.411 *10*	1915.15	$(4)^+$	755.3960	4^+				
^{x}1164.17 *19*	0.0373 *19*								
1167.0 *3*	0.019 *4*	3006.78	2^+	1839.71	2^+				
1171.2 *3*	0.059 *11*	3112.53	1^+,2^+	1941.17	2^+				
^{x}1173.4 *6*	0.014 *3*								
1176.53 *9*	0.0432 *17*	2299.66	2,3^-	1123.186	3^-				
1185.73 *7*	0.337 *8*	1941.17	2^+	755.3960	4^+	(E2)		0.00195 *3*	α(K)exp=0.0012 *4* α=0.00195 *3*; α(K)=0.001647 *23*; α(L)=0.000231 *4*; α(M)=5.01×10^{-5} *7*; α(N+..)=1.750×10^{-5} *25* α(N)=1.150×10^{-5} *17*; α(O)=1.771×10^{-6} *25*; α(P)=1.142×10^{-7} *16*; α(IPF)=4.11×10^{-6} *6* Mult.: α(K)exp is consistent with mult=E1 or E2; however, placement in the decay scheme requires Δπ=no. δ: δ(O/Q)=−0.3 *3* (1981Fe01).
1188.37 *11*	0.0562 *23*	2880.67	2^+	1692.43	2^+,3^+				
1190.44 *7*	0.604 *12*	2299.66	2,3^-	1109.203	2^+	[w]	[w]		
^{x}1193.20 *21*	0.023 *3*								
1198.97 *11*	0.036 *3*	3140.21	1,2^+	1941.17	2^+				
1202.64[g]	0.046[g] *10*	2325.68		1123.186	3^-				
1202.84[g]	0.043[g] *12*	2133.38	1^+,2^+	930.560	2^+				
1205.83 *11*	0.176 *7*	1550.15	4^+	344.2790	2^+	(E2)		0.00188	α(K)=0.001593 *23*; α(L)=0.000223 *4*; α(M)=4.84×10^{-5} *7*; α(N+..)=1.91×10^{-5} *3* α(N)=1.110×10^{-5} *16*; α(O)=1.709×10^{-6} *24*; α(P)=1.105×10^{-7} *16*; α(IPF)=6.15×10^{-6} *9* α(K)exp=0.0025 *11* Mult.: α(K)exp is consistent with M1 or E2. Placement in the decay scheme requires ΔJ=2.
1209.03 *9*	0.453 *10*	2523.81	2^+	1314.638	1^-	E1+M2	+0.06 *4*	0.00085	α(K)=0.00071 *4*; α(L)=9.2×10^{-5} *5*; α(M)=1.98×10^{-5} *11*; α(N+..)=3.38×10^{-5} *5*

γ(^{152}Gd) (continued)

E_γ[†]	I_γ[t>]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[v]	α[α]	Comments
								α(N)=4.54×10^{-6} *25*; α(O)=7.0×10^{-7} *4*; α(P)=4.8×10^{-8} *3*; α(IPF)=2.85×10^{-5} *5* α(K)exp=0.00049 *21* δ: From 1990Ta19. Other: −0.20 *14* (1981Fe01).
1215.20 *11*	0.0166 *18*	2749.23	2$^+$,3$^+$	1533.92				
^{x}1218.64 *11*	0.0347 *13*							
1221.95 *12*	0.0332 *22*	2540.45	2$^+$,3$^+$	1318.355	2$^+$			
^{x}1225.86 *10*	0.0220 *18*							
1235.57 *10*	0.0725 *25*	2927.86	2$^+$,3$^+$	1692.43	2$^+$,3$^+$			
^{x}1237.20 *11*	0.035 *3*							
^{x}1239.51 *11*	0.0337 *21*							
1247.07 *7*	0.209 *6*	2529.43	2$^+$,3,4$^+$	1282.25	4$^+$			
^{x}1250.7 *4*	0.011 *3*							
1253.48 *9*	0.0344 *18*	3009.23	3$^-$	1755.77	1$^-$			
1258.45 *10*	0.075 *3*	2729.17	2$^+$	1470.63	2$^+$			
1261.32 *8*	1.42 *3*	1605.60	2$^+$	344.2790	2$^+$	M1	0.00265 *4*	α(K)exp=0.0022 *4* α=0.00265 *4*; α(K)=0.00225 *4*; α(L)=0.000303 *5*; α(M)=6.54×10^{-5} *10*; α(N+..)=3.26×10^{-5} *5* α(N)=1.505×10^{-5} *21*; α(O)=2.35×10^{-6} *4*; α(P)=1.620×10^{-7} *23*; α(IPF)=1.508×10^{-5} *22* δ: δ≤0.10 or 2.2 *4* (1990Ta19). Other: +2.6 *+21−10* (1981Fe01). from α(K)exp, δ<0.9 which rules out the large solution of 1990Ta19. 1981Fe01 quote only the large solution.
1263.84 *11*	0.110 *4*	2386.95	(2)$^+$	1123.186	3$^-$			
1275.04 *7*	0.155 *4*	2880.67	2$^+$	1605.60	2$^+$			E_γ: Earlier work placed this transition from the 2709 level. placement from the 2880 level is established by 2004AdZZ on the basis of coincidence work.
^{x}1278.33 *9*	0.041 *6*							
1284.42 *9*	0.127 *3*	2927.86	2$^+$,3$^+$	1643.428	2$^-$			
1289.64 *9*	0.0474 *15*	2604.34	1$^-$,2,3$^-$	1314.638	1$^-$			
1299.140[s] *9*	3.25 *7*	1643.428	2$^-$	344.2790	2$^+$	E1	0.000779 *11*	α(K)exp=0.00059 *11*; δ=0.00 *3* α=0.000779 *11*; α(K)=0.000607 *9*; α(L)=7.85×10^{-5} *11*; α(M)=1.684×10^{-5} *24*; α(N+..)=7.62×10^{-5} *1* α(N)=3.87×10^{-6} *6*; α(O)=6.01×10^{-7} *9*; α(P)=4.10×10^{-8} *6*; α(IPF)=7.17×10^{-5} *10* δ: δ≤0.10 (1990Ta19), −0.10 *8* (1981Fe01).
^{x}1308.07 *16*	0.0150 *14*							
1314.26[j]	0.36[j] *5*	2437.43	2$^+$	1123.186	3$^-$	E1[j]	0.000773 *11*	α=0.000773 *11*; α(K)=0.000595 *9*; α(L)=7.69×10^{-5} *11*; α(M)=1.649×10^{-5} *23*; α(N+..)=8.43×10^{-5} *1* α(N)=3.79×10^{-6} *6*; α(O)=5.89×10^{-7} *9*; α(P)=4.01×10^{-8} *6*; α(IPF)=7.99×10^{-5} *12*
1314.64[j]	1.86[j] *7*	1314.638	1$^-$	0	0$^+$	E1[j]	0.000773 *11*	α=0.000773 *11*; α(K)=0.000595 *9*; α(L)=7.69×10^{-5} *11*;

γ(^{152}Gd) (continued)

E_γ [†]	I_γ [t>]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [v]	δ [v]	α [α]	Comments
									α(M)=1.649×10^{-5} 23; α(N+..)=8.45×10^{-5} 1 α(N)=3.79×10^{-6} 6; α(O)=5.88×10^{-7} 9; α(P)=4.01×10^{-8} 6; α(IPF)=8.01×10^{-5} 12
1316.32 12	0.310 24	2246.80	2$^+$	930.560	2$^+$	(M1,E2)[<]		0.0020 4	α(K)=0.0017 4; α(L)=0.00023 5; α(M)=5.0×10^{-5} 10; α(N+..)=3.8×10^{-5} 4 α(N)=1.14×10^{-5} 22; α(O)=1.8×10^{-6} 4; α(P)=1.2×10^{-7} 3; α(IPF)=2.44×10^{-5} 14
1318.24 13	0.420 17	1318.355	2$^+$	0	0$^+$	[E2][<]		0.001597 23	α=0.001597 23; α(K)=0.001338 19; α(L)=0.000185 3; α(M)=4.00×10^{-5} 6; α(N+..)=3.42×10^{-5} 5 α(N)=9.19×10^{-6} 13; α(O)=1.419×10^{-6} 20; α(P)=9.28×10^{-8} 13; α(IPF)=2.35×10^{-5} 4 Mult.: 2003Ad25 list M1; but 2$^+$ to 0$^+$ transition requires E2.
1325.86 7	1.24 3	1941.17	2$^+$	615.38	0$^+$	E2		0.001581 23	α(K)exp=0.0016 4 α=0.001581 23; α(K)=0.001323 19; α(L)=0.000183 3; α(M)=3.96×10^{-5} 6; α(N+..)=3.57×10^{-5} 5 α(N)=9.08×10^{-6} 13; α(O)=1.402×10^{-6} 20; α(P)=9.18×10^{-8} 13; α(IPF)=2.51×10^{-5} 4
1336.54 8	0.196 4	1680.75	0$^+$	344.2790	2$^+$				
1338.5 4	0.019 3	2772.40	2$^+$	1434.021	3$^+$				
1342.0[u]		3285.17	2$^+$	1941.17	2$^+$	E0		0.00231 4	α=0.00231 4; α(K)=0.00195 3; α(L)=0.000262 4; α(M)=5.64×10^{-5} 8; α(N+..)=4.71×10^{-5} 7 α(N)=1.299×10^{-5} 19; α(O)=2.03×10^{-6} 3; α(P)=1.400×10^{-7} 20; α(IPF)=3.19×10^{-5} 5 Mult.: α(K)exp>0.080 8. E_γ: Energy fit is poor. This transition is not included in the least-squares adjustment. From that adjustment one expects Eγ=1344.0. Mult.: The absence of a γ line and the large α(K)exp require an E0 component.
1348.15 9	1.34 3	1692.43	2$^+$,3$^+$	344.2790	2$^+$	M1+E2	>1.9	0.00162 9	α(K)=0.00135 8; α(L)=0.000186 10; α(M)=4.01×10^{-5} 20; α(N+..)=4.11×10^{-5} 11 α(N)=9.2×10^{-6} 5; α(O)=1.43×10^{-6} 8; α(P)=9.4×10^{-8} 6; α(IPF)=3.04×10^{-5} 6 α(K)exp=0.00120 22 Mult.,δ: α(K)exp gives E2(+M1) with δ>1.9. δ=−13 +4−7 for J=3 and +12 +9−4 for J=2.
1352.98 11	0.046 5	2667.56	1$^-$	1314.638	1$^-$	E0+M1+E2		0.022 5	α(K)exp=0.019 4 Mult.: α(K)=0.0019 for M1.
1360.43 11	0.0463 21	1975.72	1$^+$,2$^+$	615.38	0$^+$				
1363.39 14	0.0411 25	3006.78	2$^+$	1643.428	2$^-$				
1365.69 8	0.136 3	2121.05	2$^+$,3$^-$,4$^+$	755.3960	4$^+$				

From ENSDF

γ(^{152}Gd) (continued)

Eγ[†]	Iγ[t>]	Ei(level)	J^π_i	Ef	J^π_f	Mult.[v]	δ[v]	α[α]	Comments
1369.04 *9*	0.200 *5*	2299.66	2,3$^-$	930.560	2$^+$	[w]	[w]		α(K)exp=0.0026 *7*
1372.04 *9*	0.0773 *23*	2495.18		1123.186	3$^-$				α(K)exp=0.0019 *5* Mult.: See comment on J for the 2495 level.
^{x}1375.76 *21*	0.0092 *21*								
^{x}1383.5[u]						E0(+M1,E2)			α(K)exp>0.07 *1*
1393.86 *9*	0.0726 *19*	2999.55	1$^+$,2$^+$	1605.60	2$^+$				
1400.62[l]	0.154[l] *13*	2523.81	2$^+$	1123.186	3$^-$				
1401.32[l]	0.090[l] *8*	2719.64	2$^+$	1318.355	2$^+$				
1406.16 *8*	0.160 *4*	2529.43	2$^+$,3,4$^+$	1123.186	3$^-$				α(K)exp=0.0012 *5* Mult.: α(K)exp=0.0012 *5* compared with 0.000530 (E1) and 0.00118 (E2) suggests mult=E2; however, placement in the decay scheme requires Δπ=yes.
^{x}1410.29 *13*	0.116 *16*								
1410.82[k]	0.33[k] *2*	2729.17	2$^+$	1318.355	2$^+$	M1+E2[k]	+4.3 *+9−13*	0.00146 *4*	α(K)=0.00120 *4*; α(L)=0.000165 *5*; α(M)=3.56×10^{-5} *9*; α(N+..)=5.62×10^{-5} *10* α(N)=8.17×10^{-6} *21*; α(O)=1.26×10^{-6} *4*; α(P)=8.37×10^{-8} *24*; α(IPF)=4.67×10^{-5} *7*
1411.48[k]	0.68[k] *4*	1755.77	1$^-$	344.2790	2$^+$	E1[k]		0.000754 *11*	α=0.000754 *11*; α(K)=0.000526 *8*; α(L)=6.78×10^{-5} *10*; α(M)=1.454×10^{-5} *21*; α(N+..)=0.0001458 α(N)=3.34×10^{-6} *5*; α(O)=5.19×10^{-7} *8*; α(P)=3.55×10^{-8} *5*; α(IPF)=0.0001419 *20*
1414.40 *14*	0.0591 *21*	2964.30	2$^-$	1550.15	4$^+$				
1417.18 *15*	0.0313 *16*	2540.45	2$^+$,3$^+$	1123.186	3$^-$				
1420.76 *8*	0.0863 *24*	2544.02		1123.186	3$^-$				
1424.76 *19*	0.0192 *18*	3340.65	1$^-$,2,3,4$^+$	1915.76	2$^+$,3,4$^+$				
1427.32 *7*	0.165 *4*	1771.58	2$^+$	344.2790	2$^+$	[M1,E2]		0.0017 *4*	α=0.0017 *4*; α(K)=0.0014 *3*; α(L)=0.00019 *4*; α(M)=4.1×10^{-5} *8*; α(N+..)=6.5×10^{-5} *6* α(N)=9.5×10^{-6} *18*; α(O)=1.5×10^{-6} *3*; α(P)=1.00×10^{-7} *21*; α(IPF)=5.4×10^{-5} *4*
1430.76 *7*	0.148 *6*	2749.23	2$^+$,3$^+$	1318.355	2$^+$				
1434.54 *11*	0.0451 *22*	2557.87	2$^+$	1123.186	3$^-$				
1436.67 *9*	0.0665 *19*	3042.29	2$^+$	1605.60	2$^+$				
1441.91 *8*	0.182 *5*	2551.14		1109.203	2$^+$				
1446.34[i]	0.131[i] *13*	2201.71	2$^+$	755.3960	4$^+$	[E2][i]		0.001372 *20*	α=0.001372 *20*; α(K)=0.001120 *16*; α(L)=0.0001531 *22*; α(M)=3.31×10^{-5} *5*; α(N+..)=6.58×10^{-5} α(N)=7.60×10^{-6} *11*; α(O)=1.175×10^{-6} *17*; α(P)=7.77×10^{-8} *11*; α(IPF)=5.70×10^{-5} *8*

$^{152}_{64}$Gd$_{88}$-23

γ(^{152}Gd) (continued)

E_γ[†]	I_γ[t>]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[ν]	α[α]	Comments
1446.64[i]	0.256[i] *26*	2880.67	2+	1434.021	3+	M1,E2[i]	0.0017 *3*	α=0.0017 *3*; α(K)=0.0014 *3*; α(L)=0.00019 *4*; α(M)=4.0×10−5 *8*; α(N+..)=7.1×10−5 *6* α(N)=9.2×10−6 *17*; α(O)=1.4×10−6 *3*; α(P)=9.8×10−8 *20*; α(IPF)=6.1×10−5 *4*
[x]1449.4 *3*	0.0184 *21*							
1454.08 *12*	0.0354 *20*	2772.40	2+	1318.355	2+			
1457.25 *11*	0.0290 *22*	2927.86	2+,3+	1470.63	2+			
[x]1465.85 *18*	0.0068 *22*							
[x]1471.45 *15*	0.024 *4*							
1475.04 *14*	0.015 *5*	2749.23	2+,3+	1274.26	1,2+			
1481.18 *8*	0.098 *5*	2604.34	1−,2,3−	1123.186	3−			
[x]1485.7 *3*	0.0279 *25*							
1489.60 *10*	0.103 *3*	2598.80	1+,2+	1109.203	2+	M1(+E2)	0.0016 *3*	α(K)exp=0.0022 *8* α=0.0016 *3*; α(K)=0.00129 *24*; α(L)=0.00017 *3*; α(M)=3.8×10−5 *7*; α(N+..)=8.5×10−5 *7* α(N)=8.7×10−6 *15*; α(O)=1.35×10−6 *24*; α(P)=9.2×10−8 *19*; α(IPF)=7.5×10−5 *5*
1491.62 *22*	0.0266 *19*	2246.80	2+	755.3960	4+			
1495.44 *8*	0.163 *6*	1839.71	2+	344.2790	2+	E0+M1+E2	0.0054 *11*	α(K)exp=0.0047 *9*
1502.62 *10*	0.0240 *8*	2258.14	2+,3,4+	755.3960	4+			
1506.90 *8*	0.078 *3*	2437.43	2+	930.560	2+	M1(+E0)	0.0031 *6*	α(K)exp=0.0027 *5*
[x]1514.61 *14*	0.016 *3*							
1517.78[c]	0.80[c] *6*	1862.06	2+	344.2790	2+	M1+E2[c]	0.0015 *3*	α(K)=0.00124 *23*; α(L)=0.00017 *3*; α(M)=3.6×10−5 *7*; α(N+..)=9.5×10−5 *7* α(N)=8.3×10−6 *15*; α(O)=1.29×10−6 *23*; α(P)=8.8×10−8 *18*; α(IPF)=8.5×10−5 *6* δ: −0.28 *5* (1990Ta19), −0.21 *8* or +4.7 *+27−13* (1981Fe01).
1518.02[c]	0.050[c] *10*	2133.38	1+,2+	615.38	0+	[c]		
1518.38[c]	0.175[c] *13*	2641.59	1−,2−,3−	1123.186	3−	M1,E2[c]	0.0015 *3*	α=0.0015 *3*; α(K)=0.00124 *23*; α(L)=0.00017 *3*; α(M)=3.6×10−5 *7*; α(N+..)=9.5×10−5 *7* α(N)=8.3×10−6 *15*; α(O)=1.29×10−6 *23*; α(P)=8.8×10−8 *18*; α(IPF)=8.6×10−5 *6*
1521.57[β] *16*	0.029 *3*	3214?		1692.43	2+,3+			E_γ: Poor fit. See comment on the 3214 level.
1530.07 *15*	0.0155 *13*	2964.30	2−	1434.021	3+			
[x]1532.75 *10*	0.0567 *18*					M1	0.001773 *25*	α(K)exp=0.0018 *5* α=0.001773 *25*; α(K)=0.001433 *20*; α(L)=0.000192 *3*; α(M)=4.13×10−5 *6*; α(N+..)=0.0001076 α(N)=9.51×10−6 *14*; α(O)=1.484×10−6 *21*; α(P)=1.028×10−7 *15*; α(IPF)=9.65×10−5 *14*
[x]1535.84 *16*	0.0206 *17*							
1544.29 *8*	0.0946 *23*	2667.56	1−	1123.186	3−			E_γ: Earlier work placed this transition from the 2299 level.

$^{152}_{64}$Gd$_{88}$-24

γ(^{152}Gd) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[ν]	δ[ν]	α[α]	Comments
									placement from the 2667 level is established by 2004AdZZ on the basis of coincidence work.
1547.95 *9*	0.0646 *18*	2862.66	1^-,2,3^-	1314.638	1^-				
1554.04 *16*	0.0213 *19*	2169.65	2^+	615.38	0^+				
[x]1558.07 *12*	0.0215 *17*								
1562.45 *8*	0.129 *3*	2880.67	2^+	1318.355	2^+	M1		0.001713 *24*	α(K)exp=0.0023 *10* α=0.001713 *24*; α(K)=0.001371 *20*; α(L)=0.000183 *3*; α(M)=3.95×10^{-5} *6*; α(N+..)=0.0001194 α(N)=9.10×10^{-6} *13*; α(O)=1.420×10^{-6} *20*; α(P)=9.83×10^{-8} *14*; α(IPF)=0.0001088 *16*
1565.97 *8*	0.159 *4*	2880.67	2^+	1314.638	1^-				I_γ: 2004AdZZ give Iγ=0.1594 *4*. The uncertainty quoted here is much too small. The minimum uncertainty quoted on the strong well-resolved peaks is 2%. The evaluator assumes that the correct value should be 0.159 *4*. The uncertainty in the branching for this transition given in 2003Ad25 is also too small.
1571.25 *8*	0.249 *5*	1915.76	2^+,3,4^+	344.2790	2^+				
1575.30 *9*	0.0940 *25*	2330.72	2^+,3,4^+	755.3960	4^+				
1586.22 *7*	1.45 *3*	2709.43	2^+	1123.186	3^-	E1+M2	+0.19 *+3−14*		α(K)=0.00052 *9*; α(L)=6.8×10^{-5} *12*; α(M)=1.5×10^{-5} *3*; α(N+..)=0.000265 *8* α(N)=3.4×10^{-6} *6*; α(O)=5.2×10^{-7} *10*; α(P)=3.6×10^{-8} *7*; α(IPF)=0.000261 *8* α(K)exp=0.00045 *9* δ: Other: −0.34 *21* (1981Fe01).
1593.37 *9*	0.145 *4*	2523.81	2^+	930.560	2^+				
1596.49[e]	0.243[e] *18*	2719.64	2^+	1123.186	3^-	[E1][e]		0.000773 *11*	α=0.000773 *11*; α(K)=0.000427 *6*; α(L)=5.49×10^{-5} *8*; α(M)=1.176×10^{-5} *17*; α(N+..)=0.000279 *4* α(N)=2.70×10^{-6} *4*; α(O)=4.20×10^{-7} *6*; α(P)=2.89×10^{-8} *4*; α(IPF)=0.000276 *4* δ: δ(Q/D)=0.25 *9*.
1596.88[e]	0.478[e] *25*	1941.17	2^+	344.2790	2^+	M1+E2[e]	−0.28 *12*	0.00162 *4*	α=0.00162 *4*; α(K)=0.00128 *3*; α(L)=0.000171 *4*; α(M)=3.68×10^{-5} *9*; α(N+..)=0.0001325 *22* α(N)=8.47×10^{-6} *20*; α(O)=1.32×10^{-6} *4*; α(P)=9.14×10^{-8} *23*; α(IPF)=0.0001227 *20* δ: From 1990Ta19.
1598.90[e] *8*	0.346[e] *8*	2529.43	2^+,3,4^+	930.560	2^+	[e]			
1605.58[&]	0.35[&] *5*	1605.60	2^+	0	0^+	E2[&]		0.001190 *17*	α=0.001190 *17*; α(K)=0.000919 *13*; α(L)=0.0001243 *18*; α(M)=2.68×10^{-5} *4*; α(N+..)=0.000119 α(N)=6.16×10^{-6} *9*; α(O)=9.55×10^{-7} *14*; α(P)=6.38×10^{-8} *9*; α(IPF)=0.0001125 *16*
1605.98[&]	0.24[&] *3*	2729.17	2^+	1123.186	3^-	(E1)[&]		0.000776 *11*	α=0.000776 *11*; α(K)=0.000423 *6*; α(L)=5.43×10^{-5}

γ(^{152}Gd) (continued)

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult. ν	α α	Comments
								8; α(M)=1.165×10^{-5} *17*; α(N+..)=0.000286 *4* α(N)=2.68×10^{-6} *4*; α(O)=4.16×10^{-7} *6*; α(P)=2.86×10^{-8} *4*; α(IPF)=0.000283 *4*
1610.11 *19*	0.0248 *21*	2928.68		1318.355	2$^+$			
1613.53 *9*	0.082 *3*	2544.02		930.560	2$^+$			
^{x}1620.35 *20*	0.041 *3*							
^{x}1622.4 *4*	0.015 *3*							
1626.39 *19*	0.0214 *18*	3232.06		1605.60	2$^+$			
1631.39^f	0.109^f *8*	1975.72	1$^+$,2$^+$	344.2790	2$^+$	M1(+E2)^f	0.00138 *22*	α=0.00138 *22*; α(K)=0.00107 *18*; α(L)=0.000143 *23*; α(M)=3.1×10^{-5} *5*; α(N+..)=0.000139 *10* α(N)=7.1×10^{-6} *12*; α(O)=1.10×10^{-6} *18*; α(P)=7.5×10^{-8} *14*; α(IPF)=0.000131 *9*
1631.40^f	0.252^f *15*	2246.80	2$^+$	615.38	0$^+$	[E2]^f	0.001168 *17*	α=0.001168 *17*; α(K)=0.000892 *13*; α(L)=0.0001205 *17*; α(M)=2.60×10^{-5} *4*; α(N+..)=0.000129 α(N)=5.97×10^{-6} *9*; α(O)=9.25×10^{-7} *13*; α(P)=6.19×10^{-8} *9*; α(IPF)=0.0001226 *18*
1634.0 *3*	0.0108 *25*	2744.04	1$^-$	1109.203	2$^+$			
1640.08 *9*	0.0684 *22*	2749.23	2$^+$,3$^+$	1109.203	2$^+$	M1	0.001579 *23*	α(K)exp=0.0021 *9* α=0.001579 *23*; α(K)=0.001227 *18*; α(L)=0.0001638 *23*; α(M)=3.53×10^{-5} *5*; α(N+..)=0.000152 α(N)=8.13×10^{-6} *12*; α(O)=1.269×10^{-6} *18*; α(P)=8.79×10^{-8} *13*; α(IPF)=0.0001433 *20*
1645.92 *8*	0.105 *3*	2964.30	2$^-$	1318.355	2$^+$			
1663.67 *14*	0.067 *4*	2772.40	2$^+$	1109.203	2$^+$	E0+M1+E2	0.0084 *28*	α(K)exp=0.0073 *24*
1667.38 *8*	1.034 *24*	2011.67	1$^+$,2$^+$	344.2790	2$^+$	M1+E2	0.00134 *20*	α(K)=0.00102 *17*; α(L)=0.000137 *22*; α(M)=2.9×10^{-5} *5*; α(N+..)=0.000155 *11* α(N)=6.8×10^{-6} *11*; α(O)=1.05×10^{-6} *17*; α(P)=7.2×10^{-8} *13*; α(IPF)=0.000147 *10* α(K)=0.001165 *17*; α(L)=0.0001556 *23*; α(M)=3.35×10^{-5} *5*; α(N+..)=0.0001643 *24* α(N)=7.72×10^{-6} *12*; α(O)=1.204×10^{-6} *18*; α(P)=8.34×10^{-8} *13*; α(IPF)=0.0001552 *22* α(K)exp=0.00130 *24* Mult.,δ: α(K)exp is consistent with M1 or E2. δ=+0.29 *+9−8* for J(2011 level)=2 (1981Fe01). 1990Ta19 report δ=+0.26 *3* for J=3. Both works require a mixed M1+E2 mult for J=1 also.
1681.53 *8*	0.0657 *17*	2729.17	2$^+$	1047.78	0$^+$			
^{x}1685.28 *16*	0.0163 *12*							
^{x}1687.69 *11*	0.0211 *13*							
1690.68 *9*	0.0306 *13*	3009.23	3$^-$	1318.355	2$^+$			
1694.60 *13*	0.0264 *12*	3009.23	3$^-$	1314.638	1$^-$			
1711.02 *9*	0.0336 *11*	2641.59	1$^-$,2$^-$,3$^-$	930.560	2$^+$			

From ENSDF

γ(^{152}Gd) (continued)

E_γ[†]	I_γ[t>]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[v]	δ[v]	α[α]	Comments
1714.65 *25*	0.0066 *9*	2989.03		1274.26	1,2$^+$				
1727.72 *8*	0.116 *3*	3042.29	2$^+$	1314.638	1$^-$				
1732.42 *11*	0.0182 *16*	3006.78	2$^+$	1274.26	1,2$^+$				
^{x}1735.8[u]						E0(+M1,E2)			α(K)exp>0.042 *7*
1737.03 *9*	0.0655 *17*	2667.56	1$^-$	930.560	2$^+$				
1739.46 *8*	0.121 *3*	2862.66	1$^-$,2,3$^-$	1123.186	3$^-$	2			α(K)exp=0.00135 *30*
^{x}1748.34 *14*	0.0068 *7*								
1757.42 *7*	1.016 *23*	2880.67	2$^+$	1123.186	3$^-$	(E1)		0.000820 *12*	α(K)exp=0.00063 *13* α=0.000820 *12*; α(K)=0.000365 *6*; α(L)=4.67×10^{-5} *7*; α(M)=1.000×10^{-5} *14*; α(N+..)=0.000399 *6* α(N)=2.30×10^{-6} *4*; α(O)=3.58×10^{-7} *5*; α(P)=2.46×10^{-8} *4*; α(IPF)=0.000396 *6* Mult.: α(K)exp lies between the theoretical values for E1 and E2. The placement in the decay scheme requires $\Delta\pi$=yes, for which α(K)=0.000365.
1761.22 *16*	0.089 *5*	3079.66	2$^+$,3,4$^+$	1318.355	2$^+$	E2			α(K)exp=0.00062 *19* Mult.: α(K)exp=0.0062 *19* given in 2004AdZZ is a misprint. The correct value is 0.00062 *19*.
1771.43 *8*	0.518 *11*	2880.67	2$^+$	1109.203	2$^+$	M1		0.001412 *20*	α(K)exp=0.00141 *27* α=0.001412 *20*; α(K)=0.001030 *15*; α(L)=0.0001371 *20*; α(M)=2.95×10^{-5} *5*; α(N+..)=0.000216 α(N)=6.80×10^{-6} *10*; α(O)=1.062×10^{-6} *15*; α(P)=7.37×10^{-8} *11*; α(IPF)=0.000208 *3*
1776.3 *3*	0.023 *3*	2121.05	2$^+$,3$^-$,4$^+$	344.2790	2$^+$				
1778.78 *9*	0.165 *5*	2709.43	2$^+$	930.560	2$^+$	M1+E2		0.00124 *17*	α(K)exp=0.0016 *4* α=0.00124 *17*; α(K)=0.00089 *13*; α(L)=0.000119 *18*; α(M)=2.6×10^{-5} *4*; α(N+..)=0.000205 *15* α(N)=5.9×10^{-6} *9*; α(O)=9.2×10^{-7} *14*; α(P)=6.3×10^{-8} *11*; α(IPF)=0.000198 *14* δ: δ=−0.26 *10* or +5.9 *+70−22*.
1785.15 *11*	0.077 *4*	2540.45	2$^+$,3$^+$	755.3960	4$^+$				
1789.11[h]	0.755[h] *20*	2133.38	1$^+$,2$^+$	344.2790	2$^+$	M1[h]		0.001394 *20*	α=0.001394 *20*; α(K)=0.001007 *14*; α(L)=0.0001340 *19*; α(M)=2.89×10^{-5} *4*; α(N+..)=0.000225 α(N)=6.65×10^{-6} *10*; α(O)=1.038×10^{-6} *15*; α(P)=7.20×10^{-8} *10*; α(IPF)=0.000217 *3*
1789.12[h]	0.144[h] *11*	2719.64	2$^+$	930.560	2$^+$	M1+E2[h]	+0.26 *+9−6*	0.00137 *3*	α(K)=0.000990 *19*; α(L)=0.0001319 *24*; α(M)=2.84×10^{-5} *6*; α(N+..)=0.000223 *4*

From ENSDF

γ(^{152}Gd) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[ν]	δ[ν]	α[α]	Comments
									α(N)=6.54×10^{-6} *12*; α(O)=1.021×10^{-6} *19*; α(P)=7.07×10^{-8} *14*; α(IPF)=0.000215 *4* δ: Other: −0.13 *10* (1981Fe01).
1792.71 *14*	0.080 *6*	3074.85	2$^+$,3,4$^+$	1282.25	4$^+$				
1796.83 *14*	0.083 *5*	2920.10		1123.186	3$^-$				
1798.45 *9*	0.158 *6*	2729.17	2$^+$	930.560	2$^+$	E2(+M1)	≥14.3	0.001066 *15*	α(K)exp=0.00092 *4*; δ≥14.3 α=0.001066 *15*; α(K)=0.000745 *11*; α(L)=9.97×10^{-5} *14*; α(M)=2.15×10^{-5} *3*; α(N+..)=0.000200 *3* α(N)=4.94×10^{-6} *7*; α(O)=7.66×10^{-7} *11*; α(P)=5.17×10^{-8} *8*; α(IPF)=0.000194 *3*
1802.67 *9*	0.102 *3*	2557.87	2$^+$	755.3960	4$^+$				
1809.53 *10*	0.127 *4*	2932.71	2$^+$	1123.186	3$^-$				
1811.3 *3*	0.025 *3*	2920.10		1109.203	2$^+$				
1818.56 *9*	0.093 *3*	2927.86	2$^+$,3$^+$	1109.203	2$^+$	M1,E2		0.00121 *16*	α(K)exp=0.0016 *6* α=0.00121 *16*; α(K)=0.00085 *12*; α(L)=0.000113 *16*; α(M)=2.4×10^{-5} *4*; α(N+..)=0.000224 *16* α(N)=5.6×10^{-6} *8*; α(O)=8.7×10^{-7} *13*; α(P)=6.0×10^{-8} *10*; α(IPF)=0.000217 *15*
1825.37 *9*	0.238 *5*	2169.65	2$^+$	344.2790	2$^+$				δ: δ analyzed by 1990Ta19 as a 1$^-$ to 1$^-$ transition from the 3140 level. Reanalysis by the evaluator shows that γ(θ,H,t) rules out J(2169)=1.
1841.15[n]	0.082[n] *10*	2964.30	2$^-$	1123.186	3$^-$	M1,E2[n]		0.00120 *15*	α=0.00120 *15*; α(K)=0.00083 *12*; α(L)=0.000110 *16*; α(M)=2.4×10^{-5} *4*; α(N+..)=0.000235 *17* α(N)=5.5×10^{-6} *8*; α(O)=8.5×10^{-7} *12*; α(P)=5.8×10^{-8} *9*; α(IPF)=0.000228 *16*
1841.81[n]	0.041[n] *5*	2772.40	2$^+$	930.560	2$^+$	M1,E2[n]		0.00120 *15*	α=0.00120 *15*; α(K)=0.00083 *12*; α(L)=0.000110 *16*; α(M)=2.4×10^{-5} *4*; α(N+..)=0.000235 *17* α(N)=5.5×10^{-6} *8*; α(O)=8.5×10^{-7} *12*; α(P)=5.8×10^{-8} *9*; α(IPF)=0.000229 *16*
[x]1844.83 *12*	0.0227 *11*								
1857.48 *8*	0.272 *6*	2201.71	2$^+$	344.2790	2$^+$	M1+E2		0.00119 *15*	α(K)exp=0.00076 *28* α=0.00119 *15*; α(K)=0.00081 *12*; α(L)=0.000108 *15*; α(M)=2.3×10^{-5} *4*; α(N+..)=0.000243 *17* α(N)=5.4×10^{-6} *8*; α(O)=8.4×10^{-7} *12*; α(P)=5.7×10^{-8} *9*; α(IPF)=0.000236 *16* δ: δ=−0.8 *+2−5* or −4 *+2−4* (1990Ta19) as reanalyzed by the evaluator for J=2. The authors assumed J=3. Other: 1981Fe01, also analyzed for J=3.
1861.94 *8*	0.720 *15*	1861.89	2$^+$	0	0$^+$	(E2)		0.001040 *15*	α(K)exp=0.00085 *24* α=0.001040 *15*; α(K)=0.000698 *10*; α(L)=9.32×10^{-5} *13*; α(M)=2.01×10^{-5} *3*; α(N+..)=0.000228 *4*

γ(^{152}Gd) (continued)

E_γ [†]	I_γ [t>]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [ν]	δ [ν]	α [α]	Comments
									α(N)=4.61×10^{-6} *7*; α(O)=7.16×10^{-7} *10*; α(P)=4.84×10^{-8} *7*; α(IPF)=0.000223 *4* Mult.: α(K)exp is consistent with mult=M1 or E2; however, placement in the decay scheme requires ΔJ=2.
1870.55 *18*	0.0119 *16*	3152.89	3⁻	1282.25	4⁺				
[x]1875.35 *12*	0.0238 *18*								
1886.08 *13*	0.046 *3*	3009.23	3⁻	1123.186	3⁻	E0+M1+E2			α(K)exp=0.0036 *11*
[x]1891.45 *17*	0.062 *3*					(M1,E2)		0.00117 *14*	α(K)exp=0.0024 *10* α=0.00117 *14*; α(K)=0.00078 *11*; α(L)=0.000104 *14*; α(M)=2.2×10^{-5} *3*; α(N+..)=0.000259 *18* α(N)=5.2×10^{-6} *7*; α(O)=8.0×10^{-7} *11*; α(P)=5.5×10^{-8} *9*; α(IPF)=0.000253 *18*
[x]1896.52 *21*	0.053 *4*								
1902.49[m]	2.66[m] *6*	2246.80	2⁺	344.2790	2⁺	M1+E2[m]	−0.11 *4*	0.001297 *19*	α(K)exp=0.00092 *17* α=0.001297 *19*; α(K)=0.000874 *13*; α(L)=0.0001161 *17*; α(M)=2.50×10^{-5} *4*; α(N+..)=0.000282 α(N)=5.76×10^{-6} *9*; α(O)=8.99×10^{-7} *13*; α(P)=6.24×10^{-8} *9*; α(IPF)=0.000275 *4* Mult.: The value of α(K)exp=0.092 *17* given in 2003Ad25 is a misprint. The correct value is given in 2004AdZZ.
1902.87[m]	0.021[m] *4*	3012.37	2⁺,3⁺,4⁺	1109.203	2⁺	[m]			
[x]1907.51 *18*	0.041 *3*					(M1)		0.001297 *19*	α(K)exp=0.0036 *16* α=0.001297 *19*; α(K)=0.000871 *13*; α(L)=0.0001157 *17*; α(M)=2.49×10^{-5} *4*; α(N+..)=0.000285 α(N)=5.74×10^{-6} *8*; α(O)=8.96×10^{-7} *13*; α(P)=6.22×10^{-8} *9*; α(IPF)=0.000278 *4*
[x]1914.71 *13*	0.080 *3*								
1917.55 *15*	0.0514 *13*	3232.06		1314.638	1⁻				
1921.00 *8*	0.661 *14*	2265.29	1⁺,2⁺,3⁺	344.2790	2⁺	M1+E2		0.00115 *14*	α(K)exp=0.00092 *21* α=0.00115 *14*; α(K)=0.00076 *10*; α(L)=0.000101 *14*; α(M)=2.2×10^{-5} *3*; α(N+..)=0.000274 *19* α(N)=5.0×10^{-6} *7*; α(O)=7.8×10^{-7} *11*; α(P)=5.3×10^{-8} *8*; α(IPF)=0.000268 *19* δ: δ=−0.23 +*9*−*13*, −0.27 *3*, +0.22 *3* for J$^\pi$=1⁺, 2⁺, and 3⁺, respectively.
1932.94 *12*	0.057 *3*	3042.29	2⁺	1109.203	2⁺	M1,E2		0.00115 *14*	α(K)exp=0.00083 *22* α=0.00115 *14*; α(K)=0.00075 *10*; α(L)=0.000100 *13*; α(M)=2.1×10^{-5} *3*; α(N+..)=0.000280 *20* α(N)=4.9×10^{-6} *7*; α(O)=7.7×10^{-7} *11*; α(P)=5.3×10^{-8} *8*; α(IPF)=0.000274 *19*
1941.23 *8*	1.108 *23*	1941.17	2⁺	0	0⁺	(E2)		0.001016 *15*	α(K)exp=0.00047 *11*

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γ(^{152}Gd) (continued)

E_γ[†]	I_γ[t>]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[v]	α[α]	Comments
								α=0.001016 *15*; α(K)=0.000647 *9*; α(L)=8.60×10^{-5} *12*; α(M)=1.85×10^{-5} *3*; α(N+..)=0.000264 *4* α(N)=4.26×10^{-6} *6*; α(O)=6.61×10^{-7} *10*; α(P)=4.49×10^{-8} *7*; α(IPF)=0.000259 *4* 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.
1944.8	<0.003	3067.42	3$^-$	1123.186	3$^-$	E0(+M1,E2)		E_γ,Mult.: Not seen in the photon spectrum by 2004AdZZ. E is from the ce data of 1970Ad05. Iγ<0.003 and α(K)exp>0.049 *17* suggest an E0 component. If mult=E0, then Ice≈0.0002.
[x]1951.17 *19*	0.039 *3*							
1955.36 *8*	0.548 *12*	2299.66	2,3$^-$	344.2790	2$^+$	[w]		α(K)exp=0.00031 *9*
[x]1962.9[u]						E0		α(K)exp>0.030 *12*
1965.42 *19*	0.0241 *14*	3074.85	2$^+$,3,4$^+$	1109.203	2$^+$			
[x]1967.9 *5*	0.0089 *13*							
1970.49 *9*	0.0781 *21*	3285.17	2$^+$	1314.638	1$^-$			
1975.65 *8*	0.118 *3*	1975.72	1$^+$,2$^+$	0	0$^+$			
[x]1979.93 *19*	0.0072 *12*							
1983.41 *8*	0.114 *3*	2598.80	1$^+$,2$^+$	615.38	0$^+$			
1986.8 *4*	0.0075 *15*	2330.72	2$^+$,3,4$^+$	344.2790	2$^+$			
1993.87 *8*	0.144 *3*	2749.23	2$^+$,3$^+$	755.3960	4$^+$			
2004.93 *17*	0.0109 *9*	3232.06		1227.36	6$^+$			
[x]2014.48 *20*	0.0118 *23*					M1(+E0)	0.0074 *30*	α(K)exp=0.0064 *26*
[x]2018.09 *14*	0.0300 *12*					M1,E2[6]	0.00112 *12*	α=0.00112 *12*; α(K)=0.00069 *9*; α(L)=9.1×10^{-5} *11*; α(M)=1.96×10^{-5} *24*; α(N+..)=0.000323 *23* α(N)=4.5×10^{-6} *6*; α(O)=7.0×10^{-7} *9*; α(P)=4.8×10^{-8} *7*; α(IPF)=0.000317 *23*
2020.67 *14*	0.0190 *11*	3143.97	3$^-$	1123.186	3$^-$	M1,E2[6]	0.00112 *12*	α=0.00112 *12*; α(K)=0.00068 *9*; α(L)=9.1×10^{-5} *11*; α(M)=1.95×10^{-5} *24*; α(N+..)=0.000324 *23* α(N)=4.5×10^{-6} *6*; α(O)=7.0×10^{-7} *9*; α(P)=4.8×10^{-8} *7*; α(IPF)=0.000319 *23*
[x]2029.5[u]						E0		α(K)exp>0.012 *5*
2033.89 *9*	0.216 *5*	2964.30	2$^-$	930.560	2$^+$	E1	0.000934 *13*	α(K)exp=0.00036 *9* α=0.000934 *13*; α(K)=0.000288 *4*; α(L)=3.68×10^{-5} *6*; α(M)=7.87×10^{-6} *11*; α(N+..)=0.000601 *9* α(N)=1.81×10^{-6} *3*; α(O)=2.82×10^{-7} *4*; α(P)=1.95×10^{-8} *3*; α(IPF)=0.000599 *9* δ: δ≤0.37 from α(K)exp. Other: <5.9 (1990Ta19).
2042.67[o]	0.110[o] *8*	2386.95	(2)$^+$	344.2790	2$^+$	M1+E2(+E0)[o]		
2043.63[o]	0.016[o] *4*	3358.27	2$^+$	1314.638	1$^-$	[E1][o7]	0.000938 *14*	α=0.000938 *14*; α(K)=0.000286 *4*; α(L)=3.65×10^{-5} *6*;

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

E_γ[†]	I_γ[t>]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[v]	α[α]	Comments
								α(M)=7.81×10^{-6} *11*; α(N+..)=0.000608 *9* α(N)=1.79×10^{-6} *3*; α(O)=2.80×10^{-7} *4*; α(P)=1.93×10^{-8} *3*; α(IPF)=0.000606 *9*
2043.79[o]	0.030[o] *4*	3152.89	3$^-$	1109.203	2$^+$	[E1][o]	0.000938 *14*	α=0.000938 *14*; α(K)=0.000286 *4*; α(L)=3.65×10^{-5} *6*; α(M)=7.81×10^{-6} *11*; α(N+..)=0.000608 *9* α(N)=1.79×10^{-6} *3*; α(O)=2.80×10^{-7} *4*; α(P)=1.93×10^{-8} *3*; α(IPF)=0.000606 *9*
[x]2051.26 *11*	0.0406 *14*							
2058.47 *9*	0.0148 *13*	2989.03		930.560	2$^+$			
[x]2064.90 *16*	0.0124 *16*					(M1+E2+E0)	0.00111 *12*	α(K)exp=0.011 *4* α=0.00111 *12*; α(K)=0.00065 *8*; α(L)=8.7×10^{-5} *11*; α(M)=1.86×10^{-5} *22*; α(N+..)=0.000346 *25* α(N)=4.3×10^{-6} *5*; α(O)=6.7×10^{-7} *8*; α(P)=4.6×10^{-8} *6*; α(IPF)=0.000341 *25*
2069.00 *8*	0.145 *3*	2999.55	1$^+$,2$^+$	930.560	2$^+$	M1,E2	0.00110 *12*	α(K)exp=0.00075 *17* α=0.00110 *12*; α(K)=0.00065 *8*; α(L)=8.6×10^{-5} *10*; α(M)=1.86×10^{-5} *22*; α(N+..)=0.000348 *25* α(N)=4.3×10^{-6} *5*; α(O)=6.7×10^{-7} *8*; α(P)=4.6×10^{-8} *6*; α(IPF)=0.000343 *25*
[x]2073.51 *17*	0.0179 *21*							
2076.21 *10*	0.0593 *23*	3006.78	2$^+$	930.560	2$^+$	M1[3]	0.00110 *12*	α=0.00110 *12*; α(K)=0.00065 *8*; α(L)=8.6×10^{-5} *10*; α(M)=1.84×10^{-5} *22*; α(N+..)=0.00035 *3* α(N)=4.2×10^{-6} *5*; α(O)=6.6×10^{-7} *8*; α(P)=4.6×10^{-8} *6*; α(IPF)=0.000347 *25* Mult.: α(K)exp is somewhat larger than α(K) for M1, suggesting a possible E0 component.
2078.63 *9*	0.0521 *24*	3009.23	3$^-$	930.560	2$^+$	[E1][3]	0.000953 *14*	α=0.000953 *14*; α(K)=0.000278 *4*; α(L)=3.55×10^{-5} *5*; α(M)=7.60×10^{-6} *11*; α(N+..)=0.000632 *9* α(N)=1.746×10^{-6} *25*; α(O)=2.72×10^{-7} *4*; α(P)=1.88×10^{-8} *3*; α(IPF)=0.000630 *9*
[x]2082.22 *18*	0.0199 *12*							
[x]2086.20 *10*	0.0447 *15*							
2093.16[p]	0.211[p] *18*	2437.43	2$^+$	344.2790	2$^+$	M1+E2(+E0)[p]	0.0018 *4*	
2094.05[p]	0.122[p] *11*	2709.43	2$^+$	615.38	0$^+$	[E2][p]	0.000990 *14*	α=0.000990 *14*; α(K)=0.000564 *8*; α(L)=7.46×10^{-5} *11*; α(M)=1.604×10^{-5} *23*; α(N+..)=0.000336 α(N)=3.69×10^{-6} *6*; α(O)=5.73×10^{-7} *8*; α(P)=3.91×10^{-8} *6*; α(IPF)=0.000331 *5*
2103.54[q]	0.047[q] *10*	2448.01	$^+$	344.2790	2$^+$	M1,E2[q]	0.00110 *11*	α=0.00110 *11*; α(K)=0.00063 *7*; α(L)=8.3×10^{-5} *10*; α(M)=1.79×10^{-5} *21*; α(N+..)=0.00037 *3* α(N)=4.1×10^{-6} *5*; α(O)=6.4×10^{-7} *8*; α(P)=4.4×10^{-8} *6*; α(IPF)=0.00036 *3*
2104.30[q]	0.054[q] *12*	2719.64	2$^+$	615.38	0$^+$	[E2][q]	0.000989 *14*	α=0.000989 *14*; α(K)=0.000559 *8*; α(L)=7.39×10^{-5} *11*;

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

E_γ[†]	I_γ[t>]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[v]	α[α]	Comments
								α(M)=1.589×10^{-5} *23*; α(N+..)=0.000341 α(N)=3.65×10^{-6} *6*; α(O)=5.68×10^{-7} *8*; α(P)=3.87×10^{-8} *6*; α(IPF)=0.000336 *5*
2113.70 *9*	0.136 *3*	2729.17	2$^+$	615.38	0$^+$	(E2)	0.000988 *14*	α(K)exp=0.00070 *17* α=0.000988 *14*; α(K)=0.000554 *8*; α(L)=7.33×10^{-5} *11*; α(M)=1.576×10^{-5} *22*; α(N+..)=0.000345 α(N)=3.62×10^{-6} *5*; α(O)=5.63×10^{-7} *8*; α(P)=3.84×10^{-8} *6*; α(IPF)=0.000341 *5* Mult.: α(K)exp allows mult=M1 or E2; however, placement in the decay scheme requires ΔJ=2.
2118.66 *9*	0.0874 *23*	2734.07		615.38	0$^+$	M1	0.00120	α(K)=0.000688 *10*; α(L)=9.12×10^{-5} *13*; α(M)=1.96×10^{-5} *3*; α(N+..)=0.000400 *6* α(N)=4.52×10^{-6} *7*; α(O)=7.06×10^{-7} *10*; α(P)=4.91×10^{-8} *7*; α(IPF)=0.000394 *6* α(K)exp=0.0010 *4*
^{x}2127.99 *11*	0.0530 *21*							
^{x}2140.35 *16*	0.0260 *14*							
2150.85 *8*	0.352 *7*	2495.18		344.2790	2$^+$			α(K)exp=0.00066 *12* Mult.: See comment on J for the 2495 level.
2158.72 *10*	0.110 *3*	2914.19	2$^+$	755.3960	4$^+$	(E2)	0.000986 *14*	α(K)exp=0.00054 *18* α=0.000986 *14*; α(K)=0.000534 *8*; α(L)=7.04×10^{-5} *10*; α(M)=1.515×10^{-5} *22*; α(N+..)=0.000366 α(N)=3.48×10^{-6} *5*; α(O)=5.42×10^{-7} *8*; α(P)=3.70×10^{-8} *6*; α(IPF)=0.000362 *5* Mult.: α(K)exp gives mult=M1 or E2. Placement in the decay scheme requires ΔJ=2.
2162.05 *15*	0.0511 *24*	3285.17	2$^+$	1123.186	3$^-$			
2168.44[r]	0.082[r] *20*	3099.02	1$^+$,2$^+$,3$^+$	930.560	2$^+$	[r]		
2169.16[r]	0.064[r] *18*	2513.9	1,2$^+$	344.2790	2$^+$	[r]		
2172.45[r] *11*	0.0494[r] *17*	2927.86	2$^+$,3$^+$	755.3960	4$^+$	[r]		
^{x}2176.44 *11*	0.0575 *18*							
2179.42 *11*	0.0930 *25*	2523.81	2$^+$	344.2790	2$^+$	M1[x]	0.001183 *17*	α=0.001183 *17*; α(K)=0.000646 *9*; α(L)=8.56×10^{-5} *12*; α(M)=1.84×10^{-5} *3*; α(N+..)=0.000433 *6* α(N)=4.24×10^{-6} *6*; α(O)=6.62×10^{-7} *10*; α(P)=4.61×10^{-8} *7*; α(IPF)=0.000428 *6*
2182.10 *15*	0.0394 *19*	3112.53	1$^+$,2$^+$	930.560	2$^+$	M1[x]	0.001183 *17*	α=0.001183 *17*; α(K)=0.000645 *9*; α(L)=8.53×10^{-5} *12*; α(M)=1.84×10^{-5} *3*; α(N+..)=0.000434 *6* α(N)=4.23×10^{-6} *6*; α(O)=6.61×10^{-7} *10*; α(P)=4.59×10^{-8} *7*; α(IPF)=0.000429 *6*
2185.24 *9*	0.358 *7*	2529.43	2$^+$,3,4$^+$	344.2790	2$^+$	M1	0.00118	α(K)exp=0.00058 *17* α(K)=0.000642 *9*; α(L)=8.51×10^{-5} *12*; α(M)=1.83×10^{-5} *3*; α(N+..)=0.000436 *7*

γ(^{152}Gd) (continued)

E_γ [†]	I_γ [t>]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [v]	α [α]	Comments
								α(N)=4.22×10^{-6} *6*; α(O)=6.58×10^{-7} *10*; α(P)=4.58×10^{-8} *7*; α(IPF)=0.000431 *6* Mult.,δ: α(K)exp gives mult=M1,E2. γ(θ,H,t) gives δ=−0.06 *9* (1990Ta19).
[x]2192.22 *10*	0.0157 *11*							
2196.20 *10*	0.147 *3*	2540.45	2+,3+	344.2790	2+	M1	0.001180 *17*	α(K)exp=0.00101 *29* α=0.001180 *17*; α(K)=0.000635 *9*; α(L)=8.41×10^{-5} *12*; α(M)=1.81×10^{-5} *3*; α(N+..)=0.000442 *7* α(N)=4.17×10^{-6} *6*; α(O)=6.51×10^{-7} *10*; α(P)=4.53×10^{-8} *7*; α(IPF)=0.000437 *7*
2201.65 *26*	0.0199 *20*	2201.71	2+	0	0+			
2209.71 *13*	0.050 *3*	3140.21	1,2+	930.560	2+			
2211.7 [β]		2557.87	2+	344.2790	2+	(E0)		E_γ: From ce spectrum (1970Ad05). The energy fit is poor. The level energy difference gives 2213.56. The evaluator notes further that a comparison of the Eγ values of 2004AdZZ with the E(ce) of 1970Ad05 for 16 transitions around E=2212 shows deviations of +0.1 to +2.0 keV with an average of +1.0 keV for the ce energies. the deviation of −1.9 for the 2211.7 line thus seems unlikely, suggesting that the placement from the 2557 level May not be correct. The evaluator thus shows this transition as tentative. Mult.: Absence of photon line and α(K)exp>0.03 *1* suggests mult=E0.
2217.40 *9*	0.0749 *19*	3340.65	1−,2,3,4+	1123.186	3−	[y]		
[x]2220.81 *21*	0.0237 *14*					[y]		
[x]2223.71 *19*	0.0141 *19*							
2226.01 *23*	0.0271 *18*	2981.45	2+,3,4+	755.3960	4+			
[x]2232.76 *14*	0.0337 *12*							
[x]2239.13 *24*	0.0118 *13*							
2251.41 *9*	0.126 *3*	3006.78	2+	755.3960	4+			
2254.44 [β]		2869.84?		615.38	0+			E_γ: See comment on the 2869 level.
2254.54 *9*	0.150 *3*	2598.80	1+,2+	344.2790	2+	M1,E2 [z]	0.00108 *10*	α=0.00108 *10*; α(K)=0.00055 *6*; α(L)=7.2×10^{-5} *8*; α(M)=1.55×10^{-5} *16*; α(N+..)=0.00044 *4* α(N)=3.6×10^{-6} *4*; α(O)=5.6×10^{-7} *6*; α(P)=3.8×10^{-8} *5*; α(IPF)=0.00044 *4*
2257.22 *22*	0.0236 *15*	3012.37	2+,3+,4+	755.3960	4+			
2260.05 *11*	0.1043 *25*	2604.34	1−,2,3−	344.2790	2+			
[x]2262.9 *4*	0.0158 *18*							
2265.33 *9*	0.132 *3*	2880.67	2+	615.38	0+			
[x]2269.68 *25*	0.0099 *17*							
[x]2275.07 *19*	0.0268 *22*							
[x]2276.87 *17*	0.0257 *25*							
[x]2281.44 *11*	0.0252 *10*							
[x]2287.66 *27*	0.0049 *10*							

$^{152}_{64}Gd_{88}$-33

γ(^{152}Gd) (continued)

E_γ [†]	I_γ [t>]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [ν]	δ [ν]	α [α]	Comments
[x]2291.46 *19*	0.0124 *12*								
2306.15 *10*	0.0422 *13*	3236.96	2^+,3,4^+	930.560	2^+				
2312.00 *10*	0.0487 *14*	3067.42	3^-	755.3960	4^+				
2317.61 *24*	0.0103 *10*	2932.71	2^+	615.38	0^+				
[x]2322.3 *4*	0.014 *3*					[4]			
2324.32 *17*	0.055 *3*	3079.66	2^+,3,4^+	755.3960	4^+	[4]			
2335.00 *16*	0.0142 *8*	3090.42		755.3960	4^+				
2342.57 *9*	0.203 *4*	2686.87	2^+	344.2790	2^+	M1+E2+(E0)		0.00107 *9*	α(K)exp=0.00132 *26* α=0.00107 *9*; α(K)=0.00051 *5*; α(L)=6.7×10^{-5} *7*; α(M)=1.43×10^{-5} *14*; α(N+..)=0.00049 *4* α(N)=3.3×10^{-6} *4*; α(O)=5.1×10^{-7} *5*; α(P)=3.6×10^{-8} *4*; α(IPF)=0.00048 *4* Mult.,δ: δ≤0.20 or +2.1 *9*. α(K)=0.00055 for M1 suggests the presence of an E0 component.
[x]2347.53 *11*	0.0438 *16*								
2350.30 *15*	0.0230 *14*	3105.52	2^+	755.3960	4^+				
[x]2354.19 *14*	0.0261 *16*								
[x]2357.0	<0.003					E0(+M1,E2)			α(K)exp>0.040 *10*
2365.13 *9*	0.570 *14*	2709.43	2^+	344.2790	2^+	E0+M1+E2		0.00107 *9*	α(K)exp=0.0012 *3* α=0.00107 *9*; α(K)=0.00050 *5*; α(L)=6.5×10^{-5} *6*; α(M)=1.41×10^{-5} *13*; α(N+..)=0.00050 *4* α(N)=3.2×10^{-6} *3*; α(O)=5.0×10^{-7} *5*; α(P)=3.5×10^{-8} *4*; α(IPF)=0.00050 *4* δ: δ(E2/M1)≤0.25 or +1.8 *+6−5*.
2375.34 *9*	1.225 *26*	2719.64	2^+	344.2790	2^+	M1+E2	+0.15 *8*	0.00116 *2*	α(K)=0.000532 *8*; α(L)=7.03×10^{-5} *11*; α(M)=1.513×10^{-5} *23*; α(N+..)=0.000539 *8* α(N)=3.48×10^{-6} *6*; α(O)=5.44×10^{-7} *8*; α(P)=3.79×10^{-8} *6*; α(IPF)=0.000535 *8* α(K)exp=0.00079 *18* δ: Other: +0.10 *+27−18* (1981Fe01).
[x]2382.27 *16*	0.0215 *14*								
2384.94 *9*	0.145 *3*	2729.17	2^+	344.2790	2^+	M1+E2(+E0)[1]		0.00108 *9*	α=0.00108 *9*; α(K)=0.00049 *5*; α(L)=6.4×10^{-5} *6*; α(M)=1.38×10^{-5} *13*; α(N+..)=0.00051 *4* α(N)=3.2×10^{-6} *3*; α(O)=5.0×10^{-7} *5*; α(P)=3.4×10^{-8} *4*; α(IPF)=0.00051 *4* δ: δ=−0.22 *8* or 4.8 *+28−13*. δ: Other: −0.52≤δ≤∞ (1981Fe01).
2388.72 *11*	0.0380 *12*	3143.97	3^-	755.3960	4^+	[1]			
[x]2398.53 *26*	0.086 *10*					M1(+E0)		0.0022 *8*	α(K)exp=0.0019 *7*
2405.00 *9*	2.07 *4*	2749.23	2^+,3^+	344.2790	2^+	(E2)		0.000992 *14*	α(K)exp=0.00032 *9* α=0.000992 *14*; α(K)=0.000440 *7*; α(L)=5.76×10^{-5}

$^{152}_{64}$Gd$_{88}$-34

γ(^{152}Gd) (continued)

E_γ [†]	I_γ [t>]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [v]	α [α]	Comments
								8; α(M)=1.239×10^{-5} *18*; α(N+..)=0.000483 *7* α(N)=2.85×10^{-6} *4*; α(O)=4.44×10^{-7} *7*; α(P)=3.04×10^{-8} *5*; α(IPF)=0.000479 *7* Mult.: α(K)exp is consistent with mult=E1 or E2; however, the decay scheme requires Δπ=no.
[x]2411.45 *18*	0.0081 *9*							
[x]2420.43 *20*	0.0087 *9*							
[x]2428.36 *11*	0.0927 *25*					M1(+E0)	0.001160 *17*	α(K)exp=0.0027 *9* α=0.001160 *17*; α(K)=0.000509 *8*; α(L)=6.72×10^{-5} *10*; α(M)=1.446×10^{-5} *21*; α(N+..)=0.000569 α(N)=3.33×10^{-6} *5*; α(O)=5.20×10^{-7} *8*; α(P)=3.62×10^{-8} *5*; α(IPF)=0.000565 *8*
2437.11 *21*	0.0132 *10*	2437.43	2$^+$	0	0$^+$			
[x]2440.3 *4*	0.0050 *9*							
[x]2444.39 *22*	0.0095 *11*							
[x]2450.24 *15*	0.0080 *7*							
[x]2462.73 *21*	0.0077 *8*							
[x]2465.5[u]						E0(+M1,E2)		α(K)exp>0.010 *3*
[x]2469.72 *14*	0.0145 *9*							
[x]2472.44 *15*	0.0178 *9*							
[x]2479.26 *22*	0.0162 *11*							
2481.8 *3*	0.0076 *11*	3236.96	2$^+$,3,4$^+$	755.3960	4$^+$			
[x]2488.97 *12*	0.0389 *16*							
[x]2491.4	<0.003							α(K)exp>0.050 *10*
2495.53 *9*	0.138 *3*	3110.93	1$^+$,2$^+$	615.38	0$^+$	M1,E2	0.00108 *9*	α(K)exp=0.00065 *27* α=0.00108 *9*; α(K)=0.00045 *4*; α(L)=5.9×10^{-5} *5*; α(M)=1.26×10^{-5} *11*; α(N+..)=0.00057 *5* α(N)=2.90×10^{-6} *24*; α(O)=4.5×10^{-7} *4*; α(P)=3.1×10^{-8} *3*; α(IPF)=0.00056 *4* E_γ,δ: Earlier work placed this transition from the 2495 level. placement from the 3110 level is established by 2004AdZZ on the basis of coincidence work. 1990Ta19 report −2.7≤δ≤−0.06, analyzed as a 1$^+$ to 0$^+$ transition from the 2495 level.
[x]2503.96 *22*	0.0083 *10*							
[x]2506.3[u]						(E0+M1+E2)	0.00108 *9*	α(K)exp>0.010 *4* α=0.00108 *9*; α(K)=0.00044 *4*; α(L)=5.8×10^{-5} *5*; α(M)=1.25×10^{-5} *11*; α(N+..)=0.00057 *5* α(N)=2.87×10^{-6} *24*; α(O)=4.5×10^{-7} *4*; α(P)=3.1×10^{-8} *3*; α(IPF)=0.00057 *5*
[x]2507.8 *4*	0.0045 *10*							
2513.9 *4*	0.0071 *18*	2513.9	1,2$^+$	0	0$^+$			

γ(^{152}Gd) (continued)

E_γ [†]	I_γ [t>]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [ν]	α [α]	Comments
2518.42 *9*	0.179 *4*	2862.66	$1^-,2,3^-$	344.2790	2^+	2		α(K)exp=0.00050 *9*
2523.92 *9*	0.131 *3*	2523.81	2^+	0	0^+	(E2)	0.001006 *14*	α(K)exp=0.00051 *10* α=0.001006 *14*; α(K)=0.000403 *6*; α(L)=5.28×10^{-5} *8*; α(M)=1.134×10^{-5} *16*; α(N+..)=0.000538 *8* α(N)=2.61×10^{-6} *4*; α(O)=4.06×10^{-7} *6*; α(P)=2.79×10^{-8} *4*; α(IPF)=0.000535 *8* Mult.: α(K)exp is consistent with mult=M1 or E2. Placement in the decay scheme requires ΔJ=2.
2525.43 [β]		2869.84?		344.2790	2^+			E_γ: See comment on the 2869 level.
2536.30 *7*	0.395 *11*	2880.67	2^+	344.2790	2^+	M1	0.001165 *17*	α(K)exp=0.00064 *12* α=0.001165 *17*; α(K)=0.000463 *7*; α(L)=6.10×10^{-5} *9*; α(M)=1.313×10^{-5} *19*; α(N+..)=0.000628 *9* α(N)=3.02×10^{-6} *5*; α(O)=4.72×10^{-7} *7*; α(P)=3.29×10^{-8} *5*; α(IPF)=0.000624 *9*
^{x}2544.58 *18*	0.0074 *9*							
^{x}2548.10 *25*	0.0088 *8*							
^{x}2551.48 *11*	0.0482 *12*					M1,E2	0.00109 *8*	α(K)exp=0.00050 *13* α=0.00109 *8*; α(K)=0.00043 *4*; α(L)=5.6×10^{-5} *5*; α(M)=1.20×10^{-5} *10*; α(N+..)=0.00059 *5* α(N)=2.77×10^{-6} *22*; α(O)=4.3×10^{-7} *4*; α(P)=3.0×10^{-8} *3*; α(IPF)=0.00059 *5*
^{x}2555.34 *18*	0.0192 *10*							
2557.91 *12*	0.0389 *12*	2557.87	2^+	0	0^+			
2569.85 *10*	0.253 *6*	2914.19	2^+	344.2790	2^+	(M1,E2)	0.00109 *8*	α(K)exp=0.00030 *6* α=0.00109 *8*; α(K)=0.00042 *3*; α(L)=5.5×10^{-5} *5*; α(M)=1.19×10^{-5} *9*; α(N+..)=0.00060 *5* α(N)=2.73×10^{-6} *21*; α(O)=4.3×10^{-7} *4*; α(P)=2.95×10^{-8} *25*; α(IPF)=0.00060 *5* Mult.: α(K)exp lies between the theoretical values for E1 and M1 or E2. placement in the decay scheme requires Δπ=no.
^{x}2572.6 *4*	0.0231 *22*							
2575.82 *17*	0.0446 *19*	2920.10		344.2790	2^+			
^{x}2579.82 *17*	0.0527 *22*							
2583.0 *4*	0.047 *8*	2927.86	$2^+,3^+$	344.2790	2^+			
2584.89 *27*	0.087 *8*	2928.68		344.2790	2^+			
2588.36 *8*	0.571 *12*	2932.71	2^+	344.2790	2^+	M1,E2(+E0)	0.00109 *8*	α(K)exp=0.00062 *11* α=0.00109 *8*; α(K)=0.00041 *3*; α(L)=5.4×10^{-5} *4*; α(M)=1.17×10^{-5} *9*; α(N+..)=0.00061 *5* α(N)=2.69×10^{-6} *21*; α(O)=4.2×10^{-7} *4*; α(P)=2.91×10^{-8} *24*; α(IPF)=0.00061 *5*
^{x}2597.04 *16*	0.0192 *10*					7		
^{x}2600.69 *18*	0.0446 *23*					7		

$^{152}_{64}Gd_{88}$-36

γ(^{152}Gd) (continued)

E_γ [†]	I_γ [t>]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [ν]	δ [ν]	α [α]	Comments
2602.85 *11*	0.100 *3*	3358.27	2^+	755.3960	4^+	(E2) [7]			
^{x}2619.61 *9*	0.412 *9*					M1,E2		0.00110 *8*	α(K)exp=0.00047 *9* α=0.00110 *8*; α(K)=0.00040 *3*; α(L)=5.3×10^{-5} *4*; α(M)=1.14×10^{-5} *9*; α(N+..)=0.00063 *5* α(N)=2.62×10^{-6} *20*; α(O)=4.1×10^{-7} *3*; α(P)=2.84×10^{-8} *23*; α(IPF)=0.00062 *5* E_γ: Placed in earlier work from the 2964 level. Not placed by 2004AdZZ.
^{x}2629.74 *13*	0.0079 *6*								
2636.93 *10*	0.0425 *10*	2981.45	2^+,3,4^+	344.2790	2^+				
2644.74 *16*	0.0271 *17*	2989.03		344.2790	2^+				
2655.29 *10*	0.0872 *25*	2999.55	1^+,2^+	344.2790	2^+	M1,E2		0.00110 *8*	α(K)exp=0.00041 *12* α=0.00110 *8*; α(K)=0.00039 *3*; α(L)=5.2×10^{-5} *4*; α(M)=1.11×10^{-5} *8*; α(N+..)=0.00065 *5* α(N)=2.55×10^{-6} *19*; α(O)=4.0×10^{-7} *3*; α(P)=2.76×10^{-8} *22*; α(IPF)=0.00064 *5*
2662.55 *10*	0.269 *5*	3006.78	2^+	344.2790	2^+	M1+E2		0.001027 *15*	α(K)exp=0.00028 *13* α=0.001027 *15*; α(K)=0.000367 *6*; α(L)=4.79×10^{-5} *7*; α(M)=1.028×10^{-5} *15*; α(N+..)=0.000602 *9* α(N)=2.36×10^{-6} *4*; α(O)=3.68×10^{-7} *6*; α(P)=2.54×10^{-8} *4*; α(IPF)=0.000599 *9* Mult.: α(K)exp is consistent with E1 or E2. $\gamma(\theta$,H,t) gives δ=−0.74 +*11*−*50* or −4.6 +*18*−*24*, which rules out mult=E1+M2.
2665.18 *12*	0.107 *3*	3009.23	3^-	344.2790	2^+				
2668.13 *10*	0.205 *4*	3012.37	2^+,3^+,4^+	344.2790	2^+	M1,E2		0.00110 *8*	α(K)exp=0.00051 *19* α=0.00110 *8*; α(K)=0.00039 *3*; α(L)=5.1×10^{-5} *4*; α(M)=1.10×10^{-5} *8*; α(N+..)=0.00065 *5* α(N)=2.53×10^{-6} *18*; α(O)=3.9×10^{-7} *3*; α(P)=2.74×10^{-8} *21*; α(IPF)=0.00065 *5*
^{x}2678.03 *17*	0.0175 *11*								
^{x}2680.88 *11*	0.0602 *16*								
^{x}2687.39 *12*	0.0260 *8*								
^{x}2694.48 *11*	0.0784 *23*					M1(+E0)		0.001182 *17*	α(K)exp=0.0010 *2* α=0.001182 *17*; α(K)=0.000406 *6*; α(L)=5.34×10^{-5} *8*; α(M)=1.149×10^{-5} *16*; α(N+..)=0.000712 *1* α(N)=2.64×10^{-6} *4*; α(O)=4.13×10^{-7} *6*; α(P)=2.88×10^{-8} *4*; α(IPF)=0.000709 *10* Mult.: Authors value of 0.0010 *20* is a typo.
2697.99 *10*	0.280 *6*	3042.29	2^+	344.2790	2^+	M1(+E2)	≤0.22		α(K)exp=0.00053 *10*
^{x}2702.98 *10*	0.0993 *24*					M1,E2		0.00111 *8*	α(K)exp=0.00045 *18*

$^{152}_{64}$Gd$_{88}$-37

γ(^{152}Gd) (continued)

E_γ †	I_γ ‡	E_i(level)	J^π_i	E_f	J^π_f	Mult. ν	α α	Comments
								α=0.00111 *8*; α(K)=0.000380 *24*; α(L)=5.0×10^{-5} *4*; α(M)=1.07×10^{-5} *8*; α(N+..)=0.00067 *5* α(N)=2.46×10^{-6} *17*; α(O)=3.8×10^{-7} *3*; α(P)=2.67×10^{-8} *20*; α(IPF)=0.00067 *5*
2709.47 *9*	0.274 *6*	2709.43	2$^+$	0	0$^+$	E2	0.001036 *15*	α(K)exp=0.00027 *8* α=0.001036 *15*; α(K)=0.000356 *5*; α(L)=4.64×10^{-5} *7*; α(M)=9.96×10^{-6} *14*; α(N+..)=0.000623 *9* α(N)=2.29×10^{-6} *4*; α(O)=3.57×10^{-7} *5*; α(P)=2.46×10^{-8} *4*; α(IPF)=0.000621 *9*
2719.61 *8*	0.401 *9*	2719.64	2$^+$	0	0$^+$	(E2)	0.001038 *15*	α(K)exp=0.00037 *11* α=0.001038 *15*; α(K)=0.000354 *5*; α(L)=4.61×10^{-5} *7*; α(M)=9.89×10^{-6} *14*; α(N+..)=0.000628 *9* α(N)=2.28×10^{-6} *4*; α(O)=3.55×10^{-7} *5*; α(P)=2.45×10^{-8} *4*; α(IPF)=0.000625 *9* Mult.: α(K)exp allows mult=M1 or E2; however, placement in the decay scheme requires ΔJ=2.
^{x}2722.45 *15*	0.095 *4*							
2729.25 *11*	0.0261 *9*	2729.17	2$^+$	0	0$^+$			
2734.06 *10*	0.142 *3*	2734.07		0	0$^+$	E1	0.00126	α(K)=0.000182 *3*; α(L)=2.31×10^{-5} *4*; α(M)=4.94×10^{-6} *7*; α(N+..)=0.001048 *15* α(N)=1.137×10^{-6} *16*; α(O)=1.773×10^{-7} *25*; α(P)=1.233×10^{-8} *18*; α(IPF)=0.001046 *15* α(K)exp=0.00025 *5*
^{x}2740.93 *12*	0.0392 *12*					M1(+E0)	0.0011 *4*	α(K)exp=0.00094 *30*
2744.10 *10*	0.122 *3*	2744.04	1$^-$	0	0$^+$	E1	0.001263 *18*	α(K)exp=0.00012 *5* α=0.001263 *18*; α(K)=0.000181 *3*; α(L)=2.30×10^{-5} *4*; α(M)=4.92×10^{-6} *7*; α(N+..)=0.001053 *15* α(N)=1.130×10^{-6} *16*; α(O)=1.763×10^{-7} *25*; α(P)=1.226×10^{-8} *18*; α(IPF)=0.001052 *15*
2754.70 *10*	0.155 *3*	3099.02	1$^+$,2$^+$,3$^+$	344.2790	2$^+$	M1,E2	0.00112 *8*	α(K)exp=0.00041 *9* α=0.00112 *8*; α(K)=0.000366 *22*; α(L)=4.8×10^{-5} *3*; α(M)=1.03×10^{-5} *7*; α(N+..)=0.00069 *5* α(N)=2.37×10^{-6} *16*; α(O)=3.70×10^{-7} *25*; α(P)=2.57×10^{-8} *18*; α(IPF)=0.00069 *5*
2761.15 *12*	0.0174 *7*	3105.52	2$^+$	344.2790	2$^+$			
2768.27 *10*	0.0413 *10*	3112.53	1$^+$,2$^+$	344.2790	2$^+$			
2772.44 *18*	0.0080 *5*	2772.40	2$^+$	0	0$^+$			I_γ: The uncertainty in the value 0.0080 *50* given by 2004AdZZ is probably a misprint. The uncertainty given in 2003Ad25 is 5.
^{x}2776.04 *27*	0.0128 *11*							
^{x}2778.28 *12*	0.0395 *12*					M1,E2	0.00112 *8*	α(K)exp=0.00046 *10* α=0.00112 *8*; α(K)=0.000360 *21*; α(L)=4.7×10^{-5} *3*; α(M)=1.01×10^{-5} *7*; α(N+..)=0.00070 *6*

From ENSDF

γ(^{152}Gd) (continued)

E_γ[†]	I_γ[t>]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[ν]	α[α]	Comments
								α(N)=2.33×10^{-6} *15*; α(O)=3.64×10^{-7} *24*; α(P)=2.53×10^{-8} *18*; α(IPF)=0.00070 *6*
[x]2787.86 *11*	0.0356 *9*					M1,E2	0.00112 *8*	α(K)exp=0.00029 *10* α=0.00112 *8*; α(K)=0.000358 *20*; α(L)=4.7×10^{-5} *3*; α(M)=1.01×10^{-5} *7*; α(N+..)=0.00071 *6* α(N)=2.32×10^{-6} *15*; α(O)=3.61×10^{-7} *23*; α(P)=2.51×10^{-8} *17*; α(IPF)=0.00071 *6*
[x]2793.27 *14*	0.0308 *11*					[5]		
2795.92 *11*	0.1040 *23*	3140.21	1,2$^+$	344.2790	2$^+$	[5]		
2799.81 *14*	0.0178 *7*	3143.97	3$^-$	344.2790	2$^+$			
2808.61 *10*	0.0696 *16*	3152.89	3$^-$	344.2790	2$^+$	E1	0.001291 *18*	α(K)exp=0.00020 *8* α=0.001291 *18*; α(K)=0.0001752 *25*; α(L)=2.22×10^{-5} *4*; α(M)=4.75×10^{-6} *7*; α(N+..)=0.001089 *1* α(N)=1.091×10^{-6} *16*; α(O)=1.702×10^{-7} *24*; α(P)=1.184×10^{-8} *17*; α(IPF)=0.001088 *16*
[x]2816.84 *15*	0.0160 *6*							
[x]2820.43 *12*	0.0328 *9*					M1,E2	0.00113 *8*	α(K)exp=0.00037 *11* α=0.00113 *8*; α(K)=0.000350 *19*; α(L)=4.6×10^{-5} *3*; α(M)=9.8×10^{-6} *6*; α(N+..)=0.00072 *6* α(N)=2.26×10^{-6} *14*; α(O)=3.53×10^{-7} *22*; α(P)=2.45×10^{-8} *16*; α(IPF)=0.00072 *6*
[x]2824.2 *3*	0.0068 *6*							
[x]2833.50 *12*	0.0184 *5*					(M1)	0.001205 *17*	α(K)exp=0.0007 *4* α=0.001205 *17*; α(K)=0.000364 *5*; α(L)=4.79×10^{-5} *7*; α(M)=1.029×10^{-5} *15*; α(N+..)=0.000783 *1* α(N)=2.37×10^{-6} *4*; α(O)=3.70×10^{-7} *6*; α(P)=2.58×10^{-8} *4*; α(IPF)=0.000780 *11*
[x]2838.15 *11*	0.0372 *8*					E2(+M1)	0.00113 *8*	α(K)exp=0.00028 *9* α=0.00113 *8*; α(K)=0.000345 *18*; α(L)=4.5×10^{-5} *3*; α(M)=9.7×10^{-6} *6*; α(N+..)=0.00073 *6* α(N)=2.23×10^{-6} *13*; α(O)=3.49×10^{-7} *21*; α(P)=2.42×10^{-8} *16*; α(IPF)=0.00073 *6*
[x]2845.25 *12*	0.0143 *5*							
[x]2859.06 *13*	0.0325 *10*							
[x]2861.75 *11*	0.0650 *15*							
[x]2869.24 *11*	0.0751 *16*					M1	0.001212 *17*	α(K)exp=0.00046 *7* α=0.001212 *17*; α(K)=0.000354 *5*; α(L)=4.66×10^{-5} *7*; α(M)=1.001×10^{-5} *14*; α(N+..)=0.000801 *1* α(N)=2.31×10^{-6} *4*; α(O)=3.60×10^{-7} *5*; α(P)=2.51×10^{-8} *4*; α(IPF)=0.000799 *12*
[x]2873.2 *4*	0.0040 *6*							

From ENSDF

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

E_γ[†]	I_γ[‡>]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[ν]	α[α]	Comments
[x]2878.0[u]						E0(+M1,E2)	0.00114 *8*	α(K)exp>0.0050 *9* α=0.00114 *8*; α(K)=0.000336 *17*; α(L)=4.39×10^{-5} *24*; α(M)=9.4×10^{-6} *6*; α(N+..)=0.00075 *6* α(N)=2.17×10^{-6} *13*; α(O)=3.39×10^{-7} *20*; α(P)=2.36×10^{-8} *15*; α(IPF)=0.00075 *6*
[x]2882.39 *11*	0.1147 *25*					8		
2887.52 *13*	0.0243 *8*	3232.06		344.2790	2$^+$	8		
[x]2890.21 *12*	0.0475 *11*					8		
[x]2893.15 *11*	0.0599 *13*					8		
[x]2902.0[u]						(E0+M1+E2)	0.00115 *8*	α(K)exp>0.0070 *23* α=0.00115 *8*; α(K)=0.000331 *16*; α(L)=4.32×10^{-5} *23*; α(M)=9.3×10^{-6} *5*; α(N+..)=0.00076 *6* α(N)=2.14×10^{-6} *12*; α(O)=3.34×10^{-7} *19*; α(P)=2.32×10^{-8} *14*; α(IPF)=0.00076 *6*
[x]2906.48 *15*	0.0722 *23*					E1	0.001329 *19*	α(K)exp=0.00019 *5* α=0.001329 *19*; α(K)=0.0001664 *24*; α(L)=2.11×10^{-5} *3*; α(M)=4.51×10^{-6} *7*; α(N+..)=0.001137 *1* α(N)=1.036×10^{-6} *15*; α(O)=1.616×10^{-7} *23*; α(P)=1.125×10^{-8} *16*; α(IPF)=0.001136 *16*
[x]2910.0 *6*	0.0038 *6*							
2914.42 *14*	0.0121 *6*	2914.19	2$^+$	0	0$^+$			α(K)exp=0.0009 *4* Mult.: α(K)exp is slightly larger than the theoretical values for M1 or E2. placement in the decay scheme requires mult=E2, for which α(K)=0.00031.
[x]2918.46 *21*	0.0108 *5*							
[x]2921.85 *14*	0.0212 *7*							
[x]2927.29 *11*	0.0557 *13*					M1,E2	0.00115 *8*	α(K)exp=0.00029 *12* α=0.00115 *8*; α(K)=0.000325 *15*; α(L)=4.25×10^{-5} *22*; α(M)=9.1×10^{-6} *5*; α(N+..)=0.00078 *6* α(N)=2.10×10^{-6} *12*; α(O)=3.28×10^{-7} *18*; α(P)=2.28×10^{-8} *14*; α(IPF)=0.00077 *6*
[x]2936.0[u]						(E0+M1+E2)		α(K)exp>0.0050 *12*
2940.75 *11*	0.1140 *24*	3285.17	2$^+$	344.2790	2$^+$	M1,E2	0.00116 *8*	α(K)exp=0.00039 *11* α=0.00116 *8*; α(K)=0.000322 *15*; α(L)=4.21×10^{-5} *22*; α(M)=9.0×10^{-6} *5*; α(N+..)=0.00078 *6* α(N)=2.08×10^{-6} *11*; α(O)=3.25×10^{-7} *18*; α(P)=2.26×10^{-8} *13*; α(IPF)=0.00078 *6* E_γ: From table 2 of 2004AdZZ. The value of 2940.15 *11* given in table 1 appears to be a typo. From the level scheme one expects Eγ=2940.88.
[x]2945.9 *4*	0.0033 *5*							

$^{152}_{64}Gd_{88}$-40

γ(^{152}Gd) (continued)

E_γ †	I_γ t>	E_i(level)	J^π_i	E_f	J^π_f	Mult. ν	α α	Comments
^{x}2950.5 *3*	0.0049 *6*					E0+M1+E2	0.0038 *10*	α(K)exp=0.0033 *9*
^{x}2961.00 *12*	0.0261 *7*							
^{x}2971.46 *14*	0.0123 *5*							
^{x}2980.07 *11*	0.0478 *10*							
^{x}2983.78 *11*	0.0275 *7*							
^{x}2993.14 *15*	0.0282 *8*							
2996.26 *12*	0.0432 *10*	3340.65	1^-,2,3,4^+	344.2790	2^+			
2999.69 *16*	0.0499 *8*	2999.55	1^+,2^+	0	0^+			
3006.63 *14*	0.0118 *4*	3006.78	2^+	0	0^+			
^{x}3014.77 *13*	0.0220 *5*							
^{x}3018.13 *15*	0.0111 *4*							
^{x}3022.50 *14*	0.0220 *8*							
^{x}3024.93 *17*	0.0124 *6*							
^{x}3037.62 *22*	0.0087 *5*							
^{x}3042.64 *12*	0.1099 *23*							
^{x}3056.19 *12*	0.0315 *8*							
^{x}3059.53 *20*	0.0095 *5*							
^{x}3068.25 *15*	0.0127 *5*							
^{x}3085.05 *15*	0.0148 *5*							
^{x}3088.60 *17*	0.0091 *4*							
^{x}3094.73 *12*	0.0210 *6*							
3105.45 *16*	0.0172 *7*	3105.52	2^+	0	0^+			
^{x}3107.88 *14*	0.0252 *8*							
3112.3 *3*	0.0040 *3*	3112.53	1^+,2^+	0	0^+			
^{x}3115.6 *3*	0.00286 *25*							
^{x}3122.25 *18*	0.0043 *3*							
^{x}3132.3 *4*	0.0041 *4*							
^{x}3135.0 *3*	0.0069 *5*							
3140.20 *12*	0.0288 *7*	3140.21	1,2^+	0	0^+			
^{x}3147.2 *6*	0.0018 *3*							
^{x}3154.42 *14*	0.0186 *5*							
^{x}3158.87 *12*	0.0526 *12*							
^{x}3162.3 *4*	0.018 *2*							
^{x}3164.54 *18*	0.0760 *23*							
^{x}3166.90 *21*	0.0202 *17*							
^{x}3174.02 *12*	0.0316 *8*							
^{x}3180.51 *22*	0.00309 *25*							
^{x}3190.1 *3*	0.0242 *18*							
^{x}3194.5 *3*	0.0047 *3*							
^{x}3205.60 *21*	0.0483 *11*							

^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05 (continued)

γ(^{152}Gd) (continued)

E_γ[†]	I_γ[t>]	E_i(level)	Mult.[ν]	E_γ[†]	I_γ[t>]	E_i(level)	Mult.[ν]	E_γ[†]	I_γ[t>]	E_i(level)	Mult.[ν]
[x]3211.7 *3*	0.0050 *4*			[x]3276.00 *19*	0.0120 *3*			[x]3406.89 *23*	0.00233 *14*		
[x]3223.80 *17*	0.0381 *16*			[x]3284.24 *15*	0.0090 *3*			[x]3411.90 *15*	0.00842 *24*		
[x]3228.75 *13*	0.0209 *5*			[x]3309.75 *14*	0.0154 *4*			[x]3459.7 *3*	0.00133 *12*		
[x]3232.48 *16*	0.0086 *3*			[x]3324.22 *11*	0.0510 *12*			[x]3479.14 *14*	0.0190 *5*		
[x]3236.76 *18*	0.00500 *25*			[x]3328.24 *15*	0.0134 *4*			[x]3493.32 *18*	0.00359 *14*		
[x]3244.90 *22*	0.00361 *26*			[x]3338.12 *16*	0.00593 *22*			[x]3508.7 *3*	0.00131 *12*		
[x]3251.04 *17*	0.0060 *3*			[x]3359.86 *25*	0.00192 *14*			[x]3534.74 *24*	0.00187 *12*		
[x]3261.0 *5*	0.0013 *3*			[x]3366.46 *15*	0.00735 *24*			[x]3565.85 *24*	0.00152 *10*		
[x]3265.88 *22*	0.0070 *4*			[x]3380.23 *15*	0.00774 *24*			[x]3572.44 *18*	0.00388 *14*		
[x]3268.70 *16*	0.0162 *5*			[x]3391.1 *4*	0.00127 *14*			[x]3595.3 *3*	0.00158 *12*		
[x]3272.34 *21*	0.0073 *3*			[x]3401.45 *20*	0.00297 *16*			[x]3621.7 *4*	0.00093 *11*		

[†] From 2004AdZZ, unless noted otherwise. No uncertainties are given in 2003Ad25.

[‡] 2004AdZZ report E=703.39 *7* with Iγ=3.71 *7* placed from the 1048 and 1318 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. α(K)exp for the doublet is consistent only with mult=E2 for both components.

[#] 2004AdZZ report E=855.00 *9* with Iγ=0.103 *12* placed from the 1471, 1785, and 2170 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. from the strong ce line at this energy, and known placements, one can deduce a probable E0 component in the branch from the 1785 level.

[@] 2004AdZZ report E=557.67 *7* with Iγ=0.175 *5* placed from the 1606 and 1840 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. α(K)exp≈0.012 for the doublet is consistent with mult=E2 for both placements, both of which are ΔJ=2 transitions in the decay scheme.

[&] 2004AdZZ report E=1605.72 *7* with Iγ=0.585 *11* placed from the 1606 and 2729 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. Note that Ice(K) for the doublet, with placements as 2^+ to 0^+ and 2^+ to 3^-, is deduced to be 0.29 *3* compared with the measured value of 0.17 *4*. the experimental Ice(K) suggests mult=E1 for both placements, in disagreement with the proposed spin of the 1606 level; however, α(K)exp in 13-y Eu β^- decay is consistent with mult=E2 for the component from the 1606 level.

[a] 2004AdZZ report E=1083.96 *10* with Iγ=0.122 *5* placed from the 1840 and 2401 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ.

[b] 2004AdZZ report E=814.38 *16* with Iγ=0.055 *5* placed from the 1861.9 and 2729 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ.

[c] 2004AdZZ report E=1517.78 *7*, Iγ=1.025 *21* placed from the 1862, 2133, and 2642 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. From Ice(K) one can deduce α(K)exp=0.0016 *3* for the component from the 1862 level, consistent with mult=M1+E2 as suggested by the δ values.

[d] 2004AdZZ report E=818.25 *8* with Iγ=0.160 *4* placed from the 1941 and 2133 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ.

[e] 2004AdZZ report E=1596.75 *7*, Iγ=0.721 *15* placed from the 1941 and 2720 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. α(K)exp=0.00101 *23* for this doublet and for the 1598.9γ from the 2529 level, unresolved in the ce spectrum. The placement from the 2720 level requires mult=E1, and δ is known for the placement from the 1941 level. from these observations, one can deduce α(K)exp=0.0011 *8* for the 1598.9γ,

γ(^{152}Gd) (continued)

consistent with E1, E2, or M1.

[f] 2004AdZZ report E=1631.42 *8*, Iγ=0.361 *8* placed from the 1976 and 2247 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. From α(K)exp=0.00107 *21*, and given a 2^+ to 0^+ placement for the component from the 2247 level, one gets mult=M1(+E2) for the component from the 1976 level.

[g] 2004AdZZ report E=1202.64 *9* with Iγ=0.090 *3* placed from the 2133 and 2326 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ.

[h] 2004AdZZ report E=1789.20 *8*, Iγ=0.899 *17* placed from the 2133 and 2720 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. From Ice(K) for the doublet and with δ=+0.26 for the component from the 2720 level, both components must be mainly M1.

[i] 2004AdZZ report E=1446.43 *7*, Iγ=0.387 *8* placed from the 2202 and 2881 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. From α(K)exp=0.0013 *3* for the doublet, and given mult=E2 required for the placement from the 2202 level, one gets mult=M1 or E2 for the placement from the 2881 level.

[j] 2004AdZZ report E=1314.66 *9*, Iγ=2.22 *5* placed from the 1315 and 2437 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. α(K)exp for the doublet is consistent only with mult=E1 for both components.

[k] 2004AdZZ report E=1411.48 *9*, Iγ=1.01 *3* placed from the 1756 and 2729 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. δ=+4.3 *+9−13* for the component from the 2729 level. From this, and α(K)exp=0.00083 *14* for the doublet, one can deduce mult=E1 for the component from the 1756 level.

[l] 2004AdZZ report E=1400.60 *7* with Iγ=0.244 *5* placed from the 2524 and 2720 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ.

[m] 2004AdZZ report E=1902.45 *8*, Iγ=2.68 *5* placed from the 2247 and 3012 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. α(K)exp for the doublet can be attributed entirely to the much stronger component from the 2247 level, and along with δ gives mult=M1+E2 for this component. Nothing can be said about mult for the component from the 3012 level.

[n] 2004AdZZ report E=1841.15 *9*, Iγ=0.123 *3* placed from the 2772 and 2964 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. α(K)exp is consistent only with mult=M1,E2 for each component.

[o] 2004AdZZ report E=2043.65 *10*, Iγ=0.156 *4* placed from the 2387, 3153, and 3358 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. From α(K)exp=0.0019 *8*, and given that mult is probably E1 for the 2043.63 and 2043.79γ′s, based on their placements, the placement from the 2387 level requires an E0 component.

[p] 2004AdZZ report E=2093.51 *8*, Iγ=0.333 *7* placed from the 2437 and 2709 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. From α(K)exp=0.00125 *24* for the doublet, and given mult=E2 for the placement from the 2709 level, one gets α(K)exp=0.0016 *3* for the placement from the 2437 level. Compared with α(K)=0.000706 for M1, this α(K)exp suggests an E0 component for that placement.

[q] 2004AdZZ report E=2103.54 *9*, Iγ=0.101 *3* placed from the 2448 and 2720 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. From α(K)exp=0.00060 *14*, given that the placement from the 2720 level is 2^+ to 0^+, one gets mult=M1 or E2 for the placement from the 2448 level.

[r] 2004AdZZ report E=2169.16 *9*, Iγ=0.146 *3* placed from the 2514 and 3099 levels. The Eγ are the authors′ rounded-off values from their level scheme, and the Iγ are from γγ. α(K)exp=0.00056 *13* for the doublet plus the 2172.45γ from the 2928 level. From the J^π assignments, the placements from the 2928 and 3099 levels require Δπ=no. J^π(1514)=1,2^+, allowing mult= M1,E2 or E1 if $J^\pi=1^-$. α(K)=0.00053 for E2, so α(K)exp is reasonably consistent with Δπ=no for all three transitions; however, if J^π(2514)were 1^-, requiring mult=E1, then α(K)exp would be 0.00050 *11* for the other two components, giving better agreement with α(K) for E2, and also allowing for some M1 admixture.

[s] Calibration value used by 2003Ad25, consistent with 2000He14.

[t] From 2004AdZZ, unless noted otherwise. 2003Ad25 report only branching ratios.

[u] From ce spectrum of 1970Ad05. Not seen in the photon spectrum.

$^{152}_{64}Gd_{88}$-43

γ(^{152}Gd) (continued)

[v] From Adopted Gammas. α(K)exp values from 2004AdZZ, δ values from $\gamma(\theta$,H,t) of 1990Ta19, and δ values from $\gamma(\theta$,t) of 1981Fe01 are given in comments, as are earlier δ data as given in the evaluation of 1975Kr16. The α(K)exp values given by 2004AdZZ are based on the authors relative Iγ data along with Ice(K) data of 1970Ad05 and are normalized in the region Eγ<1000 to α(K) for the 344 (E2), 411 (E2), and 778 (E1) transitions, and in the higher-energy region, where a different detector was used, to α(K) for the 970 (E1), 990 (E2), 1185 (E2), 1209 (E1), 1299 (E1), 1314 (E1), 1941 (E2), 2033 (E1), and 2113 (E2) transitions.

[w] For mult for the 1369 and 1955γ's, see the comment on J$^\pi$ for the 2299 level. for J$^\pi$=3$^-$, 1990Ta19, from their $\gamma(\theta)$ work, deduce δ(M2/E1)=+0.28 *5*, +0.35 *6*, and +0.27 *4* for the 1190, 1369, and 1955γ's, respectively, and 1981Fe01 report δ=+0.28 *+17−14* and +0.30 *+9−8* for the 1190 and 1955γ's, respectively.

[x] α(K)exp for the 2179+2182γ's is consistent only with mult=M1 for both transitions.

[y] α(K)exp=0.0021 *8* for the 2217.40+2220.81γ's requires an E0 component in one or both of these transitions. the 2220γ is unplaced and the 2217γ deexcites the 3340 *3*- level to the 1123 3$^-$ level.

[z] α(K)exp=0.00059 *10* for the 2251.4+2254.4γ's is consistent only with mult=M1 or E2 for both transitions.

[1] α(K)exp=0.00144 *19* for the 2384.9+2388.7γ's, compared with α(K)=0.00053 for mult=M1, suggests an E0 component in one or both transitions.

[2] α(K)exp for the 1739γ to the 1123 level with π=− and for the 2518γ to the 344 level with π=+ give mult=M1,E2 for both transitions. This mult discrepancy does not allow π(2862) to be determined. From $\gamma(\theta)$, 1990Ta19 give δ(2518γ)=−0.29 *8* or +7 *+9−3* for J=2, and +0.21 *6* or −30 *+20 −INF* for J=3.

[3] α(K)exp=0.00078 *15* for Eγ=2076.21+2078.63. Placement of the 2078γ requires mult=E1, leading to α(K)exp=0.0012 *3* for the 2076γ. compared with theory values of 0.00072 for M1 and 0.00057 for E2 this α(K)exp value gives mult=M1 or E0+M1+E2.

[4] α(K)exp=0.0024 *5* for Eγ=2322.3+2324.32, compared with theory values of 0.00056 and 0.00047 for mult=M1 and E2, respectively, requires an E0 admixture in one or both transitions. The 2322γ is unplaced.

[5] α(K)exp=0.00024 *4* for Eγ=2793.27+2795.92, compared with theory values of 0.00018, 0.00034, and 0.00037 for E1, E2, and M1, respectively, suggest mult=E1 for one of the components, and mult=M1,E2 for the other. The 2793.27γ is unplaced.

[6] α(K)exp=0.00082 *20* for Eγ=2018.09+2020.67 is consistent only with mult=M1,E2 for both components.

[7] α(K)exp for the triplet 2597.04+2600.69+2602.85 is consistent only with mult=M1 or E2 for the 2602.85γ. Placement in the level scheme requires ΔJ=2. The 2597 and 2600γ's are unplaced, but α(K)exp for the triplet is consistent with mult=M1 for both transitions.

[8] ce lines are reported at 2885.0 and 2894. Eγ=2882.39, 2887.51, 2890.2, and 2893.15 for transitions close to these energies. 2004AdZZ deduce mult=E1 for the 2882γ by assigning the entire Ice for the 2885 ce line to this transition, giving α(K)exp=0.00026 *6*; however, the associations do not seem to be unambiguous. Only the 2887γ is placed, and nothing can be deduced about its mult.

[9] α(K)exp=0.038 *3* for the doublet 493.81+496.37γ. Given mult=E2 for the 493.8γ, placed as 2$^+$ to 0$^+$ from the 1109.2 level, one gets α(K)exp=0.063 *4* for the 496.37γ from the 1605.6 level compared with α(K)=0.022 for mult=M1, α(K)exp requires an E0 component.

[!] α(K)exp=0.025 *5* for the doublet 543.58+547.47. Given mult=E1 for the 547.47γ, placed as 2$^+$ to 1$^-$ from the 1862.06 level, one gets α(K)exp=0.033 *6* for the 543.58γ from the 1861.89 level compared with α(K)=0.0174 for mult=M1. α(K)exp requires an E0 component.

α(K)exp=0.030 *4* for the 195.17+196.34γ's, unresolved in the ce spectrum, is consistent only with mult=E1 for the strong 195.17 component. mult is undetermined for the unplaced 196.34γ.

[|] α(K)exp=0.018 *4* for Eγ=697.20+699.25 placed from the 2011 and 1314 levels, respectively. From these placements, mult must be E1, with α(K)=0.00197. If the placements are correct, there May be a third transition at this energy with mult=E0 and Ice=0.0026 *6*.

[/] α(K)exp=0.0036 *6* for Eγ=930.58+932.09 with placements from the 930 and 2247 levels, requiring mult=pure E2 and E1(+M2), respectively, suggests an M2 admixture for the 932.09γ.

[<] α(K)exp=0.0018 *3* for Eγ=1316.32+1318.24 with placements from the 2246 and 1318 levels. From the placement, mult(1318.24γ) must be E2. The remaining Ice(K) gives mult(1316.32γ)=M1 or E2, consistent with its placement as a 2$^+$ to 2$^+$ transition.

[>] For absolute intensity per 100 decays, multiply by 0.635 *6*.

γ(^{152}Gd) (continued)

$^{\alpha}$ 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.

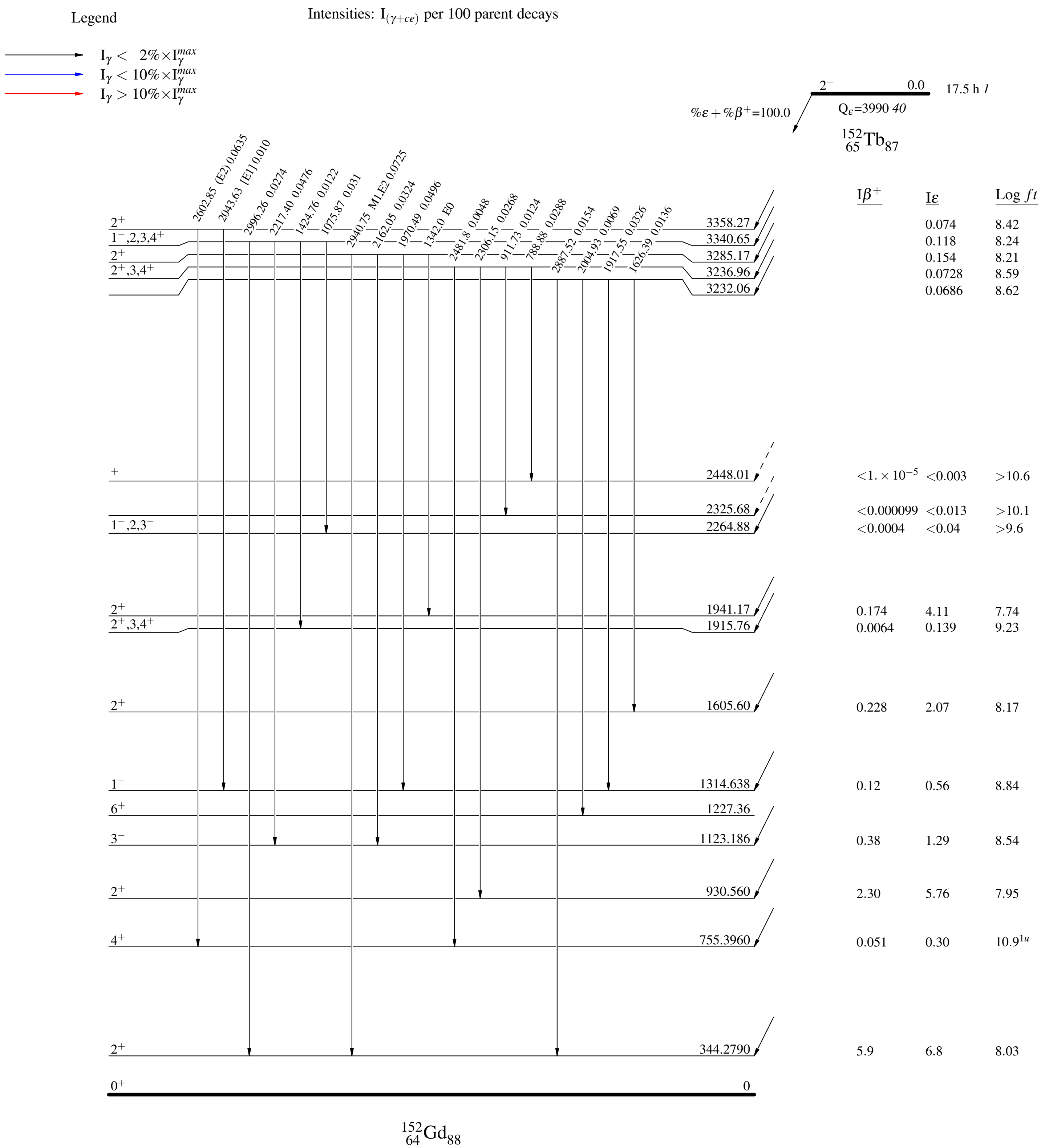
$^{\beta}$ Placement of transition in the level scheme is uncertain.

^{x} γ ray not placed in level scheme.

$^{152}_{64}$Gd$_{88}$-45

^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

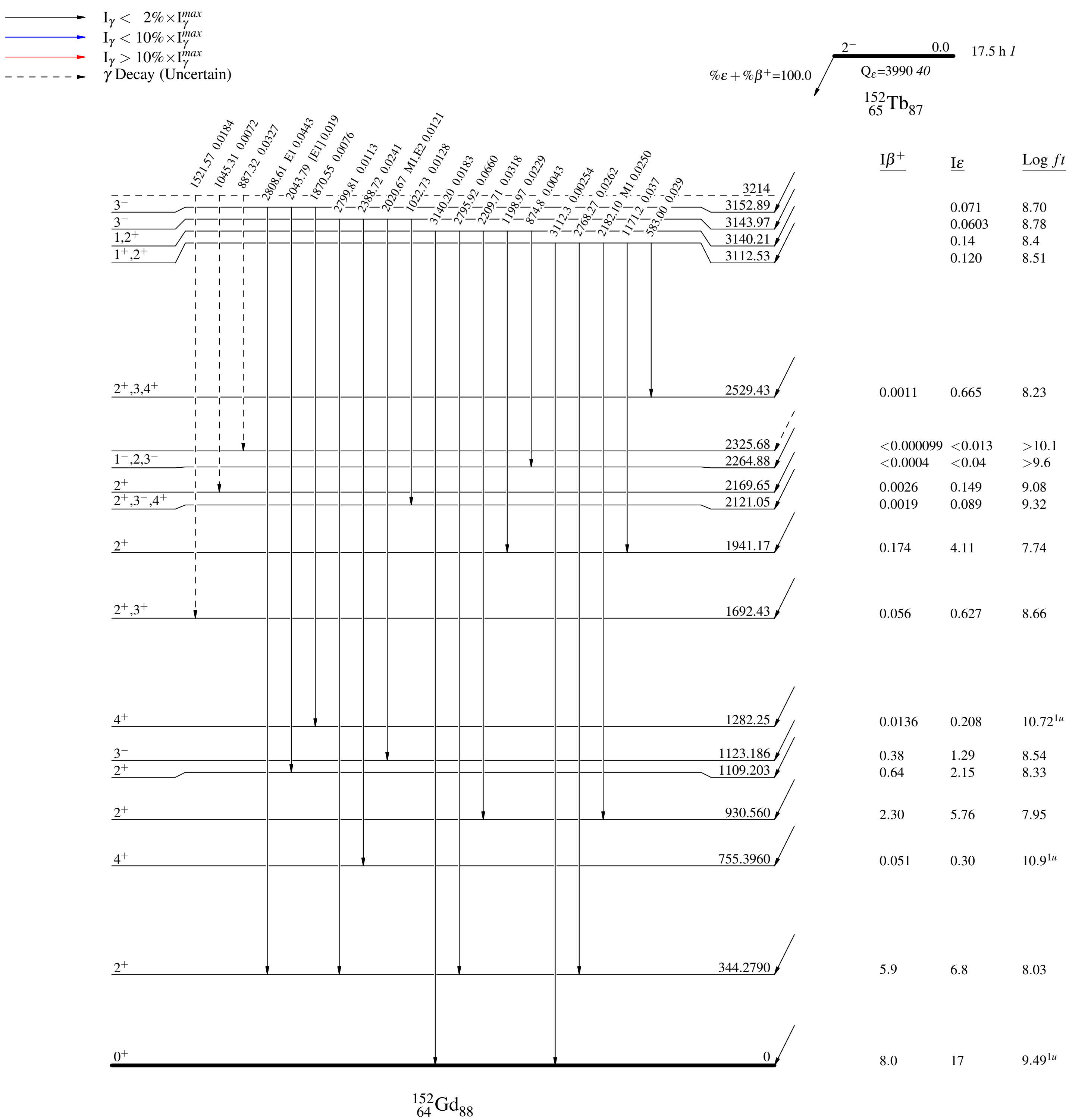
Decay Scheme



^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

Decay Scheme (continued)

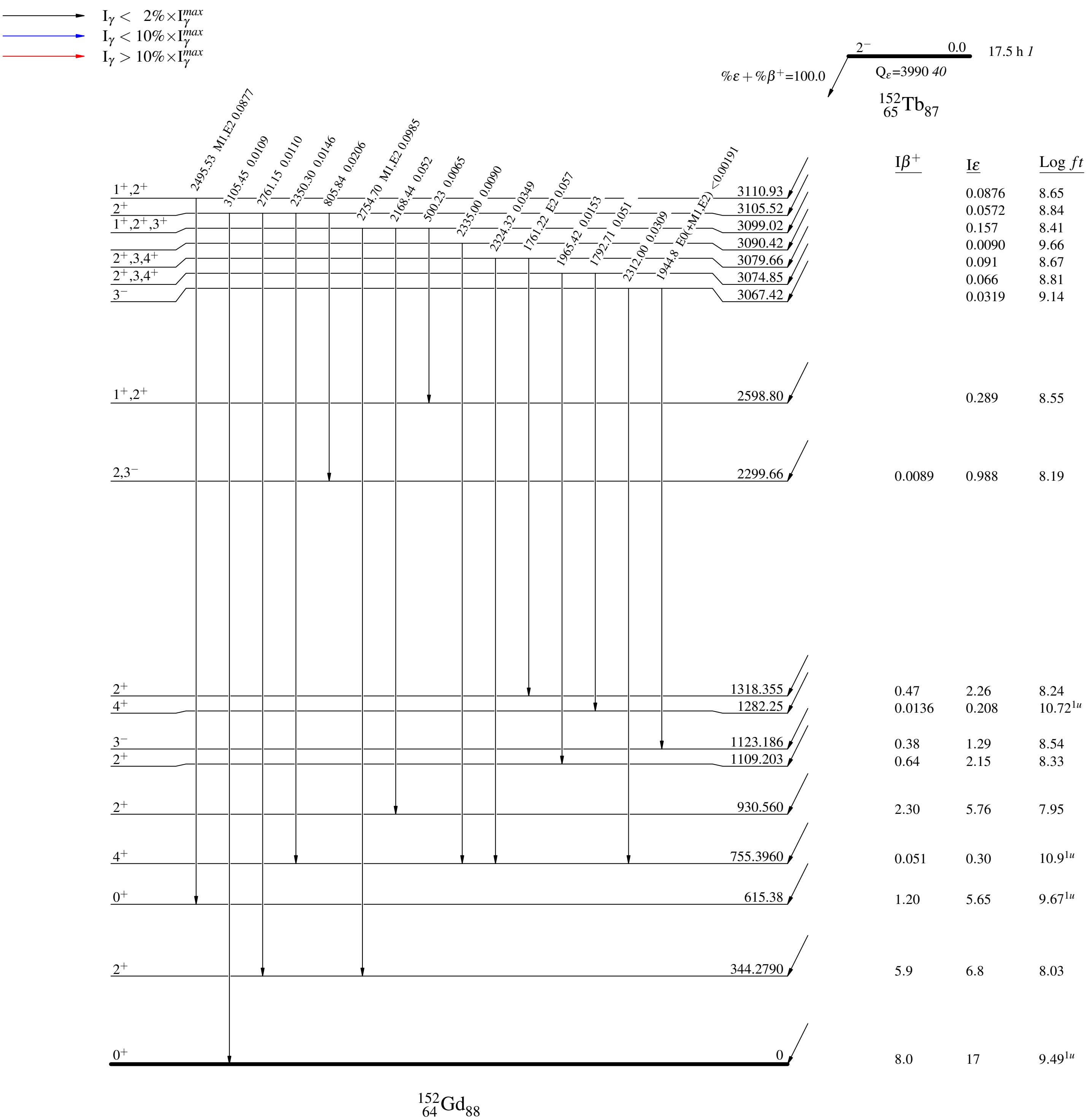
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

Decay Scheme (continued)

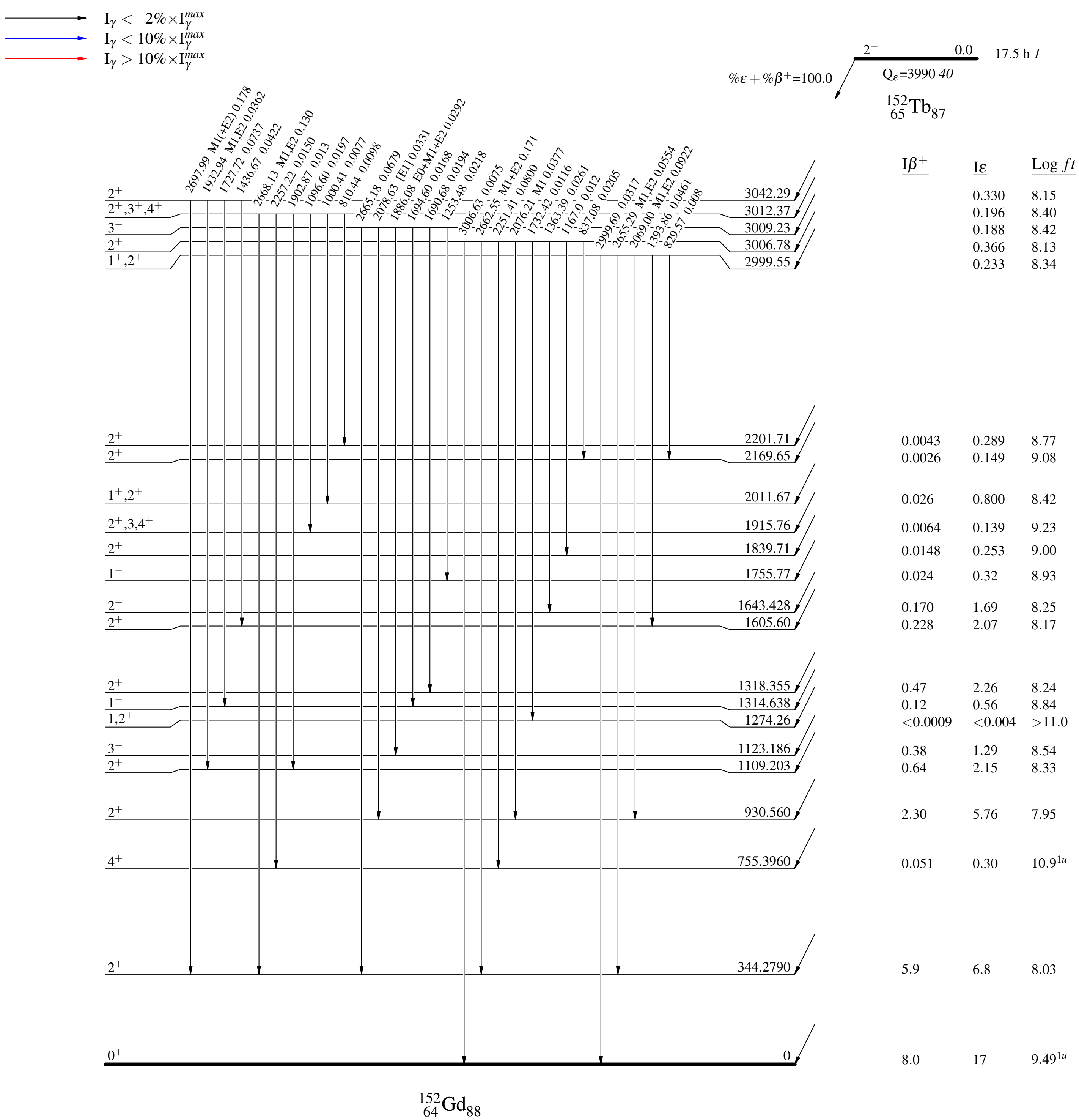
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

Decay Scheme (continued)

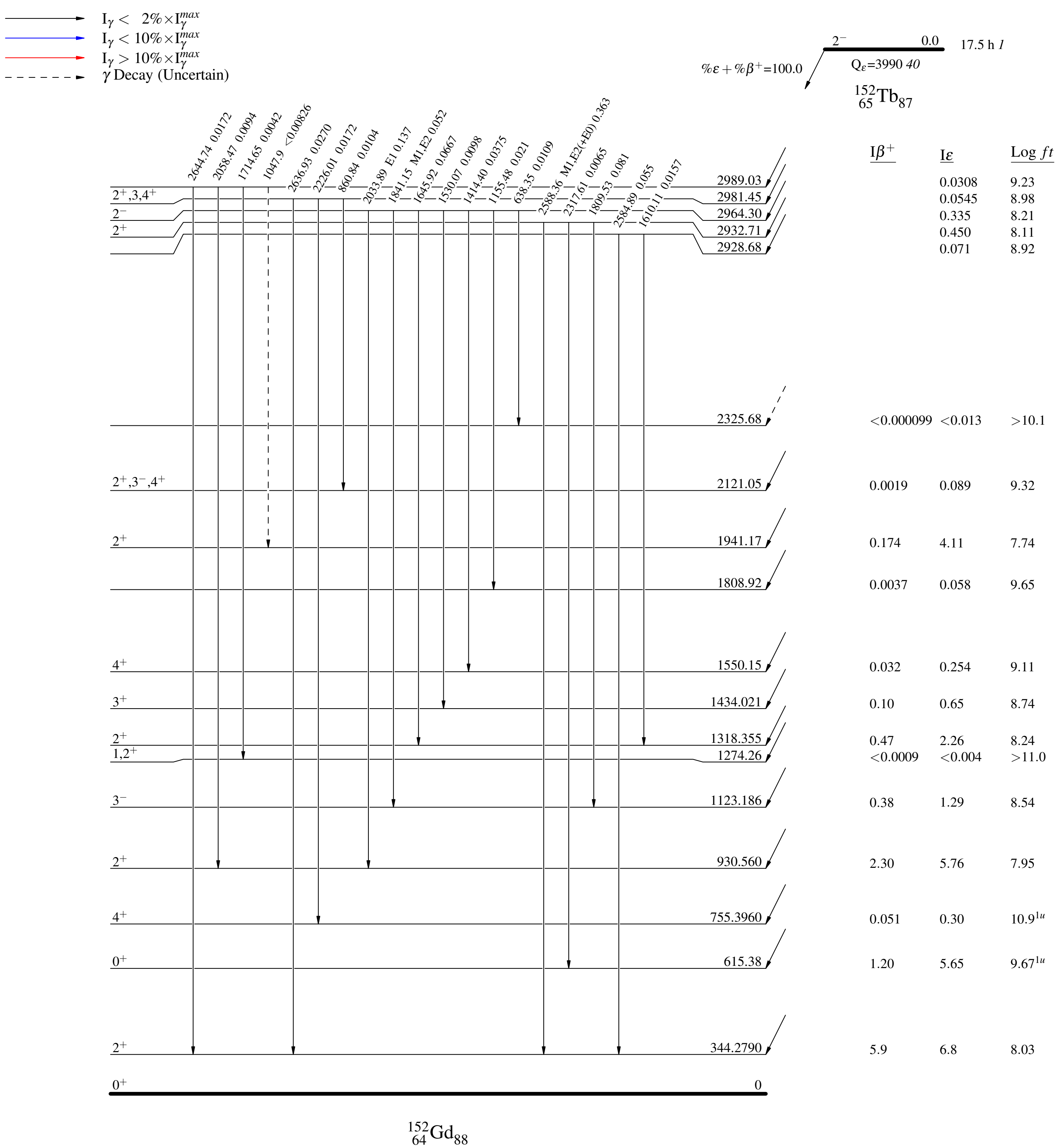
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

Decay Scheme (continued)

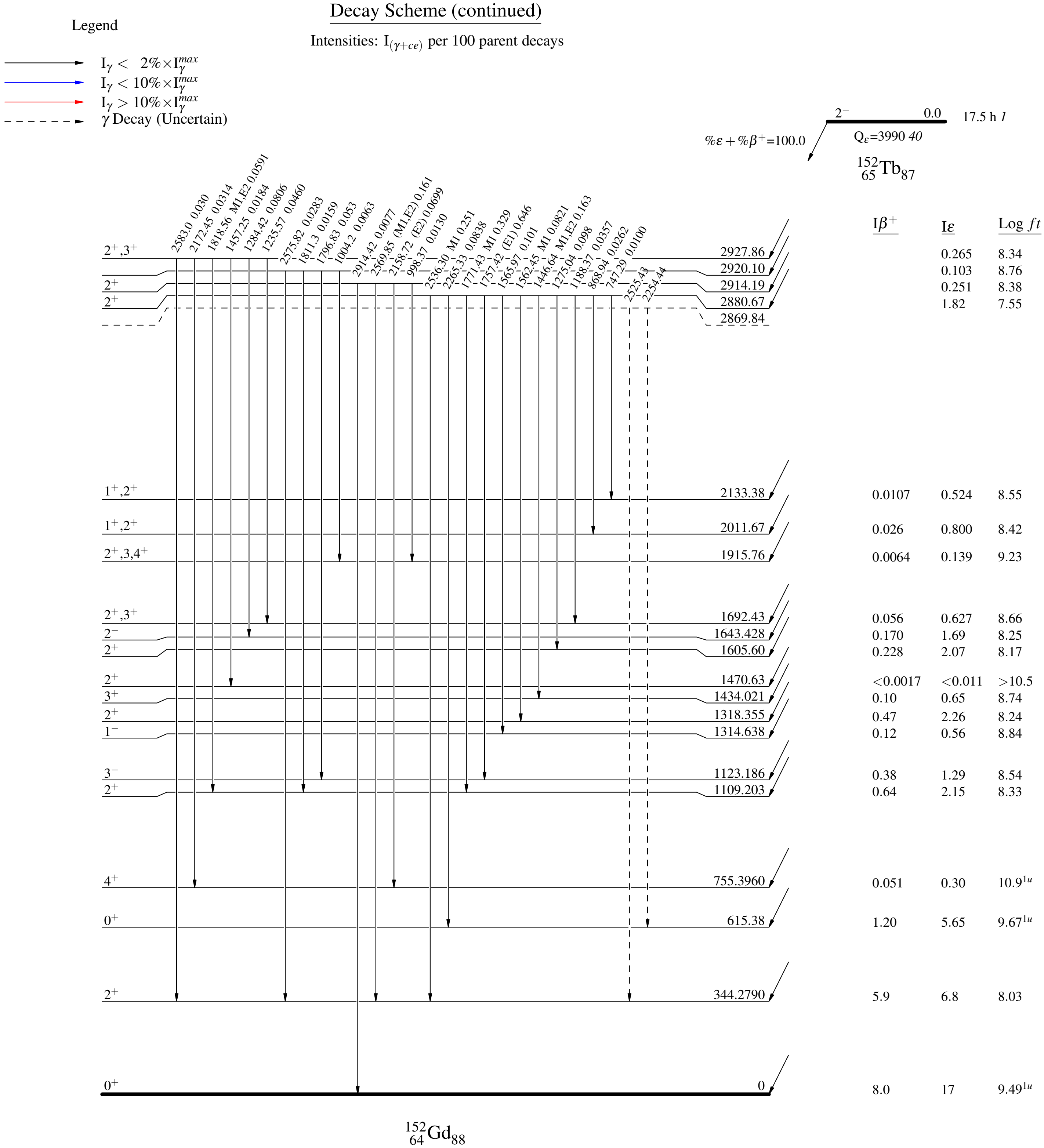
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

Decay Scheme (continued)

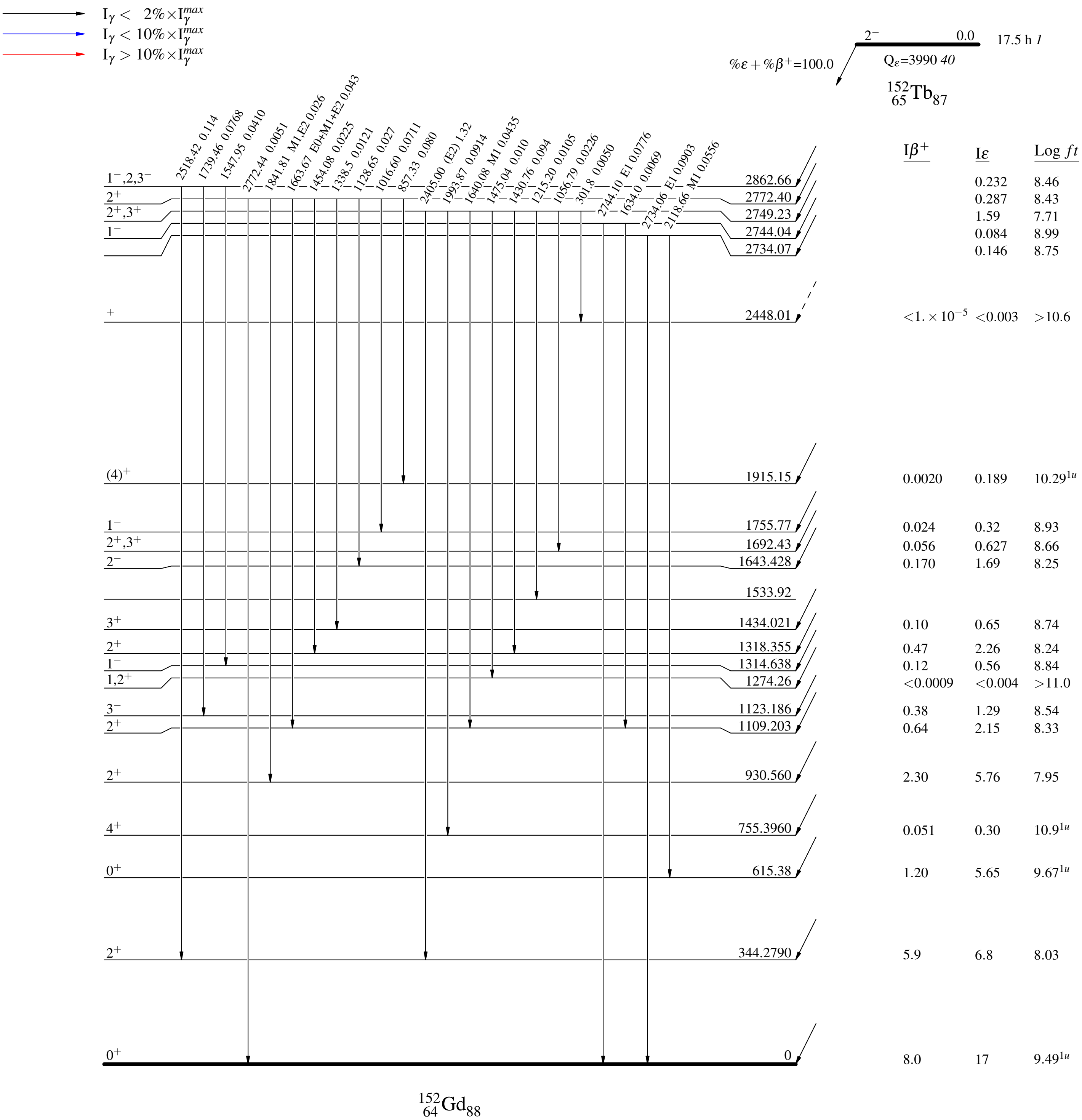
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

Decay Scheme (continued)

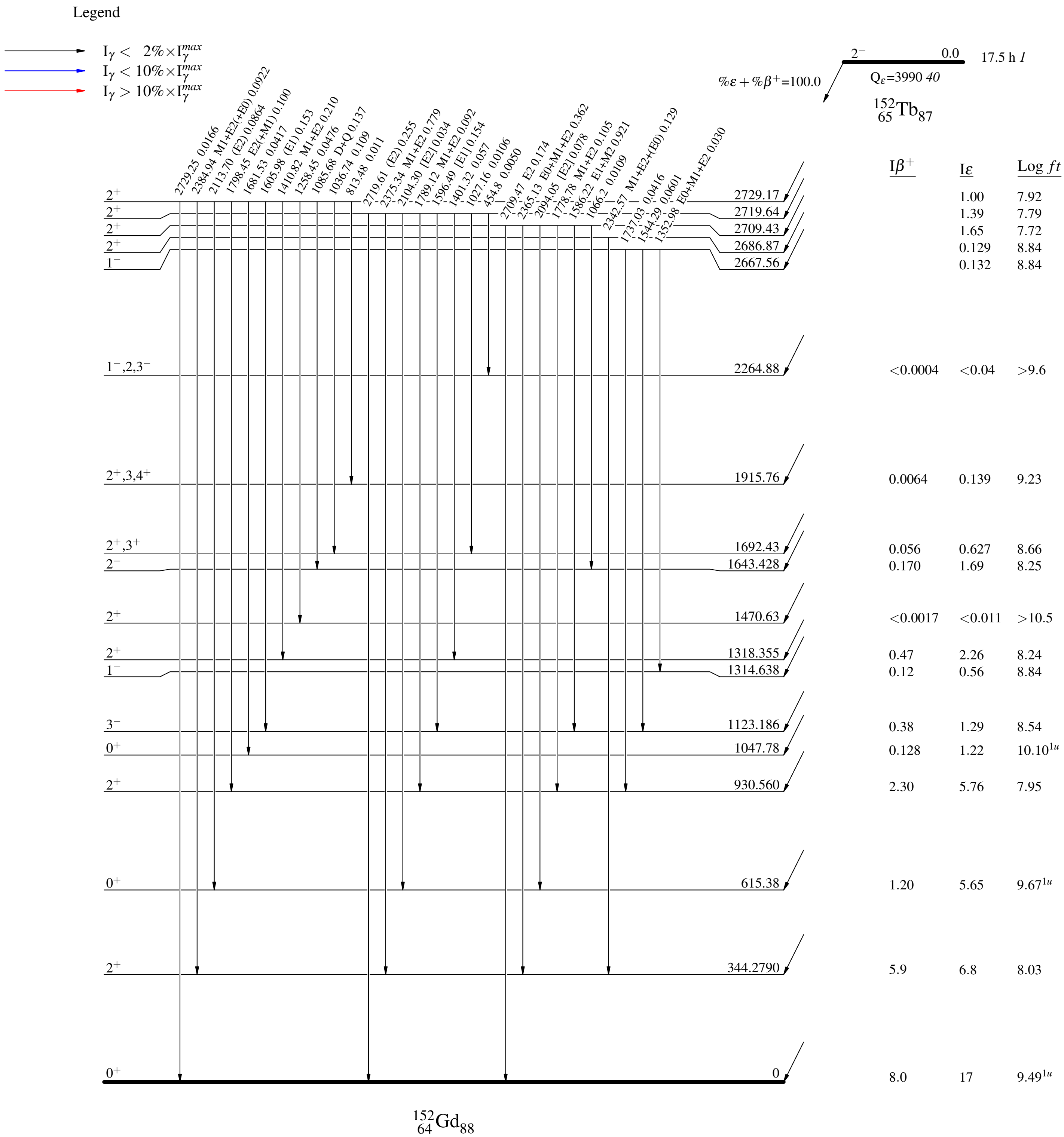
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

Decay Scheme (continued)

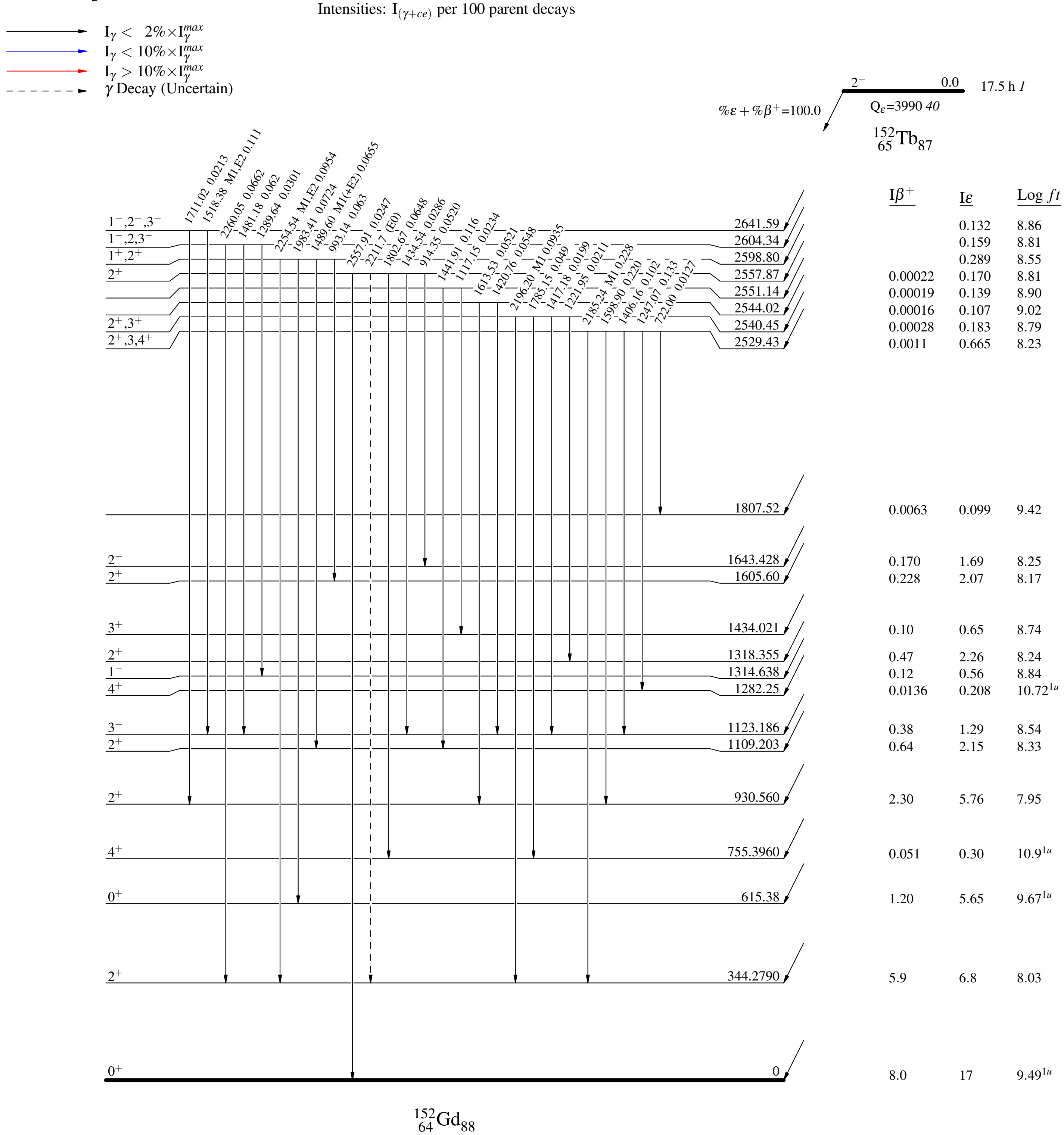
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

Decay Scheme (continued)

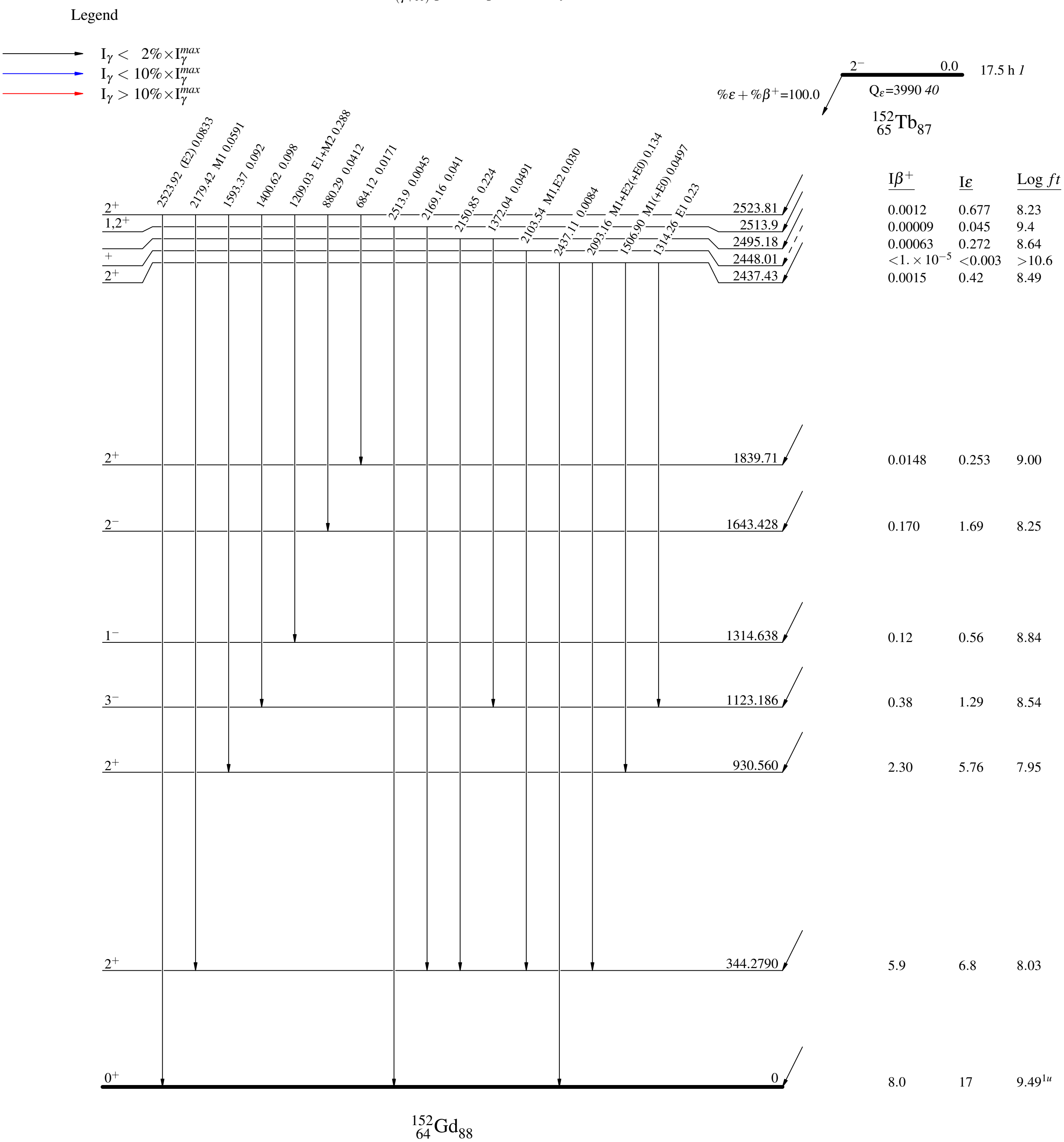
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

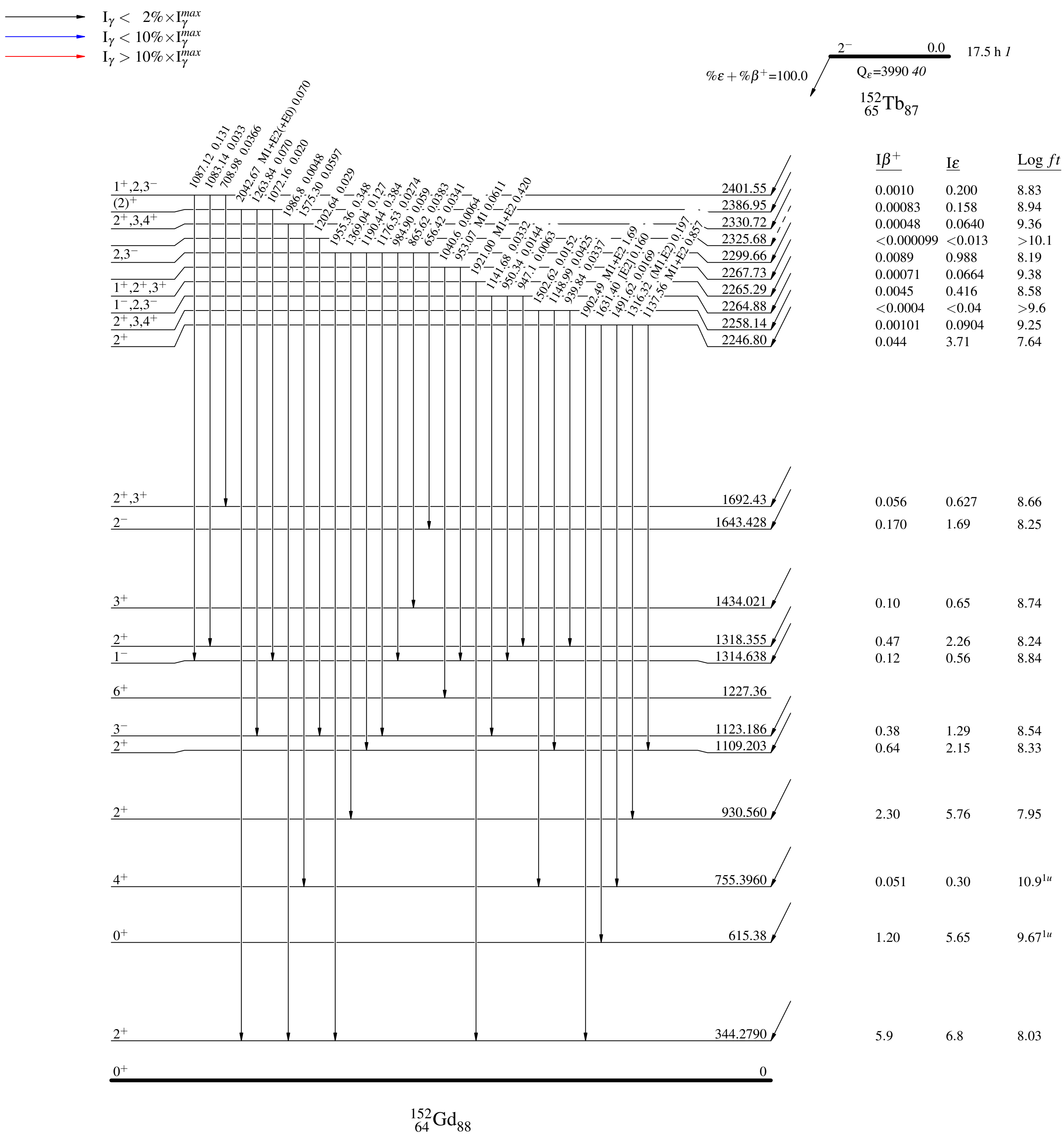


^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

Decay Scheme (continued)

Legend

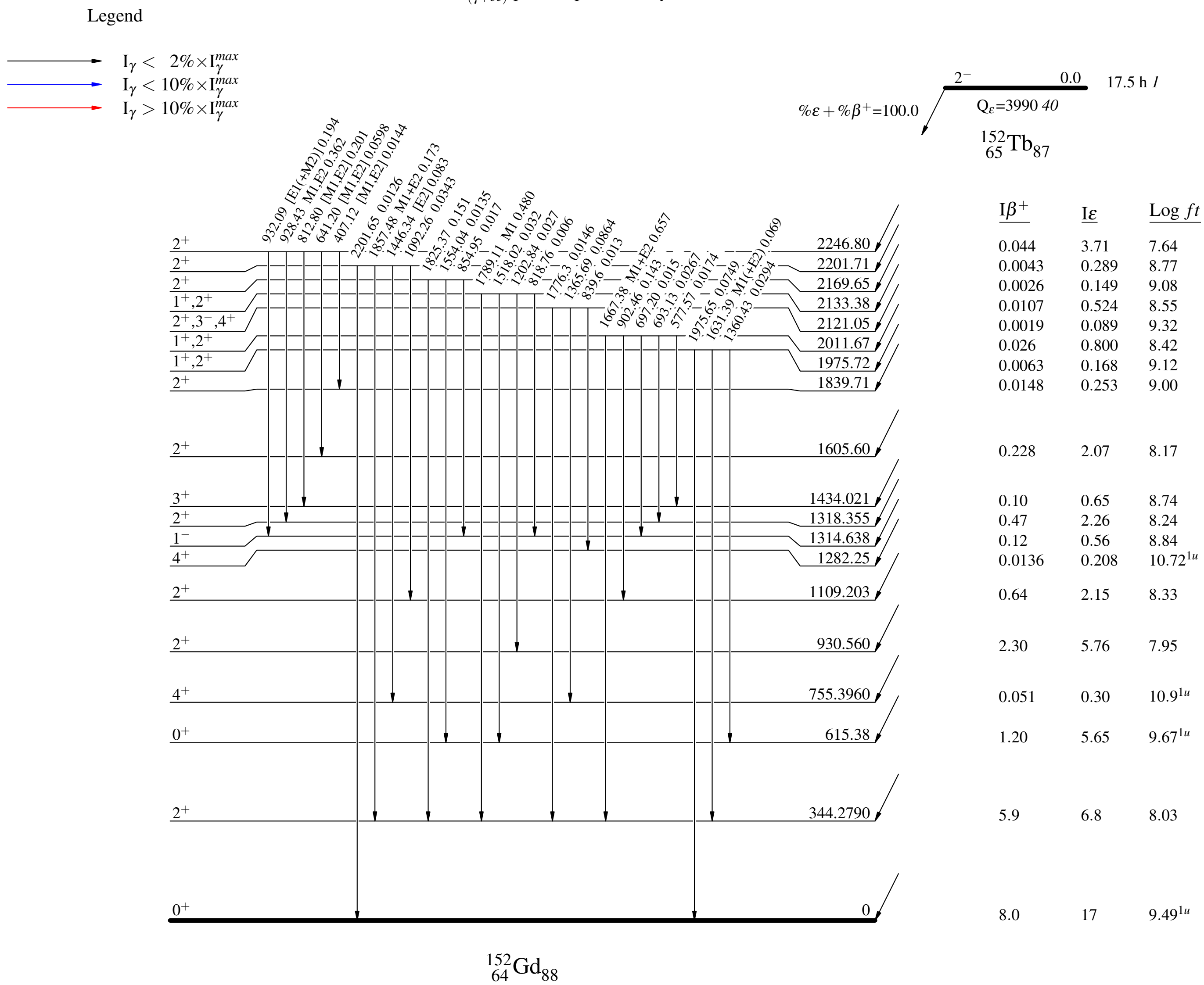
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

Decay Scheme (continued)

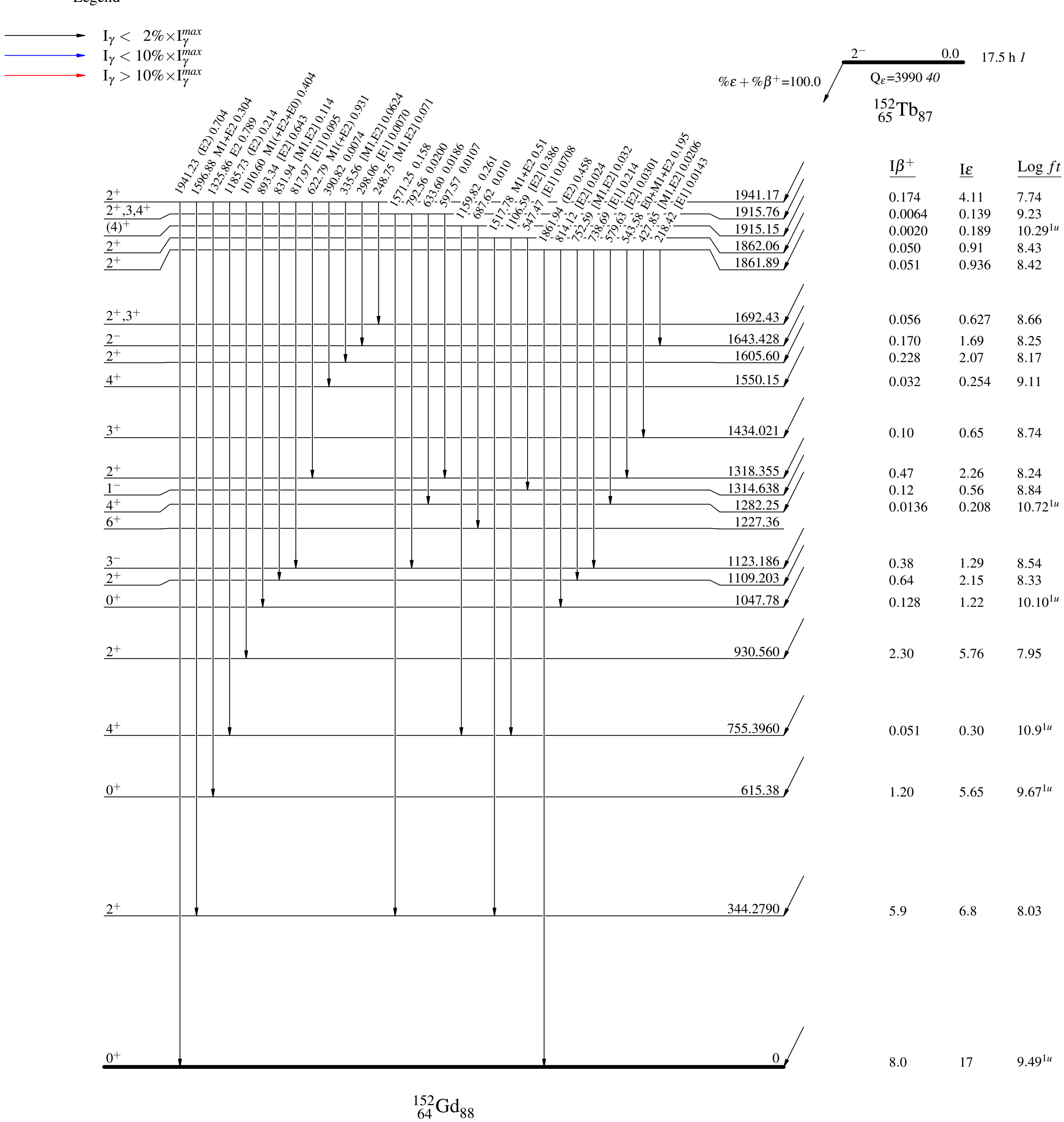
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

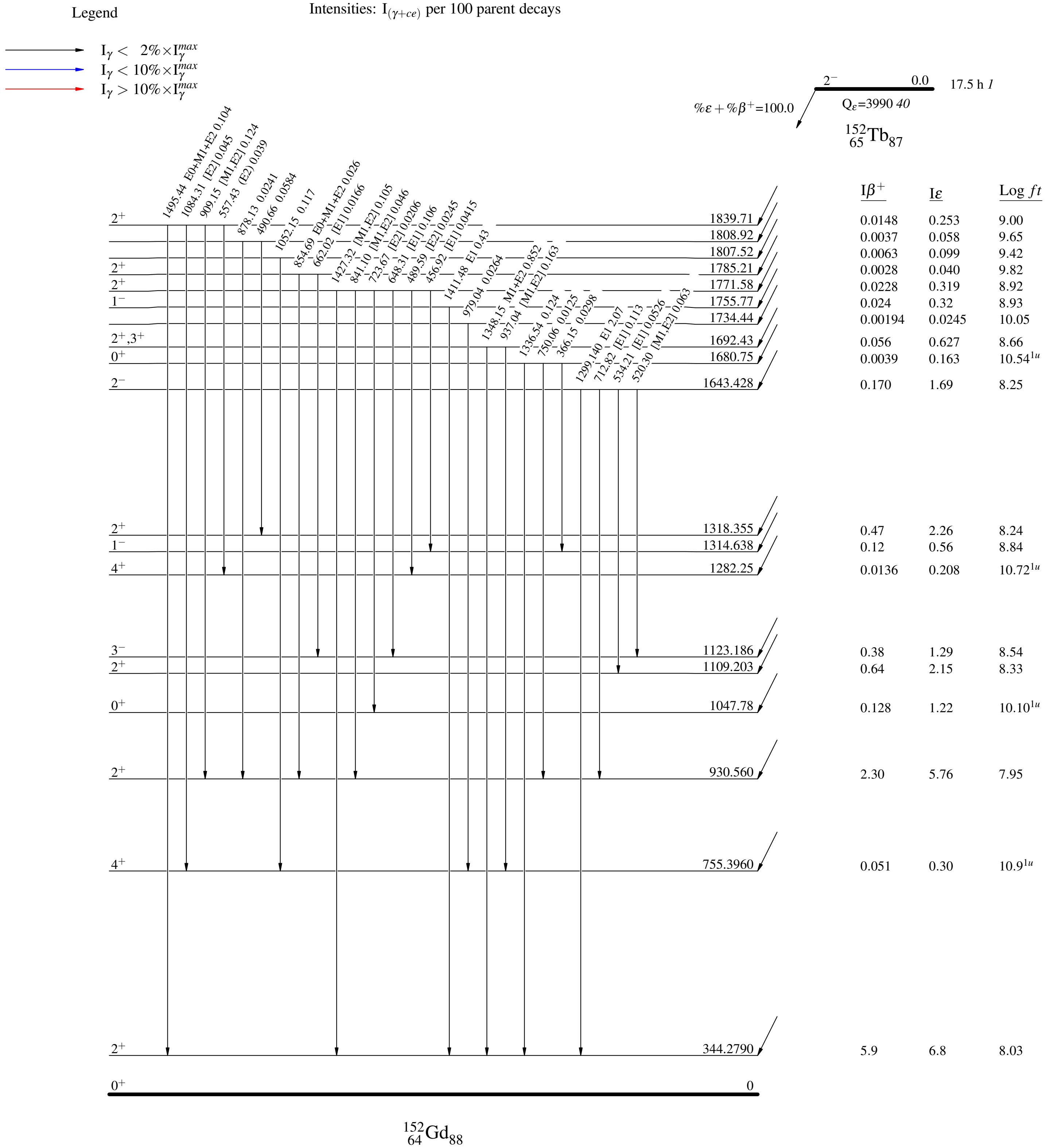
Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

Decay Scheme (continued)

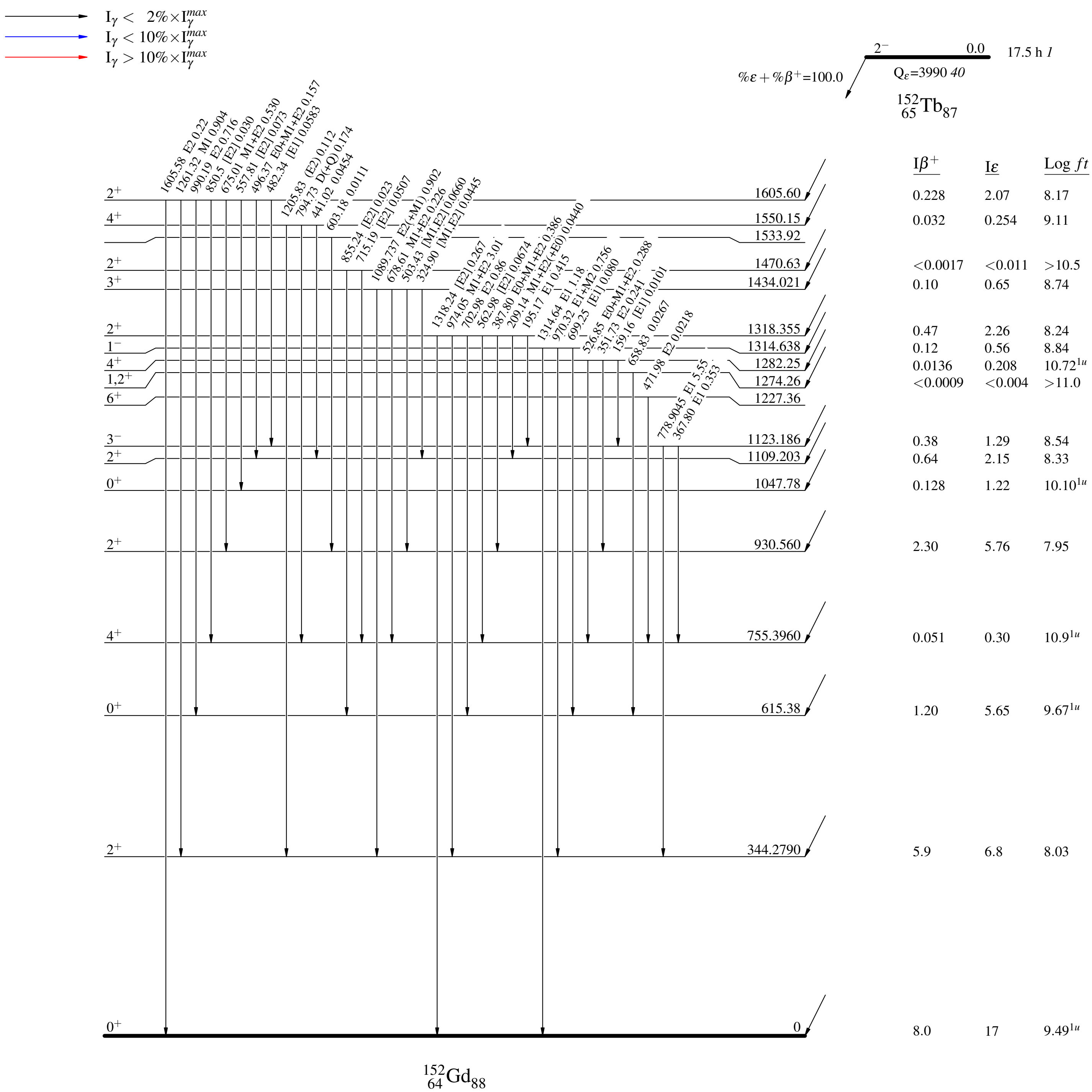


^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

Legend



^{152}Tb ε decay (17.5 h) 2004AdZZ,2003Ad25,1970Ad05

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays