^{156}Tb ε decay (5.35 d) 1970Fu06,1980Iw04,1971Mc13

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich	NDS 113, 2537 (2012)	1-Mar-2012

Parent: ^{156}Tb: E=0; J$^{\pi}$=3$^-$; $T_{1/2}$=5.35 d *10*; Q(ε)=2444 *4*; %ε+%β^+ decay=100.0
^{156}Tb-J$^{\pi}$: Additional information 2.
^{156}Tb-$T_{1/2}$: Additional information 3.
^{156}Tb-Q(ε): Additional information 4.
Additional information 5.
1970Fu06: ^{156}Tb from ^{157}Gd(p,2n), with E(p)=15 MeV. Enriched (93.7%) target. Chemical separation. ce measured in magnetic spectrometer. Report 114 Eγ, 41 multipolarities, and 5 δ.
1980Iw04: ^{156}Tb from ^{156}Gd(p,n). Enriched target. γ's measured using Ge detector. Report 104 Iγ. No Eγ.
1971Mc13: ^{156}Tb from ^{156}Gd(p,n), with E(p)=12 MeV. Enriched (97.01%) target, chemical separation. γ singles and $\gamma\gamma$ coincidences measured using Ge and NaI detectors. Report 103 Eγ and Iγ.
There are many studies of this decay including 1957Mi67, 1959Ha08, 1959He44, 1959Of11, 1961Ha23, 1961St15, 1962Lo01, 1967Ke15, 1968We17, 1970Fu06, 1970Pe10, 1971Fu12, 1971Mc01, 1971Mc13, 1972Ha29, 1975Ul01, 1979Ri17, 1980Iw04, and 1983Li06.

^{156}Gd Levels

The coincidence data on the drawings are from 1967Ke15 and 1971Mc13.
1995GrZZ, from resonance-averaged (n,γ) data, report the population, in the ^{156}Tb ε decay, of the following levels and J$^{\pi}$ values: 1970.43, 3$^-$; 1995.12, 4$^-$; 2010.35, 4$^+$; 2024.94, 3$^-$; 2139.84, 3$^+$; 2227.62, 3$^-$; and 2265.75, 3$^+$. No decay modes are given for these levels. The evaluator has chosen not to include them here.

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$[#]	Comments
0[&]	0$^+$	stable	
88.967[&] *2*	2$^+$	2.21 ns *3*	$T_{1/2}$: Weighted average of 2.19 ns *7* (1959Be57), 2.16 ns *6* (1963Fo02), 2.21 ns *6* (1968Ku03), and 2.25 ns *5* (1968Wa08). Other: 1.9 ns 1 (1958Na01).
288.20[&] *4*	4$^+$	110.5 ps *21*	$T_{1/2}$: Weighted average of 100 ps *20* (1959Of11), 118 ps *7* (1968Ku03), 115 ps *3* (1968Wa08), and 108 ps *2* (1990Sc10). Other: < 200 ps (1959Be57).
584.76[&] *5*	6$^+$		
1129.38[a] *6*	2$^+$		
1154.13[b] *5*	2$^+$		
1242.38[d] *8*	1$^-$		
1248.00[b] *5*	3$^+$		
1257.99[c] *7*	2$^+$		
1276.10[d] *6*	3$^-$		
1297.78[a] *6*	4$^+$		
1319.60[d] *8*	2$^-$		
1355.39[b] *4*	4$^+$		
1366.6[f] *4*	1$^-$		
1408[@d]	5$^-$		
1462.22[c] *8*	4$^+$		
1468.48[d] *10*	4$^-$		
1506.83[b] *5*	5$^+$		
1510.53[e] *4*	4$^+$	189 ps *5*	$T_{1/2}$: Weighted average of 188 ps *10* (1959Be57), 190 ps *11* (1968Ku03), and 190 ps *6* (1968Wa08).
1538.76[f] *11*	3$^-$		
1622.46[e] *5*	5$^+$		

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^{156}Tb ε decay (5.35 d) 1970Fu06,1980Iw04,1971Mc13 (continued)

^{156}Gd Levels (continued)

E(level)[†]	Jπ[‡]	Comments
1780.41[@g] *11*	2⁻	
1827.74[@] *11*	2⁺	
1851.79[g] *6*	3⁻	
1860.94[@] *7*	4⁺	
1934.2 *4*	2⁻	E(level): Level proposed by the evaluator based on the properties of the deexciting γ′s observed in the ^{156}Gd(n,γ) reaction. Some of the γ′s deexciting this level are proposed to deexcite the other 1934 level as well (i.e., the corresponding γ peaks are composite). These γ′s were not included in the least-squares fit to determine this level energy. Only the 567.6 γ was used in the least-squares fit for this level energy.
1934.29 *6*	3⁻	E(level): See the comment for the other 1934 level. Only the 578.9, 676.1 and 1646.2 γ′s were used in the least-squares fit for this level energy.
1952.26[g] *5*	4⁻	
1965.00[@] *11*	4⁻	
2029.6?[@] *3*	4⁻	
2044.78 *5*	4⁻	
2103.25 *5*	3⁻	
2120?[@]	2⁻	
2175.04 *6*	4	
2181.49 *22*	2⁺	
2232.47 *11*	4⁻	

† From least-squares fit to γ energies.

‡ From ^{156}Gd Adopted Levels.

From ^{156}Tb decay experiments only; all values are given in the ^{156}Gd Adopted Levels.

@ Using data from the ^{155}Gd(n,γ) reactions, 1995GrZW propose the placement of several previously unplaced γ′s, which involves the introduction into the decay scheme of several levels, known from other studies but not earlier reported to be populated in the ^{156}Tb ε decay. Where decay modes are reported for these levels, they are included here.

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

a Band(B): First excited $K^\pi=0^+$ band.

b Band(C): $K^\pi=2^+$ γ-vibrational band.

c Band(D): $K^\pi=0^+$ band.

d Band(E): $K^\pi=1^-$ Octupole-vibrational band.

e Band(F): $K^\pi=4^+$ band. Dominant conf=π5/2[413]+π3/2[411].

f Band(G): $K^\pi=0^-$ Octupole-vibrational band.

g Band(H): $K^\pi=2^-$ Octupole-vibrational band.

ε,β⁺ radiations

E(decay)	E(level)	Iε[‡]	Log *ft*	I(ε+β⁺)[†‡]	Comments
(212 *4*)	2232.47	0.119 *18*	8.00 *7*	0.119 *18*	εK=0.7700 *20*; εL=0.1760 *14*; εM+=0.0540 *5*
(269 *4*)	2175.04	0.74 *8*	7.46 *5*	0.74 *8*	εK=0.7896 *11*; εL=0.1615 *8*; εM+=0.0489 *3*
(341 *4*)	2103.25	4.3 *5*	6.93 *6*	4.3 *5*	εK=0.8032; εL=0.1515 *5*; εM+=0.04537 *15*
(399 *4*)	2044.78	75 *8*	5.85 *5*	75 *8*	εK=0.8100; εL=0.1464 *3*; εM+=0.04359 *11*
(492 *4*)	1952.26	0.23 *3*	8.56 *6*	0.23 *3*	εK=0.8171; εL=0.14110 *19*; εM+=0.04176 *7*
(510 *4*)	1934.29	12.0 *12*	6.88 *5*	12.0 *12*	εK=0.8182; εL=0.14033 *17*; εM+=0.04149 *6*
(510 *4*)	1934.2	0.108 *13*	8.92 *6*	0.108 *13*	εK=0.8182; εL=0.14032 *17*; εM+=0.04149 *6*
(592 *4*)	1851.79	0.51 *6*	8.39 *6*	0.51 *6*	εK=0.8221; εL=0.1374; εM+=0.04049 *5*
(664 *4*)	1780.41	0.28 *3*	8.76 *5*	0.28 *3*	εK=0.8246; εL=0.1356; εM+=0.03984
(976 *4*)	1468.48	0.108 *14*	9.52 *6*	0.108 *14*	εK=0.8310; εL=0.1308; εM+=0.03820

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^{156}Tb ε decay (5.35 d) 1970Fu06,1980Iw04,1971Mc13 (continued)

ε,β^+ radiations (continued)

E(decay)	E(level)	Iε‡	Log *ft*	I(ε+β^+)†‡	Comments
(982 *4*)	1462.22	0.199 *25*	9.26 *6*	0.199 *25*	εK=0.8311; εL=0.1307; εM+=0.03818
(1089 *4*)	1355.39	0.31 *21*	9.2 *3*	0.31 *21*	εK=0.8324; εL=0.1298; εM+=0.03785
(1124 *4*)	1319.60	0.55 *6*	8.94 *5*	0.55 *6*	εK=0.8327; εL=0.1295; εM+=0.03775
(1168 *4*)	1276.10	0.66 *7*	8.90 *5*	0.66 *7*	εK=0.8332; εL=0.1292; εM+=0.03764
(1196 *4*)	1248.00	1.3 *4*	8.63 *14*	1.3 *4*	εK=0.8334; εL=0.1290; εM+=0.03758
(1290 *4*)	1154.13	3.1 *4*	8.32 *6*	3.1 *4*	εK=0.8340; εL=0.1284; εM+=0.03738

† Since ΔJ=3, the g.s. ε branch has been assumed to be negligible. Values for the excited levels are from γ-intensity balances and their accuracy is limited by the incompleteness of the decay scheme. There are several unplaced γ′s with Iγ of 0.03 to 0.3%. So, computed Iε+Iβ^+ values<0.10% are not included, and such values smaller than≈0.3% should be regarded with caution.

‡ Absolute intensity per 100 decays.

γ(^{156}Gd)

Iγ normalization, I(γ+ce) normalization: Normalized to give 100% feeding of the ground state with negligible ε+β^+ to ground state since ΔJ=3.

Iγ normalization, I(γ+ce) normalization: Additional information 1.

There are several γ′s reported by 1961Ha23 from ce data that have not been verified in later measurements and, therefore, are not included in the table. These are at 170.8, 943.4, 2090, 2105, 2140, 2268, 2281, and 2310 keV.

γ′s reported by 1970Fu06 as "questionable assignment" and not reported by 1971Mc13 or 1980Iw04 are not included in the table. These are at 499.69, 956.28, 725.78, and 1073.69 keV.

In comparing with these data, above 1870 keV the Eγ of 1967Ke15 must be increased by 1 to 3 keV.

E_γ[†]	I_γ[‡e]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[f]	Comments
88.97 2	57 6	88.967	2+	0	0+	E2		3.88	α(K)=1.559 22; α(L)=1.79 3; α(M)=0.422 6; α(N+..)=0.1066 15 α(N)=0.0942 14; α(O)=0.01229 18; α(P)=7.64×10^{-5} 11 α(L1)exp/α(L3)exp=0.175 4 (1970Fu06); α(L2)exp/α(L3)exp=0.958 10 (1970Fu06)
111.93 3	4.8 5	1622.46	5+	1510.53	4+	M1+E2	0.29 1	1.475	α(K)=1.203 17; α(L)=0.212 4; α(M)=0.0470 9; α(N+..)=0.01244 22 α(N)=0.01075 20; α(O)=0.00161 3; α(P)=8.81×10^{-5} 13
115.61 3	0.17 4	1622.46	5+	1506.83	5+	M1+E2	0.22 2	1.337	α(K)=1.108 16; α(L)=0.179 4; α(M)=0.0394 10; α(N+..)=0.01049 24 α(N)=0.00904 22; α(O)=0.00137 3; α(P)=8.17×10^{-5} 12
155.15 3	5.1 4	1510.53	4+	1355.39	4+	M1+E2	0.48 2	0.569	α(K)=0.460 7; α(L)=0.0852 16; α(M)=0.0189 4; α(N+..)=0.00499 10 α(N)=0.00432 9; α(O)=0.000640 11; α(P)=3.30×10^{-5} 6
199.19 4	132 7	288.20	4+	88.967	2+	E2		0.225	α(K)=0.1566 22; α(L)=0.0531 8; α(M)=0.01225 18; α(N+..)=0.00314 5 α(N)=0.00275 4; α(O)=0.000378 6; α(P)=8.98×10^{-6} 13 α(L1)exp/α(L3)exp=0.972 19 (1970Fu06); α(L2)exp/α(L3)exp=1.187 22 (1970Fu06)
201.25 4		1355.39	4+	1154.13	2+	[E2]			I_γ: From I(ce(K))=0.0032 (1970Fu06) and E2 multipolarity deduced from the J^π, Iγ=0.021.
212.74 4	0.13 3	1510.53	4+	1297.78	4+	M1+E2	0.49 4	0.230	α(K)=0.190 4; α(L)=0.0314 6; α(M)=0.00692 13; α(N+..)=0.00184 4 α(N)=0.00158 3; α(O)=0.000239 4; α(P)=1.37×10^{-5} 3
[x]249.2[&] 4	0.07 2								
262.54 4	18.6 9	1510.53	4+	1248.00	3+	E2+M1	+8.4 10	0.0921	α(K)=0.0689 10; α(L)=0.0180 3; α(M)=0.00411 6; α(N+..)=0.001062 15 α(N)=0.000927 13; α(O)=0.0001304 19; α(P)=4.22×10^{-6} 7 α(L1)exp/α(L3)exp=1.73 3; α(L2)exp/α(L3)exp=1.37 3
267.07 4	0.22 9	1622.46	5+	1355.39	4+	E2		0.0866	α(K)=0.0648 9; α(L)=0.01693 24; α(M)=0.00386 6; α(N+..)=0.000997 14 α(N)=0.000870 13; α(O)=0.0001224 18; α(P)=3.97×10^{-6} 6
296.49 4	14.40 9	584.76	6+	288.20	4+	E2		0.0625	α(K)=0.0477 7; α(L)=0.01151 17; α(M)=0.00261 4; α(N+..)=0.000677 10 α(N)=0.000590 9; α(O)=8.38×10^{-5} 12; α(P)=2.97×10^{-6} 5
350.41[b] 5		1860.94	4+	1510.53	4+				
356.38 5	43.91 21	1510.53	4+	1154.13	2+	E2		0.0359	α(K)=0.0281 4; α(L)=0.00602 9; α(M)=0.001354 19; α(N+..)=0.000353 5 α(N)=0.000307 5; α(O)=4.42×10^{-5} 7; α(P)=1.81×10^{-6} 3
374.46 5	0.16 3	1622.46	5+	1248.00	3+	E2		0.0310	α(K)=0.0245 4; α(L)=0.00509 8; α(M)=0.001143 16; α(N+..)=0.000298 5 α(N)=0.000259 4; α(O)=3.75×10^{-5} 6; α(P)=1.589×10^{-6} 23

γ(^{156}Gd) (continued)

E$_\gamma$[†]	I$_\gamma$[‡e]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[#]	α[f]	Comments
381.10 5	2.14 4	1510.53	4$^+$	1129.38	2$^+$	E2	0.0295	α(K)=0.0234 4; α(L)=0.00480 7; α(M)=0.001077 15; α(N+..)=0.000281 4 α(N)=0.000244 4; α(O)=3.54×10^{-5} 5; α(P)=1.517×10^{-6} 22 I$_\gamma$: I(ce(K))=0.0033 (1970Fu06) and I(ce(L))=0.0004.
^{x}395.41 5								
407.1[&bh] 3	0.20 3	2029.6?	4$^-$	1622.46	5$^+$	E1	0.00757	α(K)=0.00645 9; α(L)=0.000879 13; α(M)=0.000190 3; α(N+..)=5.04×10^{-5} 8 α(N)=4.34×10^{-5} 7; α(O)=6.63×10^{-6} 10; α(P)=4.20×10^{-7} 6
422.34 6	25.66 13	2044.78	4$^-$	1622.46	5$^+$	E1	0.00694	α(K)=0.00592 9; α(L)=0.000805 12; α(M)=0.0001735 25; α(N+..)=4.62×10^{-5} 7 α(N)=3.97×10^{-5} 6; α(O)=6.08×10^{-6} 9; α(P)=3.86×10^{-7} 6
445.45 5	0.16 3	1952.26	4$^-$	1506.83	5$^+$	E1	0.00613	α(K)=0.00523 8; α(L)=0.000710 10; α(M)=0.0001529 22; α(N+..)=4.07×10^{-5} 6 α(N)=3.50×10^{-5} 5; α(O)=5.36×10^{-6} 8; α(P)=3.42×10^{-7} 5
496.37 6	0.25 3	1851.79	3$^-$	1355.39	4$^+$	E1	0.00479	α(K)=0.00409 6; α(L)=0.000552 8; α(M)=0.0001188 17; α(N+..)=3.17×10^{-5} 5 α(N)=2.72×10^{-5} 4; α(O)=4.18×10^{-6} 6; α(P)=2.69×10^{-7} 4
^{x}526.80 6	0.041 25							1995GrZW place this γ from a 1995 level, possibly from considerations of the (n,γ) data. However, Iγ(697.7γ) in the (n,γ) γ spectrum is already smaller than expected, based on comparison of the Iγ values in this and the ε-decay spectra. The evaluator has chosen to show this γ as still unplaced and the 1995 level as not observably populated in the ε decay.
534.29 6	214.8 9	2044.78	4$^-$	1510.53	4$^+$	E1	0.00407	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
537.98 6	0.627 23	2044.78	4$^-$	1506.83	5$^+$	E1	0.00400	α(K)=0.00342 5; α(L)=0.000459 7; α(M)=9.89×10^{-5} 14; α(N+..)=2.64×10^{-5} 4 α(N)=2.27×10^{-5} 4; α(O)=3.48×10^{-6} 5; α(P)=2.26×10^{-7} 4
567.61 6	0.071 23	1934.2	2$^-$	1366.6	1$^-$	M1	0.0183	α(K)=0.01560 22; α(L)=0.00216 3; α(M)=0.000467 7; α(N+..)=0.0001253 18 α(N)=0.0001074 15; α(O)=1.672×10^{-5} 24; α(P)=1.139×10^{-6} 16 E$_\gamma$: Previously placed from the other 1934 level (3$^-$). Mult.: From (n,γ). From ε decay, mult=E2 (1972Ha29).
^{x}576.2[@]	0.143 24							
578.91 6	1.44 3	1934.29	3$^-$	1355.39	4$^+$	E1	0.00341	α(K)=0.00291 4; α(L)=0.000390 6; α(M)=8.40×10^{-5} 12; α(N+..)=2.24×10^{-5} 4 α(N)=1.93×10^{-5} 3; α(O)=2.96×10^{-6} 5; α(P)=1.93×10^{-7} 3
^{x}582.6[@]	0.187 24							
582.6	0.187 24	2044.78	4$^-$	1462.22	4$^+$			
592.60 10	0.110 24	2103.25	3$^-$	1510.53	4$^+$	E1	0.00324	α(K)=0.00277 4; α(L)=0.000371 6; α(M)=7.98×10^{-5} 12; α(N+..)=2.13×10^{-5} 3 α(N)=1.83×10^{-5} 3; α(O)=2.82×10^{-6} 4; α(P)=1.84×10^{-7} 3
596.81 6	0.130 24	1952.26	4$^-$	1355.39	4$^+$	E1	0.00319	α(K)=0.00273 4; α(L)=0.000365 6; α(M)=7.86×10^{-5} 11; α(N+..)=2.10×10^{-5} 3 α(N)=1.80×10^{-5} 3; α(O)=2.77×10^{-6} 4; α(P)=1.81×10^{-7} 3
603.75 10	0.350 25	1851.79	3$^-$	1248.00	3$^+$	E1	0.00312	α(K)=0.00266 4; α(L)=0.000356 5; α(M)=7.66×10^{-5} 11; α(N+..)=2.04×10^{-5} 3 α(N)=1.756×10^{-5} 25; α(O)=2.70×10^{-6} 4; α(P)=1.767×10^{-7} 25
609.47 10	0.077 24	1851.79	3$^-$	1242.38	1$^-$	E2	0.00843	α(K)=0.00696 10; α(L)=0.001153 17; α(M)=0.000254 4; α(N+..)=6.71×10^{-5} 10 α(N)=5.80×10^{-5} 9; α(O)=8.68×10^{-6} 13; α(P)=4.74×10^{-7} 7
614.63[g] 10	0.139[gd] 3	1934.2	2$^-$	1319.60	2$^-$	M1	0.01503	α(K)=0.01278 18; α(L)=0.001762 25; α(M)=0.000381 6; α(N+..)=0.0001023 15 α(N)=8.77×10^{-5} 13; α(O)=1.366×10^{-5} 20; α(P)=9.32×10^{-7} 13 I$_\gamma$: Iγ value of the composite peak is 0.657 26.
614.63[g] 10	0.52[gd] 3	1934.29	3$^-$	1319.60	2$^-$	M1	0.01503	α(K)=0.01278 18; α(L)=0.001762 25; α(M)=0.000381 6; α(N+..)=0.0001023 15 α(N)=8.77×10^{-5} 13; α(O)=1.366×10^{-5} 20; α(P)=9.32×10^{-7} 13

$^{156}_{64}$Gd$_{92}$-5

γ(^{156}Gd) (continued)

E_γ[†]	I_γ[‡e]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	α[f]	Comments
626.28[b] 10	0.893 27	1780.41	2⁻	1154.13	2⁺			
[x]629.10 10								E_γ: Previously placed from a 1948.94 level. Some of the γ′s proposed to deexcite this level are now placed elsewhere in the decay scheme; and this level is not reported in the resonance-averaged (n,γ) reactions. It is believed that this level does not exist, leaving this γ unplaced.
632.67 10	0.040 6	1952.26	4⁻	1319.60	2⁻	E2	0.00770	α(K)=0.00637 9; α(L)=0.001041 15; α(M)=0.000229 4; α(N+..)=6.06×10⁻⁵ 9 α(N)=5.23×10⁻⁵ 8; α(O)=7.85×10⁻⁶ 11; α(P)=4.34×10⁻⁷ 6 I_γ: From Iγ(632γ)/Iγ(704γ) in (n,γ) and Iγ(704γ). From Ice(K)=0.00029 (1970Fu06) and mult=E2, Iγ=0.053.
[x]634[a]	0.05[a] 2							
636.31[b] 10		2175.04	4	1538.76	3⁻			Previously placed from the 1934, 3⁻ level.
641.01 10	0.228 26	2103.25	3⁻	1462.22	4⁺	E1	0.00274	α(K)=0.00235 4; α(L)=0.000313 5; α(M)=6.73×10⁻⁵ 10; α(N+..)=1.80×10⁻⁵ 3 α(N)=1.542×10⁻⁵ 22; α(O)=2.38×10⁻⁶ 4; α(P)=1.560×10⁻⁷ 22
[x]651.10 10	0.04[c] 2							E_γ: See the comment on the 629.10 γ.
658.12[g] 10	≤0.015[gd]	1934.2	2⁻	1276.10	3⁻	M1	0.01268	α(K)=0.01079 16; α(L)=0.001483 21; α(M)=0.000321 5; α(N+..)=8.61×10⁻⁵ 12 α(N)=7.38×10⁻⁵ 11; α(O)=1.150×10⁻⁵ 17; α(P)=7.85×10⁻⁷ 11
658.12[g] 10	0.56[gd] 3	1934.29	3⁻	1276.10	3⁻	M1	0.01268	α(K)=0.01079 16; α(L)=0.001483 21; α(M)=0.000321 5; α(N+..)=8.61×10⁻⁵ 12 α(N)=7.38×10⁻⁵ 11; α(O)=1.150×10⁻⁵ 17; α(P)=7.85×10⁻⁷ 11 I_γ: Total intensity of this peak is 0.578 27.
668.17 10	0.229 27	2175.04	4	1506.83	5⁺	M1+E2	0.009 3	α(K)=0.0080 24; α(L)=0.0012 3; α(M)=0.00025 6; α(N+..)=6.8×10⁻⁵ 16 α(N)=5.8×10⁻⁵ 13; α(O)=8.9×10⁻⁶ 22; α(P)=5.7×10⁻⁷ 19
673.60[b] 10	0.082 27	1827.74	2⁺	1154.13	2⁺			
676.13[g] 10	0.47[g] 7	1934.29	3⁻	1257.99	2⁺	[E1]	0.00246	α(K)=0.00210 3; α(L)=0.000279 4; α(M)=6.00×10⁻⁵ 9; α(N+..)=1.603×10⁻⁵ 23 α(N)=1.377×10⁻⁵ 20; α(O)=2.12×10⁻⁶ 3; α(P)=1.398×10⁻⁷ 20 I_γ: Iγ=0.484 for the doublet. The split in intensity of the peak between this level and the 1952.2 level was deduced by the evaluator from the Iγ values of the 676, 704 and 1646 γ′s in the ^{156}Tb ε decay and the (n,γ) reaction.
676.13[g] 10	0.012[g] 3	1952.26	4⁻	1276.10	3⁻	[M1,E2]	0.009 3	α(K)=0.0078 24; α(L)=0.0011 3; α(M)=0.00025 6; α(N+..)=6.6×10⁻⁵ 15 α(N)=5.6×10⁻⁵ 13; α(O)=8.7×10⁻⁶ 21; α(P)=5.5×10⁻⁷ 18 I_γ: Iγ=0.484 28 for the doublet. The split in the peak′s intensity between this level and the 1934, 3⁻ level was deduced by the evaluator from the Iγ values of the 676, 704 and 1646 γ′s in the ^{156}Tb ε decay and the (n,γ) reaction.
686.31[g] 10	0.003[gd] 1	1934.2	2⁻	1248.00	3⁺	E1	0.00238	α(K)=0.00204 3; α(L)=0.000270 4; α(M)=5.82×10⁻⁵ 9; α(N+..)=1.553×10⁻⁵ 22 α(N)=1.334×10⁻⁵ 19; α(O)=2.06×10⁻⁶ 3; α(P)=1.357×10⁻⁷ 19
686.31[g] 10	1.39[gd] 3	1934.29	3⁻	1248.00	3⁺	E1	0.00238	α(K)=0.00204 3; α(L)=0.000270 4; α(M)=5.82×10⁻⁵ 9; α(N+..)=1.553×10⁻⁵ 22 α(N)=1.334×10⁻⁵ 19; α(O)=2.06×10⁻⁶ 3; α(P)=1.357×10⁻⁷ 19 I_γ: Total intensity of this peak=1.39 3.
689.40 10	0.542 29	2044.78	4⁻	1355.39	4⁺	E1	0.00236	α(K)=0.00202 3; α(L)=0.000268 4; α(M)=5.76×10⁻⁵ 8; α(N+..)=1.538×10⁻⁵ 22 α(N)=1.321×10⁻⁵ 19; α(O)=2.04×10⁻⁶ 3; α(P)=1.344×10⁻⁷ 19
691.81[g] 10	0.009[gd] 2	1934.2	2⁻	1242.38	1⁻	E2	0.00622	α(K)=0.00517 8; α(L)=0.000821 12; α(M)=0.000180 3; α(N+..)=4.78×10⁻⁵ 7 α(N)=4.12×10⁻⁵ 6; α(O)=6.21×10⁻⁶ 9; α(P)=3.55×10⁻⁷ 5

$^{156}_{64}$Gd$_{92}$-6

γ(^{156}Gd) (continued)

E_γ[†]	I_γ[‡e]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	α[f]	Comments
691.81[g] 10	0.68[gd] 3	1934.29	3^-	1242.38	1^-	E2	0.00622	α(K)=0.00517 8; α(L)=0.000821 12; α(M)=0.000180 3; α(N+..)=4.78×10^{-5} 7 α(N)=4.12×10^{-5} 6; α(O)=6.21×10^{-6} 9; α(P)=3.55×10^{-7} 5 I_γ: Total intensity of this peak=0.687 29.
697.71 10	0.451 29	1851.79	3^-	1154.13	2^+	E1	0.00230	α(K)=0.00197 3; α(L)=0.000261 4; α(M)=5.62×10^{-5} 8; α(N+..)=1.500×10^{-5} 21 α(N)=1.288×10^{-5} 18; α(O)=1.99×10^{-6} 3; α(P)=1.312×10^{-7} 19
704.32 10	0.429 29	1952.26	4^-	1248.00	3^+	E1	0.00226	α(K)=0.00193 3; α(L)=0.000256 4; α(M)=5.51×10^{-5} 8; α(N+..)=1.471×10^{-5} 21 α(N)=1.263×10^{-5} 18; α(O)=1.95×10^{-6} 3; α(P)=1.287×10^{-7} 18
706.55[b] 10		2175.04	4	1468.48	4^-			E_γ: Previously placed from a 1948.9 level. This level, however, is no longer believed to exist. I_γ: Note that, from Ice(K)=0.0012 (1970Fu06) and an M1,E2 multipolarity deduced from the associated J^π values, Iγ is expected to be 0.17 units. A γ of that intensity should have been seen.
716.99[b] 10	0.28 3	1965.00	4^-	1248.00	3^+	E1	0.00218	α(K)=0.00186 3; α(L)=0.000247 4; α(M)=5.31×10^{-5} 8; α(N+..)=1.417×10^{-5} 20 α(N)=1.217×10^{-5} 17; α(O)=1.88×10^{-6} 3; α(P)=1.242×10^{-7} 18
[x]736.80 10	0.07 3							
747.82 10	0.87 3	2103.25	3^-	1355.39	4^+	E1	0.00200	α(K)=0.001710 24; α(L)=0.000226 4; α(M)=4.86×10^{-5} 7; α(N+..)=1.299×10^{-5} 19 α(N)=1.115×10^{-5} 16; α(O)=1.722×10^{-6} 25; α(P)=1.142×10^{-7} 16
766.83[b] 10	0.08 3	2175.04	4	1408	5^-			
770.57 10	0.08 3	1355.39	4^+	584.76	6^+	[E2]	0.00485	α(K)=0.00406 6; α(L)=0.000624 9; α(M)=0.0001364 20; α(N+..)=3.62×10^{-5} 5 α(N)=3.12×10^{-5} 5; α(O)=4.73×10^{-6} 7; α(P)=2.79×10^{-7} 4
780.08[g] 10	0.073[gd] 7	1934.2	2^-	1154.13	2^+	E1	0.00184	α(K)=0.001571 22; α(L)=0.000207 3; α(M)=4.46×10^{-5} 7; α(N+..)=1.191×10^{-5} 17 α(N)=1.023×10^{-5} 15; α(O)=1.580×10^{-6} 23; α(P)=1.050×10^{-7} 15 Mult.: From (n,γ). From ^{156}Tb ε decay, mult=(E1).
780.08[g] 10	7.50[gd] 5	1934.29	3^-	1154.13	2^+	E1	0.00184	α(K)=0.001571 22; α(L)=0.000207 3; α(M)=4.46×10^{-5} 7; α(N+..)=1.191×10^{-5} 17 α(N)=1.023×10^{-5} 15; α(O)=1.580×10^{-6} 23; α(P)=1.050×10^{-7} 15 I_γ: Total intensity of this peak=7.57 5. Mult.: From (n,γ). From ^{156}Tb ε decay, mult=(E1).
783.69 10	0.25 3	2103.25	3^-	1319.60	2^-	[M1,E2]	0.0065 18	α(K)=0.0055 16; α(L)=0.00078 19; α(M)=0.00017 4; α(N+..)=4.5×10^{-5} 11 α(N)=3.9×10^{-5} 9; α(O)=6.0×10^{-6} 15; α(P)=3.9×10^{-7} 12
796.56 10	0.053 19	2044.78	4^-	1248.00	3^+	E1	0.00176	α(K)=0.001507 22; α(L)=0.000199 3; α(M)=4.27×10^{-5} 6; α(N+..)=1.142×10^{-5} 16 α(N)=9.80×10^{-6} 14; α(O)=1.515×10^{-6} 22; α(P)=1.008×10^{-7} 15
804.82[g] 10	0.006[gd] 1	1934.2	2^-	1129.38	2^+	E1	0.00172	α(K)=0.001477 21; α(L)=0.000195 3; α(M)=4.18×10^{-5} 6; α(N+..)=1.118×10^{-5} 16 α(N)=9.60×10^{-6} 14; α(O)=1.484×10^{-6} 21; α(P)=9.88×10^{-8} 14
804.82[g] 10	0.74[gd] 3	1934.29	3^-	1129.38	2^+	E1	0.00172	α(K)=0.001477 21; α(L)=0.000195 3; α(M)=4.18×10^{-5} 6; α(N+..)=1.118×10^{-5} 16

γ(^{156}Gd) (continued)

E_γ[†]	I_γ[‡e]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	δ[#]	α[f]	Comments
									α(N)=9.60×10^{-6} *14*; α(O)=1.484×10^{-6} *21*; α(P)=9.88×10^{-8} *14* I_γ: Total intensity of this peak=0.75 *3*.
[x]816.19 *10*	0.15 *3*								
819.72[b] *10*	0.10 *3*	2175.04	4	1355.39	4$^+$				E_γ: Previously placed from a 1948.9 level. This level, however, is no longer believed to exist.
827.11 *10*	0.13 *4*	2103.25	3$^-$	1276.10	3$^-$	M1(+E2)		0.0057 *16*	α(K)=0.0048 *14*; α(L)=0.00068 *16*; α(M)=0.00015 *4*; α(N+..)=4.0×10^{-5} *10* α(N)=3.4×10^{-5} *8*; α(O)=5.2×10^{-6} *13*; α(P)=3.4×10^{-7} *11*
841.08 *10*	0.89 *4*	1129.38	2$^+$	288.20	4$^+$	E2		0.00399	α(K)=0.00335 *5*; α(L)=0.000503 *7*; α(M)=0.0001099 *16*; α(N+..)=2.92×10^{-5} *4* α(N)=2.52×10^{-5} *4*; α(O)=3.83×10^{-6} *6*; α(P)=2.31×10^{-7} *4*
[x]845.57 *10*	0.13 *4*								
855.24 *10*	0.89 *4*	2103.25	3$^-$	1248.00	3$^+$	E1		0.00153	α(K)=0.001311 *19*; α(L)=0.0001724 *25*; α(M)=3.70×10^{-5} *6*; α(N+..)=9.90×10^{-6} *14* α(N)=8.50×10^{-6} *12*; α(O)=1.315×10^{-6} *19*; α(P)=8.79×10^{-8} *13*
860.88 *10*	0.68 *4*	2103.25	3$^-$	1242.38	1$^-$	[E2]		0.00379	α(K)=0.00318 *5*; α(L)=0.000476 *7*; α(M)=0.0001038 *15*; α(N+..)=2.76×10^{-5} *4* α(N)=2.38×10^{-5} *4*; α(O)=3.62×10^{-6} *5*; α(P)=2.20×10^{-7} *3*
865.77 *10*	1.30 *4*	1154.13	2$^+$	288.20	4$^+$	E2		0.00375	α(K)=0.00315 *5*; α(L)=0.000470 *7*; α(M)=0.0001024 *15*; α(N+..)=2.73×10^{-5} *4* α(N)=2.35×10^{-5} *4*; α(O)=3.57×10^{-6} *5*; α(P)=2.17×10^{-7} *3*
877.30[g] *10*	0.23[g] *2*	1462.22	4$^+$	584.76	6$^+$	E2		0.00364	α(K)=0.00306 *5*; α(L)=0.000455 *7*; α(M)=9.92×10^{-5} *14*; α(N+..)=2.64×10^{-5} *4* α(N)=2.27×10^{-5} *4*; α(O)=3.47×10^{-6} *5*; α(P)=2.11×10^{-7} *3* I_γ: Iγ=0.38 *4* for this peak. From the (n,γ) reaction, Iγ(877γ)/Iγ(1174γ)=0.42 *4*. Thus, the component from this level has Iγ=0.23 *2*.
877.30[gb] *10*	0.15[g] *5*	2175.04	4	1297.78	4$^+$				α(K)=0.0031; α(L)=0.0005 E_γ: This portion of the 877 γ peak was previously placed from the 2232 level. I_γ: For this peak, Iγ=0.38 *4*. 0.23 *2* units were apportioned to the other placement (the 1462 level), leaving 0.15 *5* units for this one.
898.83 *10*	0.09 *4*	2175.04	4	1276.10	3$^-$	M1(+E2)		0.0047 *13*	α(K)=0.0040 *11*; α(L)=0.00056 *13*; α(M)=0.00012 *3*; α(N+..)=3.2×10^{-5} *8* α(N)=2.8×10^{-5} *7*; α(O)=4.3×10^{-6} *11*; α(P)=2.8×10^{-7} *9*
921.93 *10*	0.39 *4*	1506.83	5$^+$	584.76	6$^+$	E2		0.00327	α(K)=0.00275 *4*; α(L)=0.000405 *6*; α(M)=8.82×10^{-5} *13*; α(N+..)=2.35×10^{-5} *4* α(N)=2.02×10^{-5} *3*; α(O)=3.09×10^{-6} *5*; α(P)=1.90×10^{-7} *3*
925.68 *10*	11.00 *11*	1510.53	4$^+$	584.76	6$^+$	E2+M3	+0.068 *8*	0.00336 *6*	α(K)=0.00283 *5*; α(L)=0.000418 *8*; α(M)=9.10×10^{-5} *16*; α(N+..)=2.43×10^{-5} *5* α(N)=2.09×10^{-5} *4*; α(O)=3.19×10^{-6} *6*; α(P)=1.97×10^{-7} *4*

γ(^{156}Gd) (continued)

Eγ[†]	Iγ[‡e]	E$_i$(level)	J^π_i	E$_f$	J^π_f	Mult.[#]	δ[#]	α[f]	Comments
926.98 *10*	1.52 *9*	2175.04	4	1248.00	3$^+$				
949.08 *10*	5.19 *5*	2103.25	3$^-$	1154.13	2$^+$	E1		0.00125	α(K)=0.001074 *15*; α(L)=0.0001406 *20*; α(M)=3.02×10^{-5} *5*; α(N+..)=8.08×10^{-6} *12* α(N)=6.93×10^{-6} *10*; α(O)=1.073×10^{-6} *15*; α(P)=7.21×10^{-8} *11*
959.66 *10*	6.33 *6*	1248.00	3$^+$	288.20	4$^+$	E2+M1	−12 *+3−5*	0.00302	α(K)=0.00254 *4*; α(L)=0.000371 *6*; α(M)=8.07×10^{-5} *12*; α(N+..)=2.15×10^{-5} *3* α(N)=1.85×10^{-5} *3*; α(O)=2.83×10^{-6} *4*; α(P)=1.76×10^{-7} *3*
969.70 *10*	0.39 *4*	1257.99	2$^+$	288.20	4$^+$	E2		0.00294	α(K)=0.00248 *4*; α(L)=0.000361 *5*; α(M)=7.84×10^{-5} *11*; α(N+..)=2.09×10^{-5} *3* α(N)=1.80×10^{-5} *3*; α(O)=2.75×10^{-6} *4*; α(P)=1.714×10^{-7} *24*
974.1[&] *3*	0.38 *4*	2103.25	3$^-$	1129.38	2$^+$	[E1]		0.00119	α(K)=0.001023 *15*; α(L)=0.0001337 *19*; α(M)=2.87×10^{-5} *4*; α(N+..)=7.68×10^{-6} *11* α(N)=6.59×10^{-6} *10*; α(O)=1.021×10^{-6} *15*; α(P)=6.87×10^{-8} *10* 1993Kl03, in (n,γ), place this γ from a 2216 level.
984.43 *10*	0.31 *4*	2232.47	4$^-$	1248.00	3$^+$	E1		0.00117	α(K)=0.001003 *14*; α(L)=0.0001310 *19*; α(M)=2.81×10^{-5} *4*; α(N+..)=7.53×10^{-6} *11* α(N)=6.46×10^{-6} *9*; α(O)=1.001×10^{-6} *14*; α(P)=6.74×10^{-8} *10*
987.76 *10*	0.92 *4*	1276.10	3$^-$	288.20	4$^+$	E1		0.00116	α(K)=0.000997 *14*; α(L)=0.0001302 *19*; α(M)=2.80×10^{-5} *4*; α(N+..)=7.48×10^{-6} *11* α(N)=6.42×10^{-6} *9*; α(O)=9.94×10^{-7} *14*; α(P)=6.70×10^{-8} *10*
1009.58 *15*	0.23 *4*	1297.78	4$^+$	288.20	4$^+$	E2+E0,M1		0.017 *2*	
^{x}1032[@]	0.10 *3*								
1037.76 *15*	3.37 *4*	1622.46	5$^+$	584.76	6$^+$	E2+M1	−7 *+3−21*	0.00258 *8*	α(K)=0.00218 *7*; α(L)=0.000313 *8*; α(M)=6.80×10^{-5} *18*; α(N+..)=1.81×10^{-5} *5* α(N)=1.56×10^{-5} *4*; α(O)=2.39×10^{-6} *7*; α(P)=1.51×10^{-7} *5*
1040.40 *15*	2.08 *4*	1129.38	2$^+$	88.967	2$^+$	E2+E0+M1	−5.9 *+14−28*	0.0143	α: Computed as α(K)exp×(α/α(K)).
1065.11 *14*	34.75 *16*	1154.13	2$^+$	88.967	2$^+$	E2+M1	−16 *5*	0.00242	α(K)=0.00205 *3*; α(L)=0.000293 *5*; α(M)=6.35×10^{-5} *9*; α(N+..)=1.695×10^{-5} *24* α(N)=1.458×10^{-5} *21*; α(O)=2.24×10^{-6} *4*; α(P)=1.419×10^{-7} *21*
1067.15 *15*	9.07 *8*	1355.39	4$^+$	288.20	4$^+$	E2+M1	−4.0 *+9−16*	0.00249 *7*	α(K)=0.00211 *6*; α(L)=0.000300 *7*; α(M)=6.52×10^{-5} *16*; α(N+..)=1.74×10^{-5} *5* α(N)=1.50×10^{-5} *4*; α(O)=2.30×10^{-6} *6*; α(P)=1.47×10^{-7} *4*
1120[@b]	0.084 *28*	1408	5$^-$	288.20	4$^+$				
1129.25 *15*	0.546 *29*	1129.38	2$^+$	0	0$^+$	E2		0.00214	α(K)=0.00182 *3*; α(L)=0.000257 *4*; α(M)=5.57×10^{-5} *8*; α(N+..)=1.574×10^{-5} *22* α(N)=1.279×10^{-5} *18*; α(O)=1.97×10^{-6} *3*; α(P)=1.259×10^{-7} *18*; α(IPF)=8.64×10^{-7} *13*

γ(^{156}Gd) (continued)

E_γ[†]	I_γ[‡e]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	δ[#]	α[f]	Comments
1153.5[@h]	0.76 *7*	1242.38	1$^-$	88.967	2$^+$	E1		8.83×10^{-4}	α(K)=0.000750 *11*; α(L)=9.74×10^{-5} *14*; α(M)=2.09×10^{-5} *3*; α(N+..)=1.506×10^{-5} *21* α(N)=4.80×10^{-6} *7*; α(O)=7.45×10^{-7} *11*; α(P)=5.05×10^{-8} *7*; α(IPF)=9.47×10^{-6} *14*
1154.07 *15*	33.46 *16*	1154.13	2$^+$	0	0$^+$	E2		0.00205	α(K)=0.001738 *25*; α(L)=0.000245 *4*; α(M)=5.31×10^{-5} *8*; α(N+..)=1.605×10^{-5} *23* α(N)=1.220×10^{-5} *17*; α(O)=1.88×10^{-6} *3*; α(P)=1.205×10^{-7} *17*; α(IPF)=1.86×10^{-6} *3*
1159.03 *15*	23.38 *11*	1248.00	3$^+$	88.967	2$^+$	E2+M1	−11.8 *+6−7*	0.00204	α(K)=0.001730 *25*; α(L)=0.000244 *4*; α(M)=5.29×10^{-5} *8*; α(N+..)=1.625×10^{-5} *23* α(N)=1.213×10^{-5} *17*; α(O)=1.87×10^{-6} *3*; α(P)=1.201×10^{-7} *17*; α(IPF)=2.14×10^{-6} *4*
1168.98 *15*	0.262 *28*	1257.99	2$^+$	88.967	2$^+$	E2+M1(+E0)	+0.38 *6*	0.0031 *8*	α: Computed as α(K)exp×(α/α(K)).
1174.27 *15*	0.546 *29*	1462.22	4$^+$	288.20	4$^+$	M1(+E2,E0)		0.0032	α: Computed as α(K)exp×(α/α(K)).
1180.27 *15*	0.349 *29*	1468.48	4$^-$	288.20	4$^+$	E1		8.56×10^{-4}	α(K)=0.000720 *10*; α(L)=9.34×10^{-5} *13*; α(M)=2.00×10^{-5} *3*; α(N+..)=2.26×10^{-5} *4* α(N)=4.60×10^{-6} *7*; α(O)=7.14×10^{-7} *10*; α(P)=4.85×10^{-8} *7*; α(IPF)=1.728×10^{-5} *25*
1187.08 *15*	2.03 *3*	1276.10	3$^-$	88.967	2$^+$	E1		8.50×10^{-4}	α(K)=0.000712 *10*; α(L)=9.24×10^{-5} *13*; α(M)=1.98×10^{-5} *3*; α(N+..)=2.50×10^{-5} *4* α(N)=4.55×10^{-6} *7*; α(O)=7.07×10^{-7} *10*; α(P)=4.80×10^{-8} *7*; α(IPF)=1.97×10^{-5} *3*
1208.7[&] *4*	0.179 *27*	1297.78	4$^+$	88.967	2$^+$	E2		0.00188	α(K)=0.001586 *23*; α(L)=0.000222 *4*; α(M)=4.81×10^{-5} *7*; α(N+..)=1.93×10^{-5} *3* α(N)=1.104×10^{-5} *16*; α(O)=1.700×10^{-6} *24*; α(P)=1.100×10^{-7} *16*; α(IPF)=6.48×10^{-6} *11*
1218.82 *15*	1.09 *8*	1506.83	5$^+$	288.20	4$^+$	E2		0.00185	α(K)=0.001560 *22*; α(L)=0.000218 *3*; α(M)=4.73×10^{-5} *7*; α(N+..)=2.03×10^{-5} *3* α(N)=1.085×10^{-5} *16*; α(O)=1.671×10^{-6} *24*; α(P)=1.082×10^{-7} *16*; α(IPF)=7.68×10^{-6} *11*
1222.44[&] *9*	100.0 *4*	1510.53	4$^+$	288.20	4$^+$	M1+E2	−1.7 *2*	0.00210 *6*	α(K)=0.00177 *5*; α(L)=0.000245 *7*; α(M)=5.30×10^{-5} *14*; α(N+..)=2.25×10^{-5} *5* α(N)=1.22×10^{-5} *4*; α(O)=1.88×10^{-6} *6*; α(P)=1.25×10^{-7} *4*; α(IPF)=8.36×10^{-6} *13*
1230.76 *15*	2.68 *3*	1319.60	2$^-$	88.967	2$^+$	E1		8.16×10^{-4}	α(K)=0.000668 *10*; α(L)=8.65×10^{-5} *13*; α(M)=1.86×10^{-5} *3*; α(N+..)=4.33×10^{-5} *6* α(N)=4.26×10^{-6} *6*; α(O)=6.62×10^{-7} *10*; α(P)=4.50×10^{-8} *7*; α(IPF)=3.83×10^{-5} *6*
[x]1235.67 *15*									I_γ: I(ce(K))=0.00023 (1970Fu06).
1242.52 *15*	0.727 *24*	1242.38	1$^-$	0	0$^+$	E1		8.09×10^{-4}	α(K)=0.000657 *10*; α(L)=8.51×10^{-5} *12*;

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γ(^{156}Gd) (continued)

E_γ †	I_γ ‡e	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	δ#	α f	Comments
									α(M)=1.82×10^{-5} *3*; α(N+..)=4.87×10^{-5} *7* α(N)=4.19×10^{-6} *6*; α(O)=6.51×10^{-7} *10*; α(P)=4.43×10^{-8} *7*; α(IPF)=4.38×10^{-5} *7*
1250.7& *5*	0.132 *22*	1538.76	3$^-$	288.20	4$^+$	E1		8.04×10^{-4}	α(K)=0.000649 *10*; α(L)=8.41×10^{-5} *12*; α(M)=1.80×10^{-5} *3*; α(N+..)=5.25×10^{-5} *8* α(N)=4.14×10^{-6} *6*; α(O)=6.43×10^{-7} *9*; α(P)=4.38×10^{-8} *7*; α(IPF)=4.77×10^{-5} *7*
1257.87 *15*	0.086 *22*	1257.99	2$^+$	0	0$^+$	E2		0.00174	α(K)=0.001466 *21*; α(L)=0.000204 *3*; α(M)=4.42×10^{-5} *7*; α(N+..)=2.49×10^{-5} *4* α(N)=1.014×10^{-5} *15*; α(O)=1.564×10^{-6} *22*; α(P)=1.017×10^{-7} *15*; α(IPF)=1.306×10^{-5} *19*
1266.60 *15*	3.46 *4*	1355.39	4$^+$	88.967	2$^+$	E2		0.00172	α(K)=0.001446 *21*; α(L)=0.000201 *3*; α(M)=4.35×10^{-5} *6*; α(N+..)=2.60×10^{-5} *4* α(N)=1.000×10^{-5} *14*; α(O)=1.541×10^{-6} *22*; α(P)=1.003×10^{-7} *14*; α(IPF)=1.440×10^{-5} *21*
1277.5& *5*	0.059 *25*	1366.6	1$^-$	88.967	2$^+$	E1		7.89×10^{-4}	α(K)=0.000625 *9*; α(L)=8.09×10^{-5} *12*; α(M)=1.735×10^{-5} *25*; α(N+..)=6.53×10^{-5} *10* α(N)=3.99×10^{-6} *6*; α(O)=6.19×10^{-7} *9*; α(P)=4.22×10^{-8} *6*; α(IPF)=6.07×10^{-5} *9*
1334.46 *15*	8.19 *6*	1622.46	5$^+$	288.20	4$^+$	E2+M1	−3.6 *3*	1.62×10^{-3} *3*	α(K)=0.001354 *21*; α(L)=0.000187 *3*; α(M)=4.03×10^{-5} *6*; α(N+..)=3.79×10^{-5} *6* α(N)=9.26×10^{-6} *14*; α(O)=1.431×10^{-6} *22*; α(P)=9.43×10^{-8} *15*; α(IPF)=2.72×10^{-5} *4*
1366.8& *6*	0.054 *14*	1366.6	1$^-$	0	0$^+$	E1		7.59×10^{-4}	α(K)=0.000556 *8*; α(L)=7.18×10^{-5} *10*; α(M)=1.539×10^{-5} *22*; α(N+..)=0.0001160 *17* α(N)=3.53×10^{-6} *5*; α(O)=5.49×10^{-7} *8*; α(P)=3.75×10^{-8} *6*; α(IPF)=0.0001118 *17*
1374.0& *7*	0.091 *21*	1462.22	4$^+$	88.967	2$^+$	E2		0.00149	α(K)=0.001235 *18*; α(L)=0.0001700 *24*; α(M)=3.67×10^{-5} *6*; α(N+..)=4.62×10^{-5} *7* α(N)=8.44×10^{-6} *12*; α(O)=1.303×10^{-6} *19*; α(P)=8.57×10^{-8} *12*; α(IPF)=3.64×10^{-5} *6*
1421.67& *9*	39.46 *17*	1510.53	4$^+$	88.967	2$^+$	E2		0.00141	α(K)=0.001157 *17*; α(L)=0.0001585 *23*; α(M)=3.43×10^{-5} *5*; α(N+..)=5.87×10^{-5} *9* α(N)=7.87×10^{-6} *11*; α(O)=1.216×10^{-6} *17*; α(P)=8.03×10^{-8} *12*; α(IPF)=4.96×10^{-5} *7*
1450.2& *4*	0.126 *20*	1538.76	3$^-$	88.967	2$^+$	E1		7.53×10^{-4}	α(K)=0.000649 *10*; α(L)=8.41×10^{-5} *12*; α(M)=1.80×10^{-5} *3*; α(N+..)=5.25×10^{-5} *8* α(N)=4.14×10^{-6} *6*; α(O)=6.43×10^{-7} *9*; α(P)=4.38×10^{-8} *7*; α(IPF)=4.77×10^{-5} *7*
1564.0& *4*	0.167 *22*	1851.79	3$^-$	288.20	4$^+$	[E1]			

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$\gamma(^{156}Gd)$ (continued)

E_γ[†]	I_γ[‡e]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	Comments
1646.24[&] *10*	12.20 *7*	1934.29	3⁻	288.20	4⁺	E1	
1739.1[&b] *6*	0.093 *14*	1827.74	2⁺	88.967	2⁺		
1763.1[&] *6*	0.335 *16*	1851.79	3⁻	88.967	2⁺	[E1]	
1815.32[&] *14*	1.357 *24*	2103.25	3⁻	288.20	4⁺	E1	
1845.45[g] *10*	0.030[gd] *5*	1934.2	2⁻	88.967	2⁺	E1	Mult.: From (n,γ). From ε decay, mult=(E1).
1845.45[g] *10*	13.3[gd] *1*	1934.29	3⁻	88.967	2⁺	E1	I_γ: Total intensity=13.28 *8* (1971Mc13). Mult.: From (n,γ). From ε decay, mult=(E1).
1887.4[&] *3*	0.209 *11*	2175.04	4	288.20	4⁺		
1893.4[&] *3*	0.131 *9*	2181.49	2⁺	288.20	4⁺		
1944.8[&] *4*	0.075 *7*	2232.47	4⁻	288.20	4⁺		
[x]1950.7							
[x]1987.4[&] *4*	0.041 *6*						
2014.45[&] *16*	3.62 *4*	2103.25	3⁻	88.967	2⁺	E1	
2031[@bh]	0.019 *5*	2120?	2⁻	88.967	2⁺		
[x]2051.2[&] *4*	0.054 *6*						
2092.4[&] *3*	0.148 *8*	2181.49	2⁺	88.967	2⁺		
2103.5[&h] *5*	0.015 *5*	2103.25	3⁻	0	0⁺	[E3]	
[x]2138.4 *5*	0.037 *5*						

[†] From 1970Fu06 unless otherwise noted. The only other extensive list of Eγ is given in 1971Mc13. The unplaced γ's are from 1970Fu06, 1971Mc13, and 1980Iw04.

[‡] From 1980Iw04 for γ's above 290 keV and 1971Mc13 below this energy. These are the only extensive lists of Iγ.

[#] From ^{156}Gd Adopted γ radiations and based on studies of this decay (1959Of11, 1961Ha23, 1962Lo01, 1967Ke15, 1968We17, 1970Fu06, 1970Pe10, 1971Mc01, 1972Ha29, 1975Ul01, 1976Ya11, 1979Ri17, 1981Mc06, 1983Li06), as well as studies of ^{156}Eu β^- decay, Coul. ex., and (HI,xnγ) and (n,γ) reactions.

[@] From 1980Iw04.

[&] From 1971Mc13.

[a] From 1971Mc13 and reported as probable doublet.

[b] Previously unplaced. Placement is that proposed by 1995GrZW, using data from the ^{155}Gd(n,γ) reaction.

[c] From 1971Mc13.

[d] Establishing the γ-decay patterns of the two 1934 levels (J^π=2⁻ and 3⁻) is problematic, in that a number of γ's are proposed to deexcite both of them. These levels are also populated in the (n,γ) reaction. In this evaluation, the evaluator has used the data from both the (n,γ) reaction and the ^{156}Tb ε decay to deduce the split in intensity of these γ's between these two levels. For the details of this analysis, see the discussion of this point in the ^{156}Gd(n,γ) E=th Data Set.

[e] For absolute intensity per 100 decays, multiply by 0.31 *3*.

[f] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies,

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$\gamma(^{156}Gd)$ (continued)

assigned multipolarities, and mixing ratios, unless otherwise specified.

[g] Multiply placed with intensity suitably divided.

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

[x] γ ray not placed in level scheme.

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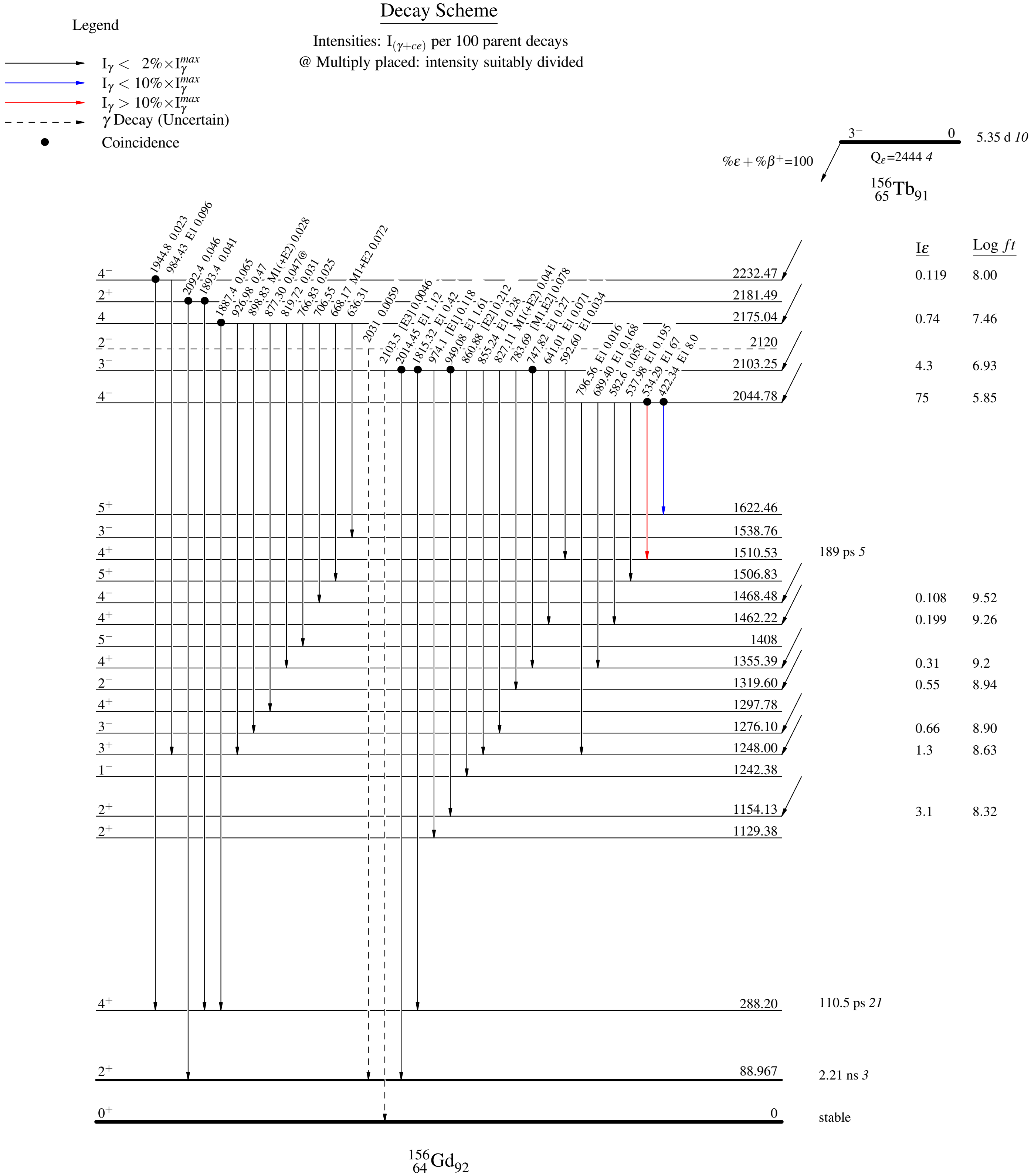
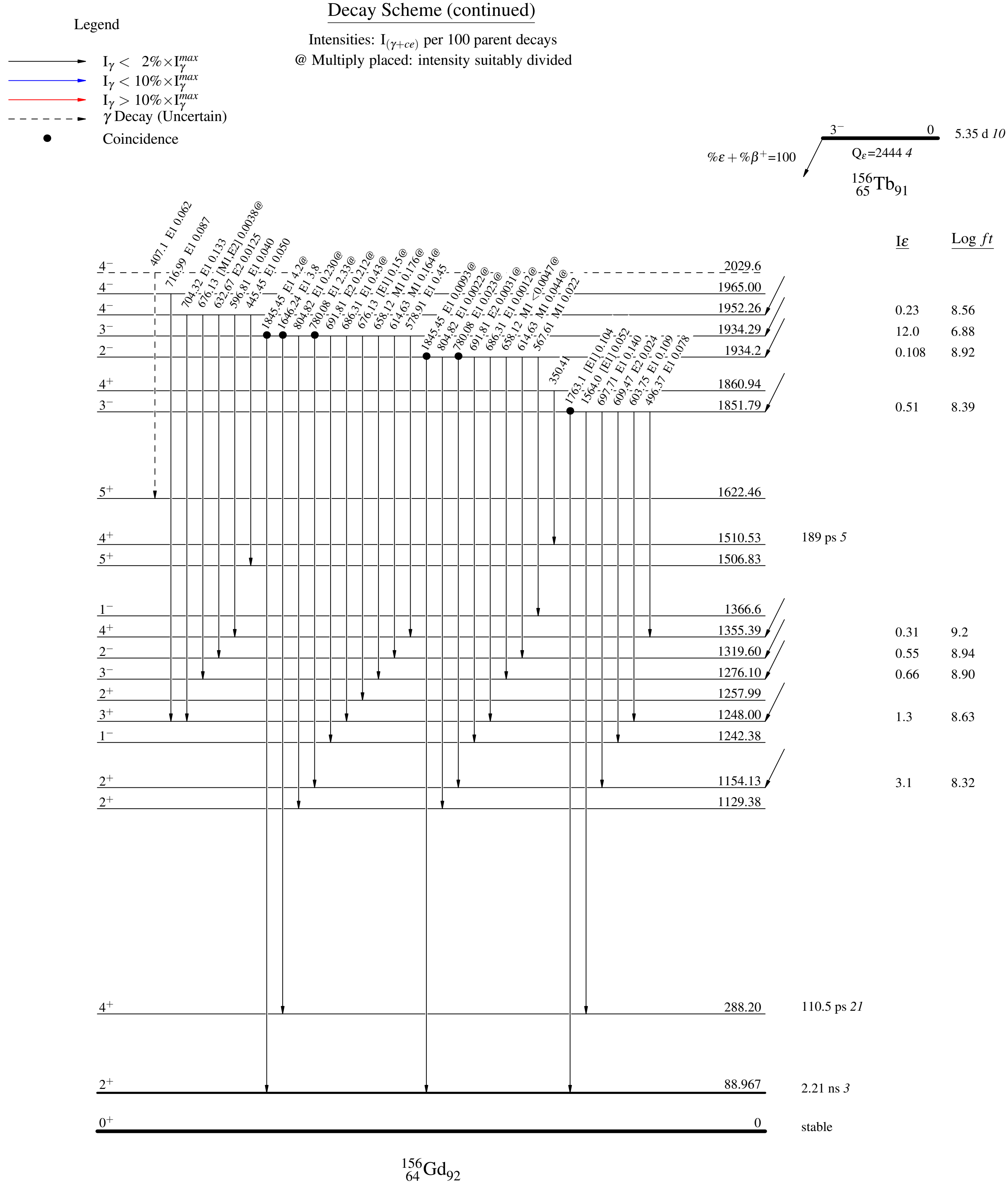
^{156}Tb ε decay (5.35 d) 1970Fu06,1980Iw04,1971Mc13



^{156}Tb ε decay (5.35 d) 1970Fu06,1980Iw04,1971Mc13

Decay Scheme (continued)

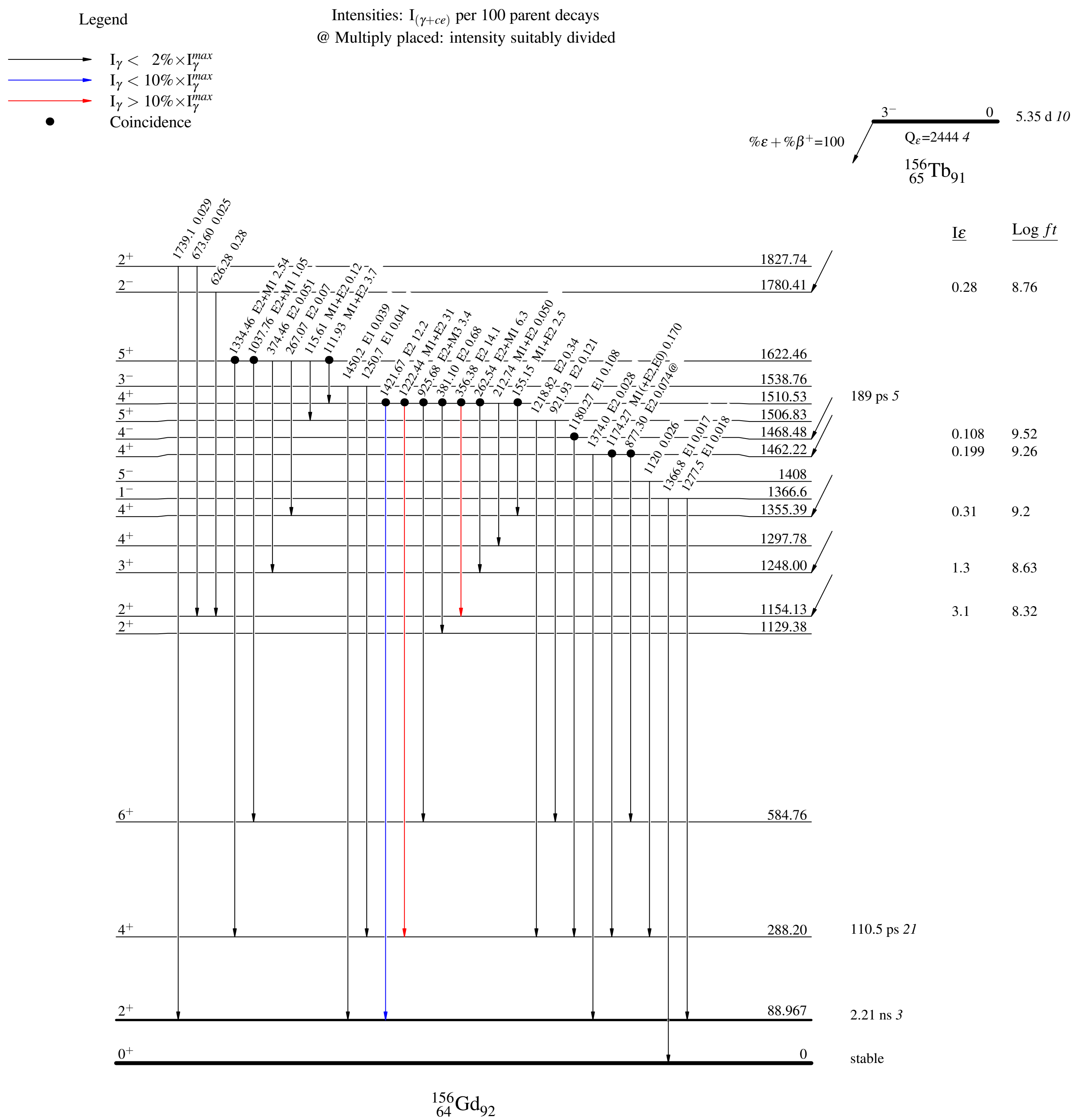
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided



^{156}Tb ε decay (5.35 d) 1970Fu06,1980Iw04,1971Mc13

Decay Scheme (continued)

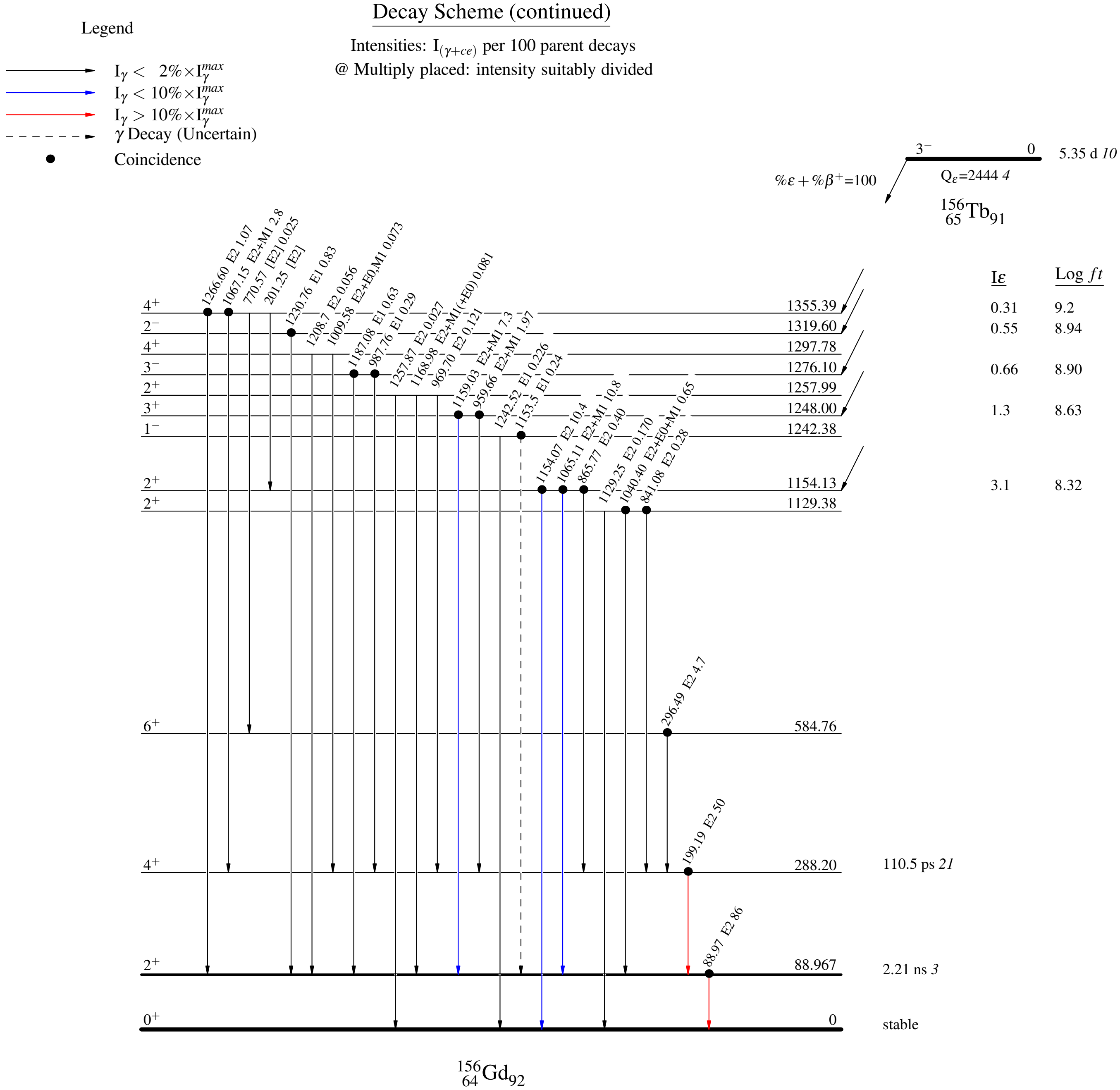
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided



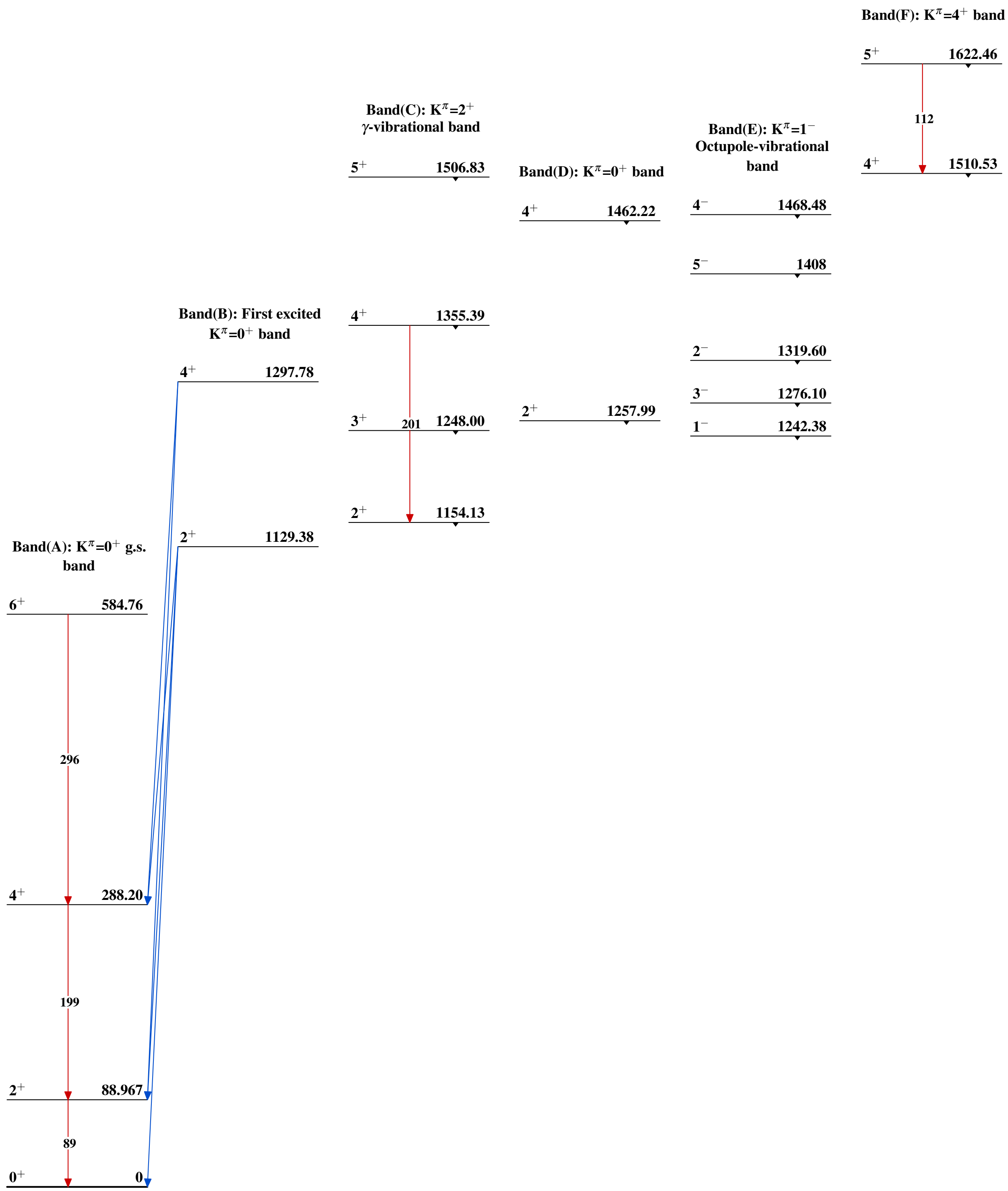
^{156}Tb ε decay (5.35 d) 1970Fu06,1980Iw04,1971Mc13

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided



^{156}Tb ε decay (5.35 d) 1970Fu06,1980Iw04,1971Mc13



$^{156}_{64}Gd_{92}$

^{156}Tb ε decay (5.35 d) 1970Fu06,1980Iw04,1971Mc13 (continued)