^{152}Ho ε decay (50.0 s)

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

Parent: ^{152}Ho: E=160 *1*; $J^{\pi}=9^+$; $T_{1/2}$=50.0 s *4*; Q(ε)=6519 *14*; %ε+%β^+ decay=89.2 *17*

^{152}Ho-%ε+%β^+ decay: %ε+%β^+=89.2 *17* (from %α=10.8 *17*, weighted average of 10.5 *30* (1979To09) and 11 *2* (1981Ga36)).

1990Sa32: measured γ, $\gamma\gamma$, γX/$\gamma\gamma\pm$; Ge detectors.

1989Ga11: measured γ, ce, $\gamma\gamma$, γX; Ge detectors for γ, mag spect with Si(Li) detector for ce.

1985Sc09: Q value deduced from $\gamma\gamma$ and γX coin measurements.

1982Ba75: measured γ, ce.

1979To09: measured t, γ, $\gamma\gamma$, γX, Iγ/Iα; Ge(Li) detectors.

1974Sc19: measured γ.

1974La32, 1974La28: measured Eγ, $T_{1/2}$.

The decay scheme is that proposed by 1989Ga11 and confirmed by 1990Sa32. 1982Ba75 report many more transitions and propose some additional levels; however, no coincidence work was done, and several γ placements have been shown by the later works to be incorrect. These are noted.

^{152}Dy Levels

Q(ε)=6333 MeV *100* from total γ-absorption spectroscopy (1993Al03). The value from 2012Wa38 is 6519 *14*.

E(level)[†]	J^{π}[‡]	Comments
0.0	0^+	
613.80 *10*	2^+	
1227.70 *24*	3^-	
1261.19 *14*	4^+	
1313.7 *3*	(2^+)	
1750.70 *23*	4^+	
1781.94 *16*	5^-	
1944.61 *16*	6^+	
2071.01 *18*	6^+	
2296.56 *18*	$(7)^+$	
2342.68 *20*	7^-	
2437.39 *18*	8^+	
2703.19 *18*	8^+	
2726.8 *6*	$(8)^-$	
2906.0 *3*	9^-	
2930.1 *6*	$(7)^-$	
3149.7 *6*	8^-	
3160.1? *6*		E(level): Level seen in (HI,xnγ).
3172.8 *4*	(10^-)	
3173.3 *3*	10^+	
3184.0 *3*	10^+	
3227.6 *4*	8^-	
3244.0 *4*	$(9)^+$	
3535.0 *6*	8^-,9^-	
3820?	12^+	
4015.8 *6*	8^+	

[†] From a least-squares fit to the Eγ data. For the least-squares calculation, Eγ data quoted to the nearest tenth of a keV but with no uncertainty, are assigned ΔE=0.5 keV, and values quoted to the nearest keV are assigned ΔE=1 keV.

[‡] From Adopted Levels.

^{152}Ho ε decay (50.0 s) (continued)

ε,β$^+$ radiations

On the basis of J^π, there should be no measurable feeding to levels below 2437 apart from the 7^- 2343 level, for which log $f^{1u}t$>8.5 requires a feeding of <0.3%. Feeding to that level of 3.2% 6 and of 3.1% 10 to the 6^+ 2071 level probably result from transitions from additional unknown levels at higher energies.

E(decay)	E(level)	Iβ$^+$ ‡	Iε‡	Log *ft*	I(ε+β$^+$)†‡	Comments
(2663 *14*)	4015.8	0.065 *2*	0.38 *1*	5.98 *2*	0.44 *1*	av Eβ=742.5 *63*; εK=0.713 *3*; εL=0.1079 *5*; εM+=0.03174 *14*
(3144 *14*)	3535.0	0.22 *1*	0.58 *1*	5.94 *2*	0.80 *2*	av Eβ=958.2 *64*; εK=0.603 *4*; εL=0.0908 *6*; εM+=0.02668 *16*
(3435 *14*)	3244.0	0.2 *1*	0.4 *2*	6.20 *22*	0.6 *3*	av Eβ=1089.9 *64*; εK=0.532 *4*; εL=0.0798 *6*; εM+=0.02344 *16*
(3451 *14*)	3227.6	0.37 *11*	0.63 *19*	5.98 *13*	1.0 *3*	av Eβ=1097.4 *64*; εK=0.528 *4*; εL=0.0792 *6*; εM+=0.02326 *16*
(3495 *14*)	3184.0	0.46 *8*	0.74 *12*	5.92 *8*	1.2 *2*	av Eβ=1117.2 *64*; εK=0.517 *4*; εL=0.0776 *6*; εM+=0.02278 *16*
(3506 *14*)	3173.3	0.54 *15*	0.86 *25*	5.86 *13*	1.4 *4*	av Eβ=1122.0 *64*; εK=0.514 *4*; εL=0.0772 *6*; εM+=0.02267 *16*
(3506 *14*)	3172.8	0.1 *1*	0.2 *1*	6.5 *3*	0.3 *2*	av Eβ=1122.3 *64*; εK=0.514 *4*; εL=0.0771 *6*; εM+=0.02266 *16*
(3529 *14*)	3149.7	0.28 *1*	0.43 *1*	6.17 *2*	0.71 *2*	av Eβ=1132.8 *64*; εK=0.509 *4*; εL=0.0763 *6*; εM+=0.02241 *16*
(3773 *14*)	2906.0	0.97 *14*	1.1 *2*	5.81 *7*	2.1 *3*	av Eβ=1243.9 *65*; εK=0.451 *4*; εL=0.0676 *5*; εM+=0.01985 *15*
(3952 *14*)	2726.8	0.34 *1*	0.32 *1*	6.39 *2*	0.66 *2*	av Eβ=1326.0 *65*; εK=0.412 *3*; εL=0.0616 *5*; εM+=0.01809 *14*
(3976 *14*)	2703.19	4.7 *3*	4.5 *3*	5.26 *3*	9.2 *6*	av Eβ=1336.8 *65*; εK=0.407 *3*; εL=0.0609 *5*; εM+=0.01787 *14*
(4242 *14*)	2437.39	34 *1*	25 *1*	4.57 *2*	59 *2*	av Eβ=1459.1 *65*; εK=0.354 *3*; εL=0.0528 *4*; εM+=0.01551 *12*

† From an intensity balance at each level.
‡ Absolute intensity per 100 decays.

γ(^{152}Dy)

Iγ normalization: From Σ (I(γ+ce) to g.s.)=100.
The unplaced transitions are from 1982Ba75 and have not been reported by other authors, either in decay or in (HI,xnγ). Some of these May not belong to ^{152}Ho decay. 1989Ga11 confirm the assignment of only 23 of the 65 transitions reported by 1982Ba75. in cases where 1983Ba75 have proposed placements, these are given in comments.

Eγ†	Iγ‡*b*	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.#	α*c*	Comments
x72.8 *2*	0.3 *1*							
x100.80 *15*	0.4 *1*							
x117.2 *2*	0.8 *2*					(M1)	1.521	α(K)=1.281 *19*; α(L)=0.188 *3*; α(M)=0.0413 *7*; α(N+..)=0.01103 *17* α(N)=0.00956 *15*; α(O)=0.001398 *21*; α(P)=7.98×10^{-5} *12* α(L)=0.192; α(M)=0.0420; α(N+..)=0.0122 Eγ: Placed from the 2906 level, but the resulting final level, at 2788 is not ADOPTED.
126.3 *3*	0.7 *2*	2071.01	6$^+$	1944.61	6$^+$	M1	1.230	α(K)=1.036 *16*; α(L)=0.1520 *23*; α(M)=0.0334 *5*;

Continued on next page (footnotes at end of table)

^{152}Ho ε decay (50.0 s) (continued)

γ(^{152}Dy) (continued)

E_γ [†]	I_γ [‡b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[c]	Comments
								α(N+..)=0.00892 *13* α(N)=0.00772 *12*; α(O)=0.001130 *17*; α(P)=6.45×10^{-5} *10* α(L)=0.155; α(M)=0.0339; α(N+..)=0.0098
140.8 *1*	1.7 *2*	2437.39	8$^+$	2296.56	(7)$^+$	M1	0.903	E_γ: Unplaced by 1982Ba75. α(K)=0.761 *11*; α(L)=0.1115 *16*; α(M)=0.0245 *4*; α(N+..)=0.00654 *10* α(N)=0.00566 *8*; α(O)=0.000829 *12*; α(P)=4.74×10^{-5} *7* α(L)=0.114; α(M)=0.0248; α(N+..)=0.00720
162.6 *2*	0.7 *3*	1944.61	6$^+$	1781.94	5$^-$			E_γ: Unplaced by 1982Ba75.
[x]167.3 *3*	0.6 *2*							E_γ: Placed from a 4045 level.
203.2 *5*	0.4 *1*	2906.0	9$^-$	2703.19	8$^+$			E_γ: From 1989Ga11. 1982Ba75 give 203.1 with no uncertainty.
225.50 *15*	3.0 *1*	2296.56	(7)$^+$	2071.01	6$^+$	M1	0.244	α(K)=0.206 *3*; α(L)=0.0299 *5*; α(M)=0.00656 *10*; α(N+..)=0.001752 *25* α(N)=0.001517 *22*; α(O)=0.000222 *4*; α(P)=1.276×10^{-5} *18* α(L)=0.0305; α(M)=0.00666; α(N+..)=0.00189 E_γ,Mult.: 1982Ba75 place this transition from a 4046 level and assign mult=E2. 1989Ga11 report M1. ΔJ=1 from the decay scheme.
254.1[a]	≤0.3[a]	3160.1?		2906.0	9$^-$			
265.5 *3*	0.6 *2*	2703.19	8$^+$	2437.39	8$^+$	M1	0.1566	α(K)=0.1322 *19*; α(L)=0.0191 *3*; α(M)=0.00419 *6*; α(N+..)=0.001119 *16* α(N)=0.000969 *14*; α(O)=0.0001421 *21*; α(P)=8.17×10^{-6} *12* α(L)=0.0195; α(M)=0.00426; α(N+..)=0.00120
266.8 *2*	0.3 *2*	3172.8	(10$^-$)	2906.0	9$^-$	(M1)	0.1544	α(K)=0.1303 *19*; α(L)=0.0188 *3*; α(M)=0.00413 *6*; α(N+..)=0.001103 *16* α(N)=0.000955 *14*; α(O)=0.0001400 *21*; α(P)=8.05×10^{-6} *12* α(L)=0.0192; α(M)=0.00420; α(N+..)=0.00118
[x]278.0 *3*	1.0 *3*							E_γ: Placed from the 3184 level.
320.3 *2*	3.2 *2*	2071.01	6$^+$	1750.70	4$^+$	E2	0.0529	α(K)=0.0401 *6*; α(L)=0.00991 *14*; α(M)=0.00227 *4*; α(N+..)=0.000588 *9* α(N)=0.000517 *8*; α(O)=6.85×10^{-5} *10*; α(P)=2.11×10^{-6} *3* α(L)=0.0100; α(M)=0.00228; α(N+..)=0.00062
[x]351.0 *3*	2.2 *5*					E1	0.0403	E_γ: Placed by authors from a 3109 level. α(K)=0.0311 *5*; α(L)=0.00719 *11*; α(M)=0.001645 *24*; α(N+..)=0.000426 *6* α(N)=0.000374 *6*; α(O)=5.00×10^{-5} *8*; α(P)=1.663×10^{-6} *24*
352.2 *3*	4.9 *3*	2296.56	(7)$^+$	1944.61	6$^+$	(M1)	0.0738	E_γ: Placed from a 2788 level. α(K)=0.0623 *9*; α(L)=0.00893 *13*; α(M)=0.00196 *3*; α(N+..)=0.000523 *8* α(N)=0.000453 *7*; α(O)=6.64×10^{-5} *10*; α(P)=3.84×10^{-6} *6* α(L)=0.00910; α(M)=0.00199; α(N+..)=0.00055 E_γ,Mult.: 1982Ba75 place this transition from a 2788 level and assign mult=E2. 1989Ga11 report (M1). ΔJ=1 from the decay scheme.
360.4 *3*	0.3 *1*	2703.19	8$^+$	2342.68	7$^-$	[E1]	0.01097	α(K)=0.00931 *14*; α(L)=0.001302 *19*;

Continued on next page (footnotes at end of table)

^{152}Ho ε decay (50.0 s) (continued)

γ(^{152}Dy) (continued)

E_γ[†]	I_γ[‡b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[c]	Comments
								α(M)=0.000284 *4*; α(N+..)=7.51×10^{-5} *11* α(N)=6.52×10^{-5} *10*; α(O)=9.35×10^{-6} *14*; α(P)=4.98×10^{-7} *7* α(L)=0.00130; α(M)=0.00028
366.3 *2*	2.4 *4*	2437.39	8$^+$	2071.01	6$^+$	E2	0.0356	α(K)=0.0276 *4*; α(L)=0.00622 *9*; α(M)=0.001418 *20*; α(N+..)=0.000368 *6* α(N)=0.000323 *5*; α(O)=4.33×10^{-5} *6*; α(P)=1.488×10^{-6} *21* α(L)=0.00626; α(M)=0.00142; α(N+..)=0.00039 E_γ,Mult.: 1982Ba75 place this transition from a 3879 level and assign mult=M1. 1989Ga11 report E2. ΔJ=2 from the decay scheme.
[x]381.6 *3*	0.8 *3*							E_γ: Placed from a 3085 level.
384.1	0.7	2726.8	(8)$^-$	2342.68	7$^-$	M1	0.0588	α(K)=0.0497 *8*; α(L)=0.00710 *11*; α(M)=0.001555 *23*; α(N+..)=0.000416 *6* α(N)=0.000360 *6*; α(O)=5.28×10^{-5} *8*; α(P)=3.05×10^{-6} *5*
398.1 *2*	4.4 *4*	2342.68	7$^-$	1944.61	6$^+$	(E1)	0.00866	α(K)=0.00736 *11*; α(L)=0.001023 *15*; α(M)=0.000223 *4*; α(N+..)=5.90×10^{-5} *9* α(N)=5.13×10^{-5} *8*; α(O)=7.37×10^{-6} *11*; α(P)=3.96×10^{-7} *6* α(L)=0.00102; α(M)=0.00022
406.8 *2*	0.5 *2*	2703.19	8$^+$	2296.56	(7)$^+$	(M1)	0.0506	α(K)=0.0428 *6*; α(L)=0.00610 *9*; α(M)=0.001337 *19*; α(N+..)=0.000357 *5* α(N)=0.000309 *5*; α(O)=4.54×10^{-5} *7*; α(P)=2.63×10^{-6} *4* α(L)=0.00623; α(M)=0.00136; α(N+..)=0.00038
437.0[&]	0.1[&]	1750.70	4$^+$	1313.7	(2$^+$)			E_γ: Unplaced by 1982Ba75.
[x]446.3 *2*	0.8 *3*							E_γ: Placed from a 2788 level.
[x]460.2 *2*	1.0 *3*							
[x]468.5 *3*	0.9 *3*							E_γ: Placed from the 2906 level.
[x]475.8 *3*	0.6 *3*							E_γ: Placed from a 2435 level.
489.5[&]	2.2[&]	1750.70	4$^+$	1261.19	4$^+$	M1	0.0314	α(K)=0.0266 *4*; α(L)=0.00376 *6*; α(M)=0.000824 *12*; α(N+..)=0.000220 *4* α(N)=0.000191 *3*; α(O)=2.80×10^{-5} *4*; α(P)=1.624×10^{-6} *24* α(L)=0.00384; α(M)=0.00084; α(N+..)=0.00023
492.8 *1*	65.1 *16*	2437.39	8$^+$	1944.61	6$^+$	E2	0.01575	α(K)=0.01266 *18*; α(L)=0.00240 *4*; α(M)=0.000542 *8*; α(N+..)=0.0001417 *20* α(N)=0.0001239 *18*; α(O)=1.707×10^{-5} *24*; α(P)=7.08×10^{-7} *10* α(L)=0.00241; α(M)=0.00054; α(N+..)=0.00015 E_γ: Includes value from 1974Sc19. Other: 492.2 *1* (1979To09). I_γ: From 1990Sa32. Others: 78 *6* (1982Ba75), 67 (1989Ga11).
[x]500.6 *3*	1.2 *4*							
520.7 *1*	3.4 *3*	1781.94	5$^-$	1261.19	4$^+$	E1	0.00469	α(K)=0.00400 *6*; α(L)=0.000548 *8*; α(M)=0.0001192 *17*; α(N+..)=3.16×10^{-5} *5* α(N)=2.74×10^{-5} *4*; α(O)=3.97×10^{-6} *6*; α(P)=2.18×10^{-7} *3* α(L)=0.00055
554.2 *2*	1.7 *5*	1781.94	5$^-$	1227.70	3$^-$	E2	0.01164	α(K)=0.00946 *14*; α(L)=0.001700 *24*;

Continued on next page (footnotes at end of table)

^{152}Ho ε decay (50.0 s) (continued)

γ(^{152}Dy) (continued)

E_γ[†]	I_γ[‡b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[c]	Comments
								α(M)=0.000381 *6*; α(N+..)=0.0001000 *14* α(N)=8.73×10^{-5} *13*; α(O)=1.215×10^{-5} *17*; α(P)=5.34×10^{-7} *8* α(L)=0.00171
560.6 *2*	2.7 *2*	2342.68	7$^-$	1781.94	5$^-$	E2	0.01131	α(K)=0.00920 *13*; α(L)=0.001646 *23*; α(M)=0.000369 *6*; α(N+..)=9.68×10^{-5} *14* α(N)=8.45×10^{-5} *12*; α(O)=1.176×10^{-5} *17*; α(P)=5.20×10^{-7} *8* α(L)=0.00165
563.3 *2*	2.4 *2*	2906.0	9$^-$	2342.68	7$^-$	E2	0.01118	α(K)=0.00910 *13*; α(L)=0.001623 *23*; α(M)=0.000364 *5*; α(N+..)=9.54×10^{-5} *14* α(N)=8.33×10^{-5} *12*; α(O)=1.160×10^{-5} *17*; α(P)=5.14×10^{-7} *8*
[x]607.0 *3*	0.7 *4*							E_γ: Placed from a 3512 level.
613.7 *5*	3.9 *9*	1227.70	3$^-$	613.80	2$^+$			E_γ,I_γ: From 1990Sa32, unplaced by authors. Other: Iγ=1.4 (1989Ga11).
613.8[@] *1*	100	613.80	2$^+$	0.0	0$^+$	E2	0.00906	α(K)=0.00742 *11*; α(L)=0.001277 *18*; α(M)=0.000285 *4*; α(N+..)=7.50×10^{-5} *11* α(N)=6.54×10^{-5} *10*; α(O)=9.17×10^{-6} *13*; α(P)=4.22×10^{-7} *6* α(L)=0.00128
636.7[d] *2*	1.8 *4*	3820?	12$^+$	3184.0	10$^+$			E_γ,I_γ: Reported only by 1982Ba75 but placement agrees with that in (HI,xnγ); however, Iγ is such that this transition should have been seen by 1989Ga11 and 1990Sa32.
647.4[@] *1*	99.4 *24*	1261.19	4$^+$	613.80	2$^+$	E2	0.00797	α(K)=0.00655 *10*; α(L)=0.001106 *16*; α(M)=0.000246 *4*; α(N+..)=6.49×10^{-5} *9* α(N)=5.65×10^{-5} *8*; α(O)=7.95×10^{-6} *12*; α(P)=3.74×10^{-7} *6* α(L)=0.00111 I_γ: From 1990Sa32. Others: 118 *6* (1982Ba75), 97.7 (1989Ga11). from the decay scheme, Iγ≤Iγ(614γ)=100.
[x]654.0 *3*	0.8 *3*							E_γ: Placed from a 2435 level.
660[d]	0.4	3820?	12$^+$	3160.1?				E_γ: From decay scheme of 1982Ba75. Not given in author's table. the transition is seen in (HI,xnγ).
[x]669.0 *3*	1.3 *4*							
683.5[@] *1*	86.7 *21*	1944.61	6$^+$	1261.19	4$^+$	E2	0.00701	α(K)=0.00579 *9*; α(L)=0.000957 *14*; α(M)=0.000213 *3*; α(N+..)=5.61×10^{-5} *8* α(N)=4.89×10^{-5} *7*; α(O)=6.90×10^{-6} *10*; α(P)=3.31×10^{-7} *5* α(L)=0.00096 I_γ: From 1990Sa32. Others: 95 *7* (1982Ba75), 86.6 (1989Ga11).
[x]694.7 *3*	0.8 *3*							E_γ: Placed from a 3879 level.
[x]698.5 *3*	2.5 *5*							E_γ: Placed from a 1959 level.
700.0[&]	0.1[&]	1313.7	(2$^+$)	613.80	2$^+$	(E2)	0.00664	α(K)=0.00548 *8*; α(L)=0.000900 *13*; α(M)=0.000200 *3*; α(N+..)=5.27×10^{-5} *8* α(N)=4.59×10^{-5} *7*; α(O)=6.49×10^{-6} *10*; α(P)=3.14×10^{-7} *5* α(L)=0.00090
[x]732.0 *3*	1.0 *3*							E_γ: Placed from a 1959 level.
735.9 *2*	1.6 *4*	3173.3	10$^+$	2437.39	8$^+$	E2	0.00592	α(K)=0.00490 *7*; α(L)=0.000791 *11*;

Continued on next page (footnotes at end of table)

^{152}Ho ε decay (50.0 s) (continued)

γ(^{152}Dy) (continued)

E_γ[†]	I_γ[‡b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[c]	Comments
								α(M)=0.0001756 *25*; α(N+..)=4.64×10^{-5} *7* α(N)=4.03×10^{-5} *6*; α(O)=5.72×10^{-6} *8*; α(P)=2.81×10^{-7} *4* α(L)=0.00079 I_γ: From 1990Sa32. Others: 3.2 *3* (1982Ba75), 1.6 (1989Ga11).
746.6 *2*	1.4 *2*	3184.0	10$^+$	2437.39	8$^+$	(E2)	0.00573	α(K)=0.00476 *7*; α(L)=0.000764 *11*; α(M)=0.0001695 *24*; α(N+..)=4.48×10^{-5} *7* α(N)=3.89×10^{-5} *6*; α(O)=5.53×10^{-6} *8*; α(P)=2.73×10^{-7} *4* α(L)=0.00077 E_γ: From 1982Ba75. The value of 1990Sa32, 745.7 *2*, May be a misprint. 1989Ga11 report 746.5 and from (HI,xnγ) one has 746.5 *2*.
758.6[@] *1*	9.2 *5*	2703.19	8$^+$	1944.61	6$^+$	E2	0.00552	α(K)=0.00459 *7*; α(L)=0.000733 *11*; α(M)=0.0001625 *23*; α(N+..)=4.29×10^{-5} *6* α(N)=3.74×10^{-5} *6*; α(O)=5.31×10^{-6} *8*; α(P)=2.63×10^{-7} *4* α(L)=0.00074
[x]764.5 *3*	0.8 *3*							
[x]770.0 *3*	0.9 *3*							E_γ: Placed from a 3879 level.
[x]796.3 *3*	0.9 *3*							
809.7 *2*	5.6 *8*	2071.01	6$^+$	1261.19	4$^+$	E2	0.00478	α(K)=0.00398 *6*; α(L)=0.000624 *9*; α(M)=0.0001380 *20*; α(N+..)=3.65×10^{-5} *6* α(N)=3.17×10^{-5} *5*; α(O)=4.53×10^{-6} *7*; α(P)=2.29×10^{-7} *4* α(L)=0.00063 E_γ,Mult.: 1982Ba75 place this transition from a 3512 level and assign mult=M1. 1989Ga11 report E2. ΔJ=2 from the decay scheme.
853.1[&]	0.8[&]	3149.7	8$^-$	2296.56	(7)$^+$	E1	1.69×10^{-3}	α(K)=0.001442 *21*; α(L)=0.000193 *3*; α(M)=4.18×10^{-5} *6*; α(N+..)=1.114×10^{-5} *16* α(N)=9.65×10^{-6} *14*; α(O)=1.407×10^{-6} *20*; α(P)=8.02×10^{-8} *12* α(L)=0.00019
859.1[&]	0.8[&]	2930.1	(7)$^-$	2071.01	6$^+$	E1	1.67×10^{-3}	α(K)=0.001423 *20*; α(L)=0.000190 *3*; α(M)=4.13×10^{-5} *6*; α(N+..)=1.098×10^{-5} *16* α(N)=9.52×10^{-6} *14*; α(O)=1.388×10^{-6} *20*; α(P)=7.91×10^{-8} *12* α(L)=0.00019
[x]890.7 *3*	0.9 *3*							
[x]896.0 *3*	1.0 *3*							
931.0 *3*	1.1 *3*	3227.6	8$^-$	2296.56	(7)$^+$	E1	1.43×10^{-3}	α(K)=0.001222 *18*; α(L)=0.0001627 *23*; α(M)=3.53×10^{-5} *5*; α(N+..)=9.40×10^{-6} *14* α(N)=8.14×10^{-6} *12*; α(O)=1.188×10^{-6} *17*; α(P)=6.81×10^{-8} *10* α(L)=0.00016
[x]937.0 *3*	0.8 *4*							E_γ: Placed from a 4045 level.
947.4 *3*	0.7 *3*	3244.0	(9)$^+$	2296.56	(7)$^+$	E2	0.00341	α(K)=0.00286 *4*; α(L)=0.000430 *6*; α(M)=9.48×10^{-5} *14*; α(N+..)=2.51×10^{-5} *4* α(N)=2.18×10^{-5} *3*; α(O)=3.14×10^{-6} *5*; α(P)=1.648×10^{-7} *23* α(L)=0.00043

Continued on next page (footnotes at end of table)

^{152}Ho ε decay (50.0 s) (continued)

γ(^{152}Dy) (continued)

E_γ[†]	I_γ[‡b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[c]	Comments
[x]1002.6 *3*	1.1 *5*							
[x]1090.0 *3*	1.4 *4*							
1097.6[&]	0.9[&]	3535.0	8^-,9^-	2437.39	8^+	E1	1.05×10^{-3}	α(K)=0.000899 *13*; α(L)=0.0001189 *17*; α(M)=2.58×10^{-5} *4*; α(N+..)=6.87×10^{-6} *10* α(N)=5.95×10^{-6} *9*; α(O)=8.70×10^{-7} *13*; α(P)=5.03×10^{-8} *7*
[x]1106.5 *2*	1.6 *4*							
[x]1124.9 *3*	1.1 *4*							
[x]1135.2 *2*	2.4 *5*							
1136.8[&]	0.9[&]	1750.70	4^+	613.80	2^+			
[x]1139.9 *2*	2.6 *5*							E_γ: Placed from a 4045 level.
[x]1158.6 *3*	2.0 *6*							
[x]1175.9 *3*	1.9 *5*							E_γ: Placed from a 3879 level.
[x]1194.3 *3*	1.0 *4*							
[x]1259.8 *3*	2.0 *5*							
[x]1294.4 *3*	1.6 *4*							
1313.7[&]	0.03[&]	1313.7	(2^+)	0.0	0^+			
[x]1331.7 *3*	2.1 *5*							
1719.2[&]	0.5[&]	4015.8	8^+	2296.56	$(7)^+$	M1	1.66×10^{-3}	α(K)=0.001259 *18*; α(L)=0.0001711 *24*; α(M)=3.73×10^{-5} *6*; α(N+..)=0.000196 *3* α(N)=8.62×10^{-6} *12*; α(O)=1.271×10^{-6} *18*; α(P)=7.52×10^{-8} *11*; α(IPF)=0.000186 *3*

[†] Values with uncertainties are weighted averages from 1990Sa32 and 1982Ba75. Values given without uncertainties are from 1989Ga11. Data of these authors agree with the weighted averages within 0.3 keV.

[‡] Weighted averages from 1990Sa32, 1989Ga11, and 1982Ba75 normalized to Iγ(614γ)=100. For the data of 1989Ga11, quoted without uncertainties, the evaluator has assigned uncertainties of 10% or 0.2, whichever is larger.

[#] Both 1989Ga11 and 1982Ba75 give mult assignments based on α(K)exp, but no data are given by 1989Ga11, and 1982Ba75 give data only in graphical form. The mults adopted here are those of 1989Ga11. they agree with those of 1982Ba75, except as noted.

[@] Weighted average includes also measurements by 1979To09 and 1974Sc19.

[&] Reported only by 1989Ga11. The evaluator has assigned an uncertainty of 0.5 keV to the energies as input to the least-squares adjustment for the level energies.

[a] Reported only by 1982Ba75.

[b] For absolute intensity per 100 decays, multiply by 0.884 *17*.

[c] 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.

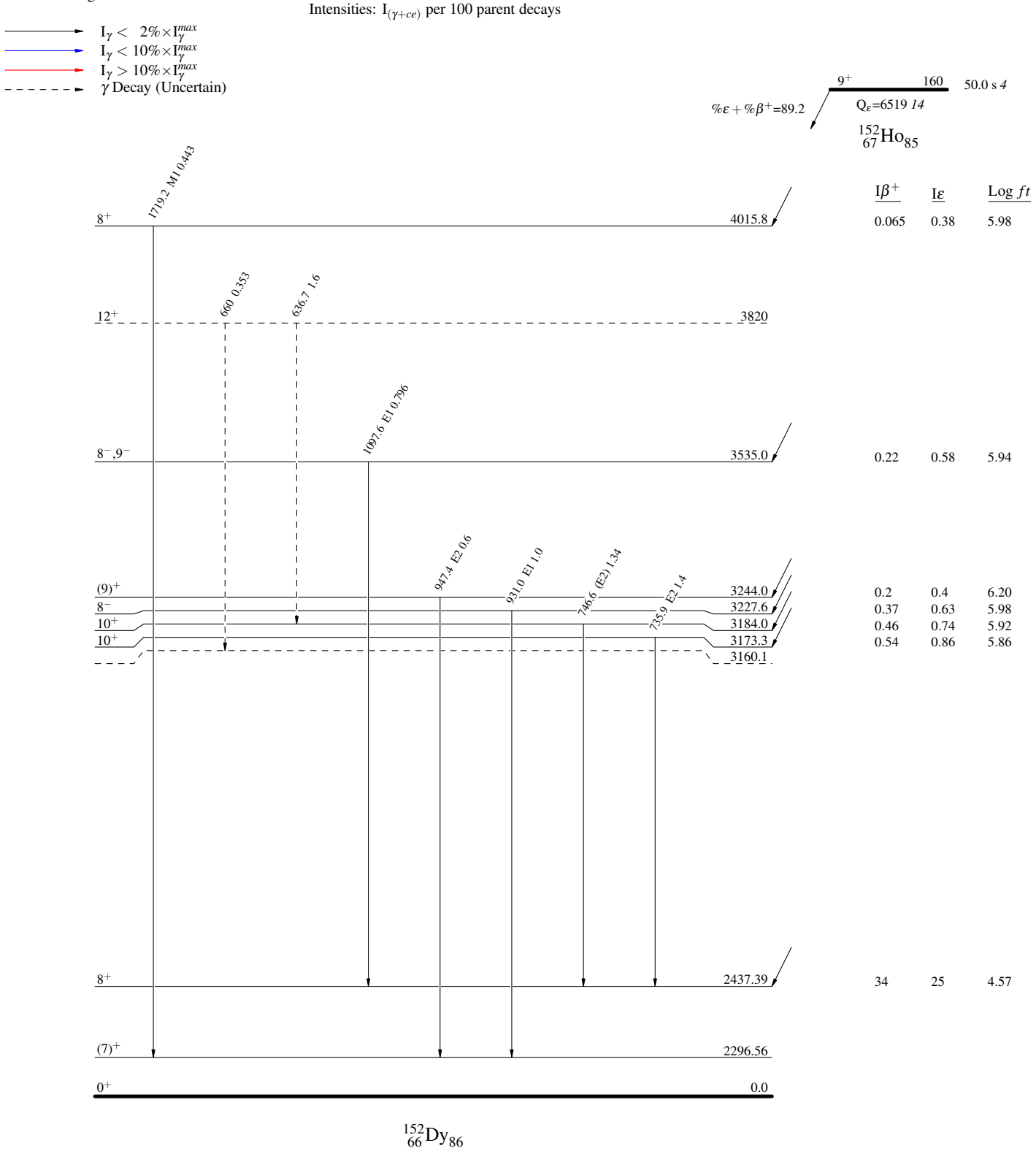
[d] Placement of transition in the level scheme is uncertain.

[x] γ ray not placed in level scheme.

^{152}Ho ε decay (50.0 s)

Decay Scheme

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

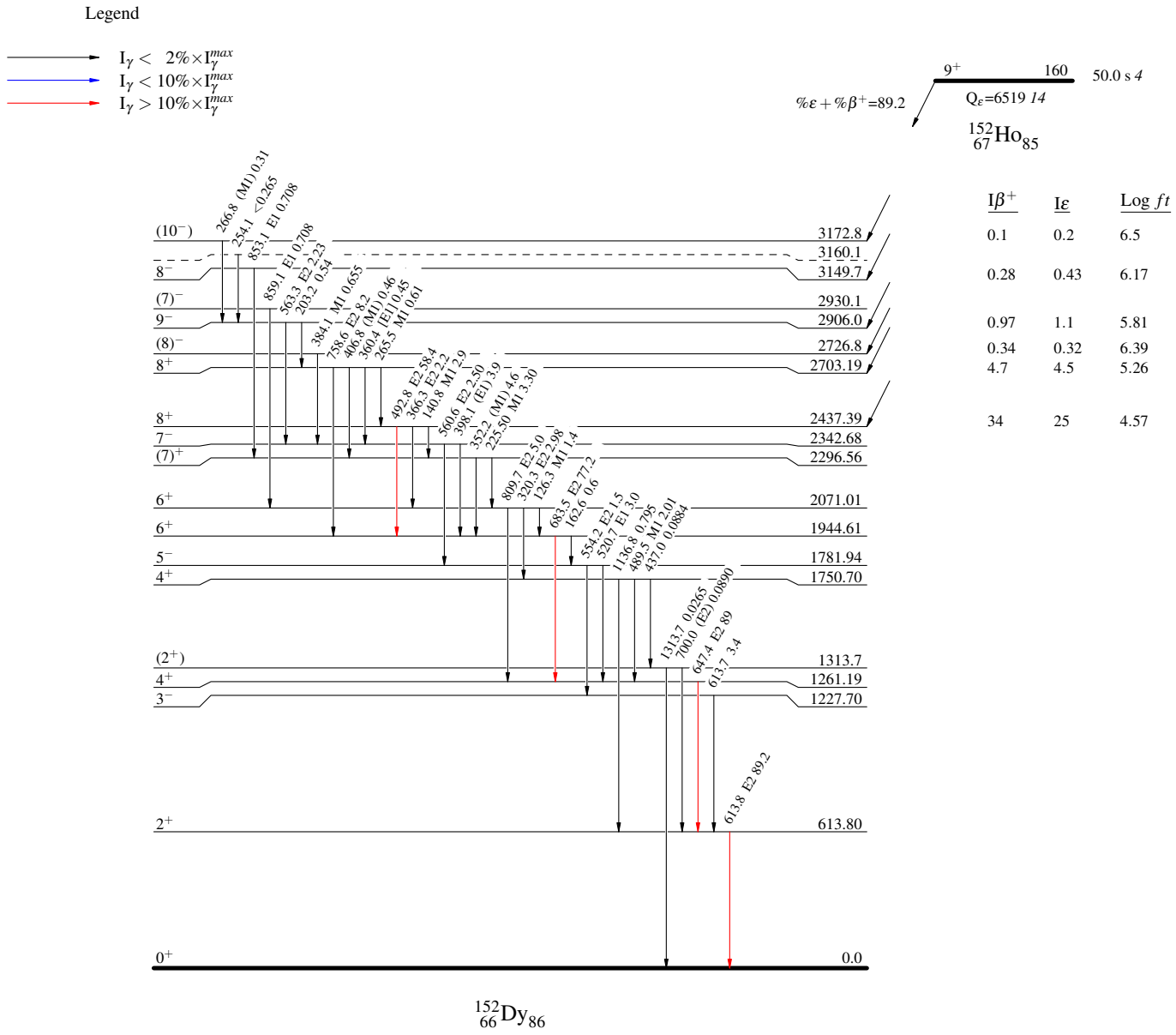


$^{152}_{66}Dy_{86}$

^{152}Ho ε decay (50.0 s)

Decay Scheme (continued)

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



$^{152}_{66}Dy_{86}$