^{152}Eu ε decay (13.517 y)

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

Parent: ^{152}Eu: E=0.0; $J^{\pi}=3^-$; $T_{1/2}$=13.517 y *14*; Q(ε)=1874.6 *7*; %ε+%β^+ decay=72.08 *13*

^{152}Eu-%ε+%β^+ decay: The absolute intensity of the 1408γ has been evaluated to be 20.85% 9 (2007BeZP). Normalization of the photon intensities to Iγ(344γ in Gd)=100 gives Iγ(1408γ)=78.41 *10* and Σ I(γ+ce)(to Gd g.s.)=105.02 *18*. From these data one gets branching (β-)=27.92 13 and thus branching (ε)=72.08 13.

ce: 1991Go22, 1990Ka35, 1988KaZF, 1987BaYQ, 1985Co08, 1983KaZJ, 1982TrZV, 1981Ka40, 1979De22, 1978Ar24, 1970SpZW, 1968Bo38, 1967Ma29, 1966He02; other: 1990Ka43, 1983Ha34.

$\gamma\gamma$: 1981Is12, 1980Sh15, 1972Bb05, 1971Ba54, 1971Ba63, 1971Ha06, 1970Ka43, 1970Ri19.

$\gamma\gamma$(t): 1993Se08 (centroid shift), 1988Ka21, 1972El20, 1968Ku03, 1966Mc07, 1963Fo02, 1962Ba38, 1955Su64.

$\gamma\gamma(\theta)$: 1982La26 (evaluation of E0+M1+E2 measurements to 1980); others: 1973Ka05, 1971Ba54, 1971Ho08, 1971La11, 1971Ru05, 1970Ba32, 1970He29, 1970RaZF, 1970Ru09, 1969Aq01.

$\gamma\gamma(\theta$,H): 1971Do17, 1962Ba38.

$\gamma(\theta$,H,T): 1985KrZU, 1975Ba69; other: 1983Bl07.

$\gamma\gamma(\theta$,H,t): 1992De29.

β^+: 1977MiZV, 1972Sv02; others: 1962Pe05, 1959An31, 1958Al99.

ε: 1976ScZS, 1975Da13.

Monoenergetic e+: 1972Sv02; others: 1965Pe12, 1964Sh15, 1962Pe05, 1960Va21.

^{152}Sm Levels

Additional possible levels have been proposed at 1436.65 and 1681.36 keV (1990St02,1993Ka30). However, 1992Ya12 have searched for the γ's reported as depopulating these levels and set an upper limit for their intensity which is considerably lower than the intensity reported by 1990St02 and 1993Ka30. EXCEPT FOR the 1315γ proposed from the 1681 level, these transitions have also not been seen by 2007Ku20. The 1681 level, deexcited by α 1315γ is adopted here.

E(level)[†]	J^{π}[‡]	$T_{1/2}$	Comments
0.0	0^+	stable	
121.7818 *3*	2^+	1.396 ns *8*	$T_{1/2}$: from 1988Ka21. Others: 1.40 ns *2* (1992De29), 1.35 ns *5* (1972El20), 1.41 ns *4* (1968Ku03), 1.36 ns *6* (1966Mc07), 1.37 ns *4* (1963Fo02), 1,42 ns *4* (1962Ba38), 1.40 ns *10* (1955Su64). g-factor: 0.40 *3* (1992De29). Others: 0.30 *3* (1971Do17), 0.35 *3* (1962Ba38).
366.4795 *9*	4^+	60 ps *5*	$T_{1/2}$: from 1993Se08. Other: 42 ps *18* (1972El20). J^{π}: $\gamma\gamma(\theta)$ data (1970He29,1973Ka05) are consistent with J=4 but not with J=0,1,3; possible J=2 is ruled out by ce data.
684.69 *6*	0^+		
706.91 *4*	6^+		
810.453 *4*	2^+	7 ps *5*	$T_{1/2}$: from 1993Se08.
963.363 *3*	1^-	19.9 fs *7*	$T_{1/2}$: From 2000Jo10.
1022.969 *5*	4^+		
1041.1217 *23*	3^-	<5 ps	$T_{1/2}$: from 1993Se08.
1082.816 *24*	0^+		
1085.8408 *21*	2^+	<4 ps	$T_{1/2}$: from 1993Se08.
1221.67 *4*	5^-		
1233.8626 *17*	3^+	<6 ps	$T_{1/2}$: from 1993Se08.
1292.753 *8*	2^+		
1371.721 *14*	4^+		
1529.8019 *17*	2^-		$T_{1/2}$: From the intensity of the K-positon line to that of the 1408γ, 1972Sv02 deduce $T_{1/2}$=27 fs. For data and calculations see authors' paper. this value of $T_{1/2}$ gives

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^{152}Eu ε decay (13.517 y) (continued)

^{152}Sm Levels (continued)

E(level)[†]	J^{π}[‡]	Comments
		B(M2)(W.u.)≈10 for the 1408γ and≈900 for the 444γ, both much larger than the RUL limit of <1. δ(1408γ) is an average from eight authors, so the discrepancy May lie with the value of $T_{1/2}$. This value of $T_{1/2}$ is not ADOPTED.
1579.427 *8*	3^-	
1612.88 *4*	4^+	
1649.833 *6*	2^-	J^{π}: γγ(θ) data are consistent with J=3, not with J=0 or 1.
1682.07 *12*	4^-	
1730.207 *24*	3^-	
1757.001 *14*	4^+	
1769.130 *23*	2^+	
1776.56 *5*	2^+	
1779.119 *25*	3^-	
1822.03 *22*	4^-	

† From a least-squares fit to the Eγ data.
‡ From Adopted Levels.

ε,β^+ radiations

(εK(exp)/ε)av=0.80 *3* (1976ScZS).
I(Kα x ray)/decay=0.591 *12*, I(Kβ x ray)/decay=0.149 *3* (1979De36).

E(decay)	E(level)	Iβ^+ [‡#]	Iε[‡#]	Log *ft*	I(ε+β^+)[†#]	Comments
(52.6 *7*)	1822.03		0.0049 *12*	10.37 *11*	0.0049 *12*	εK=0.078 *17*; εL=0.674 *12*; εM+=0.248 *6*
(95.5 *7*)	1779.119		0.0124 *4*	10.93 *2*	0.0124 *4*	εK=0.622 *4*; εL=0.2849 *23*; εM+=0.0932 *9*
(98.0 *7*)	1776.56		0.0086 *6*	11.12 *4*	0.0086 *6*	εK=0.633 *3*; εL=0.2770 *21*; εM+=0.0903 *8*
(105.5 *7*)	1769.130		0.0816 *21*	10.25 *2*	0.0816 *21*	εK=0.6590 *23*; εL=0.2577 *17*; εM+=0.0833 *6*
(117.6 *7*)	1757.001		0.054 *3*	10.57 *3*	0.054 *3*	εK=0.6908 *16*; εL=0.2344 *12*; εM+=0.0748 *5*
(144.4 *7*)	1730.207		0.0538 *24*	10.82 *2*	0.0538 *24*	εK=0.7339 *9*; εL=0.2027 *7*; εM+=0.06334 *22*
(192.5 *7*)	1682.07		0.00364 *16*	12.32 *2*	0.00364 *16*	εK=0.7718 *4*; εL=0.1748 *3*; εM+=0.05342 *10*
(224.8 *7*)	1649.833		0.928 *9*	10.078 *6*	0.928 *9*	εK=0.7857 *3*; εL=0.16452 *19*; εM+=0.04982 *7*
(261.7 *7*)	1612.88		0.0205 *6*	11.89 *2*	0.0205 *6*	εK=0.7964 *2*; εL=0.1566 *2*; εM+=0.04705 *5*
(295.2 *7*)	1579.427		2.082 *12*	10.007 *4*	2.082 *12*	εK=0.8033 *2*; εL=0.1515 *1*; εM+=0.04526 *4*
(344.8 *7*)	1529.8019		24.78 *11*	9.086 *3*	24.78 *11*	εK=0.81064 *9*; εL=0.14600 *7*; εM+=0.04337 *3* Iε: εK/ε=0.79 *2* (1962Lu02), 0.76 *9* (1975Da13).
(502.9 *7*)	1371.721		0.853 *17*	10.912 *9*	0.853 *17*	εK=0.8233; εL=0.13659 *3*; εM+=0.04012 *1*
(581.8 *7*)	1292.753		0.625 *8*	11.184 *6*	0.625 *8*	εK=0.8268; εL=0.13399 *2*; εM+=0.039227 *7*
(640.7 *7*)	1233.8626		17.09 *8*	9.837 *3*	17.09 *8*	εK=0.8288; εL=0.13250 *2*; εM+=0.038718 *6* Iε: εK/ε=0.88 *10* (1975Da13).
(788.8 *7*)	1085.8408		21.50 *11*	9.928 *3*	21.50 *11*	εK=0.8324; εL=0.1298; εM+=0.03780 ε-branch 38 *9* % L=1 (1975Ba69).
(791.8 *7*)	1082.816		0.0038 *24*	13.7 *3*	0.0038 *24*	εK=0.8324; εL=0.1298; εM+=0.03778
(833.5 *7*)	1041.1217		0.067 *7*	12.49 *5*	0.067 *7*	εK=0.8332; εL=0.1292; εM+=0.03759
(851.6 *7*)	1022.969		0.233 *4*	11.963 *8*	0.233 *4*	εK=0.8335; εL=0.1290; εM+=0.03751
(1064.1 *7*)	810.453		1.175 *15*	11.463 *6*	1.175 *15*	εK=0.8363; εL=0.1269; εM+=0.03681
(1508.1 *7*)	366.4795	0.0026 *1*	0.85 *4*	11.92 *2*	0.85 *4*	av Eβ=230.84 *31*; εK=0.8369; εL=0.1242; εM+=0.03589 E(decay): Eβ+=483 *6* (1977MiZV), 479 *10* (1972Sv02). Iβ^+,Iε: from Iβ^+(to 121 level)/Iβ^+(to 366 level)=3.9 *7* (1972Sv02).

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^{152}Eu ε decay (13.517 y) (continued)

ϵ,β^+ radiations (continued)

E(decay)	E(level)	Iβ^+ ‡#	Iε‡#	Log *ft*	I($\varepsilon+\beta^+$)†#	Comments
(1752.8 *7*)	121.7818	0.023 *7*	1.6 *5*	11.8 *2*	1.6 *5*	av Eβ=338.25 *31*; εK=0.8282; εL=0.1220; εM+=0.03521 E(decay): Eβ+=729.0 *15* (1977MiZV), 727 *3* (1972Sv02). Iβ^+,Iε: from Iβ^+=0.011 % 2 per parent decay (1972Sv02) based on Iβ^+/I(ce(K) 1408γ)=1.08 *20*.

† From intensity balance in decay scheme, unless otherwise noted.
‡ From Iε+Iβ^+ and theoretical ε/β^+ ratios, unless otherwise noted.
# Absolute intensity per 100 decays.

γ(^{152}Sm)

Iγ normalization: The absolute intensity of the 1408γ has been evaluated to be 20.85% 9 (2007BeZP). Normalization of the photon intensities to Iγ(344γ in Gd)=100 gives Iγ(1408γ)=78.41 *10* and Σ I(γ+ce)(to Gd g.s.)=105.02 *18*. From these data one gets branching (β-)=27.92 13 and thus branching (ε)=72.08 13.

All unplaced γ's from 13-y ^{152}Eu decay are listed in this dataset. some of these May belong in Gd following decay of the β^- branch.

α(K)exp have been calculated by the evaluator from I(ce(K)) (weighted average of references given) and the adopted Iγ. The I(ce(K)) have been normalized to the 344.2780γ in ^{152}Gd, α(K)(344γ,E2)=0.03103. The experimental α ratios given are also weighted averages of the references cited.

Kα x ray=224 *34*, Kβ x ray=51.6 *20* (relative to I(344γ, ^{152}Gd)=100) (1993Ka30).

E_γ[†]	I_γ[‡m]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	δ[#]	α[n]	Comments
118.97[l] *15*	0.0020[l] *4*	1082.816	0^+	963.363	1^-				E_γ: Poor fit. Not included in the least-squares adjustment. The adjustment gives Eγ=119.48 *3*.
121.7817[c] *3*	107.3 *4*	121.7818	2^+	0.0	0^+	E2		1.155	α(K)=0.678 *10*; α(L)=0.370 *6*; α(M)=0.0853 *12*; α(N+..)=0.0212 *3* α(N)=0.0187 *3*; α(O)=0.00239 *4*; α(P)=3.00×10^{-5} *5* I_γ: Value of 1969Va09 is excluded. Mult.: α(K)exp=0.661 *10* (1981Ka40, 1979De22, 1978Ar24, 1967Ma29). K/L=1.73 *3* (1981Ka40, 1979De22, 1978Ar24, 1957Ke08). L2/L1=2.58 *12* (1981Ka40), 2.43 *24* (1978Ar24), 2.30 *26* (1967Ma29), 2.297 *13* (1970SpZW), 2.22 *4* (1957Ke08). L3/L1=2.66 *13* (1981Ka40), 2.45 *24* (1978Ar24), 2.260 *15* (1970SpZW), 2.27 *26* (1967Ma29), 2.16 *5* (1957Ke08). The E2 theory values are 2.439 and 2.415 for L2/L1 and L3/L1, respectively, so the values of 1970SpZW and 1957Ke08 are 9.0% 17 and 5.9% 6 low for L2/L1, and 6.4% 6 and 10.0% 21 low for L3/L1, respectively. The experimental L2/L3 values agree well with theory, 1.016 *5* for 1970SpZW and 1.028 *24* for 1957Ke08 compared with 1.010 for E2 theory. L/M=4.34 *7* (1960Mu05, 1957Ke08). M2/M1=2.72 *5* (1970SpZW), 3.4 *1* (1957Ke08). M3/M1=2.76 *10* (1970SpZW), 3.3 *2* (1957Ke08). The E2 theory values are 2.72 and 2.76, respectively.
125.68[l] *10*	0.0193[l] *7*	810.453	2^+	684.69	0^+	[E2]		1.033	α(K)=0.618 *9*; α(L)=0.322 *5*; α(M)=0.0742 *11*; α(N+..)=0.0184 *3* α(N)=0.01631 *24*; α(O)=0.00209 *3*; α(P)=2.75×10^{-5} *4*
137.56[l] *22*	0.0028[l] *5*	1371.721	4^+	1233.8626	3^+				
148.00 *5*	0.077 *4*	1233.8626	3^+	1085.8408	2^+	M1+E2	+1.0 *6*	0.569 *16*	α(K)=0.42 *5*; α(L)=0.11 *5*; α(M)=0.025 *11*; α(N+..)=0.006 *3* α(N)=0.0056 *24*; α(O)=0.0008 *3*; α(P)=2.4×10^{-5} *7* I_γ: From 2007Ku20. Others: 0.18 *2* (1993Ka30), 0.15 *3* (1990Me15), 0.17 *2* (1990St02), 0.12 *1* (1980Sh15),≈0.04 (1975LeZH), ≤0.02 (1972Bb05), 0.06 *2* (1971Ba63).

γ(^{152}Sm) (continued)

E_γ[†]	I_γ[‡m]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	α[n]	Comments
								Mult.: The adopted $T_{1/2}$=0.76 ps *14* for the 1234 level, and δ(Q/D)=1.0 *6* rule out mult=E1+M2. δ: From linear polarization (2002Za07).
150.13[i] *8*	0.0034[i] *3*	1371.721	4$^+$	1221.67	5$^-$			
[x]166.91[d] *25*	0.008[d] *3*							
[x]175.18[d]	0.015[d] *4*							
[x]202.74 *13*	0.019 *4*							E_γ,I_γ: Weighted average from 1990Me15 and 1990St02. 1992Ya12 report Iγ<0.005.
207.03[l] *23*	0.0043[l] *9*	1292.753	2$^+$	1085.8408	2$^+$			
207.64 *11*	0.0276 *10*	1579.427	3$^-$	1371.721	4$^+$	[E1]	0.0382	α(K)=0.0325 *5*; α(L)=0.00450 *7*; α(M)=0.000961 *14*; α(N+..)=0.000249 *4* α(N)=0.000216 *3*; α(O)=3.14×10^{-5} *5*; α(P)=1.729×10^{-6} *25* I_γ: Values of 1990Me15, 1980Sh15, and 1971Ba63 are excluded.
209.97 *3*	0.0162 *26*	1292.753	2$^+$	1082.816	0$^+$			E_γ: Weighted average from 2007Ku20 and 2004Ca04. I_γ: The 209γ is a triplet with Iγ=0.0209 *20*. 2004Ca04 determine Iγ=0.0045 *15* for placement from the 1643 level in Gd, and 0.0162 *26* for placement from the 1293 level in Sm. A third placement is from the 1318 level in Gd, whose intensity from branching in Tb ε decay is 0.0099 *4*. The sum of these components is 0.0213 *30*, consistent with the value measured for the triplet. I_γ: Unweighted average of 0.0241 *10* (2007Ku20) and 0.0162 *26* (2004Ca04). the transition is a doublet and is not resolved in the other works.
210.95[l] *14*	0.0143[l] *6*	1233.8626	3$^+$	1022.969	4$^+$			
212.43 *11*	0.0780 *20*	1022.969	4$^+$	810.453	2$^+$	E2	0.1706	α(K)=0.1246 *18*; α(L)=0.0359 *5*; α(M)=0.00811 *12*; α(N+..)=0.00204 *3* α(N)=0.00179 *3*; α(O)=0.000239 *4*; α(P)=6.26×10^{-6} *9* E_γ: Weighted average from 2007Ku20 and 1990St02. The value of 212.569 *15* reported by 1990Me15 is not consistent with the level energy difference of 212.516 *6*.
237.10[i] *3*	0.0238[i] *7*	1529.8019	2$^-$	1292.753	2$^+$			
239.33[o]	<0.02	1769.130	2$^+$	1529.8019	2$^-$	[E1]	0.0263	α(K)=0.0224 *4*; α(L)=0.00308 *5*; α(M)=0.000657 *10*; α(N+..)=0.0001704 *24* α(N)=0.0001476 *21*; α(O)=2.16×10^{-5} *3*; α(P)=1.208×10^{-6} *17* E_γ,I_γ: E is from the level energy difference and Iγ is the limit from 1971Ba63. 2007Ku20 report Iγ<0.09. 1990St02 report Eγ=239.47 *33* with Iγ=0.04 *1*, 1972Bb05 report Eγ=238.8 *10* with Iγ=0.25 *12*, from γγ.
241[o]	<0.0014	1612.88	4$^+$	1371.721	4$^+$			E_γ,I_γ: Transition not seen. Eγ is a rounded-off value from the E(level) difference and Iγ is the limit determined by 2007Ku20.
244.6974[c] *8*	28.39 *10*	366.4795	4$^+$	121.7818	2$^+$	E2	0.1073	α(K)=0.0808 *12*; α(L)=0.0207 *3*; α(M)=0.00465 *7*; α(N+..)=0.001176 *17* α(N)=0.001032 *15*; α(O)=0.0001394 *20*; α(P)=4.18×10^{-6} *6* I_γ: Values of 1993Ka30, 1990St02, and 1970No06 are excluded. Mult.: α(K)exp=0.0809 *16*, K/L=3.91 *9* (1985Co08, 1981Ka40, 1979De22, 1978Ar24, 1967Ma29). α(L)exp=0.0210 *9* (1991Go22). α(M)exp=0.00466 *14* (1983KaZJ). L2/L1=0.78 *3* (1985Co08, 1981Ka40, 1967Ma29). L3/L1=0.61 *3* (1985Co08, 1981Ka40). Other: L3/L1=0.39 *4* of

$^{152}_{62}Sm_{90}$-5

^{152}Eu ε decay (13.517 y) (continued)

γ(^{152}Sm) (continued)

E_γ[†]	I_γ[‡m]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	δ[#]	α[n]	Comments
									1967Ma29 is discrepant. E2 theory values are α(K)=0.0808, K/L=3.90, α(L)=0.0207, α(M)=0.00465, L2/L1=0.772, L3/L1=0.603. δ: From $\gamma\gamma(\theta)$, 1985KrZU report δ(M3/E2)=−0.01 *3*.
251.633[h] *9*	0.252 *7*	1292.753	2^+	1041.1217	3^-	E1+M2	0.24 *+4−6*	0.055 *14*	α(K)=0.046 *12*; α(L)=0.0074 *21*; α(M)=0.0016 *5*; α(N+..)=0.00043 *12* α(N)=0.00037 *11*; α(O)=5.4×10^{-5} *15*; α(P)=3.1×10^{-6} *9* I_γ: The value of 1975LeZH is excluded. Mult.,δ: α(K)exp=0.045 *10* (1991Go22). α(K)(theory)=0.0197 (E1), 0.0742 (E2), 0.500 (M2). This gives mult=E1+M2 with δ=0.24 *+4−6*.
269.84 *6*	0.0295 *19*	1292.753	2^+	1022.969	4^+	[E2]		0.0784	α(K)=0.0601 *9*; α(L)=0.01432 *20*; α(M)=0.00321 *5*; α(N+..)=0.000812 *12* α(N)=0.000712 *10*; α(O)=9.71×10^{-5} *14*; α(P)=3.17×10^{-6} *5* I_γ: The value of 1972Bb05 is excluded.
272.41[i] *9*	0.0024[i] *6*	1082.816	0^+	810.453	2^+				
275.42 *4*	0.130 *3*	1085.8408	2^+	810.453	2^+	M1		0.1015	α(K)=0.0863 *12*; α(L)=0.01198 *17*; α(M)=0.00257 *4*; α(N+..)=0.000676 *10* α(N)=0.000583 *9*; α(O)=8.75×10^{-5} *13*; α(P)=5.46×10^{-6} *8* I_γ: The values of 1993Ka30 and 1977Ge12 are excluded. Mult.: α(K)exp=0.106 *19* (1991Go22). α(K)(theory)=0.0862 (M1).
285.98[g] *18*	0.037[g] *6*	1371.721	4^+	1085.8408	2^+	[E2]		0.0653	α(K)=0.0505 *8*; α(L)=0.01156 *17*; α(M)=0.00258 *4*; α(N+..)=0.000656 *10* α(N)=0.000574 *9*; α(O)=7.87×10^{-5} *12*; α(P)=2.69×10^{-6} *4*
286.50[g] *11*	0.0052[g] *11*	1579.427	3^-	1292.753	2^+				
295.9387[c] *17*	1.656 *15*	1529.8019	2^-	1233.8626	3^+	E1		0.01523	α(K)=0.01299 *19*; α(L)=0.001765 *25*; α(M)=0.000377 *6*; α(N+..)=9.79×10^{-5} *14* α(N)=8.48×10^{-5} *12*; α(O)=1.244×10^{-5} *18*; α(P)=7.13×10^{-7} *10* I_γ: The value of 0.72 *5* given in 1990St02 is probably a misprint. the evaluator assumes that the value should be 1.72 *5* and includes it in the weighted average. Mult.: α(K)exp=0.0108 *8* (1991Go22, 1982TrZV, 1967Ma29). Note that the reported values are all smaller than the E1 theory value of 0.0130. δ: −0.00 *3* (1985KrZU).
316.13[j] *13*	0.0378 *19*	1022.969	4^+	706.91	6^+	(E2)		0.0478	α(K)=0.0375 *6*; α(L)=0.00806 *12*; α(M)=0.00179 *3*; α(N+..)=0.000457 *7* α(N)=0.000399 *6*; α(O)=5.52×10^{-5} *8*; α(P)=2.03×10^{-6} *3* I_γ: Exclude 1990Me15.
320.10[i] *5*	0.0077[i] *4*	1612.88	4^+	1292.753	2^+				E_γ: Weighted average from 2007Ku20, 2004Ca04, and 1990Me15.

$^{152}_{62}Sm_{90}$-6

γ(^{152}Sm) (continued)

E_γ [†]	I_γ [‡m]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [#]	α [n]	Comments
329.41 *5*	0.456 *9*	1292.753	2^+	963.363	1^-	[E1]	0.01163	α(K)=0.00993 *14*; α(L)=0.001342 *19*; α(M)=0.000286 *4*; α(N+..)=7.45×10^{-5} *11* α(N)=6.45×10^{-5} *9*; α(O)=9.49×10^{-6} *14*; α(P)=5.50×10^{-7} *8* I_γ: Weighted average of 2007Ku20, 1990Me15, and 1972Bb05. The other works May include the 330.58γ from the 1372 level.
330.58 *8*	0.035 *4*	1371.721	4^+	1041.1217	3^-	[E1]	0.01154	α(K)=0.00985 *14*; α(L)=0.001331 *19*; α(M)=0.000284 *4*; α(N+..)=7.39×10^{-5} *11* α(N)=6.39×10^{-5} *9*; α(O)=9.41×10^{-6} *14*; α(P)=5.45×10^{-7} *8* I_γ: Weighted average of 2007Ku20, 1990Me15, and 1972Bb05. The value of 0.28 *4* given in 1990Me15 is assumed by the evaluator to be α mistake and is taken as 0.028 *4*.
340.46 *10*	0.100 *3*	706.91	6^+	366.4795	4^+	E2	0.0382	α(K)=0.0302 *5*; α(L)=0.00622 *9*; α(M)=0.001379 *20*; α(N+..)=0.000352 *5* α(N)=0.000308 *5*; α(O)=4.28×10^{-5} *6*; α(P)=1.660×10^{-6} *24* I_γ: The values of 1993Ka30 and 1977Ge12 are excluded.
345.54 *3*	0.0369 *18*	1579.427	3^-	1233.8626	3^+			I_γ: Weighted average of 2007Ku20 and 2004Ca04. The transition is not fully resolved in the other works from the 344γ in Gd.
348.752[i] *15*	0.0064[i] *6*	1371.721	4^+	1022.969	4^+			
357.26 *5*	0.0229 *16*	1649.833	2^-	1292.753	2^+	[E1]	0.00953 *14*	α=0.00953 *14*; α(K)=0.00814 *12*; α(L)=0.001095 *16*; α(M)=0.000234 *4*; α(N+..)=6.09×10^{-5} *9* α(N)=5.26×10^{-5} *8*; α(O)=7.76×10^{-6} *11*; α(P)=4.53×10^{-7} *7*
358.48[i] *7*	0.0062[i] *5*	1730.207	3^-	1371.721	4^+			
378.15[l] *24*	0.00089[l] *21*	1612.88	4^+	1233.8626	3^+			E_γ: Poor fit. Not included in the least-squares adjustment. The adjustment gives Eγ=379.02.
[x]379.36[e] *18*	0.0031[e] *8*							
385.61 *21*	0.0209 *9*	1757.001	4^+	1371.721	4^+	[M1,E2]	0.034 *8*	α(K)=0.028 *8*; α(L)=0.0045 *5*; α(M)=0.00097 *8*; α(N+..)=0.000253 *23* α(N)=0.000220 *19*; α(O)=3.2×10^{-5} *4*; α(P)=1.7×10^{-6} *6* I_γ: 1990St02 report Iγ=0.21 *2*. This May be a misprint.
[x]389.07 *11*	0.013 *5*							E_γ,I_γ: From 1990St02. 1993Ka30 report Iγ=0.014 *4*. Not seen by 1992Ya12, Iγ<0.005.
391.19 *7*	0.00530 *16*	1612.88	4^+	1221.67	5^-			
[x]395.75 *19*	0.03 *1*							E_γ,I_γ: From 1990St02. 1993Ka30 report Iγ=0.02 *1*. Not seen by 1992Ya12, Iγ<0.005.
397.75[l] *26*	0.00140[l] *22*	1769.130	2^+	1371.721	4^+			
401.29[i] *9*	0.00240[i] *16*	1085.8408	2^+	684.69	0^+			
[x]406.74[e] *15*	0.0031[e] *8*							
416.02 *3*	0.409 *7*	1649.833	2^-	1233.8626	3^+	[E1]	0.00660 *10*	α=0.00660 *10*; α(K)=0.00565 *8*; α(L)=0.000755 *11*; α(M)=0.0001609 *23*; α(N+..)=4.20×10^{-5} *6* α(N)=3.63×10^{-5} *5*; α(O)=5.36×10^{-6} *8*; α(P)=3.17×10^{-7} *5*
423.45[l] *4*	0.0112[l] *8*	1233.8626	3^+	810.453	2^+	[M1,E2]	0.027 *7*	α(K)=0.022 *6*; α(L)=0.0034 *5*; α(M)=0.00074 *8*; α(N+..)=0.000193 *24* α(N)=0.000167 *20*; α(O)=2.4×10^{-5} *4*; α(P)=1.3×10^{-6} *5*
[x]441.00[d]	[d]							

$^{152}_{62}Sm_{90}$-7

^{152}Eu ε decay (13.517 y) (continued)

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

E_γ[†]	I_γ[‡m]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[n]	Comments
443.9606[&] *16*	10.63[&] *3*	1529.8019	2⁻	1085.8408	2⁺	E1+M2[&]	+0.058 *12*	0.00598 *17*	α=0.00598 *17*; α(K)=0.00511 *14*; α(L)=0.000688 *22*; α(M)=0.000147 *5*; α(N+..)=3.83×10^{-5} *13* α(N)=3.31×10^{-5} *11*; α(O)=4.91×10^{-6} *16*; α(P)=2.92×10^{-7} *10* δ: from 1985KrZU. Other: +0.03 *8* (1973Ka05).
444.01[&] *17*	1.12[&] *4*	810.453	2⁺	366.4795	4⁺	E2[&]		0.01772	α(K)=0.01441 *21*; α(L)=0.00259 *4*; α(M)=0.000569 *8*; α(N+..)=0.0001463 *21* α(N)=0.0001274 *18*; α(O)=1.81×10^{-5} *3*; α(P)=8.19×10^{-7} *12*
464.28[l] *14*	0.0017[l] *7*	1757.001	4⁺	1292.753	2⁺				
476.42[i] *9*	0.0064[i] *12*	1769.130	2⁺	1292.753	2⁺				
482.33 *5*	0.093 *3*	1292.753	2⁺	810.453	2⁺	E0+M1+E2		0.062 *12*	α(K)=0.054 *12*; α(L)=0.0077 *17* E_γ,I_γ: The 482γ is placed from the 1293 level in Sm and from the 1606 level in Gd. 2007Ku20 resolve the Sm component which constitutes 92% of the total intensity. The evaluator assumes that the measured energy can be assigned to this placement. Mult.: α(K)exp=0.054 *12* (1991Go22, 1990Ka35, 1982TrZV). The value for 1991Go22 is deduced by the evaluator from the authors′ unresolved ce intensity for Ice(K)(482γ)+Ice(L)(444γ doublet). α(K)(theory)=0.0201 for mult=M1 and 0.0116 for E2 give Ice(K)(E0)/Ice(K)(E2)=3.6 *10* for mult=E0+E2, and Ice(K)(E0)/Ice(K)(M1)=1.7 *6* for mult=E0+M1.
488.6792[c] *20*	1.558 *10*	1529.8019	2⁻	1041.1217	3⁻	M1+E2	+5.6 *5*	0.01392 *21*	α(K)=0.01143 *17*; α(L)=0.00195 *3*; α(M)=0.000427 *6*; α(N+..)=0.0001101 *16* α(N)=9.57×10^{-5} *14*; α(O)=1.371×10^{-5} *20*; α(P)=6.59×10^{-7} *10* Mult.: α(K)exp=0.0118 *9* (1991Go22,1967Ma29). α(K)(theory)=0.0194 (M1), 0.0112 (E2). δ: from 1970Ba32. Other: +4.5 *+18−11* (1985KrZU).
493.54 *4*	0.114 *5*	1579.427	3⁻	1085.8408	2⁺	[E1]		0.00444 *7*	α=0.00444 *7*; α(K)=0.00380 *6*; α(L)=0.000504 *7*; α(M)=0.0001074 *15*; α(N+..)=2.80×10^{-5} *4* α(N)=2.42×10^{-5} *4*; α(O)=3.59×10^{-6} *5*; α(P)=2.16×10^{-7} *3* E_γ,I_γ: From 2007Ku20. The transition is also placed in Gd and is unresolved in the other works. The placement in Sm is dominant and the evaluator assumes that the measured energy can be assigned to this placement.
496.56[l] *24*	0.022[l] *8*	1730.207	3⁻	1233.8626	3⁺	[E1]		0.00438 *7*	α=0.00438 *7*; α(K)=0.00375 *6*; α(L)=0.000497 *7*;

$^{152}_{62}Sm_{90}$-8

E_γ[†]	I_γ[‡m]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[n]	Comments
									α(M)=0.0001059 *15*; α(N+..)=2.77×10^{-5} *4* α(N)=2.39×10^{-5} *4*; α(O)=3.55×10^{-6} *5*; α(P)=2.13×10^{-7} *3*
514.78[i] *6*	0.0016[i] *3*	1221.67	5⁻	706.91	6⁺				
523.13 *5*	0.0575 *24*	1757.001	4⁺	1233.8626	3⁺	[M1,E2]		0.015 *4*	α(K)=0.013 *4*; α(L)=0.0019 *4*; α(M)=0.00041 *7*; α(N+..)=0.000107 *19* α(N)=9.3×10^{-5} *16*; α(O)=1.4×10^{-5} *3*; α(P)=7.8×10^{-7} *25* I_γ: The value of 0.0056 *4* given in 1990Me15 is probably a misprint. the evaluator assumes that the value should be 0.056 *4* and includes it in the weighted average.
527.1[o]	<0.0007	1612.88	4⁺	1085.8408	2⁺				E_γ,I_γ: Transition not seen. Eγ is a rounded-off value from the E(level) difference and Iγ is the limit determined by 2007Ku20.
535.44[i] *12*	0.0065[i] *5*	1769.130	2⁺	1233.8626	3⁺				
[x]536.23[d]	[d]								
538.29 *6*	0.0163 *11*	1579.427	3⁻	1041.1217	3⁻	[M1,E2]		0.014 *4*	α(K)=0.012 *4*; α(L)=0.0018 *4*; α(M)=0.00038 *7*; α(N+..)=9.9×10^{-5} *18* α(N)=8.6×10^{-5} *15*; α(O)=1.27×10^{-5} *25*; α(P)=7.3×10^{-7} *23*
556.48 *10*	0.0666 *23*	1579.427	3⁻	1022.969	4⁺	[E1]		0.00340 *5*	α=0.00340 *5*; α(K)=0.00291 *4*; α(L)=0.000384 *6*; α(M)=8.17×10^{-5} *12*; α(N+..)=2.14×10^{-5} *3* α(N)=1.84×10^{-5} *3*; α(O)=2.74×10^{-6} *4*; α(P)=1.659×10^{-7} *24* E_γ: Weighted average from 2007Ku20 and 1990St02. The value of 556.562 *27* reported by 1990Me15 is not consistent with the level energy difference of 556.458 *12*. The value May be a misprint.
561.26 *17*	0.0053 *9*	1371.721	4⁺	810.453	2⁺	[E2]		0.00949 *14*	α=0.00949 *14*; α(K)=0.00785 *11*; α(L)=0.001285 *18*; α(M)=0.000280 *4*; α(N+..)=7.24×10^{-5} *11* α(N)=6.29×10^{-5} *9*; α(O)=9.07×10^{-6} *13*; α(P)=4.56×10^{-7} *7*
562.98[l] *14*	0.076[l] *7*	684.69	0⁺	121.7818	2⁺	E2		0.00941 *14*	α=0.00941 *14*; α(K)=0.00779 *11*; α(L)=0.001274 *18*; α(M)=0.000278 *4*; α(N+..)=7.18×10^{-5} *10* α(N)=6.24×10^{-5} *9*; α(O)=9.00×10^{-6} *13*; α(P)=4.52×10^{-7} *7*
563.986[f] *5*	1.856 *16*	1649.833	2⁻	1085.8408	2⁺	(E1)		0.00330 *5*	α=0.00330 *5*; α(K)=0.00283 *4*; α(L)=0.000372 *6*; α(M)=7.93×10^{-5} *11*; α(N+..)=2.07×10^{-5} *3* α(N)=1.79×10^{-5} *3*; α(O)=2.66×10^{-6} *4*; α(P)=1.612×10^{-7} *23* Mult.: α(K)exp=0.0070 *4* (1981Ka40) and 0.0036 *17* (1967Ma29) do not agree. α(K)(theory)=0.00283 (E1), 0.00775 (E2). Placement in the decay scheme requires Δπ=yes. δ: +0.07 *+11−9* (1985KrZU).
566.438[f] *6*	0.493 *12*	1529.8019	2⁻	963.363	1⁻	M1+E2	−0.74 *35*	0.0134 *15*	α(K)=0.0114 *13*; α(L)=0.00162 *13*; α(M)=0.00035 *3*; α(N+..)=9.1×10^{-5} *8* α(N)=7.9×10^{-5} *6*; α(O)=1.17×10^{-5} *10*; α(P)=7.0×10^{-7} *9*

^{152}Eu ε decay (13.517 y) (continued)

γ(^{152}Sm) (continued)

E_γ[†]	I_γ[‡m]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	α[n]	Comments
								Mult.: α(K)exp=0.010 *5* (1967Ma29). α(K)(theory)=0.0134 (M1), 0.00767 (E2). δ: from 1985KrZU.
571.83[l] *8*	0.0167[l] *6*	1612.88	4$^+$	1041.1217	3$^-$			
588.6[l] *3*	0.009[l] *4*	1822.03	4$^-$	1233.8626	3$^+$			
589.83[i] *17*	0.0049[i] *3*	1612.88	4$^+$	1022.969	4$^+$			
[x]595.61 *12*	0.12 *4*							E_γ,I_γ: From 1990St02. 1993Ka30 report Iγ=0.012 *6*. Not seen by 1992Ya12, Iγ<0.006.
608.06[l] *15*	0.0010[l] *3*	1292.753	2$^+$	684.69	0$^+$			
609.23[l] *22*	0.0046[l] *6*	1649.833	2$^-$	1041.1217	3$^-$			
616.05 *5*	0.0345 *20*	1579.427	3$^-$	963.363	1$^-$	[E2]	0.00750 *11*	α=0.00750 *11*; α(K)=0.00624 *9*; α(L)=0.000991 *14*; α(M)=0.000215 *3*; α(N+..)=5.58×10^{-5} *8* α(N)=4.84×10^{-5} *7*; α(O)=7.02×10^{-6} *10*; α(P)=3.65×10^{-7} *6*
644.39 *6*	0.0248 *18*	1730.207	3$^-$	1085.8408	2$^+$	[E1]	0.00248 *4*	α=0.00248 *4*; α(K)=0.00212 *3*; α(L)=0.000278 *4*; α(M)=5.92×10^{-5} *9*; α(N+..)=1.548×10^{-5} *22* α(N)=1.336×10^{-5} *19*; α(O)=1.99×10^{-6} *3*; α(P)=1.216×10^{-7} *17* I_γ: The values of 1990St02 and 1971Ba63 are excluded.
656.489[h] *5*	0.542 *8*	1022.969	4$^+$	366.4795	4$^+$	E0+M1+E2	0.0568 *20*	α(K)=0.0491 *15*; α(L)=0.0070 *2* I_γ: Exclude 1970Ri19. Mult.,δ: α(K)exp=0.0491 *15* (1991γ022, 1990Ka35, 1985Co08, 1982TrZV, 1979De22, 1967Ma29). The value for 1991Go22 is deduced by the evaluator from the authors′ unresolved ce intensity for ce(K)(656γ)+ ce(L)(615 E0 in Gd). K/L=4.5 *+29−15* (1967Ma29). α(K)(theory)=0.00931 (M1) and 0.00536 (E2), and from the evaluation of 1982La26 one has δ=+2.1 *3*, which gives α(K)(M1+E2 theory)=0.00611 *18*. From these data one gets Ice(K)(E0)/Ice(K)(E2)= 8.0 *3* and Ice(K)(E0)/Ice(K)(M1+E2)=7.0 *3*.
664.77 *5*	0.0373 *19*	1371.721	4$^+$	706.91	6$^+$	[E2]	0.00623 *9*	α=0.00623 *9*; α(K)=0.00520 *8*; α(L)=0.000807 *12*; α(M)=0.0001749 *25*; α(N+..)=4.54×10^{-5} *7* α(N)=3.94×10^{-5} *6*; α(O)=5.73×10^{-6} *8*; α(P)=3.05×10^{-7} *5* I_γ: Values of 1990Me15 and 1972Bb05 are excluded.
671.155 *14*	0.092 *16*	1757.001	4$^+$	1085.8408	2$^+$			Mult.: See comment in (α,2nγ).
674.64[k] *14*	0.636[k] *12*	1041.1217	3$^-$	366.4795	4$^+$	E1	0.00225 *4*	α=0.00225 *4*; α(K)=0.00193 *3*; α(L)=0.000252 *4*; α(M)=5.36×10^{-5} *8*; α(N+..)=1.403×10^{-5} *20* α(N)=1.211×10^{-5} *17*; α(O)=1.81×10^{-6} *3*; α(P)=1.107×10^{-7} *16* δ: δ(M2/E1)=−0.03 *6* (1971Ba54).
683.25 *9*	0.0178 *10*	1769.130	2$^+$	1085.8408	2$^+$			I_γ: Weighted average from 2007Ku20 and 2004Ca04. E_γ: Weighted average from 2007Ku20 and 1990Me15. The value of 683.70 *9* from 2004Ca04 appears to be discrepant. Eγ=683.29 *3* is expected from Adopted Levels.
686.60[l] *5*	0.0762[l] *25*	1649.833	2$^-$	963.363	1$^-$	[M1,E2]	0.0078 *20*	α=0.0078 *20*; α(K)=0.0066 *18*; α(L)=0.00093 *20*; α(M)=0.00020 *4*; α(N+..)=5.2×10^{-5} *11*

From ENSDF

γ(^{152}Sm) (continued)

E_γ[†]	I_γ[‡m]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[n]	Comments
								α(N)=4.5×10^{-5} *10*; α(O)=6.7×10^{-6} *15*; α(P)=4.0×10^{-7} *12* I_γ: From 2007Ku20. 2004VaZW report 0.075 *7*.
688.670[c] *5*	3.221 *19*	810.453	2$^+$	121.7818	2$^+$	E0+M1+E2	0.0409 *13*	α(K)=0.0356 *11*; α(L)=0.0051 *2* Mult.,δ: α(K)exp=0.0357 *11* (1990Ka35, 1981Ka40, 1991Go22, 1967Ma29). α(K)(E2 theory)=0.00479, and from the evaluation of 1982La26 one has δ(E2/M1)=19 *+5−4*, which gives α(K)(theory)=0.00480. from these data one gets Ice(K)(E0)/Ice(K)(E2)=6.4 *3*. α(M)exp=0.0019 *4* (1983KaZJ). K/L=7.0 *8* (1991Go22), other: 7.2 *13* (1967Ma29). The value of 4.0 *4* reported by 1981Ka40 is discrepant. L/M=3.3 *5* (1991Go22), other: 3.3 *14* (1967Ma29). I(ce(K))(E0)/I(ce(K))(E2)=6.1 *15*, ρ=0.23 *2* (1990Ka35); δ: δ(E2/M1)=+19 *+5−4* (adopted gammas (1982La26), includes 1973Ka05,1971Ru05,1970RaZF). Other: +31 +[-17 (1985KrZU). From (ce(K))(γ)(θ) 1973Ka05 deduce penetration parameter −365≤λ≤+290 and δ(E0/E2)=2.47 *31*.
[x]696.87 *19*	0.06 *3*							E_γ,I_γ: From 1990St02. 1993Ka30 report Iγ=0.011 *4*. Not seen by 1992Ya12, Iγ<0.007.
707.16[i] *7*	0.00535[i] *21*	1730.207	3$^-$	1022.969	4$^+$			
719.346[b] *7*	0.94[b] *3*	1085.8408	2$^+$	366.4795	4$^+$	(E2)[b]	0.00517 *8*	α=0.00517 *8*; α(K)=0.00433 *6*; α(L)=0.000657 *10*; α(M)=0.0001420 *20*; α(N+..)=3.69×10^{-5} *6* α(N)=3.20×10^{-5} *5*; α(O)=4.68×10^{-6} *7*; α(P)=2.55×10^{-7} *4*
719.36[b] *14*	0.357[b] *12*	1529.8019	2$^-$	810.453	2$^+$	(E1)[b]	0.00197 *3*	α=0.00197 *3*; α(K)=0.001689 *24*; α(L)=0.000220 *3*; α(M)=4.68×10^{-5} *7*; α(N+..)=1.226×10^{-5} *18* α(N)=1.058×10^{-5} *15*; α(O)=1.578×10^{-6} *23*; α(P)=9.71×10^{-8} *14*
728.04 *4*	0.0418 *14*	1769.130	2$^+$	1041.1217	3$^-$	[E1]	0.00192 *3*	α=0.00192 *3*; α(K)=0.001648 *23*; α(L)=0.000215 *3*; α(M)=4.57×10^{-5} *7*; α(N+..)=1.195×10^{-5} *17* α(N)=1.032×10^{-5} *15*; α(O)=1.539×10^{-6} *22*; α(P)=9.48×10^{-8} *14* E_γ: Weighted average from 2007Ku20 and 1990Me15. The value of 727.42 *16* reported by 1990St02 appears to be discrepant. I_γ: From 2007Ku20.
734.14[i] *12*	0.0034[i] *5*	1757.001	4$^+$	1022.969	4$^+$			
735.43 *8*	0.0166 *7*	1776.56	2$^+$	1041.1217	3$^-$			
756.16 *3*	0.0167 *16*	1779.119	3$^-$	1022.969	4$^+$			
766.38[l] *18*	0.0026[l] *3*	1730.207	3$^-$	963.363	1$^-$			E_γ: Poor fit. Not included in the least-squares adjustment. The adjustment gives Eγ=766.842 *24*.
768.96 *4*	0.308 *16*	1579.427	3$^-$	810.453	2$^+$	[E1]	0.001719 *24*	α=0.001719 *24*; α(K)=0.001475 *21*; α(L)=0.000192 *3*; α(M)=4.08×10^{-5} *6*; α(N+..)=1.068×10^{-5} *1* α(N)=9.22×10^{-6} *13*; α(O)=1.376×10^{-6} *20*; α(P)=8.50×10^{-8} *12* I_γ: The value of 2007Ku20 (0.433 *14*) is excluded.
802.0[l] *5*	0.00155[l] *18*	1612.88	4$^+$	810.453	2$^+$			
805.71 *9*	0.0571 *22*	1769.130	2$^+$	963.363	1$^-$	[E1]	0.001565 *22*	α=0.001565 *22*; α(K)=0.001344 *19*; α(L)=0.0001743 *25*;

γ(^{152}Sm) (continued)

E_γ[†]	I_γ[‡m]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[n]	Comments
									α(M)=3.71×10^{-5} *6*; α(N+..)=9.71×10^{-6} α(N)=8.38×10^{-6} *12*; α(O)=1.251×10^{-6} *18*; α(P)=7.75×10^{-8} *11*
810.451[c] *5*	1.193 *10*	810.453	2$^+$	0.0	0$^+$	E2		0.00393 *6*	α=0.00393 *6*; α(K)=0.00331 *5*; α(L)=0.000487 *7*; α(M)=0.0001051 *15*; α(N+..)=2.74×10^{-5} *4* α(N)=2.37×10^{-5} *4*; α(O)=3.48×10^{-6} *5*; α(P)=1.96×10^{-7} *3* Mult.: α(K)exp=0.0037 *5* (1991Go22, 1983KaZJ, 1967Ma29). α(K)(theory)= 0.00557 (M1), 0.00331 (E2) which give δ>1.2. Placement to 0$^+$ requires pure mult. I_γ: The value of 1970Ri19 is excluded.
813.21[i] *6*	0.0162[i] *16*	1776.56	2$^+$	963.363	1$^-$				
839.36 *4*	0.0666 *19*	1649.833	2$^-$	810.453	2$^+$	[E1]		0.001444 *21*	α=0.001444 *21*; α(K)=0.001240 *18*; α(L)=0.0001605 *23*; α(M)=3.41×10^{-5} *5*; α(N+..)=8.94×10^{-6} α(N)=7.72×10^{-6} *11*; α(O)=1.153×10^{-6} *17*; α(P)=7.16×10^{-8} *10* I_γ: The value of 1990St02 is excluded.
841.574[c] *5*	0.630 *11*	963.363	1$^-$	121.7818	2$^+$	E1		0.001436 *21*	α=0.001436 *21*; α(K)=0.001234 *18*; α(L)=0.0001597 *23*; α(M)=3.39×10^{-5} *5*; α(N+..)=8.89×10^{-6} α(N)=7.68×10^{-6} *11*; α(O)=1.147×10^{-6} *16*; α(P)=7.12×10^{-8} *10*
855.21[i] *7*	0.0074[i] *5*	1221.67	5$^-$	366.4795	4$^+$				
867.380[c] *3*	15.90 *9*	1233.8626	3$^+$	366.4795	4$^+$	M1+E2	−6.2 *5*	0.00343 *5*	α=0.00343 *5*; α(K)=0.00290 *4*; α(L)=0.000419 *6*; α(M)=9.01×10^{-5} *13*; α(N+..)=2.35×10^{-5} *4* α(N)=2.03×10^{-5} *3*; α(O)=3.00×10^{-6} *5*; α(P)=1.719×10^{-7} *25* Mult.: α(K)exp=0.00302 *20* (1985Co08, 1979De22, 1967Ma29). Other: the value of 0.00441 *25* from 1981Ka40 seems discrepant. α(L)exp=0.040 *3* (1991Go22, 1982TrZV, 1967Ma29). α(K)(theory)=0.00473 (M1), 0.00285 (E2) and α(L)(theory)=0.000632 (M1), 0.000414 (E2). From α(K)exp and α(L)exp one gets δ>2.0 and >3.6, respectively. δ: Unweighted average of −6.5 *3* (1982La26), −6.9 *+7−8* (1985KrZU) −5.3 *4* (2008ZaZY). δ: from 1982La26. Other: −6.9 *+7−8* (1985KrZU).
^{x}896.59 *9*	0.252 *8*								E_γ: from 1990St02. I_γ: weighted average of 1990St02 and 1993Ka30.
901.19 *5*	0.321 *9*	1022.969	4$^+$	121.7818	2$^+$	E2		0.00311 *5*	α=0.00311 *5*; α(K)=0.00263 *4*; α(L)=0.000378 *6*; α(M)=8.13×10^{-5} *12*; α(N+..)=2.12×10^{-5} *3* α(N)=1.83×10^{-5} *3*; α(O)=2.71×10^{-6} *4*; α(P)=1.558×10^{-7} *22*
906.06 *10*	0.0345 *15*	1612.88	4$^+$	706.91	6$^+$				I_γ: From 2007Ku20. Others: 0.068 *6* (1993Ka30), 0.056 *5* (1990Me15). the high values are inconsistent with data in Coulomb excitation.
919.337[c] *4*	1.574[a] *16*	1041.1217	3$^-$	121.7818	2$^+$	E1		0.001210 *17*	α=0.001210 *17*; α(K)=0.001040 *15*; α(L)=0.0001341 *19*; α(M)=2.85×10^{-5} *4*; α(N+..)=7.47×10^{-6} α(N)=6.44×10^{-6} *9*; α(O)=9.64×10^{-7} *14*; α(P)=6.01×10^{-8} *9*

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^{152}Eu ε decay (13.517 y) (continued)

γ(^{152}Sm) (continued)

E_γ [†]	I_γ [‡m]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [#]	δ [#]	α [n]	Comments
									Mult.: α(K)exp=0.00127 *19* (1991Go22). α(K)(theory)=0.00104 (E1), 0.0104 (M2). δ: δ(M2/E1)=−0.09 *12* (1985KrZU), 0.16 *+5−10* from α(K)exp, <0.07 from RUL (B(M2)(W.u.)<1).
919.74 [i] *4*	0.0244 [i] *14*	1730.207	3⁻	810.453	2⁺				
926.31 *5*	1.024 *12*	1292.753	2⁺	366.4795	4⁺	[E2]		0.00293 *4*	α=0.00293 *4*; α(K)=0.00248 *4*; α(L)=0.000354 *5*; α(M)=7.62×10⁻⁵ *11*; α(N+..)=1.99×10⁻⁵ *3* α(N)=1.720×10⁻⁵ *24*; α(O)=2.54×10⁻⁶ *4*; α(P)=1.470×10⁻⁷ *21*
947.15 [l] *14*	0.0041 [l] *7*	1757.001	4⁺	810.453	2⁺				E_γ: Poor fit. Not included in the least-squares adjustment. The adjustment gives Eγ=946.544 *14*.
958.63 *5*	0.074 *4*	1769.130	2⁺	810.453	2⁺	[M1,E2]		0.0035 *9*	α=0.0035 *9*; α(K)=0.0030 *8*; α(L)=0.00041 *9*; α(M)=8.8×10⁻⁵ *18*; α(N+..)=2.3×10⁻⁵ *5* α(N)=2.0×10⁻⁵ *4*; α(O)=3.0×10⁻⁶ *7*; α(P)=1.8×10⁻⁷ *5*
961.08 [i] *4*	0.030 [i] *8*	1082.816	0⁺	121.7818	2⁺				
963.367 [@] *7*	0.528 [@] *23*	963.363	1⁻	0.0	0⁺	[E1] [@]		0.001107 *16*	α=0.001107 *16*; α(K)=0.000951 *14*; α(L)=0.0001225 *18*; α(M)=2.60×10⁻⁵ *4*; α(N+..)=6.82×10⁻⁶ α(N)=5.88×10⁻⁶ *9*; α(O)=8.81×10⁻⁷ *13*; α(P)=5.50×10⁻⁸ *8*
964.057 [@] *5*	54.57 [@] *13*	1085.8408	2⁺	121.7818	2⁺	M1+E2 [@]	−9.3 *6*	0.00271 *4*	α=0.00271 *4*; α(K)=0.00229 *4*; α(L)=0.000325 *5*; α(M)=6.98×10⁻⁵ *10*; α(N+..)=1.82×10⁻⁵ *3* α(N)=1.577×10⁻⁵ *23*; α(O)=2.33×10⁻⁶ *4*; α(P)=1.362×10⁻⁷ *20* δ: weighted average of −8.0 *6* (1985KrZU) and −9.6 *3* (1982La26). Other: −7.5 *+5−25* (1992De29).
968.65 [i] *4*	0.0298 [i] *8*	1779.119	3⁻	810.453	2⁺				
[x]1001.1 *3*	0.017 *3*								E_γ: From 1990Me15$. I_γ: Weighted average from 1990Me15 and 1993Ka30.
1005.27 *5*	2.48 *4*	1371.721	4⁺	366.4795	4⁺	M1+E2	−3.1 *+2−3*	0.00259 *5*	α=0.00259 *5*; α(K)=0.00220 *4*; α(L)=0.000308 *5*; α(M)=6.60×10⁻⁵ *11*; α(N+..)=1.73×10⁻⁵ *3* α(N)=1.492×10⁻⁵ *24*; α(O)=2.22×10⁻⁶ *4*; α(P)=1.316×10⁻⁷ *22* Mult.: α(K)exp=0.0028 *3* (1990Ka35, 1967Ma29). α(K)(theory)=0.00333 (M1), 0.00208 (E2). δ: from 1982La26. Other: −3.9 *25* (1985KrZU).
1050.1 [l] *6*	0.0027 [l] *11*	1757.001	4⁺	706.91	6⁺				
[x]1084 [e] *1*	0.92 [e] *3*								
1084.38 [i] *11*	0.040 [i] *3*	1769.130	2⁺	684.69	0⁺				
1085.837 [c] *10*	38.04 *10*	1085.8408	2⁺	0.0	0⁺	E2		0.00209 *3*	α=0.00209 *3*; α(K)=0.001779 *25*; α(L)=0.000247 *4*; α(M)=5.30×10⁻⁵ *8*; α(N+..)=1.387×10⁻⁵ *20* α(N)=1.199×10⁻⁵ *17*; α(O)=1.780×10⁻⁶ *25*;

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

E_γ [†]	I_γ [‡m]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	δ [#]	α [n]	Comments
									α(P)=1.058×10^{-7} *15* Mult.: α(K)exp=0.00202 *5* 91985co08, 1981Ka40, 1979De22, 1967Ma29). α(L+...)exp=0.000281 *17* (1991Go22). α(K)(theory)=0.00277 (M1), 0.00178 (E2). α(L)+(theory)=0.000467 (M1), 0.000315 (E2). from α(K)exp, δ=2.1 +*6*−*3*, and from α(L+...)exp, no M1 component is required. placement in the decay scheme is to the 0$^+$ g.s., so pure mult is required. Note that 1991Go22 report α(K)exp=0.00180 *8*, consistent with mult=E2; however, 1981Ka40 report α(K)exp=0.00212 *8*.
1112.076[c] *3*	51.40 *23*	1233.8626	3$^+$	121.7818	2$^+$	M1+E2	−8.7 *6*	0.00201 *3*	α=0.00201 *3*; α(K)=0.001707 *24*; α(L)=0.000236 *4*; α(M)=5.06×10^{-5} *8*; α(N+..)=1.375×10^{-5} *20* α(N)=1.144×10^{-5} *16*; α(O)=1.701×10^{-6} *24*; α(P)=1.017×10^{-7} *15*; α(IPF)=5.03×10^{-7} *7* I_γ: The value of 1998Hw07 is excluded. Mult.: α(K)exp=0.00184 *12* (1985Co08, 1981Ka40, 1979De22, 1967Ma29). α(L)exp=0.000226 *12* (1991Go22). Other: 0.00035 *5* (1982TrZV). α(K)(theory)=0.00262 (M1), 0.00170 (E2) and α(L)(theory)=0.000348 (M1), 0.000235 (E2). α(K)exp gives δ>1.6 and α(L)exp gives δ>6.0. δ: from 1982La26. Others: −34 +*6*−*8* (1992De29), −8.1 +*6*−*7* (1985KrZU).
[x]1139 *1*	0.0047 *3*								E_γ: From 1990Me15$. I_γ: weighted average of 1990Me15 and 1993Ka30.
1170.97 *9*	0.140 *6*	1292.753	2$^+$	121.7818	2$^+$	[M1,E2]		0.0023 *5*	α=0.0023 *5*; α(K)=0.0019 *4*; α(L)=0.00026 *5*; α(M)=5.5×10^{-5} *11*; α(N+..)=1.8×10^{-5} *3* α(N)=1.25×10^{-5} *24*; α(O)=1.9×10^{-6} *4*; α(P)=1.2×10^{-7} *3*; α(IPF)=3.14×10^{-6} *11*
1212.948[c] *11*	5.320 *21*	1579.427	3$^-$	366.4795	4$^+$	E1		0.000756 *11*	α=0.000756 *11*; α(K)=0.000624 *9*; α(L)=7.96×10^{-5} *12*; α(M)=1.689×10^{-5} *24*; α(N+..)=3.61×10^{-5} *5* α(N)=3.82×10^{-6} *6*; α(O)=5.73×10^{-7} *8*; α(P)=3.62×10^{-8} *5*; α(IPF)=3.17×10^{-5} *5* Mult.: α(K)exp=0.00059 *5* (1991Go22, 1967La13). α(K)(theory)=0.000624 (E1). other: the value of 0.00024 *7* from 1967Ma29 is discrepant. δ: 0.00 *2* (combined results of 1973Ka05, 1970He29, 1971Ba54, 1970Ba32, 1969Aq01). Others: +0.04 *2* (1985KrZU), −0.007 *17* (2008ZaZY).
1246.34[l] *16*	0.0035[l] *5*	1612.88	4$^+$	366.4795	4$^+$				
1249.94 *5*	0.703 *9*	1371.721	4$^+$	121.7818	2$^+$	E2		0.001586 *23*	α=0.001586 *23*; α(K)=0.001341 *19*; α(L)=0.000183 *3*; α(M)=3.91×10^{-5} *6*; α(N+..)=2.25×10^{-5} *4* α(N)=8.84×10^{-6} *13*; α(O)=1.318×10^{-6} *19*; α(P)=7.99×10^{-8} *12*; α(IPF)=1.222×10^{-5} *18*

^{152}Eu ε decay (13.517 y) (continued)

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

E_γ [†]	I_γ [‡m]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [#]	δ [#]	α [n]	Comments
									Mult.: α(K)exp=0.0017 *6* (1967La13). δ: +0.04 *9* (1985KrZU).
1292.78 *5*	0.378 *10*	1292.753	2^+	0.0	0^+	[E2]		0.001491 *21*	α=0.001491 *21*; α(K)=0.001255 *18*; α(L)=0.0001703 *24*; α(M)=3.64×10^{-5} *5*; α(N+..)=2.87×10^{-5} α(N)=8.24×10^{-6} *12*; α(O)=1.229×10^{-6} *18*; α(P)=7.48×10^{-8} *11*; α(IPF)=1.92×10^{-5} *3*
1315.58[l] *16*	0.0137[l] *6*	1682.07	4^-	366.4795	4^+				
1363.78 *5*	0.0972 *22*	1730.207	3^-	366.4795	4^+	(E1)			Mult.: Mult=d(+Q) with δ=−0.05 *12* (1971Ba54). Placement in the decay scheme requires $\Delta\pi$=yes. δ: −0.05 *12* (1971Ba54).
1390.50 *12*	0.0160 *6*	1757.001	4^+	366.4795	4^+				
1408.013[c] *3*	78.48 *13*	1529.8019	2^-	121.7818	2^+	E1+M2	+0.043 *3*	0.000707 *10*	α=0.000707 *10*; α(K)=0.000486 *7*; α(L)=6.18×10^{-5} *9*; α(M)=1.311×10^{-5} *19*; α(N+..)=0.0001457 α(N)=2.97×10^{-6} *5*; α(O)=4.46×10^{-7} *7*; α(P)=2.83×10^{-8} *4*; α(IPF)=0.0001423 *20* Mult.: α(K)exp=0.000490 *26* (1985Co08, 1979De22, 1967Ma29). Other: the value of 0.00060 *4* from 1981Ka40 seems discrepant. α(K)(theory)= 0.000481 (E1), 0.00347 (M2). α(L)exp=0.000061 *3* (1991Go22). α(L)(theory)=0.0000610 (E1), 0.000478 (M2). δ: An unweighted average of A_2 and A_4 values from $\gamma\gamma(\theta)$ data of 1973Ka05, 1970Ba32, 1970He29, 1970RaZF, 1970Ru09, 1969Aq01, 1969La09 and 1992De29 give δ=+0.043 *3*. Monoenergetic e+ observed, for data see 1972Sv02.
1455.1[l] *3*	0.0094[l] *18*	1822.03	4^-	366.4795	4^+				
1457.643[c] *11*	1.869 *14*	1579.427	3^-	121.7818	2^+	E1		0.000703 *10*	α=0.000703 *10*; α(K)=0.000453 *7*; α(L)=5.75×10^{-5} *8*; α(M)=1.219×10^{-5} *17*; α(N+..)=0.000181 *3* α(N)=2.76×10^{-6} *4*; α(O)=4.15×10^{-7} *6*; α(P)=2.63×10^{-8} *4*; α(IPF)=0.0001775 *25* I_γ: The values of 1993Ka30 and 1977Ge12 are excluded. Mult.: α(K)exp=0.00050 *8* (1967La13). α(L)(theory)=0.000453 (E1). δ: 0.00 *3* (1985KrZU), 0.00 *6* (combined results of $\gamma\gamma(\theta)$ (1970Ba32,1970He29,1969Aq01).
[x]1485.9 *3*	0.021 *9*								E_γ,I_γ: From 1990St02. 1993Ka30 report Iγ=0.011 *4*. Not seen by 1992Ya12, Iγ<0.005.
1491.4[l] *8*	0.0022[l] *10*	1612.88	4^+	121.7818	2^+				
1528.10 *4*	1.051 *12*	1649.833	2^-	121.7818	2^+	E1		0.000715 *10*	α=0.000715 *10*; α(K)=0.000418 *6*; α(L)=5.30×10^{-5} *8*; α(M)=1.124×10^{-5} *16*; α(N+..)=0.000232 *4* α(N)=2.54×10^{-6} *4*; α(O)=3.82×10^{-7} *6*; α(P)=2.43×10^{-8} *4*; α(IPF)=0.000229 *4*

^{152}Eu ε decay (13.517 y) (continued)

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

E_γ[†]	I_γ[‡m]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	δ[#]	α[n]	Comments
									I_γ: The value of 1970Ri19 is excluded. Mult.: α(K)exp=0.00040 *3* (1967La13). α(K)(theory)=0.000418 (E1). δ: −0.01 *3* (1985KrZU), −0.01 *6* (1970Ba32).
1608.36 *7*	0.0203 *8*	1730.207	3^-	121.7818	2^+	E1		0.000735 *11*	α=0.000735 *11*; α(K)=0.000384 *6*; α(L)=4.86×10^{-5} *7*; α(M)=1.030×10^{-5} *15*; α(N+..)=0.000292 *4* α(N)=2.33×10^{-6} *4*; α(O)=3.51×10^{-7} *5*; α(P)=2.23×10^{-8} *4*; α(IPF)=0.000289 *4* I_γ: The value of 0.0030 *6* given in 1993Ka30 is probably a misprint. the evaluator assumes that the value should be 0.030 *6* and includes it in the weighted average. Mult.: Ice(K)(1608γ in Sm + 1606γ in Gd) from 1967La13 is consistent only with mult=E1 for one transition and mult=E2 for the other. placement of the 1604γ in Gd, from 2^+ to 0^+ requires mult=E2. this then establishes mult(1608γ)=E1.
1635.38 *20*	0.00061 *16*	1757.001	4^+	121.7818	2^+				E_γ: Flag=Z.
1647.44 *12*	0.0273 *13*	1769.130	2^+	121.7818	2^+	E2(+M1)	>0.6	0.00117 *13*	α=0.00117 *13*; α(K)=0.00089 *10*; α(L)=0.000117 *13*; α(M)=2.5×10^{-5} *3*; α(N+..)=0.000142 *6* α(N)=5.7×10^{-6} *7*; α(O)=8.5×10^{-7} *10*; α(P)=5.4×10^{-8} *7*; α(IPF)=0.000135 *6* Mult.: α(K)exp=0.00088 *11* (1967La13). α(K)(theory)=0.00106 (M1), 0.000790 (E2).
[x]1674.31[e] *6*	0.023[e] *3*								
[x]1698.1 *4*	0.022 *7*								E_γ,I_γ: From 1990St02. Not seen by 1992Ya12, Iγ<0.005.
1769.09 *4*	0.0350 *8*	1769.130	2^+	0.0	0^+	E2		0.000989 *14*	α=0.000989 *14*; α(K)=0.000691 *10*; α(L)=9.09×10^{-5} *13*; α(M)=1.94×10^{-5} *3*; α(N+..)=0.000188 *3* α(N)=4.38×10^{-6} *7*; α(O)=6.57×10^{-7} *10*; α(P)=4.12×10^{-8} *6*; α(IPF)=0.000182 *3* Mult.: α(K)exp=0.00072 *5* (1967La13). α(K)(theory)=0.000905 (M1), 0.000691 (E2). α(K)exp allows some M1; however, placement in the decay scheme requires ΔJ=2.

[†] Weighted average of values of 2007Ku20, 1990Me15, and 1990St02, except where noted otherwise. In particular, values from 2000He14 are adopted wherever available. These authors give recommended values, based on Eγ=411.80205 (17) for the ^{198}Au transition, from a reanalysis of data of 1992Le19 and 1986Wa33. transitions seen only by 2007Ku20 are noted. Based on extensive coincidence studies, these authors report several weak transitions and also resolve for the first time the 444 and 719 γ doublets. 2004Ca04 also report some of the weak transitions, and inclusion of values from these authors is noted. For the data of 1990Me15, α comparison of the values with those from other works and from energy level differences, and the observation of some internal inconsistencies, suggest that In some cases the stated uncertainties are too small. The evaluator has assigned a minimum uncertainty of 50 eV to the data from this reference.

[‡] Values are weighted averages of data of 2007Ku20, 2004Ca04, 1998Hw07, 1993Ka30, 1992Ya12, 1990Me15, 1990St02, 1989Da12, 1986Me10, 1984Iw03, 1980Sh15, 1979De21, 1977Ge12, 1975LeZH, 1972Bb05, 1971Ba63, 1970No06, 1970Ri19, and 1969Va09 normalized to Iγ=100 for the 344γ in Gd. Some of the

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values adopted here differ from those of 2004VaZW, an evaluation of data published prior to 2004. Some of these differences are a result of inclusion here of the new work, 2007Ku20, and one older reference, 1975LeZH. Another difference is one of policy. In 2004VaZW, the uncertainties in the work of 1998Hw07 were increased by a factor of two. This was not done in the present evaluation. also, In the present evaluation, for the data from 1990Me15, an uncertainty of 2% has been added In quadrature to take into account the uncertainty In the efficiency calibration. Intensities for some weak transitions have been given by 2004Ca04, and these are noted. Some additional weak transitions have been reported by 1989Gh02. These have been looked for but not confirmed by 1993Ka30, except for the the 137.56γ from the 1372 level which has been confirmed by 2007Ku20. Transitions noted As being excluded In individual cases are outliers As determined from CHAUVENET′s criterion.

[#] From Adopted Gammas. Mult measurements from this decay are given in comments. The α(K)exp values are from the ce data of the references as noted, using the adopted Iγ values, normalized to α(K)=0.03103 for the 344 E2 transition in Gd.

[@] The 963γ-964γ doublet is placed from the 963 and 1085 levels, respectively. The doublet has been resolved by 2007Ku20, 1972Bb05, and 1971Ba63 with Iγ(963γ)=0.528 *23* and Iγ(964γ)/Iγ(doublet)=0.9904 *6*. The value given for Iγ(964γ) is α weighted average of all values with this correction factor applied to the unresolved data. Since 99% of the intensity belongs with the 1085 level, the evaluator assumes that the measured energies can be assigned to this placement. The evaluator adopts Eγ=964.057 *5* from 1986Wa33. From a measurement of ce energies, 1984Bu35 determine E(964γ)-Eγ(963γ)=0.690 *5*, which then gives Eγ(963γ)=963.367 *5*. α(K)exp=0.00245 *6* (1990Ka35, 1985Co08, 1981Ka40, 1979De22, 1967Ma29), for the doublet, along with δ=−9.3 *6* is consistent only with mult=M1+E2 for the strong component (α(K)=0.00233 *11* for E2). No assignment can be made for the weak component based just on the ce data but if one assumes mult(963γ)=E1, based on its placement, then one gets α(K)exp=0.00246 *6* for the 964γ, consistent with mult=E2. there seems to be No need to invoke an E0 component for the 964γ As has been suggested by some authors.

[&] The 444γ is a doublet placed from the 810 and 1530 levels. The doublet has been resolved by 2007Ku20, 1972Bb05, 1971Ba63, 1970Ri19, and 1969Va09 with Iγ(from 810)=1.12 *4* and Iγ(from 1530)/Iγ(doublet)=0.906 *4*. The value adopted for the 1530 level is a weighted average of all data with this correction factor applied to the unresolved data. The value of 1970No06 has been excluded. Since 91% of the intensity belongs with the 1530 level, the evaluator assumes that the measured energies can be assigned to this placement. The evaluator adopts Eγ from 1992Le19. The value given for the 810 level is from 2007Ku20. from α(K)exp=0.00596 *16* (1991Go22, 1985Co08, 1979De22) for the doublet, with α(K)(theory)=0.00485 (E1) and 0.0144 (E2), the strong component must be E1 and the weak component mainly E2. placement of the weak component In the decay scheme requires ΔJ=2.

[a] The 919γ is placed from the 1041 and 1730 levels. The doublet has been resolved by 2007Ku20 and 2004Ca04 from which a weighted average of Iγ=0.0244 *14* is obtained for the weak component from the 1730 level. The values for the doublet obtained by the other authors are corrected for this component and give α weighted average of 1.574 *16* for the component from the 1041 level.

[b] The 719γ is placed from the 1086 and 1530 levels. 2007Ku20 resolve the components and show that 85% of the intensity belongs with the 1086 level. The evaluator assumes that the accurate Eγ value from 1992Le19 can be assigned to this placement. the doublet is not resolved in the other works. α(K)exp=0.0038 *7* (1983KaZJ) for the doublet is consistent with mult=E2 for placement from the 1086 level and mult=E1 for placement from the 1530 level. These mults are expected based on the ADOPTED J$^{\pi}$ values.

[c] From 2000He14.

[d] This unplaced transition is from 1993Ka30.

[e] This unplaced transition is from 1990Me15.

[f] Weighted average from 1992Le19 and 1986Wa33. Not included in 2000He14.

[g] The 285γ is doubly placed, from the 1372 and 1579 levels. Eγ and Iγ for placement from the 1372 level are from 2007Ku20 and for the 1579 level are weighted averages from 2007Ku20 and 2004Ca04. The transitions are not resolved in other works.

[h] From 1986Wa33.

[i] Weighted average from 2007Ku20 and 2004Ca04.

[j] Weighted average from 2007Ku20, 2004Ca04, and 1990Me15.

γ(^{152}Sm) (continued)

[k] The 674γ is placed from the 1041 level in Sm and from the 1606 level in Gd with Iγ(doublet)=0.706 *14*. the component in Sm is resolved by 2007Ku20 with Eγ=674.64 *14* and Iγ=0.656 *21*. From branching in Tb ε decay, the component in Gd can be deduced as 0.080 *3* which, combined with Iγ for the doublet, gives Iγ=0.628 *15* for the component in Sm. The value adopted is a weighted average of these two determinations.

[l] From 2007Ku20.

[m] For absolute intensity per 100 decays, multiply by 0.2659 *11*.

[n] 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.

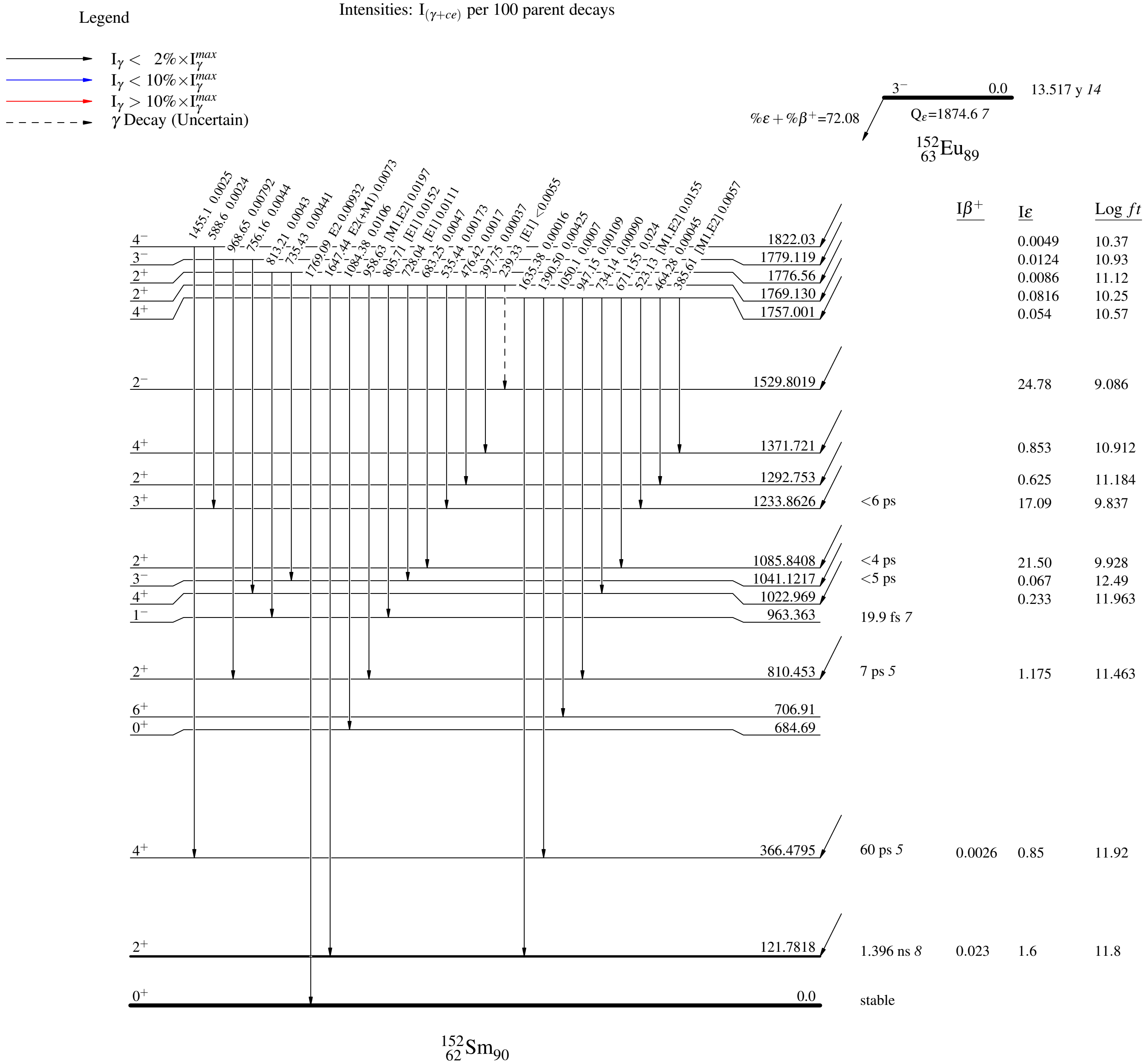
[o] Placement of transition in the level scheme is uncertain.

[x] γ ray not placed in level scheme.

^{152}Eu ε decay (13.517 y)

Decay Scheme

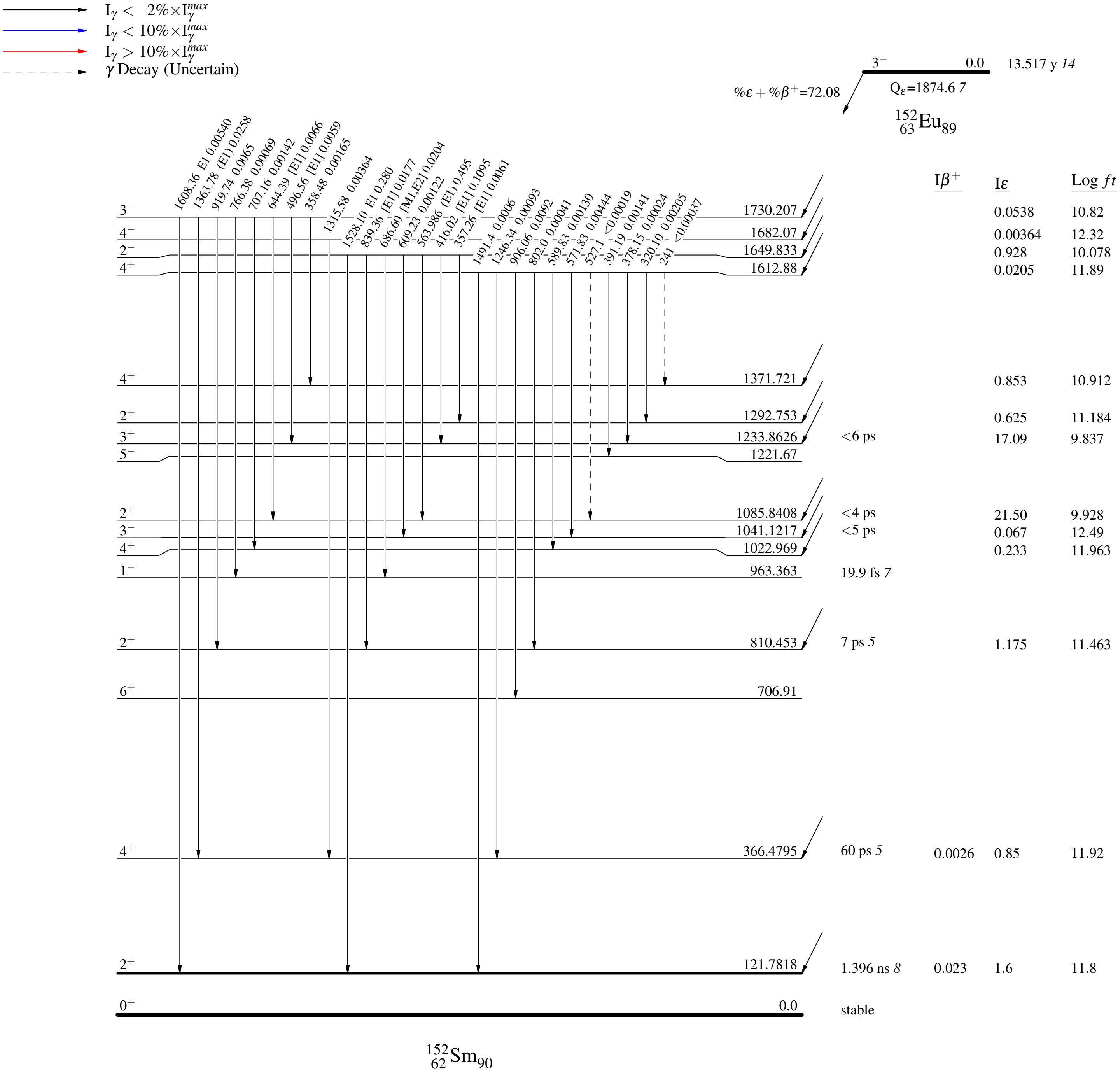
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{152}Eu ε decay (13.517 y)

Decay Scheme (continued)

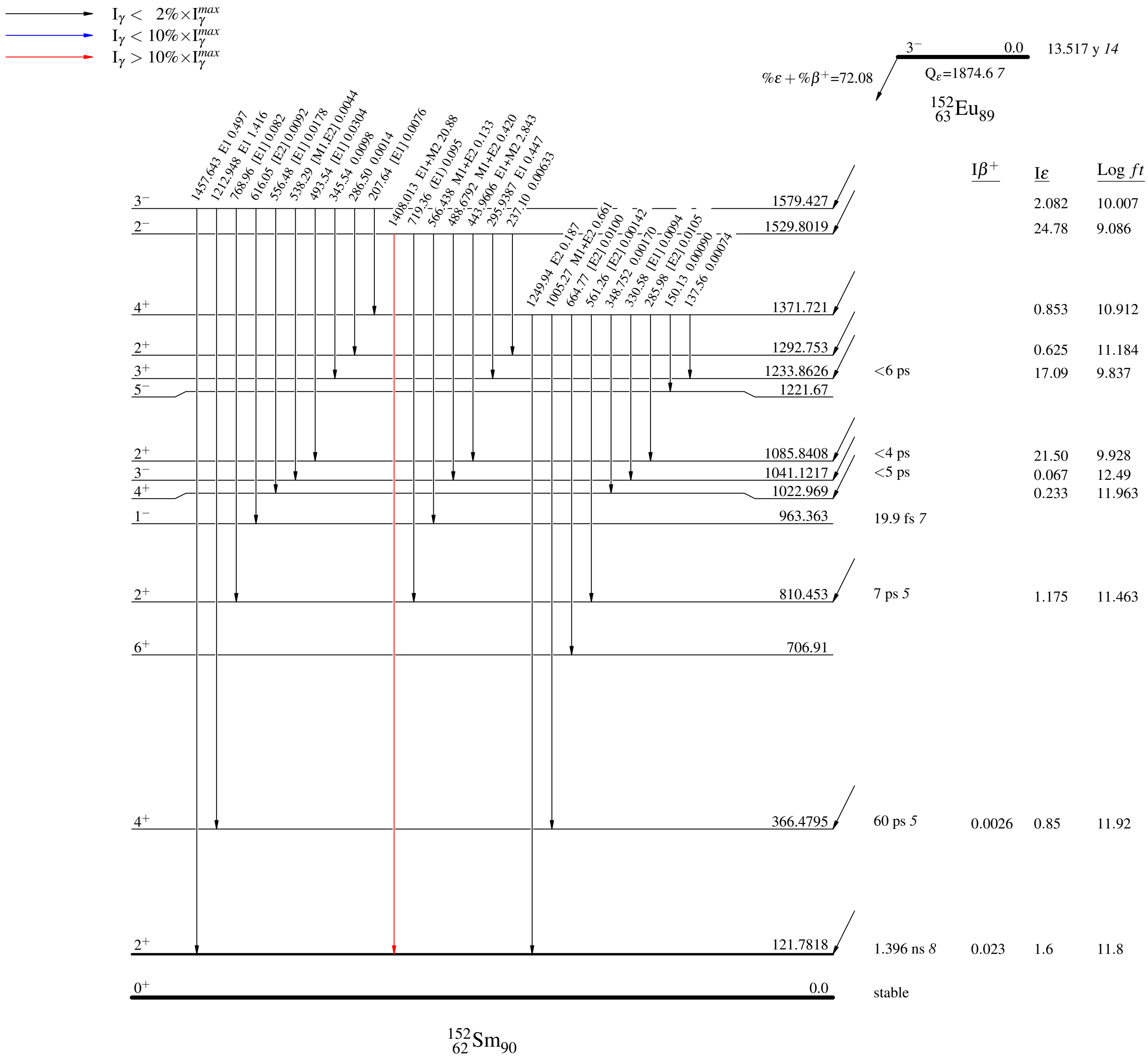
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{152}Eu ε decay (13.517 y)

Decay Scheme (continued)

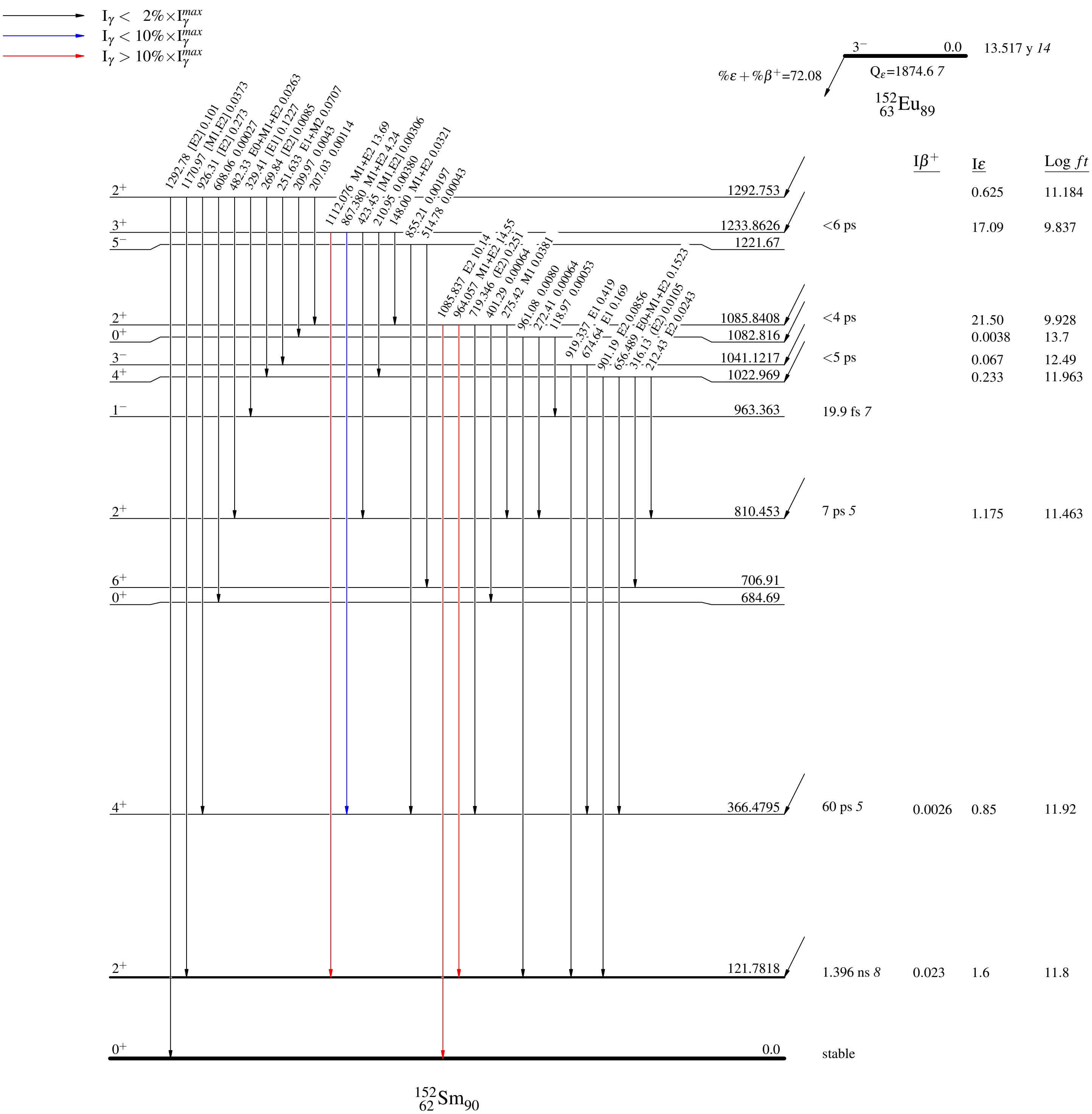
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{152}Eu ε decay (13.517 y)

Decay Scheme (continued)

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



^{152}Eu ε decay (13.517 y)

Decay Scheme (continued)