^{153}Sm β^- decay

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 170, 1 (2020)	16-Aug-2020

Parent: ^{153}Sm: E=0.0; $J^\pi=3/2^+$; $T_{1/2}$=46.284 h *4*; Q(β^-)=807.5 *7*; %β^- decay=100.0

The Iγ and the decay scheme are from 1964Al09, 1966Bl06, 1969Pa03, 1974HeYW, 1985Ab08, 1987Co04, 1992Ch44, 1998Bo18, 1999Sc12, 2006Le32.

The Eγ are from 1969Un03, 1978He21, 1985Ab08, and 2000He14. Other measurements: 1950Hi17, 1952Ba49, 1952Ru10, 1954Gr19, 1954Le08, 1955Ma62, 1956Du31, 1957Jo24, 1958Co76, 1958Gu09, 1960Su08, 1961Gr18, 1961Mo07, 1961Ru01, 1961Wy01, 1962Bi16, 1962Ca24, 1962Su01, 1963Ch25, 1963Ho15, 1964No08, 1966Ne06, 1968Re04, 1969Sm04, 1970Ch09, 1970Me26, 1970Mi15, 1970PaZI, and 1970Ra37.

Additional information 1.

^{153}Eu Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0.0	$5/2^+$	stable	
83.36722 *11*	$7/2^+$		
97.43099 *14*	$5/2^-$		
103.18018 *11*	$3/2^+$	3.87 ns *5*	$T_{1/2}$: Adopted value. The weighted value of 3.80 ns *2* (1961Na06), 3.3 ns *2* (1961Re11), and 3.89 ns *8* (1965Me08) measured in ^{153}Sm β^- decay is 3.80 ns *4*. See ^{153}Eu Adopted Levels for values from other decay modes.
151.6239 *4*	$7/2^-$		
172.85318 *13*	$5/2^+$		
269.7355 *6*	$(7/2^+)$		
585.02 *15*			
634.74 *12*	$(1/2^+)$		
636.47 *10*	$3/2^-$		
657.68? *14*			
681.90 *10*	$(5/2^-)$		
694.18 *11*	$5/2^+$		
701.39 *17*			
706.62 *9*	$5/2^+$		
713.11 *19*			
718.69 *14*	$(3/2^+)$		
760.40 *14*			
763.8? *6*			

[†] From least-squares fit to Eγ.
[‡] From ^{153}Eu Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-[†‡]	Log *ft*	Comments
(43.7 *9*)	763.8?	0.000044 *12*	8.90 *13*	av Eβ=11.12 *24*
(47.1 *7*)	760.40	0.0102 *15*	6.63 *7*	av Eβ=12.01 *19*
(88.8 *7*)	718.69	0.00138 *11*	8.34 *4*	av Eβ=23.10 *20*
(94.4 *7*)	713.11	0.0139 *5*	7.421 *19*	av Eβ=24.61 *20*
(100.9 *7*)	706.62	0.0234 *4*	7.284 *12*	av Eβ=26.38 *20*
(106.1 *7*)	701.39	0.00705 *15*	7.872 *13*	av Eβ=27.80 *22*
(113.3 *7*)	694.18	0.0231 *4*	7.445 *12*	av Eβ=29.80 *20*
(125.6 *7*)	681.90	0.0101 *2*	7.942 *12*	av Eβ=33.21 *20*
(149.8 *7*)	657.68?	0.00090 *7*	9.23 *4*	av Eβ=40.03 *21*
(171.0 *7*)	636.47	0.0649 *6*	7.552 *7*	av Eβ=46.11 *21*

Continued on next page (footnotes at end of table)

^{153}Sm β^- decay (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†‡]	Log *ft*	Comments
(172.8 *7*)	634.74	0.0477 *16*	7.700 *16*	av Eβ=46.61 *21*
(222.5 *7*)	585.02	0.00227 *8*	9.369 *16*	av Eβ=61.26 *22*
(537.8 *7*)	269.7355	≤0.001	≥11.0	av Eβ=164.69 *25* Iβ^-: From γ intensity balance Iβ=0.020 *3*, but log *ft* systematics (1973Ra10), log *ft* ≥ 11, so Iβ ≤ 0.001%.
(634.6 *7*)	172.85318	30.4 *5*	6.741 *8*	av Eβ=199.46 *26* E(decay): Measured values: 640 *15* (1954Gr19), 650 *15* (1955Ma62), 645 *10* (1956Du31), 610 *20* (1957Jo24), 640 *20* (1958Co76). Iβ^-: Measured intensities include 30 (1954Gr19), 43 (1955Ma62), 40 (1956Du31), 15 (1957Jo24), and 40 (1958Co76).
(655.9 *7*)	151.6239	0.031 *12*	10.02[1u] *17*	av Eβ=220.96 *25*
(704.3 *7*)	103.18018	49.2 *9*	6.689 *8*	av Eβ=225.22 *27* E(decay): Measured values: 680 *10* (1950Hi17), 700 *20* (1952Ba49), 710 *15* (1954Gr19), 685 *5* (1954Le08), 720 *15* (1955Ma62), 720 *10* (1956Du31), 685 *15* (1957Jo24), 710 *20* (1958Co76). Iβ^-: Measured intensities include 67 (1950Hi17), 49 (1954Gr19), 70 (1954Le08), 35 (1955Ma62), 38 (1956Du31), 65 (1957Jo24), 40 (1958Co76).
(710.1 *7*)	97.43099	0.58 *6*	8.63 *5*	av Eβ=227.36 *27*
(807.5 *7*)	0.0	19.5 *9*	7.300 *20*	av Eβ=264.28 *27* E(decay): Measured values: 800 *10* (1950Hi17), 800 *20* (1952Ba49), 810 *10* (1954Gr19), 795 *5* (1954Le08), 820 *10* (1955Ma62), 825 *10* (1956Du31), 792 *10* (1957Jo24), and 813 *20* (1958Co76).

[†] From γ intensity balances with all questionable γ's included.
[‡] Absolute intensity per 100 decays.

^{153}Sm β^- decay (continued)

$\gamma(^{153}Eu)$

Iγ normalization: Based on weighted average of Iγ(103) per 100 decays of ^{153}Sm of the following values: 29.07 *20* (2006Le32), 29.23 *18* (1999Sc12), 29.8 *4* (1987Co04), 28.5 *5* (1998Bo18), 28.3 *6* (1966Ne06).
K and L x-rays measurements: 2006Le32 and 1992Ch44.
In comments are given the values measured for relative intensity, and other value(s) that are discrepant and not considered in the weighted average.
Conversion electron intensities are from 1961Mo07, 1962Su01, 1969Sm04, and 1970PaZI, and are given in number of K-conversion electrons per 100 decays normalized to 40.8 for the 103 γ to give α_K(exp)(103 γ)=1.44.

E_γ †	I_γ ‡#@ *c*	E_i(level)	J_i^π	E_f	J_f^π	Mult. &	δ & *b*	α *a*	$I_{(\gamma+ce)}$ *c*	Comments
(14.06383 *20*)		97.43099	5/2$^-$	83.36722	7/2$^+$	E1		10.89		α(L)=8.54 *12*; α(M)=1.90 *3* α(N)=0.405 *6*; α(O)=0.0479 *7*; α(P)=0.00189 *3* E_γ: Computed from level energies; observed in ce spectra (1963Gr09).
19.81296 *5*		103.18018	3/2$^+$	83.36722	7/2$^+$	E2		3.22×10^3	115 *23*	ce(L)/(γ+ce)=0.775 *8*; ce(M)/(γ+ce)=0.180 *4* ce(N)/(γ+ce)=0.0395 *8*; ce(O)/(γ+ce)=0.00520 *11*; ce(P)/(γ+ce)=2.11×10^{-6} *5* α(L)=2.49×10^3 *4*; α(M)=578 *8* α(N)=127.1 *18*; α(O)=16.73 *24*; α(P)=0.00678 *10* E_γ: From level energy difference. $I_{(\gamma+ce)}$: From intensity balance at 83 level.
54.1934 *4*	0.43 *12*	151.6239	7/2$^-$	97.43099	5/2$^-$	M1(+E2)		18.4 *76*		α(K)=6.3 *28*; α(L)=9.3 *80*; α(M)=2.2 *19* α(N)=0.48 *42*; α(O)=0.065 *55*; α(P)=6.8×10^{-4} *35* E_γ: From evaluator′s adjustment to new energy scale (2000He14) of 54.1919 *4* from 1970Mu04 in ^{152}Eu(n,γ).
68.2557 *e* *5*	0.43 *13*	151.6239	7/2$^-$	83.36722	7/2$^+$	E1		0.790		α(K)=0.657 *10*; α(L)=0.1042 *15*; α(M)=0.0225 *4* α(N)=0.00503 *7*; α(O)=0.000739 *11*; α(P)=5.20×10^{-5} *8* E_γ: From evaluator′s adjustment to new energy scale (2000He14) of 68.2539 *5* from 1970Mu04 in ^{152}Eu(n,γ). I_γ: From 1964Al09; but not reported in other measurements, so presence of γ is not assured by these data. However, this γ is reported in ^{152}Eu(n,γ).

$^{153}_{63}Eu_{90}$-3

^{153}Sm β^- decay (continued)

$\gamma(^{153}Eu)$ (continued)

E_γ [†]	I_γ [‡#@c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ[&b]	α[a]	Comments
									I_γ: From 1964Al09; but not reported in other measurements, so presence of γ is not assured by these data. However, this γ is reported in ^{152}Eu(n,γ).
69.67300 *13*	1602 *11*	172.85318	$5/2^+$	103.18018	$3/2^+$	M1+E2	0.136 *4*	5.31	ce(K)=22 *1* α(K)=4.39 *7*; α(L)=0.719 *12*; α(M)=0.1572 *25* α(N)=0.0358 *6*; α(O)=0.00555 *9*; α(P)=0.000485 *7* I_γ: 1579 *20* (2006Le32), 1591 *20* (1999Sc12), 1639 *34* (1998Bo18), 1620 *50* (1992Ch44), 1626 *29* (1987Co04), 1930 *273* (1985Ab08), 1620 *140* (1974HeYW), 1730 *100* (1964Al09).
75.42213 *23*	66 *9*	172.85318	$5/2^+$	97.43099	$5/2^-$	E1+M2	0.055 *10*	0.76 *7*	ce(K)=0.073 *8* α(K)=0.62 *5*; α(L)=0.112 *13*; α(M)=0.025 *3* α(N)=0.0056 *7*; α(O)=0.00083 *11*; α(P)=6.3×10^{-5} *9* I_γ: Values are quite discrepant, varying from 55 *2* (1992Ch44) to 117 *5* (1987Co04). I_γ: 61 7 (2006LE32), 80 7 (1999SC12), 55 2 (1992CH44, unc increased to 2.3), 117 *5* (1987Co04), 50 *8* (1985Ab08), 110 *12* (1973HeYW), 61 *4* (1964Al09), 65 *8* (1962Su01). K/L$_1$=10/1.17.
83.36717 *21*	65.5 *16*	83.36722	$7/2^+$	0.0	$5/2^+$	E2+M1	0.81 *4*	3.76 *7*	ce(K)=0.60 *2* α(K)=2.33 *4*; α(L)=1.11 *5*; α(M)=0.257 *12* α(N)=0.0573 *25*; α(O)=0.0080 *4*; α(P)=0.000230 *5* I_γ: 70 *4* (2006Le32), 72 *4* (1999Sc12), 65 *4* (1998Bo18), 63 *2* (1992Ch44), 68 *4* (1987Co04), 55 *9* (1985Ab08), 63 *6* (1973HeYW), 75 *4* (1964Al09), 68 *8* (1962Su01).
89.48595 *22*	54 *3*	172.85318	$5/2^+$	83.36722	$7/2^+$	M1+E2	0.25 *10*	2.60 *7*	ce(K)=0.44 *5* α(K)=2.11 *5*; α(L)=0.38 *7*; α(M)=0.085 *16* α(N)=0.019 *4*; α(O)=0.0029 *5*; α(P)=0.000230 *7* I_γ: 37 8 (2006LE32), 53.4 24 (1999SC12), 58 4 (1998BO18), 59 2 (1992Ch44), 51 *8* (1985Ab08), 32 *4* (1973HeYW), 58 *3* (1964Al09), 43 *6* (1962Su01).
96.8825 *7*	2.5	269.7355	$(7/2^+)$	172.85318	$5/2^+$	E2(+M1)		2.4 *4*	α(K)=1.49 *22*; α(L)=0.68 *44*; α(M)=0.16 *11* α(N)=0.035 *23*; α(O)=0.0049 *30*; α(P)=1.41×10^{-4} *48* E_γ: From evaluator′s adjustment to new energy scale (2000He14) of 96.8799 *7* from 1970Mu04 in ^{152}Eu(n,γ). I_γ: Seen only in coincidence by 1969Un03.
97.43100 *21*	262 *4*	97.43099	$5/2^-$	0.0	$5/2^+$	E1		0.305	ce(K)=0.20 *1* α(K)=0.256 *4*; α(L)=0.0382 *6*; α(M)=0.00823 *12* α(N)=0.00185 *3*; α(O)=0.000278 *4*; α(P)=2.13×10^{-5} *3* I_γ: 254 *5* (2006Le32), 258.3 *29* (1999Sc12), 279 *8* (1998Bo18), 255 *4* (1992Ch44), 284 *5* (1987Co04), 222 *33* (1985Ab08), 233 *20* (1973HeYW), 263 *13* (1964Al09); other: 207 *10* (1962Su01).

$^{153}_{63}Eu_{90}$-4

^{153}Sm β^- decay (continued)

$\gamma(^{153}Eu)$ (continued)

E_γ †	I_γ ‡#@c	E_i(level)	J_i^π	E_f	J_f^π	Mult.&	δ&b	αa	Comments
103.18012 *17*	10000	103.18018	3/2$^+$	0.0	5/2$^+$	E2+M1	0.119 *3*	1.694	α(K)=1.422 *20*; α(L)=0.213 *3*; α(M)=0.0462 *7* α(N)=0.01057 *15*; α(O)=0.001662 *24*; α(P)=0.0001568 *22* δ: Calculated with penetration parameter λ=5.3 *8*.
118.1117 *10*	0.06 *1*	269.7355	(7/2$^+$)	151.6239	7/2$^-$	[E1]		0.181	α(K)=0.1525 *22*; α(L)=0.0223 *4*; α(M)=0.00480 *7* α(N)=0.001081 *16*; α(O)=0.0001636 *23*; α(P)=1.303×10^{-5} *19* E_γ: From evaluator's adjustment to new energy scale (2000He14) of 118.1085 *10* from 1970Mu04 in ^{152}Eu(n,γ). I_γ: From 1992Ch44; other value: 0.06 *6* (1985Ab08).
124.9e *4*	3.1 *5*	760.40		634.74	(1/2$^+$)				E_γ,I_γ: Reported only by 1985Ab08, so uncertain.
151.6245 *12*	3.56 *9*	151.6239	7/2$^-$	0.0	5/2$^+$	E1		0.0920	α(K)=0.0779 *11*; α(L)=0.01112 *16*; α(M)=0.00239 *4* α(N)=0.000541 *8*; α(O)=8.26×10^{-5} *12*; α(P)=6.88×10^{-6} *10* E_γ: From evaluator's adjustment to new energy scale (2000He14) of 151.6204 *12* from 1970Mu04 in ^{152}Eu(n,γ). I_γ: 3.47 *21* (2006Le32), 3.93 *21* (1999Sc12), 3.50 *10* (1992Ch44), 4.4 *8* (1985Ab08), 3.0 *5* (1973HeYW), 5.1 *16* (1969Pa03), 5.3 *15* (1966Bl06), 3.2 *5* (1964Al09); other: 8 *2* (1962Su01).
166.5548 *15*	0.21 *2*	269.7355	(7/2$^+$)	103.18018	3/2$^+$	[E2]		0.400	α(K)=0.267 *4*; α(L)=0.1035 *15*; α(M)=0.0238 *4* α(N)=0.00531 *8*; α(O)=0.000745 *11*; α(P)=2.18×10^{-5} *3* E_γ: From evaluator's adjustment to new energy scale (2000He14) of 166.5503 *15* from 1970Mu04 in ^{152}Eu(n,γ). I_γ: From 1992Ch44; other value: < 0.25 (1985Ab08).
172.3035 *20*	0.14	269.7355	(7/2$^+$)	97.43099	5/2$^-$	E1		0.0652	α(K)=0.0553 *8*; α(L)=0.00782 *11*; α(M)=0.001682 *24* α(N)=0.000381 *6*; α(O)=5.84×10^{-5} *9*; α(P)=4.96×10^{-6} *7* E_γ: From evaluator's adjustment to new energy scale (2000He14) of 172.2988 *20* from 1970Mu04 in ^{152}Eu(n,γ).
172.85307 *21*	24.8 *3*	172.85318	5/2$^+$	0.0	5/2$^+$	M1+E2	0.81 *8*	0.377	α(K)=0.296 *7*; α(L)=0.0637 *22*; α(M)=0.0142 *6* α(N)=0.00321 *12*; α(O)=0.000477 *15*; α(P)=3.00×10^{-5} *10* I_γ: 25.0 6 (2006LE32), 24.50 28 (1999SC12), 25.3 11 (1998BO18), 25.0 4 (1992Ch44), 27.0 *5* (1987Co04), 30 *5* (1985Ab08), 28.0 *25* (1973HeYW), 23.6 *5* (1969Pa03), 24.5 *5* (1966Bl06), 21 *2* (1964Al09); other: 33 *4* (1962Su01).
412.05d *20*	0.656d *17*	585.02		172.85318	5/2$^+$				I_γ: 0.65 *4* (1999Sc12), 0.65 *2* (1992Ch44), 0.80 *10* (1973HeYW), 0.73 *13* (1969Pa03), 0.64 *20*

^{153}Sm β^- decay (continued)

$\gamma(^{153}Eu)$ (continued)

E_γ [†]	I_γ [‡#@c]	E_i(level)	J_i^π	E_f	J_f^π	Comments
						(1966Bl06); other values: 0.39 *5* (2006Le32), 1.00 *18* (1985Ab08), 1.4 *3* (1962Su01).
412.05[d] *20*	0.656[d] *17*	681.90	(5/2$^-$)	269.7355	(7/2$^+$)	
424.4 *3*	0.676 *22*	694.18	5/2$^+$	269.7355	(7/2$^+$)	I_γ: 0.76 *3* (2006Le32), 0.62 *4* (1999Sc12), 0.65 *2* (1992Ch44), 0.84 *15* (1985Ab08), 0.70 *10* (1973HeYW), 0.60 *12* (1969Pa03), 0.75 *20* (1966Bl06); other: 1.3 *3* (1962Su01).
436.9 *3*	0.550 *20*	706.62	5/2$^+$	269.7355	(7/2$^+$)	I_γ: 0.55 *4* (2006Le32), 0.57 *3* (1999Sc12), 0.53 *2* (1992Ch44), 0.77 *14* (1985Ab08), 0.80 *10* (1973HeYW), 0.50 *10* (1969Pa03), 0.48 *12* (1966Bl06); other value: 1.0 *3* (1962Su01).
443.2 *5*	0.14 *10*	713.11		269.7355	(7/2$^+$)	I_γ: The measured values 0.24 *4* (2006Le32), 0.030 *5* (1992Ch44), 0.132 *20* (1985Ab08) are discrepant. Adopted is the mean values with unc that covers all values.
462.0 *3*	0.54 *9*	634.74	(1/2$^+$)	172.85318	5/2$^+$	I_γ: 0.7 *2* (1992Ch44), 0.5 *1* (1969Pa03).
463.6 *2*	4.36 *9*	636.47	3/2$^-$	172.85318	5/2$^+$	I_γ: 3.92 *24* (2006Le32), 4.34 *7* (1999Sc12), 4.3 *8* (1992Ch44), 5.3 *7* (1985Ab08), 5.0 *4* (1973HeYW, reported 5 *4* looks typo), 4.68 *40* (1969Pa03), 5.1 *8* (1966Bl06), 5.5 *6* (1962Su01).
485.0[e] *2*	0.132 *9*	657.68?		172.85318	5/2$^+$	I_γ: 0.12 *3* (1999Sc12), 0.13 *1* (1992Ch44), 0.150 *22* (1985Ab08), 0.12 *6* (1969Pa03), 0.12 *6* (1966Bl06).
487.75 *23*	0.124 *19*	585.02		97.43099	5/2$^-$	E_γ,I_γ: Only reported by 1985Ab08, existence questionable.
509.15 *20*	0.65 *5*	681.90	(5/2$^-$)	172.85318	5/2$^+$	I_γ: 0.46 *10* (2006Le32), 0.63 *7* (1999Sc12), 0.62 *3* (1992Ch44), 0.84 *13* (1985Ab08), 1.00 *10* (1973HeYW), 0.61 *20* (1969Pa03), 0.85 *16* (1966Bl06).
521.3 *25*	2.33 *4*	694.18	5/2$^+$	172.85318	5/2$^+$	I_γ: 2.27 *24* (2006Le32), 2.31 *4* (1999Sc12), 2.30 *10* (1992Ch44), 2.8 *4* (1985Ab08), 2.80 *20* (1973HeYW), 2.5 *9* (1969Pa03), 2.5 *3* (1962Su01); other value: 3.5 *7* (1966Bl06).
530[e]		681.90	(5/2$^-$)	151.6239	7/2$^-$	
531.40 *15*	18.76 *19*	634.74	(1/2$^+$)	103.18018	3/2$^+$	I_γ: 18.75 *21* (2006Le32), 18.37 *23* (1999Sc12), 19.3 *21* (1998Bo18), 18.9 *2* (1992Ch44), 19.9 *26* (1985Ab08), 23.8 *20* (1973HeYW), 23.1 *30* (1969Pa03), 22.3 *20* (1966Bl06), 23 *2* (1962Su01).
533.2 *2*	10.14 *10*	636.47	3/2$^-$	103.18018	3/2$^+$	I_γ: 9.91 *10* (2006L232), 10.02 *11* (1999Sc12), 9.8 *21* (1998Bo18), 10.4 *1* (1992Ch44), 11.6 *15* (1985Ab08), 11.9 *8* (1974HeYW), 8.8 *25* (1969Pa03), 11.6 *10* (1966Bl06), 12 *1* (1962Su01).
539.1 *2*	7.09 *7*	636.47	3/2$^-$	97.43099	5/2$^-$	I_γ: 7.09 *7* (2006Le32), 7.04 *10* (1999Sc12), 7.2 *2* (1992Ch44), 7.3 *9* (1985Ab08), 8.6 *6* (1973HeYW), 8.2 *25* (1969Pa03), 9.1 *14* (1966Bl06), 6.2 *6* (1962Su01).
542.7 *2*	0.76 *5*	694.18	5/2$^+$	151.6239	7/2$^-$	I_γ: 0.85 *5* (2006Le32), 0.75 *6* (1999Sc12), 0.77 *8* (1992Ch44), 1.06 *16* (1985Ab08), 0.65 *5* (1969Pa03); other value: 1.40 *10* (1973HeYW).
545.75 *15*	0.275 *22*	718.69	(3/2$^+$)	172.85318	5/2$^+$	I_γ: 0.37 *3* (2006Le32), 0.41 *17* (1999Sc12), 0.26 *1* (1992Ch44), 0.48 *7* (1985Ab08), 0.30 *10* (1973HeYW).
554.94 *10*	1.59 *3*	706.62	5/2$^+$	151.6239	7/2$^-$	I_γ: 1.48 *5* (2006Le32), 1.62 *4* (1999Sc12), 1.61 *4* (1992Ch44), 1.51 *23* (1985Ab08), 2.00 *20* (1973HeYW), 1.60 *13* (1969Pa03), 1.93 *30* (1966Bl06), 1.8 *6* (1962Su01).
574.1[e] *3*	0.053 *18*	657.68?		83.36722	7/2$^+$	I_γ: From 1992Ch44; other value: < 0.1 (1985Ab08).
578.75 *20*	1.07 *3*	681.90	(5/2$^-$)	103.18018	3/2$^+$	I_γ: 1.001 *22* (2006Le32), 1.17 *3* (1999Sc12), 1.07 *3* (1992Ch44), 1.21 *18* (1985Ab08), 1.30 *20* (1973HeYW), 1.15 *23* (1969Pa03), 1.38 *20* (1966Bl06), 1.0 *3* (1962Su01).
584.55 *20*	0.368 *9*	681.90	(5/2$^-$)	97.43099	5/2$^-$	I_γ: 0.406 *21* (2006Le32), 0.35 *3* (1999Sc12), 0.36 *1* (1992Ch44), 0.39 *6* (1985Ab08), 0.40 *10* (1973HeYW), 0.45 *15* (1969Pa03); other value: 0.54 *10* (1966Bl06).
587.60 *25*	0.169 *13*	760.40		172.85318	5/2$^+$	I_γ: 0.155 *21* (2006Le32), 0.16 *3* (1999Sc12), 0.16 *4* (1992Ch44), 0.18 *3* (1985Ab08), 0.20 *3* (1973HeYW); other value: 0.1 *1* (1969Pa03).
590.96 *20*	0.410 *15*	694.18	5/2$^+$	103.18018	3/2$^+$	I_γ: 0.447 *11* (2006Le32), 0.42 *3* (1999Sc12), 0.38 *1* (1992Ch44), 0.34 *5* (1985Ab08), 0.50 *10* (1973HeYW), 0.45 *15* (1969Pa03); other value: 0.72 *15* (1966Bl06).

$^{153}_{63}Eu_{90}$-6

^{153}Sm β^- decay (continued)

$\gamma(^{153}Eu)$ (continued)

E_γ [†]	I_γ [‡#@c]	E_i(level)	J_i^π	E_f	J_f^π	Comments
596.7 *2*	3.73 *10*	694.18	$5/2^+$	97.43099	$5/2^-$	I_γ: 3.10 *50* (2006Le32), 3.56 *10* (1999Sc12), 3.8 *1* (1992Ch44), 3.2 *5* (1985Ab08), 4.50 *30* (1973HeYW), 4.2 *6* (1969Pa03), 4.43 *65* (1966Bl06), 4.4 *5* (1962Su01).
598.3[d] *3*	0.71[d] *3*	681.90	$(5/2^-)$	83.36722	$7/2^+$	I_γ: 0.73 *3* (2006Le32), 0.70 *3* (1999Sc12), 0.61 *9* (1992Ch44), 0.99 *15* (1985Ab08), 0.50 *10* (1973HeYW).
598.3[de] *3*	0.705[d] *15*	701.39		103.18018	$3/2^+$	I_γ: 0.73 *3* (2006Le32), 0.70 *3* (1999Sc12), 0.61 *9* (1992Ch44), 0.99 *15* (1985Ab08), 0.50 *10* (1973HeYW).
603.6[de] *4*	1.46[d] *3*	701.39		97.43099	$5/2^-$	I_γ: 1.39 *3* (2006Le32), 1.49 *3* (1999Sc12), 1.53 *5* (1992Ch44), 1.42 *21* (1985Ab08), 1.90 *20* (1973HeYW), 1.8 *3* (1969Pa03), 2.05 *40* (1966Bl06), 1.4 *2* (1962Su01).
603.6[d] *4*	1.46[d] *3*	706.62	$5/2^+$	103.18018	$3/2^+$	I_γ: 1.39 *3* (2006Le32), 1.49 *3* (1999Sc12), 1.53 *5* (1992Ch44), 1.42 *21* (1985Ab08), 1.90 *20* (1973HeYW), 1.8 *3* (1969Pa03), 2.05 *40* (1966Bl06), 1.4 *2* (1962Su01).
609.5[d] *3*	4.42[d] *11*	706.62	$5/2^+$	97.43099	$5/2^-$	I_γ: 4.58 *21* (2006Le32), 4.04 *14* (1999Sc12), 4.5 *1* (1992Ch44), 5.0 *7* (1985Ab08), 5.10 *40* (1973HeYW), 5.25 *75* (1969Pa03), 5.54 *80* (1966Bl06), 4.2 *5* (1962Su01).
609.5[d] *3*	4.42[d] *11*	713.11		103.18018	$3/2^+$	I_γ: 4.58 *21* (2006Le32), 4.04 *14* (1999Sc12), 4.5 *1* (1992Ch44), 5.0 *7* (1985Ab08), 5.10 *40* (1973HeYW), 5.25 *75* (1969Pa03), 5.54 *80* (1966Bl06), 4.2 *5* (1962Su01).
615.8[d] *4*	0.19[d] *3*	713.11		97.43099	$5/2^-$	I_γ: 0.158 *21* (2006Le32), 0.233 *24* (1999Sc12), 0.14 *2* (1992Ch44), 0.33 *5* (1985Ab08), 0.30 *5* (1973HeYW), 0.21 *10* (1969Pa03); other value: 0.60 *12* (1966Bl06).
615.8[d] *4*	0.19[d] *3*	718.69	$(3/2^+)$	103.18018	$3/2^+$	I_γ: 0.158 *21* (2006Le32), 0.233 *24* (1999Sc12), 0.14 *2* (1992Ch44), 0.33 *5* (1985Ab08), 0.30 *5* (1973HeYW), 0.21 *10* (1969Pa03); other value: 0.60 *12* (1966Bl06).
617.9 *3*	0.238 *20*	701.39		83.36722	$7/2^+$	I_γ: 0.213 *21* (2006Le32), 0.304 *24* (1999Sc12), 0.20 *2* (1992Ch44), 0.25 *4* (1985Ab08), 0.30 *5* (1973HeYW), 0.32 *14* (1969Pa03).
630.5 *4*	0.037 *4*	713.11		83.36722	$7/2^+$	I_γ: 0.034 *5* (1992Ch44), 0.040 *6* (1985Ab08), 0.04 *2* (1969Pa03).
634.8 *3*	0.171 *9*	634.74	$(1/2^+)$	0.0	$5/2^+$	I_γ: 0.169 *10* (2006Le32), 0.15 *3* (1999Sc12), 0.20 *5* (1992Ch44), 0.17 *3* (1985Ab08), 0.20 *3* (1973HeYW).
636.5 *2*	0.675 *21*	636.47	$3/2^-$	0.0	$5/2^+$	I_γ: 0.65 *6* (2006Le32), 0.60 *3* (1999Sc12), 0.70 *2* (1992Ch44), 0.84 *13* (1985Ab08), 0.70 *10* (1973HeYW), 0.74 *8* (1969Pa03), 0.81 *15* (1966Bl06); other value: 1.8 *5* (1962Su01).
657.55[de] *25*	0.125[d] *6*	657.68?		0.0	$5/2^+$	I_γ: 0.110 *10* (2006Le32), 0.140 *24* (1999Sc12), 0.14 *1* (1992Ch44), 0.13 *2* (1985Ab08), 0.10 *3* (1973HeYW), 0.12 *3* (1969Pa03), 0.13 *3* (1966Bl06).
657.55[de] *25*	0.125[d] *6*	760.40		103.18018	$3/2^+$	I_γ: 0.110 *10* (2006Le32), 0.140 *24* (1999Sc12), 0.14 *1* (1992Ch44), 0.13 *2* (1985Ab08), 0.10 *3* (1973HeYW), 0.12 *3* (1969Pa03), 0.13 *3* (1966Bl06).
662.4 *6*	0.08 *6*	760.40		97.43099	$5/2^-$	I_γ: Mean value of 0.20 *4* (2006Le32), 0.007 *2* (1992Ch44), 0.03 *1* (1969Pa03).
677.0 *3*	0.0143 *18*	760.40		83.36722	$7/2^+$	I_γ: 0.014 *2* (1985Ab08), 0.016 *5* (1992Ch44); other value: 0.0025 *25* (1969Pa03).
682.0 *6*	0.005 *3*	681.90	$(5/2^-)$	0.0	$5/2^+$	I_γ: 0.009 *3* (1992Ch44), 0.0025 *25* (1969Pa03); other value: 0.09 *3* (1966Bl06).
[x]686.0 *4*	0.077 *5*					I_γ: 0.072 *21* (1999Sc12), 0.077 *8* (1992Ch44), 0.066 *10* (1985Ab08), 0.09 *1* (1969Pa03); other value: 0.40 *6* (1973HeYW).
694.1 *3*	0.0052 *22*	694.18	$5/2^+$	0.0	$5/2^+$	I_γ: 0.007 *2* (1992Ch44), 0.0025 *25* (1969Pa03); other value: 0.028 *4* (1985Ab08),
701.8 *4*	0.010 *2*	701.39		0.0	$5/2^+$	I_γ: From 1992Ch44, sustained by 0.0087 (1969Un03, given with no unc); other values: 0.029 *4* (1985Ab08), 0.0025 *25* (1969Pa03).
706.8 *5*	0.0039 *14*	706.62	$5/2^+$	0.0	$5/2^+$	I_γ: Unweighted mean value of <0.005 (1969Pa03) and 0.0053 *5* (1969Un03, unc adopted by evaluator); other value: 0.0117 *18* (1985Ab08).
[x]713.9 *3*	0.079 *6*					I_γ: 0.09 *4* (1999Sc12), 0.077 *8* (1992Ch44), 0.080 *12* (1985Ab08), 0.10 *3* (1973HeYW), 0.066 *20* (1969Pa03), 0.11 *3* (1966Bl06).

$^{153}_{63}Eu_{90}$-7

^{153}Sm β^- decay (continued)

$\gamma(^{153}Eu)$ (continued)

E_γ [†]	I_γ [‡#@c]	E_i(level)	J_i^π	E_f	J_f^π	Comments
719.0 *4*	0.0086 *18*	718.69	(3/2$^+$)	0.0	5/2$^+$	I_γ: 0.009 *2* (1992Ch44), 0.007 *4* (1969Pa03); other value: 0.023 *3* (1985Ab08).
760.5 *4*	0.0108 *18*	760.40		0.0	5/2$^+$	I_γ: 0.010 *2* (1992Ch44), 0.027 *15* (1969Pa03), 0.013 *4* (1966Bl06); other value: 0.023 *3* (1985Ab08).
763.8[e] *6*	0.015 *4*	763.8?		0.0	5/2$^+$	I_γ: 0.017 *5* (1992Ch44), 0.011 *6* (1969Pa03).

[†] From the 2000He14 evaluation of γ-ray energies for the lines previously measured with curved-crystal spectrometers; on this scale the strong ^{198}Au line is 411.80205 *17* keV. This reference gives several Eγ deduced level energies. Other Eγ are average of values from 1969Pa03, 1969Un03, and 1985Ab08, unless otherwise noted.

[‡] From weighted averages of the data from 1962Su01, 1964Al09, 1966Bl06, 1969Pa03, 1974HeYW, 1985An08, 1987Co04, 1992Ch44, 1998Bo18, 1999Sc12, and 2006Le32. About 60% of these weighted averages have reduced-χ^2 values of greater than 1.0. In these cases the uncertainty is either the external uncertainty.

[#] Additional information 2.

[@] Values of 1987Co04, 1998Bo18, 1999Sc12, and 2006Le32 are given as absolute intensities.

[&] From ^{153}Eu Adopted γ's.

[a] Additional information 3.

[b] Additional information 4.

[c] For absolute intensity per 100 decays, multiply by 0.002914 *16*.

[d] Multiply placed with undivided intensity.

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

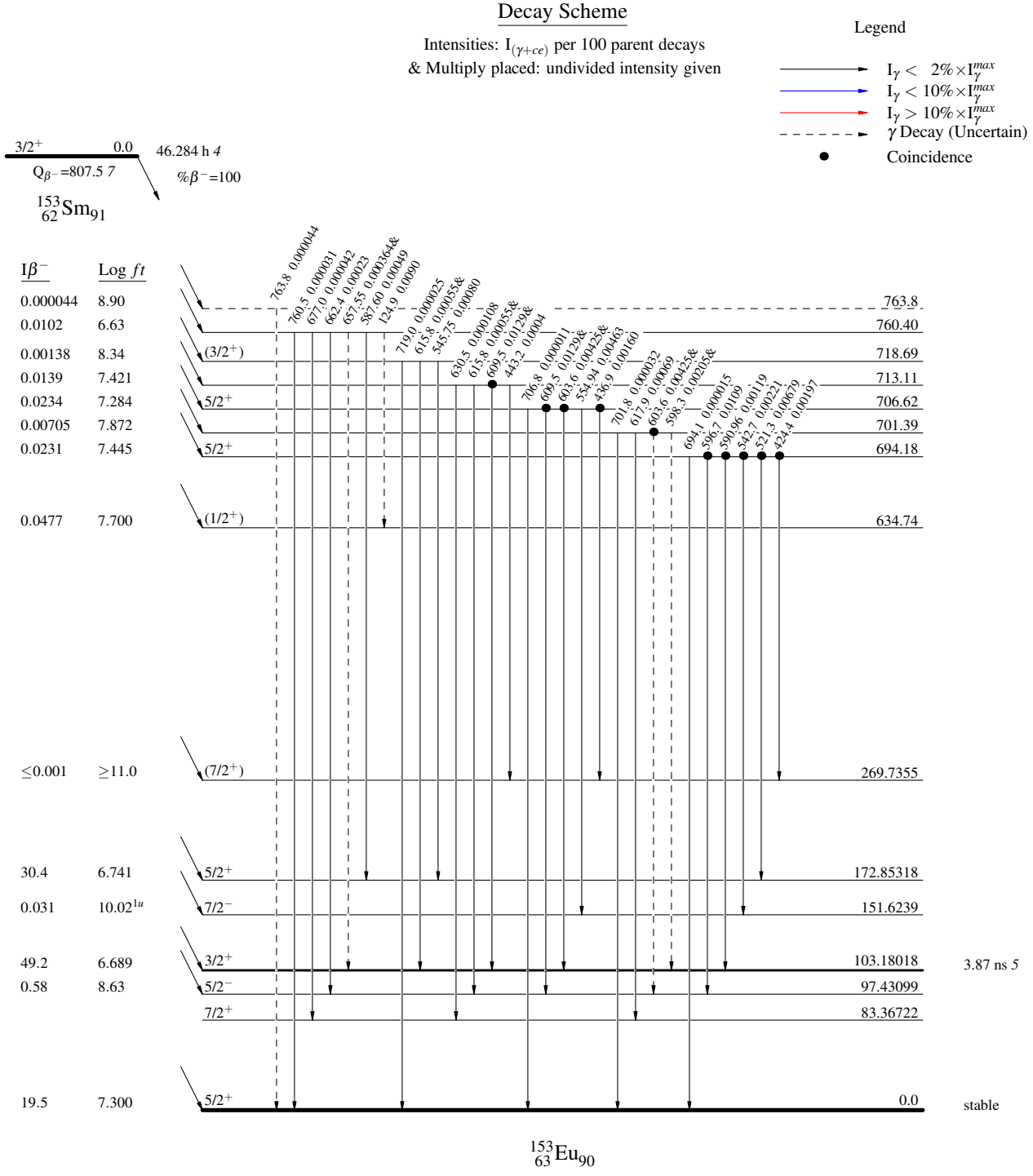
[x] γ ray not placed in level scheme.

$^{153}_{63}Eu_{90}$-8

^{153}Sm β^- decay

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given



^{153}Sm β^- decay

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given