Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 200,2 (2025)	22-Aug-2022

Q(β^-)=−717.2 *11*; S(n)=7966.8 *8*; S(p)=9097 *9*; Q(α)=−1200.5 *11* 2021Wa16
S(2n)=13835.2 *8*, S(2p)=16884 *24* (2021Wa16).
The data on Eγ and Iγ values and J$^\pi$ assignments are primarily from the ^{154}Pm β^- decays (1.73 min and 2.68 min) (1971Da28,1974Ya07,1993GrZY) and the (n,n′γ) reaction (2006De19).

^{154}Sm Levels

In the Inelastic Scattering and (n,n′γ) data sets, a number of levels are shown which are not included in this Adopted Levels data set. For a listing of those levels, see those source data sets.
2006De19, in (n,n′γ), do not confirm the population of levels at 1104, 1120, 1295, 1365 and 1371 keV, if they have J≤5. see, also, the Inelastic Scattering Data Set.

Cross Reference (XREF) Flags

A	^{154}Pm β^- decay (2.68 min)	E	^{154}Sm(γ,γ'),(e,e′)
B	^{154}Pm β^- decay (1.73 min)	F	Coulomb excitation
C	^{154}Eu ε decay	G	^{154}Sm(n,n′γ)
D	^{152}Sm(t,p)	H	inelastic scattering

E(level)[†]	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0[#]	0$^+$	stable	ABCDEFGH	T$_{1/2}$: The T$_{1/2}$ for two-neutrino double β^- decay to the 2$^+$ level in ^{154}Gd is measured to be ≥ 2.3x10^{18} y (1996De60). This is the same value listed in the tabulation of 2002Tr04. A model calculation of the T$_{1/2}$ for double β^- decay gives 1.0x10^{23} y for two-neutrino mode and 9x10^{24}(m$_n^2$) y×(eV)^2. The change in the nuclear charge radius between ^{152}Sm and ^{154}Sm can given by either λ or Δ<r^2> where λ = Δ<r^2> + c$_1$ Δ<r^4> + c$_2$ Δ<r^6>. λ=0.219 fm^2 *10* with the corresponding values Δ<r^2>=0.231 fm^2 *11*, Δ<r^4>=0.00187 fm^4 *9*, and Δ<r^6>=0.0000126 fm^6 *7* from 1990Wa25. Other values: λ=0.221 *13* (1973Le16), 0.220 *11* (1981Ne01) and 0.222 *11* (1997Ji06) and Δ<r^2>=0.215 *16* (1974He28), 0.250 *14* (1979Po04 as quoted in 1983La06), 0.230 *12* (1980Br15), 0.230 (1985Al06), 0.226 *12* (1987Bo58), and 0.222 (1990En01). Other: 1989GaZO, 1995Ne12, and 1996La03. Δ<r^2> for the neutron distribution is 0.27 *4* (1983Ja06). From an analysis of proton-diffraction data using 800-MeV protons, 2004Ko34 deduce r$_{BS}$=5.24 fm *9* for the “Black-Sphere” radius, taken to be a measure of the matter distribution. The nuclear radius has been reported as <r^2>$^{1/2}$=5.113 fm *11* (1979Po04) and 5.1143 fm *9* (1995Fr22 evaluation). From an analysis of data on nuclear rms charge radii, 2004An14 report <r^2>$^{1/2}$=5.111 fm 6, while 2007Li14 recommend 5.120 fm 28. For other values, see 1976Co08 and 1977HoZF in the (γ,γ'),(e,e′) Data Set.
81.981[#] *15*	2$^+$	3.02 ns *4*	ABCDEFGH	Q=−1.87 *4*; μ=+0.78 *4* XREF: D(86) The isomer shift is Δ<r^2>=0.0008 fm^2 *5* (1974Ka38) and 0.0012 fm^2 *9* [computed from Δ<r^2>/<r^2>(0) of 1970Wh02 and <r^2>(0) of 1979Po04]. J$^\pi$: From E2 γ to 0$^+$ ground state. T$_{1/2}$: Weighted average of 3.03 ns *5* (1967Wo06) and 3.00 ns *6* (1968Ri09) from Coul. ex. Other: 2.74 ns *24* (1959Bi10) from Coul. ex. From the B(E2) value of 4.32 *2*, T$_{1/2}$=3.01 ns *4*, with the uncertainty primarily from the 1.5% uncertainty assigned to the theoretical α.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{154}Sm Levels (continued)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
				Q: From 1989Ra17 evaluation and 2005St24 compilation and based on muonic atom study (1979Po04). Others: −1.3 *5* (1969Wh04), −1.5 *3* (1982Cl03), and 1.42 (from ratio given by 1975Ro24 and converted to actual value by 1978LeZA). μ: From 1989Ra17 evaluation and 2005St24 compilation and based on data of 1969Wh04 in Coul. ex. For other values, see the Coul. ex. data set.
266.817[#] *22*	4+	172 ps *4*	ABC EFGH	μ=+1.35 *15*; Q=−2.2 *8*; B(E4)↑=0.305 *18* Jπ: From E2 γ to 2+ level and band structure. $T_{1/2}$: Weighted average of 173 ps *5* (1972Di06) and 169 ps *10* (1980Jo08) from Coul. ex. μ: From 1989Ra17 evaluation and 2005St24 compilation and based on data of 1972Ku10. Q: From 1982Cl03 (inel. scatt.). B(E4)↑: From Coul. ex. Other: 0.221 *10*, from 1976Co08, (e,e′).
544.10[#] *4*	6+	22.7 ps *6*	A EFGH	μ=+1.90 *28* B(E6)↑=0.007 *5* Jπ: From γ to 4+ level and band structure. Coulomb-excited. $T_{1/2}$: Weighted average of 23.3 ps *7* (1972Di06) and 22.1 ps *7* (average of two values in 1980Jo08) from Coul. ex. μ: From 1989Ra17 evaluation and 2005St24 compilation and based on data of 1972Ku10. B(E6)↑: From 1977HoZF, (e,e′), reported as a preliminary result.
902.75[#] *19*	8+	5.9 ps *3*	FG	μ=2.8 *4* Jπ: From γ to 6+ level and band structure. Coulomb-excited. $T_{1/2}$: Weighted average of 6.2 ps *6* (1972Di06), 6.0 ps *4* (1977Ke06), and 5.8 ps *4* (1980Jo08) from Coul. ex. μ: From graph in 1982An10. Other: see J-dependent expression given in 1989Ra17 evaluation which is based on data of 1982An10.
921.345[@] *19*	1−	21 fs *1*	AB EFGH	Jπ: E1 excitation in (γ,γ′). $T_{1/2}$: From weighted average of 20.1 fs *14*, by DSAM in (n,n′γ) (1993Ju04) and 24 fs *3*, (γ,γ′).
1012.40[@] *3*	3−	23 fs *3*	AB FGH	B(E3)↑=0.10 *2* Jπ: E3 excitation in Coul. ex. $T_{1/2}$: From 1993Ju04 by DSAM in (n,n′γ). B(E3)↑: From Coul. ex.
1099.26[&] *5*	0+	0.92 ps *18*	B DEFGH	XREF: D(1117) Jπ: L=0 in (t,p). $T_{1/2}$: Weighted average of 0.90 ps *21* (1999Kr10, DSAM) and 0.94 ps *18* (2012Mo23, measured B(E2)(W.u.)=11.2 *21*), both from Coul. ex.
1177.812[&] *21*	2+	4.3 ps *5*	AB EFGh	Jπ: From γ's to 0+ and 4+ states. E2 excitation in Coul. ex. $T_{1/2}$: weighted average of 4.23 ps *49*, 4.25 ps *54* and 4.35 ps *55* (from Coul. ex. respective B(E2)(W.u.)↓ values measured by 2012Mo23 for the γ rays from this level: 1.32 *15*, 0.72 *9*, 0.32 *4*). Other values: from Coul. ex. (1999Kr10): >2.4 ps (DSAM); 1.4 ps *3* (from B(E2)=0.023 *5*, but 1999Kr10 argue that this value is too small).
1181.26[@] *4*	5−		FGh	Jπ: From γ to 4+ state and octupole-band structure.
1202.44[b] *6*	0+		B DE GH	XREF: D(1218) Jπ: L=0 transition in (t,p) (1966Bj01). Nuclear shape is discussed by 1999Kr10 and 2001MoZT.
1286.29[b] *4*	2+		AB D G	XREF: D(1299) Jπ: From γ's to 0+ and 4+ states.
1333.0[#] *9*	10+	2.45 ps *12*	FG	μ=3.2 *8* Jπ: From multiple Coulomb excitation and band structure.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{154}Sm Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$	XREF	Comments
				$T_{1/2}$: Weighted average of 2.52 ps *16* (1977Ke06) and 2.37 ps *18* (1980Jo08), measured following Coulomb excitation. μ: From graph in 1982An10. Other: see J-dependent expression given in 1989Ra17 evaluation, which is based on data of 1982An10.
1337.60[&] *5*	4^+	5.7 ps *18*	FGH	$T_{1/2}$: weighted average of 5.6 ps *18*, 5.8 ps *18* and 5.6 ps *19* (from Coul. ex. respective B(E2)(W.u.)↓ values measured by 2012Mo23 for the γ rays from this level: 0.66 *21*, 0.57 *18*, 0.32 ps *11*). Jπ: From γ's to 2^+ and 6^+ states. Populated in Coul. ex.
1430.93[@] *14*	7^-		FG	Jπ: From γ's to 6^+ and 8^+ levels and band structure.
1440.04[a] *3*	2^+	0.42 ps *3*	FGH	Jπ: γ's to 0^+ and 4^+ states. E2 excitation in Coul. ex. $T_{1/2}$: Coul. ex. weighted average of 0.42 ps *3* (1999Kr10, DSAM) and 0.42 ps *4* (2012Mo23, B(E2)(W.u.)↓). The latter value is the weighted average of 0.42 ps *7*, 0.42 ps *4* and 0.42 ps *5* (calculated from the respective B(E2)(W.u.)↓ values measured by 2012Mo23 for the γ rays from this level: 0.36 *5*, 3.2 *3*, 1.9 ps *2*). From Coul. ex.; other: 0.28 ps *4*, computed from B(E2)=0.069 *10* (1999Kr10).
1472.16[b] *12*	(4^+)		A G	Jπ: From γ's to 3^- and 4^+ levels; expected band structure.
1475[‡]	(6^+)		F	Jπ: From γ's to 4^+ and 6^+ levels. Suggested band member.
1475.81[c] *4*	1^-		B GH	Jπ: γ's to 0^+ and 2^+ levels; angular distribution in inelastic scattering. Assigned as the bandhead of the $K^\pi=1^-$ octupole band.
1515.18[c] *5*	2^-		AB GH	XREF: H(1522) Jπ: γ to 2^+ state only. Expected band structure.
1539.19[a] *4*	3^+		A FGH	XREF: H(1547) Jπ: From γ's to 2^+ and 4^+ states. Expected band structure.
1577[&]	6^+		F	Jπ: From γ's to 4^+ and 8^+ states. Band assignment is from 1992Mo20 (Coul. ex.).
1584.50[c] *5*	3^-		A FGH	Jπ: From γ to 2^+ and 4^+ states and angular distribution in inelastic scattering.
1614.77 *7*			B	
1660.65[c] *4*	4^-		G	Jπ: From γ to 4^+ state and band structure.
1664.82[a] *7*	4^+		A FGH	Jπ: From γ's to 2^+ and 4^+ states, angular distribution in inelastic scattering, and expected band structure.
1673.90 *7*	2		AB G	Jπ: Dipole γ's to 1^- and 3^- levels.
1706.71 *5*	3^+		A FGH	Jπ: From γ(θ) in (n,n'γ), assuming that the transition to the 2^+ level involves no parity change.
1741[‡]	(8^+)		F	Jπ: From γ to 6^+ level. Suggested band member.
1754.51 *5*			AB	
1755.67 *4*	(3^-)		AB E G	Jπ: From γ's to 1^- and 3^- levels and log *ft* > 7.3 from (4^+) parent.
1760[@]	9^-		F	Jπ: From γ to 8^+ level and band structure.
1764.4 *4*			B	
1774.31[c] *8*	5^-		A GH	Jπ: From E1 γ to 4^+ level, γ to 6^+ level, and band structure.
1804.99[a] *10*	5^+		A FG	Jπ: From γ's to 4^+ and 6^+ levels and band structure.
1815.04 *5*	2^+,3		A FGH	Jπ: Dipole γ to 2^+ level, γ to 4^+ level.
1818.37 *8*	$(4^+,5)$		A G	Jπ: From γ's to 4^+ and 6^+ levels and log *ft* ≈ 7.3 from (4^+) parent.
1825.9[#] *10*	12^+	1.39 ps *9*	F	Jπ: From multiple Coulomb excitation and band structure. $T_{1/2}$: From Coulomb excitation (1980Jo08).
1878.70 *4*	(2^+)		A G	Jπ: From γ's to 0^+ and 4^+ levels.
1890.45 *11*	1^-		B E G	Jπ: E1 transitions to 0^+ and 2^+ levels in (n,n'γ). Excitation via a presumptive E1 transition in (γ,γ'). See the comment in that data set.
1900			E	
1922.05 *4*	2^+		A E G	Jπ: Fed by primary γ from 1^- state populated via n-capture γ rays; γ's to 2^+ and 4^+ levels. E1 γ from 3^- indicates π=+.
1925.56 *16*			G	Jπ: 2006De19, (n,n'γ), report $J^\pi=4^+$.
1945.61 *6*	(3^-)		AB G	Jπ: From γ's to 1^- and 3^- levels and log *ft* > 7.0 from (4^+) parent.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{154}Sm Levels (continued)

E(level)[†]	J^π	XREF	Comments
1973.76 *5*	$1^-,2^+$	B E GH	J^π: From γ's to 0^+ and 3^- levels. Proposed to be excited via M1 in (γ,γ'), indicating $J^\pi=1^+$, but this leads to a violation of RUL for the 961.3 γ (which would then be M2) deexciting this level.
1974[a]	(6^+)	F	J^π: From γ's to 4^+ and 6^+ levels. Assigned as the 6^+ member of the γ-vibrational band by 1992Mo20 (Coul. ex.).
1986.59 *4*	3^-	A E G	J^π: γ's to $2^+,2^-$ and 4^+ levels indicate $J^\pi=2^+,3$. E1 γ's to positive-parity states indicate $\pi=-$, and hence J=3. (See the comment on the decay modes of this level in the (n,n$'\gamma$) data set).
2013.4 *6*		GH	XREF: H(2012)
2015.40 *6*	$(1^-,2^+)$	B G	XREF: G(?) J^π: From γ's to 0^+ and 3^- levels.
2062 *4*		H	
2065.90 *8*	$(3,4^+)$	A	J^π: From γ's to 2^+ and 4^+ levels and log *ft* ≈ 6.4 from (4^+) parent.
2069[‡]	(10^+)	F	J^π: From γ to 8^+ level and band structure.
2069.07 *4*	(2^+)	B G	XREF: G(?) J^π: From γ's to 0^+ and 4^+ levels.
2130 *4*		H	
2131.82 *6*	(2^+)	B G	J^π: From γ's to 0^+ and 4^+ levels.
2139.82 *4*	$(1,2^+)$	B G	XREF: G(?) J^π: γ's to 0^+ and 2^+ levels.
2154.3?[a]	7^+	F	J^π: From γ to 6^+ state and band structure.
2163[@]	11^-	F	J^π: From γ's to 9^- and 10^+ and band structure.
2196.2? *5*	$(1,2^+)$	B	J^π: From γ to 0^+ level.
2232.8 *4*	$(3,4^+)$	A G	XREF: G(?) J^π: From γ's to 2^+ and 3^+ levels and log *ft* ≈ 6.8 from (4^+) parent.
2275 *4*		H	
2288 *4*		H	
2293.85 *12*	$(3,4^+)$	A G	J^π: From γ's to 2^+ and 4^+ levels and log *ft* ≈ 6.4 from (4^+) parent.
2368.81 *14*	$(1,2^+)$	B G	J^π: From γ's to 0^+ and 2^+ levels.
2373.0[#]	14^+	F	J^π: From γ to 12^+ level and band structure.
2421.4?	$(1,2^+)$	B	J^π: From γ's to 0^+ and 2^+ levels.
2428.48 *11*		B	
2439[‡]	(12^+)	F	J^π: From γ to 10^+ level and band structure.
2443.5 *4*	1^+	E G	J^π: Excited via an M1 transition in (γ,γ').
2486? *3*		E	
2556.56 *22*	1^-	B E G	J^π: γ's to 0^+ and 2^+ levels; E1 excitation in (γ,γ').
2591.32 *10*		B G	
2618.03 *12*	1^-	B E G	J^π: From E1 excitation in (γ,γ').
2636[@]	13^-	F	J^π: From γ's to 11^- and 12^+ levels and band structure.
2721.28 *24*	$(1,2^+)$	B G	J^π: From γ's to 0^+ and 2^+ levels.
2743.7 *4*	1^-	E G	J^π: From E1 excitation in (γ,γ').
2778.63 *17*	1	B E G	J^π: From γ's to 0^+ and 2^+ levels, $J^\pi=1,2^+$. Dipole excitation in (γ,γ') rules out 2^+.
2793?[‡]	(14^+)	F	J^π: From γ to 12^+ level and band structure.
2825.3 *5*	1^-	E	J^π: From E1 excitation in (γ,γ').
2842.8 *4*	1^-	B E	J^π: From E1 excitation in (γ,γ').
2882.0 *5*	1^-	E	J^π: From E1 excitation in (γ,γ').
2907.3 *5*	1^+	E	J^π: From M1 excitation in (γ,γ').
2968.2[#]	16^+	F	J^π: From γ to 14^+ level and band structure.
3051.23 *15*		B	
3091.5 *5*	1^+	E	J^π: From M1 excitation in (γ,γ').
3117.0 *5*	1^+	E	J^π: From M1 excitation in (γ,γ').
3193.42 *17*	1^+	B E H	J^π: From M1 excitation in (γ,γ').
3339.5 *5*	1	E	J^π: From dipole excitation in (γ,γ').
3365.9 *5*	1	E	J^π: From dipole excitation in (γ,γ').
3371.1 *5*	1^+	E	J^π: From M1 excitation in (γ,γ').

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{154}Sm Levels (continued)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
3426.4 *5*	1		E	J^π: From dipole excitation in (γ,γ').
3492.4 *5*	1^+		E	J^π: From M1 excitation in (γ,γ').
3609.3[#]	18^+		F	J^π: γ to 16^+, and band structure.
3621.7 *5*	1^+		E	J^π: From M1 excitation in (γ,γ').
3745.8 *5*	1		E	J^π: From dipole excitation in (γ,γ').
3759.8 *5*	1		E	J^π: From dipole excitation in (γ,γ').
3801.3 *5*	1		E	J^π: From dipole excitation in (γ,γ').
3826.7 *5*	1^-		E	J^π: From E1 excitation in (γ,γ').
3836.7 *5*	1		E	J^π: From dipole excitation in (γ,γ').
3844.0 *5*	1		E	J^π: From dipole excitation in (γ,γ').
4020 *10*			E	
4240 *10*			E	
4295.7[#]	20^+		F	J^π: γ to 18^+ and band structure.
4300 *10*			E	
5027.9[#]	22^+		F	J^π: γ to 20^+ and band structure.
6465.2 *10*	1^-	4.3 fs *21*	E	J^π: From E1 excitation in (γ,γ'). $T_{1/2}$: Calculated from level width of 0.105 eV *50* (1977Be05).

[†] From least-squares fit to γ energies, except omitted are those γ's with questionable placements and Eγ's that do not have uncertainties.

[‡] Proposed as a member of a band by 1992Mo20 in Coul. ex., but the existence of the suggested bandhead (at 1371 keV) is questionable, and the band characteristics are not otherwise clear.

[#] Band(A): K^π=0^+ ground-state band. A=13.80 keV, B=−23.0 eV, computed from the energies of the 0^+, 2^+ and 4^+ levels.

[@] Band(B): K^π=0^- octupole−vibrational band. A=8.97 keV, B=+9.8 eV, computed from the energies of the 1^-, 3^- and 5^- levels.

[&] Band(C): First excited K^π=0^+ band. α=13.60 keV, β=−84 eV, computed from the energies of the 0^+, 2^+ and 4^+ levels. 2001Ga02 suggest that this is probably not a pure β vibration.

[a] Band(D): K^π=2^+ γ-vibrational band. A=17.30 keV, B=−72 eV, A_4=+2.2 eV, computed from the energies of the 2^+ through 5^+ levels.

[b] Band(E): Second excited K^π=0^+ band. α=14.18 keV, β=−35 eV, computed from the energies of the 0^+, 2^+ and 4^+ levels.

[c] Band(F): K^π=1^- octupole−vibrational band. A=10.40 keV, B=+13 eV, A_2=+0.316 keV, computed from the energies of the 1^- through 4^- levels.

Adopted Levels, Gammas (continued)

$\gamma(^{154}Sm)$

The unplaced γ's are not given here, see ^{154}Pm γ- decay (1.73 m and 2.68 m) and ^{154}Sm(n,n$'\gamma$).
Above 2430 the B(E1)(W.u.) and B(M1)(W.u.) values are deduced by the evaluator from the B(E1)↑ and B(M1)↑ values in the ^{154}Sm(γ,γ'),(e,e$'$) dataset.

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[d]	Comments
81.981	2^+	81.990 *18*	100	0.0	0^+	E2	4.86 *7*	B(E2)(W.u.)=176 *3* α(K)=1.989 *28*; α(L)=2.228 *31*; α(M)=0.518 *7* α(N)=0.1134 *16*; α(O)=0.01414 *20*; α(P)=8.30×10^{-5} *12* B(E2)(W.u.) value computed directly from B(E2)↑.
266.817	4^+	184.810 *25*	100	81.981	2^+	E2	0.272 *4*	B(E2)(W.u.)=245 *6* α(K)=0.1915 *27*; α(L)=0.0628 *9*; α(M)=0.01427 *20* α(N)=0.00315 *4*; α(O)=0.000416 *6*; α(P)=9.32×10^{-6} *13*
544.10	6^+	277.34 *4*	100	266.817	4^+	E2	0.0719 *10*	B(E2)(W.u.)=289 *8* α(K)=0.0553 *8*; α(L)=0.01294 *18*; α(M)=0.00289 *4* α(N)=0.000643 *9*; α(O)=8.79×10^{-5} *12*; α(P)=2.93×10^{-6} *4*
902.75	8^+	358.8 *2*	100	544.10	6^+	E2	0.0327 *5*	B(E2)(W.u.)=319 *16* α(K)=0.0260 *4*; α(L)=0.00520 *7*; α(M)=0.001150 *16* α(N)=0.000257 *4*; α(O)=3.58×10^{-5} *5*; α(P)=1.439×10^{-6} *20*
921.345	1^-	839.36 *2*	100 *3*	81.981	2^+	E1	1.44×10^{-3} *2*	α(K)=0.001240 *17*; α(L)=0.0001605 *22*; α(M)=3.41×10^{-5} *5* α(N)=7.72×10^{-6} *11*; α(O)=1.153×10^{-6} *16*; α(P)=7.16×10^{-8} *10* B(E1)(W.u.)=0.0113 *6* exceeds RUL=0.01.
		921.33 *3*	68 *2*	0.0	0^+	E1	1.20×10^{-3} *2*	B(E1)(W.u.)=0.0058 *3* α(K)=0.001036 *14*; α(L)=0.0001335 *19*; α(M)=2.84×10^{-5} *4* α(N)=6.42×10^{-6} *9*; α(O)=9.60×10^{-7} *13*; α(P)=5.99×10^{-8} *8* Mult.: From $\gamma(\theta)$ and linear polarization measurements in (γ,γ') (1976Me17).
1012.40	3^-	745.50 *4*	59.0 *18*	266.817	4^+	E1	1.83×10^{-3} *3*	B(E1)(W.u.)=0.0092 *+14−11* α(K)=0.001571 *22*; α(L)=0.0002044 *29*; α(M)=4.35×10^{-5} *6* α(N)=9.82×10^{-6} *14*; α(O)=1.466×10^{-6} *21*; α(P)=9.04×10^{-8} *13* B(E1)(W.u.)=0.0092 *+14−11* upper bound exceeds RUL=0.01.
		930.37 *3*	100 *1*	81.981	2^+	E1	1.18×10^{-3} *2*	B(E1)(W.u.)=0.0080 *+12−9* α(K)=0.001016 *14*; α(L)=0.0001310 *18*; α(M)=2.78×10^{-5} *4* α(N)=6.30×10^{-6} *9*; α(O)=9.42×10^{-7} *13*; α(P)=5.88×10^{-8} *8*
1099.26	0^+	1017.23 *10*	100.0 *16*	81.981	2^+	[E2]	2.40×10^{-3} *3*	B(E2)(W.u.)=11.4 *+28−19* α(K)=0.002035 *28*; α(L)=0.000286 *4*; α(M)=6.14×10^{-5} *9* α(N)=1.387×10^{-5} *19*; α(O)=2.056×10^{-6} *29*; α(P)=1.209×10^{-7} *17*

$^{154}_{62}Sm_{92}$-6

Adopted Levels, Gammas (continued)

$\gamma(^{154}Sm)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ	α[d]	$I_{(\gamma+ce)}$	Comments
1099.26	0^+	1099.3[g]		0.0	0^+	E0			0.55 *20*	Conversion electrons corresponding to 1099γ found only by 2009WiZU (Coul. ex.). $\rho^2(E0)_{exp}$=0.096 42 (2009WiZU) 2022Ki03 evaluation results for E0, 1099.3 transition and E2, 1017.2γ: $\rho^2(E0)_{exp}$≠0.110 *40*, q_K^2=2.3 *8*, X(E0/E2)=0.31 *10* for $T_{1/2}$=0.90 ps *21*. $I_{(\gamma+ce)}$: see corresponding comment in Coul. Ex.
1177.812	2^+	910.96 *3*	72.4 *19*	266.817	4^+	E2		0.00304 *4*		B(E2)(W.u.)=1.30 *+17−14* α(K)=0.00257 *4*; α(L)=0.000368 *5*; α(M)=7.92×10^{-5} *11* α(N)=1.789×10^{-5} *25*; α(O)=2.64×10^{-6} *4*; α(P)=1.523×10^{-7} *21* I_γ: weighted average of 75 *6* from (n,n′γ) and 72.1 *19* from Coulomb excitation.
		1095.86 *3*	100.0 *19*	81.981	2^+	E0+M1+E2	−30 *21*	0.0052[@] *32*		B(E2)(W.u.)=0.71 *9* α(K)=0.001747 *27*; α(L)=0.000243 *4*; α(M)=5.20×10^{-5} *8* α(N)=1.175×10^{-5} *18*; α(O)=1.746×10^{-6} *26*; α(P)=1.040×10^{-7} *16* Additional information 1. α: α(M1+E2)=0.00206 *4*. I_γ: weighted average of 100.0 *19* from (n,n′γ) and 100.0 *19* from Coulomb excitation. δ: from 2012Mo23, with the other value, δ=−0.48 *2*, rejected by 2012Mo23 due to the Alaga rule. Others: δ=+56 *+130−25* or δ=−42 *2* in (n,n′γ), 2006De19. $\rho^2(E0)_{exp}$≤0.0094 *15* (2014Sm02, Coul. Ex.) using α(K)=0.00257 *4* for 911γ (theory from BrIcc code), and α(K)exp≤0.0067 *6* for 1096γ from current experiment. Other value: <0.0063 (2009WiZU). 2022Ki03 evaluation results: $\rho^2(E0)_{exp}$≤0.009, q_K^2≤3.1, X(E0/E2)≤0.45, α(K)exp≤0.0067 *6* , δ=−30 *21*, $T_{1/2}$≥2.4 ps. B(E2)(W.u.)=0.72 *9* is for δ=−30 *21*. The other calculated value, B(E2)(W.u.)=0.15 *2* for δ=−0.48 *2*, is rejected by 2012Mo23 from Alaga Rule.
		1177.79 *4*	65.2 *14*	0.0	0^+	E2		1.78×10^{-3} *3*		B(E2)(W.u.)=0.32 *4* α(K)=0.001510 *21*; α(L)=0.0002074 *29*; α(M)=4.44×10^{-5} *6*

$^{154}_{62}Sm_{92}$-7

$^{154}_{62}Sm_{92}$-8

γ(^{154}Sm) (continued)

E_i(level)	J^π_i	E_γ†	I_γ‡	E_f	J^π_f	Mult.#	δ	α[d]	Comments
									α(N)=1.004×10^{-5} *14*; α(O)=1.494×10^{-6} *21*; α(P)=8.99×10^{-8} *13*; α(IPF)=3.58×10^{-6} *5* I_γ: weighted average of 65.8 *14* from (n,n′γ) and 64.0 *19* from Coulomb excitation. Other value: 74 *4* (β^- decay (1.73 m)).
1181.26	5$^-$	637.14[f] *6*	35[f]	544.10	6$^+$	E1		2.54×10^{-3} *4*	α(K)=0.002174 *30*; α(L)=0.000285 *4*; α(M)=6.06×10^{-5} *8* α(N)=1.369×10^{-5} *19*; α(O)=2.039×10^{-6} *29*; α(P)=1.245×10^{-7} *17*
		914.44 *3*	100 *2*	266.817	4$^+$	E1		1.22×10^{-3} *2*	α(K)=0.001051 *15*; α(L)=0.0001355 *19*; α(M)=2.88×10^{-5} *4* α(N)=6.51×10^{-6} *9*; α(O)=9.74×10^{-7} *14*; α(P)=6.07×10^{-8} *9*
1202.44	0$^+$	281.01 *9*	100 *21*	921.345	1$^-$				
		1120.51 *8*	79 *2*	81.981	2$^+$	E2		1.96×10^{-3} *3*	α(K)=0.001669 *23*; α(L)=0.0002310 *32*; α(M)=4.95×10^{-5} *7* α(N)=1.119×10^{-5} *16*; α(O)=1.663×10^{-6} *23*; α(P)=9.93×10^{-8} *14*; α(IPF)=6.80×10^{-7} *10*
1286.29	2$^+$	274.0 *10*	34 *1*	1012.40	3$^-$				
		364.91 *6*	52 *6*	921.345	1$^-$	E1		0.00905 *13*	α(K)=0.00773 *11*; α(L)=0.001039 *15*; α(M)=0.0002216 *31* α(N)=5.00×10^{-5} *7*; α(O)=7.37×10^{-6} *10*; α(P)=4.31×10^{-7} *6*
		1019.40 *20*	54.1 *17*	266.817	4$^+$				
		1204.30 *4*	100 *10*	81.981	2$^+$	M1+E2	+0.8 *+15−6*	0.0022 *4*	α(K)=0.00189 *33*; α(L)=0.00025 *4*; α(M)=5.4×10^{-5} *9* α(N)=1.22×10^{-5} *20*; α(O)=1.84×10^{-6} *30*; α(P)=1.15×10^{-7} *22*; α(IPF)=6.44×10^{-6} *21*
		1286.8 *5*	6.9 *10*	0.0	0$^+$				
1333.0	10$^+$	430.2 *5*	100	902.75	8$^+$	[E2]		0.01935 *28*	B(E2)(W.u.)=314 *16* α(K)=0.01569 *23*; α(L)=0.00286 *4*; α(M)=0.000629 *9* α(N)=0.0001408 *20*; α(O)=1.995×10^{-5} *29*; α(P)=8.89×10^{-7} *13*
1337.60	4$^+$	794.9 *2*	20.7 *18*	544.10	6$^+$	[E2]		0.00411 *6*	B(E2)(W.u.)=0.64 *+30−16* α(K)=0.00346 *5*; α(L)=0.000511 *7*; α(M)=0.0001102 *15* α(N)=2.486×10^{-5} *35*; α(O)=3.65×10^{-6} *5*; α(P)=2.043×10^{-7} *29* I_γ: 20.7 *18* from Coulomb excitation. Other value: 31.9 *21* from (n,n′γ). Value from Coulomb excitation preferred because the branching ratios (and B(E2)(W.u.)↓ values) measured by 2012Mo23 for the γ′s decaying this level

$\gamma(^{154}Sm)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ	α[d]	Comments
									give consistent $T_{1/2}$ values indicating that the branching ratio from (n,n′γ) is discrepant.
1337.60	4^+	1070.68 *7*	83.0 *28*	266.817	4^+	E0+M1+E2	>50	0.013[@] *7*	B(E2)(W.u.)=0.58 *+31−16* α(K)=0.001831 *26*; α(L)=0.000255 *4*; α(M)=5.47×10^{-5} *8* α(N)=1.237×10^{-5} *17*; α(O)=1.836×10^{-6} *26*; α(P)=1.089×10^{-7} *15* Additional information 2. α: α(M1+E2)=0.00216 *3*. I_γ: weighted average of 83.7 *28* from (n,n′γ) and 80 *6* from Coulomb excitation. δ: from 2006De19 in (n,n′γ), which also report δ=−1.1 *3*. $\rho^2(E0)_{exp}$=0.0082 *+120−82* (2014Sm02) 2022Ki03 evaluation results: $\rho^2(E0)_{exp}$=0.012 *9*, q_K^2=4.9 *34*, X(E0/E2)=0.8 *5*, α(K)exp=0.0079 *+87−73*, δ>50, $T_{1/2}$=43 ps *+10−16* (original reference not found).
		1255.55 *7*	100.0 *21*	81.981	2^+	E2		1.57×10^{-3} *2*	B(E2)(W.u.)=0.32 *+14−8* α(K)=0.001330 *19*; α(L)=0.0001811 *25*; α(M)=3.87×10^{-5} *5* α(N)=8.76×10^{-6} *12*; α(O)=1.306×10^{-6} *18*; α(P)=7.92×10^{-8} *11*; α(IPF)=1.306×10^{-5} *18* I_γ: weighted average of 100.0 *21* from (n,n′γ) and 100 *4* from Coulomb excitation.
1430.93	7^-	528.8[f] *4*	30[f] *4*	902.75	8^+				
		886.75 *14*	100 *6*	544.10	6^+				
1440.04	2^+	1173.1 *4*	5.4 *4*	266.817	4^+	E2		1.79×10^{-3} *3*	B(E2)(W.u.)=0.36 *4* α(K)=0.001522 *21*; α(L)=0.0002092 *29*; α(M)=4.48×10^{-5} *6* α(N)=1.013×10^{-5} *14*; α(O)=1.507×10^{-6} *21*; α(P)=9.06×10^{-8} *13*; α(IPF)=3.20×10^{-6} *5* I_γ: 5.4 *4* from Coulomb excitation. Other value: 8.0 *9* from (n,n′γ). Value from Coulomb excitation preferred because the branching ratios (and B(E2)(W.u.)↓ values) measured by 2012Mo23 for the γ′s decaying this level give consistent $T_{1/2}$ values indicating that the branching ratio from (n,n′γ) is discrepant.
		1358.09 *3*	100.0 *22*	81.981	2^+	M1+E2	−19 *10*	1.37×10^{-3} *2*	B(E2)(W.u.)=3.19 *+23−27* α(K)=0.001142 *17*; α(L)=0.0001540 *22*; α(M)=3.29×10^{-5} *5* α(N)=7.44×10^{-6} *11*; α(O)=1.111×10^{-6} *16*; α(P)=6.80×10^{-8} *10*; α(IPF)=3.31×10^{-5} *5*

Adopted Levels, Gammas (continued)

γ(^{154}Sm) (continued)

E_i(level)	J^π_i	E_γ [†]	I_γ [‡]	E_f	J^π_f	Mult. [#]	δ	α [d]	$I_{(\gamma+ce)}$	Comments
										I_γ: weighted average of 100.0 *22* from (n,n′γ) and 100.0 *24* from Coulomb excitation. δ: from 2012Mo23, with the other value, δ=−0.51 *7*, rejected by 2012Mo23 due to the Alaga rule. In 2006De19, (n,n′γ), report δ=−0.59 *3* or −8.5 *15*. B(E2)(W.u.)=3.2 *3* is for δ=−19 *10*. Additional information 3.
1440.04	2$^+$	1440.05 [f] *10*	80.4 [f] *21*	0.0	0$^+$	E2		1.25×10^{-3} *2*		B(E2)(W.u.)=1.93 *14* α(K)=0.001018 *14*; α(L)=0.0001365 *19*; α(M)=2.91×10^{-5} *4* α(N)=6.59×10^{-6} *9*; α(O)=9.86×10^{-7} *14*; α(P)=6.07×10^{-8} *8*; α(IPF)=5.59×10^{-5} *8* I_γ: from Coulomb excitation.
1472.16	(4$^+$)	460.0 *3*	34	1012.40	3$^-$					
		1205.4 *2*	100 *18*	266.817	4$^+$					
1475	(6$^+$)	931		544.10	6$^+$					
		1208		266.817	4$^+$					
1475.81	1$^-$	554.3 *4*	5.6 *11*	921.345	1$^-$					
		1393.83 [f] *3*	100 [f]	81.981	2$^+$					
		1476.0 *6*	2.5 *7*	0.0	0$^+$					
1515.18	2$^-$	1433.19 *5*	100 *3*	81.981	2$^+$	E1		7.01×10^{-4} *10*		α(K)=0.000466 *7*; α(L)=5.92×10^{-5} *8*; α(M)=1.255×10^{-5} *18* α(N)=2.84×10^{-6} *4*; α(O)=4.27×10^{-7} *6*; α(P)=2.71×10^{-8} *4*; α(IPF)=0.0001601 *22*
1539.19	3$^+$	1272.34 *7*	38.0 *17*	266.817	4$^+$					
		1457.23 *4*	100 *3*	81.981	2$^+$	E2+M1	−7.5 *10*	1.23×10^{-3} *2*		α(K)=0.001003 *14*; α(L)=0.0001341 *19*; α(M)=2.86×10^{-5} *4* α(N)=6.48×10^{-6} *9*; α(O)=9.69×10^{-7} *14*; α(P)=5.98×10^{-8} *9*; α(IPF)=6.14×10^{-5} *9* δ: from 2006De19.
1577	6$^+$	674		902.75	8$^+$					
		1033		544.10	6$^+$					
		1310		266.817	4$^+$					
1584.50	3$^-$	45.5		1539.19	3$^+$				55	E_γ,$I_{(\gamma+ce)}$: From ^{154}Pm β^- decay (2.68 min).
		1317.68 *4*	100 *3*	266.817	4$^+$	E1		7.10×10^{-4} *10*		α(K)=0.000539 *8*; α(L)=6.86×10^{-5} *10*; α(M)=1.455×10^{-5} *20* α(N)=3.29×10^{-6} *5*; α(O)=4.94×10^{-7} *7*; α(P)=3.13×10^{-8} *4*; α(IPF)=8.43×10^{-5} *12*
		1502.6 *2*	20.0 *16*	81.981	2$^+$	E1		7.10×10^{-4} *10*		α(K)=0.000430 *6*; α(L)=5.45×10^{-5} *8*;

$^{154}_{62}Sm_{92}$-10

Adopted Levels, Gammas (continued)

$\gamma(^{154}Sm)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ‡	E_f	J^π_f	Mult.#	δ	α d	Comments
									α(M)=1.157×10^{-5} *16* α(N)=2.62×10^{-6} *4*; α(O)=3.93×10^{-7} *6*; α(P)=2.502×10^{-8} *35*; α(IPF)=0.0002101 *29*
1614.77		693.39 *6*	100	921.345	1$^-$				
1660.65	4$^-$	1393.83 f *3*	100 f	266.817	4$^+$				
1664.82	4$^+$	1398.00 *6*	100 *3*	266.817	4$^+$	M1(+E2)	−2.5 *+10−25*	0.00138 *9*	α(K)=0.00114 *8*; α(L)=0.000153 *10*; α(M)=3.26×10^{-5} *21* α(N)=7.4×10^{-6} *5*; α(O)=1.11×10^{-6} *8*; α(P)=6.8×10^{-8} *5*; α(IPF)=4.41×10^{-5} *9* δ: from 2006De19.
		1582.8 *3*	33.0 *18*	81.981	2$^+$	E2		1.10×10^{-3} *2*	α(K)=0.000851 *12*; α(L)=0.0001130 *16*; α(M)=2.409×10^{-5} *34* α(N)=5.45×10^{-6} *8*; α(O)=8.17×10^{-7} *11*; α(P)=5.07×10^{-8} *7*; α(IPF)=0.0001051 *15*
1673.90	2	661.47 *9*	100 *2*	1012.40	3$^-$	E1,M1		0.007 *4*	α(K)=0.006 *4*; α(L)=7; α(M)=1.6×10^{-4} *10* α(N)=3.6×10^{-5} *24*; α(O)=5; α(P)=3.4×10^{-7} *23*
		752.57 *10*	82 *3*	921.345	1$^-$	E1,M1		0.0048 *30*	α(K)=0.0041 *26*; α(L)=5.5×10^{-4} *35*; α(M)=1.2×10^{-4} *7* α(N)=2.6×10^{-5} *17*; α(O)=4.0×10^{-6} *25*; α(P)=2.5×10^{-7} *16* I_γ: From (n,n′γ); Iγ=121 from ^{154}Pm β^- decay (1.73 m).
1706.71	3$^+$	1440.05 f *10*	100 f	266.817	4$^+$	M1+E2		0.00149 *25*	α(K)=0.00123 *21*; α(L)=0.000163 *27*; α(M)=3.5×10^{-5} *6* α(N)=7.9×10^{-6} *13*; α(O)=1.18×10^{-6} *20*; α(P)=7.5×10^{-8} *14*; α(IPF)=5.83×10^{-5} *25*
		1624.87 *12*	45 *18*	81.981	2$^+$	M1+E2	+0.75 *+25−10*	0.00129 *5*	α(K)=0.00099 *4*; α(L)=0.000130 *5*; α(M)=2.78×10^{-5} *11* α(N)=6.30×10^{-6} *26*; α(O)=9.5×10^{-7} *4*; α(P)=6.04×10^{-8} *28*; α(IPF)=0.0001291 *25*
1741	(8$^+$)	1197		544.10	6$^+$				
1754.51		742.2 *3*	85	1012.40	3$^-$				
		833.4 *3*	100	921.345	1$^-$				
1755.67	(3$^-$)	315.5 *3*	33 *7*	1440.04	2$^+$				
		742.90 *6*	100 *3*	1012.40	3$^-$				
		834.05 *20*	99 *3*	921.345	1$^-$				
		1674.1 *4*	11.7 *15*	81.981	2$^+$				
1760	9$^-$	857		902.75	8$^+$				
1764.4		1681.6 *5*	60	81.981	2$^+$				

$\gamma(^{154}Sm)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ	α[d]	Comments
1764.4		1764.9 *4*	100	0.0	0^+				
1774.31	5^-	1230.16 *7*	100 *4*	544.10	6^+				
		1509.0 *4*	20 *3*	266.817	4^+	E1		7.11×10^{-4} *10*	α(K)=0.000427 *6*; α(L)=5.42×10^{-5} *8*; α(M)=1.148×10^{-5} *16* α(N)=2.60×10^{-6} *4*; α(O)=3.91×10^{-7} *5*; α(P)=2.485×10^{-8} *35*; α(IPF)=0.0002148 *30*
1804.99	5^+	1261.0 *1*	47 *4*	544.10	6^+				
		1538.1 *2*	100 *5*	266.817	4^+	M1(+E2)		0.00134 *20*	α(K)=0.00107 *17*; α(L)=0.000141 *22*; α(M)=3.0×10^{-5} *5* α(N)=6.8×10^{-6} *11*; α(O)=1.03×10^{-6} *16*; α(P)=6.5×10^{-8} *11*; α(IPF)=9.3×10^{-5} *4* Mult.: From (n,n′γ), δ=0.00 *2* or −9 *2* (2006De19).
1815.04	2^+,3	276.00 *25*	46	1539.19	3^+				
		375.06 *8*	100	1440.04	2^+				
		528.8[f] *4*	12[f]	1286.29	2^+				E_γ: From 2006De19, (n,n′γ).
		637.14[f] *6*	24[f]	1177.812	2^+				E_γ: From 2006De19, (n,n′γ).
		802.7 *3*	27	1012.40	3^-				
		1548.6 *2*	77	266.817	4^+				
		1733.11 *15*	93	81.981	2^+	E1,M1		0.00103 *26*	α(K)=6.4×10^{-4} *30*; α(L)=8; α(M)=1.8×10^{-5} *9* α(N)=4.0×10^{-6} *20*; α(O)=6.1×10^{-7} *30*; α(P)=3.9×10^{-8} *19*; α(IPF)=2.8×10^{-4} *10* Mult.: From 2006De19 (n,n′γ).
1818.37	(4^+,5)	1274.33 *19*	40 *4*	544.10	6^+				
		1551.54 *9*	100 *4*	266.817	4^+				δ: 2006De19, (n,n′γ), give δ=−0.05 *5* or −5 *+1−2*.
1825.9	12^+	492.9 *5*	100	1333.0	10^+	[E2]		0.01333 *19*	B(E2)(W.u.)=282 *+19−17* α(K)=0.01093 *16*; α(L)=0.001880 *27*; α(M)=0.000411 *6* α(N)=9.22×10^{-5} *13*; α(O)=1.319×10^{-5} *19*; α(P)=6.28×10^{-7} *9*
1878.70	(2^+)	339.68 *20*	25	1539.19	3^+				
		406.63 *15*	23	1472.16	(4^+)				
		438.76 *20*	79	1440.04	2^+				
		592.5 *3*	45	1286.29	2^+				
		701.1 *3*	21	1177.812	2^+				
		956.9 *3*	76 *9*	921.345	1^-				E_γ: From (n,n′γ). In ^{154}Pm β^- decay (2.68 min), a questionable γ with Eγ=958.1 *4* is shown. I_γ: From Iγ(956.9γ)/Iγ(1796.8γ) in (n,n′γ) and Iγ(1796.8γ). from ^{154}Pm β^- decay (2.68 min), Iγ≤12, but γ is shown as questionable.
		1611.97 *25*	46	266.817	4^+				
		1796.85 *15*	100	81.981	2^+	M1+E2	−1.5 *+8−70*	0.00106 *9*	α(K)=0.00073 *7*; α(L)=9.6×10^{-5} *10*; α(M)=2.05×10^{-5} *20*

$^{154}_{62}Sm_{92}$-12

$\gamma(^{154}Sm)$ (continued)

E_i(level)	J_i^π	E_γ†	I_γ‡	E_f	J_f^π	Mult.#	αd	Comments
								α(N)=4.6×10⁻⁶ 5; α(O)=7.0×10⁻⁷ 7; α(P)=4.4×10⁻⁸ 5; α(IPF)=0.000201 8 Mult.,δ: From 2006De19 (n,n′γ).
1878.70	(2⁺)	1878.3 *5*	6.2	0.0	0⁺			
1890.45	1⁻	603.54 *25*	12	1286.29	2⁺			Eγ,Iγ: From ¹⁵⁴Pm β⁻ decay (1.73 min). γ not reported by 2006De19, in (n,n′γ).
		688.1 *4*	15 *5*	1202.44	0⁺			
		1808.29 *19*	100 *7*	81.981	2⁺	E1	8.06×10⁻⁴ *11*	α(K)=0.000317 *4*; α(L)=3.99×10⁻⁵ *6*; α(M)=8.46×10⁻⁶ *12* α(N)=1.917×10⁻⁶ *27*; α(O)=2.88×10⁻⁷ *4*; α(P)=1.843×10⁻⁸ *26*; α(IPF)=0.000439 *6*
		1890.80 *16*	83 *5*	0.0	0⁺	E1	8.42×10⁻⁴ *12*	α(K)=0.000295 *4*; α(L)=3.71×10⁻⁵ *5*; α(M)=7.87×10⁻⁶ *11* α(N)=1.781×10⁻⁶ *25*; α(O)=2.68×10⁻⁷ *4*; α(P)=1.715×10⁻⁸ *24*; α(IPF)=0.000500 *7*
1900		1820		81.981	2⁺			
		1900		0.0	0⁺			
1922.05	2⁺	584.4 *6*	19 *4*	1337.60	4⁺			
		909.7 *3*	21	1012.40	3⁻			Eγ: From ¹⁵⁴Pm β⁻ decay (2.68 min). γ not reported by 2006De19 in (n,n′γ). Iγ: From Iγ(909.7γ)/Iγ(1655γ) in ¹⁵⁴Pm β⁻ decay (2.68 min) and Iγ(1655γ).
		1655.24 *15*	100 *6*	266.817	4⁺			
		1840.44 *18*	98 *6*	81.981	2⁺			
1925.56		1658.73 *15*	100	266.817	4⁺			
1945.61	(3⁻)	933.5 *4*	100	1012.40	3⁻			Eγ: γ not reported by 2006De19, (n,n′γ).
		1024.40 *8*	69	921.345	1⁻			Eγ,Mult.: From 2006De19, (n,n′γ).
		1863.3 *5*	18	81.981	2⁺			Iγ: From Iγ(1863γ)/Iγ(1024γ) in (n,n′γ) and Iγ(1024γ). In ¹⁵⁴Pm β⁻ decay (1.73 min), Iγ≤150.
1973.76	1⁻,2⁺	961.3 *5*	17	1012.40	3⁻			
		1891.8 *3*	81	81.981	2⁺			
		1973.59 *20*	100	0.0	0⁺			
1974	(6⁺)	1430		544.10	6⁺			
		1707		266.817	4⁺			
1986.59	3⁻	64.548 *25*	33	1922.05	2⁺	E1&	0.893 *13*	α(K)=0.744 *10*; α(L)=0.1174 *16*; α(M)=0.02518 *35* α(N)=0.00557 *8*; α(O)=0.000767 *11*; α(P)=3.39×10⁻⁵ *5*
		107.896 *25*	47	1878.70	(2⁺)	E1&	0.2242 *31*	α(K)=0.1892 *27*; α(L)=0.0276 *4*; α(M)=0.00590 *8* α(N)=0.001315 *18*; α(O)=0.0001865 *26*; α(P)=9.27×10⁻⁶ *13*
		171.6 *3*	49	1815.04	2⁺,3	E1&	0.0637 *9*	α(K)=0.0541 *8*; α(L)=0.00757 *11*; α(M)=0.001617 *24* α(N)=0.000362 *5*; α(O)=5.24×10⁻⁵ *8*; α(P)=2.81×10⁻⁶ *4*

$^{154}_{62}Sm_{92}$-13

$^{154}_{62}$Sm$_{92}$-14

γ(^{154}Sm) (continued)

E_i(level)	J^{π}_i	E_{γ}[†]	I_{γ}[‡]	E_f	J^{π}_f	Mult.[#]	α[d]	Comments
1986.59	3⁻	230.82 *3*	43	1755.67	(3⁻)			
		232.08 *3*	30	1754.51				
		279.93 *4*	82	1706.71	3⁺			
		402.15 *10*	11	1584.50	3⁻			
		447.5 *3*	3.0	1539.19	3⁺			
		471.36 *20*	7.0	1515.18	2⁻			
		546.66 *6*	100	1440.04	2⁺			
		700.0[g] *3*	4.5	1286.29	2⁺			
		974.0[g] *4*	2.0	1012.40	3⁻			
		1719.74 *25*	4.8	266.817	4⁺			
		1905.1 *4*	5.2	81.981	2⁺			
2013.4		675.8 *6*	100 *20*	1337.60	4⁺			
2015.40	(1⁻,2⁺)	837.4	100	1177.812	2⁺			
		1002.8 *10*	53	1012.40	3⁻			
		1933.5 *3*	93	81.981	2⁺			
		2015.5[e] *4*	67[e]	0.0	0⁺			
2065.90	(3,4⁺)	143.74 *15*	12	1922.05	2⁺			
		247.75 *15*	17	1818.37	(4⁺,5)			
		359.16 *8*	100	1706.71	3⁺			
		526.7 *4*	7.1	1539.19	3⁺			
		1799.4[g] *5*	3.7	266.817	4⁺			
2069	(10⁺)	1166		902.75	8⁺			
2069.07	(2⁺)	95.2[g] *3*	0.5	1973.76	1⁻,2⁺			
		782.9 *3*	2.5	1286.29	2⁺			
		866.5 *3*	5.3	1202.44	0⁺			
		891.28 *4*	71	1177.812	2⁺			
		969.79 *6*	56 *4*	1099.26	0⁺			
		1057.0 *5*	1.0	1012.40	3⁻			
		1147.69 *6*	100 *6*	921.345	1⁻			
		1801.6 *5*	1.4	266.817	4⁺			
		1987.04 *10*	14 *2*	81.981	2⁺			
		2069.04 *8*	20 *2*	0.0	0⁺			
2131.82	(2⁺)	62.62[g] *6*	3.2	2069.07	(2⁺)			
		953.97 *8*	100	1177.812	2⁺			
		1032.55 *8*	69	1099.26	0⁺			
		1210.2 *3*	15	921.345	1⁻			
		1865.7 *5*	6.4	266.817	4⁺			
		2050.1 *3*	13	81.981	2⁺			
2139.82	(1,2⁺)	124.43 *4*	1.1	2015.40	(1⁻,2⁺)			
		166.06 *3*	3.6	1973.76	1⁻,2⁺	E1[a]	0.0696 *10*	α(K)=0.0591 *8*; α(L)=0.00828 *12*; α(M)=0.001770 *25* α(N)=0.000397 *6*; α(O)=5.73×10^{-5} *8*; α(P)=3.06×10^{-6} *4*

From ENSDF

$^{154}_{62}$Sm$_{92}$-14

Adopted Levels, Gammas (continued)

$\gamma(^{154}Sm)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[d]	Comments
2139.82	(1,2$^+$)	194.29 *6*	0.9	1945.61	(3$^-$)			
		384.5 *3*	0.4	1755.67	(3$^-$)			
		465.8 *3*	1.0	1673.90	2			
		524.2 *3*	0.5	1614.77				
		624.6 *4*	0.8	1515.18	2$^-$			
		664.20 *14*	3.0	1475.81	1$^-$			
		700.0 *3*	1.2	1440.04	2$^+$			
		853.1[g] *5*	0.6	1286.29	2$^+$			
		937.30 *12*	2.2	1202.44	0$^+$			
		962.00 *8*	19.1 *16*	1177.812	2$^+$			
		1040.7 *5*	0.8	1099.26	0$^+$			
		1218.57 *10*	3.7	921.345	1$^-$			
		1873.6[g] *8*	0.4	266.817	4$^+$			
		2057.76 *6*	100 *10*	81.981	2$^+$			
		2139.76 *8*	57	0.0	0$^+$			
2163	11$^-$	403[g]		1760	9$^-$			
		830		1333.0	10$^+$			
2196.2?	(1,2$^+$)	1096.9[g] *5*	100	1099.26	0$^+$			E_γ: The existence and placement of this γ are doubtful.
2232.8	(3,4$^+$)	526.0 *4*	100	1706.71	3$^+$			
		2150.5[g] *5*	14	81.981	2$^+$			
2293.85	(3,4$^+$)	307.3[g] *3*	27	1986.59	3$^-$			
		371.7[g] *3*	≤29	1922.05	2$^+$			
		415.23 *15*	100	1878.70	(2$^+$)			
		709.1 *3*	48	1584.50	3$^-$			
		853.1[g] *5*	≤60	1440.04	2$^+$			
		2026.9 *3*	57	266.817	4$^+$			
		2211.9 *3*	48	81.981	2$^+$			
2368.81	(1,2$^+$)	853.3	≤26	1515.18	2$^-$			
		1082.0 *5*	22	1286.29	2$^+$			
		1191.1 *3*	44	1177.812	2$^+$			
		1447.4[g] *3*	34	921.345	1$^-$			
		2287.0 *3*	26	81.981	2$^+$			
		2368.74 *20*	100	0.0	0$^+$			
2373.0	14$^+$	547.1		1825.9	12$^+$			
2421.4?	(1,2$^+$)	2340.8[g] *5*	100	81.981	2$^+$			
		2421.4[g] *4*	87	0.0	0$^+$			
2428.48		2346.48 *10*	100	81.981	2$^+$			
2439	(12$^+$)	1106		1333.0	10$^+$			
2443.5	1$^+$	2361.5 *5*	38 *24*	81.981	2$^+$	[M1]	1.07×10^{-3} *2*	B(M1)(W.u.)=0.014 *9*

$^{154}_{62}Sm_{92}$-15

$\gamma(^{154}Sm)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[d]	Comments
								α(K)=0.000479 *7*; α(L)=6.21×10^{-5} *9*; α(M)=1.320×10^{-5} *18* α(N)=3.00×10^{-6} *4*; α(O)=4.52×10^{-7} *6*; α(P)=2.92×10^{-8} *4*; α(IPF)=0.000517 *7*
2443.5	1^+	2443.5 *5*	100	0.0	0^+	M1[c]	1.08×10^{-3} *2*	B(M1)(W.u.)=0.033 *8* α(K)=0.000445 *6*; α(L)=5.76×10^{-5} *8*; α(M)=1.225×10^{-5} *17* α(N)=2.78×10^{-6} *4*; α(O)=4.20×10^{-7} *6*; α(P)=2.71×10^{-8} *4*; α(IPF)=0.000561 *8*
2556.56	1^-	2474.5 *3*	100	81.981	2^+	[E1]	1.12×10^{-3} *2*	B(E1)(W.u.)=0.0021 *3* α(K)=0.0001935 *27*; α(L)=2.422×10^{-5} *34*; α(M)=5.13×10^{-6} *7* α(N)=1.162×10^{-6} *16*; α(O)=1.750×10^{-7} *24*; α(P)=1.126×10^{-8} *16*; α(IPF)=0.000893 *13*
		2556.6 *3*	48 *6*	0.0	0^+	E1[c]	1.16×10^{-3} *2*	B(E1)(W.u.)=9.4×10^{-4} *10* α(K)=0.0001842 *26*; α(L)=2.303×10^{-5} *32*; α(M)=4.88×10^{-6} *7* α(N)=1.105×10^{-6} *15*; α(O)=1.664×10^{-7} *23*; α(P)=1.072×10^{-8} *15*; α(IPF)=0.000943 *13* I_γ: From (γ,γ'); other: Iγ(2556)/Iγ(2474)=0.74 from ^{154}Pm β^- decay (1.73 m).
2591.32		917.0 *5*	13	1673.90	2			
		1389.3 *3*	25	1202.44	0^+			
		1670.16 *25*	19	921.345	1^-			
		2509.27 *15*	100	81.981	2^+			
		2591.14 *20*	39	0.0	0^+			
2618.03	1^-	2536.08 *15*	100	81.981	2^+	[E1]	1.15×10^{-3} *2*	B(E1)(W.u.)=0.0017 *4* α(K)=0.0001864 *26*; α(L)=2.332×10^{-5} *33*; α(M)=4.94×10^{-6} *7* α(N)=1.118×10^{-6} *16*; α(O)=1.685×10^{-7} *24*; α(P)=1.085×10^{-8} *15*; α(IPF)=0.000931 *13*
		2617.92 *20*	67 *12*	0.0	0^+	E1[c]	1.19×10^{-3} *2*	B(E1)(W.u.)=0.0010 *1* α(K)=0.0001777 *25*; α(L)=2.221×10^{-5} *31*; α(M)=4.70×10^{-6} *7* α(N)=1.065×10^{-6} *15*; α(O)=1.605×10^{-7} *22*; α(P)=1.034×10^{-8} *14*; α(IPF)=0.000980 *14* I_γ: From (γ,γ'); other: Iγ(2617)/Iγ(2536)=0.76 from ^{154}Pm β^- decay (1.73 m).
2636	13^-	473[g]		2163	11^-			
		810		1825.9	12^+			
2721.28	$(1,2^+)$	2639.2 *4*	41	81.981	2^+			
		2721.3 *3*	100	0.0	0^+			
2743.7	1^-	2661.7 *5*	100	81.981	2^+	[E1]	1.21×10^{-3} *2*	B(E1)(W.u.)=0.0014 *2* α(K)=0.0001733 *24*; α(L)=2.166×10^{-5} *30*; α(M)=4.59×10^{-6} *6* α(N)=1.039×10^{-6} *15*; α(O)=1.565×10^{-7} *22*; α(P)=1.009×10^{-8} *14*; α(IPF)=0.001007 *14*
		2743.7 *5*	58 *8*	0.0	0^+	E1[c]	1.25×10^{-3} *2*	B(E1)(W.u.)=7.4×10^{-4} *6*

$^{154}_{62}Sm_{92}$-16

Adopted Levels, Gammas (continued)

$\gamma(^{154}Sm)$ (continued)

E$_i$(level)	J^π_i	E_γ†	I_γ‡	E_f	J^π_f	Mult.#	α d	Comments
								α(K)=0.0001656 *23*; α(L)=2.068×10^{-5} *29*; α(M)=4.38×10^{-6} *6* α(N)=9.92×10^{-7} *14*; α(O)=1.495×10^{-7} *21*; α(P)=9.64×10^{-9} *13*; α(IPF)=0.001055 *15*
2778.63	1	1022.4 *4*	33	1755.67	(3$^-$)			
		1576.7 *8*	36	1202.44	0$^+$			
		1856.3 *4*	36	921.345	1$^-$			
		2697.4 *3*	27	81.981	2$^+$			I$_\gamma$: From ^{154}Pm β$^-$ decay (1.73 m); other: ≤ 17 from (γ,γ′).
		2778.6 *3*	100	0.0	0$^+$	D		
2793?	(14$^+$)	967g		1825.9	12$^+$			
2825.3	1$^-$	2743.3 *5*	100	81.981	2$^+$	[E1]	1.25×10^{-3} *2*	B(E1)(W.u.)=7.1×10^{-4} *16* α(K)=0.0001656 *23*; α(L)=2.069×10^{-5} *29*; α(M)=4.38×10^{-6} *6* α(N)=9.92×10^{-7} *14*; α(O)=1.495×10^{-7} *21*; α(P)=9.64×10^{-9} *13*; α(IPF)=0.001055 *15*
		2825.3 *5*	53 *14*	0.0	0$^+$	E1c	1.28×10^{-3} *2*	B(E1)(W.u.)=3.5×10^{-4} *8* α(K)=0.0001585 *22*; α(L)=1.979×10^{-5} *28*; α(M)=4.19×10^{-6} *6* α(N)=9.49×10^{-7} *13*; α(O)=1.430×10^{-7} *20*; α(P)=9.23×10^{-9} *13*; α(IPF)=0.001099 *15*
2842.8	1$^-$	2761.1 *5*	100	81.981	2$^+$	[E1]	1.25×10^{-3} *2*	B(E1)(W.u.)=8.5×10^{-4} *16* α(K)=0.0001640 *23*; α(L)=2.049×10^{-5} *29*; α(M)=4.34×10^{-6} *6* α(N)=9.82×10^{-7} *14*; α(O)=1.480×10^{-7} *21*; α(P)=9.55×10^{-9} *13*; α(IPF)=0.001065 *15*
		2842.6 *4*	71 *10*	0.0	0$^+$	E1c	1.29×10^{-3} *2*	B(E1)(W.u.)=5.6×10^{-4} *7* α(K)=0.0001571 *22*; α(L)=1.961×10^{-5} *27*; α(M)=4.15×10^{-6} *6* α(N)=9.40×10^{-7} *13*; α(O)=1.417×10^{-7} *20*; α(P)=9.14×10^{-9} *13*; α(IPF)=0.001108 *16* I$_\gamma$: From (γ,γ′); other: Iγ(2761)/Iγ(2842)=0.87 from ^{154}Pm β$^-$ decay (1.73 m).
2882.0	1$^-$	2800.0 *5*	100	81.981	2$^+$	[E1]	1.27×10^{-3} *2*	B(E1)(W.u.)=3.4×10^{-4} *16* α(K)=0.0001607 *22*; α(L)=2.006×10^{-5} *28*; α(M)=4.25×10^{-6} *6* α(N)=9.62×10^{-7} *13*; α(O)=1.449×10^{-7} *20*; α(P)=9.35×10^{-9} *13*; α(IPF)=0.001086 *15*
		2882.0 *5*	79 *26*	0.0	0$^+$	E1c	1.31×10^{-3} *2*	B(E1)(W.u.)=2.5×10^{-4} *8* α(K)=0.0001539 *22*; α(L)=1.921×10^{-5} *27*; α(M)=4.07×10^{-6} *6* α(N)=9.21×10^{-7} *13*; α(O)=1.388×10^{-7} *19*; α(P)=8.96×10^{-9} *13*; α(IPF)=0.001127 *16*
2907.3	1$^+$	2825.3 *5*	52 *13*	81.981	2$^+$	[M1]	1.14×10^{-3} *2*	B(M1)(W.u.)=0.019 *6* α(K)=0.000326 *5*; α(L)=4.21×10^{-5} *6*; α(M)=8.95×10^{-6} *13* α(N)=2.030×10^{-6} *28*; α(O)=3.06×10^{-7} *4*; α(P)=1.982×10^{-8} *28*; α(IPF)=0.000760 *11*

$\gamma(^{154}Sm)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[d]	Comments
2907.3	1^+	2907.3 *5*	100	0.0	0^+	M1[c]	1.16×10^{-3} *2*	B(M1)(W.u.)=0.033 *7* α(K)=0.000307 *4*; α(L)=3.96×10^{-5} *6*; α(M)=8.42×10^{-6} *12* α(N)=1.909×10^{-6} *27*; α(O)=2.88×10^{-7} *4*; α(P)=1.865×10^{-8} *26*; α(IPF)=0.000801 *11*
2968.2	16^+	595.2		2373.0	14^+			
3051.23		919.23 *20*	100	2131.82	(2^+)			
		1576.7 *8*	41	1475.81	1^-			
		1764.9 *4*	55	1286.29	2^+			
		1873.6 *8*	24	1177.812	2^+			
		2130.4 *3*	72	921.345	1^-			
		2968.9 *4*	45	81.981	2^+			
3091.5	1^+	3009.5 *5*	49 *5*	81.981	2^+	[M1]	1.18×10^{-3} *2*	B(M1)(W.u.)=0.045 *6* α(K)=0.000286 *4*; α(L)=3.68×10^{-5} *5*; α(M)=7.82×10^{-6} *11* α(N)=1.774×10^{-6} *25*; α(O)=2.68×10^{-7} *4*; α(P)=1.733×10^{-8} *24*; α(IPF)=0.000852 *12*
		3091.5 *5*	100	0.0	0^+	M1[c]	1.21×10^{-3} *2*	B(M1)(W.u.)=0.084 *8* α(K)=0.000270 *4*; α(L)=3.47×10^{-5} *5*; α(M)=7.39×10^{-6} *10* α(N)=1.676×10^{-6} *23*; α(O)=2.530×10^{-7} *35*; α(P)=1.638×10^{-8} *23*; α(IPF)=0.000891 *12*
3117.0	1^+	3035.0 *5*	53 *6*	81.981	2^+	[M1]	1.19×10^{-3} *2*	B(M1)(W.u.)=0.033 *5* α(K)=0.000281 *4*; α(L)=3.61×10^{-5} *5*; α(M)=7.68×10^{-6} *11* α(N)=1.742×10^{-6} *24*; α(O)=2.63×10^{-7} *4*; α(P)=1.702×10^{-8} *24*; α(IPF)=0.000864 *12*
		3117.0 *5*	100	0.0	0^+	M1[c]	1.21×10^{-3} *2*	B(M1)(W.u.)=0.058 *7* α(K)=0.000265 *4*; α(L)=3.42×10^{-5} *5*; α(M)=7.26×10^{-6} *10* α(N)=1.647×10^{-6} *23*; α(O)=2.487×10^{-7} *35*; α(P)=1.610×10^{-8} *23*; α(IPF)=0.000904 *13*
3193.42	1^+	2015.5[e] *4*	71[e]	1177.812	2^+			
		3111.2 *5*	57	81.981	2^+	[M1]	1.21×10^{-3} *2*	B(M1)(W.u.)=0.092 *9* α(K)=0.000266 *4*; α(L)=3.43×10^{-5} *5*; α(M)=7.29×10^{-6} *10* α(N)=1.653×10^{-6} *23*; α(O)=2.497×10^{-7} *35*; α(P)=1.616×10^{-8} *23*; α(IPF)=0.000901 *13* E_γ: Simple average of 3111.4 *5* (γ,γ') and 3110.9 *5* (^{154}Pm β^- decay (1.73 m)).
		3193.4 *5*	100 *8*	0.0	0^+	M1[c]	1.23×10^{-3} *2*	B(M1)(W.u.)=0.150 *11* α(K)=0.0002524 *35*; α(L)=3.25×10^{-5} *5*; α(M)=6.90×10^{-6} *10* α(N)=1.565×10^{-6} *22*; α(O)=2.363×10^{-7} *33*; α(P)=1.530×10^{-8} *21*;

$^{154}_{62}Sm_{92}$-18

γ(^{154}Sm) (continued)

E_i(level)	J^π_i	E_γ†	I_γ‡	E_f	J^π_f	Mult.#	α[d]	Comments
								α(IPF)=0.000941 *13* E_γ: From (γ,γ'); γ not reported in ^{154}Pm β^- decay (1.73 m). I_γ: Computed from Iγ(3111) and Iγ(3111)/Iγ(3193)=0.57 *4* (from (γ,γ')).
3339.5	1	(3257.5 *5*)	≤21	81.981	2^+			
		3339.5 *5*	100	0.0	0^+	D[c]		
3365.9	1	(3283.9 *5*)	≤21	81.981	2^+			
		3365.9 *5*	100	0.0	0^+	D[c]		
3371.1	1^+	3289.1 *5*	67 *20*	81.981	2^+	[M1]	1.26×10^{-3} *2*	B(M1)(W.u.)=0.019 *7* α(K)=0.0002375 *33*; α(L)=3.05×10^{-5} *4*; α(M)=6.49×10^{-6} *9* α(N)=1.471×10^{-6} *21*; α(O)=2.221×10^{-7} *31*; α(P)=1.439×10^{-8} *20*; α(IPF)=0.000988 *14*
		3371.1 *5*	100	0.0	0^+	M1[c]	1.29×10^{-3} *2*	B(M1)(W.u.)=0.027 *7* α(K)=0.0002258 *32*; α(L)=2.90×10^{-5} *4*; α(M)=6.16×10^{-6} *9* α(N)=1.397×10^{-6} *20*; α(O)=2.110×10^{-7} *30*; α(P)=1.367×10^{-8} *19*; α(IPF)=0.001027 *14*
3426.4	1	(3344.4 *5*)	≤21	81.981	2^+			
		3426.4 *5*	100	0.0	0^+	D[c]		
3492.4	1^+	3410.4 *5*	42 *20*	81.981	2^+	[M1]	1.30×10^{-3} *2*	B(M1)(W.u.)=0.008 *5* α(K)=0.0002205 *31*; α(L)=2.83×10^{-5} *4*; α(M)=6.01×10^{-6} *8* α(N)=1.364×10^{-6} *19*; α(O)=2.060×10^{-7} *29*; α(P)=1.334×10^{-8} *19*; α(IPF)=0.001044 *15*
		3492.4 *5*	100	0.0	0^+	M1[c]	1.32×10^{-3} *2*	B(M1)(W.u.)=0.018 *7* α(K)=0.0002100 *29*; α(L)=2.69×10^{-5} *4*; α(M)=5.72×10^{-6} *8* α(N)=1.299×10^{-6} *18*; α(O)=1.961×10^{-7} *27*; α(P)=1.271×10^{-8} *18*; α(IPF)=0.001077 *15*
3609.3	18^+	641.1		2968.2	16^+			
3621.7	1^+	3539.7 *5*	49 *14*	81.981	2^+	[M1]	1.33×10^{-3} *2*	B(M1)(W.u.)=0.019 *8* α(K)=0.0002044 *29*; α(L)=2.62×10^{-5} *4*; α(M)=5.57×10^{-6} *8* α(N)=1.263×10^{-6} *18*; α(O)=1.907×10^{-7} *27*; α(P)=1.236×10^{-8} *17*; α(IPF)=0.001096 *15*
		3621.7 *5*	100	0.0	0^+	M1[c]	1.36×10^{-3} *2*	B(M1)(W.u.)=0.036 *11* α(K)=0.0001951 *27*; α(L)=2.500×10^{-5} *35*; α(M)=5.31×10^{-6} *7* α(N)=1.205×10^{-6} *17*; α(O)=1.819×10^{-7} *25*; α(P)=1.179×10^{-8} *17*; α(IPF)=0.001129 *16*
3745.8	1	(3663.8 *5*)	≤17	81.981	2^+			
		3745.8 *5*	100	0.0	0^+	D[c]		
3759.8	1	(3677.8 *5*)	≤28	81.981	2^+			
		3759.8 *5*	100	0.0	0^+	D[c]		
3801.3	1	3719.3 *5*	93 *23*	81.981	2^+			

$^{154}_{62}$Sm$_{92}$-19

Adopted Levels, Gammas (continued)

$\gamma(^{154}Sm)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ‡	E_f	J^π_f	Mult.#	α[d]	Comments
3801.3	1	3801.3 4	100	0.0	0^+	D[c]		
3826.7	1^-	3744.7 5	100	81.981	2^+	[E1]	1.66×10^{-3} 2	B(E1)(W.u.)=0.0012 3 α(K)=0.0001054 15; α(L)=1.310×10^{-5} 18; α(M)=2.77×10^{-6} 4 α(N)=6.28×10^{-7} 9; α(O)=9.47×10^{-8} 13; α(P)=6.13×10^{-9} 9; α(IPF)=0.001543 22
		3826.7 5	41 6	0.0	0^+	E1[c]	1.70×10^{-3} 2	B(E1)(W.u.)=4.5×10^{-4} 9 α(K)=0.0001023 14; α(L)=1.270×10^{-5} 18; α(M)=2.69×10^{-6} 4 α(N)=6.09×10^{-7} 9; α(O)=9.18×10^{-8} 13; α(P)=5.95×10^{-9} 8; α(IPF)=0.001578 22
3836.7	1	3754.7 5	85 30	81.981	2^+			
		3836.7 5	100	0.0	0^+	D[c]		
3844.0	1	3762.0 5	112 40	81.981	2^+			
		3844.0 5	100	0.0	0^+	D[c]		
4020		3940		81.981	2^+			
		4020		0.0	0^+			
4240		4160		81.981	2^+			
		4240		0.0	0^+			
4295.7	20^+	686.4		3609.3	18^+			
4300		4220		81.981	2^+			
		4300		0.0	0^+			
5027.9	22^+	732.2		4295.7	20^+			
6465.2	1^-	3979[g] 2	10 2	2486?				
		4479 3	0.3	1986.59	3^-			
		4543 3	10 2	1922.05	2^+			
		4709 3	4 3	1755.67	(3^-)			
		5025 3	5 3	1440.04	2^+	[E1]	2.09×10^{-3} 3	B(E1)(W.u.)=8×10^{-6} +9−4 α(K)=7.03×10^{-5} 10; α(L)=8.70×10^{-6} 12; α(M)=1.840×10^{-6} 26 α(N)=4.17×10^{-7} 6; α(O)=6.29×10^{-8} 9; α(P)=4.08×10^{-9} 6; α(IPF)=0.002005 28
		5263 3	7 1	1202.44	0^+	E1[b]	2.15×10^{-3} 3	B(E1)(W.u.)=1.0×10^{-5} +8−4 α(K)=6.61×10^{-5} 9; α(L)=8.17×10^{-6} 11; α(M)=1.728×10^{-6} 24 α(N)=3.92×10^{-7} 5; α(O)=5.91×10^{-8} 8; α(P)=3.84×10^{-9} 5; α(IPF)=0.002077 29
		5287 3	8 2	1177.812	2^+	E1[b]	2.16×10^{-3} 3	α(K)=6.57×10^{-5} 9; α(L)=8.12×10^{-6} 11; α(M)=1.718×10^{-6} 24 α(N)=3.89×10^{-7} 5; α(O)=5.87×10^{-8} 8; α(P)=3.81×10^{-9} 5; α(IPF)=0.002084 29 B(E1)(W.u.)=1.1×10^{-5} +10−5
		5366 3	45 1	1099.26	0^+	E1[b]	2.18×10^{-3} 3	B(E1)(W.u.)=6.0×10^{-5} +49−20 α(K)=6.44×10^{-5} 9; α(L)=7.96×10^{-6} 11; α(M)=1.684×10^{-6} 24 α(N)=3.82×10^{-7} 5; α(O)=5.76×10^{-8} 8; α(P)=3.74×10^{-9} 5; α(IPF)=0.002108 30
		5544 3	8 2	921.345	1^-			α(K)=6.17×10^{-5} 9; α(L)=7.62×10^{-6} 11; α(M)=1.612×10^{-6} 23

$^{154}_{62}Sm_{92}$-20

Adopted Levels, Gammas (continued)

γ(^{154}Sm) (continued)

E_i(level)	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	δ	Comments
							α(N)=3.65×10^{-7} *5*; α(O)=5.51×10^{-8} *8*; α(P)=3.58×10^{-9} *5*; α(IPF)=0.002161 *30* BE1W=1.0E−5 +9−4. Mult.: E1 multipolarity is not consistent with J^π's of 1$^-$ to 1$^-$.
6465.2	6383 *3*	67 *1*	81.981	2$^+$	E1+M2[b]	0.081 *18*	B(E1)(W.u.)=5.3×10^{-5} *+43−18*; B(M2)(W.u.)=0.039 *+43−19* δ: From γ(θ) in (γ,γ′), mult=D+Q. Since a parity change is involved in the transition, mult is not M1+E2.
	6465 *3*	100	0.0	0$^+$	E1		B(E1)(W.u.)=8×10^{-5} *+6−3* Mult.: From γ(θ) and linear polarization in (γ,γ′).

[†] Values are from the measurement giving the most precise value. This is often the ^{154}Sm(n,n′γ) reaction or one of the ^{154}Pm β$^-$ decays.

[‡] Unless mentioned otherwise, from ^{154}Pm β$^-$ decays (1971Da28, 1974Ya07, 1993GrZY) and (n,n′γ) (1986Be52).

[#] From ce data following Coulomb excitation (1970Da28) and (n,n′γ), unless noted otherwise.

[@] α(E0+M1+E2) = α(E0)+α(M1)+α(E2) with α(E0) = α_K(E2) × q_K^2 / (Ω_K(E0)/Ω(E0)) and α(M1), α(E2) and the ratio of electronic factors Ω_K(E0)/Ω(E0) calculated by the code BrIcc.

[&] From α_K(exp) in ^{154}Pm β$^-$ decay (2.68 m).

[a] From α_K(exp) in ^{154}Pm β$^-$ decay (1.73 m).

[b] From γ(θ) in (γ,γ′) (1977Be05) together with the observation that the transition involves a change of parity.

[c] From γ(θ) and γ-branching considerations in (γ,γ′) (1993Zi05).

[d] Additional information 4.

[e] Multiply placed with undivided intensity.

[f] Multiply placed with intensity suitably divided.

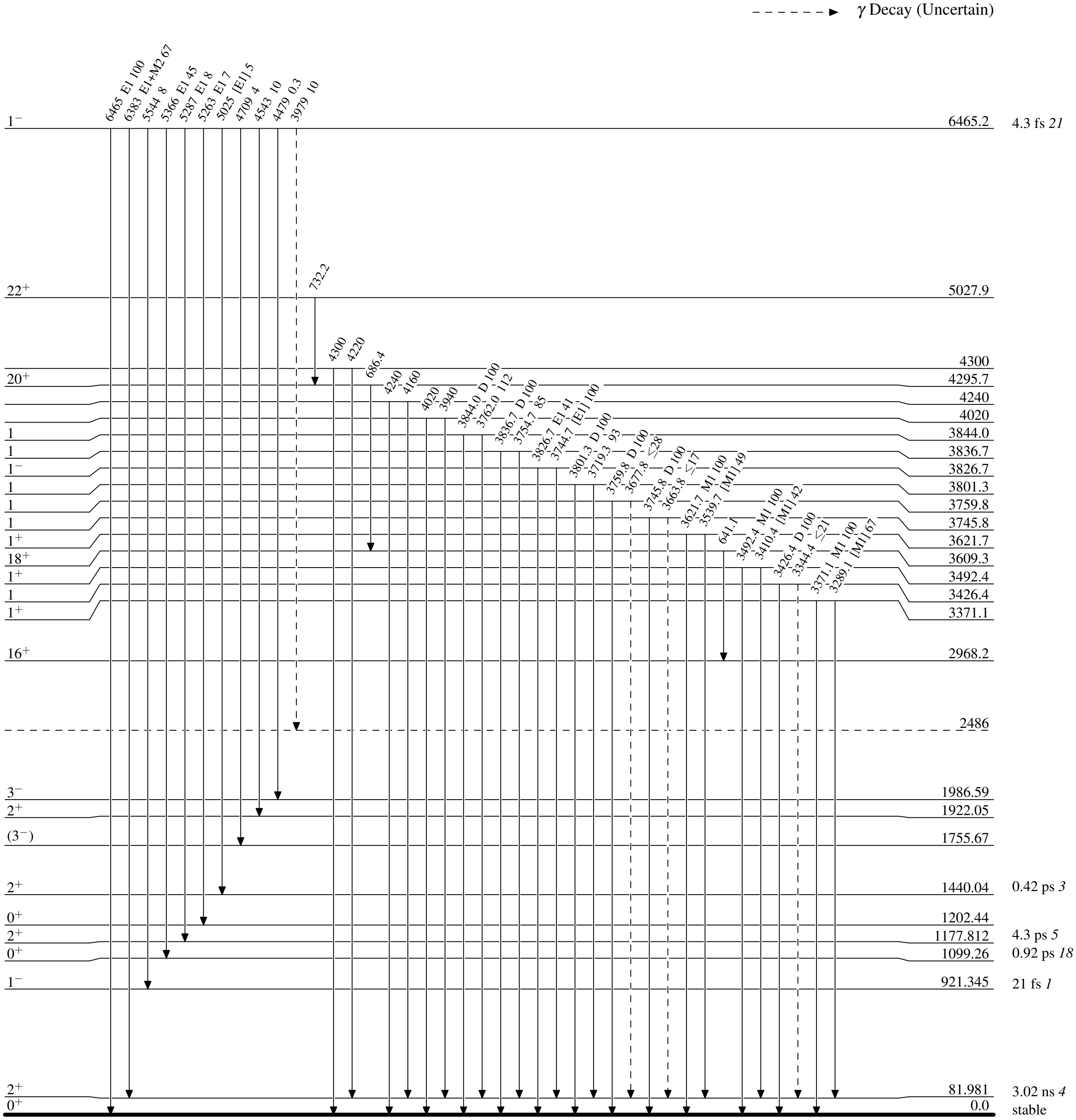
[g] Placement of transition in the level scheme is uncertain.

$^{154}_{62}$Sm$_{92}$-21

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{154}_{62}Sm_{92}$

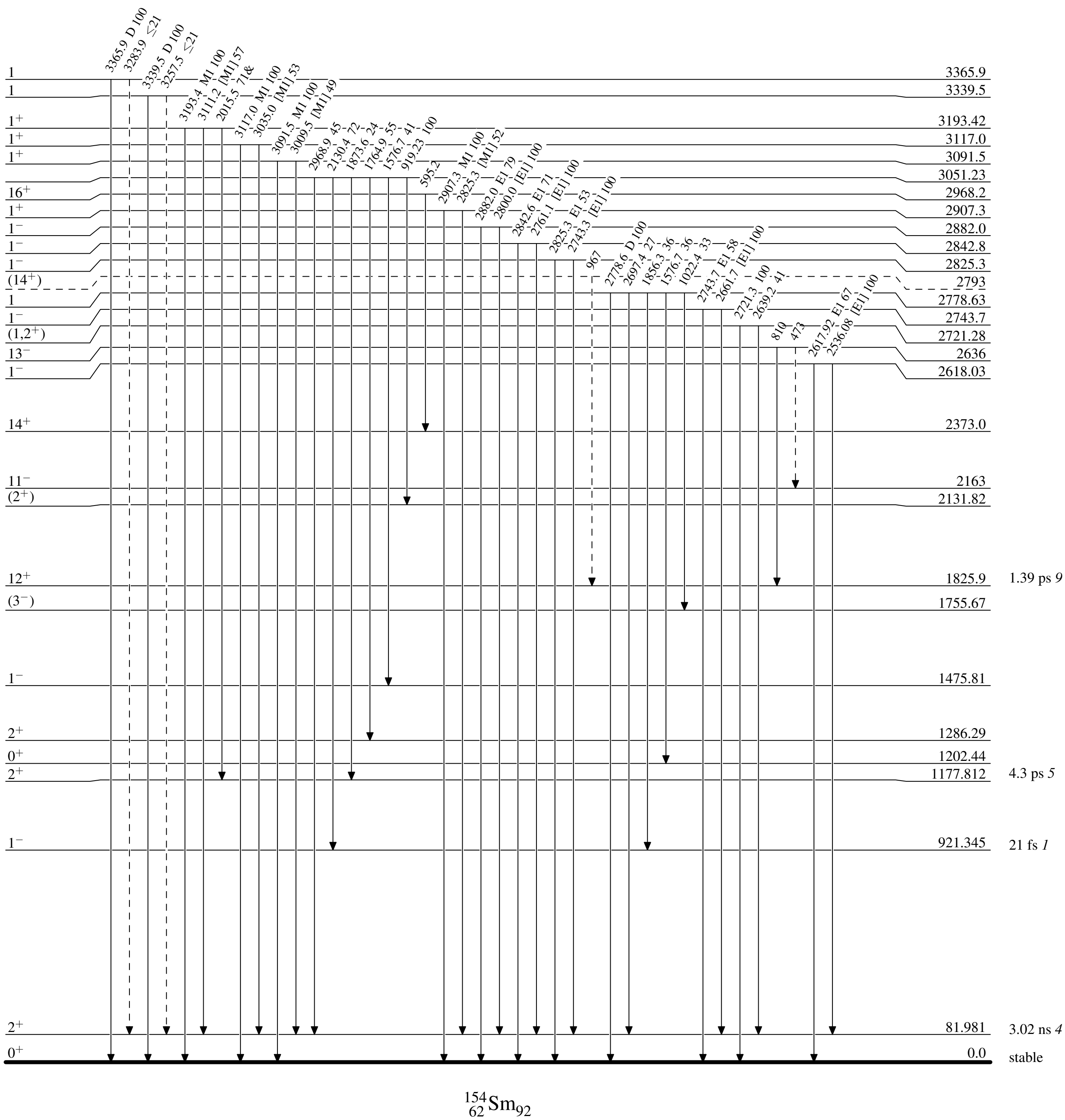
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)

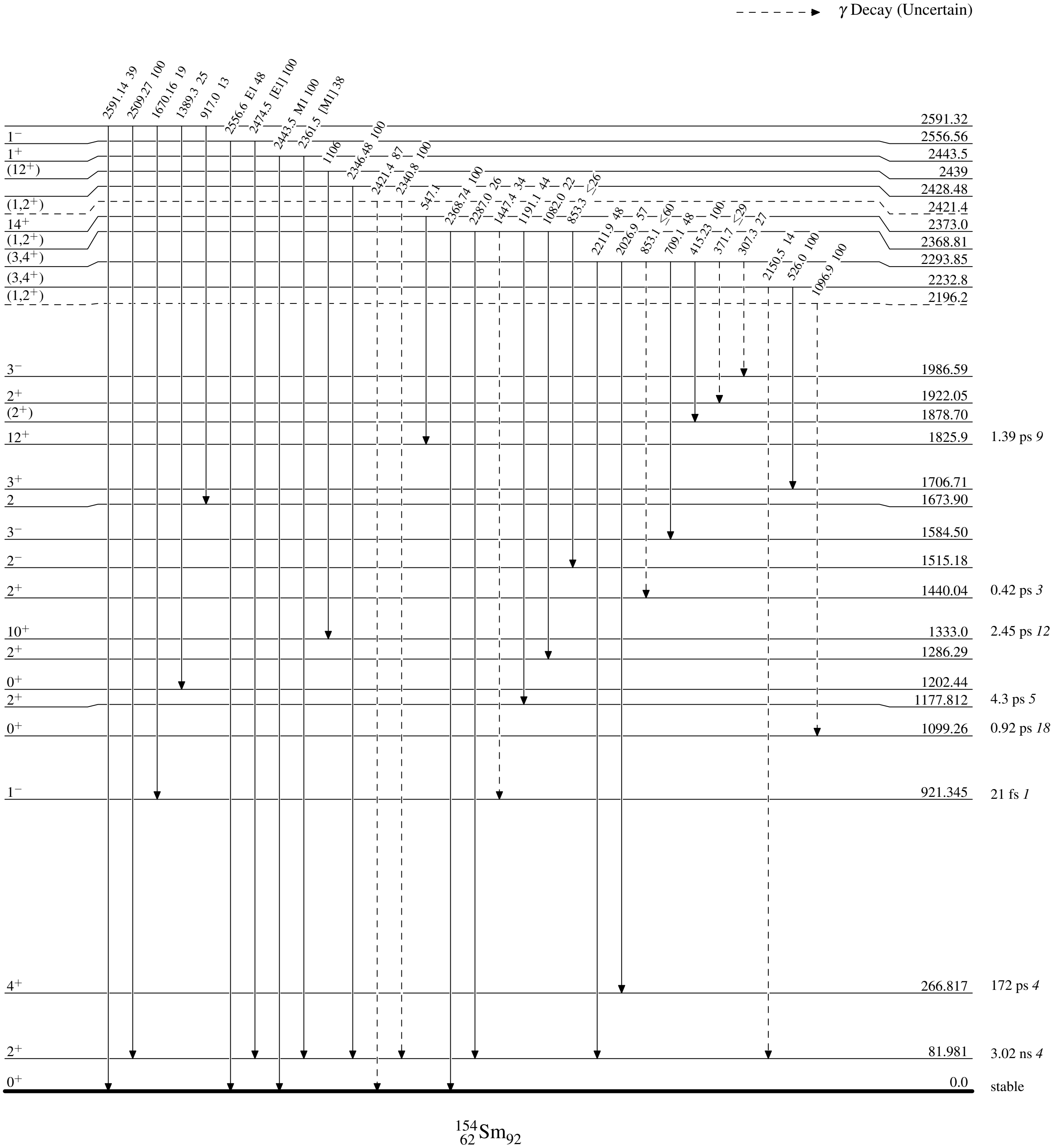


Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



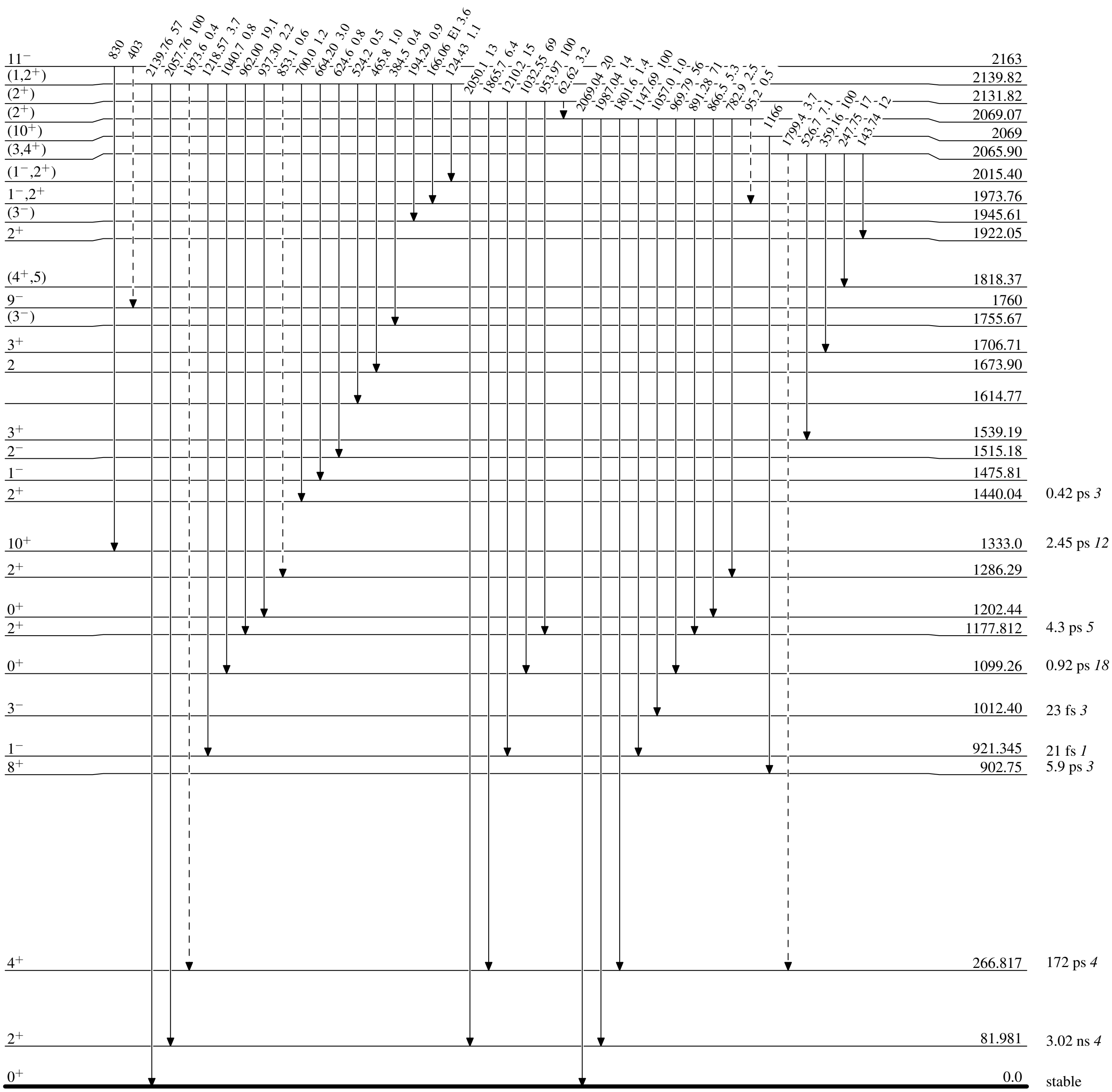
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

- - - - - -▶ γ Decay (Uncertain)



$^{154}_{62}Sm_{92}$

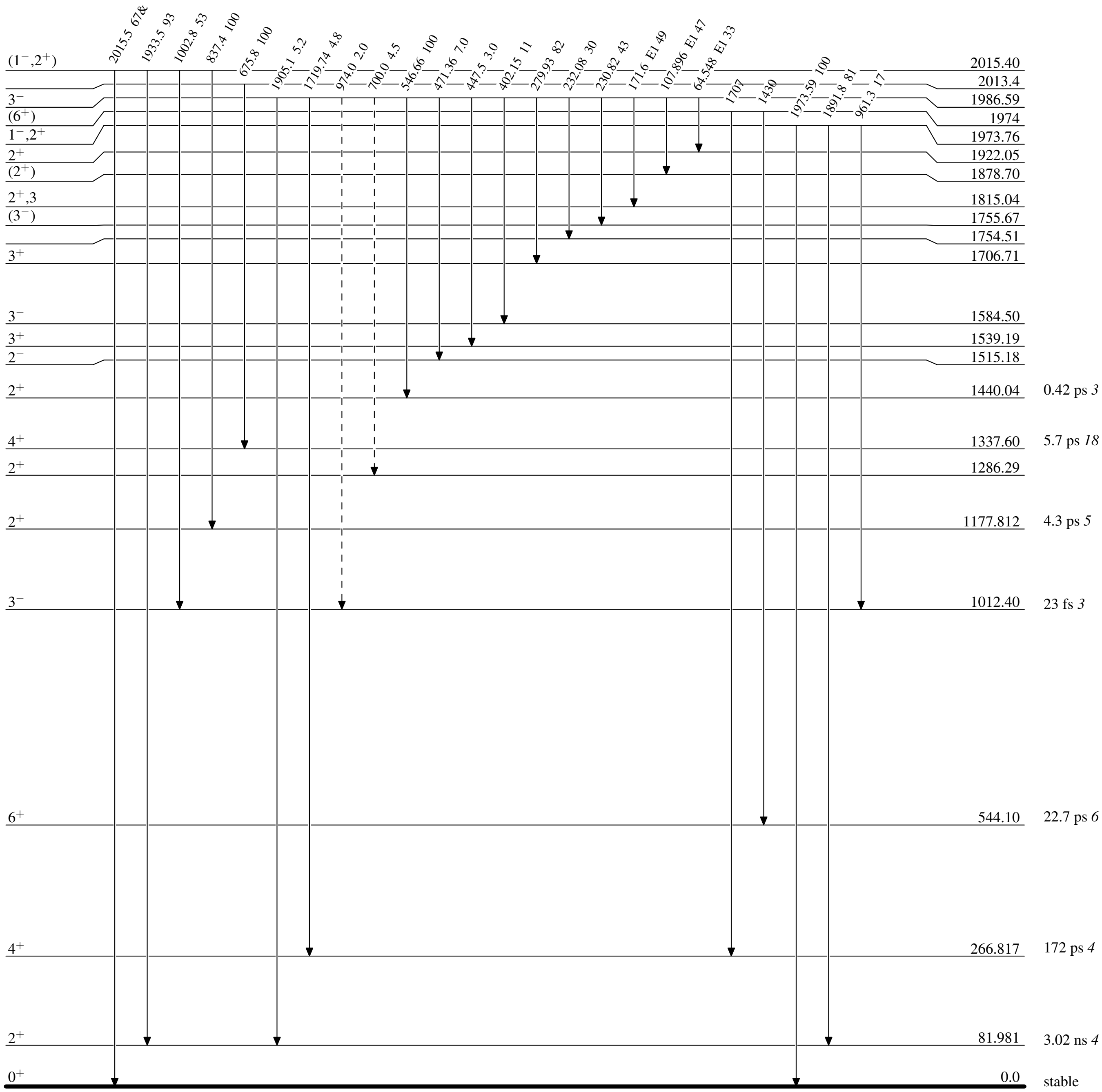
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)

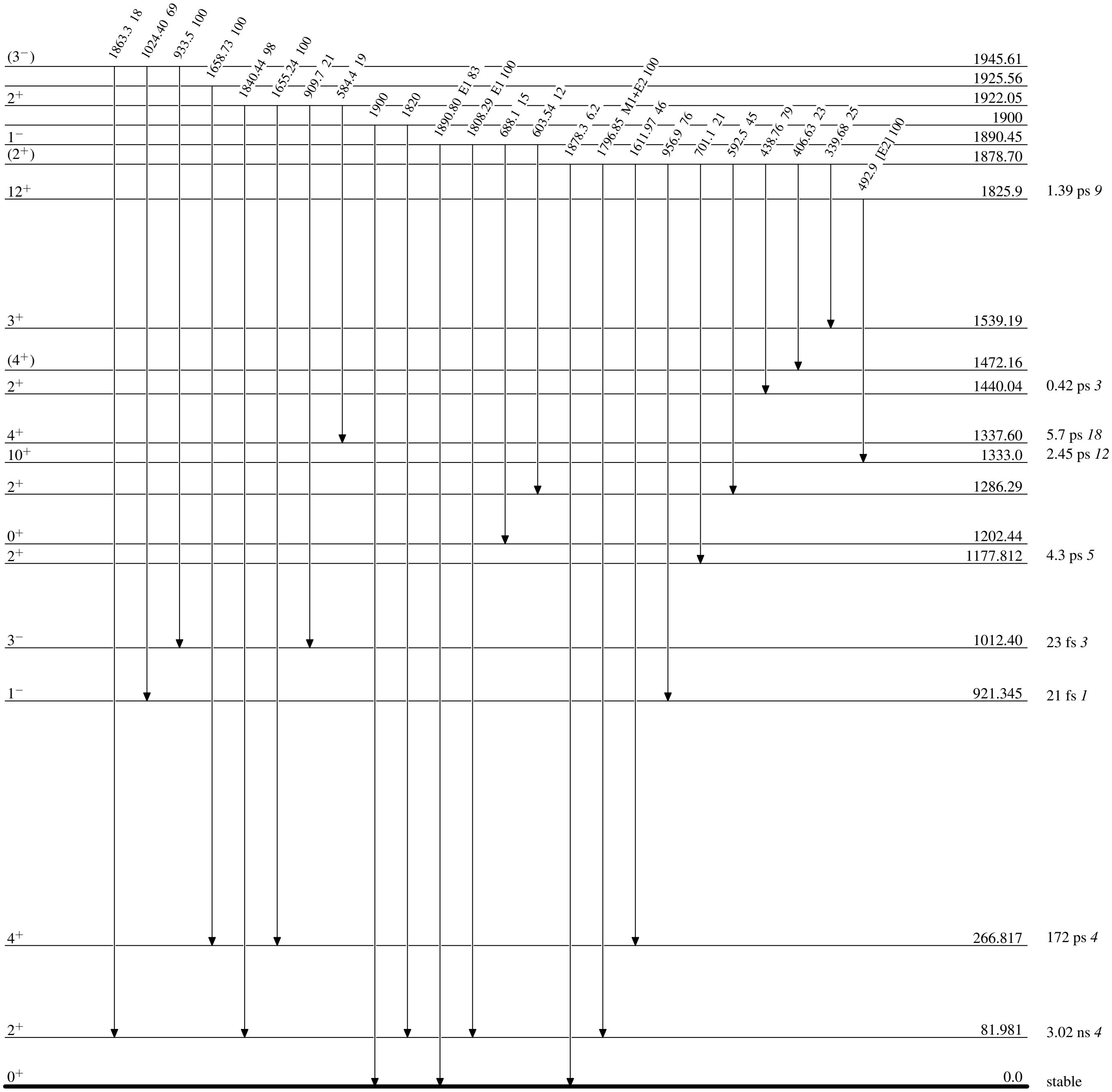


$^{154}_{62}Sm_{92}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

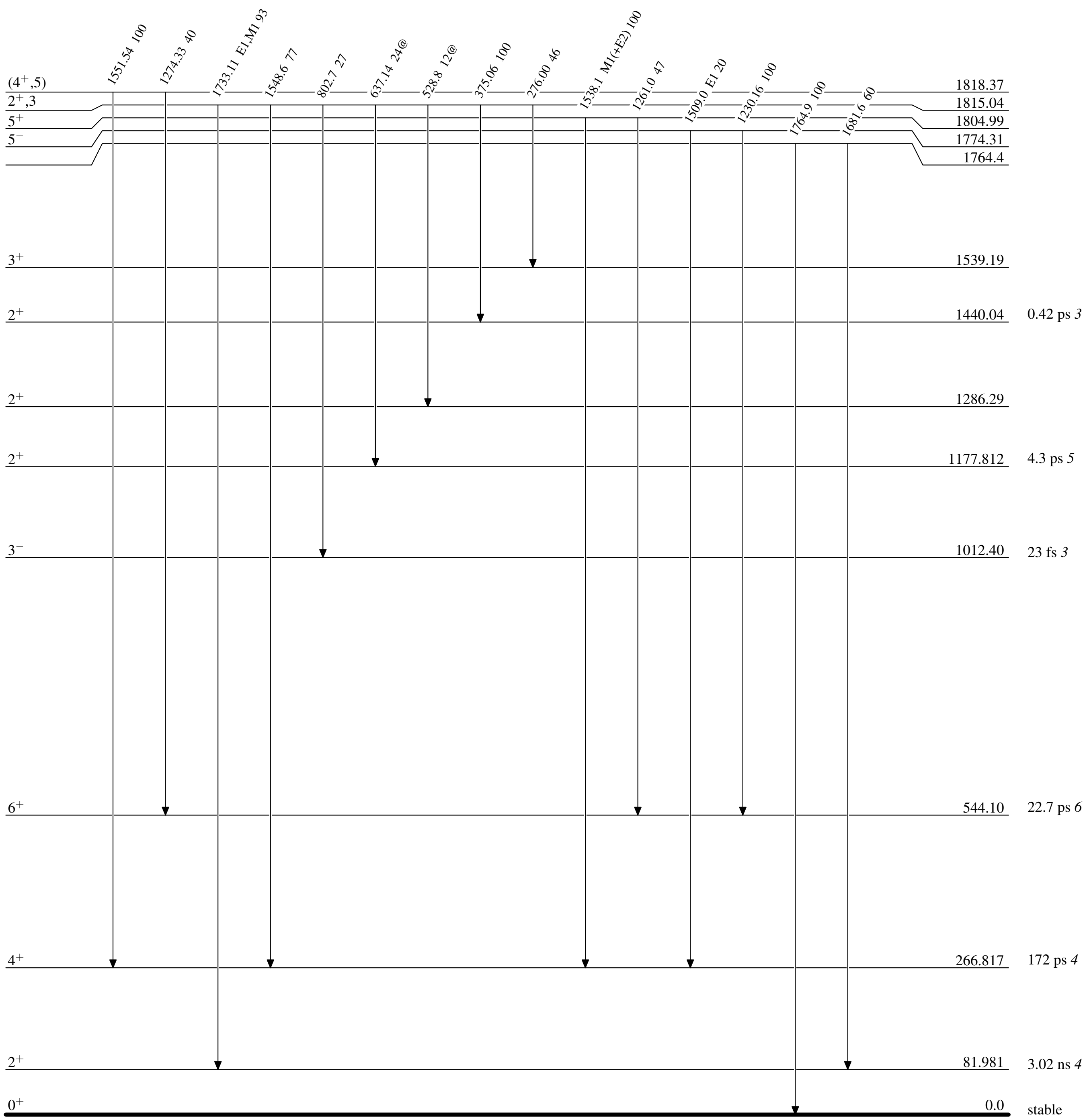


$^{154}_{62}Sm_{92}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

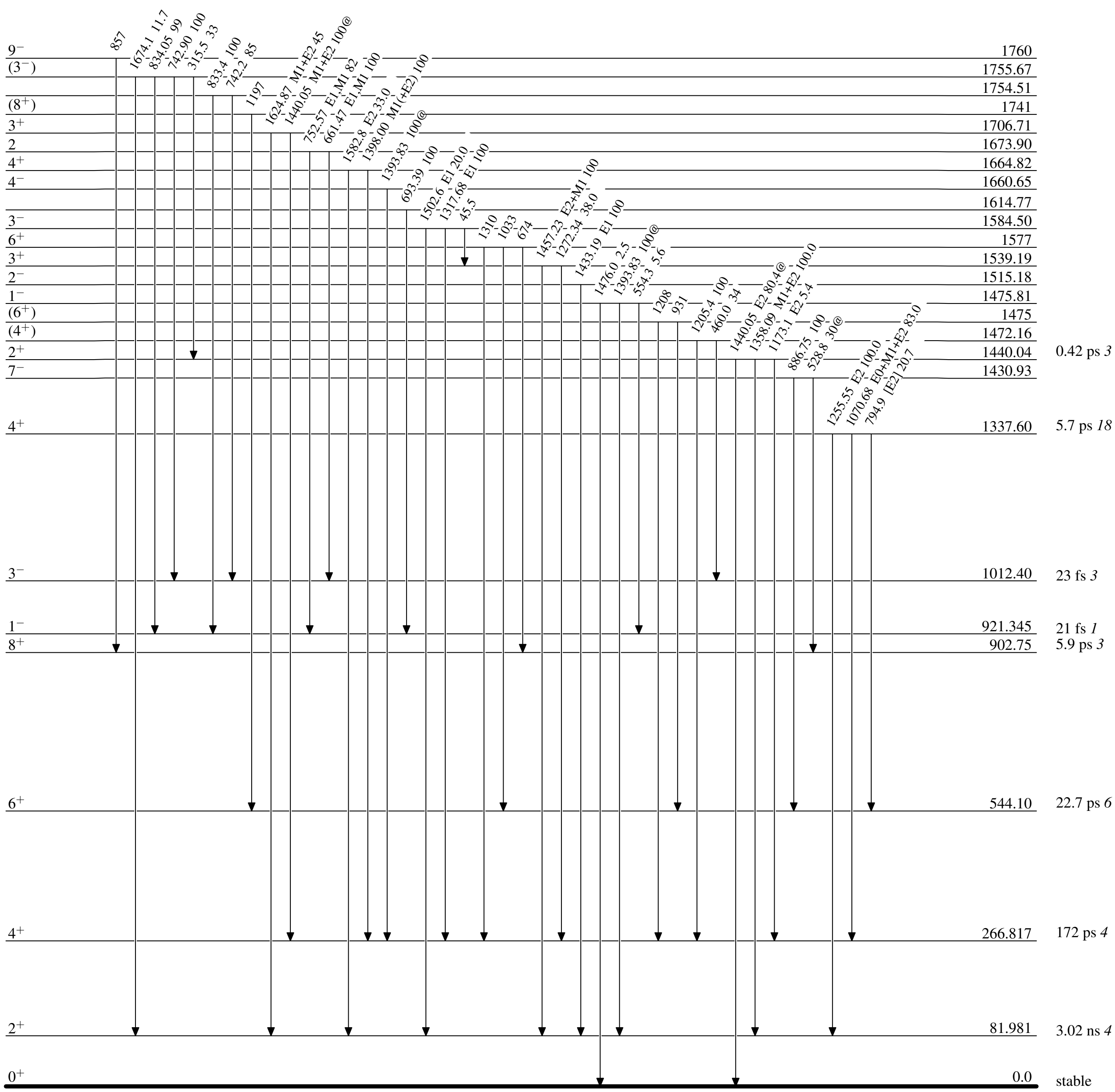


$^{154}_{62}Sm_{92}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

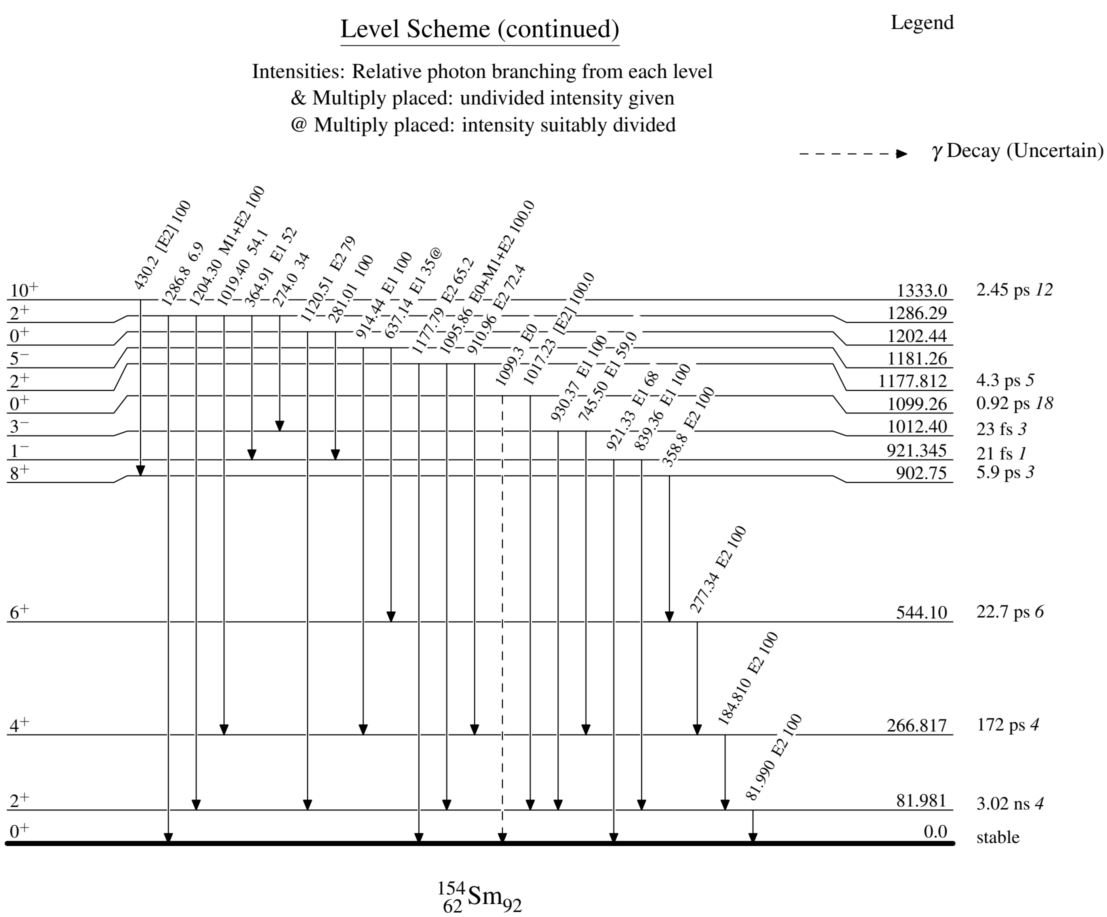


$^{154}_{62}Sm_{92}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



Adopted Levels, Gammas