Adopted Levels, Gammas

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

Q(β^-)=−1874.3 *7*; S(n)=8257.6 *6*; S(p)=8666 *5*; Q(α)=220.5 *19* 2017Wa10
S(2n)=13854.1 *6*; S(2p)=15660.8 *5* 2017Wa10
Additional information 1.

^{152}Sm Levels

Charge distribution: 2004An14 and references therein.
Isomer shift:1979Po04, 1978Ya11, 1974Ba77, 1968Ga26, 1968Be24, 1967St12, 1967Ye01.
Isotope shift: 1979Po04, 1978Ya11, 1970Hi03.
The band assignments are from Coulomb excitation except for the $K^\pi=7^-$ band which is from (α,2nγ).

Cross Reference (XREF) Flags

A	^{152}Pm β^- decay (4.12 min)	J	^{152}Sm(n,n′γ)	S	^{155}Gd(n,α)
B	^{152}Pm β^- decay (7.52 min)	K	Coulomb excitation	T	^{154}Sm(^{12}C,^{14}C)
C	^{152}Pm β^- decay (13.8 min)	L	^{152}Sm(x,x′)	U	^{152}Sm(γ,γ'):Mossbauer
D	^{152}Eu ε decay (13.517 y)	M	^{153}Eu(t,α)	V	^{154}Sm(α,^{6}He)
E	^{152}Eu ε decay (9.3116 h)	N	^{154}Sm(p,t)	W	^{154}Sm(^{208}Pb,Xγ),(^{176}Yb,Xγ)
F	^{150}Nd(α,2nγ)	O	Muonic atom	X	^{152}Sm(α,α'):giant resonances
G	^{151}Sm(n,γ) E=thermal	P	^{252}Cf SF decay	Y	^{151}Sm(n,γ) E=resonance
H	^{151}Sm(d,p)	Q	^{150}Sm(t,p)		
I	^{152}Sm(γ,γ')	R	^{150}Sm(t,pγ)		

E(level)†	J^π	$T_{1/2}$‡	XREF	Comments
0.0[e]	0^+	stable	ABCDEFGHIJKL NOPQR T VW	$<r^2>^{1/2}$=5.084 fm 6 (2004Zn14).
121.7818[e] *3*	2^+	1.403 ns *11*	ABCDEFGHIJKLMNOPQRSTUVW	μ=+0.82 *4* (1967At04,1992De29,2005St24) Q=−1.683 *18* (1978Ya11,1979Po04,2005St24) Additional information 2. μ: From g=+0.411 *19*, a weighted average of 0.419 *25* (muonic atom, 1967At04) and 0.40 *3* (13-y Eu ε decay, 1992De29). Q: Weighted average of −1.702 *17* (1978Ya11) and −1.666 *16* (1979Po04). J^π: E2 γ to 0^+. $T_{1/2}$: Weighted average of $T_{1/2}$=1.396 ns *8* from 13-y ε decay and 1.420 ns *12* from B(E2)=3.451 *8* with α=1.155 *17*. The B(E2) value is a weighted average of values from Coulomb excitation and muonic atom. Other: 1.47 ns *4* from 4.12-min Pm β^- decay. Isotope shift: 1995Be19, 1994Ji08.
366.4793[e] *9*	4^+	57.7 ps *6*	ABCDEFGH JKLMN QRS W	μ=+1.68 *20* (1987By02,2005St24); Q=−2.6 *14* Additional information 3. μ: Other: +1.22 *15* (1972Ku10). J^π: E2 γ to 2^+ level; $\sigma(\theta)$, analyzing power (inelastic scattering). $T_{1/2}$: From Coulomb excitation. Other: 60 ps *5* from 13-y Eu ε decay. Q: From Coulomb excitation.
684.751[f] *21*	0^+	6.10 ps *14*	A DEF H JKL N QR	J^π: E0 transition to 0^+. $T_{1/2}$: From Coulomb excitation.

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Adopted Levels, Gammas (continued)

^{152}Sm Levels (continued)

E(level)[†]	J^π	$T_{1/2}$[‡]	XREF	Comments
706.928[e] *17*	6^+	10.29 ps *16*	BCD F H JKLMN W	μ=+2.3 *3* (1987By02,2005St24) J^π: $\sigma(\theta)$, analyzing power (inelastic scattering); E2 γ to 4^+ level. $T_{1/2}$: From Coulomb excitation.
810.453[f] *5*	2^+	7.4 ps *4*	AB DEFGH JKLMN Q	μ=+0.76 *19* (1987By02,2005St24) Additional information 4. J^π: E0 component in transition to 2^+. $T_{1/2}$: From Coulomb excitation. Other: 7 ps *5* from 13-y Eu ε decay.
963.358[g] *5*	1^-	20.5 fs *16*	A DEFG IJKL R	Additional information 5. J^π: E1 γ to 0^+. $T_{1/2}$: Weighted average of 28.2 fs *24* from (γ,γ'), 20 fs *3* from (n,n$'\gamma$), and 19.9 fs *7* from 13-y Eu ε decay. The (γ,γ') value comes from $\Gamma_{\gamma 0}$=0.0073 *6* eV with $\Gamma_{\gamma 0}/\Gamma$=0.451 *6*.
1022.970[f] *5*	4^+	8.3 ps *13*	B D F H JKLMN	Additional information 6. J^π: E0 component in transition to 4^+. $T_{1/2}$: From Coulomb excitation.
1041.122[g] *4*	3^-	27 fs *5*	AB DEFGH JKL N	Additional information 7. J^π: E1 γ's to 2^+ and 4^+. $T_{1/2}$: Others: 33 fs *+8−6* from (n,γ), <5 ps from 13-y Eu ε decay, <16 ps from 4.1-min Pm β^- decay.
1082.842[h] *18*	0^+	15 ps *6*	A DE JK QR	J^π: L(t,p)=0. $\gamma\gamma(\theta)$ in 9.3-hr ε decay is consistent only with J=0. $T_{1/2}$: From 4.1-min Pm β^- decay.
1085.841[i] *5*	2^+	1.09 ps *14*	AB DEFGH JKL N	μ=+0.82 *20* (1987By02,2005St24) Additional information 8. J^π: E2 γ to 0^+. $T_{1/2}$: From Coulomb excitation. Other: <4 ps from 13-y Eu ε decay.
1125.39[e] *3*	8^+	3.06 ps *4*	F JKL W	μ=+2.8 *5* (1987By02,2005St24) J^π: E2 ΔJ=2 γ to 6^+. Member of the g.s. $K^\pi=0^+$ band. $T_{1/2}$: From Coulomb excitation.
1221.64[g] *3*	5^-	73 fs *+16−12*	D F H JKLMn	XREF: n(1230). J^π: E1+M2 γ to 4^+ level; $\sigma(\theta)$, analyzing power (inelastic scattering).
1226?	(2^+)		L n	XREF: n(1230). E(level),J^π: Seen in (α,α') unresolved from the 1222 5- level. DWBA analysis suggests $J^\pi=2^+$.
1233.863[j] *3*	3^+	0.76 ps *14*	AB D FGH JKL	Additional information 9. J^π: M1+E2 γ's to 2^+ and 4^+. $T_{1/2}$: From ^{151}Sm(n,γ). Other: <6 ps from 13-y ^{152}Eu ε decay.
1292.773[h] *10*	2^+	<16 ps	A DEFGH JKL N Q	Additional information 10. J^π: E0 component in transition to 2^+. $T_{1/2}$: From 4.1-min Pm β^- decay.
1310.505[f] *22*	6^+		B F JK	J^π: E0 component in transition to 6^+.
1371.735[i] *12*	4^+	1.1 ps *+7−4*	B D FG JKL N	Additional information 11. J^π: E2 γ to 2^+. γ to 5^-. $T_{1/2}$: From Coulomb excitation.
1505.77[g] *3*	7^-		F JK	J^π: E1 γ to 6^+. Dipole γ to 8^+.
1510.790[k] *25*	1^-	91 fs *6*	A E JKLMN	J^π: E1+M2 γ to 2^+. γ to 0^+.
1529.802[l] *3*	2^-	0.27 ps *+6−4*	A D F JK	Additional information 12.

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Adopted Levels, Gammas (continued)

^{152}Sm Levels (continued)

E(level)[†]	J$^\pi$	T$_{1/2}$[‡]	XREF	Comments
				J$^\pi$: M1+E2 γ's to 1$^-$ and 3$^-$.
1559.62[j] *3*	5$^+$		BC F JK	J$^\pi$: M1+E2 γ's to 4$^+$ and 6$^+$.
1579.429[k] *11*	3$^-$	72 fs *6*	B D FG JKL N	Additional information 13. J$^\pi$: E1 γ's to 2$^+$ and 4$^+$.
1609.26[e] *4*	10$^+$	1.38 ps *13*	F K W	μ=+3.7 *17* (1987By02,2005St24) J$^\pi$: E2 ΔJ=2 γ to 8$^+$. Member of K$^\pi$=0$^+$ g.s. band. T$_{1/2}$: From Coulomb excitation.
1612.90[h] *4*	4$^+$		D GH JKL N	J$^\pi$: γ's to 2$^+$ and 6$^+$.
1649.831[m] *7*	2$^-$	164 ps *+33−24*	A D G JK	Additional information 14. J$^\pi$: E1 γ's to 2$^+$. $\gamma\gamma(\theta)$ in 13-y Eu ε decay rules out J=1 and 3.
1658.80[o] *25*	0$^+$		A JK N	J$^\pi$: L(p,t)=0. T$_{1/2}$: The experimental values are discrepant. T$_{1/2}$=8 ps *5* is reported in 4.1-min Pm β^- decay, and 0.123 ps *+45−29* is reported in (n,n$'\gamma$).
1666.45[f] *4*	8$^+$		F K	J$^\pi$: E0 component in transition to 8$^+$.
1680.56[p] *3*	1$^-$	38.1 fs *28*	A E JKL	J$^\pi$: γ's to 0$^+$ and 3$^-$. log *ft*=6.8 from 0$^-$.
1682.07[l] *12*	4$^-$	>596 fs	D F JK	J$^\pi$: γ to 4$^+$. Member of a K$^\pi$=1$^-$ band.
1728.27[i] *3*	6$^+$		F JKl	J$^\pi$: M1+E2 γ to 6$^+$. Member of the K$^\pi$=2$^+$ γ-vibrational band.
1730.205[n] *19*	3$^-$	82 fs *+11−9*	B D JKl	J$^\pi$: E1 γ to 2$^+$. D(+Q) γ to 4$^+$.
1736	0$^+$		N	J$^\pi$: L(p,t)=0.
1754.98[q] *4*	0$^+$	>277 fs	JK m	J$^\pi$: From 792γ(E) and 792$\gamma(\theta)$ in (n,n$'\gamma$). Assigned as the bandhead of a K$^\pi$=0$^+$ band in Coulomb excitation.
1757.001[r] *14*	4$^+$		B D FG JKLm	Additional information 15. J$^\pi$: γ's to 2$^+$ and 6$^+$.
1764.32[k] *5*	5$^-$	0.08 ps *+9−4*	B F JKl	J$^\pi$: γ's to 4$^+$ and 6$^+$. Member of a K$^\pi$=1$^-$ band.
1769.132[t] *23*	2$^+$	130 fs *+42−28*	A D GH JKl N	J$^\pi$: E2 γ to 0$^+$.
1776.56[o] *5*	(2$^+$)	<15 ps	A D JKLM	J$^\pi$: γ's to 1$^-$ and 3$^-$. log *ft*=7.0 from 1$^+$. Assigned in Coulomb excitation as the 2$^+$ member of a K$^\pi$=0$^+$ band built on the 1659 level but no other band members have been identified. T$_{1/2}$: From 4.1-min Pm β^- decay.
1779.119[p] *25*	3$^-$	56 fs *+11−9*	D JK	Additional information 16. J$^\pi$: γ's to 2$^+$ and 4$^+$. Member of a K$^\pi$=1$^-$ band.
1803.94[cv] *5*	5$^-$		BC F JK M	J$^\pi$: E1 γ's to 4$^+$ and 6$^+$.
1822.03[m] *21*	(4$^-$)		D F JK	J$^\pi$: γ's to 3$^+$, 3$^-$, and 4$^+$. Assigned in Coulomb excitation to α K$^\pi$=2$^-$ band with bandhead at 1649. From an angular distribution measurement in (α,2nγ) the 1455γ to 4$^+$ is assigned as M1+E2, in conflict with the suggested band assignment.
1879.14[g] *4*	9$^-$		F K	J$^\pi$: E1 ΔJ=1 γ to 8$^+$. γ to 10$^+$. Member of K$^\pi$=0$^-$ octupole vibrational band.
1891.06[ds] *6*	5$^+$		F JK m	J$^\pi$: γ's to 3$^+$ and 6$^+$. Member of a K$^\pi$=4$^+$ band.
1892.48 *5*	0$^+$,1,2		A JK m	J$^\pi$: γ's to 1$^-$ and 2$^+$. log *ft*=7.5 from 1$^+$.
1901 *2*	(2$^+$)		G L n	J$^\pi$: L(p,t)=(2).
1906.13 *3*	2$^+$		JK n	J$^\pi$: γ's to 0$^+$, 3$^+$ and 3$^-$.
1907.73[u] *4*	(3$^+$)		JK	J$^\pi$: γ's to 2$^+$ and 4$^+$. Assigned in Coulomb excitation as α member of a K$^\pi$=2$^+$ band with bandhead at 1768, but no other band members have been identified.

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Adopted Levels, Gammas (continued)

^{152}Sm Levels (continued)

E(level)[†]	J^π	$T_{1/2}$[‡]	XREF	Comments
1920.46[w] *5*	6^-		C F JK M	J^π: M1+E2 γ to 5^-. γ to 6^+. Member of a $K^\pi=5^-$ band.
1929.93[l] *6*	6^-		F JK	J^π: E1 γ to 5^+. γ to 6^+. Member of a $K^\pi=1^-$ band.
1930.17 *13*			G	J^π: Primary γ from 2^-,3^- suggests that this level is different from the 1929.9 level with $J^\pi=6^-$.
1933.30 *5*	$(4^+,5,6^+)$		J	J^π: γ's to 4^+ and 6^+.
1944.61 *4*	1^-,2		A JK	J^π: log *ft*=7.3 from 1^+. γ's to 1^- and 3^-.
1945.10 *3*	$1,2^+$		A JK	J^π: γ's to 0^+ and 2^+.
1945.90[j] *5*	7^+		F K	J^π: M1+E2 γ's to 6^+ and 8^+.
1946.15 *6*	$0,1,2,3^-$		J	J^π: γ to 1^-.
1954.30 *5*	3^-,4,5^-		JK M	J^π: γ's to 3^- and 5^-.
1958.27 *5*	$(2^+,3,4^+)$		J	J^π: γ's to 2^+ and 4^+.
1962 *1*			G L	
1963.95 *4*	$(1,2^+)$		A J M	J^π: γ's to 0^+ and 2^+.
1976.98[@] *6*	$4^+,5,6^+$		J	J^π: γ's to 4^+ and 6^+.
1977.19[@p] *19*	5^-		K	J^π: γ's to 4^+ and 6^+. Member of a $K^\pi=1^-$ band.
2003.66 *20*	$2^+,3,4^+$		B	J^π: γ to 2^+. γ from 2589.02 with $J^\pi=4^+,5$.
2004.24[h] *6*	6^+		K	J^π: γ's to 4^+ and 6^+. Member of $K^\pi=0^+$ second β band.
2004.29[k] *11*	7^-		F JK	J^π: E1 $\Delta J=1$ γ to 6^+. γ to 8^+. Member of $K^\pi=1^-$ band.
2006.61 *5*	$0,1,2,3^-$		J	J^π: γ to 1^-.
2011.55 *6*	3^-,4,5^-		g JK n	XREF: n(2023). J^π: γ's to 3^- and 5^-. L(p,t)=3 for either or both of the 2012 levels.
2011.84 *5*	$2^+,3,4^+$		g JK n	XREF: n(2023). J^π: γ's to 2^+ and 4^+. L(p,t)=3 for either or both of the 2012 levels.
2038.37 *6*	$1,2^+$		JKl	J^π: γ's to 0^+ and 2^+.
2040.09[r] *8*	6^+		F JKl	J^π: γ's to 4^+ and 6^+. Member of $K^\pi=4^+$ band.
2042.79 *5*	$0^+,1,2$		A JKl	J^π: log *ft*=6.9 from 1^+. γ's to 2^+.
2044.45 *8*	$3,4^+$		B J	J^π: log *ft*=6.2 from 4^-. γ's to 2^+.
2046.16 *10*	$4^+,5,6,7^+$		F J	J^π: γ's to 5^+ and 6^+.
2048.04 *11*			J	J^π: γ to 2^+.
2051.45 *8*			J	J^π: γ to 2^-.
2051.83 *7*	4^+		G JK	J^π: γ's to 2^+ and 3^+. Member of $K^\pi=2^+$ band.
2053.52 *8*			J	J^π: γ's to 2^+.
2055.8 *10*			F	J^π: γ to 6^+.
2057.52[bv] *5*	7^-		C F K M	J^π: γ's to 5^- and 8^+. Member of $K^\pi-5^-$ band. Note that $J^\pi=(7^-)$ from (t,α) based on α comparison of experimental and calculated spectroscopic factors for members of a $K^\pi=5^-$ rotational band with configuration (π 5/2[413])(ν 5/2[532]).
2063.78 *4*	$(1^-,2,3^-)$		J	J^π: γ's to 1^- and 3^-.
2069.31 *8*	$0^+,1,2,3^-$		J	J^π: γ's to 1^- and 2^+.
2070.83 *8*	3^-,4,5^-		JK	J^π: γ's to 3^- and 5^-.
2079.57[f] *4*	10^+		F K	J^π: E2 γ to 8^+. M1 γ to 10^+. Member of the $K^\pi=0^+$ β-vibrational band.
2091.21 *4*	$1^-,2$		A JK	J^π: γ's to 1^- and 3^-. log *ft*=7.2 from 1^+ (log $f^{1u}t$<8).
2091.66 *7*			A J	J^π: γ to 2^+.
2096.82 *5*	$3^+,4$		G J	J^π: γ's to 4^+ and 5^+. Fed by primary in (n,γ) from 2^-,3^-.
2112.71 *5*	$(2^+,3,4^+)$		J MN	J^π: γ's to 2^+ and 4^+.
2120.98[z] *7*	7^-	2.4 ns *2*	C F	J^π: γ's to 6^- and 7^-. Bandhead of a $K^\pi=7^-$ band. $T_{1/2}$: from (α,2nγ).

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Adopted Levels, Gammas (continued)

^{152}Sm Levels (continued)

E(level)[†]	J^π	XREF	Comments
2127.17 *7*	0^+,1,2	A J	E(level): (n,n′γ) reports a level at 2127.17 deexciting via a single transition with Eγ=2005.38 *7*. In 4.12-M Pm β^- decay, a level at 2127.4 is postulated with a 2007.0 *5* transition along with 616 and 1317γ′s. The evaluator assumes that the 2005 and 2007γ′s correspond to the same transition and that there is just one level at 2127; however, based on branching in the decay, the 1317γ should have been seen in (n,n′γ). J^π: log *ft*=7.0 from 1^+. γ′s to 2^+.
2129.84 *5*	$(1^+,2,3^-)$	J	J^π: γ′s to 1^- and 3^+.
2137.69 *6*		J	J^π: γ to 2^+.
2137.92 *6*	$(2^+,3,4^+)$	J	J^π: γ′s to 2^+ and 4^+.
2138.17 *12*	2^+	K	J^π: γ′s to 0^+ and 4^+.
2139.71[i] *4*	8^+	F K	J^π: γ′s to 6^+ and 9^-. Member of $K^\pi=2^+$ γ-vibrational band.
2146 *3*		M	
2148.81[e] *5*	12^+	F K W	J^π: E2 $\Delta J=2$ γ to 10^+. Member of $K^\pi=0^+$ g.s. band.
2167.0 *6*	0^+,1,2	A	J^π: log *ft*=7.4 from 1^+. γ to 2^+.
2172.60 *23*	$1,2^+$	A	J^π: γ to 0^+.
2175.7 *10*	0^+,1,2,3^-	A	J^π: log $f^{1u}t$=8.7 from 1^+. γ to 2^+.
2176.62[p] *16*	7^-	K	J^π: γ′s to 5^- and 8^+. Member of a $K^\pi=1^-$ band.
2194 *3*		LM	
2201.20 *12*	0^+,1,2	A	J^π: log *ft*=6.8 from 1^+. γ to 2^+.
2201.47[l] *7*	8^-	F K	J^π: E1 γ to 7^+. Member of a $K^\pi=1^-$ band.
2206[s]	7^+	F	J^π: γ′s to 6^+ and 8^+. Member of a $K^\pi=4^+$ band.
2214.98[w] *7*	8^-	F K	J^π: E2 $\Delta J=2$ γ to 6^-. Member of a $K^\pi=5^-$ band.
2224.8 *5*	$1,2^+$	A	J^π: γ to 0^+.
2227.71 *22*	$(5^-,6,7^-)$	K	J^π: γ′s to 5^- and 7^-.
2237.3 *5*	1,2	A G	J^π: log *ft*=7.4 from 1^+. Fed by primary γ in (n,γ) from 2^-,3^-.
2239.8 *3*	2^+	A	J^π: γ′s to 0^+ and 4^+.
2263.9 *4*	6^+,7,8^+	K	J^π: γ′s to 6^+ and 8^+.
2268 *5*	2^+	N	J^π: L(p,t)=2.
2269.87[z] *8*	8^-	F	J^π: M1+E2 $\Delta J=1$ γ to 7^-. Member of a $K^\pi=7^-$ band.
2284.96 *20*	0,1,2	A K M	J^π: log *ft*=6.4 from 1^+.
2287.4 *10*	0^+,1,2,3^-	A	J^π: log $f^{1u}t$=8.6 from 1^+. γ to 2^+.
2290.37[k] *7*	9^-	F K	J^π: E1 $\Delta J=1$ γ to 8^+. D+Q γ to 10^+.
2295.3 *3*	1^-,2	A	J^π: log *ft*=7.2 from 1^+. γ to 3^-.
2308.6 *4*		F	J^π: γ to 8^+.
2308.9 *5*	$1,2^+$	A	J^π: γ to 0^+.
2320.35 *23*	4^+,5	B	J^π: log *ft*=6.7 from 4^-. γ to 6^+.
2326.94[g] *5*	11^-	F K	J^π: E1 γ to 10^+. Member of $K^\pi=0^-$ octupole vibrational band.
2340 *3*		MN	
2348.76 *7*		F K	J^π: γ′s to 7^- and 8^+.
2359.8 *3*		F	J^π: γ to 8^+.
2367.3 *3*	1^-,2	A	J^π: log *ft*=7.2 from 1^+. γ to 3^-.
2375.49[j] *7*	9^+	F K	J^π: M1+E2 γ to 10^+. γ to 8^-.
2376.8 *15*		A	J^π: γ to 2^+.
2388.79[v] *8*	9^-	F K	J^π: γ′s to 7^- and 8^+. Member of $K^\pi=5^-$ band.
2391.7[r] *3*	8^+	F K	J^π: γ′s to 7^- and 8^+. Member of $K^\pi=4^+$ band.
2402.23 *14*	$3,4^+$	B	J^π: log *ft*=6.8 from 4^-. γ′s to 2^+.
2415 *3*		M	
2423 *10*		N	
2424.36[z] *8*	9^-	F	J^π: M1+E2 γ to 8^-. γ to 7^-. Member of $K^\pi=7^-$ band.
2445.90[p] *8*	9^-	K	J^π: γ′s to 7^- and 9^-. Member of a $K^\pi=1^-$ band.
2458.6[x] *3*	8^+	K N	J^π: γ to 6^+. Bandhead of a $K^\pi=8^+$ band.
2482.00 *20*	3,4,5	B	J^π: log *ft*=6.7 from 4^-.

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Adopted Levels, Gammas (continued)

^{152}Sm Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
2489 *3*			MN	
2506.29 *12*	7^-,8,9^-		K	Jπ: γ's to 7^- and 9^-.
2510.4 *5*	$1^{(-)}$#	0.0097 eV *25*	A I	
2510.59[l] *8*	10^-		F K	Jπ: E2 ΔJ=2 γ to 8^-. E1 γ to 9^+.
2517.41 *15*			F K M	Jπ: γ's to 9^- and 10^+.
2525.69[f] *5*	12^+		F K	Jπ: E2 ΔJ=2 γ to 10^+. γ to 12^+.
2541.6 *4*	$1^{(+)}$#	0.0058 eV *20*	I	
2544			N	
2567.06 *17*	4^+,5		B	Jπ: log *ft*=6.5 from 4^-. γ to 6^+.
2576.29[w] *9*	10^-		F	Jπ: M1+E2 γ to 9^-. Member of a $K^π=5^-$ band.
2588[s]	9^+		F	Jπ: γ's to 8^+. Member of a $K^π=4^+$ band.
2589.02 *16*	4^+,5		B	Jπ: log *ft*=6.8 from 4^-. γ to 6^+.
2590.68[z] *9*	10^-		F	Jπ: M1+E2 γ to 9^-. Member of $K^π=7^-$ band.
2599.36 *14*	7^-,8^+		K N	Jπ: γ's to 6^+ and 9^-.
2612 *3*			M	
2641.09[k] *10*	11^-		F K	Jπ: E1 ΔJ=1 γ to 10^+. Member of $K^π=1^-$ band.
2643.4 *4*	$1^{(-)}$#	0.047 eV *5*	I	
2662.47[i] *5*	10^+		K	Jπ: γ's to 8^+ and 10^+. Member of $K^π=2^+$ γ-vibrational band.
2663.4 *4*	$1^{(+)}$#	0.0088 eV *26*	I	
2687.8 *10*	0^+,1,2		A	Jπ: log *ft*=7.0 from 1^+. γ to 2^+.
2697 *3*			M	
2712.5 *3*			F	Jπ: γ to 10^+.
2736.19[e] *6*	14^+		F K W	Jπ: γ to 12^+. Member of $K^π=0^+$ g.s. band.
2751.51[z] *10*	11^-		F	Jπ: γ's to 9^-. Member of $K^π=7^-$ band.
2808.92[&p] *11*	11^-		K	Jπ: Member of a $K^π=1^-$ band.
2810[r]	(10^+)		F	
2818.1 *4*	$1^{(+)}$#	0.0141 eV *26*	I	
2832.85[j] *16*	11^+		K	Jπ: γ to 9^+. Member of $K^π=2^+$ γ-vibrational band.
2833.30[g] *6*	13^-		F K	Jπ: E1 ΔJ=1 γ to 12^+. Member of $K^π=0^-$ octupole vibrational band.
2841.89 *10*			F K	Jπ: γ's to 11^- and 12^+.
2887.3 *4*	$1^{(+)}$#	0.012 eV *3*	I	
2891.7 *4*	$1^{(+)}$#	0.028 eV *4*	I	
2895.49 *12*	4^+		B	Jπ: γ's to 2^+ and 6^+.
2898.6? *3*			B	Jπ: γ to 3,4^+.
2901.39[l] *13*	12^-		F	Jπ: E2 ΔJ=2 γ to 10^-. Member of a $K^π=1^-$ band.
2905.17[x] *10*	10^+		K	Jπ: γ's to 8^+ and 10^+. Member of a band with unknown K.
2925.5 *10*	0^+,1,2		A	Jπ: log *ft*=6.3 from 1^+. γ to 2^+.
2930.6 *4*	$1^{(+)}$#	0.078 eV *5*	I	
2939.3 *4*	$1^{(+)}$#	0.0036 eV *25*	I	
2946.8 *4*	$1^{(-)}$#	0.013 eV *6*	I	
2976.87[y] *6*	14^+		F K	Jπ: E2 ΔJ=2 γ to 12^+. Member of a band with unknown $K^π$.
2991.6 *4*	$1^{(+)}$#	0.039 eV *5*	I	
3012.6 *4*	$1^{(+)}$#	0.015 eV *4*	I	
3025.3 *4*	$1^{(+)}$#	0.059 eV *4*	I	
3027[s]	11^+		F	Jπ: γ to 9^+. Member of a $K^π=4^+$ band.
3080.1[k] *3*	13^-		F K	Jπ: γ to 12^+. Member of a $K^π=1^-$ band.

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Adopted Levels, Gammas (continued)

^{152}Sm Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
3090.2 *4*	1(+)#	0.078 eV *5*	I	
3107.9 *4*	1(−)#	0.032 eV *7*	I	
3122.6 *5*		0.0091 eV *11*	I	
3128.33[i] *21*	12+		K	Jπ: γ to 12+. Member of the Kπ=2+ γ-vibrational band.
3262.9 *3*	10+,11,12+		K	Jπ: γ's to 10+ and 12+.
3281.7 *4*	1(+)#	0.022 eV *4*	I	
3292.82[f] *7*	14+		K	Jπ: γ's to 12+ and 14+. Member of the Kπ=0+ β vibrational band.
3352.26[x] *13*	12+		K	Jπ: γ's to 10+ and 12+. Member of band with unknown K.
3365.02[e] *6*	16+		F K W	Jπ: γ to 14+. Member of Kπ=0+ g.s. band.
3378.39[l] *24*	14−		F	Jπ: γ to 12−. Member of Kπ=1− band.
3383.35[g] *8*	15−		F K	Jπ: γ's to 13− and 14+. Member of the Kπ=0− octupole vibrational band.
3390.90[p] *22*	13−		K	Jπ: γ to 11−. Member of a Kπ=1− band.
3422.1 *4*	1(−)#	0.053 eV *17*	I	
3462.95[y] *13*	16+		K	Jπ: γ's to 14+. Member of band with unknown K.
3708.8 *4*		0.0144 eV *25*	I	
3794.1 *4*		0.0123 eV *26*	I	
3857.16[f] *9*	16+		K	Jπ: γ's to 14+ and 16+. Member of Kπ=0+ β vibrational band.
3882.6 *4*		0.018 eV *3*	I	
3931.2[x] *4*	14+		K	Jπ: γ's to 12+ and 14+. Member of band with unknown K.
3973.2[g] *5*	17−		K	Jπ: γ's to 15− and 16+. Member of Kπ=0− octupole vibrational band.
4004.64[y] *17*	18+		K	Jπ: γ's to 16+. Member of band with unknown K.
4047.7[ae] *12*	18+		K	Additional information 17. Jπ: γ's to 16+. Member of Kπ=0+ g.s. band.
4524.8[x] *23*	16+		K	Jπ: γ to 14+. Member of band with unknown K.
4749.56[e] *15*	20+		K	Jπ: γ to 18+. Member of the Kπ=0+ g.s. band.
8257.7+x *7*			Y	E(level): E=neutron separation energy. For x=neutron resonances see ^{151}Sm(n,γ) E=resonance.
11.3×10^3	0+		X	E(level): ΔE=+3-5. configuration: Low-energy component of the giant monopole resonance. %EWSR=17 +2−4.
11.53×10^3 *14*	2+		X	configuration: Low-energy component of the giant quadrupole resonance. %EWSR=71 *5*.
12.8×10^3 *4*	1−		X	configuration: Low-energy component of the isoscalar giant dipole resonance. %EWSR=29 *1*.
13.2×10^3 *38*	3−		X	configuration: Low-energy component of the high-energy octupole resonance. %EWSR=3 *1*.

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Adopted Levels, Gammas (continued)

^{152}Sm Levels (continued)

E(level)[†]	Jπ	XREF	Comments
14.9×10^3 *4*	2$^+$	X	configuration: High-energy component of the giant quadrupole resonance. %EWSR=40 *+5−17*.
15.44×10^3	0$^+$	X	E(level): ΔE=+12-23. configuration: High-energy component of the giant monopole resonance. %EWSR=73 *+4−25*.
23×10^3 *4*	3$^-$	X	configuration: High-energy component of the high-energy octupole resonance. %EWSR=31 *4*.
25.1×10^3 *10*	1$^-$	X	configuration: High-energy component of the isoscalar giant dipole resonance. %EWSR=103 *3*.

[†] From a least-squares fit to the adopted Eγ data, where available. other energies are weighted averages of the reaction data.
[‡] From (n,n′γ), except where noted otherwise. Values given as widths are from (γ,γ′).
[#] J from Iγ(127°)/Iγ(90°) in (γ,γ′). π from Iγ(g.s.)/Iγ(2$^+$) (Alaga rule).
[@] There is some overlap in the energies reported in Coulomb excitation and (n,n′γ) for the two 1977 levels. IT is possible that these are the same level.
[&] There are two γ′s from the 2808 level in Coulomb excitation, 728.48 *15* and 930.64 *15*. These give inconsistent level energies of 2808.02 *16* and 2809.77 *16*, respectively. One or both of these Eγ values must be in error. The evaluator adopts E(level)=2808.9 *9*.
[a] There are two γ′s from the 4048 level in Coulomb excitation, 585.98 *8* and 681.54 *5*. These give inconsistent level energies of 4048.91 *15* and 4046.53 *8*, respectively. One or both of these Eγ values must be in error. The evaluator adopts E(level)=4047.7 *12*.
[b] The γ branchings from the 2057 level in Coulomb excitation and (α,2nγ) are not consistent. The evaluator has chosen not to adopt branchings for this level. From Coulomb excitation one has Iγ(137γ):Iγ(253γ):Iγ(1351γ)=60 *9*:7 *10*:100 *9* and from (α,2nγ), normalized to the 1351γ, one has Iγ(137γ):Iγ(253γ):Iγ(329γ):Iγ(747γ):Iγ(932γ):Iγ(1351γ)=230 *2*:40:32 *3*:40 *2*:150 *30*:100 *30*.
[c] The γ branchings from the 1804 level are not consistent. The values shown are from 7.52-min Pm β$^-$ decay. Coulomb excitation reports only the two highest energy γ′s, with Iγ(1097γ):Iγ(1437)= 100 *9*:72 *7*, consistent with the decay value. (n,n′γ) reports Iγ(781γ):Iγ(1097γ):Iγ(1437γ)=41 *7*:100 *50*:42 *8*, and (α,2nγ) reports Iγ(432γ):Iγ(781γ):Iγ(1097γ):Iγ(1437γ)=18.9 *15*:20 *5*:100 *4*:16 *7*.
[d] The γ energies from the 1891 level as measured in (n,n′γ) and Coulomb excitation are not consistent. the 1183 and 1524γ′s are reported only in (n,n′γ), and along with Eγ=331.33 *3* give E(level)=1890.93 *3*. The other transitions are taken from Coulomb excitation and, with Eγ=331.5 *5*, give E(level)=1891.53 *12*. The 134γ is not reported in Coulomb excitation. all the transitions except the 1183γ are reported in (α,2nγ).
[e] Band(A): Kπ=0$^+$ g.s. band.
[f] Band(B): Kπ=0$^+$ β-vibrational band.
[g] Band(C): Kπ=0$^-$ octupole vibrational band.
[h] Band(D): Kπ=0$^+$ second β band.
[i] Band(E): Kπ=2$^+$ γ-vibrational band (even).
[j] Band(F): Kπ=2$^+$ γ-vibrational band (odd).
[k] Band(G): Kπ=1$^-$ (odd).
[l] Band(H): Kπ=1$^-$ (even).
[m] Band(I): Kπ=2$^-$ (even).
[n] Band(J): Kπ=2$^-$ (odd).
[o] Band(K): Kπ=0$^+$.
[p] Band(L): Kπ=1$^-$.
[q] Band(M): Kπ=0$^+$.

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Adopted Levels, Gammas (continued)

^{152}Sm Levels (continued)

[r] Band(N): $K^{\pi}=4^{+}$ (even).
[s] Band(O): $K^{\pi}=4^{+}$ (odd).
[t] Band(P): $K^{\pi}=2^{+}$ (even).
[u] Band(Q): $K^{\pi}=2^{+}$ (odd).
[v] Band(R): $K^{\pi}=5^{-}$ (odd).
[w] Band(S): $K^{\pi}=5^{-}$ (even).
[x] Band(T): K=?
[y] Band(U): K=?
[z] Band(V): $K^{\pi}=7^{-}$.

Adopted Levels, Gammas (continued)

γ(^{152}Sm)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[ef]	α[g]	$I_{(\gamma+ce)}$	Comments
121.7818	2^+	121.7817 *3*	100	0.0	0^+	E2	1.155		B(E2)(W.u.)=145.0 *16*
366.4793	4^+	244.6974 *8*	100	121.7818	2^+	E2	0.1073		B(E2)(W.u.)=209.5 *22*
684.751	0^+	562.98 *3*	100.0 *19*	121.7818	2^+	E2	0.00941		B(E2)(W.u.)=33.3 *12*
		684.85 *20*		0.0	0^+	E0		1.30 *14*	ρ^2(E0)=0.051 *5*. $I_{(\gamma+ce)}$: From 9.3-h Eu ε decay relative to Iγ(563γ).
706.928	6^+	340.45 *3*	100	366.4793	4^+	E2	0.0382		B(E2)(W.u.)=240 *4*
810.453	2^+	125.64 *7*	0.599 *22*	684.751	0^+	[E2]	1.034		B(E2)(W.u.)=170 *12*
		444.00 *3*	34.8 *13*	366.4793	4^+	E2	0.01772		B(E2)(W.u.)=18.0 *12*
		688.670 *5*	100.0 *6*	121.7818	2^+	E0+M1+E2	0.0434 *13*		B(E2)(W.u.)=5.7 *4*; B(M1)(W.u.)=1.5×10^{-5} *7* δ: δ(E2/M1)=+19 *+5−4* (1982La26); I(ce(K))(E0)/I(ce(K))(E2)=6.5 *3* (^{152}Eu ε decay (13.517 y)). α: from ^{152}Eu ε decay (13.517 y).
		810.451 *5*	37.0 *3*	0.0	0^+	E2	0.00393		B(E2)(W.u.)=0.94 *6*
963.358	1^-	152.77 *16*	0.0126 *11*	810.453	2^+	[E1]	0.0872		B(E1)(W.u.)=0.000225 *27*
		278.7 *3*		684.751	0^+	[E1]	0.0177		I_γ: weak (^{152}Eu ε decay (9.3116 h)).
		841.570 *5*	100.0 *18*	121.7818	2^+	E1	0.00144		B(E1)(W.u.)=0.0106 *9*
		963.367 *5*	82.3 *13*	0.0	0^+	[E1]	0.00111		B(E1)(W.u.)=0.0058 *5*
1022.970	4^+	212.43 *11*	14.4 *4*	810.453	2^+	E2	0.1706		B(E2)(W.u.)=2.5×10^2 *4*
		316.13 *13*	7.00 *4*	706.928	6^+	(E2)	0.0478		B(E2)(W.u.)=17 *3*
		656.489 *5*	100.0 *15*	366.4793	4^+	E2+M1+E0	0.0568 *20*		B(E2)(W.u.)=5.0 *+10−7*; B(M1)(W.u.)=9.0×10^{-4} *25* δ: δ(E2/M1)=2.1 *3* (1982La26, Coulomb excitation). I(ce(K))(E0)/I(ce(K))(E2)=10.0 *6* (^{152}Eu ε decay (13.517 y)). α: from ^{152}Eu decay (13.517 y).
		901.19 *5*	59.2 *17*	121.7818	2^+	E2	0.00311		B(E2)(W.u.)=0.74 *12*
1041.122	3^-	674.65 *3*	40.4 *8*	366.4793	4^+	E1	0.00225		B(E1)(W.u.)=0.0082 *16* δ: δ(M2/E1)=−0.03 *6*.
		919.337 *4*	100.0 *10*	121.7818	2^+	E1	0.00121		B(E1)(W.u.)=0.0081 *15* δ: δ(M2/E1)=−0.09 *12*.
1082.842	0^+	119.46 *12*	8.1 *7*	963.358	1^-	[E1]	0.1700		B(E1)(W.u.)=0.00063 *+43−19* I_γ: From 9.3-hr Eu ε decay.
		272.41 *4*	7.8 *5*	810.453	2^+	(E2)	0.0761		B(E2)(W.u.)=34 *+23−11* I_γ: From 9.3-hr Eu ε decay.
		398.00 *15*		684.751	0^+	E0		1.52 *22*	Mult.: ρ^2(E0)=0.023 *9*. $I_{(\gamma+ce)}$: From 9.3-h Eu ε decay relative to the 961γ.
		961.08 *3*	100 *6*	121.7818	2^+	[E2]	0.00270		B(E2)(W.u.)=0.80 *+53−23*
		1082.8 *5*		0.0	0^+	E0		0.13 *6*	Mult.: ρ^2(E0)=0.0007 *4*. $I_{(\gamma+ce)}$: From 9.3-h Eu ε decay relative to the 961γ.
1085.841	2^+	275.41 *4*	0.238 *6*	810.453	2^+	M1	0.1015		B(M1)(W.u.)=0.00134 *18*
		401.29 *9*	0.0044 *3*	684.751	0^+	[E2]	0.0236		B(E2)(W.u.)=0.026 *4*
		719.346 *7*	1.72 *6*	366.4793	4^+	E2	0.00517		B(E2)(W.u.)=0.56 *8*

$^{152}_{62}Sm_{90}$-10

Adopted Levels, Gammas (continued)

γ(^{152}Sm) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [†]	E_f	J_f^π	Mult.[ef]	δ[e]	α[g]	Comments
									E_γ: Not included in the least-squares adjustment. The adjustment gives 719.406 *7*.
1085.841	2^+	964.057 *5*	100.00 *24*	121.7818	2^+	E2+M1	−9.3 *6*	0.00270	B(M1)(W.u.)=0.00015 *3*; B(E2)(W.u.)=7.4 *10*
		1085.837 *10*	69.71 *19*	0.0	0^+	E2		0.00209	B(E2)(W.u.)=2.9 *4*
1125.39	8^+	418.45 *3*	100	706.928	6^+	E2		0.0209	B(E2)(W.u.)=293 *4*
1221.64	5^-	514.78 *6*	21.9 *5*	706.928	6^+	[E1]		0.0075	B(E1)(W.u.)=0.0043 *+9−8*
									I_γ: Weighted average from 13-y and 9.3-h Eu ε decays.
		855.21 *7*	100 *3*	366.4793	4^+	E1+M2	−0.11 *7*	0.0016	B(E1)(W.u.)=0.0042 *+9−8*; B(M2)(W.u.)=3.2×10^2 *+52−29*
									δ: B(M2)(W.u.)<1 is expected from RUL. This requirement gives δ<0.0023;
1233.863	3^+	147.99 *5*	0.150 *8*	1085.841	2^+	M1+E2	+1.0 *6*	0.570 *13*	B(M1)(W.u.)=0.0051 *+25−38*; B(E2)(W.u.)=12×10^1 *+6−9*
		210.95 *14*	0.0278 *12*	1022.970	4^+	[M1,E2]		0.192 *18*	
		423.45 *4*	0.0218 *16*	810.453	2^+	[M1,E2]		0.027 *7*	
		867.380 *3*	30.93 *18*	366.4793	4^+	M1+E2	−6.5 *3*	0.00343 *5*	B(M1)(W.u.)=0.00024 *+6−5*; B(E2)(W.u.)=7.2 *+16−11*
		1112.076 *3*	100.0 *5*	121.7818	2^+	M1+E2	−8.7 *6*	0.00201 *3*	B(M1)(W.u.)=0.00021 *+6−5*; B(E2)(W.u.)=6.8 *+15−11*
1292.773	2^+	207.03 *23*	0.42 *9*	1085.841	2^+	[M1,E2]		0.203 *17*	
		209.97 *3*	1.58 *26*	1082.842	0^+	[E2]		0.1774	B(E2)(W.u.)>12
		251.633 *9*	24.6 *7*	1041.122	3^-	E1		0.0231	B(E1)(W.u.)>9.7×10^{-5}
									Mult.: α(K)exp in 13-y Eu ε decay gives δ(M2/E1)=0.24 *+4−6*; however this value of δ, assuming that the measured $T_{1/2}$ is correct, gives B(M2)(W.u.)>260. The RUL limit is 1, and suggests δ<0.014.
		269.84 *6*	2.88 *19*	1022.970	4^+	[E2]		0.0784	B(E2)(W.u.)>6.2
		329.436 *17*	44.5 *9*	963.358	1^-	[E1]		0.01163	B(E1)(W.u.)>7.8×10^{-5}
		482.35 *14*	9.1 *3*	810.453	2^+	E0+M1+E2		0.062 *12*	
		608.06 *15*	0.10 *3*	684.751	0^+	[E2]		0.0078	B(E2)(W.u.)>0.0037
		926.29 *4*	100.0 *12*	366.4793	4^+	[E2]		0.00293	B(E2)(W.u.)>0.46
		1170.98 *4*	13.7 *6*	121.7818	2^+	[M1,E2]		0.0023 *5*	
		1292.77 *4*	36.9 *10*	0.0	0^+	[E2]		0.00149	B(E2)(W.u.)>0.032
1310.505	6^+	89.17 *8*	4.26 *18*	1221.64	5^-				
		185.1 *10*	0.85 *34*	1125.39	8^+				
		287.53 *4*	95 *3*	1022.970	4^+	E2		0.0642	
		603.56 *3*	100 *4*	706.928	6^+	E0+M1+E2		0.032 *4*	δ: δ(E2/M1)=+1.6 *3*.
		944.00 *5*	61.3 *19*	366.4793	4^+	E2		0.00281	
1371.735	4^+	137.56 *22*	0.113 *20*	1233.863	3^+	[M1,E2]		0.72 *4*	
		150.13 *8*	0.137 *12*	1221.64	5^-	[E1]		0.0914	B(E1)(W.u.)=6.6×10^{-5} *+38−26*
		285.84 *5*	1.49 *24*	1085.841	2^+	[E2]		0.0654	B(E2)(W.u.)=62 *+35−24*
		330.60 *6*	1.41 *16*	1041.122	3^-	[E1]		0.01153	B(E1)(W.u.)=6.4×10^{-5} *+37−25*
		348.751 *15*	0.258 *24*	1022.970	4^+	[M1,E2]			
		561.26 *17*	0.21 *4*	810.453	2^+	[E2]		0.00949	B(E2)(W.u.)=0.30 *+18−13*
		664.77 *5*	1.50 *8*	706.928	6^+	[E2]		0.00623	B(E2)(W.u.)=0.9 *+6−4*
		1005.27 *5*	100.0 *16*	366.4793	4^+	M1+E2	−3.1 *+3−2*	0.00259 *5*	B(M1)(W.u.)=0.0014 *+8−6*; B(E2)(W.u.)=7 *+4−3*

$^{152}_{62}Sm_{90}$-11

Adopted Levels, Gammas (continued)

γ(^{152}Sm) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.[ef]	δ[e]	α[g]	Comments
1371.735	4+	1249.94 *5*	28.3 *4*	121.7818	2+	E2		0.00159	B(E2)(W.u.)=0.7 *+5−3* δ: δ(M3/E2)=+0.04 *9*.
1505.77	7−	380.36 *12*	4.7 *3*	1125.39	8+	(E1)		0.00818	I_γ: From Coulomb excitation. Others: <38 from (n,n′γ), 12 from (α,2nγ). Mult.: Dipole from angular distribution. Δπ=yes from placement.
		798.82 *3*	100 *3*	706.928	6+	E1		0.00159	
1510.790	1−	218.10 *15*	0.073 *9*	1292.773	2+	[E1]		0.0336	B(E1)(W.u.)=0.000172 *25*
		424.3 *4*	0.021 *9*	1085.841	2+	[E1]		0.0063	B(E1)(W.u.)=7.E−6 *3*
		427.9	<0.010	1082.842	0+	[E1]		0.0062	
		469.97 *20*	0.068 *11*	1041.122	3−	[E2]		0.0152	B(E2)(W.u.)=3.6 *7*
		547.36 *8*	1.17 *7*	963.358	1−	[M1,E2]		0.014 *4*	
		700.28 *14*	1.27 *9*	810.453	2+	[E1]		0.0021	B(E1)(W.u.)=9.0×10^{-5} *9*
		826.01 *5*	3.55 *21*	684.751	0+	[E1]		0.0015	B(E1)(W.u.)=0.000154 *14*
		1389.03 *4*	100.0 *21*	121.7818	2+	E1+M2	−0.025 *12*	0.00070	B(E1)(W.u.)=0.00091 *7*; B(M2)(W.u.)=1.3 *+18−11*
		1510.77 *5*	0.79 *3*	0.0	0+	[E1]		0.00071	B(E1)(W.u.)=5.6×10^{-6} *5*
1529.802	2−	237.11 *3*	0.0303 *9*	1292.773	2+	[E1]		0.0270	B(E1)(W.u.)=1.7×10^{-5} *3*
		295.9387 *17*	2.110 *19*	1233.863	3+	E1		0.01523	B(E1)(W.u.)=0.00060 *12* δ: δ(M2/E1)=0.00 *3*.
		443.9606 *16*	13.54 *4*	1085.841	2+	E1+M2	+0.058 *12*	0.00598 *17*	B(E1)(W.u.)=0.00114 *22*; B(M2)(W.u.)=90 *+43−39* δ: The measured δ gives a value of B(M2)(W.u.) much larger than the RUL limit of 1, suggesting that the δ value is too large. RUL<1 requires δ<0.007.
		488.6792 *20*	1.985 *13*	1041.122	3−	M1+E2	+5.6 *5*	0.01392 *21*	B(M1)(W.u.)=0.00036 *+10−9*; B(E2)(W.u.)=25 *5*
		566.438 *6*	0.628 *15*	963.358	1−	M1+E2	−0.74 *35*	0.0134 *15*	B(M1)(W.u.)=0.0015 *6*; B(E2)(W.u.)=1.4 *9*
		719.36 *14*	0.455 *15*	810.453	2+	(E1)		0.00197	B(E1)(W.u.)=9.0×10^{-6} *17*
		1408.013 *3*	100.00 *17*	121.7818	2+	E1+M2	+0.043 *3*	0.00071 *1*	B(E1)(W.u.)=0.00026 *5*; B(M2)(W.u.)=1.1 *3*
1559.62	5+	325.69 *6*	4.71 *26*	1233.863	3+	(E2)		0.0437	Mult.: Mult=(Q) from angular distribution. Δπ=no from placement.
		852.67 *7*	35.1 *13*	706.928	6+	M1+E2			α: α=0.0053 *3* for δ=−0.5 *2*, and 0.0041 *3* for δ=−1.6 *4*. δ: −0.5 *2* or −1.6 *4*. I_γ: From Coulomb excitation. Iγ/Iγ(1193γ)=0.564 *23* from (α,2nγ), <0.33 from (n,n′γ).
		1193.10 *5*	100 *3*	366.4793	4+	M1+E2	−4.0 *8*	0.00178 *4*	
1579.429	3−	207.64 *11*	0.519 *19*	1371.735	4+	[E1]		0.0382	B(E1)(W.u.)=0.00130 *12*
		286.50 *11*	0.098 *21*	1292.773	2+	[E1]		0.0165	B(E1)(W.u.)=9.4×10^{-5} *22*
		345.54 *3*	0.69 *4*	1233.863	3+	[E1]		0.0103	B(E1)(W.u.)=0.00038 *4*
		493.54 *4*	2.14 *10*	1085.841	2+	[E1]		0.0044	B(E1)(W.u.)=0.00040 *4*
		538.29 *6*	0.306 *21*	1041.122	3−	[M1,E2]		0.014 *4*	
		556.48 *10*	1.25 *5*	1022.970	4+	[E1]		0.0034	B(E1)(W.u.)=0.000163 *15*
		616.05 *5*	0.65 *4*	963.358	1−	[E2]		0.0075	B(E2)(W.u.)=8.1 *9*
		768.96 *4*	5.8 *3*	810.453	2+	[E1]		0.0017	B(E1)(W.u.)=0.00029 *3*
		1212.948 *11*	100.0 *4*	366.4793	4+	E1		0.00076 *1*	B(E1)(W.u.)=0.00126 *11* δ: δ(M2/E1)=0.00 *2*.

$^{152}_{62}Sm_{90}$-12

Adopted Levels, Gammas (continued)

γ(^{152}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[ef]	α[g]	Comments
1579.429	3⁻	1457.643 *11*	35.13 *26*	121.7818	2⁺	E1	0.00070 *1*	B(E1)(W.u.)=0.000255 *22* δ: δ(M2/E1)=0.00 *3*.
1609.26	10⁺	483.86 *3*	100	1125.39	8⁺	E2	0.01400	B(E2)(W.u.)=314 *+35−26*
1612.90	4⁺	241[h]	<4.1	1371.735	4⁺			
		320.10 *5*	21.4 *11*	1292.773	2⁺			
		379.05 *17*	2.6 *6*	1233.863	3⁺			
		391.19 *7*	15.4 *5*	1221.64	5⁻			
		527.1[h]	<2.0	1085.841	2⁺			
		571.83 *8*	48.4 *18*	1041.122	3⁻			
		589.83 *17*	14.2 *9*	1022.970	4⁺			
		802.0 *5*	4.5 *5*	810.453	2⁺			
		906.06 *10*	100 *5*	706.928	6⁺			
		1246.34 *16*	10.1 *15*	366.4793	4⁺			
		1491.4 *8*	6 *3*	121.7818	2⁺			
1649.831	2⁻	357.26 *5*	1.23 *9*	1292.773	2⁺	[E1]	0.0095	B(E1)(W.u.)=2.1×10^{-7} *+4−3*
		416.02 *3*	22.0 *4*	1233.863	3⁺	[E1]	0.0066	B(E1)(W.u.)=2.4×10^{-6} *+5−4*
		563.986 *5*	100.0 *9*	1085.841	2⁺	E1	0.00330	B(E1)(W.u.)=4.3×10^{-6} *+9−7* δ: δ(M2/E1)=+0.07 *+11−9*.
		609.23 *22*	0.25 *3*	1041.122	3⁻	[M1,E2]	0.010 *3*	
		686.60 *5*	4.11 *14*	963.358	1⁻	[M1,E2]	0.0078 *20*	
		839.36 *4*	3.59 *10*	810.453	2⁺	[E1]	0.00144	B(E1)(W.u.)=4.7×10^{-8} *+9−7*
		1528.10 *4*	56.6 *7*	121.7818	2⁺	E1	0.00072	B(E1)(W.u.)=1.22×10^{-7} *+24−18* δ: δ(M2/E1)=−0.01 *3*.
1658.80	0⁺	695.9 *3*	100 *5*	963.358	1⁻	[E1]	0.00211	
		847.5 *5*	2.4 *6*	810.453	2⁺	[E2]	0.00356	
		1535.3 *10*	1.2 *6*	121.7818	2⁺	[E2]	0.00114	
1666.45	8⁺	160.8 *2*	10.8 *4*	1505.77	7⁻			
		355.9 *1*	100 *3*	1310.505	6⁺	E2	0.0334	
		540.9 *3*	39.7 *13*	1125.39	8⁺	E0+M1+E2	0.066 *10*	δ: −0.45<δ(Q/D)<+1.0.
		959.5 *1*	21.9 *7*	706.928	6⁺	E2	0.00271	Mult.: Mult=Q from (α,2nγ).
1680.56	1⁻	388.3 *5*	0.13 *5*	1292.773	2⁺	[E1]	0.0078	B(E1)(W.u.)=7.2×10^{-5} *28*
		594.7 *4*	0.38 *11*	1085.841	2⁺	[E1]	0.0029	B(E1)(W.u.)=5.9×10^{-5} *18*
		597.50 *14*	0.77 *11*	1082.842	0⁺	[E1]	0.0029	B(E1)(W.u.)=0.000117 *19*
		639.14 *14*	0.57 *11*	1041.122	3⁻	[E2]	0.0069	B(E2)(W.u.)=8.6 *18*
		716.84 *21*	1.33 *21*	963.358	1⁻	[M1,E2]	0.0070 *18*	
		870.14 *5*	100.0 *24*	810.453	2⁺	[E1]	0.0013	B(E1)(W.u.)=0.0049 *4*
		995.84 *5*	73 *3*	684.751	0⁺	[E1]	0.0010	B(E1)(W.u.)=0.00240 *+22−19*
		1558.74 *6*	9.0 *3*	121.7818	2⁺	[E1]	0.00072	B(E1)(W.u.)=7.7×10^{-5} *+7−6*
		1680.62 *10*	6.2 *3*	0.0	0⁺	[E1]	0.00076	B(E1)(W.u.)=4.2×10^{-5} *4*
1682.07	4⁻	1315.49 *5*	100	366.4793	4⁺			B(E1)(W.u.)<0.00018
1728.27	6⁺	222.89 *13*	1.15 *10*	1505.77	7⁻			
		356.56 *5*	8.0 *3*	1371.735	4⁺			
		506.60 *5*	6.91 *25*	1221.64	5⁻			

$^{152}_{62}Sm_{90}$-13

Adopted Levels, Gammas (continued)

γ(^{152}Sm) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.[ef]	δ[e]	α[g]	Comments
1728.27	6+	1021.41 *4*	100 *3*	706.928	6+	M1+E2	−1.4 *+4−7*	0.00284 *23*	
		1361.7 *6*	20.6 *7*	366.4793	4+				E_γ: From (α,2nγ). Eγ=1361.31 *11* is reported in Coulomb excitation.
1730.205	3−	358.48 *7*	6.4 *5*	1371.735	4+	[E1]		0.0095	B(E1)(W.u.)=0.0019 *3*
		496.56 *24*	23 *8*	1233.863	3+	[E1]		0.0044	B(E1)(W.u.)=0.0026 *10*
		644.39 *6*	26.5 *19*	1085.841	2+	[E1]		0.0025	B(E1)(W.u.)=0.00136 *+20−19*
		707.15 *7*	5.50 *21*	1022.970	4+	[E1]		0.0020	B(E1)(W.u.)=0.00021 *3*
		766.84 *3*	2.7 *3*	963.358	1−	[E2]		0.0045	B(E2)(W.u.)=6.9 *+12−11* E_γ: Rounded-off value from the level energies. Eγ=766.38 *18* is reported in 13-y Eu ε decay.
		919.74 *4*	25.1 *15*	810.453	2+	[E1]		0.0012	B(E1)(W.u.)=0.00044 *6*
		1363.78 *5*	100.0 *23*	366.4793	4+	(E1)		0.00070 *1*	B(E1)(W.u.)=0.00054 *+7−6* Mult.: Mult=D(+Q) with δ=−0.05 *12*. Placement in the level scheme requires Δπ=yes.
		1608.36 *8*	20.9 *8*	121.7818	2+	E1		0.00074 *1*	B(E1)(W.u.)=6.9×10^{-5} *9*
1754.98	0+	462.16 *6*		1292.773	2+				E_γ: Reported only in (n,n′γ).
		791.67 *7*	100 *5*	963.358	1−				E_γ: Weighted average from (n,n′γ) and Coulomb excitation.
		944.8 *10*	6.3 *20*	810.453	2+				E_γ: Reported only in Coulomb excitation.
1757.001	4+	385.61 *21*	22.7 *10*	1371.735	4+				
		464.28 *14*	1.8 *7*	1292.773	2+				
		523.13 *5*	62.5 *26*	1233.863	3+				
		671.155 *14*	100 *18*	1085.841	2+				Mult.: See comment in (α,2nγ).
		734.12 *12*	3.7 *6*	1022.970	4+				
		946.5	4.5 *8*	810.453	2+				E_γ: Rounded-off value from the level energies. Eγ=947.15 *14* is reported in 13-y Eu ε decay.
		1050.1 *6*	2.9 *12*	706.928	6+				
		1390.50 *12*	17.4 *7*	366.4793	4+				
		1635.38 *20*	0.66 *18*	121.7818	2+				
1764.32	5−	1057.36 *6*	100 *6*	706.928	6+	[E1]		0.00093	B(E1)(W.u.)=0.0014 *+14−8*
		1397.88 *7*	82 *5*	366.4793	4+	[E1]		0.00070	B(E1)(W.u.)=0.00049 *+49−26*
1769.132	2+	239.33[h] *17*	<27	1529.802	2−	[E1]		0.026	B(E1)(W.u.)<0.012
		397.75 *26*	1.9 *3*	1371.735	4+	[E2]			B(E2)(W.u.)=40 *+13−12*
		476.43 *10*	8.6 *16*	1292.773	2+	[M1,E2]			
		535.44 *12*	8.8 *7*	1233.863	3+	[M1,E2]			
		683.25 *9*	24.1 *14*	1085.841	2+	[M1,E2]			
		728.03 *4*	56.5 *19*	1041.122	3−	[E1]			B(E1)(W.u.)=6.2×10^{-4} *+17−16*
		805.71 *9*	77 *3*	963.358	1−	[E1]			B(E1)(W.u.)=6.3×10^{-4} *+18−16*
		958.63 *5*	100 *6*	810.453	2+	[M1,E2]			
		1084.36 *14*	54 *4*	684.751	0+	[E2]			B(E2)(W.u.)=7.6 *+22−20*
		1647.44 *12*	36.9 *18*	121.7818	2+	E2(+M1)	>0.6	0.00117 *13*	B(M1)(W.u.)<0.0033; B(E2)(W.u.)>0.12<0.82
		1769.09 *5*	47.3 *11*	0.0	0+	E2		0.00099 *2*	B(E2)(W.u.)=0.58 *+16−15*
1776.56	(2+)	735.43 *8*	100	1041.122	3−	D,E2			Mult.: from comparison with RUL.
		813.20 *6*	93 *7*	963.358	1−	D,E2			I_γ: Weighted average from 4.12-min Pm β− and 13-y Eu ε

$^{152}_{62}Sm_{90}$-14

Adopted Levels, Gammas (continued)

γ(^{152}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[ef]	α[g]	Comments
								decays. Mult.: from comparison with RUL.
1779.119	3⁻	737.84 *7*	11.2 *21*	1041.122	3⁻	[M1,E2]	0.0065 *17*	I_γ: Not seen in 13-y ε decay. From Iγ/Iγ(756γ+969γ)=0.072 *14* in Coulomb excitation.
		756.16 *5*	56 *6*	1022.970	4⁺	[E1]	0.0018	B(E1)(W.u.)=0.0033 *+7−6*
		968.64 *4*	100 *3*	810.453	2⁺	[E1]	0.0011	B(E1)(W.u.)=0.0028 *+6−5*
1803.94	5⁻	432.1 *2*	5.7[c] *4*	1371.735	4⁺			
		762.2 *3*	0.7[c] *3*	1041.122	3⁻			
		780.8 *1*	14.7[c] *9*	1022.970	4⁺			
		1097.1 *1*	100[c] *5*	706.928	6⁺	E1	0.00087 *2*	δ: δ(M2/E1)=−0.03 *8*.
		1437.5 *1*	79[c] *4*	366.4793	4⁺	E1	0.00070 *1*	δ: δ(M2/E1)=−0.07 *11*.
1822.03	(4⁻)	588.6 *3*	16 *6*	1233.863	3⁺			
		780.9	16.3 *24*	1041.122	3⁻			E_γ: Rounded-off value from the level energies. Eγ=779.8 *5* is reported in Coulomb excitation.
		1455.1 *3*	100 *6*	366.4793	4⁺			
1879.14	9⁻	269.8 *4*	15	1609.26	10⁺			E_γ: Reported only in (α,2nγ).
		373.7 *4*	0.70 *15*	1505.77	7⁻			E_γ: Reported only in Coulomb excitation.
		753.83 *3*	100 *3*	1125.39	8⁺	E1		δ: δ(M2/E1)=−0.03 *3*. ΔJ=1 from (α,2nγ).
1891.06	5⁺	134.73[d] *21*	56 *8*	1757.001	4⁺			
		331.5[d] *5*	65 *19*	1559.62	5⁺			
		519.90[d] *20*	100 *8*	1371.735	4⁺			
		657.39[d] *23*	85 *7*	1233.863	3⁺			
		1183.95[d] *9*		706.928	6⁺			
		1524.47[d] *10*		366.4793	4⁺			
1892.48	0⁺,1,2	929.12 *5*	100 *10*	963.358	1⁻			E_γ: From (n,n′γ). Eγ=929.4 *5* in Coulomb excitation, and 929.1 *4* in 4.12-min Pm β^- decay.
		1080.7 *11*	40 *10*	810.453	2⁺			E_γ: From Coulomb excitation. Not reported in (n,n′γ) or in 4.12-min Pm β^- decay.
1906.13	2⁺	255.96 *15*		1649.831	2⁻			E_γ: Reported only in (n,n′γ).
		376.24 *8*		1529.802	2⁻			E_γ: Reported only in (n,n′γ).
		672.5 *6*	2.8 *6*	1233.863	3⁺			E_γ: Reported only in Coulomb excitation.
		820.31 *7*		1085.841	2⁺			E_γ: Reported only in (n,n′γ).
		865.04 *6*		1041.122	3⁻			E_γ: Reported only in (n,n′γ).
		942.85 *6*	8.5 *12*	963.358	1⁻			
		1784.27 *7*	100 *8*	121.7818	2⁺			
		1906.14 *7*		0.0	0⁺			E_γ: Reported only in (n,n′γ).
1907.73	(3⁺)	821.0 *6*	22 *3*	1085.841	2⁺			E_γ: Reported only in Coulomb excitation.
		884.76 *10*	21.6 *21*	1022.970	4⁺			
		1096.95 *22*	98 *6*	810.453	2⁺			
		1541.24 *7*	60 *5*	366.4793	4⁺			
		1785.97 *6*	100 *16*	121.7818	2⁺			

$^{152}_{62}Sm_{90}$-15

Adopted Levels, Gammas (continued)

γ(^{152}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[ef]	δ[e]	α[g]	Comments
1920.46	6⁻	116.51 *6*	66 *7*	1803.94	5⁻	M1+E2	+0.21 *7*	1.104 *18*	E_γ: Reported only in (α,2nγ).
		360.90 *7*	100 *9*	1559.62	5⁺				
		1213.4 *3*	38 *8*	706.928	6⁺				I_γ: From Coulomb excitation. Iγ=74 *18* in (α,2nγ).
1929.93	6⁻	370.24 *6*	23.1 *19*	1559.62	5⁺	E1		0.00873	I_γ: From Coulomb excitation. (α,2nγ) reports Iγ(370γ):Iγ(1223γ)= 123 *5*:100 *25*.
		1223.16 *9*	100 *6*	706.928	6⁺				
1933.30	(4⁺,5,6⁺)	910.38 *7*		1022.970	4⁺				
		1226.32 *7*		706.928	6⁺				
		1566.82 *8*		366.4793	4⁺				
1944.61	1⁻,2	861.7 *8*	7 *7*	1082.842	0⁺				
		903.50 *5*	50 *7*	1041.122	3⁻				
		981.24 *5*	100 *7*	963.358	1⁻				E_γ: From (n,n′γ). Eγ=982.19 *23* is reported in Coulomb excitation, and Eγ=981.0 *3* in 4.12-min Pm β⁻ decay.
1945.10	1,2⁺	652.31 *6*	67 *33*	1292.773	2⁺				
		862.26 *5*		1082.842	0⁺				
		1260.41 *7*	100 *33*	684.751	0⁺				E_γ: Assigned in Coulomb excitation to the 1944.6 level, and in (n,n′γ) to the 1945.1 level. The Eγ data in (n,n′γ) agree well with placement from the higher-energy member of the doublet, suggesting that Coulomb excitation is exciting both members of the doublet; however, none of the other transitions from this level is seen in Coulomb excitation.
		1823.22 *7*		121.7818	2⁺				
		1945.15 *10*		0.0	0⁺				
1945.90	7⁺	217.6 *3*	7.6	1728.27	6⁺				
		386.2[#] *1*	19.6 *9*	1559.62	5⁺				
		820.6[#] *1*	48.1 *19*	1125.39	8⁺	M1+E2	−1.6 *4*	0.0045 *4*	
		1238.9[#] *1*	100 *3*	706.928	6⁺	M1+E2	−1.7 *2*	0.00181 *5*	
1946.15	0,1,2,3⁻	982.79 *6*		963.358	1⁻				
1954.30	3⁻,4,5⁻	732.66 *8*	70 *4*	1221.64	5⁻				
		913.17 *6*	100 *5*	1041.122	3⁻				
1958.27	(2⁺,3,4⁺)	935.33 *7*		1022.970	4⁺				
		1147.75 *8*		810.453	2⁺				
		1591.81 *8*		366.4793	4⁺				
1963.95	(1,2⁺)	1153.41 *7*		810.453	2⁺				
		1842.19 *6*		121.7818	2⁺				
		1963.98 *7*		0.0	0⁺				
1976.98	4⁺,5,6⁺	954.00 *7*		1022.970	4⁺				
		1270.11 *10*		706.928	6⁺				
		1610.41 *11*		366.4793	4⁺				
1977.19	5⁻	667.5 *4*	50 *6*	1310.505	6⁺				
		755.5 *3*	48 *5*	1221.64	5⁻				
		953.8 *3*	100 *9*	1022.970	4⁺				
2003.66	2⁺,3,4⁺	1193.2 *2*	100	810.453	2⁺				

$^{152}_{62}Sm_{90}$-16

Adopted Levels, Gammas (continued)

γ(^{152}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[ef]	α[g]	Comments
2004.24	6+	391.27 *7*	58.8 *25*	1612.90	4+			
		444.99 *19*	9.3 *9*	1559.62	5+			
		693.98 *13*	35.0 *17*	1310.505	6+			
		782.37 *23*	20.4 *14*	1221.64	5−			
		879.0 *10*	47.2 *26*	1125.39	8+			
		982.3 *3*	17.0 *14*	1022.970	4+			
		1297.4 *10*	11×10[1] *12*	706.928	6+			
		1637.43 *14*	100 *4*	366.4793	4+			E_γ: From the level energies. Eγ=1635.36 *14* in Coulomb excitation.
2004.29	7−	879.02 *17*	71 *24*	1125.39	8+			I_γ: From (α,2nγ). Iγ/Iγ(1297γ)=0.30 *+80−12* in Coulomb excitation.
		1297.29 *13*	100 *7*	706.928	6+	E1	0.00072 *1*	Mult.: ΔJ=1 from (α,2nγ).
2006.61	0,1,2,3−	1043.25 *5*		963.358	1−			
2011.55	3−,4,5−	789.96 *8*	86 *5*	1221.64	5−			
		970.38 *7*	100 *6*	1041.122	3−			
2011.84	2+,3,4+	989.08 *8*	13.1 *17*	1022.970	4+			
		1201.7 *6*	6.0 *6*	810.453	2+			
		1645.30 *10*	100 *9*	366.4793	4+			
		1889.95 *6*	50 *9*	121.7818	2+			
2038.37	1,2+	1227.96 *6*	100 *11*	810.453	2+			
		1352.97 *21*	30 *4*	684.751	0+			
		1916.56 *24*		121.7818	2+			
2040.09	6+	149.06 *16*	41 *4*	1891.06	5+			E_γ: Not reported in (n,n′γ).
		283.94[h] *23*	27 *4*	1757.001	4+			E_γ: From Coulomb excitation and not included in the least-squares adjustment which gives Eγ= 283.08 *8*. This transition is not reported in (α,2nγ); however, in that reaction a 276γ is seen and placed feeding the 1764 *5*- level. No 276γ is reported in Coulomb excitation. The two works are from the same group.
		312[‡]		1728.27	6+			
		427[‡]		1612.90	4+			
		818.8 *3*	30 *3*	1221.64	5−			E_γ: Not reported in Coulomb excitation.
		1333.11 *9*	100 *6*	706.928	6+			E_γ: From (n,n′γ). Eγ=1334.7 *3* is reported in Coulomb excitation.
		1672[‡]		366.4793	4+			
2042.79	0+,1,2	1079.43 *5*	100 *8*	963.358	1−			
		1234 *4*	10 *8*	810.453	2+			E_γ: Reported only in Coulomb excitation.
		1921.6 *10*	3 *3*	121.7818	2+			E_γ: Reported only in 4.12-min Pm β−.
2044.45	3,4+	810.2 *2*	100 *7*	1233.863	3+			
		1021.4 *2*	28 *3*	1022.970	4+			
		1234.2 *1*	68 *5*	810.453	2+			
		1677.6 *2*	9 *3*	366.4793	4+			
2046.16	4+,5,6,7+	486.2 *2*	100 *6*	1559.62	5+			E_γ: Not reported in (n,n′γ).
		1339.33 *11*	89 *11*	706.928	6+			
2048.04		962.20 *11*		1085.841	2+			
2051.45		401.62 *8*		1649.831	2−			

$^{152}_{62}Sm_{90}$-17

Adopted Levels, Gammas (continued)

γ(^{152}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[ef]	δ[e]	α[g]	Comments
2051.83	4+	817.8 *3*	100 *10*	1233.863	3+				
		965.0 *7*	57 *7*	1085.841	2+				E_γ: Reported only in Coulomb excitation.
		1930.05 *7*		121.7818	2+				E_γ: Reported only in (n,n′γ).
2053.52		1243.06 *9*		810.453	2+				
		1931.74 *16*		121.7818	2+				
2055.8		1348.9 *10*		706.928	6+				
2057.52	7−	137.08 *5*	100[b] *9*	1920.46	6−	M1+E2	+0.18 *+3−4*	0.692 *10*	
		253.2 *2*	17[b]	1803.94	5−				
		329.4 *1*	13.9[b] *13*	1728.27	6+				
		747.1 *2*	17[b] *9*	1310.505	6+				
		931.9 *2*	65[b] *13*	1125.39	8+				
		1350.9 *4*	43[b] *13*	706.928	6+				
2063.78	(1−,2,3−)	383.21 *9*		1680.56	1−				
		1022.68 *6*		1041.122	3−				
		1100.41 *5*		963.358	1−				
2069.31	0+,1,2,3−	388.75 *7*		1680.56	1−				
		1947.6 *3*		121.7818	2+				
2070.83	3−,4,5−	849.14 *7*	61 *5*	1221.64	5−				
		1030.21 *24*	100 *7*	1041.122	3−				
2079.57	10+	200.52 *4*	11.9 *4*	1879.14	9−				
		413.11 *3*	100 *3*	1666.45	8+	E2		0.0217	
		470.36 *5*	10.0 *3*	1609.26	10+	M1		0.0251	Mult.,δ: δ(E2/M1)=+0.3 *5*.
		953.84 *9*	8.5 *3*	1125.39	8+				
2091.21	1−,2	1050.10 *5*	100 *7*	1041.122	3−				
		1127.84 *5*	82 *7*	963.358	1−				
2091.66		1969.86 *7*		121.7818	2+				
2096.82	3+,4	537.12 *7*		1559.62	5+				
		725.13 *5*		1371.735	4+				
2112.71	(2+,3,4+)	1071.48 *7*		1041.122	3−				
		1746.27 *6*		366.4793	4+				
		1991.02 *11*		121.7818	2+				
2120.98	7−	63.51 *5*	67 *9*	2057.52	7−	[M1,E2]		10 *4*	
		200.6 *1*	100	1920.46	6−	[M1,E2]		0.223 *17*	
2127.17	0+,1,2	616.0 *3*	8 *8*	1510.790	1−				
		1317.4 *5*	100 *8*	810.453	2+				
		2005.38 *7*	85 *8*	121.7818	2+				
2129.84	(1+,2,3−)	896.12 *7*		1233.863	3+				
		1166.34 *7*		963.358	1−				
2137.69		1327.23 *6*		810.453	2+				
2137.92	(2+,3,4+)	1771.33 *10*		366.4793	4+				
		2016.17 *7*		121.7818	2+				
2138.17	2+	1096.96 *12*	100 *4*	1041.122	3−				

$^{152}_{62}Sm_{90}$-18

Adopted Levels, Gammas (continued)

γ(^{152}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[ef]	δ[e]	α[g]	Comments
2138.17	2+	1116.9 *6*	15.9 *19*	1022.970	4+				
		1327.7 *5*	15.0 *14*	810.453	2+				
		1454.0 *8*	7.0 *10*	684.751	0+				
2139.71	8+	260.60 *23*	1.12 *15*	1879.14	9−				E_γ: Reported only in Coulomb erxcitation.
		411.65 *6*	16.0 *7*	1728.27	6+				E_γ: Reported only in Coulomb excitation.
		633.85 *5*	19.4 *7*	1505.77	7−				
		1014.28 *4*	100 *3*	1125.39	8+				
		1432.93 *19*	8.9 *4*	706.928	6+				E_γ: Reported only in Coulomb excitation.
2148.81	12+	539.50 *3*		1609.26	10+	E2		0.01050	
2167.0	0+,1,2	2045.2 *6*		121.7818	2+				
2172.60	1,2+	642.8 *3*	67 *7*	1529.802	2−				
		661.7 *4*	100 *7*	1510.790	1−				
		1488.1 *6*	13 *7*	684.751	0+				
2175.7	0+,1,2,3−	2053.9 *10*		121.7818	2+				
2176.62	7−	510.0	21 *4*	1666.45	8+				E_γ: Rounded-off value from the level energies. Eγ=507.4 *5* is reported in Coulomb excitation.
		670.7 *3*	31 *4*	1505.77	7−				
		866.2 *4*	38 *4*	1310.505	6+				
		955.03 *20*	100 *6*	1221.64	5−				
2201.20	0+,1,2	2079.3 *4*		121.7818	2+				
2201.47	8−	255.6 *1*	100 *3*	1945.90	7+	E1		0.0222	δ: δ(M2/E1)=−0.03 *3*.
		271.3 *1*	18	1929.93	6−				E_γ: Reported only in (α,2nγ).
		322.2 *1*	6.1 *18*	1879.14	9−				E_γ: Reported only in (α,2nγ).
		1075 *1*	7 *4*	1125.39	8+				E_γ: Reported only in (α,2nγ).
2206	7+	260[‡]		1945.90	7+				
		276[‡]		1929.93	6−				
		478[‡]		1728.27	6+				
		1081[‡]		1125.39	8+				
		1499[‡]		706.928	6+				
2214.98	8−	157.3 *1*	100 *10*	2057.52	7−	M1+E2	+0.36 *6*	0.469	E_γ: Reported only in (α,2nγ).
		269.0 *1*	73	1945.90	7+				
		294.4 *1*	89	1920.46	6−	E2		0.0596	E_γ: Reported only in (α,2nγ).
2224.8	1,2+	2224.8 *5*		0.0	0+				
2227.71	(5−,6,7−)	722.3 *3*	55 *5*	1505.77	7−				
		1005.7 *3*	100 *10*	1221.64	5−				
2237.3	1,2	727.1 *7*	67 *33*	1510.790	1−				
		1274.4 *7*	100 *33*	963.358	1−				
		2114.2 *8*	67 *33*	121.7818	2+				
2239.8	2+	1873.1 *10*	8 *8*	366.4793	4+				
		2118.0 *3*	100 *8*	121.7818	2+				
		2239.7 *8*	31 *8*	0.0	0+				
2263.9	6+,7,8+	1138.3 *5*	45 *5*	1125.39	8+				

$^{152}_{62}Sm_{90}$-19

Adopted Levels, Gammas (continued)

γ(^{152}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[ef]	δ[e]	α[g]	Comments
2263.9	6+,7,8+	1557.1 *4*	100 *7*	706.928	6+				
2269.87	8−	148.95 *5*		2120.98	7−	M1+E2	−0.18 *8*	0.547 *8*	
2284.96	0,1,2	1321.6 *2*		963.358	1−				
2287.4	0+,1,2,3−	2165.6 *10*		121.7818	2+				
2290.37	9−	623.9	52.1 *24*	1666.45	8+				
		681.6 *3*	49 *4*	1609.26	10+	D+Q			
		783.9 *4*	7.5 *9*	1505.77	7−				E_γ: Reported only in Coulomb excitation.
		1165.0 *2*	100 *4*	1125.39	8+	E1		0.00079	δ: δ(M2/E1)=−0.05 *11*.
2295.3	1−,2	1253.2 *6*	100 *25*	1041.122	3−				
		1332.0 *4*	75 *25*	963.358	1−				
		2175.0 *8*	100 *25*	121.7818	2+				
2308.6		1183.2 *4*		1125.39	8+				
2308.9	1,2+	2187.0 *6*	100 *20*	121.7818	2+				
		2309.1 *9*	80 *20*	0.0	0+				
2320.35	4+,5	516.3 *4*	100 *10*	1803.94	5−				
		1297.8 *5*	7 *7*	1022.970	4+				
		1613.4 *6*	13 *3*	706.928	6+				
		1953.7 *4*	30 *7*	366.4793	4+				
2326.94	11−	448.18 *23*	5.4 *5*	1879.14	9−				E_γ: Reported only in Coulomb excitation.
		717.78 *4*	100 *3*	1609.26	10+	E1		0.00198	
2348.76		682.11 *9*	55.9 *23*	1666.45	8+				
		843.36 *17*	31.2 *17*	1505.77	7−				
		1223.47 *9*	100 *4*	1125.39	8+				
2359.8		1234.4 *3*		1125.39	8+				
2367.3	1−,2	1326.4 *3*	60 *20*	1041.122	3−				
		1403.0 *6*	100 *20*	963.358	1−				
2375.49	9+	174.28 *12*	23.5 *20*	2201.47	8−				
		235.8 *2*	33	2139.71	8+				E_γ: Reported only in (α,2nγ).
		429.35 *9*	61 *3*	1945.90	7+				
		766.3 *2*	40 *4*	1609.26	10+	M1+E2	−1.0 *4*	0.0060 *8*	E_γ: From (α,2nγ). Eγ=759.7 *3* in Coulomb excitation.
		1250.25 *16*	100 *4*	1125.39	8+				
2376.8		2255.0 *15*		121.7818	2+				
2388.79	9−	173.8 *1*	≤100	2214.98	8−				E_γ: Reported only in (α,2nγ).
		187.6 *2*	≤100	2201.47	8−				E_γ: Reported only in (α,2nγ).
		331.3 *1*	33 *27*	2057.52	7−				
		721.9 *6*	100 *17*	1666.45	8+				E_γ: Reported only in Coulomb excitation.
2391.7	8+	727[‡]		1666.45	8+				
		885.9 *3*		1505.77	7−				
		1267[‡]		1125.39	8+				
2402.23	3,4+	645.7 *3*	100 *9*	1757.001	4+				
		1591.6 *3*	12 *3*	810.453	2+				
		2280.2 *3*	9 *3*	121.7818	2+				
2424.36	9−	154.6 *1*	100 *10*	2269.87	8−	M1+E2	−0.25 *+9−15*	0.493 *10*	

$^{152}_{62}Sm_{90}$-20

Adopted Levels, Gammas (continued)

γ(^{152}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[ef]	δ[e]	α[g]	Comments
2424.36	9⁻	303.5 *1*	38	2120.98	7⁻				
2445.90	9⁻	567.1 *3*	9.4 *11*	1879.14	9⁻				
		779.97 *12*	43.0 *19*	1666.45	8⁺				
		939.80 *9*	100 *4*	1505.77	7⁻				
2458.6	8⁺	1751.7 *3*		706.928	6⁺				
2482.00	3,4,5	725.0 *2*		1757.001	4⁺				
2506.29	7⁻,8,9⁻	628.4 *9*	20 *3*	1879.14	9⁻				
		1000.50 *11*	100 *4*	1505.77	7⁻				
2510.4	1(−)	2388.8[@] *5*	106 *34*	121.7818	2⁺	[E1]		0.00108 *2*	B(E1)(W.u.)=1.9×10^{-4} *6*
		2510.6 *5*	100	0.0	0⁺	[E1]		0.00114 *2*	B(E1)(W.u.)=1.5×10^{-4} *5*
2510.59	10⁻	135.13 *5*	77 *8*	2375.49	9⁺	E1		0.1216	E_γ: Reported only in (α,2nγ). δ: δ(M2/E1)=−0.11 +*11*−*7* (α,2nγ).
		309.0 *1*	100 *4*	2201.47	8⁻	E2		0.0513	Mult.: ΔJ=2 from (α,2nγ).
		631.5 *3*	42 *5*	1879.14	9⁻				I_γ: From Iγ<47 in (α,2nγ) and 54 *17* in Coulomb excitation.
2517.41		638.00 *18*	38 *10*	1879.14	9⁻				I_γ: Weighted average of Iγ/Iγ(909γ)=0.45 *5* (Coulomb excitation) and 0.24 *7* (α,2nγ).
		908.62 *24*	100	1609.26	10⁺				
2525.69	12⁺	198.83 *6*	8.9 *4*	2326.94	11⁻				
		376.7 *10*	4.6 *5*	2148.81	12⁺				
		446.13 *3*	100 *3*	2079.57	10⁺	E2		0.01748	
		916.3 *5*	7.3 *4*	1609.26	10⁺				E_γ: Unweighted average of 916.8 *2* from (α,2nγ) and 915.79 *16* from Coulomb excitation.
2541.6	1(+)	2419.8[@] *5*	62 *30*	121.7818	2⁺	[M1]			B(M1)(W.u.)=0.008 *4*
		2541.6 *5*	100	0.0	0⁺	[M1]			B(M1)(W.u.)=0.011 *5*
2567.06	4⁺,5	1859.8 *3*	33 *8*	706.928	6⁺				
		2200.7 *2*	100 *17*	366.4793	4⁺				
2576.29	10⁻	152.1 *1*	93 *10*	2424.36	9⁻	M1(+E2)	+0.07 +*7*−*10*	0.515 *8*	
		187.6 *2*	<250	2388.79	9⁻				
		361.0 *1*	100	2214.98	8⁻				
2588	9⁺	195[‡]		2391.7	8⁺				
		1463[‡]		1125.39	8⁺				
2589.02	4⁺,5	584.8 *2*	100 *30*	2003.66	2⁺,3,4⁺				
		1217.7 *4*	WEAK	1371.735	4⁺				
		1881.8 *3*	23 *8*	706.928	6⁺				
2590.68	10⁻	166.2 *1*	44 *5*	2424.36	9⁻	M1(+E2)	−0.11 *11*	0.402 *7*	
		202.0 *2*	80 *20*	2388.79	9⁻				
		320.9 *1*	17 *5*	2269.87	8⁻				
		375.5 *3*	100 *30*	2214.98	8⁻				
2599.36	7⁻,8⁺	719.56 *20*	68 *5*	1879.14	9⁻				
		1094.37 *23*	100 *7*	1505.77	7⁻				
		1474.1 *3*	83 *5*	1125.39	8⁺				

$^{152}_{62}Sm_{90}$-21

Adopted Levels, Gammas (continued)

γ(^{152}Sm) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.[ef]	α[g]	Comments
2599.36	7⁻,8⁺	1892.4	76 *5*	706.928	6⁺			E_γ: Rounded-off value from the level energies. Eγ=1895.1 *5* is reported in Coulomb excitation.
2641.09	11⁻	314.3 *1*	81 *4*	2326.94	11⁻	(M1+E2)	0.060 *12*	Mult.: Mult=D+Q from angular distributions. Δπ=no from placement.
		493.0 *2*	59 *24*	2148.81	12⁺			
		560.9 *3*	24	2079.57	10⁺			
		1031.5 *2*	100 *5*	1609.26	10⁺	E1	0.00097 *2*	δ: δ(M2/E2)=+0.03 *8*.
2643.4	1(−)	2521.6@ *5*	147 *16*	121.7818	2⁺	[E1]	0.00114 *2*	B(E1)(W.u.)=9.0×10⁻⁴ *11*
		2643.4 *5*	100	0.0	0⁺	[E1]	0.00120 *2*	B(E1)(W.u.)=5.3×10⁻⁴ *7*
2662.47	10⁺	372.11 *6*	53.3 *23*	2290.37	9⁻			
		522.78 *6*	62.1 *24*	2139.71	8⁺			
		583.04 *6*	100 *4*	2079.57	10⁺			
		1052.98 *9*	74 *3*	1609.26	10⁺			
		1536.73 *14*	52.9 *20*	1125.39	8⁺			
2663.4	1(+)	2541.6@ *5*	31 *13*	121.7818	2⁺	[M1]	0.00109	B(M1)(W.u.)=0.006 *3*
		2663.4 *5*	100	0.0	0⁺	[M1]	0.00111	B(M1)(W.u.)=0.017 *6*
2687.8	0⁺,1,2	2566.0 *10*		121.7818	2⁺			
2712.5		1103.2 *3*		1609.26	10⁺			
2736.19	14⁺	587.37 *3*		2148.81	12⁺			
2751.51	11⁻	160.8 *2*	<103	2590.68	10⁻			
		175.1 *1*	<102	2576.29	10⁻			
		327.3 *1*	100 *7*	2424.36	9⁻			
		362.4 *3*	67 *10*	2388.79	9⁻			
2808.92	11⁻	728.48[a] *15*	75 *4*	2079.57	10⁺			
		930.64[a] *15*	100 *5*	1879.14	9⁻			
2810	(10⁺)	730‡		2079.57	10⁺			
		931‡		1879.14	9⁻			
2818.1	1(+)	2696.3@ *5*	62 *16*	121.7818	2⁺	[M1]	0.00111	B(M1)(W.u.)=0.013 *3*
		2818.1 *5*	100	0.0	0⁺	[M1]	0.00114	B(M1)(W.u.)=0.019 *4*
2832.85	11⁺	457.1 *3*		2375.49	9⁺			
2833.30	13⁻	506.26 *9*	17.3 *8*	2326.94	11⁻			
		684.44 *6*	100 *3*	2148.81	12⁺	E1	0.00218	δ: δ(M2/E1)=−0.03 *3*. ΔJ=1 from (α,2nγ).
2841.89		515.20 *10*	94 *5*	2326.94	11⁻			
		692.52 *15*	100 *5*	2148.81	12⁺			
2887.3	1(+)	2765.5@ *5*	36 *17*	121.7818	2⁺	[M1]		B(M1)(W.u.)=0.0073 *27*
		2887.3 *5*	100 *30*	0.0	0⁺	[M1]	0.00115	B(M1)(W.u.)=0.018 *5*
2891.7	1(+)	2769.9@ *5*	35 *6*	121.7818	2⁺	[M1]		B(M1)(W.u.)=0.017 *4*
		2891.7 *5*	100	0.0	0⁺	[M1]	0.00116	B(M1)(W.u.)=0.042 *7*
2895.49	4⁺	493.3 *2*	100 *23*	2402.23	3,4⁺			
		1524.5 *4*	15 *7*	1371.735	4⁺			
		1810.5 *4*	38 *23*	1085.841	2⁺			
		2188.6 *2*	54 *15*	706.928	6⁺			

$^{152}_{62}Sm_{90}$-22

Adopted Levels, Gammas (continued)

γ(^{152}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[ef]	α[g]	Comments
2895.49	4^+	2528.5 *2*	77 *15*	366.4793	4^+			
2898.6?		854.1 *3*		2044.45	$3,4^+$			
2901.39	12^-	390.8 *1*		2510.59	10^-	E2	0.0254	
2905.17	10^+	756.4	8.4 *21*	2148.81	12^+			E_γ: Rounded-off value from the least squares adjustment, which gives Eγ=756.37 *10*. The value 759.9 *3* reported in Coulomb excitation may be a typo.
		1026.48 *14*	65 *3*	1879.14	9^-			
		1295.98 *17*	76 *4*	1609.26	10^+			
		1779.05 *17*	100 *4*	1125.39	8^+			
2925.5	$0^+,1,2$	2803.7 *10*		121.7818	2^+			
2930.6	$1^{(+)}$	2808.8[@] *5*	50 *4*	121.7818	2^+	[M1]	0.00114	B(M1)(W.u.)=0.057 *5*
		2930.6 *5*	100	0.0	0^+	[M1]	0.00116	B(M1)(W.u.)=0.100 *7*
2939.3	$1^{(+)}$	2817.5[@] *5*	48 *47*	121.7818	2^+	[M1]	0.00114	B(M1)(W.u.)=0.003 *3*
		2939.3 *5*	100	0.0	0^+	[M1]	0.00117	B(M1)(W.u.)=0.005 *4*
2946.8	$1^{(-)}$	2825.0[@] *5*	180 *90*	121.7818	2^+	[E1]	0.00128	B(E1)(W.u.)=1.9×10^{-4} *10*
		2946.8 *5*	100	0.0	0^+	[E1]	0.00133	B(E1)(W.u.)=9×10^{-5} *5*
2976.87	14^+	451.25 *4*	100 *4*	2525.69	12^+	E2	0.01694	
		827.6 *3*	6.9 *5*	2148.81	12^+			E_γ: Reported only in Coulomb excitation.
2991.6	$1^{(+)}$	2869.8[@] *5*	41 *8*	121.7818	2^+	[M1]	0.00115	B(M1)(W.u.)=0.023 *5*
		2991.6 *5*	100	0.0	0^+	[M1]	0.00118	B(M1)(W.u.)=0.050 *7*
3012.6	$1^{(+)}$	2890.8[@] *5*	47 *20*	121.7818	2^+			B(M1)(W.u.)=0.010 *4*
		3012.6 *5*	100	0.0	0^+	[M1]	0.00118	B(M1)(W.u.)=0.019 *5*
3025.3	$1^{(+)}$	2903.5[@] *5*	43 *4*	121.7818	2^+			B(M1)(W.u.)=0.035 *4*
		3025.3 *5*	100	0.0	0^+	[M1]	0.00119	B(M1)(W.u.)=0.072 *6*
3027	11^+	440[‡]		2588	9^+			
3080.1	13^-	931.3 *3*		2148.81	12^+			
3090.2	$1^{(+)}$	2968.4[@] *5*	67 *6*	121.7818	2^+	[M1]	0.00117	B(M1)(W.u.)=0.058 *5*
		3090.2 *5*	100	0.0	0^+	[M1]	0.00120	B(M1)(W.u.)=0.077 *6*
3107.9	$1^{(-)}$	2986.1[@] *5*	100 *35*	121.7818	2^+	[E1]	0.00135	B(E1)(W.u.)=3.2×10^{-4} *9*
		3107.9 *5*	92 *32*	0.0	0^+	[E1]	0.00141	B(E1)(W.u.)=2.6×10^{-4} *7*
3122.6		(3000.8[@])	<13	121.7818	2^+			
		3122.6 *5*	100	0.0	0^+			
3128.33	12^+	979.51 *20*		2148.81	12^+			
3262.9	$10^+,11,12^+$	1113.8 *3*	97 *7*	2148.81	12^+			
		1654.6 *6*	100 *9*	1609.26	10^+			
3281.7	$1^{(+)}$	3159.9[@] *5*	52 *12*	121.7818	2^+	[M1]	0.00122	B(M1)(W.u.)=0.012 *3*
		3281.7 *5*	100	0.0	0^+	[M1]	0.00126	B(M1)(W.u.)=0.020 *4*
3292.82	14^+	316.03 *5*	87 *3*	2976.87	14^+			
		459.34 *8*	64 *3*	2833.30	13^-			
		556.49 *18*	27.7 *19*	2736.19	14^+			

$^{152}_{62}Sm_{90}$-23

Adopted Levels, Gammas (continued)

γ(^{152}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[ef]	α[g]	Comments
3292.82	14^+	766.6	100 *4*	2525.69	12^+			E_γ: Rounded-off value from the level energies. Eγ=765.82 *7* is reported in Coulomb excitation.
3352.26	12^+	1026.32 *25*	61 *4*	2326.94	11^-			
		1203.32 *16*	100 *4*	2148.81	12^+			
		1742.0 *3*	57 *3*	1609.26	10^+			
3365.02	16^+	628.82 *3*		2736.19	14^+			
3378.39	14^-	477.0 *2*		2901.39	12^-			
3383.35	15^-	550.42 *17*	28.1 *19*	2832.85	11^+			E_γ: Reported only in Coulomb excitation.
		647.14 *7*	100 *4*	2736.19	14^+			
3390.90	13^-	1063.95 *21*		2326.94	11^-			
3422.1	$1^{(-)}$	3300.3[@] *5*	230 *80*	121.7818	2^+	[E1]	0.00149	B(E1)(W.u.)=5.4×10^{-4} *18*
		3422.1 *5*	100	0.0	0^+	[E1]	0.00153	B(E1)(W.u.)=2.1×10^{-4} *9*
3462.95	16^+	486.1	100 *6*	2976.87	14^+			E_γ: Rounded-off value from the least squares adjustment, which gives Eγ=486.09 *13*. The value 487.03 *9* reported in Coulomb excitation may be a typo.
		726.88 *18*	25.4 *18*	2736.19	14^+			
3708.8		(3587.0[@] *5*)	<18	121.7818	2^+			
		3708.8 *5*	100	0.0	0^+			
3794.1		(3672.3[@] *5*)	25	121.7818	2^+			
		3794.0 *5*	100	0.0	0^+			
3857.16	16^+	394.19 *16*	56 *5*	3462.95	16^+			
		473.75 *10*	99 *5*	3383.35	15^-			
		564.36 *11*	100 *5*	3292.82	14^+			
		880.53 *20*	54 *4*	2976.87	14^+			
3882.6		3760.8[@] *5*	20	121.7818	2^+			
		3882.6 *5*	100	0.0	0^+			
3931.2	14^+	1194.8 *6*	25.0 *24*	2736.19	14^+			
		1783.2 *5*	100 *9*	2148.81	12^+			
3973.2	17^-	589.9 *10*	87 *26*	3383.35	15^-			
		608.2 *5*	100 *17*	3365.02	16^+			
4004.64	18^+	542.1 *3*	100 *13*	3462.95	16^+			
		639.47 *18*	82 *6*	3365.02	16^+			
4047.7	18^+	585.98[&h] *8*	60.8 *24*	3462.95	16^+			
		681.54[&h] *5*	100 *4*	3365.02	16^+			
4524.8	16^+	1788.6 *23*		2736.19	14^+			
4749.56	20^+	701.86 *15*		4047.7	18^+			

[†] From 13-y Eu ε decay except where stated otherwise. other data are from (n,n′γ), Coulomb excitation, (α,2nγ), and (γ,γ′).
[‡] Reported only in (α,2nγ).

$^{152}_{62}Sm_{90}$-24

Adopted Levels, Gammas (continued)

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

E=386.41 *7*, 821.53 *7*, and 1238.70 *7* are reported in Coulomb excitation; however, these energies do not give consistent E(level) values.
@ Energy for transition to the 2^+ level is not given explicitly by the authors in (γ,γ'). The value is that of the evaluator deduced from E(level)-E(2^+) with E(2^+) taken as 121.8.
& See comment on 4048 level.
a Not included in the least-squares adjustment. See comment on the 2808 level.
b See comment on the 2057 level.
c See comment on the 1804 level.
d See comment on the 1891 level.
e From α data in 9.3-h and 13-y Eu ε decay, and angular distributions and linear polarization measurements in $(\alpha,2n\gamma)$. For the levels seen in (γ,γ') with probable $J^\pi=1^+$ or 1^-, the transitions to 2^+ could have a quadrupole contribution. The M2/E1 component is probably negligible, but the E2/M1 component could be significant. The B(M1)(W.u.) values given for these transitions should thus be considered as upper limits.
f Values of ρ^2(E0), given in comments, are from 2005Ki02 and references therein.
g 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.
h Placement of transition in the level scheme is uncertain.

$^{152}_{62}Sm_{90}$-25

Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified

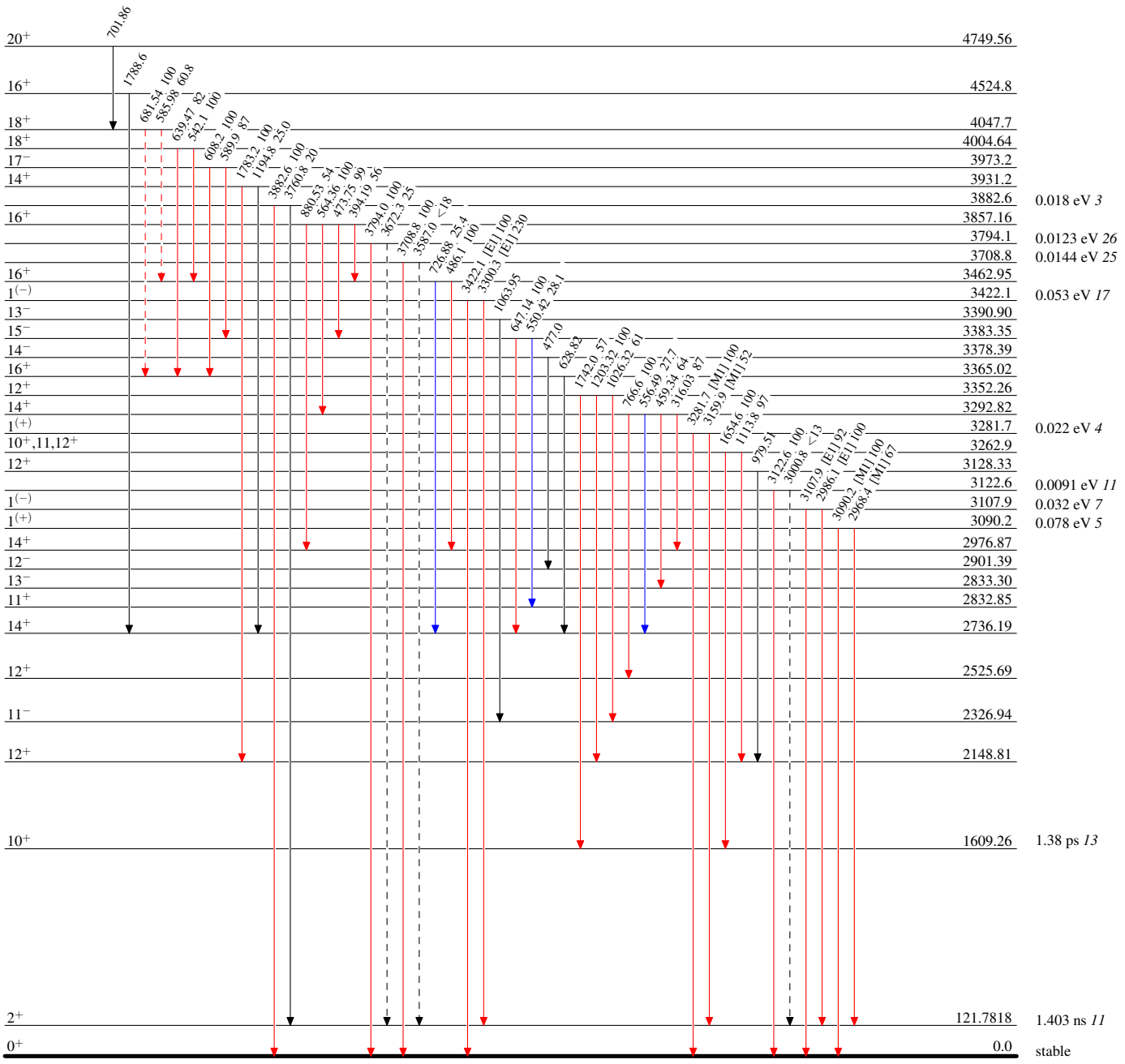
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)

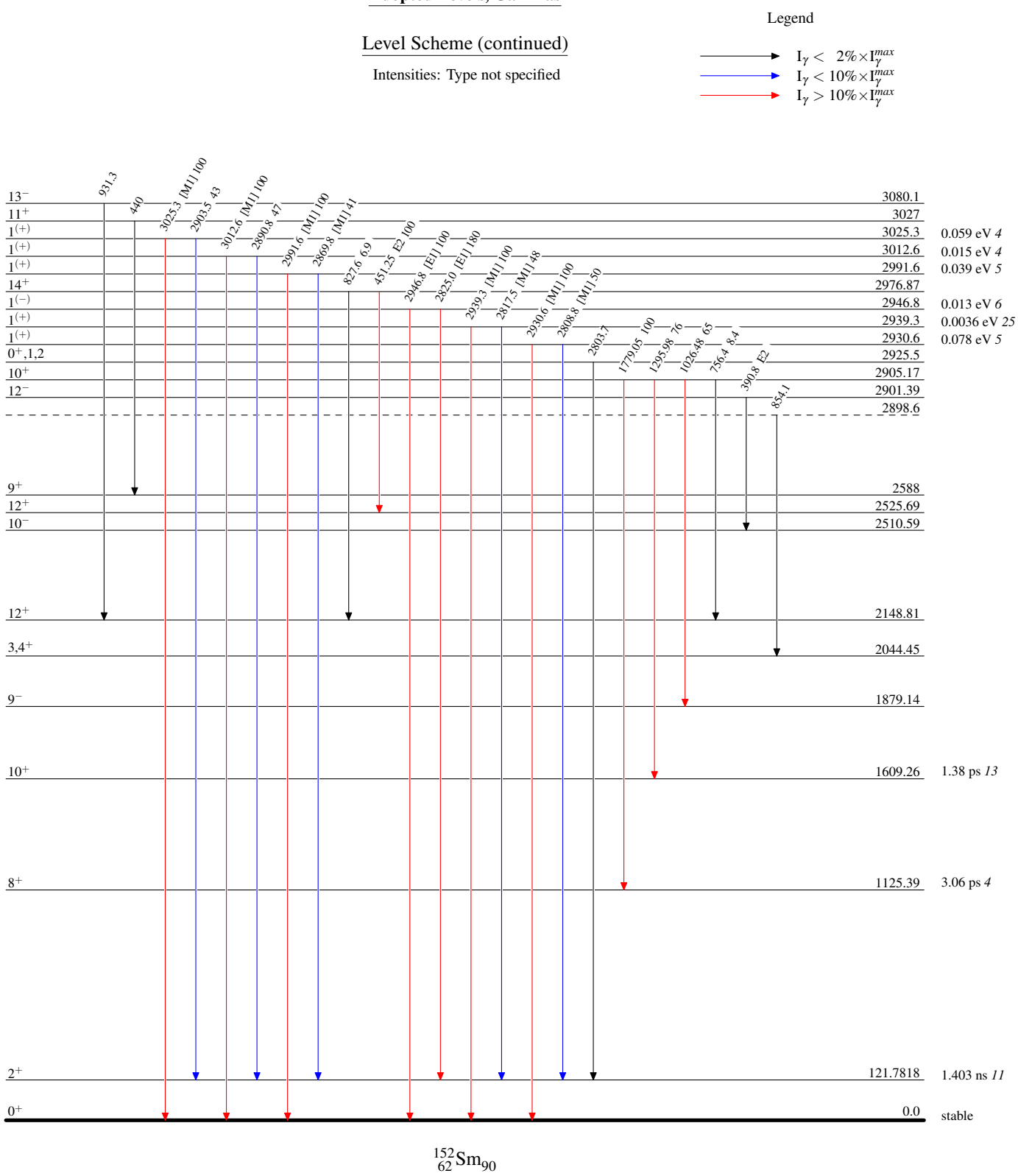


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

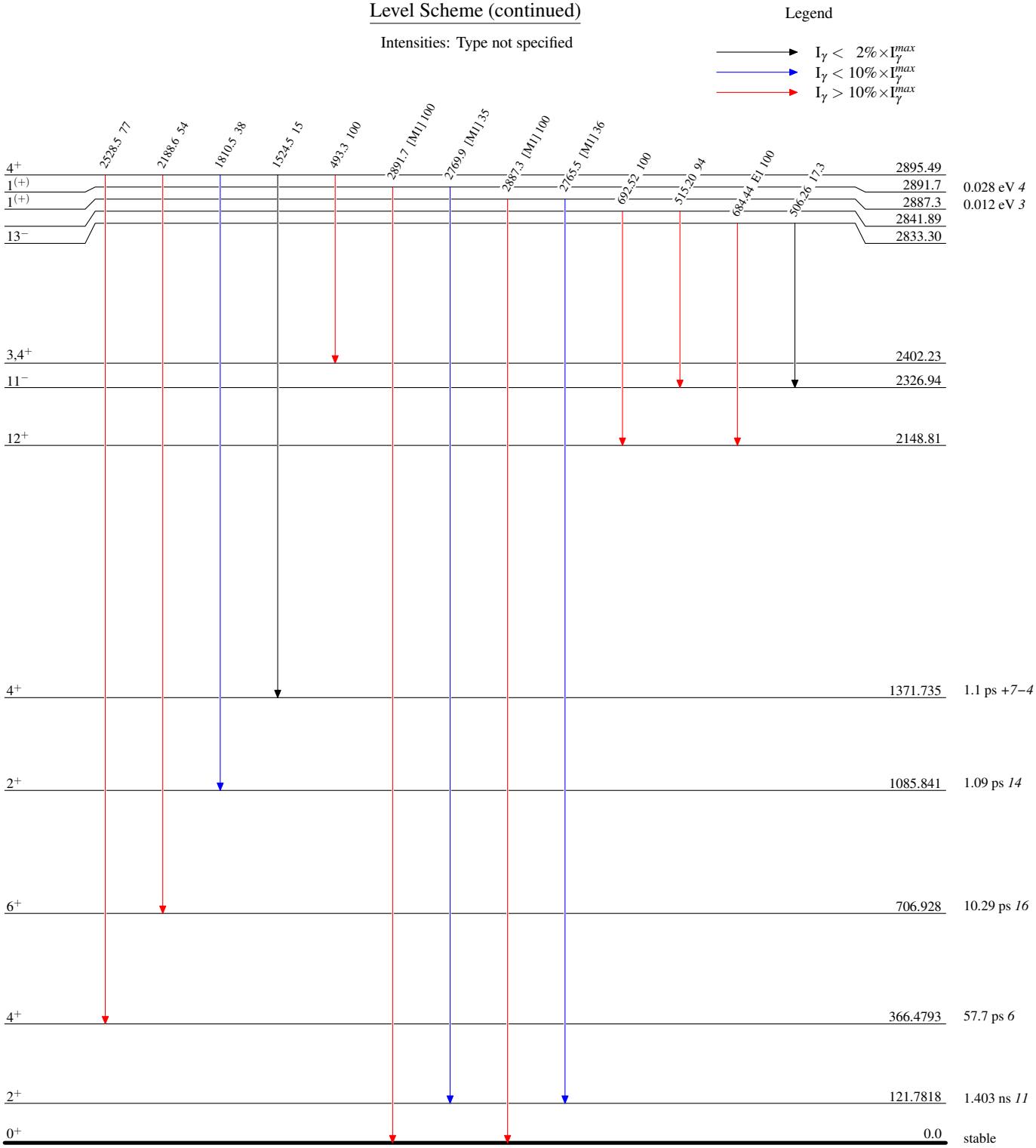


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

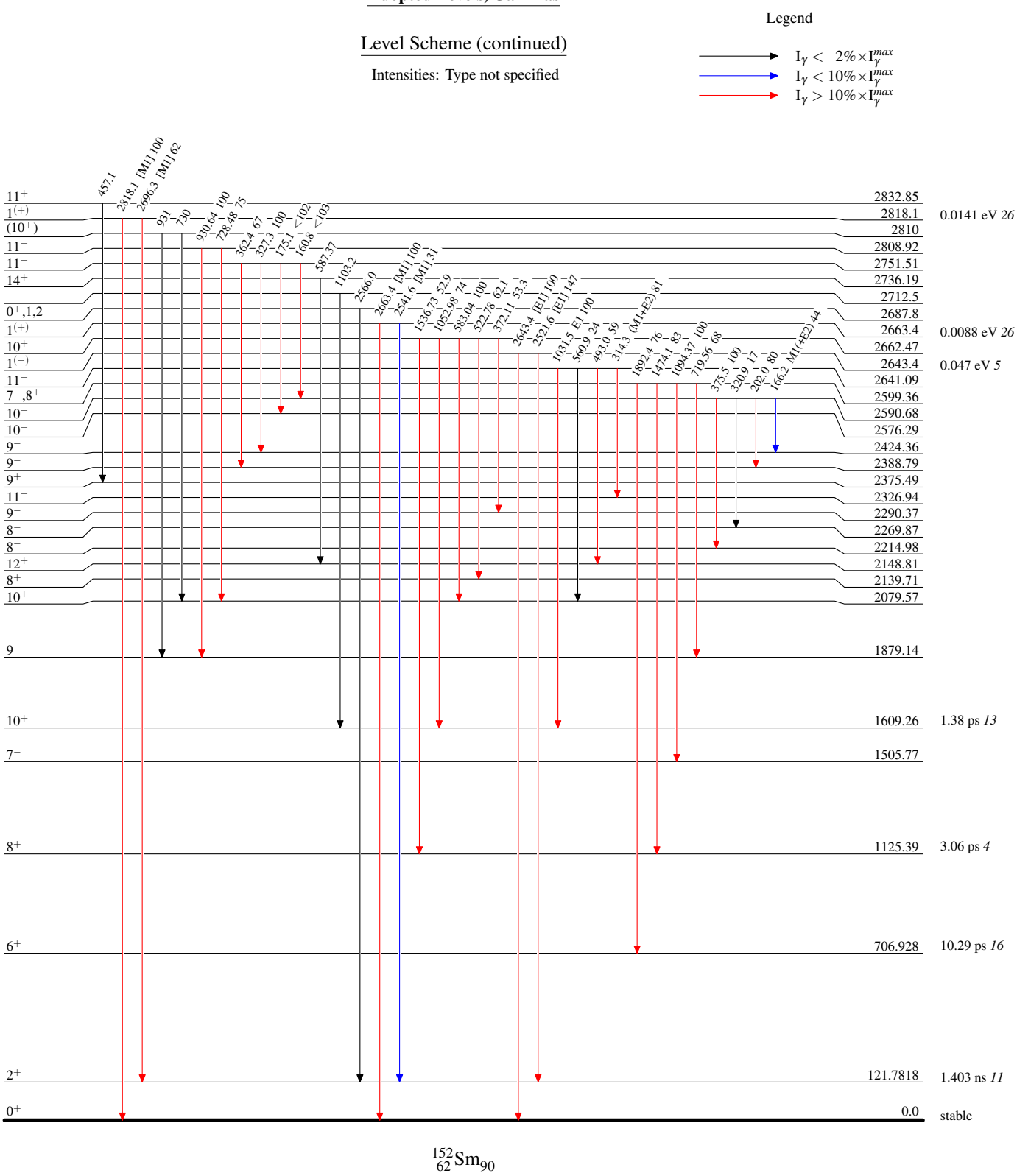


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

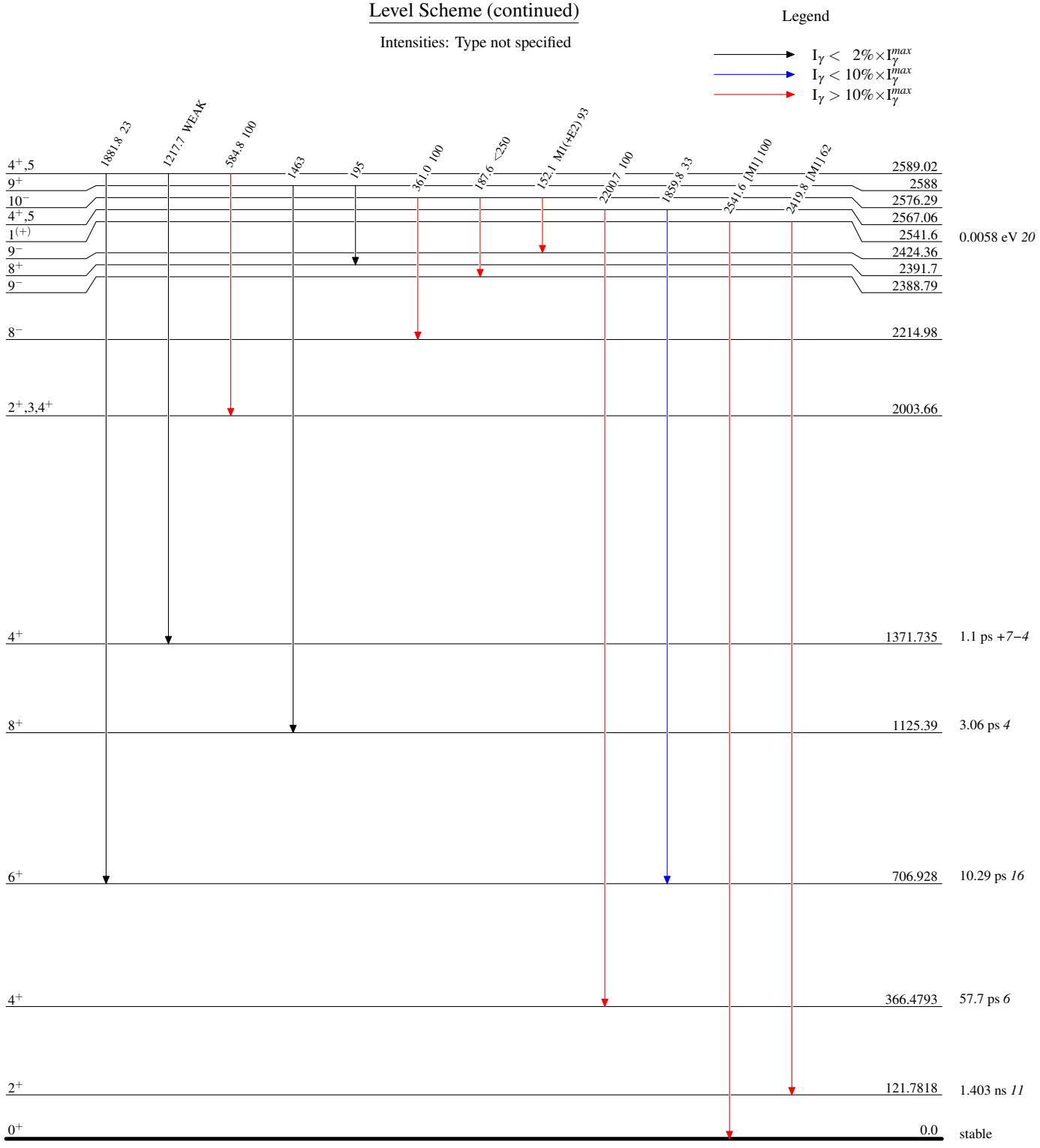


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

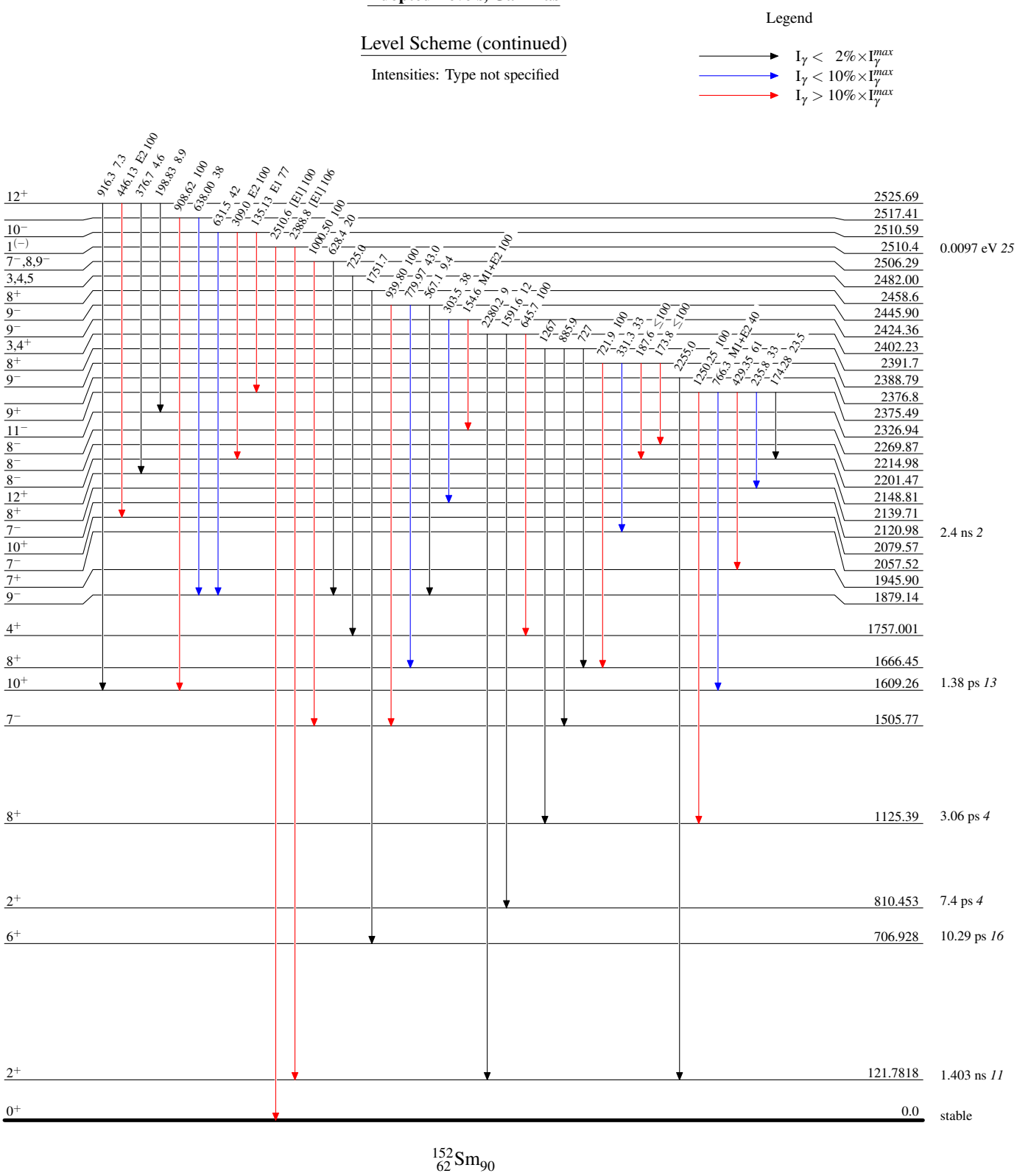


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

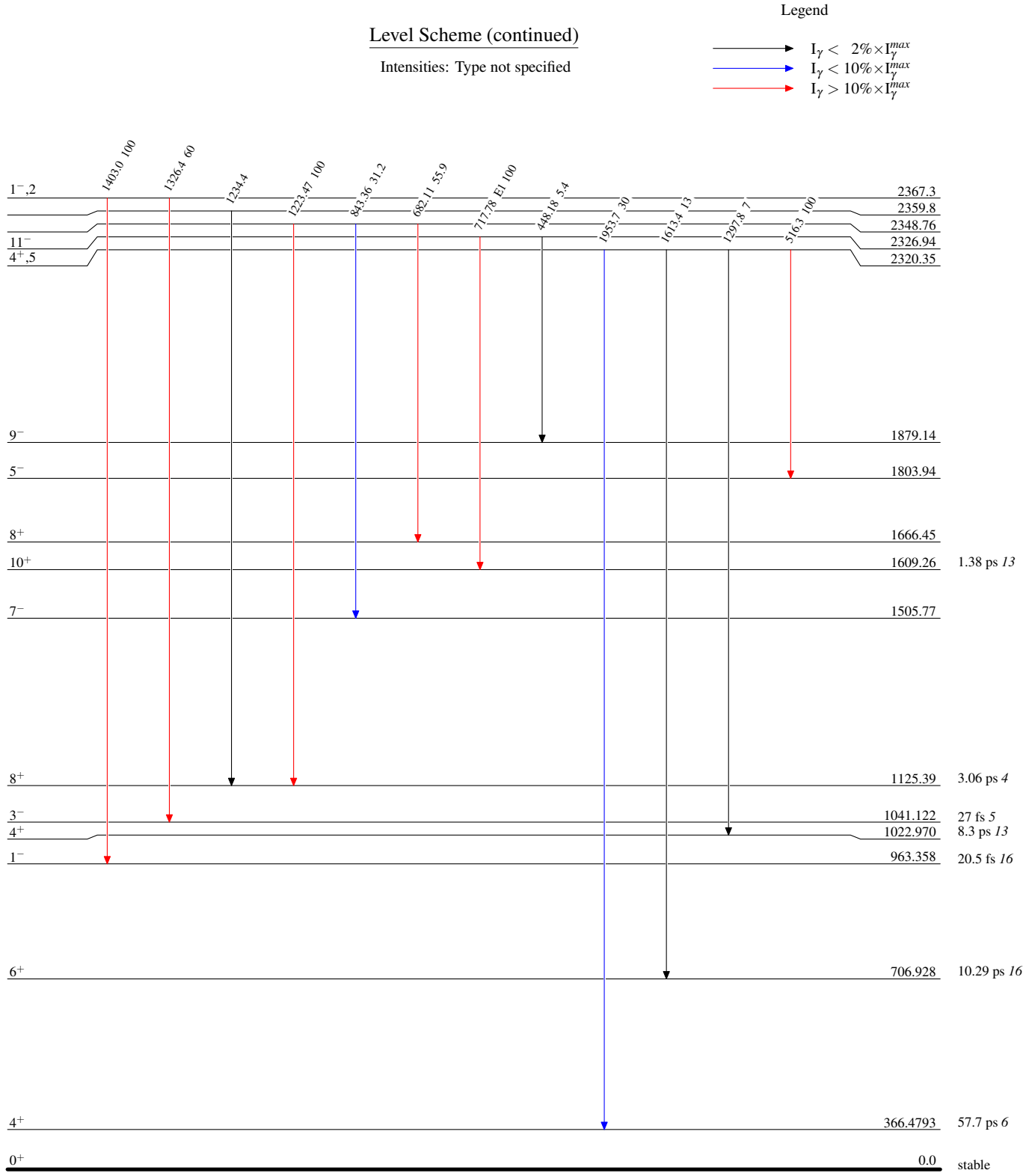


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

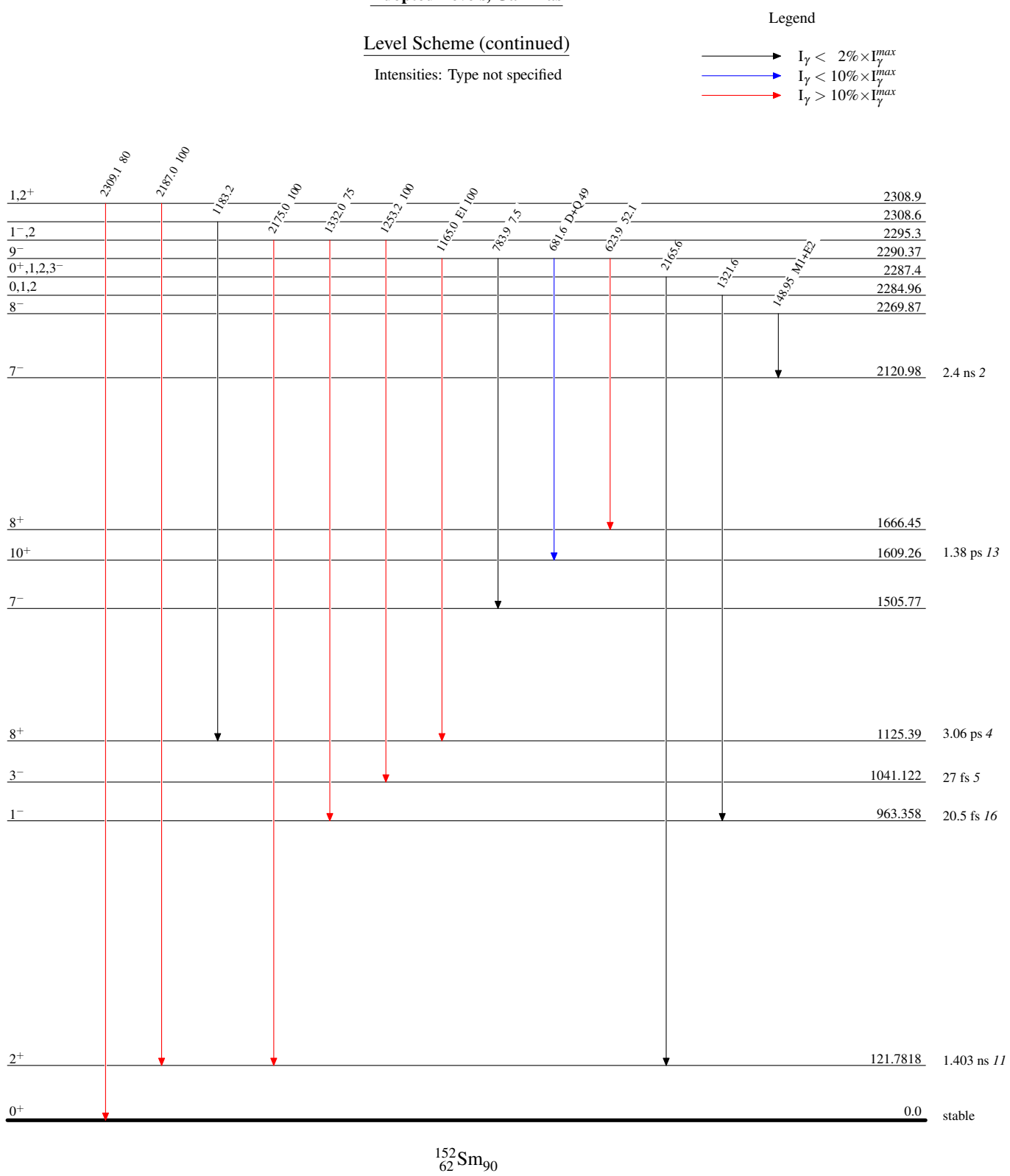


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

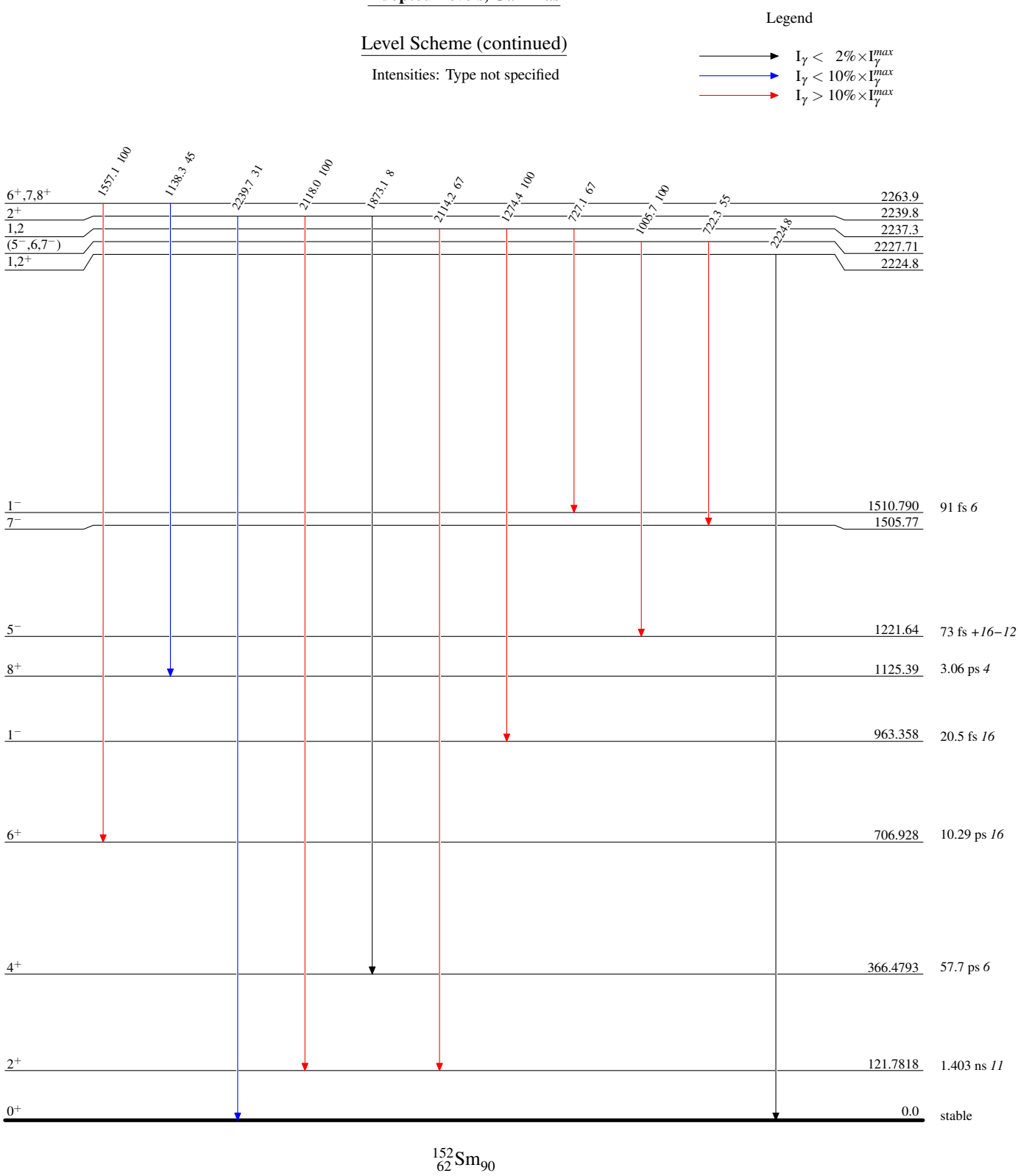


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

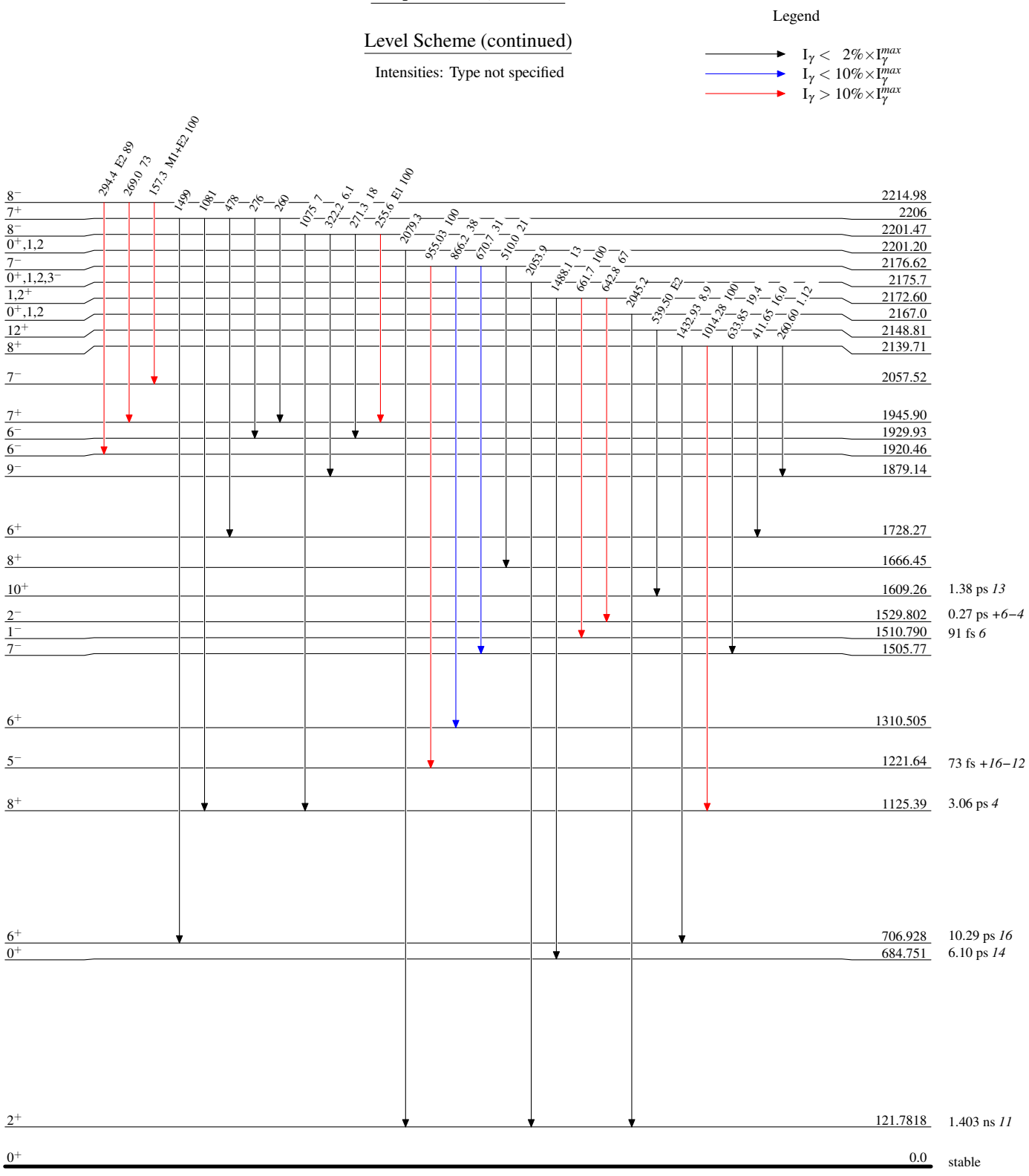


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

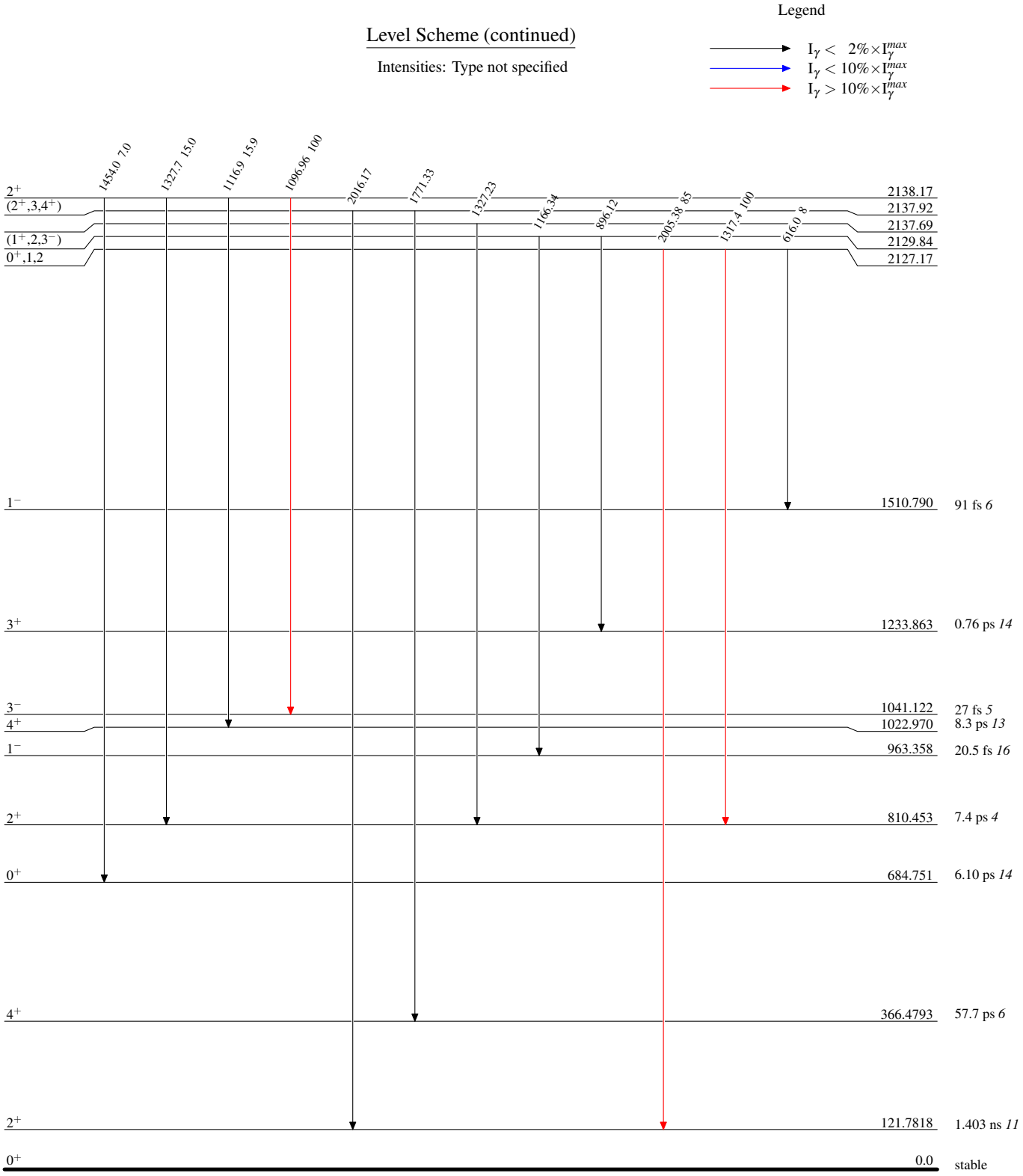


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

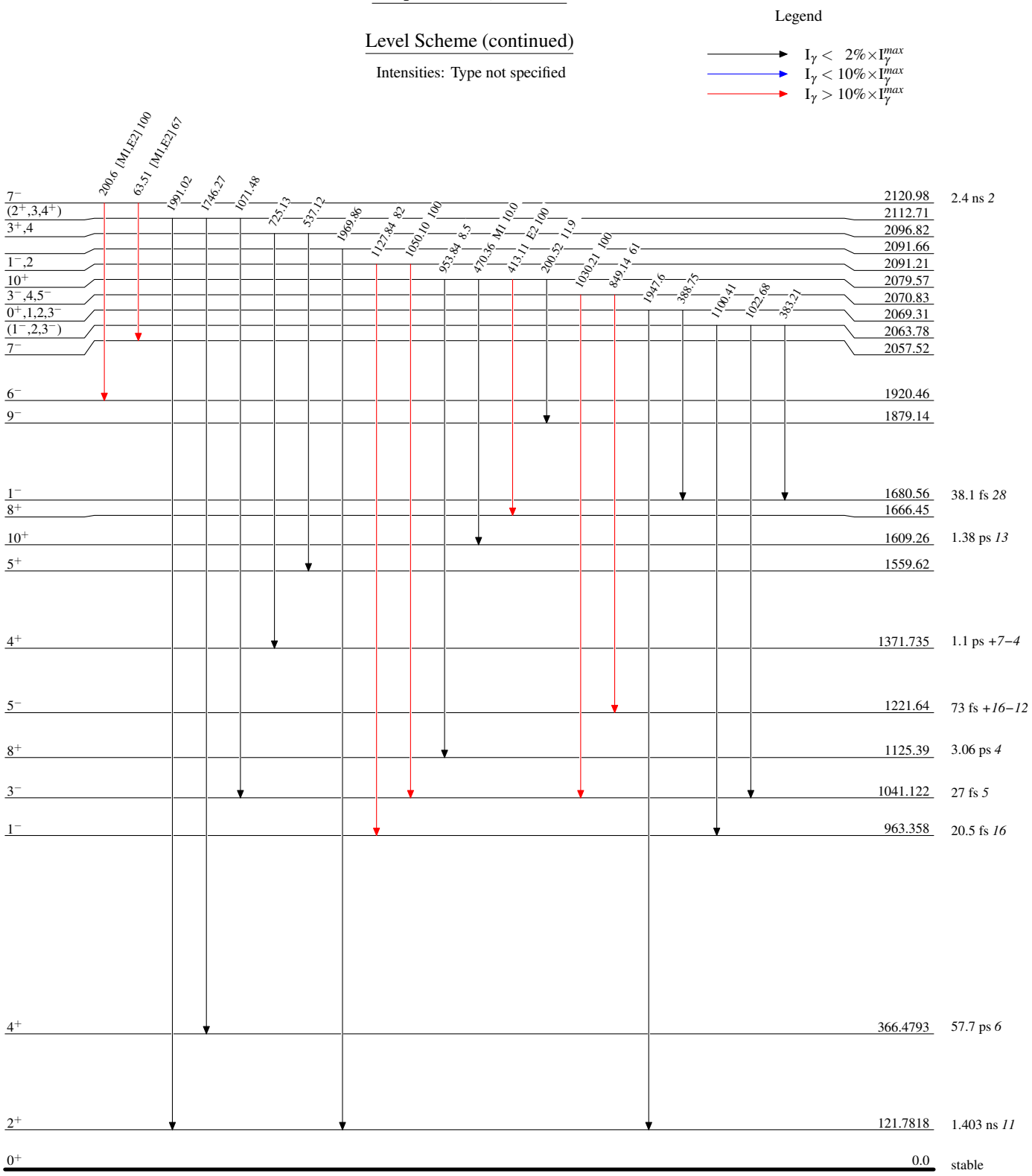


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

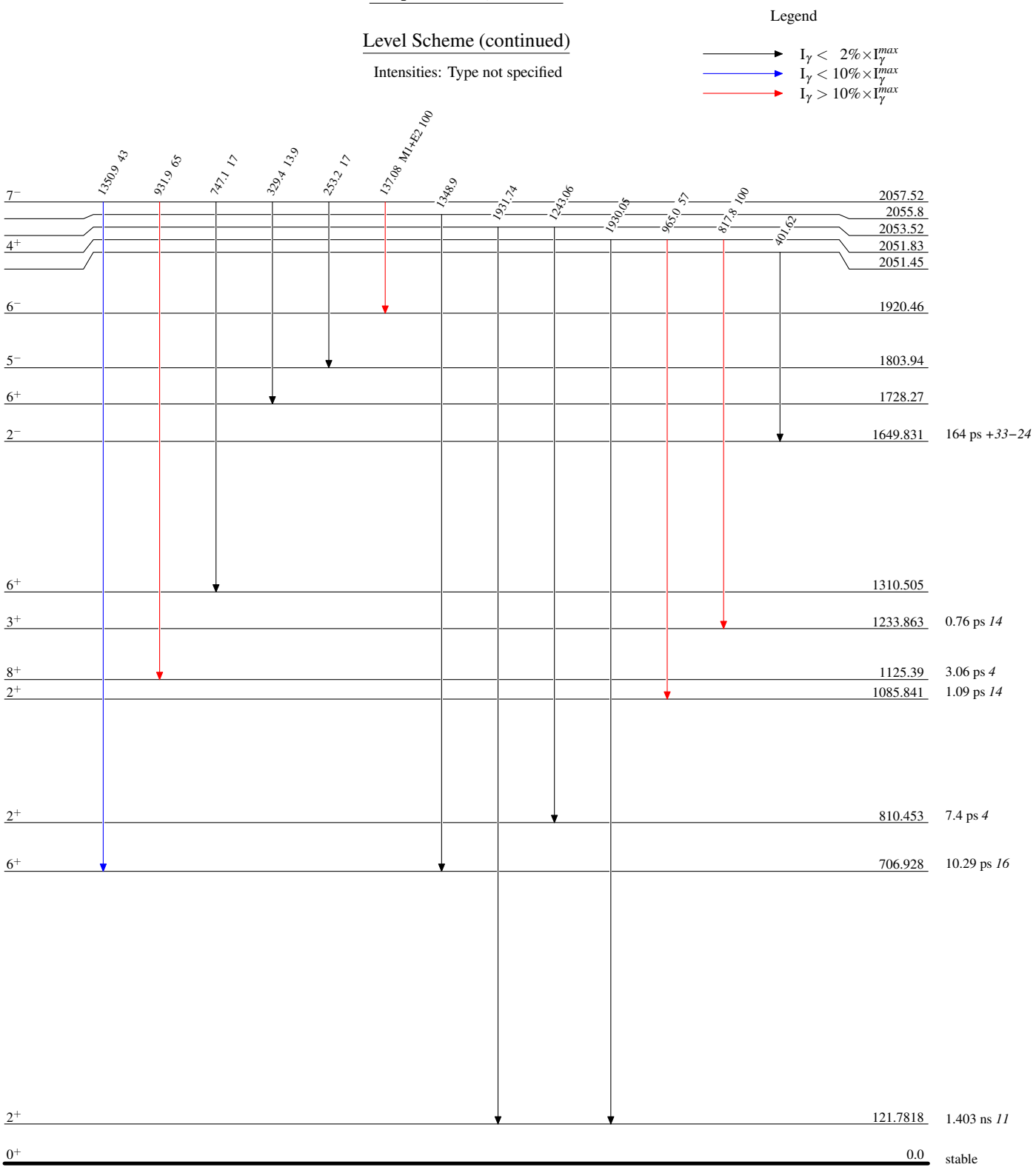


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

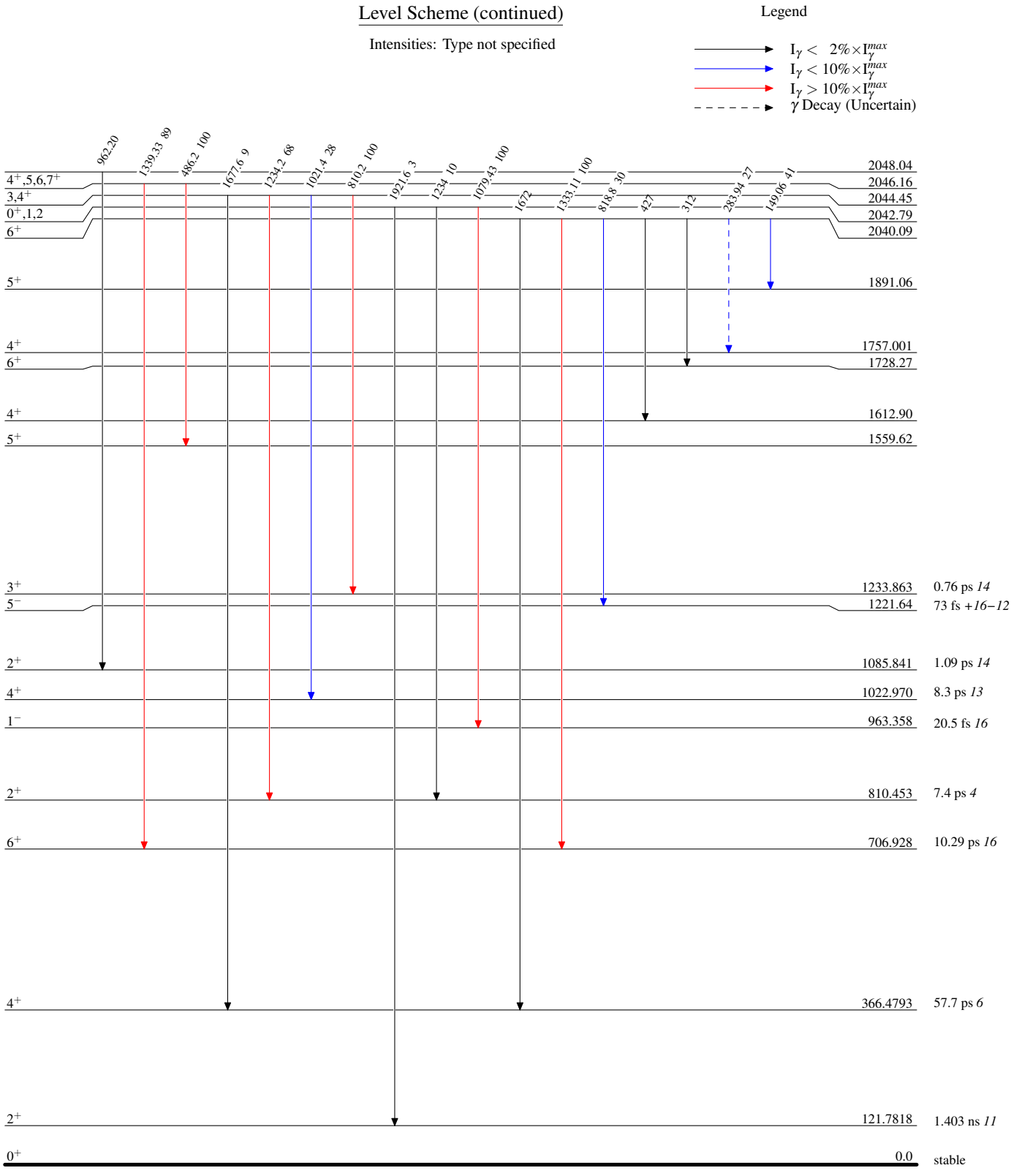


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

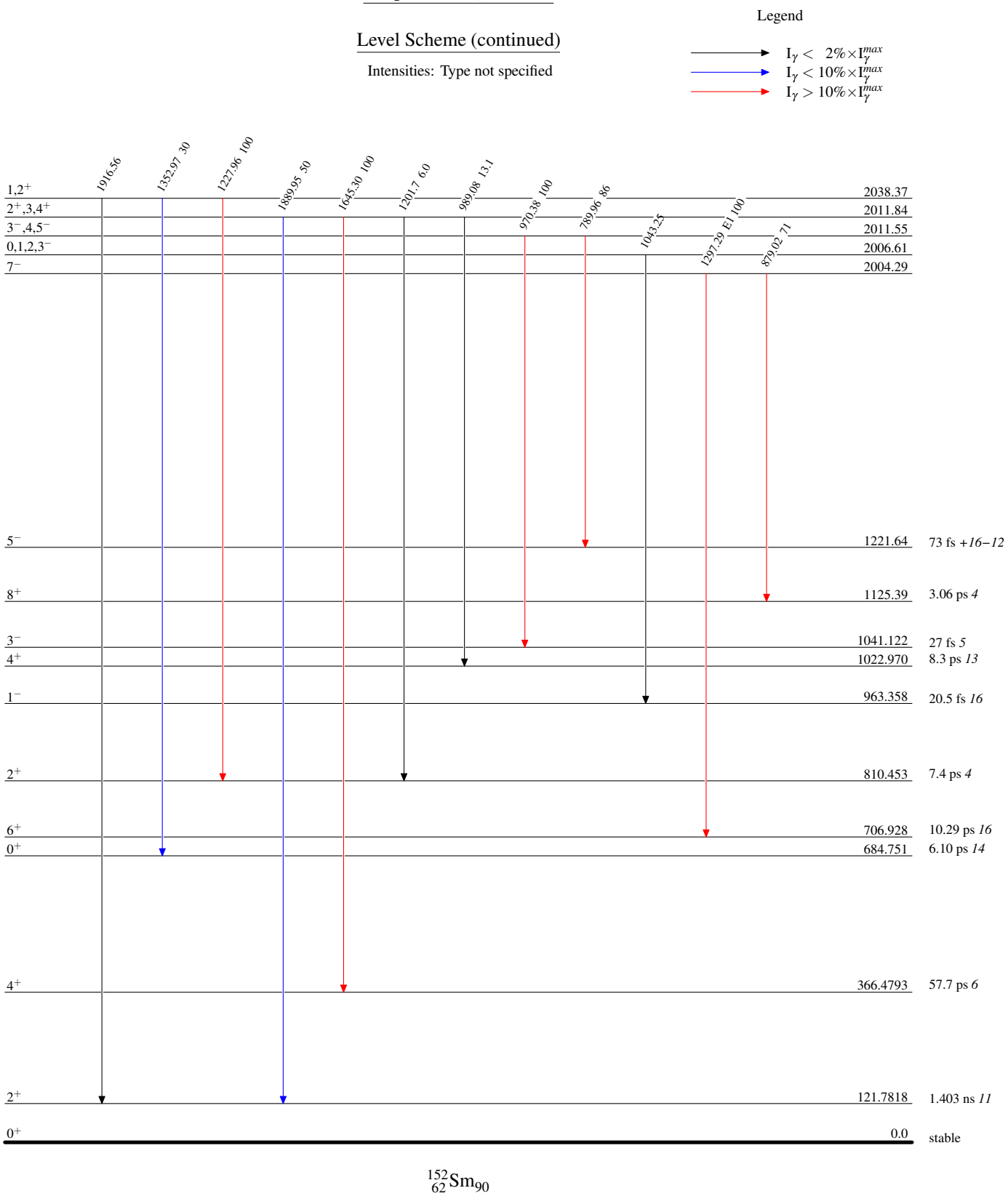


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

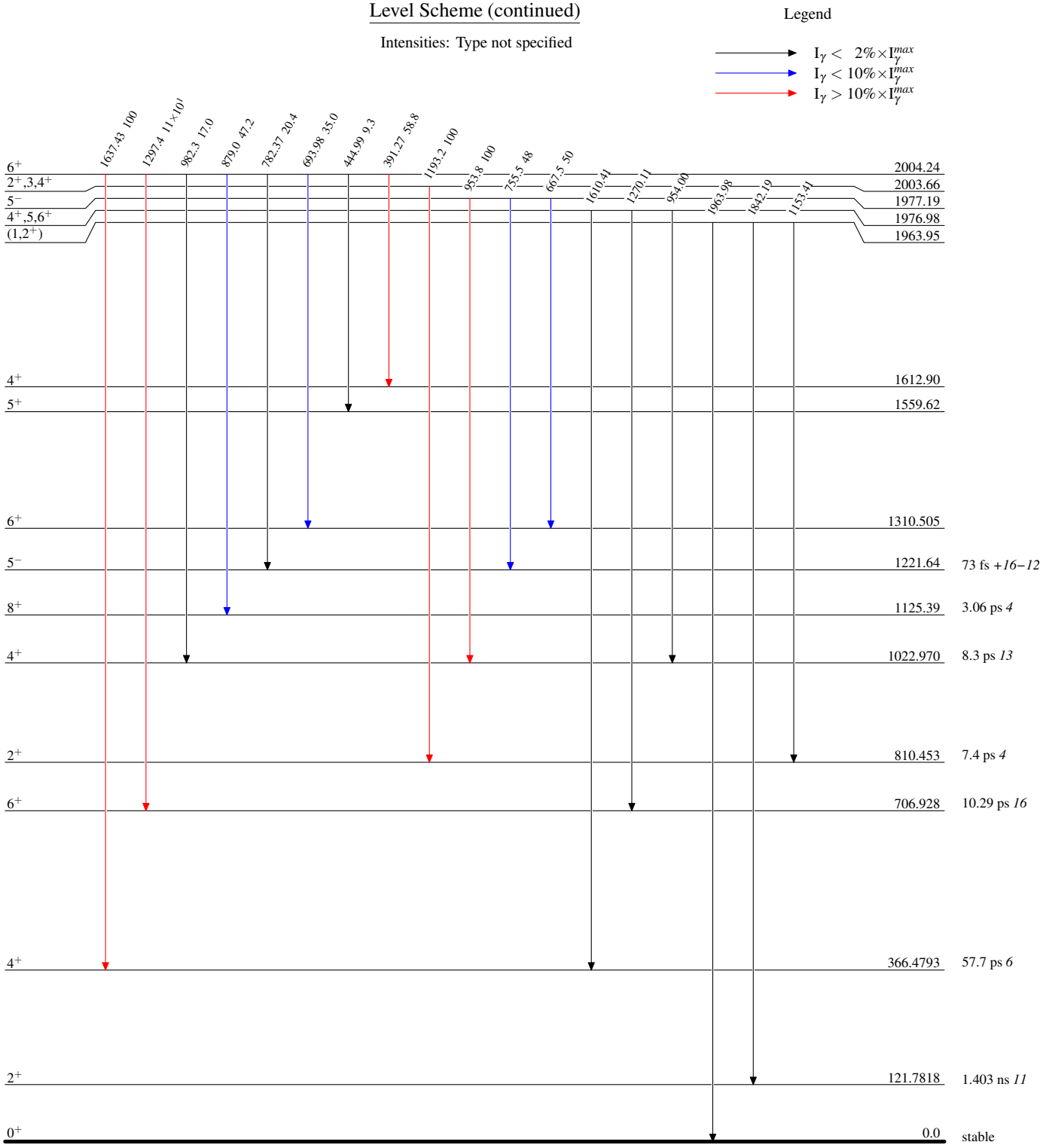


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

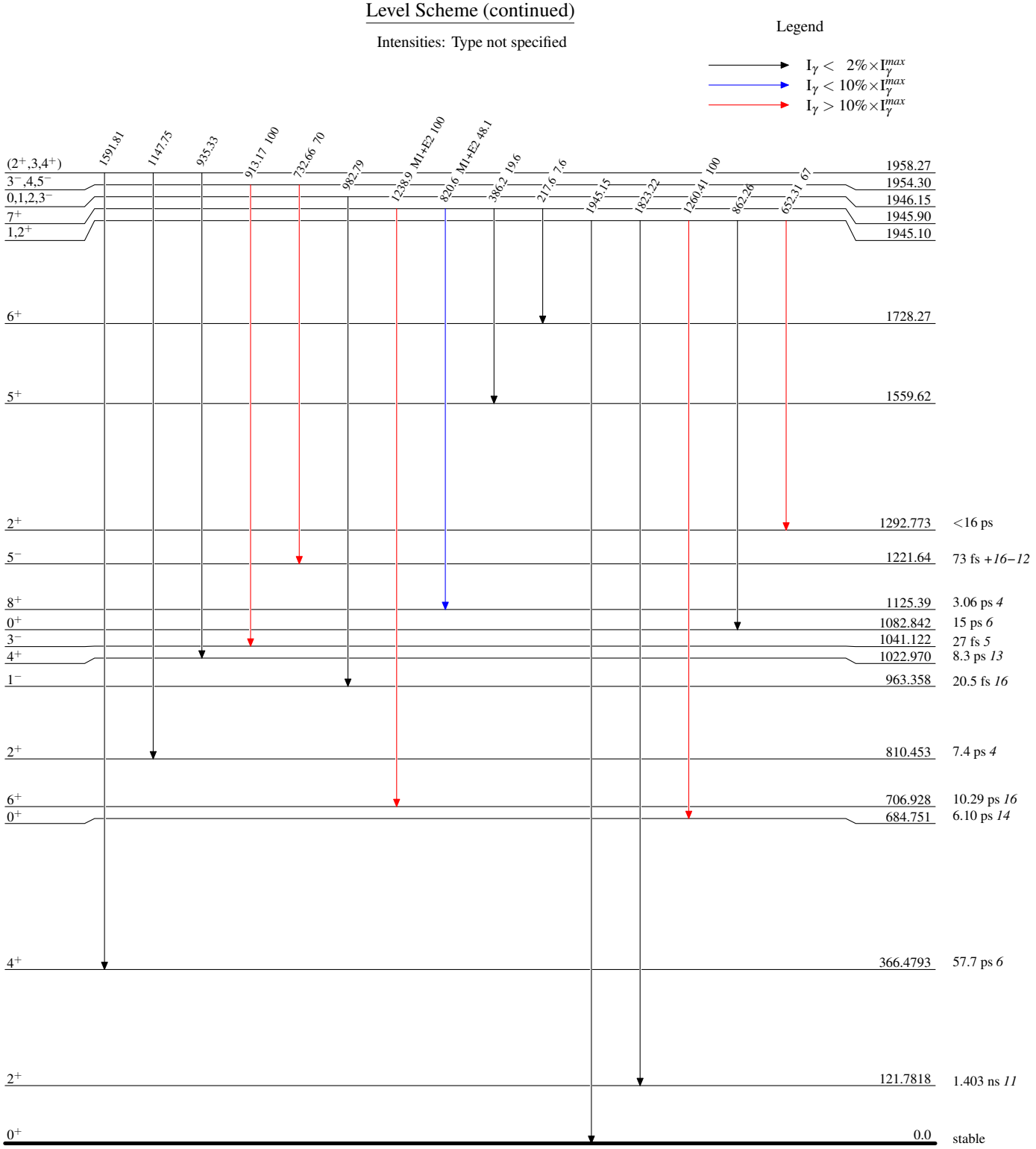


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

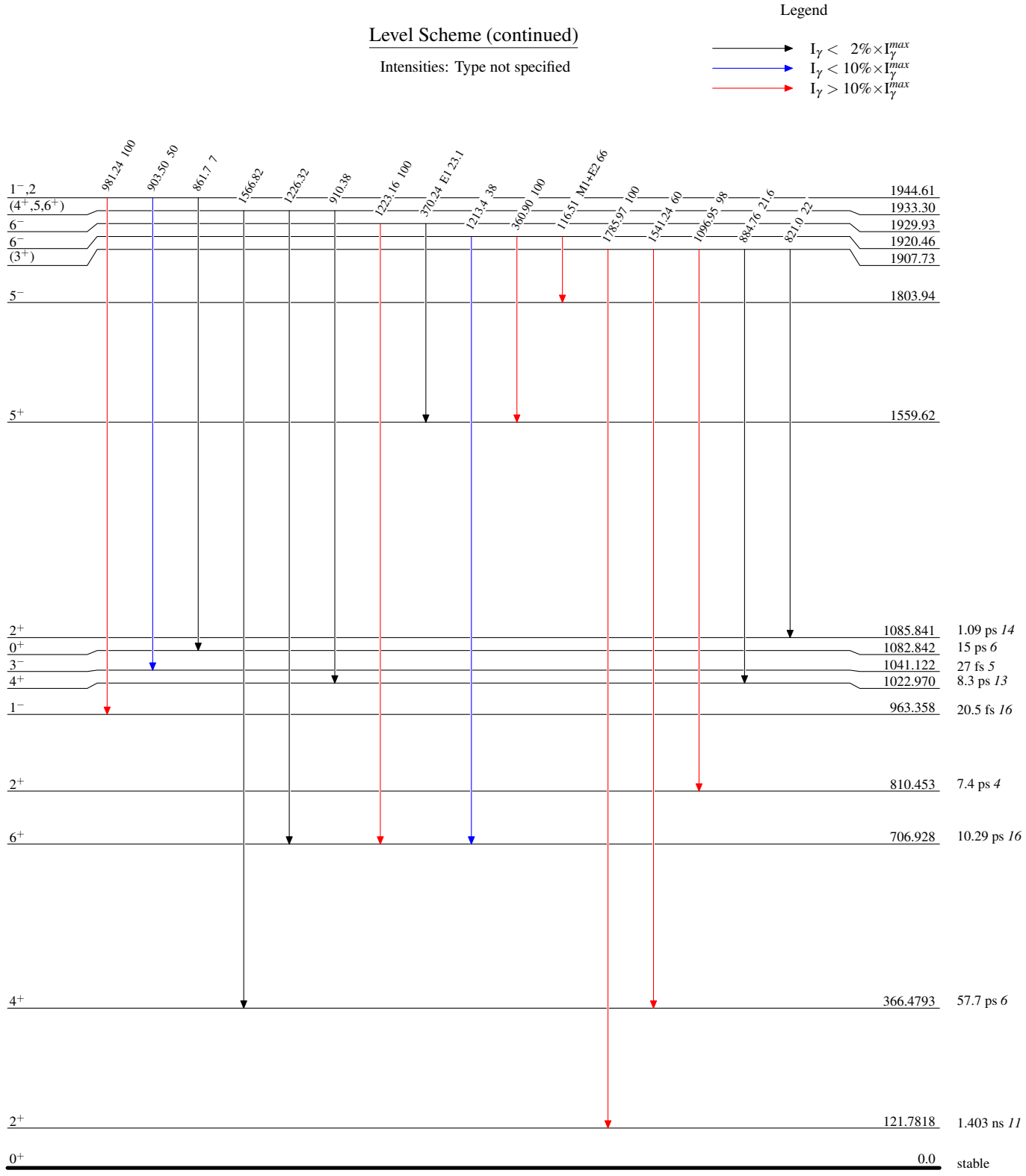


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

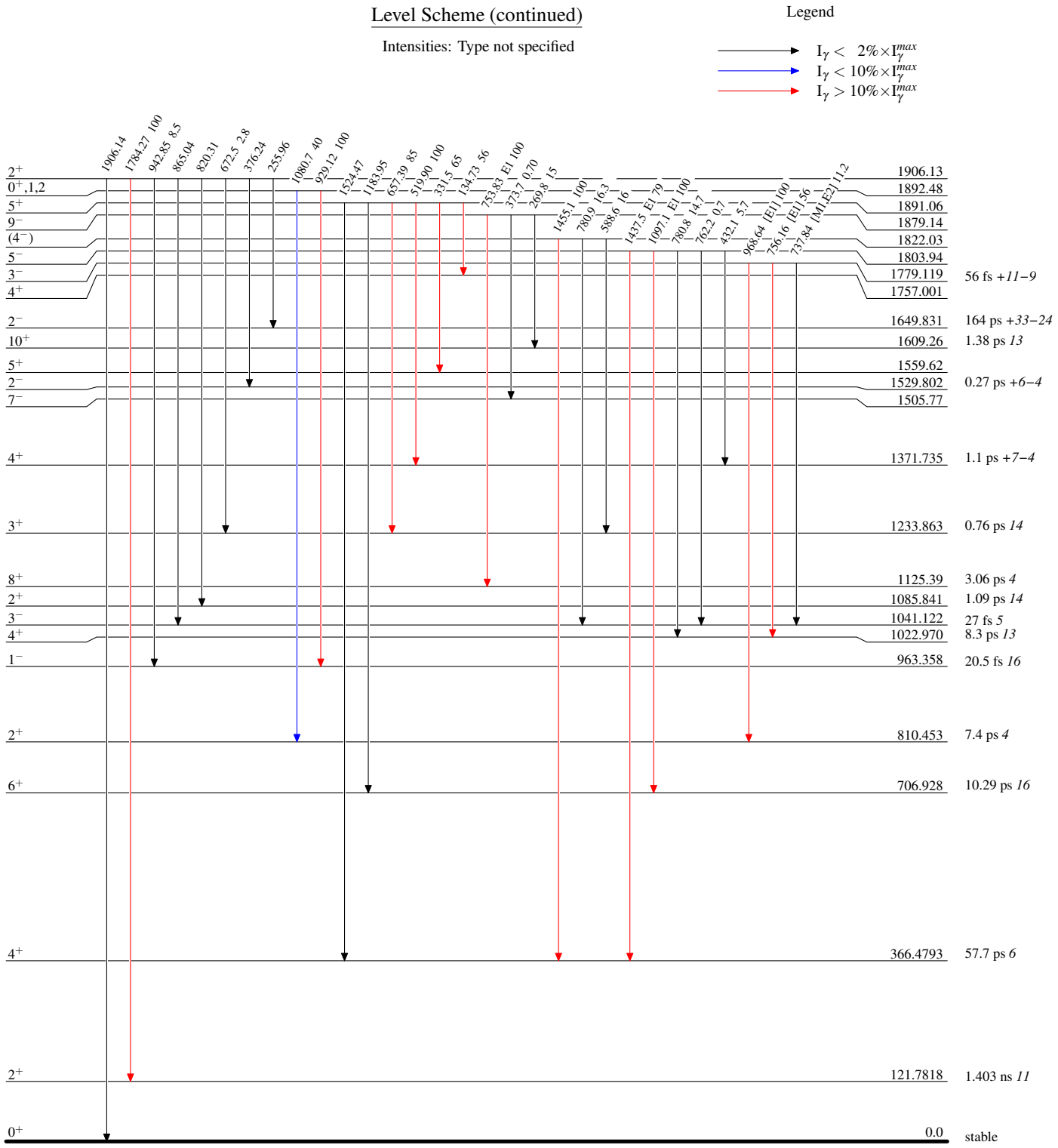


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

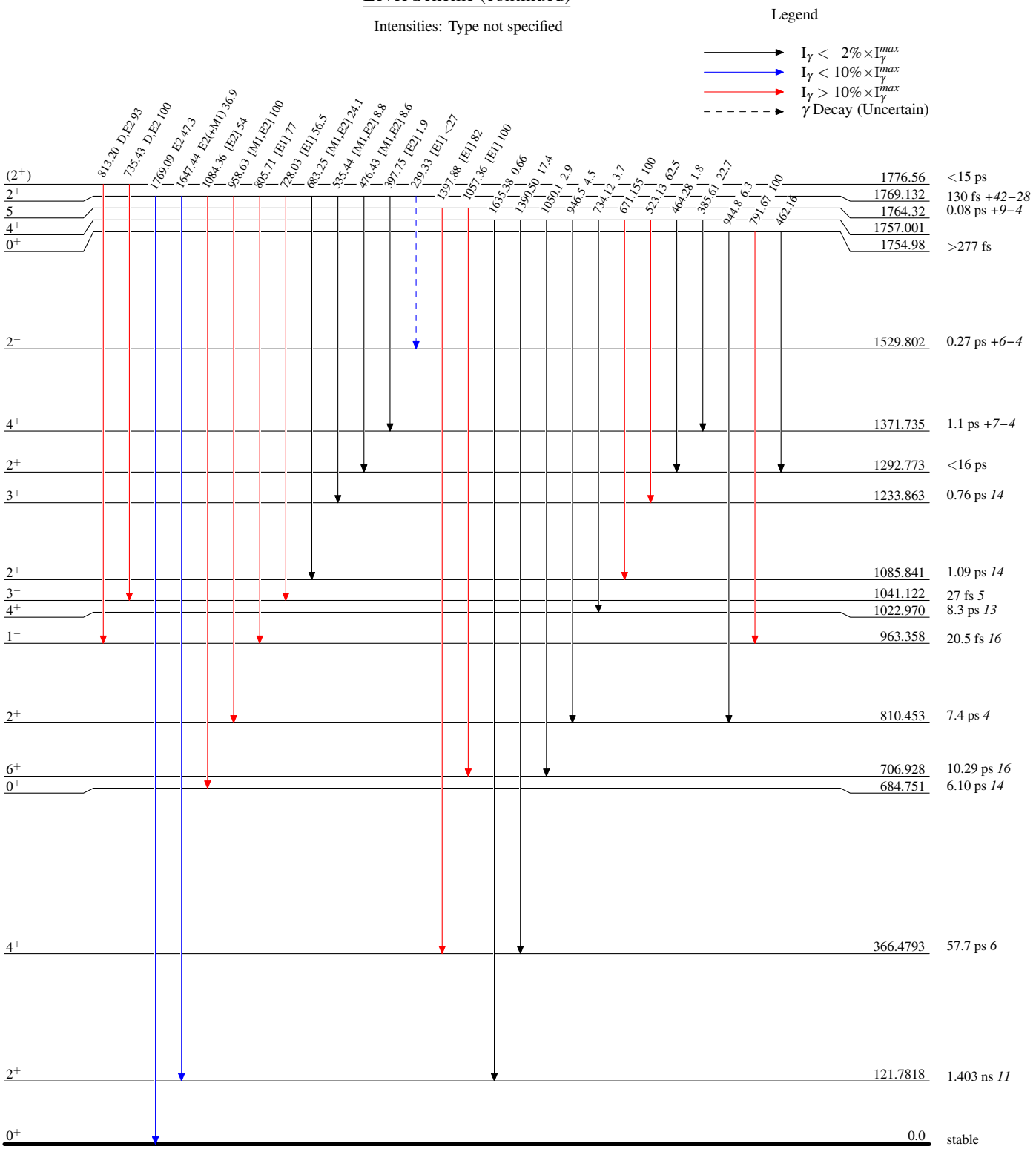


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

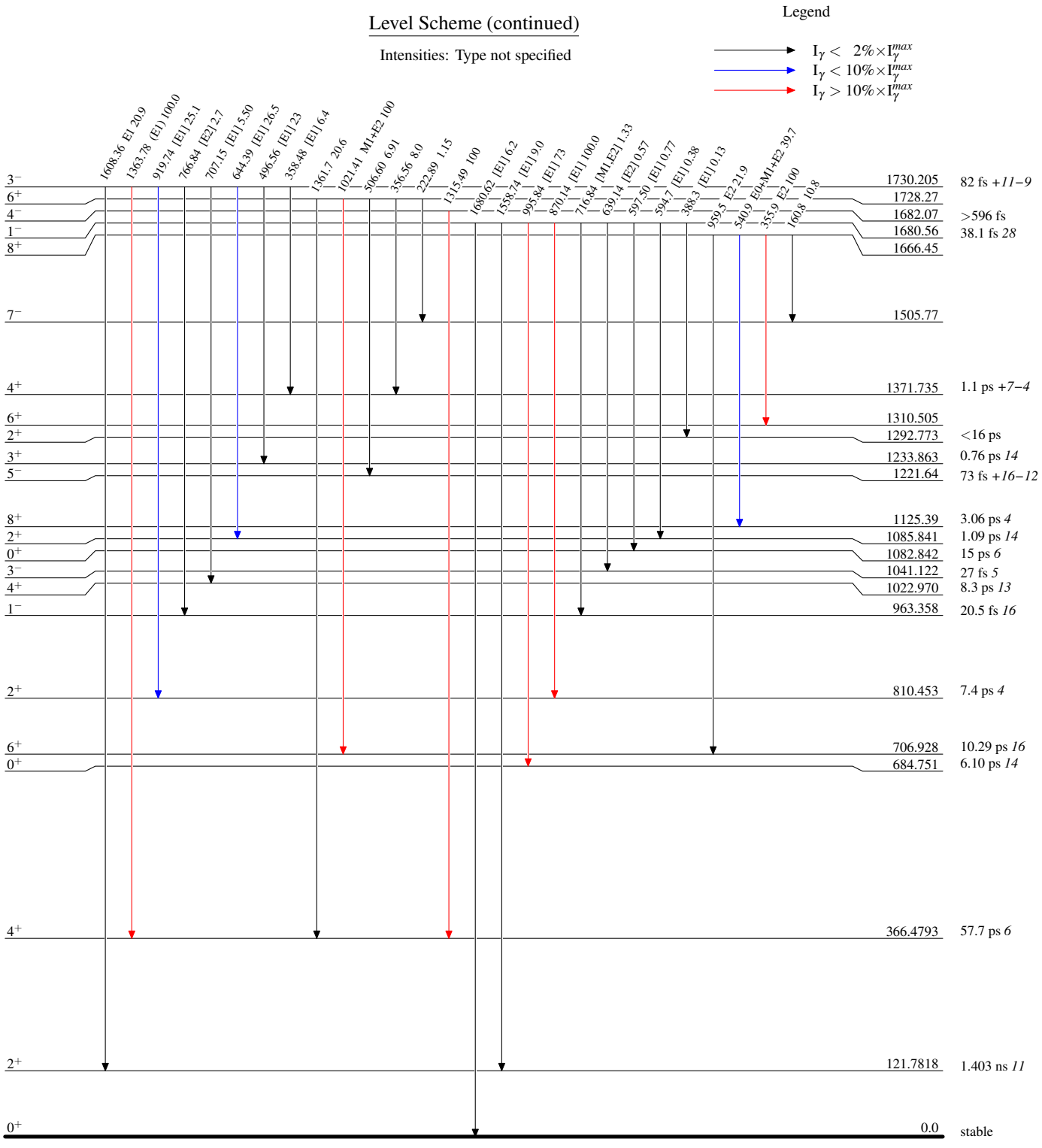


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

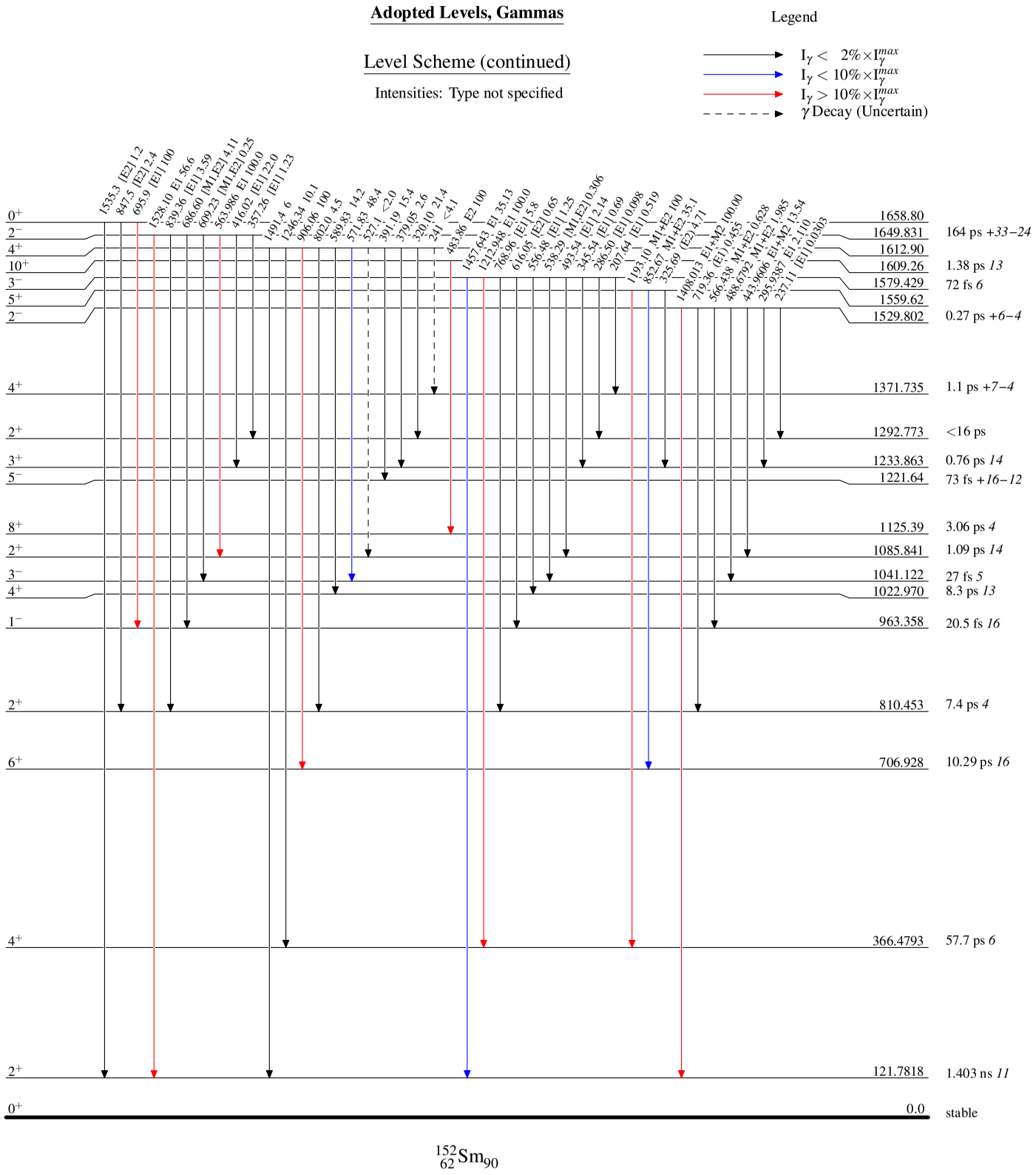


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

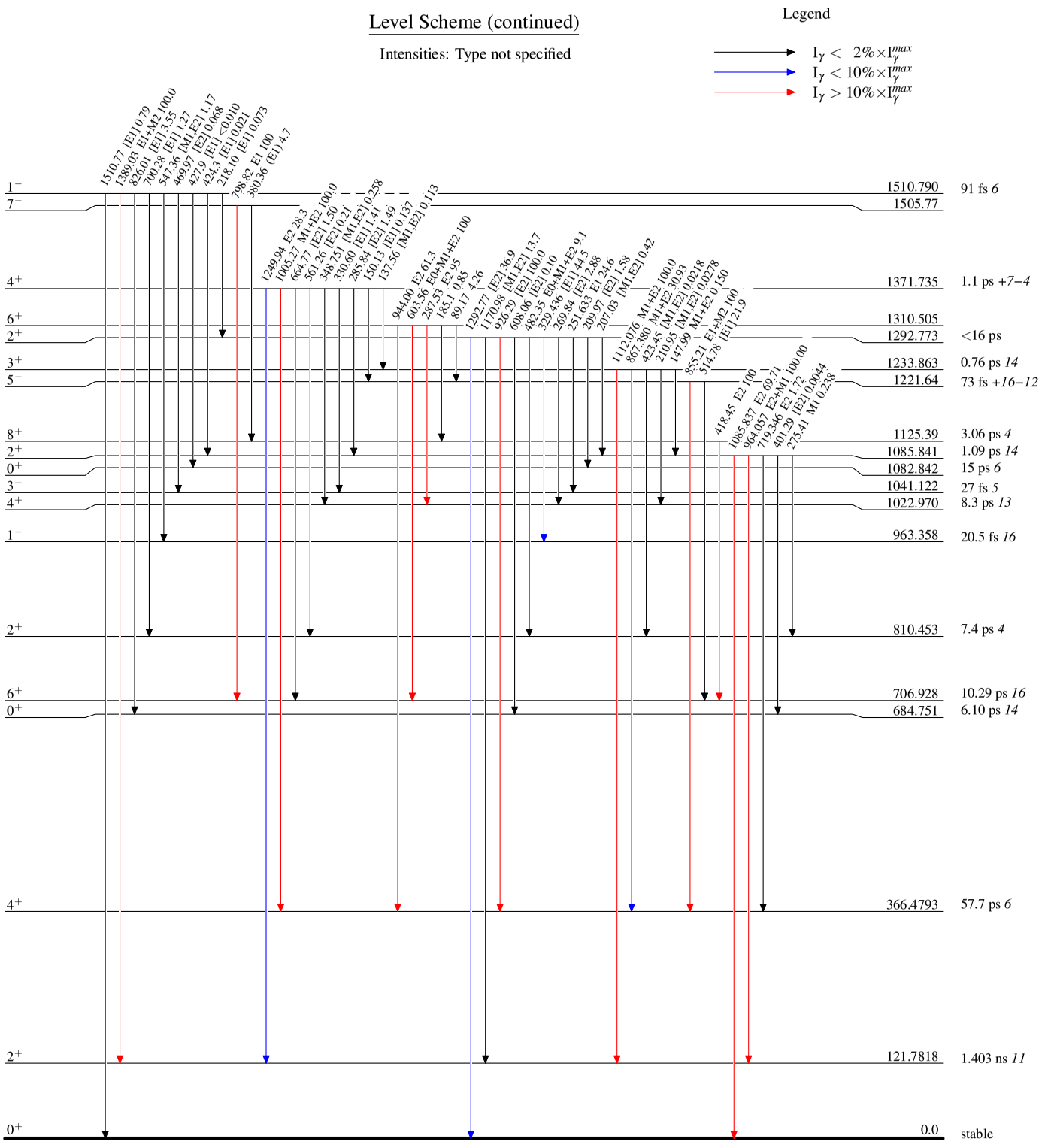


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

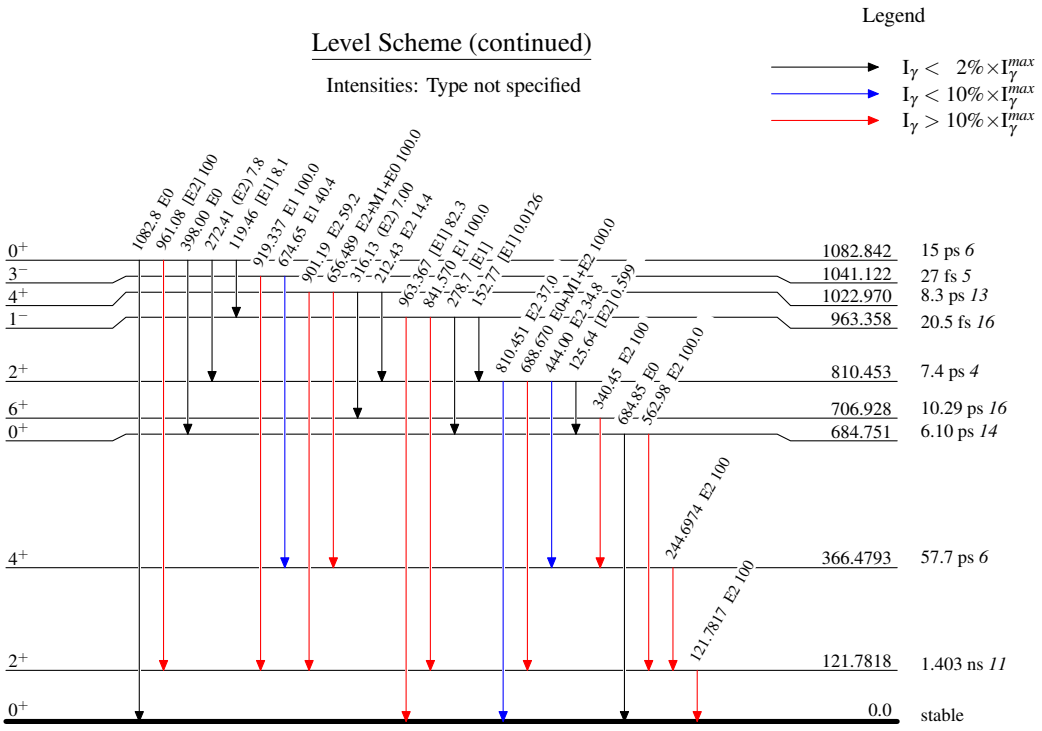


$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas

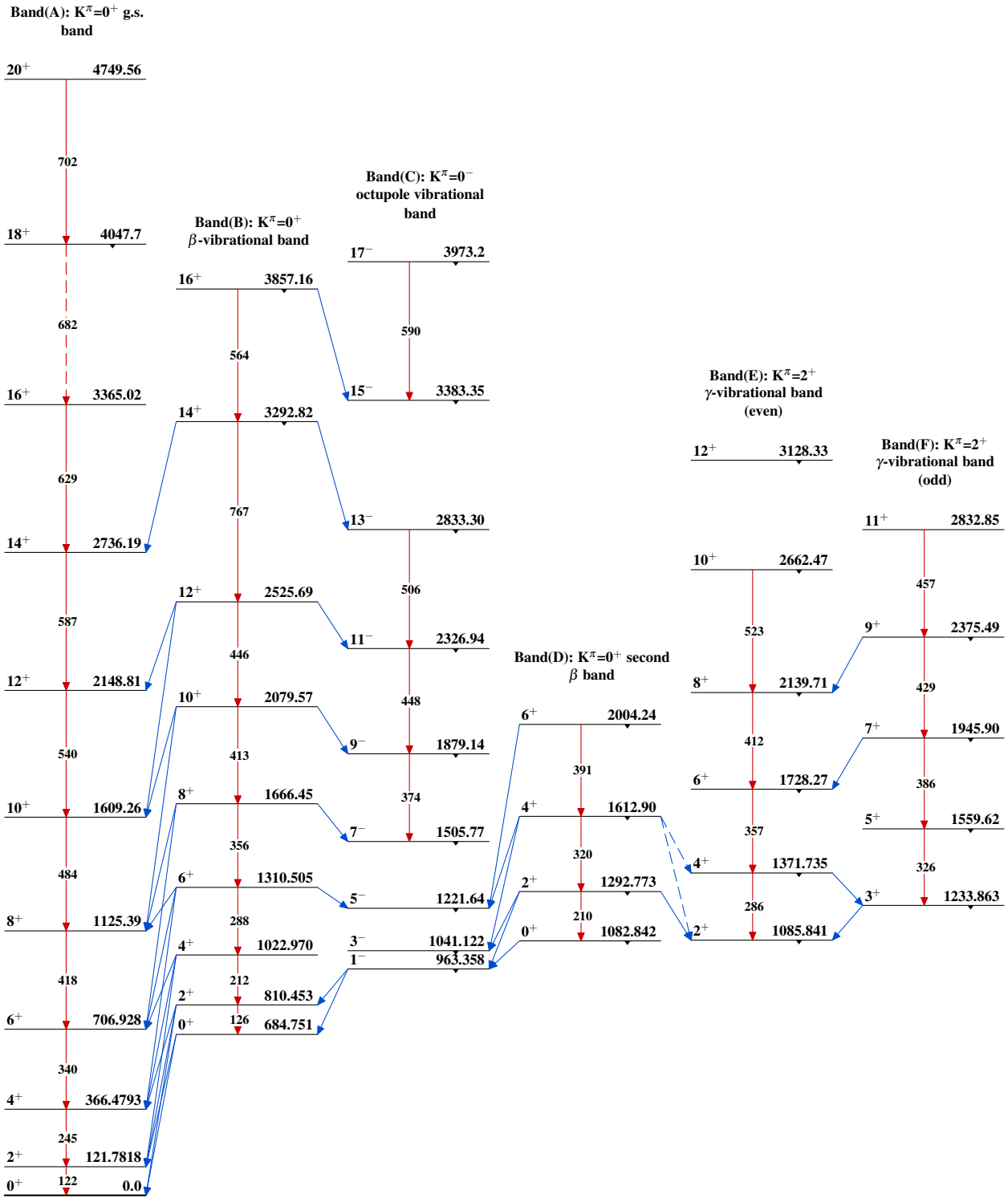
Level Scheme (continued)

Intensities: Type not specified



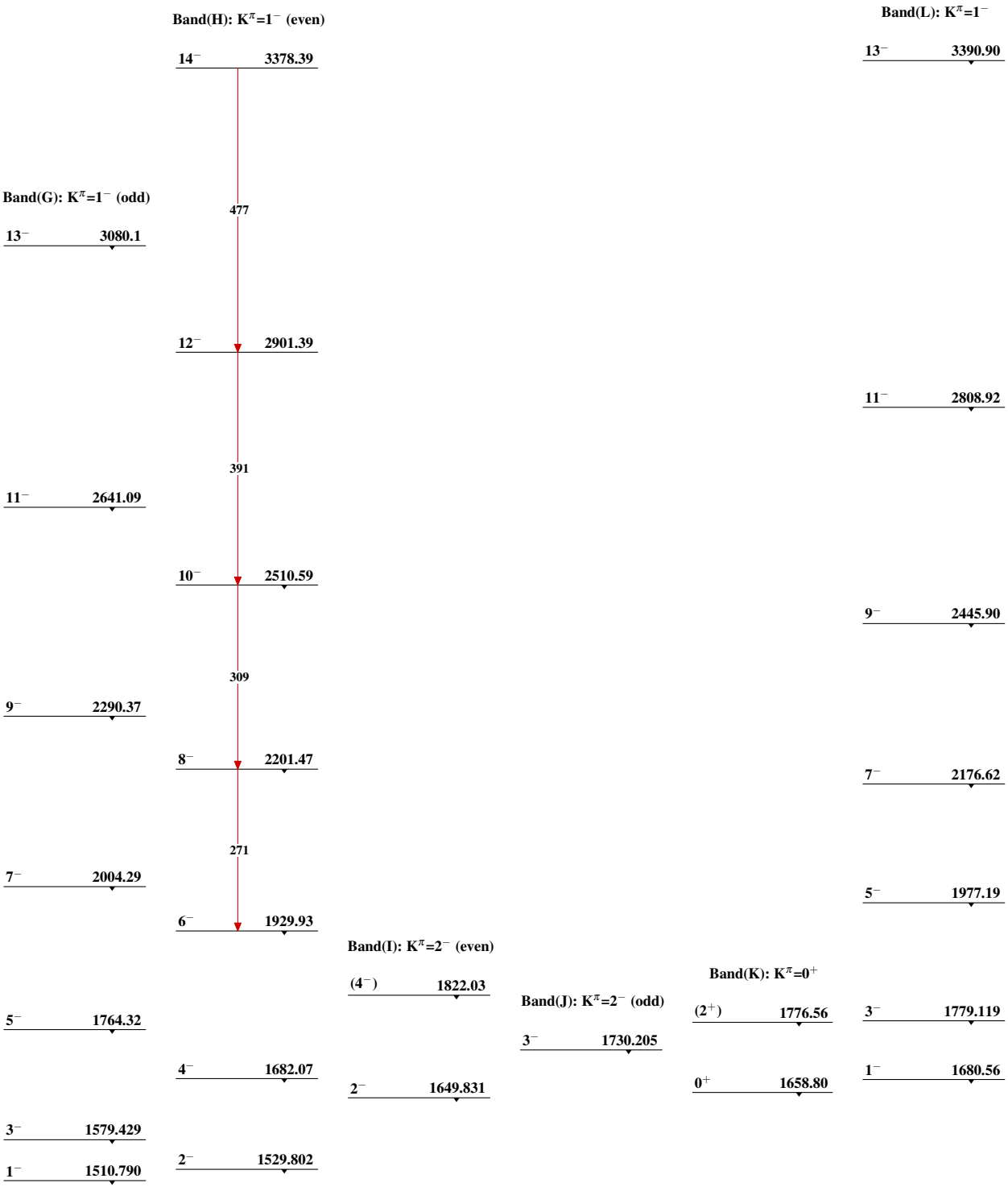
$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas



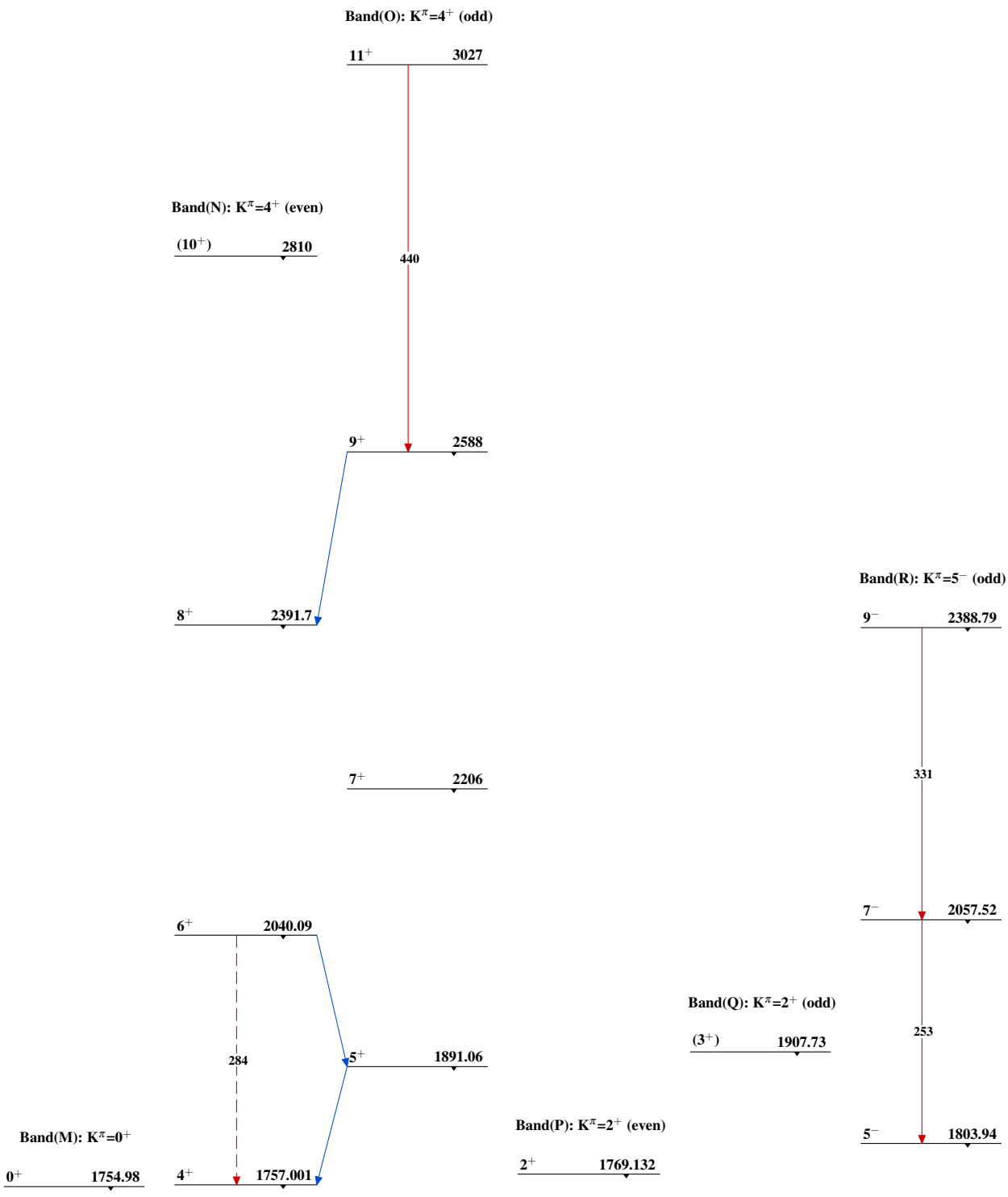
$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas (continued)



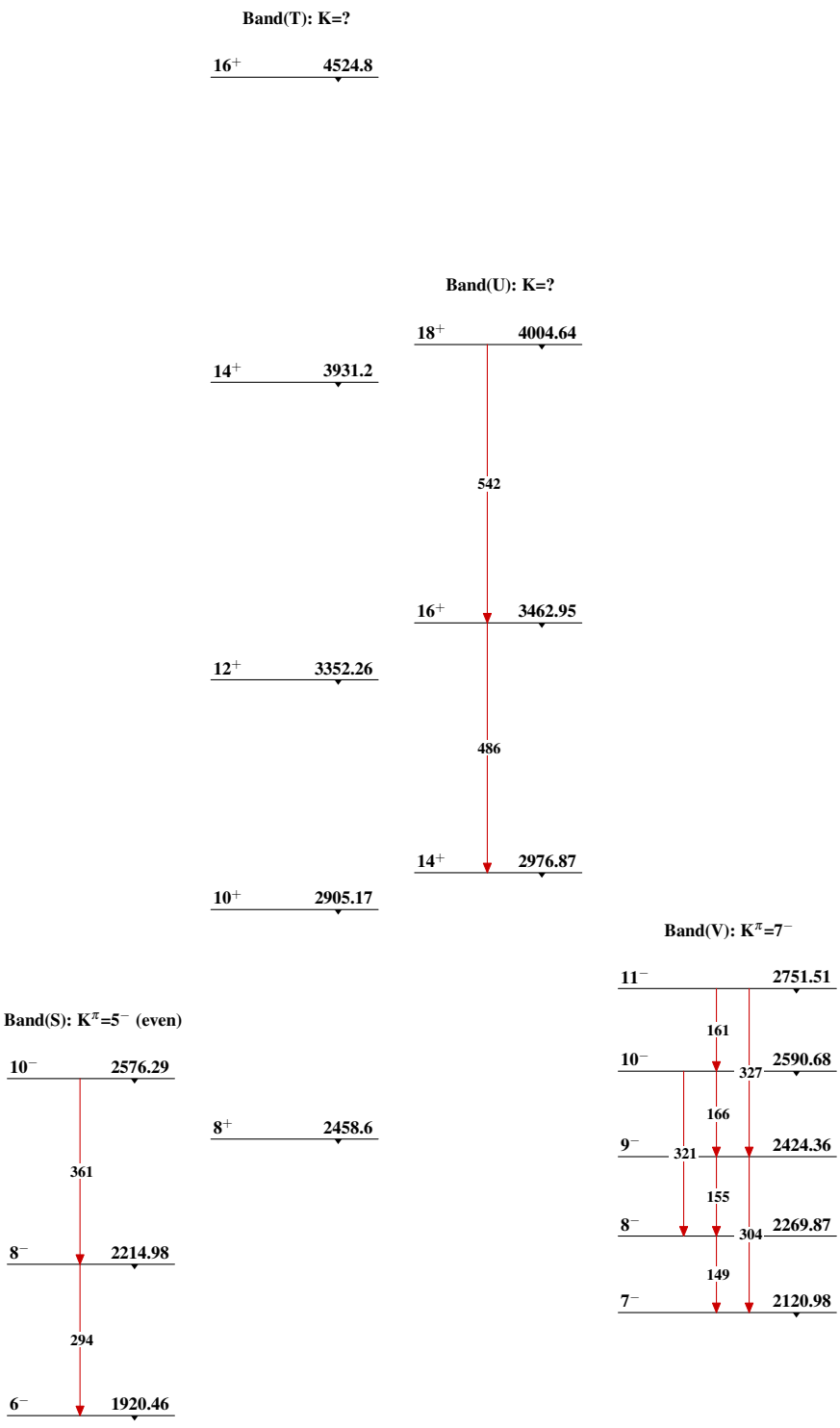
$^{152}_{62}Sm_{90}$

Adopted Levels, Gammas (continued)



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

Adopted Levels, Gammas (continued)



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