Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 185, 2 (2022)	23-Aug-2022

Q(β^-)=1071.5 *19*; S(n)=7270 *6*; S(p)=5945.2 *25*; Q(α)=1137 *7* 2021Wa16
S(2n)=13165.1 *21*, S(2p)=15198 *16* (2021Wa16).
^{149}Pm produced and identified by 1941La01, 1946Bo25, 1947In06, and 1947Ma28, followed by several later studies of its decay.
2012Da16 investigated possible α decay of ^{153}Eu to the ground state in ^{149}Pm at the HADES underground laboratory. A lower limit of $T_{1/2}$ of 5.5×10^{17} y was established for this decay mode, essentially, with no observation of a signal for α decay of ^{153}Eu.
Mass measurement: 1975Ka25.
Other reactions:
^{148}Pm(n,γ): 1967Fe07, 1995To01.
^{148}Pm(n,X): E=0.007-317 eV (1973Ki13).
^{232}Th(p,F): E=8-22 MeV (1982Ku07).
^{238}U(n,F): E=8.3 MeV (1985Li23).
^{252}Cf SF decay: 1972Ho08.
Additional information 1.
2011Ba04: theory: calculated levels, J^π, bands, B(M1), B(E2), spectroscopic factors for pickup and stripping reactions, electrical quadrupole and magnetic dipole moments using neutron-proton interacting boson-fermion model (IBFM-2).
1985Bh03, 1983Gu06: calculated levels, spectroscopic factors, magnetic dipole moment, B(E2), and quadrupole moment using rotor-particle coupling and unified vibrational model.
1984Sc22, 1983Sc20: calculated levels, B(λ), stripping and pickup spectroscopic factors, and magnetic dipole moment using interacting boson-fermion model.
Other theoretical studies: consult the NSR database at www.nndc.bnl.gov/nsr/ for seven references for structure and one for radioactive decay listed under 'document records' which can be accessed through web retrieval of the ENSDF database at www.nndc.bnl.gov/ensdf/.

^{149}Pm Levels

Cross Reference (XREF) Flags

A	^{149}Nd β^- decay (1.726 h)	F	^{150}Sm(μ^-,nγ)
B	^{148}Nd(^{3}He,d)	G	^{150}Sm(d,^{3}He)
C	^{148}Nd(α,t)	H	^{150}Sm(pol t,α)
D	^{150}Nd(p,2nγ)	I	^{152}Sm(p,α)
E	^{150}Nd(d,3nγ)		

E(level)‡	J^π#	$T_{1/2}$†	XREF	Comments
0.0@	7/2$^+$	53.08 h *9*	ABCDEFGHI	%β^-=100 μ=3.3 *5* (1963Gr10,2019StZV) J^π: atomic beam (1961Ca07), L(pol t,α)=4; Ay(θ) gives L-1/2. $T_{1/2}$: weighted average of 53.08 h *11* (1971Ba28), 53.08 h *10* (1966Mc11), 53.07 h *10* (1963Ho15,1964Ho03), 53.09 h *9* (1960Bu06). Others: 53.3 h *7* (2015Ba10), 2.13 d *9* (1999Po32, 95% confidence limit); 48 h *3* (1960Ch15), 50.0 h *15* (1952Ru10), 47 h (1950Ma05). μ: static nuclear orientation (1963Gr10). Other: 1960Ch15. ^{150}Sm(t,α) yields spectroscopic strength of 3.2 for ground state. The remaining strength of 0.83 is distributed among the 360, 462 and 475 levels.
114.313^d *5*	5/2$^+$	2.53 ns *3*	ABCDEFGHI	μ=+2.0 *2* (1970Se11,2020StZV) J^π: L(pol t,α)=2; M1+E2 γ to 7/2$^+$. $T_{1/2}$: other: 2.7 ns *2* (γ(t) in (p,2nγ),1979Ko35). μ: from TDPAC (1970Se11). Others: +2.13 *15* (IPAC,1970Be67), 2.5 *3* (1969Ta08), 2.3 *3* (1966Sv01).

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Adopted Levels, Gammas (continued)

^{149}Pm Levels (continued)

E(level)[‡]	J^{π}[#]	$T_{1/2}$[†]	XREF	Comments
				Strength of $d_{5/2}$ shell in (t,α) is mainly associated with this level. Remaining strength found in 211, 871, 959 levels.
188.631 *6*	3/2+	3.27 ns *5*	ABCDEF HI	μ=+1.09 *15* (1970Be67,2014StZZ) Jπ: L(pol t,α)=2; L-1/2 from Ay(θ). $T_{1/2}$: other: 3.1 ns *2* (γ(t) in (p,2nγ),1979Ko35). μ: from IPAC (1970Be67). Other: 2.25 *60* (1970Se11,TDPAC). Value is not listed in 2020StZV.
211.308 *5*	5/2+	80 ps *15*	ABCDEFgHI	μ=+2.20 *35* (1970Be67,2014StZZ) Jπ: L(pol t,α)=2; M1+E2 γ to 7/2+. μ: from IPAC (1970Be67). Value is not listed in 2020StZV.
240.214[a] *7*	11/2−	35 μs *3*	ABCDEFgHI	%IT=100 Jπ: L(pol t,α)=5; L+1/2 from Ay(θ); M2 γ to 7/2+. $T_{1/2}$: from (ce)γ(t) in β− (1967Ba27). Other: 41 μs *10* from βγ(t) (1966He04).
270.170 *5*	7/2−	2.59 ns *2*	ABCDE GHI	μ=+3.6 *2* (1970Be67,2020StZV) Jπ: L(pol t,α)=3; L+1/2 from Ay(θ). $T_{1/2}$: other: 2.8 ns *2* (γ(t) in (p,2nγ),1979Ko35). μ: from TDPAC (1970Se11). Other: +2.19 *11* IPAC (1970Be67).
288.208[@] *8*	9/2+		A DEF	Jπ: M1+E2 γ to 7/2+; γγ(θ) in ^{149}Nd β− decay.
360.046[d] *9*	7/2+		A DE gHI	Jπ: L(pol t,α)=4; M1+E2 γ to 5/2+.
387.559 *10*	1/2+	0.6 ns *1*	ABCDEFgHI	Jπ: L(pol t,α)=L(^{3}He,d)=0.
396.774 *7*	5/2+		A DEFg	Jπ: E1 γ to 7/2−; M1+E2 γ to 3/2+.
415.450 *9*	3/2+		ABCD gHI	Jπ: L(pol t,α)=2; L-1/2 from Ay(θ).
425.276 *7*	7/2+		A D g	Jπ: M1+E2 γ to 5/2+, γ to 9/2+. γγ(θ) in ^{149}Nd β− excludes 5/2.
462.191 *10*	3/2−		AB D H	Jπ: E1 γ to 1/2+; E2 γ to 7/2−.
497.56[@] *11*	(11/2)+		DE	Jπ: ΔJ=(2), E2 γ to 7/2+; γ to 9/2+.
510.17[a] *17*	(15/2)−	<3 ns	bcDE hi	Jπ: ΔJ=2, E2 γ to 11/2−; excitation function. $T_{1/2}$: γ(t) in (p,2nγ) (1979Ko35).
515.645[b] *9*	(9/2)−		AbcDE hi	Jπ: M1 γ to 11/2− and γs to 7/2+ and 7/2−.
537.863 *6*	5/2−	≤50 ps	A D g	Jπ: E1 γs to 3/2+ and 7/2+.
547.124 *13*	(5/2,7/2+)		A D g	Jπ: γs to 3/2+, 7/2+ and 7/2−.
552 *3*	(11/2−)		BC gHI	Jπ: L(pol t,α)=(5); L+1/2 from Ay(θ). E(level): this state appears to be different from 547 and 558 levels excited in β− or (p,2nγ).
558.17[d] *6*	(9/2)+		A DE g	Jπ: E2 γ to 5/2+; M1+E2 γ to 7/2+; γ to 7/2− and from (11/2+); probable band member.
636.5 *28*	1/2+		BC H	XREF: H(646). Jπ: L(^{3}He,d)=0.
651.014 *18*	(5/2+)		A DE	Jπ: γs to 3/2+, 7/2+ and 7/2−. Possible γs to 1/2+ and 3/2− forbid 7/2. 7/2+ proposed in (d,3nγ).
654.843 *5*	7/2−	≤0.18 ns	A D i	Jπ: E1 γs to 5/2+ and 9/2+.
666.55 *12*	(7/2−,9/2+)		D i	Jπ: γs to 5/2+ and 11/2−.
716.72 *17*	(3/2−)		D	Jπ: ΔJ=2, Q γ to 7/2−; γ to 3/2+.
721.23 *11*	7/2+		ABCD gHI	Jπ: L(pol t,α)=4; L-1/2 from Ay(θ).
744.579 *13*	(3/2,5/2+)		A g	Jπ: γs to 1/2+ and 5/2+; log $f^{1u}t$=7.8 from 5/2−.
750.47 *3*	(7/2−,9/2+)		A D g	Jπ: γs to 5/2+ and 11/2−.
751.5 *19*	3/2+		BC gHI	Jπ: L(pol t,α)=2; L-1/2 from Ay(θ).
758.67 *7*	(5/2+,7/2,9/2+)		A	Jπ: γs to 5/2+ and 9/2+.
768.188 *17*	(5/2,7/2+)		A D	Jπ: γs to 3/2+, 7/2+ and 7/2−.
771.47[b] *15*	(13/2−)		DE	Jπ: ≥11/2 from excitation function. γ to 11/2−.
778.90[@] *12*	(13/2)+		DE	Jπ: ΔJ=(2), E2 γ to 9/2+; M1+E2 γ to 11/2+.
786.72 *3*	(3/2+,5/2+)		A g	Jπ: γs to 1/2+ and 7/2+.
791.05[&] *14*	11/2−		BCDE gHI	Jπ: L(pol t,α)=5; L+1/2 from Ay(θ).
808.66[d] *15*	(11/2)+		DE	Jπ: ΔJ=2, E2 γ to 7/2+; M1+E2 γ to (9/2)+.

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Adopted Levels, Gammas (continued)

^{149}Pm Levels (continued)

E(level)[‡]	Jπ[#]	XREF	Comments
872.94? *8*		Abc	XREF: b(871)c(871). Jπ: 3/2+,5/2,7/2,9/2+ from γs to 5/2+ and 7/2+. L(^{3}He,d)=2 suggests 3/2+, 5/2+; however, 871 group in (^{3}He,d) may correspond to 885, (5/2+) level.
884.89 *7*	(5/2+)	Abc GHI	XREF: b(871)c(871). Jπ: L(pol t,α)=(2); L+1/2 from Ay(θ).
885.8 *5*	(11/2,13/2+)	D	Jπ: ≥11/2 from excitation function; γ to 9/2+.
907.1 *25*	1/2+	BC HI	Jπ: L(pol t,α)=0 from 0+.
923.886 *18*	(5/2+,7/2)	A g	Jπ: γs to 5/2+ and 9/2+; log $f^{1u}t$=7.9 from 5/2−.
942.927 *22*	(3/2+,5/2,7/2+)	A g	Jπ: γs to 3/2+ and 7/2+.
955 *5*	(5/2+)	C gHI	Jπ: L(pol t,α)=(2); L+1/2 from Ay(θ).
956.92[a] *22*	(19/2−)	E	Jπ: (E2) γ to (15/2)−.
1006.26[&] *18*	(13/2)−	E	Jπ: E1 γ to (11/2)+; M1+E2 γ to 11/2−.
1008 *4*	1/2+	B	Jπ: L(^{3}He,d)=0.
1008.11[@] *16*	(15/2)+	E	Jπ: E2 γ to (11/2)+; M1+E2 γ to (13/2)+.
1031.68 *3*	(7/2+)	ABC	Jπ: γs to 5/2− and 9/2+ and log $f^{1u}t$=8.0 from 5/2− restrict Jπ to (5/2+,7/2). L(^{3}He,d)=5 is inconsistent with this but data would marginally fit L=4 also to allow 7/2+.
1043.39 *5*	(3/2+,5/2,7/2)	A	Jπ: γs to 5/2+ and 7/2+; log $f^{1u}t$=8.3 from 5/2−.
1050.18 *3*		A	Jπ: 1/2+,3/2,5/2,7/2+ from γs to 3/2+ and 5/2+.
1141.537 *18*	5/2+	ABC	Jπ: L(^{3}He,d)=2; γ to 7/2−.
1145.30[&] *17*	(15/2)−	E	Jπ: E1 γ to (13/2)+; E2 γ to 11/2−.
1156.038 *24*	(3/2+,5/2,7/2+)	A	Jπ: γs to 3/2+ and 7/2+.
1162.90[c] *24*	(15/2+)	E	Jπ: γs to (15/2)− and (13/2−).
1181 *3*	3/2+,5/2+	BC	Jπ: L(^{3}He,d)=2.
1190.274 *17*	(5/2)	ABC	Jπ: γs to 3/2+, 3/2−, 7/2+ and 7/2−.
1211.07[b] *21*	(17/2−)	E	Jπ: (M1+E2) γ to (19/2−); γs to (15/2)− and (13/2−).
1213 *4*		BC	
1229.13[@] *19*	(17/2)+	E	Jπ: E2 γ to (13/2)+; γ to (15/2)+.
1234.098 *9*	(7/2)	A	Jπ: γs to 5/2+, 5/2−, 9/2+ and (9/2)−.
1239.622 *22*	(5/2+,7/2)	A	Jπ: γs to 5/2+ and 9/2+; log $f^{1u}t$=7.2 from 5/2−.
1264.01 *6*	(5/2,7/2)	ABC	Jπ: γs to 5/2+, 7/2+ and 7/2−; log $f^{1u}t$=7.5 from 5/2−. L(^{3}He,d)=2,3 from 0+ would support 5/2+ or 7/2−.
1290.079 *25*	(3/2+,5/2,7/2)	A	Jπ: γs to 5/2+ and 7/2+; log $f^{1u}t$=7.0 from 5/2−.
1312.106 *15*	(5/2)	AB	Jπ: γs to 3/2+, 3/2−, 7/2+ and 7/2−.
1329 *4*	3/2+	C gH	XREF: g(1350). Jπ: L(pol t,α)=2; L-1/2 from Ay(θ). L(d,^{3}He)=1 is inconsistent with 3/2+. But the level in (d,^{3}He) may be 1329 and/or 1367.
1367 *4*		B g	XREF: g(1350).
1394.25 *20*	3/2+	A H	Jπ: L(pol t,α)=2; L-1/2 from Ay(θ).
1405 *3*	9/2−,11/2−	BC	Jπ: L(^{3}He,d)=5.
1406.60[&] *20*	(17/2)−	E	Jπ: E1 γ to (15/2)+; γ to (15/2−).
1412.10 *4*	(5/2,7/2)	A	Jπ: γs to 7/2+ and 7/2−; log $f^{1u}t$=6.8 from 5/2−.
1448.24 *7*	(3/2+,5/2,7/2+)	A	Jπ: γs to 3/2+ and 7/2+.
1462 *3*	(7/2+,9/2,11/2−)	BC	Jπ: L(^{3}He,d)=4,5.
1476.97[c] *25*	(19/2+)	E	Jπ: γs to (19/2−), (17/2−) and (15/2)+.
1495.86 *5*	(5/2,7/2+)	A	Jπ: γs to 3/2+, 7/2+ and 7/2−.
1504.7[a] *3*	(23/2−)	E	Jπ: (E2) γ to (19/2)−.
1531 *3*	5/2−,7/2−	BC	Jπ: L(^{3}He,d)=3.
1549.19[@] *21*	(19/2)+	E	Jπ: E2 γ to (15/2)+; γ to (17/2)+.
1568.60 *5*	(5/2+,7/2)	AB	Jπ: γs to 5/2+, 9/2+; log *ft*=6.2 from 5/2−.
1589 *3*	7/2+,9/2+	BC	Jπ: L(^{3}He,d)=4.
1590.6[&] *4*	(19/2−)	E	Jπ: γ to (15/2)−.
1612.7[b] *3*	(21/2−)	E	Jπ: γ to (19/2)−.

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Adopted Levels, Gammas (continued)

^{149}Pm Levels (continued)

E(level)[‡]	Jπ[#]	XREF	Comments
1642.3 *25*	(3/2)$^+$	BC H	Jπ: L(^{3}He,d)=2; L(pol t,α)=(2); L-1/2 from Ay(θ).
1696 *3*	3/2$^+$,5/2$^+$	BC	Jπ: L(^{3}He,d)=2.
1738.6[@] *4*	(21/2)$^+$	E	Jπ: E2 γ to (17/2)$^+$.
1765 *3*	1/2$^+$	BC	Jπ: L(^{3}He,d)=0.
1782? *4*		BC	
1834? *4*		B	
1884.9[&] *3*	(21/2$^-$)	E	Jπ: γs to (17/2)$^-$ and (19/2)$^+$.
1923.6[c] *3*	(23/2$^+$)	E	Jπ: γs to (19/2)$^+$, (21/2$^-$) and (23/2$^-$).
2112.3[a] *4*	(27/2$^-$)	E	Jπ: γ to (23/2$^-$).
2122.0[@] *3*	(23/2)$^+$	E	Jπ: E2 γ to (19/2)$^+$; γ to (21/2$^-$).

[†] Unless otherwise stated, values are from γγ(t) and/or βγ(t) in ^{149}Nd β^-.

[‡] From least-squares fit to Eγ data when a level is populated in γ-ray studies. Uncertainty of 0.2 keV is assumed when not stated. When a level is populated only in particle-transfer reactions, weighted average is taken of values available from (^{3}He,d), (α,t), (d,^{3}He) and (pol t,α).

[#] For high-spin (J>11/2) states populated in (d,3nγ), the assignments are based on multipolarities from ce data for selected transitions, probable band assignments, and the assumption of population of ascending order of spins in such reactions. In particle-transfer reactions, when L-transfer arguments are used, all the targets have $J^\pi=0^+$ for the ground states.

[@] Band(A): Band based on 7/2$^+$ ground state. Possibly based on π7/2[404] (1996Jo19), although Nilsson- model assignment is not quite valid here for N=88 nuclide. See also comment for band based on 11/2$^-$.

[&] Band(B): Band based on 11/2$^-$. In comparison with a similar structure of opposite parity bands (probably reflection-asymmetric) in ^{147}Pm, this band may form a parity doublet with the band based on 7/2$^+$ g.s. (1996Jo19), the difference in energies of levels of similar spins (but of opposite parity) ranges from about 300 keV at J=11/2 to about 50 keV at J=19/2.

[a] Band(C): $\pi h_{11/2}$ band based on 35−μs isomer.

[b] Band(D): Band based on (9/2$^-$).

[c] Band(E): Band based on (15/2$^+$). Possible configuration=$\pi h_{11/2}\otimes(3^-)$. Only the 15/2$^+$, 19/2$^+$, 23/2$^+$ members observed.

[d] Band(F): Band based on (5/2$^+$). Possibly based on π5/2[402] (1996Jo19), although Nilsson model assignment is not quite valid for N=88 nuclide.

γ(^{149}Pm)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[#]	δ[#]	α[@]	Comments
114.313	5/2+	114.314 *11*	100	0.0	7/2+	M1+E2	+0.16 *2*	1.065 *15*	B(M1)(W.u.)=2.751×10^{-3} *+41−43*; B(E2)(W.u.)=3.0 *+8−7*
188.631	3/2+	74.32 *3*	62 *13*	114.313	5/2+	M1+E2	+0.71 *6*	4.68 *14*	B(M1)(W.u.)=0.00142 *+11−13*; B(E2)(W.u.)=71 *+8−10*
		188.640 *8*	100 *4*	0.0	7/2+	E2		0.2462 *34*	B(E2)(W.u.)=3.2 *+6−5*
211.308	5/2+	22.7	0.021 *6*	188.631	3/2+	[M1]		18.20 *25*	B(M1)(W.u.)=0.0037 *+14−12* 22.7-keV transition cannot be pure E2 or have large E2 admixture, as deduced B(E2)(W.u.) of 3230 *100* is much larger than RUL=300.
		97.001 *12*	5.6 *4*	114.313	5/2+	M1(+E2)	+0.09 *9*	1.696 *31*	B(M1)(W.u.)=0.0125 *+47−33*; B(E2)(W.u.)<31
		211.309 *7*	100 *4*	0.0	7/2+	M1+E2	−0.41 *3*	0.1874 *27*	B(M1)(W.u.)=0.0186 *+41−30*; B(E2)(W.u.)=38 *+10−8*
240.214	11/2−	240.220 *7*	100	0.0	7/2+	M2		0.664 *9*	B(M2)(W.u.)=0.0237 *+22−19*
270.170	7/2−	30.00 *3*	0.16 *4*	240.214	11/2−	(E2)		341	B(E2)(W.u.)=127 *+24−26*
		58.883 *20*	12 *2*	211.308	5/2+	[E1]		1.110 *16*	B(E1)(W.u.)=2.26×10^{-5} *36*
		155.873 *9*	55 *2*	114.313	5/2+	E1		0.0798 *11*	B(E1)(W.u.)=5.59×10^{-6} *+39−35* δ(M2/E1)<0.012 from ce data gives B(M2)(W.u.)<0.15.
		270.166 *7*	100 *3*	0.0	7/2+	E1(+M2)	−0.07 *5*	0.021 *4*	B(E1)(W.u.)=1.94×10^{-6} *12*; B(M2)(W.u.)=0.6 *+12−5* Upper bound of B(M2)(W.u.) exceeds RUL=1, implying δ(M2/E1)<0.06.
288.208	9/2+	288.194 *10*	100	0.0	7/2+	M1+E2	+0.78 *7*	0.0747 *14*	
360.046	7/2+	245.72 *5*	100 *8*	114.313	5/2+	M1+E2	+0.23 *2*	0.1255 *18*	I_γ: from (p,2nγ).
		360.052 *18*	19.0 *6*	0.0	7/2+				
387.559	1/2+	176.27	3.5 *7*	211.308	5/2+	[E2]		0.310 *4*	B(E2)(W.u.)=2.9 *+9−7*
		198.928 *8*	100 *3*	188.631	3/2+	M1(+E2)	+0.2 *3*	0.224 *4*	B(M1)(W.u.)=0.0032 *+9−10*; B(E2)(W.u.)<11
		273.24 *4*	13 *3*	114.313	5/2+	E2		0.0728 *10*	B(E2)(W.u.)=1.22 *+36−30* I_γ: other: 40 *9* in (d,3nγ) is discrepant.
396.774	5/2+	36.7	0.7 *3*	360.046	7/2+	[M1]		4.38 *6*	δ(E2/M1)<0.56 required from γ intensity balance in β^- decay.
		126.630 *18*	4.4 *3*	270.170	7/2−	E1		0.1404 *20*	
		185.489 *25*	4.1 *2*	211.308	5/2+	[M1,E2]		0.267 *7*	
		208.147 *9*	100.0 *4*	188.631	3/2+	M1+E2	+0.17 *3*	0.1980 *28*	
		282.456 *10*	24.2 *6*	114.313	5/2+	M1+E2	+0.65 *20*	0.0808 *30*	I_γ: other: 36 *7* in (d,3nγ).
		396.76 *4*	2.8 *1*	0.0	7/2+				
415.450	3/2+	226.847 *19*	43 *2*	188.631	3/2+	[M1,E2]		0.145 *12*	
		301.128 *14*	100 *3*	114.313	5/2+	M1,E2		0.064 *10*	
425.276	7/2+	65.23	3 *1*	360.046	7/2+	[M1,E2]		8.2 *29*	
		137.05 *3*	12 *1*	288.208	9/2+	[M1,E2]		0.69 *5*	
		155.1	7 *3*	270.170	7/2−	[E1]		0.0808 *11*	
		213.947 *16*	78 *5*	211.308	5/2+	M1,E2		0.173 *12*	
		310.979 *13*	100 *3*	114.313	5/2+	M1+E2	+0.23 *12*	0.0667 *15*	
		425.22 *3*	53 *2*	0.0	7/2+				
462.191	3/2−	65.4	3.1 *10*	396.774	5/2+	[E1]		0.841 *12*	
		74.66 *10*	100 *16*	387.559	1/2+	E1		0.590 *9*	
		192.026 *9*	58 *2*	270.170	7/2−	E2		0.2318 *32*	
		250.826 *31*	3.4 *3*	211.308	5/2+				
		273.5	8 *4*	188.631	3/2+				

Adopted Levels, Gammas (continued)

$\gamma(^{149}Pm)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[#]	δ[#]	α[@]	Comments
497.56	(11/2)$^+$	209.3 *2*	18 *1*	288.208	9/2$^+$	M1+E2		0.185 *11*	
		497.8 *2*	100	0.0	7/2$^+$	E2		0.01244 *17*	
510.17	(15/2)$^-$	269.9 *3*	100	240.214	11/2$^-$	E2		0.0757 *11*	B(E2)(W.u.)>2.6
515.645	(9/2)$^-$	245.5 *3*	34 *9*	270.170	7/2$^-$	[M1,E2]		0.115 *12*	E_γ,I_γ: from (p,2nγ). Same energy is given in (d,nγ). Intensity is not known well in β^- and (d,3nγ).
		275.437 *11*	100 *3*	240.214	11/2$^-$	M1(+E2)		0.082 *11*	Mult.: ce data in ^{149}Nd β^- give M1,E2 but negative A_2 for 275$\gamma(\theta)$ in (p,2nγ) supports M1 or M1+E2 with small δ.
		515.75 *9*	5.6 *8*	0.0	7/2$^+$				
537.863	5/2$^-$	75.69 *6*	3.0 *3*	462.191	3/2$^-$	M1(+E2)	<0.8	4.0 *6*	B(M1)(W.u.)≥0.0055
		112.52 *4*	1.6 *2*	425.276	7/2$^+$	[E1]		0.1939 *27*	B(E1)(W.u.)≥1.5×10^{-5}
		122.415 *13*	3.4 *2*	415.450	3/2$^+$	E1		0.1540 *22*	B(E1)(W.u.)≥2.7×10^{-5}
		141.06 *7*	0.52 *3*	396.774	5/2$^+$	[E1]		0.1046 *15*	B(E1)(W.u.)≥2.7×10^{-6}
		177.818 *18*	2.1 *2*	360.046	7/2$^+$	E1		0.0558 *8*	B(E1)(W.u.)≥5.3×10^{-6}
		267.693 *8*	81 *2*	270.170	7/2$^-$	M1+E2	+0.24 *7*	0.0994 *16*	B(M1)(W.u.)≥0.0055; B(E2)(W.u.)≥1.3
		326.554 *10*	61.3 *14*	211.308	5/2$^+$	E1(+M2)	−0.07 *6*	0.0125 *27*	B(E1)(W.u.)≥2.7×10^{-5}; B(M2)(W.u.)≥0.12
		349.231 *9*	18.5 *5*	188.631	3/2$^+$	E1		0.00966 *14*	B(E1)(W.u.)≥6.6×10^{-6}
		423.553 *10*	100 *5*	114.313	5/2$^+$	E1		0.00606 *8*	B(E1)(W.u.)≥2.0×10^{-5}
547.124	(5/2,7/2$^+$)	131.7	1.3	415.450	3/2$^+$				
		276.960 *17*	100 *3*	270.170	7/2$^-$	D			
		358.49 *10*	3.0 *15*	188.631	3/2$^+$				
		432.8 *2*	5.9 *22*	114.313	5/2$^+$				E_γ: from (p,2nγ). I_γ: unweighted average of 3.8 *15* (β^-) and 8.1 *27* (p,2nγ).
		547.1	4.5 *22*	0.0	7/2$^+$				
558.17	(9/2)$^+$	198.18 *16*	100 *9*	360.046	7/2$^+$	M1+E2		0.218 *10*	E_γ: weighted average of 198.1 *1* (p,2nγ) and 198.5 *2* (d,3nγ). I_γ: from (d,3nγ).
		287.7	26 *10*	270.170	7/2$^-$				γ not reported in (p,2nγ) and (d,3nγ).
		444.7[‡] *2*	64 *5*	114.313	5/2$^+$	E2		0.01693 *24*	E_γ: level-energy difference=443.9. E_γ,I_γ: from (d,3nγ); in (p,2nγ) value of 200 seems to be in error, perhaps, due to incorrect split of intensity in two locations (558 and 655 levels).
		558.0	21	0.0	7/2$^+$				γ not reported in (p,2nγ) and (d,3nγ).
651.014	(5/2$^+$)	188.8	12	462.191	3/2$^-$				
		254.228 *22*	100 *3*	396.774	5/2$^+$	M1+E2		0.104 *12*	Mult.: from (d,3nγ), where this is the only γ reported from 651 level.
		263.4	27	387.559	1/2$^+$				E_γ: γ not in (p,2nγ).
		380.66[‡] *5*	61 *3*	270.170	7/2$^-$				E_γ: level-energy difference=380.84.
		439.4 *2*	42 *18*	211.308	5/2$^+$				E_γ: from (p,2nγ). Eγ=439.6 in β^-.
		462.34 *10*	38 *8*	188.631	3/2$^+$				I_γ: from (p,2nγ). Iγ=48 *24* in β^-.
		536.6	55 *24*	114.313	5/2$^+$				E_γ: γ not in (p,2nγ).
		651.0	73 *30*	0.0	7/2$^+$				E_γ: γ not in (p,2nγ).
654.843	7/2$^-$	96.9	0.42 *15*	558.17	(9/2)$^+$	[E1]		0.291 *4*	B(E1)(W.u.)≥1.5×10^{-6}

$\gamma(^{149}Pm)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.#	δ#	α@	Comments
654.843	7/2⁻	107.79 *3*	1.1 *2*	547.124	(5/2,7/2⁺)	[D,E2]		1.0 *8*	If E1, B(E1)(W.u.)≥4.7×10⁻⁶. B(E2)(W.u.)≥16 if E2.
		116.930 *24*	1.4 *4*	537.863	5/2⁻	M1+E2	0.5 *+11−3*	1.05 *16*	B(M1)(W.u.)≥8.4×10⁻⁵; B(E2)(W.u.)≥0.46
		139.210 *12*	6.4 *3*	515.645	(9/2)⁻	(M1+E2)	+3 *3*	0.69 *9*	B(M1)(W.u.)≥2.9×10⁻⁵ B(E2)(W.u)=0 for δ(E2/M1)=0, ≥32 *1* for δ=3 to 6.
		229.566 *9*	6.06 *16*	425.276	7/2⁺	E1		0.0282 *4*	B(E1)(W.u.)≥2.6×10⁻⁶
		258.067 *13*	4.72 *13*	396.774	5/2⁺	E1		0.02079 *29*	B(E1)(W.u.)≥1.4×10⁻⁶
		294.802 *10*	7.16 *19*	360.046	7/2⁺	E1		0.01477 *21*	B(E1)(W.u.)≥1.4×10⁻⁶
		366.634 *14*	6.80 *19*	288.208	9/2⁺	E1		0.00857 *12*	B(E1)(W.u.)≥7.0×10⁻⁷ I_γ: 33 *16* in (p,2nγ) is discrepant.
		384.687 *16*	3.35 *9*	270.170	7/2⁻	[M1,E2]		0.032 *7*	B(M1)(W.u.)≥2.7×10⁻⁵ if M1, B(E2)(W.u.)≥0.1 if E2.
		443.551 *11*	14.4 *6*	211.308	5/2⁺	E1		0.00543 *8*	B(E1)(W.u.)≥8.3×10⁻⁷
		540.509 *10*	83 *3*	114.313	5/2⁺	E1		0.00346 *5*	B(E1)(W.u.)≥2.7×10⁻⁶
		654.831 *13*	100 *5*	0.0	7/2⁺	E1		2.28×10⁻³ *3*	B(E1)(W.u.)≥1.8×10⁻⁶
666.55	(7/2⁻,9/2⁺)	241.2 *3*	50 *19*	425.276	7/2⁺				
		396.4 *3*	72 *3*	270.170	7/2⁻				
		426.3 *2*	100 *19*	240.214	11/2⁻				
		455.3 *2*	56 *10*	211.308	5/2⁺				
716.72	(3/2⁻)	301.2 *2*	56 *16*	415.450	3/2⁺				
		446.7 *3*	100 *19*	270.170	7/2⁻	Q			
721.23	7/2⁺	361.4 *2*	49 *11*	360.046	7/2⁺				E_γ,I_γ: from (p,2nγ). Same energy in β^-, but with no uncertainty; Iγ=62 *25* in β^-, as the 721 level is weakly populated in decay.
		606.67 *16*	100 *22*	114.313	5/2⁺				I_γ: from (p,2nγ).
744.579	(3/2,5/2⁺)	197.4	2.2	547.124	(5/2,7/2⁺)				
		282.4	2.9 *11*	462.191	3/2⁻				
		329.18	3.5 *17*	415.450	3/2⁺				
		347.843 *18*	27.4 *9*	396.774	5/2⁺				
		357.03 *4*	8.0 *4*	387.559	1/2⁺				
		533.20 *4*	15.5 *9*	211.308	5/2⁺				
		555.88 *9*	100 *5*	188.631	3/2⁺				
		630.237 *19*	32.3 *4*	114.313	5/2⁺				
750.47	(7/2⁻,9/2⁺)	480.32 *5*	67 *4*	270.170	7/2⁻	D(+Q)			
		510.30 *5*	100 *25*	240.214	11/2⁻				
		636.2	83 *17*	114.313	5/2⁺				
		749.63 *5*	22 *3*	0.0	7/2⁺				E_γ: poor fit. Level-energy difference=750.47. Uncertainty increased to 0.20 keV in the fitting procedure.

$\gamma(^{149}Pm)$ (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.#	α @	Comments
758.67	(5/2$^+$,7/2,9/2$^+$)	470.5	67 *33*	288.208	9/2$^+$			
		547.4	67 *33*	211.308	5/2$^+$			
		758.65& *8*	100& *10*	0.0	7/2$^+$			
768.188	(5/2,7/2$^+$)	342.81 *10*	19 *4*	425.276	7/2$^+$			
		352.78 *3*	12.5 *6*	415.450	3/2$^+$			
		498.06	2.4 *6*	270.170	7/2$^-$			
		556.83 *9*	100 *12*	211.308	5/2$^+$			
		653.9	4.2	114.313	5/2$^+$			
		768.172 *21*	13.7 *12*	0.0	7/2$^+$			
771.47	(13/2$^-$)	256.0 *3*	20 *10*	515.645	(9/2)$^-$			γ from (d,3nγ), not reported in (p,2nγ).
		261.29 *12*	100 *15*	510.17	(15/2)$^-$	(M1+E2)	0.096 *12*	E_γ: weighted average of 261.25 *12* (p,2nγ) and 261.4 *2* (d,3nγ).
		531.2 *2*	111 *41*	240.214	11/2$^-$			I_γ: unweighted average of 152 *22* (p,2nγ) and 70 *20* (d,3nγ).
778.90	(13/2)$^+$	281.34 *10*	18.3 *16*	497.56	(11/2)$^+$	M1+E2	0.077 *11*	E_γ: weighted average of 281.3 *1* (p,2nγ) and 281.5 *2* (d,3nγ). I_γ: weighted average of 16.1 *29* (p,2nγ) and 19.0 *16* (d,3nγ).
		490.75 *20*	100 *9*	288.208	9/2$^+$	E2	0.01292 *18*	E_γ: average of 490.7 *2* (p,2nγ) and 490.8 *2* (d,3nγ).
		538.5 *3*	20 *7*	240.214	11/2$^-$			γ from (p,2nγ), not reported in (d,3nγ).
786.72	(3/2$^+$,5/2$^+$)	239.6	45	547.124	(5/2,7/2$^+$)			
		399.1	51 *20*	387.559	1/2$^+$			
		575.4 *3*	27 *9*	211.308	5/2$^+$			
		598.06 *5*	100 *9*	188.631	3/2$^+$			
		786.73 *4*	35 *5*	0.0	7/2$^+$			
791.05	11/2$^-$	232.6 *3*		558.17	(9/2)$^+$	E1	0.0273 *4*	γ from (d,3nγ), not reported in (p,2nγ).
		293.6 *3*	50 *15*	497.56	(11/2)$^+$			γ from (d,3nγ), not reported in (p,2nγ).
		502.8 *2*	100 *18*	288.208	9/2$^+$	E1	0.00407 *6*	E_γ: weighted average of 502.8 *2* (p,2nγ) and 502.9 *3* (d,3nγ).
808.66	(11/2)$^+$	250.4 *2*	55 *15*	558.17	(9/2)$^+$	M1+E2	0.108 *12*	E_γ: weighted average of 250.3 *2* (p,2nγ) and 250.7 *3* (d,3nγ). I_γ: unweighted average of 40 *8* (p,2nγ) and 70 *10* (d,3nγ).
		448.7 *2*	100 *10*	360.046	7/2$^+$	E2	0.01652 *23*	
872.94?		512.7&	&	360.046	7/2$^+$			
		758.65& *8*	&	114.313	5/2$^+$			
884.89	(5/2$^+$)	673.58 *7*	100	211.308	5/2$^+$			
885.8	(11/2,13/2$^+$)	597.6 *5*	100	288.208	9/2$^+$			
923.886	(5/2$^+$,7/2)	498.62	36 *3*	425.276	7/2$^+$			
		563.8	9 *4*	360.046	7/2$^+$			
		635.7	67 *13*	288.208	9/2$^+$			
		712.59 *3*	69 *5*	211.308	5/2$^+$			
		809.6	15	114.313	5/2$^+$			
		923.874 *23*	100 *8*	0.0	7/2$^+$			
942.927	(3/2$^+$,5/2,7/2$^+$)	527.6	30 *8*	415.450	3/2$^+$			
		582.9	47 *20*	360.046	7/2$^+$			
		754.291 *21*	100 *7*	188.631	3/2$^+$			
		828.6	22 *5*	114.313	5/2$^+$			
		942.97 *17*	8 *3*	0.0	7/2$^+$			

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γ(^{149}Pm) (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.#	α@	Comments
956.92	(19/2⁻)	446.8 *2*	100	510.17	(15/2)⁻	(E2)	0.01671 *23*	
1006.26	(13/2)⁻	215.0 *3*	12 *3*	791.05	11/2⁻	M1+E2	0.170 *12*	
		508.9 *2*	100 *20*	497.56	(11/2)⁺	E1	0.00396 *6*	
1008.11	(15/2)⁺	229.2 *2*	10.9 *4*	778.90	(13/2)⁺	M1+E2	0.141 *12*	
		510.5 *2*	100 *4*	497.56	(11/2)⁺	E2	0.01163 *16*	
1031.68	(7/2⁺)	376.9	13 *6*	654.843	7/2⁻			
		493.85 *5*	100 *9*	537.863	5/2⁻			
		671.56 *10*	17 *6*	360.046	7/2⁺			
		743.5 *4*	4.3 *17*	288.208	9/2⁺			
		761.46 *5*	48 *4*	270.170	7/2⁻			
		1031.77 *8*	7.4 *21*	0.0	7/2⁺			
1043.39	(3/2⁺,5/2,7/2)	617.9	32 *11*	425.276	7/2⁺			
		832.09 *5*	100 *11*	211.308	5/2⁺			
		929.2	<45	114.313	5/2⁺			
1050.18		861.54 *3*	100 *10*	188.631	3/2⁺			
		935.90 *6*	26 *4*	114.313	5/2⁺			
1141.537	5/2⁺	390.9	23 *8*	750.47	(7/2⁻,9/2⁺)			
		594.40 *5*	85 *8*	547.124	(5/2,7/2⁺)			
		781.40 *6*	12 *3*	360.046	7/2⁺			
		871.375 *23*	100 *8*	270.170	7/2⁻			
		1027.18 *4*	26 *5*	114.313	5/2⁺			
		1141.77& *8*	<8&	0.0	7/2⁺			
1145.30	(15/2)⁻	139.3 *3*	7.4 *10*	1006.26	(13/2)⁻			
		354.2 *3*	16.8 *21*	791.05	11/2⁻	E2	0.0327 *5*	
		366.4 *2*	100 *11*	778.90	(13/2)⁺	E1	0.00858 *12*	
1156.038	(3/2⁺,5/2,7/2⁺)	740.57 *3*	100 *2*	415.450	3/2⁺			
		795.93 *9*	49 *7*	360.046	7/2⁺			
		967.44 *4*	58 *7*	188.631	3/2⁺			
		1156.3 *4*	7 *4*	0.0	7/2⁺			
1162.90	(15/2⁺)	391.4 *3*	67 *17*	771.47	(13/2⁻)			
		652.9 *3*	100 *33*	510.17	(15/2)⁻			
1190.274	(5/2)	727.88‡ *5*	21 *2*	462.191	3/2⁻			E_γ: level-energy difference=728.08.
		765.1	9.7 *23*	425.276	7/2⁺			
		774.6	4.0 *17*	415.450	3/2⁺			
		793.43 *3*	29 *23*	396.774	5/2⁺			
		920.3 *2*	5 *2*	270.170	7/2⁻			
		979.013 *23*	100 *13*	211.308	5/2⁺			
		1075.95 *4*	27 *3*	114.313	5/2⁺			
		1190.28 *7*	3.0 *7*	0.0	7/2⁺			
1211.07	(17/2⁻)	254.3 *3*	38 *15*	956.92	(19/2⁻)	(M1+E2)	0.104 *12*	
		439.6 *3*	46 *15*	771.47	(13/2⁻)			
		700.8 *2*	100 *23*	510.17	(15/2)⁻			
1229.13	(17/2)⁺	221.0 *3*	5.9 *9*	1008.11	(15/2)⁺			

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$\gamma(^{149}Pm)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[#]	α[@]	Comments
1229.13	$(17/2)^+$	450.2 *2*	100 *5*	778.90	$(13/2)^+$	E2	0.01636 *23*	
1234.098	(7/2)	483.59 *5*	36 *1*	750.47	$(7/2^-,9/2^+)$			
		512.7[&]	7[&] *3*	721.23	$7/2^+$			
		579.28 *3*	40 *3*	654.843	$7/2^-$			
		583.03 *3*	26 *7*	651.014	$(5/2^+)$			
		675.79[‡] *4*	13 *1*	558.17	$(9/2)^+$			E_γ: level-energy difference=675.92.
		686.943 *21*	46 *3*	547.124	$(5/2,7/2^+)$			
		696.264 *21*	90 *6*	537.863	$5/2^-$			
		718.43 *4*	26 *3*	515.645	$(9/2)^-$			
		808.843 *20*	100 *7*	425.276	$7/2^+$			
		837.40 *3*	16 *1*	396.774	$5/2^+$			
		874.00 *8*	2.5 *5*	360.046	$7/2^+$			
		945.80 *3*	11 *1*	288.208	$9/2^+$			
		963.95 *3*	13 *1*	270.170	$7/2^-$			
		1022.78 *3*	55 *4*	211.308	$5/2^+$			
		1234.12 *4*	14 *2*	0.0	$7/2^+$			
1239.622	$(5/2^+,7/2)$	588.5 *3*	11 *4*	651.014	$(5/2^+)$			
		681.34 *15*	15 *3*	558.17	$(9/2)^+$			
		842.847 *23*	100 *10*	396.774	$5/2^+$			
		951.3	5 *2*	288.208	$9/2^+$			
		1125.32 *5*	57 *7*	114.313	$5/2^+$			
		1239.5 *3*	3.5 *10*	0.0	$7/2^+$			
1264.01	(5/2,7/2)	993.05	17 *8*	270.170	$7/2^-$			E_γ: level-energy difference=993.84.
		1150.08[‡] *8*	100 *10*	114.313	$5/2^+$			E_γ: level-energy difference=1149.70.
		1264.02 *6*	33 *6*	0.0	$7/2^+$			
1290.079	$(3/2^+,5/2,7/2)$	864.9	5.3 *20*	425.276	$7/2^+$			
		893.3	7.0 *17*	396.774	$5/2^+$			
		929.8 *4*	17 *2*	360.046	$7/2^+$			
		1078.76 *3*	100 *11*	211.308	$5/2^+$			
		1175.75 *6*	5.3 *12*	114.313	$5/2^+$			
		1290.11 *6*	6.5 *12*	0.0	$7/2^+$			
1312.106	(5/2)	567.56	34 *7*	744.579	$(3/2,5/2^+)$			
		657.2	37 *16*	654.843	$7/2^-$			
		849.926 *25*	44 *4*	462.191	$3/2^-$			
		886.59 *8*	11 *2*	425.276	$7/2^+$			
		896.65 *14*	8 *3*	415.450	$3/2^+$			
		915.35 *9*	4.2 *21*	396.774	$5/2^+$			
		952.0	15 *6*	360.046	$7/2^+$			
		1041.95 *3*	58 *6*	270.170	$7/2^-$			
		1100.77 *3*	100 *10*	211.308	$5/2^+$			
		1123.47 *8*	30 *5*	188.631	$3/2^+$			
		1197.84 *6*	14 *2*	114.313	$5/2^+$			

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$\gamma(^{149}Pm)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[#]	α[@]	Comments
1312.106	(5/2)	1312.13 *6*	15 *2*	0.0	7/2+			
1394.25	3/2+	978.8	100	415.450	3/2+			
1406.60	(17/2)−	261.5 *3*	4.0 *13*	1145.30	(15/2)−			
		398.4 *2*	100.0 *13*	1008.11	(15/2)+	E1	0.00701 *10*	
1412.10	(5/2,7/2)	661.90 *11*	39 *16*	750.47	(7/2−,9/2+)			
		854.74	33 *8*	558.17	(9/2)+			E_γ: level-energy difference=853.93.
		865.00 *5*	100 *49*	547.124	(5/2,7/2+)			
		986.68 *10*	18 *4*	425.276	7/2+			
		1051.90 *11*	33 *10*	360.046	7/2+			
		1141.77[&] *8*	<20[&]	270.170	7/2−			
1448.24	(3/2+,5/2,7/2+)	1259.62 *7*	100 *19*	188.631	3/2+			
		1448.07 *19*	12 *6*	0.0	7/2+			
1476.97	(19/2+)	265.8 *3*	63 *13*	1211.07	(17/2−)			
		314.2 *3*	38 *13*	1162.90	(15/2+)			
		520.0 *3*	100 *25*	956.92	(19/2−)			
1495.86	(5/2,7/2+)	1135.94 *9*	100 *38*	360.046	7/2+			
		1225.67 *11*	75 *25*	270.170	7/2−			
		1284.49 *13*	75 *25*	211.308	5/2+			
		1307.6	50 *25*	188.631	3/2+			E_γ: level-energy difference=1307.2.
		1381.42 *8*	100 *25*	114.313	5/2+			
		1495.80 *14*	75 *25*	0.0	7/2+			
1504.7	(23/2−)	547.8 *2*	100	956.92	(19/2−)	(E2)	0.00966 *14*	
1549.19	(19/2)+	142.7 *3*	9 *7*	1406.60	(17/2)−			
		320.0 *3*	17.6 *17*	1229.13	(17/2)+			
		541.1 *2*	100 *7*	1008.11	(15/2)+	E2	0.00997 *14*	
1568.60	(5/2+,7/2)	818.18	100 *27*	750.47	(7/2−,9/2+)			
		1021.8	45 *18*	547.124	(5/2,7/2+)			
		1171.97 *10*	68 *14*	396.774	5/2+			
		1280.28 *12*	18 *9*	288.208	9/2+			
		1298.32 *10*	14 *9*	270.170	7/2−			
		1357.26 *11*	36 *9*	211.308	5/2+			
		1454.29 *12*	23 *9*	114.313	5/2+			
		1568.43 *18*	9 *5*	0.0	7/2+			
1590.6	(19/2−)	445.3 *3*	100	1145.30	(15/2)−			
1612.7	(21/2−)	401.6 *3*	9 *6*	1211.07	(17/2−)			
		655.7 *2*	100 *18*	956.92	(19/2−)			
1738.6	(21/2)+	509.5 *3*	100	1229.13	(17/2)+	E2	0.01169 *16*	
1884.9	(21/2−)	335.8 *3*	100 *17*	1549.19	(19/2)+			
		478.2 *3*	75 *17*	1406.60	(17/2)−			
1923.6	(23/2+)	310.8 *3*	68 *14*	1612.7	(21/2−)			
		419.0 *3*	91 *46*	1504.7	(23/2−)			
		446.6 *3*	100 *23*	1476.97	(19/2+)			
2112.3	(27/2−)	607.6 *2*	100	1504.7	(23/2−)			

$^{149}_{61}Pm_{88}$-11

Adopted Levels, Gammas (continued)

γ(^{149}Pm) (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.#	α@
2122.0	$(23/2)^+$	237.0 *3*	47 *13*	1884.9	$(21/2^-)$		
		572.8 *3*	100 *25*	1549.19	$(19/2)^+$	E2	0.00861 *12*

† Primarily from ^{149}Nd β^- decay, when a level is populated in this decay, as the energy and intensity data are more precise and complete than in (p,2nγ) and (d,3nγ). Exceptions are noted. Above 900 keV excitation, no levels are reported in (p,2nγ), and levels are separately populated in β^- decay and (d,3nγ).

‡ Uncertainty doubled in the fitting procedure.

From ce data in ^{149}Nd β^- decay, and in (d,3nγ). For levels populated in (p,2nγ) only, multipolarity assignment is from $\gamma(\theta)$ data.

@ 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.

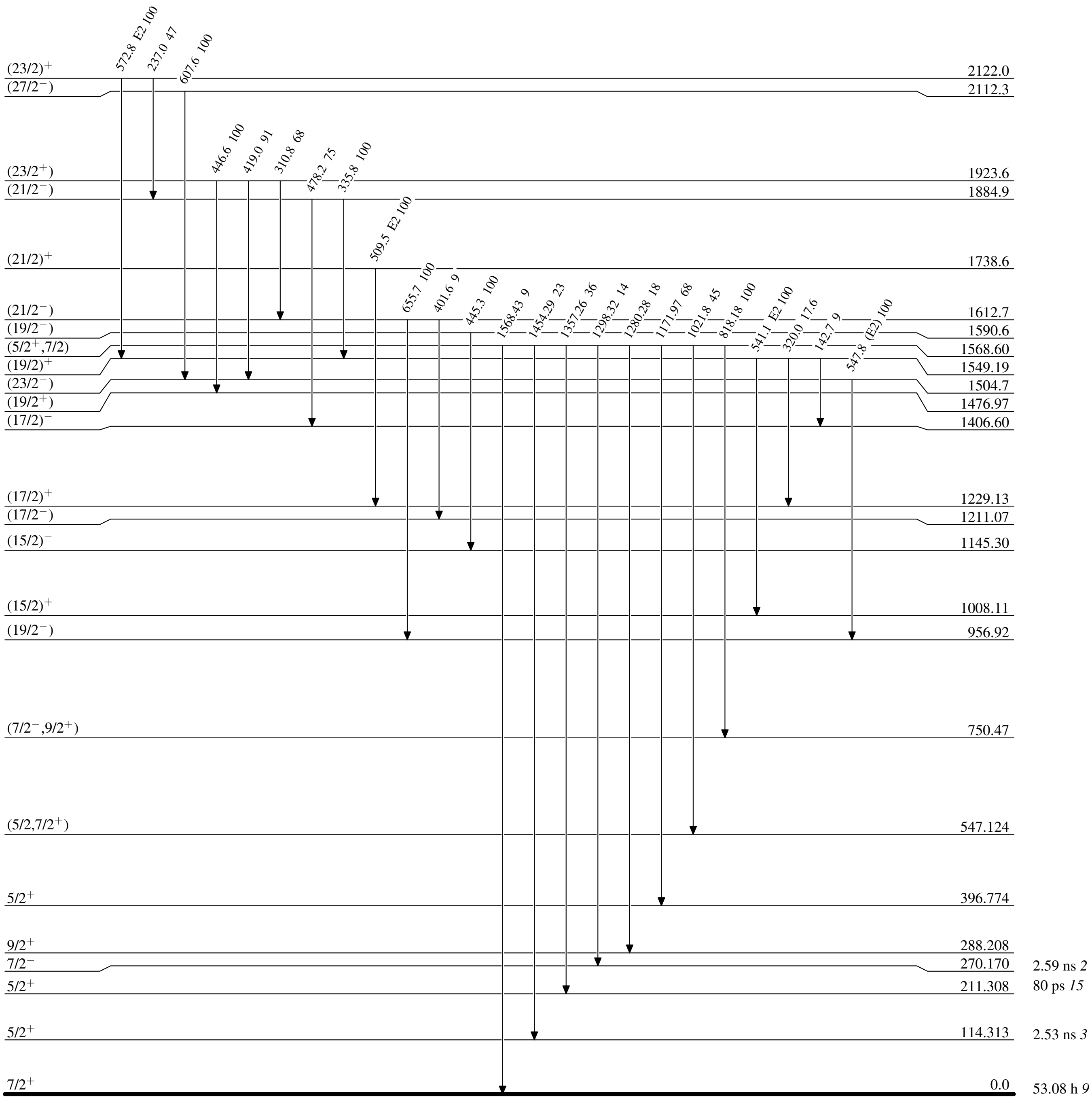
& Multiply placed with undivided intensity.

$^{149}_{61}$Pm$_{88}$-12

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

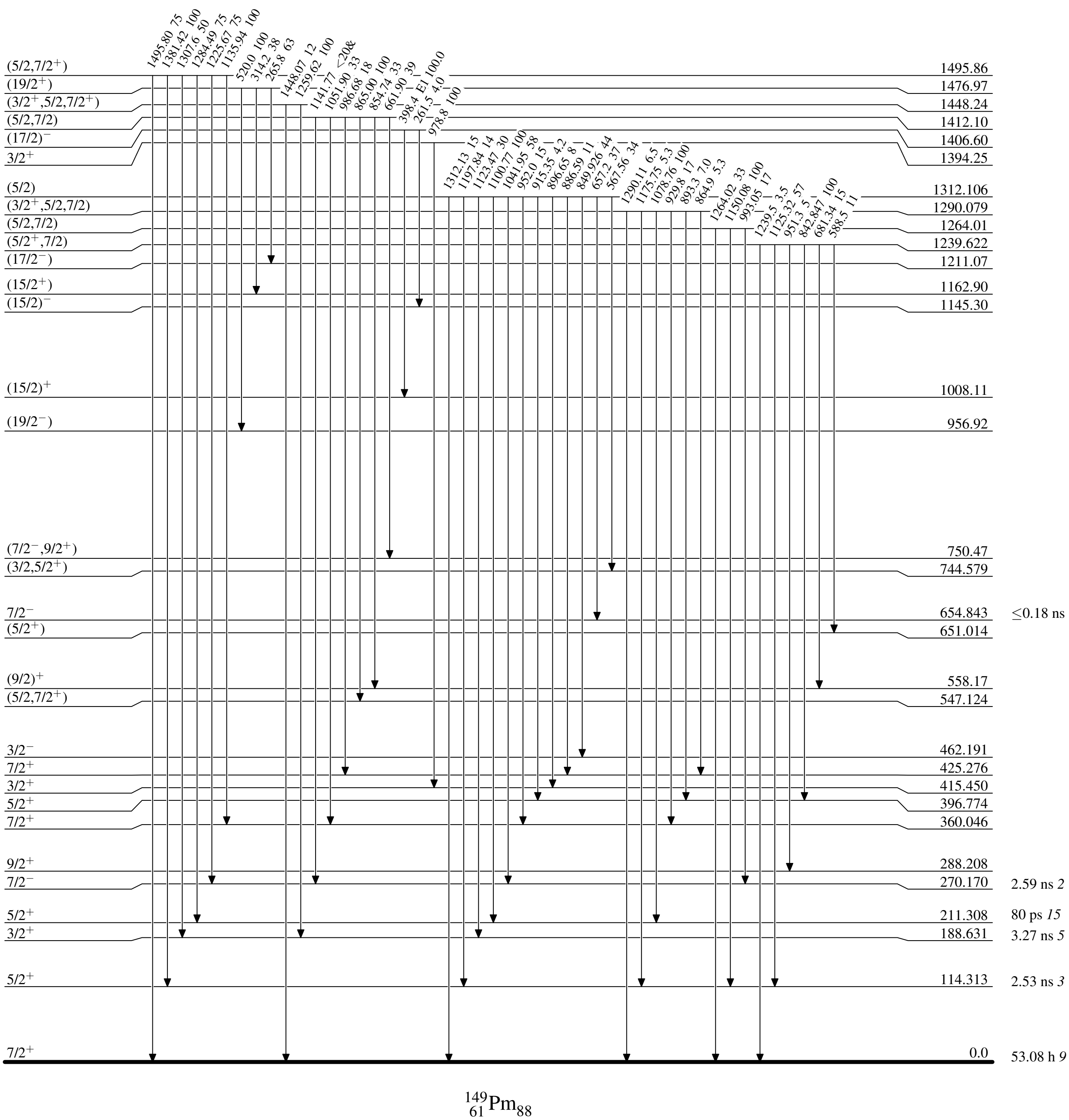


$^{149}_{61}Pm_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

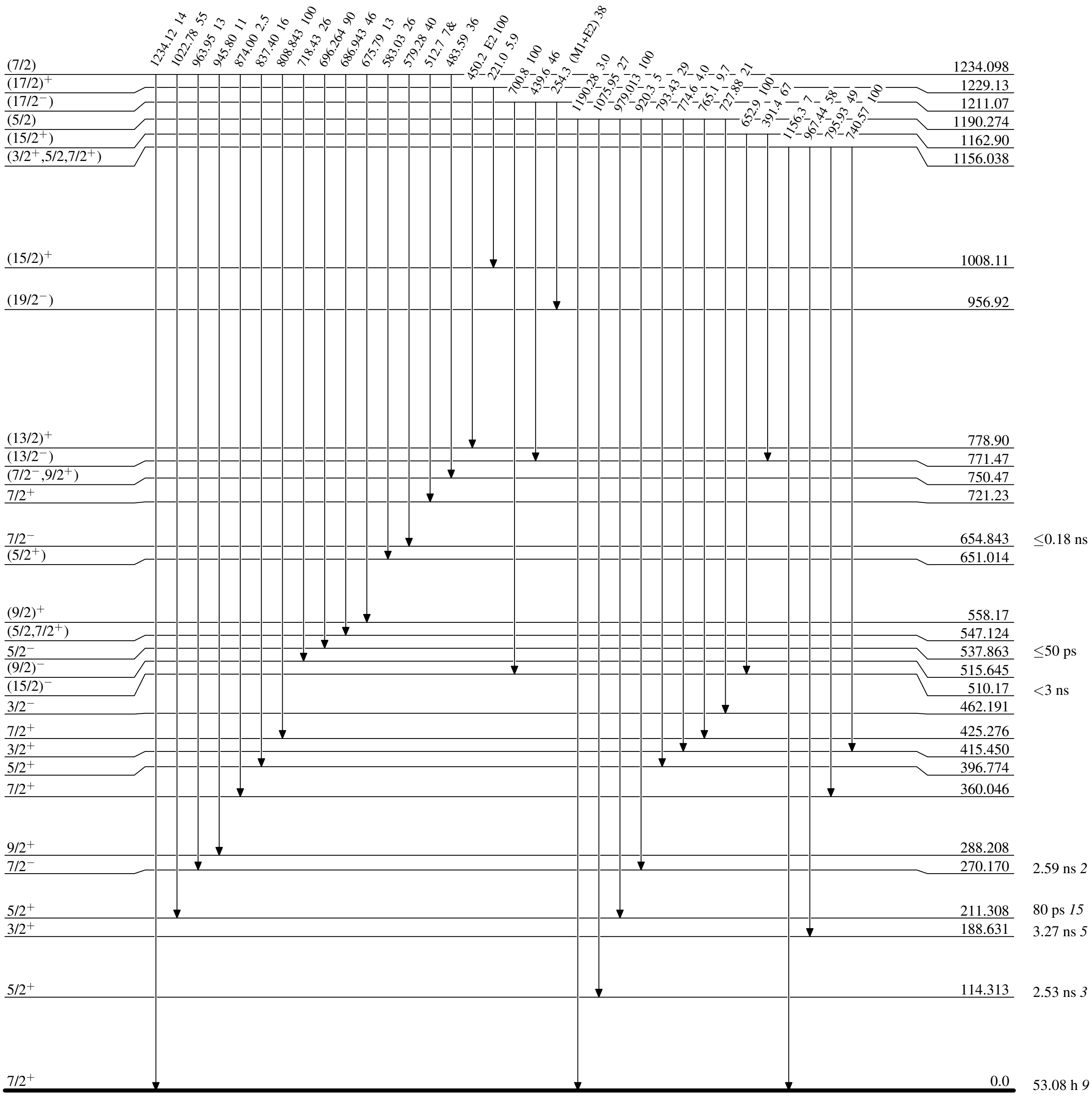
Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



Adopted Levels, Gammas

Level Scheme (continued)

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

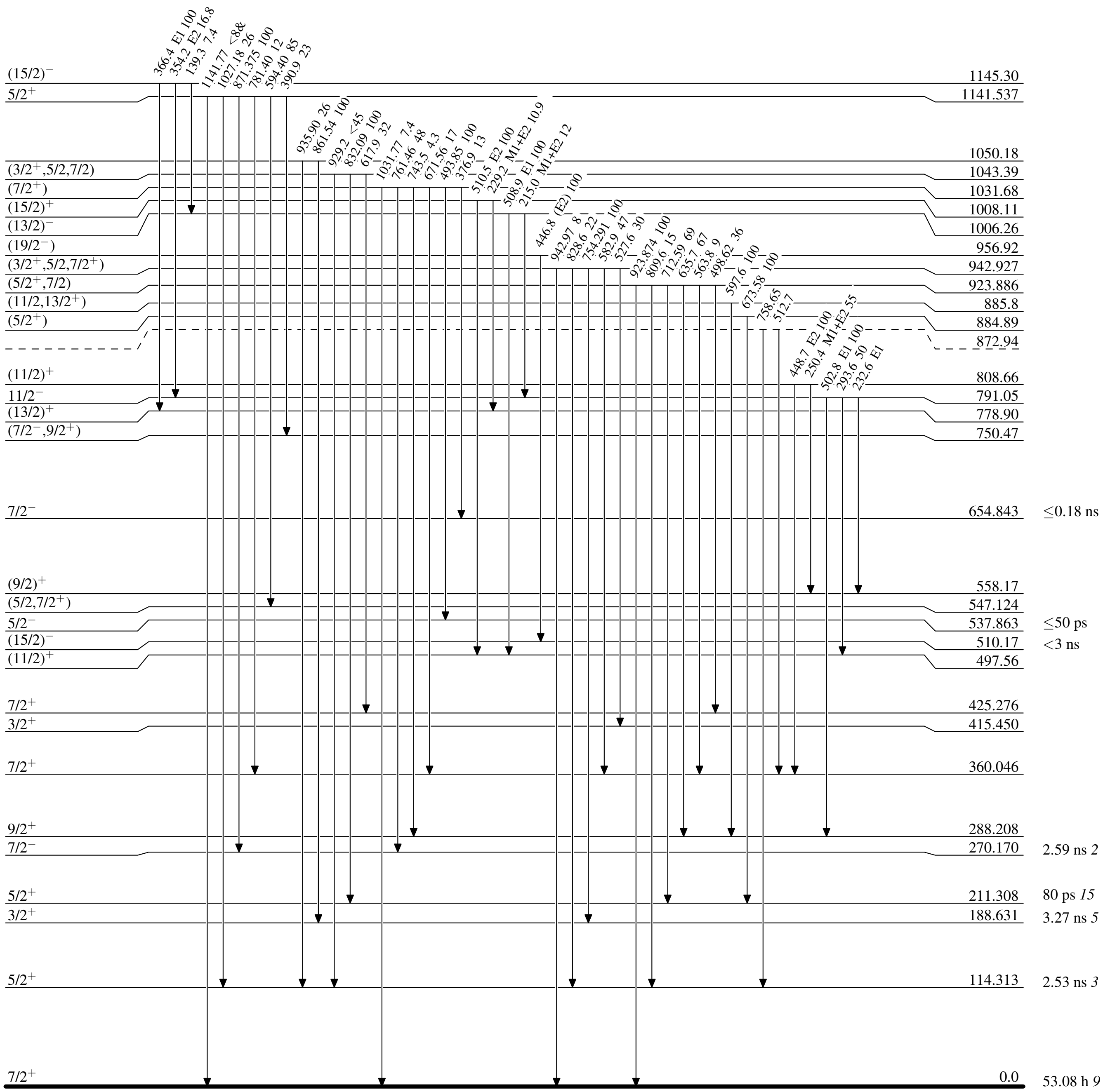


$^{149}_{61}Pm_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

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

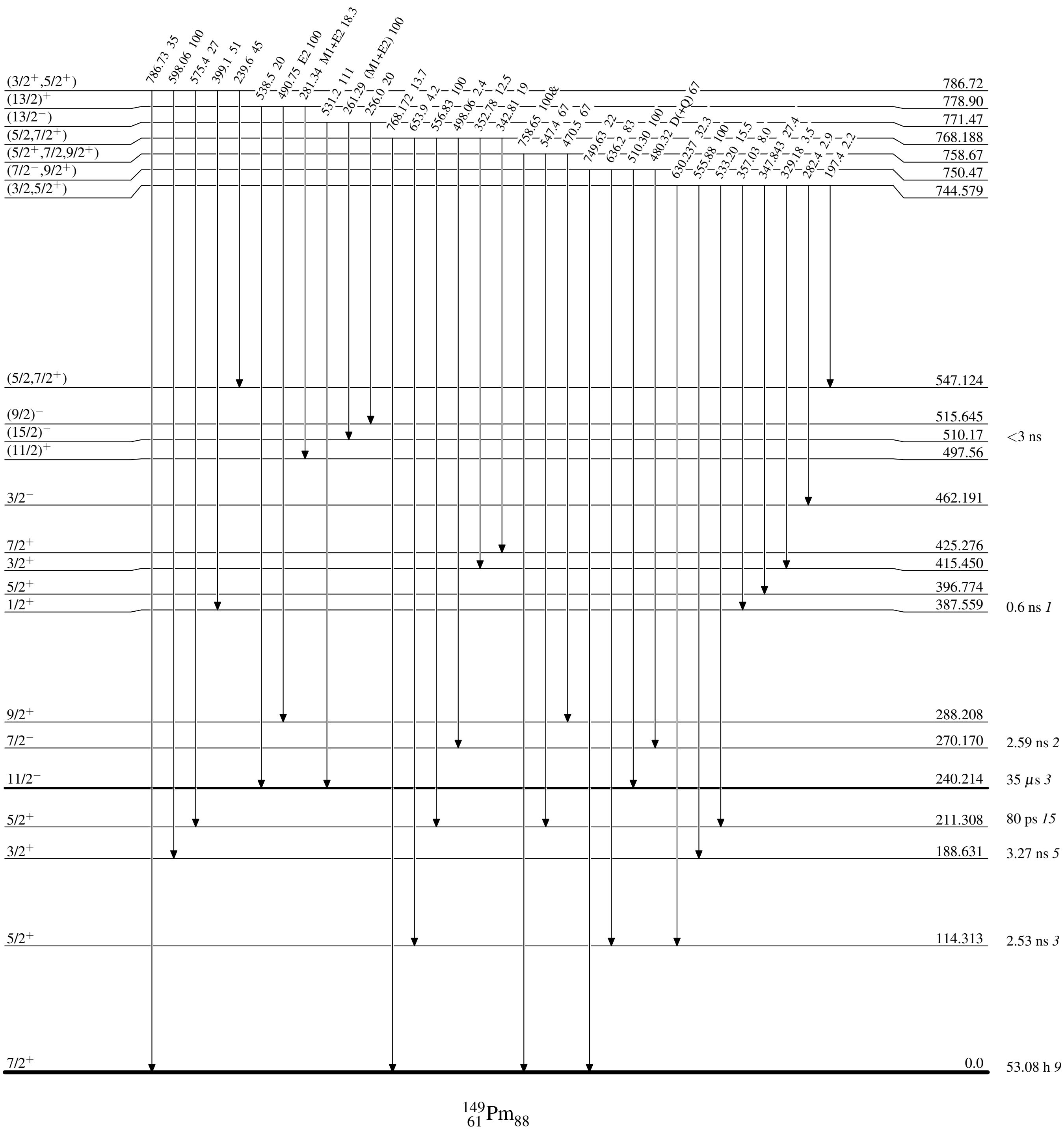


$^{149}_{61}Pm_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

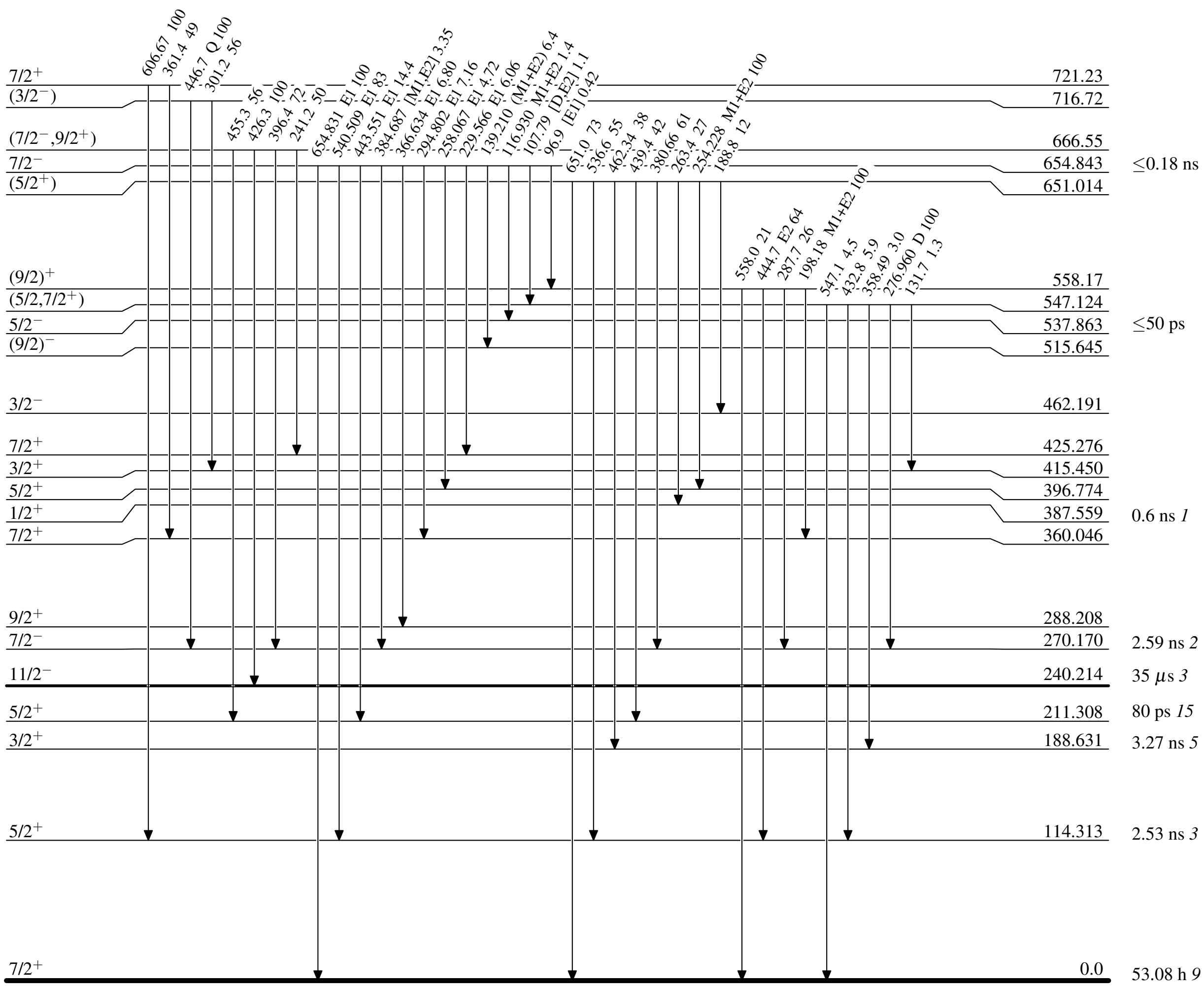
Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



Adopted Levels, Gammas

Level Scheme (continued)

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

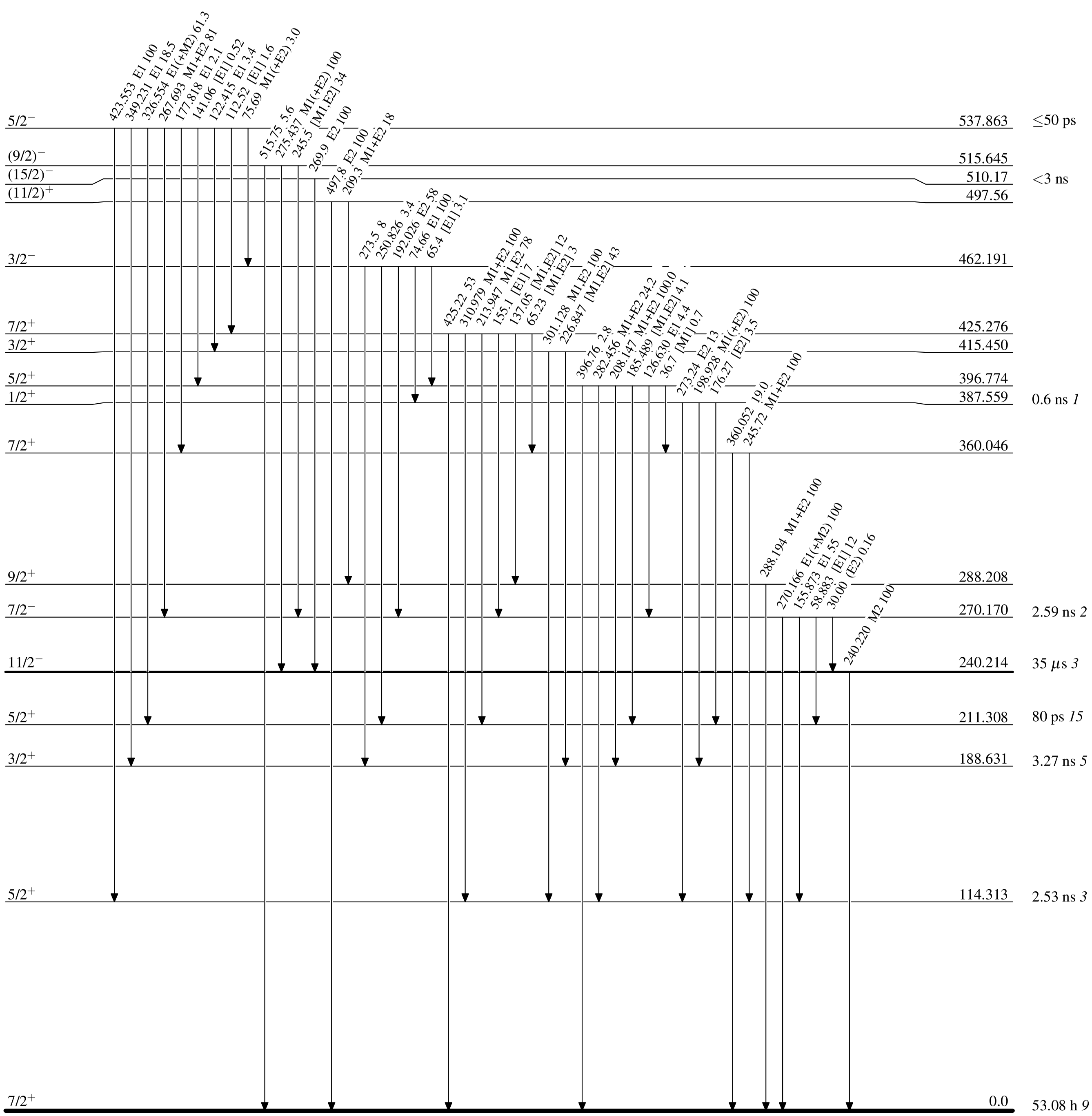


$^{149}_{61}Pm_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

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

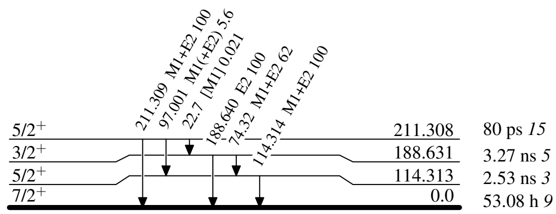


$^{149}_{61}Pm_{88}$

Adopted Levels, Gammas

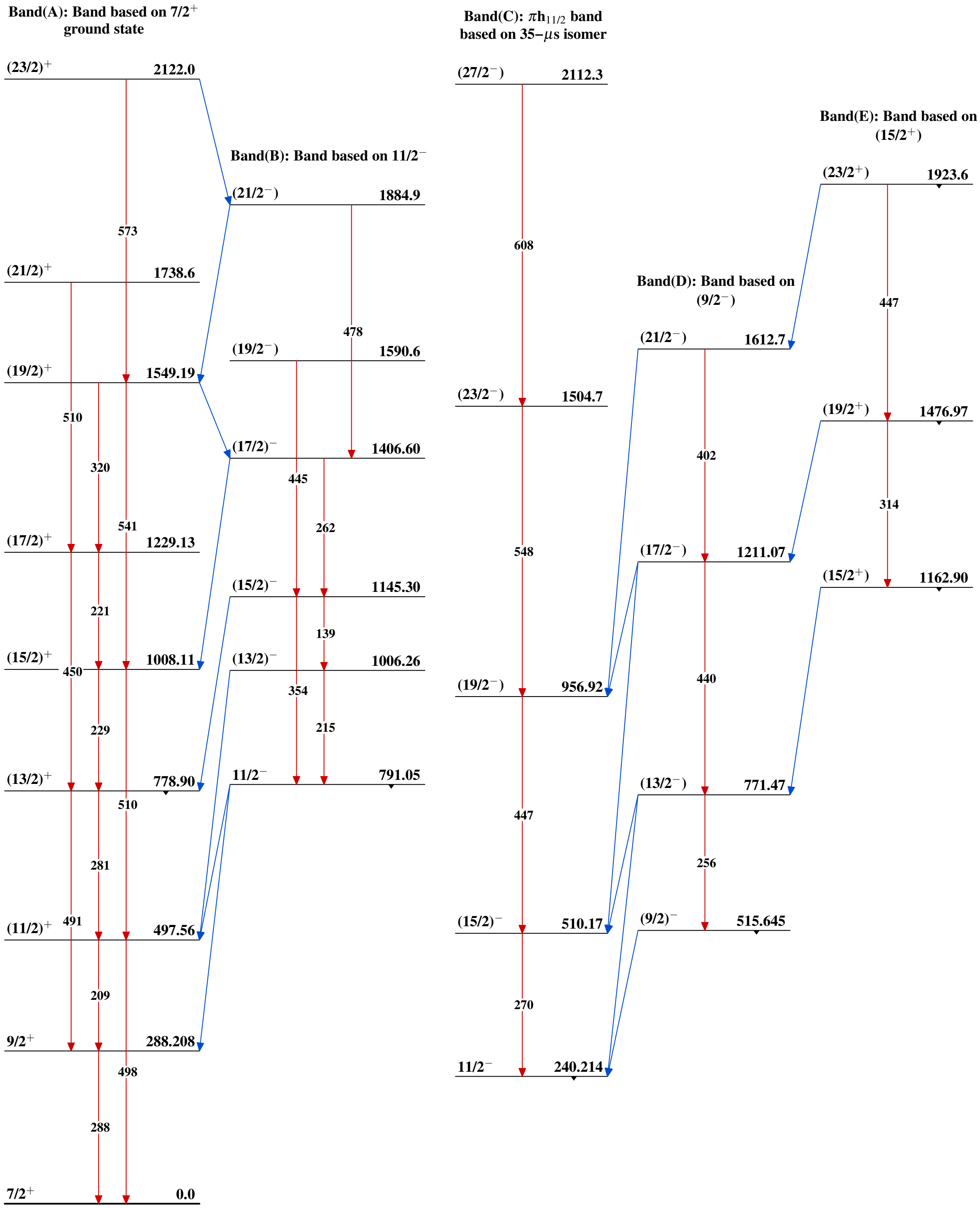
Level Scheme (continued)

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



$^{149}_{61}Pm_{88}$

Adopted Levels, Gammas



Adopted Levels, Gammas (continued)