Adopted Levels, Gammas

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov and A. Rodionov, F. G. Kondev	NDS 112,855 (2011)	31-Oct-2010

Q(β^-)=−8.2×10^3 *syst*; S(n)=1.185×10^4 *syst*; S(p)=1.27×10^3 *6*; Q(α)=1.94×10^3 *6* 2012Wa38
Note: Current evaluation has used the following Q record −8139 syst 11767 syst 1271 56 *1941* 58 2009AuZZ.
ΔQ(β^+)=202 (syst, 2009AuZZ).
ΔS(n)=202 (syst, 2009AuZZ).
Q(εp)=2517 *76* (2009AuZZ).

^{133}Pm Levels

Cross Reference (XREF) Flags

- A ^{133}Sm ε decay (2.89 s)
- B ^{133}Sm ε decay (3.5 s)
- C ^{96}Ru(^{40}Ca,3pγ)

E(level)[†]	J$^\pi$[#]	T$_{1/2}$	XREF	Comments
0.0[&]	(3/2$^+$)	13.5 s *21*	A C	%ε+%β^+=100 J$^\pi$: from direct feeding of low-spin (3/2,5/2) states in ^{133}Nd, following %ε+%β^+ decay; systematics of structures in neighboring Pm nuclei. The properties of rotational band associated with this state support the proposed π3/2[411] (d$_{5/2}$) configuration assignment and, hence, J^π=3/2$^+$ to the band-head. T$_{1/2}$: weighted average of 15 s *3* (1995Br21) and 12 s *3* (1977Bo02). configuration: π3/2[411] (d$_{5/2}$).
0+x[‡]			B	Additional information 1.
32.7+x[‡] *5*			B	
84.48[a] *23*	(5/2$^+$)		A C	J$^\pi$: 84.44γ to (3/2$^+$); band assignment.
129.6+x[‡] *7*			B	
129.7[b] *7*	(11/2$^-$)	<8.8 s	C	%ε+%β^+=?; %IT=? E(level): Although, no γ-rays were identified to depopulate this level, the level energy is obtained from the least-square fitting procedure due to connections between the π3/2[411] and π3/[541] bands using 643, 723 and 698 keV transitions. J$^\pi$: from population of high-spin (9/2,11/2) states in ^{133}Nd, following %ε+%β^+ decay; systematics in neighboring odd-Z nuclei. T$_{1/2}$: Value deduced from B(E3)(W.u.)=0.137 *8* from decay of a similar isomer in the N=72 isotone ^{131}Pr and α=2927 *284* (from BrIcc). configuration: π3/2[541] (h$_{11/2}$), strongly Coriolis mixed.
147.9[c] *8*	(9/2$^-$)		C	J$^\pi$: 262.55γ E2 from (13/2$^-$); band assignment.
205.6 *6*			A	
214.2[&] *3*	(7/2$^+$)		A C	J$^\pi$: 129.52γ M1+E2 to (5/2$^+$), 214.0γ to (3/2$^+$); band assignment.
286.4+x[‡] *9*			B	
371.9 *3*	(7/2$^+$)		C	J$^\pi$: 287.4γ to (5/2$^+$), 372.6γ to (3/2$^+$); band assignment.
381.9[a] *3*	(9/2$^+$)		C	J$^\pi$: 167.0γ M1+E2 to (7/2$^+$), 297.72γ E2 to (5/2$^+$); band assignment.
382.1[b] *7*	(15/2$^-$)	50 ps *4*	C	J$^\pi$: 252.45γ E2 to (11/2$^-$); band assignment. T$_{1/2}$: Using the recoil distance method in 1987Wa02.
402.3+x[‡] *7*			B	
410.4[c] *7*	(13/2$^-$)		C	J$^\pi$: 262.55γ E2 to (9/2$^-$), 280.75γ to (11/2$^-$); band assignment.
571.6[&] *3*	(11/2$^+$)		C	J$^\pi$: 189.35γ M1+E2 to (9/2$^+$), 357.42γ E2 to (7/2$^+$); band assignment.
653.4[e] *3*	(9/2$^+$)		C	J$^\pi$: 281.6γ to (7/2$^+$), 439.1γ to (7/2$^+$); band assignment. configuration: π9/2[404] (g$_{9/2}$).

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Adopted Levels, Gammas (continued)

^{133}Pm Levels (continued)

E(level)[†]	Jπ[#]	XREF	Comments
802.5[a] 3	(13/2+)	C	Jπ: 230.80γ M1+E2 to (11/2+), 420.73γ E2 to (9/2+); band assignment.
810.1[d] 4	(11/2+)	C	Jπ: 156.35γ M1+E2 to (9/2+); band assignment.
812.0[b] 7	(19/2−)	C	Jπ: 429.86γ E2 to (15/2−); band assignment.
815.9[f] 7	(15/2−)[@]	C	
820.3[c] 7	(17/2−)[@]	C	
991.1[e] 4	(13/2+)	C	Jπ: 180.45γ M1+E2 to (11/2+), 338.4γ to (9/2+); band assignment.
1025.3[&] 3	(15/2+)	C	Jπ: 222.4γ M1+E2 to (13/2+), 453.73γ E2 to (11/2+); band assignment.
1196.5[d] 4	(15/2+)	C	Jπ: 205.0γ M1+E2 to (13/2+), 386.7γ to (11/2+); band assignment.
1226.9[f] 7	(19/2−)[@]	C	
1294.9[a] 4	(17/2+)	C	Jπ: 269.45γ M1+E2 to (15/2+), 492.45γ E2 to (13/2+); band assignment.
1334.2[c] 7	(21/2−)	C	Jπ: 514.4γ E2 to (17/2−); band assignment.
1383.4[b] 7	(23/2−)	C	Jπ: 571.33γ E2 to (19/2−); band assignment.
1425.4[e] 4	(17/2+)	C	Jπ: 228.55γ M1+E2 to (15/2+), 434.4γ to (13/2+); band assignment.
1534.8[&] 4	(19/2+)	C	Jπ: 239.5γ M1+E2 to (17/2+), 509.49γ E2 to (15/2+); band assignment.
1677.4[d] 4	(19/2+)[@]	C	
1758.4[f] 7	(23/2−)[@]	C	
1830.6[a] 4	(21/2+)	C	Jπ: 295.60γ M1+E2 to (19/2+), 535.8γ to (17/2+); band assignment.
1927.9[c] 7	(25/2−)	C	Jπ: 593.8γ E2 to (21/2−); band assignment.
1952.0[e] 5	(21/2+)	C	Jπ: 274.46γ M1+E2 to (19/2+), 526.74γ to (17/2+); band assignment.
2058.9[b] 7	(27/2−)[@]	C	
2081.4[&] 4	(23/2+)[@]	C	
2249.1[d] 5	(23/2+)[@]	C	
2388.9[f] 7	(27/2−)[@]	C	
2397.1[a] 4	(25/2+)[@]	C	
2567.5[e] 5	(25/2+)[@]	C	
2598.5[c] 7	(29/2−)[@]	C	
2674.4[&] 4	(27/2+)[@]	C	
2805.4[b] 7	(31/2−)[@]	C	
2909.2[d] 5	(27/2+)[@]	C	
2991.6[a] 5	(29/2+)[@]	C	
3114.9[f] 7	(31/2−)[@]	C	
3271.9[e] 5	(29/2+)[@]	C	
3338.1[&] 5	(31/2+)[@]	C	
3348.5[c] 8	(33/2−)[@]	C	
3609.1[b] 8	(35/2−)[@]	C	
3655.3[d] 6	(31/2+)[@]	C	
3671.8[a] 5	(33/2+)[@]	C	
3911.0[f] 13	(35/2−)[@]	C	
4059.5[e] 6	(33/2+)[@]	C	
4089.2[&] 5	(35/2+)[@]	C	
4180.8[c] 8	(37/2−)[@]	C	
4457.7[a] 7	(37/2+)[@]	C	
4474.8[b] 8	(39/2−)[@]	C	
4480.0[d] 6	(35/2+)[@]	C	
4773.0[f] 16	(39/2−)[@]	C	

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Adopted Levels, Gammas (continued)

^{133}Pm Levels (continued)

E(level)†	Jπ#	XREF	E(level)†	Jπ#	XREF	E(level)†	Jπ#	XREF
4926.2[e] *7*	(37/2$^+$)@	C	5872.2[e] *12*	(41/2$^+$)@	C	7492.1[b] *13*	(51/2$^-$)@	C
4927.6& *7*	(39/2$^+$)@	C	6099.8[c] *14*	(45/2$^-$)@	C	7768.8& *12*	(51/2$^+$)@	C
5096.8[c] *10*	(41/2$^-$)@	C	6290.7[a] *11*	(45/2$^+$)@	C	8290.5[a] *17*	(53/2$^+$)@	C
5337.4[a] *9*	(41/2$^+$)@	C	6414.0[b] *11*	(47/2$^-$)@	C	8646.6[b] *19*	(55/2$^-$)@	C
5390.0[d] *12*	(39/2$^+$)@	C	6796.8& *10*	(47/2$^+$)@	C	8767.3& *14*	(55/2$^+$)@	C
5409.1[b] *8*	(43/2$^-$)@	C	7137.3[c] *19*	(49/2$^-$)@	C	9361.5[a] *23*	(57/2$^+$)@	C
5838.3& *9*	(43/2$^+$)@	C	7278.6[a] *14*	(49/2$^+$)@	C	9877.7[b] *25*	(59/2$^-$)@	C

† From a least-squares fit to Eγ.

‡ From ^{133}Sm ε decay (3.4 s). The assignment to ^{133}Pm is tentative, since the observed γ-rays were not observed in the (HI,xnγ) work. The parent state is proposed $J^\pi=1/2^-$, originating from the 1/2[541] ($h_{9/2}$) configuration, but in well deformed nuclei $J^\pi=5/2^-$ level is frequently observed as a band-head, owing to the large decoupling parameter and strong Coriolis mixing.

From deduced γ-ray transition multipolarities in ^{96}Ru(^{40}Ca,3pγ), unless otherwise specified.

@ From the apparent band structure with ΔJ=2 cascade transitions or with ΔJ=1 cascade and ΔJ=2 crossover transitions.

& Band(A): 1-qp band based on the (3/2$^+$) g.s., α=−1/2. configuration=π3/2[411] ($d_{5/2}$). Q(intrinsic)=5.4 eb *6* (1996Ga17) and 4.1 eb *2* (2001Ri20).

[a] Band(B): 1-qp band based on the (5/2$^+$) state at 84.5-keV, α=+1/2. configuration=π3/2[411] ($d_{5/2}$). Q(intrinsic)=5.4 eb *6* (1996Ga17) and 4.1 eb *2* (2001Ri20).

[b] Band(C): 1-qp band based on the (11/2$^-$) state 129.7-keV, α=−1/2. configuration=π3/2[541] ($h_{11/2}$), strongly Coriolis mixed. Q(intrinsic)=5.2 eb *5* (1996Ga17) and 4.0 eb *2* (2001Ri20).

[c] Band(D): 1-qp band based on the (9/2$^-$)state 147.9-keV, α=+1/2. configuration=π3/2[541] ($h_{11/2}$), strongly Coriolis mixed. Q(intrinsic)=5.2 eb *5* (1996Ga17) and 4.0 eb *2* (2001Ri20).

[d] Band(E): 1-qp band based on the (11/2$^+$) state at 810.1-keV, α=−1/2. configuration=π9/2[404] ($g_{9/2}$). Q(intrinsic)=7.4 eb *10* (1996Ga17) and 5.0 eb 4 (2001Ri20,2002La09).

[e] Band(F): 1-qp band based on the (9/2$^+$) state at 653.4-keV, α=+1/2. configuration=π9/2[404] ($g_{9/2}$). Q(intrinsic)=7.4 eb *10* (1996Ga17) and 5.0 eb 4 (2001Ri20,2002La09).

[f] Band(G): 1-qp band based on the (15/2$^-$) state at 815.9-keV, α=+1/2. Probable configuration=$h_{11/2}$, strongly Coriolis mixed band.

Adopted Levels, Gammas (continued)

$\gamma(^{133}Pm)$

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[‡]	α[†]	Comments
32.7+x		32.7[&] *5*	100[&]	0+x					
84.48	(5/2$^+$)	84.44 *27*	100	0.0	(3/2$^+$)				
129.6+x		96.9[&] *5*	100[&]	32.7+x					
129.7	(11/2$^-$)	(45.2 *7*)	100	84.48	(5/2$^+$)	[E3]		2927	E_γ: Not observed experimentally. Value deduced from the energy difference between the (11/2$^-$) and (5/2$^+$) levels.
205.6		121.1[@] *5*	100[@]	84.48	(5/2$^+$)				
214.2	(7/2$^+$)	129.52 *19*	100 *10*	84.48	(5/2$^+$)	M1+E2	0.150 *16*	0.745	α(K)=0.628 *10*; α(L)=0.0920 *16*; α(M)=0.0197 *4*; α(N+..)=0.00514 *9* α(N)=0.00444 *8*; α(O)=0.000664 *11*; α(P)=4.02×10^{-5} *6*
		214.0 *5*	40 *4*	0.0	(3/2$^+$)				
286.4+x		156.8[&] *5*	100[&]	129.6+x					
371.9	(7/2$^+$)	287.4 *2*	100 *5*	84.48	(5/2$^+$)				
		372.6 *7*	57 *29*	0.0	(3/2$^+$)				
381.9	(9/2$^+$)	167.0 *3*	77 *4*	214.2	(7/2$^+$)	M1+E2	0.178 *16*	0.364	α(K)=0.308 *5*; α(L)=0.0445 *8*; α(M)=0.00954 *16*; α(N+..)=0.00249 *4* α(N)=0.00215 *4*; α(O)=0.000321 *5*; α(P)=1.96×10^{-5} *3*
		297.72 *24*	100 *47*	84.48	(5/2$^+$)	E2		0.0556	α(K)=0.0436 *7*; α(L)=0.00938 *14*; α(M)=0.00207 *3*; α(N+..)=0.000525 *8* α(N)=0.000459 *7*; α(O)=6.38×10^{-5} *10*; α(P)=2.37×10^{-6} *4*
382.1	(15/2$^-$)	252.45 *23*	100	129.7	(11/2$^-$)	E2		0.0939	α(K)=0.0718 *11*; α(L)=0.01724 *25*; α(M)=0.00383 *6*; α(N+..)=0.000966 *14* α(N)=0.000846 *13*; α(O)=0.0001160 *17*; α(P)=3.78×10^{-6} *6* B(E2)(W.u.)=250 *20*
402.3+x		369.6[&] *5*	100[&]	32.7+x					
410.4	(13/2$^-$)	262.55 *23*	100 *4*	147.9	(9/2$^-$)	E2		0.0827	α(K)=0.0637 *9*; α(L)=0.01488 *22*; α(M)=0.00330 *5*; α(N+..)=0.000833 *12* α(N)=0.000730 *11*; α(O)=0.0001004 *15*; α(P)=3.38×10^{-6} *5*
		280.75 *23*	92 *4*	129.7	(11/2$^-$)				
571.6	(11/2$^+$)	189.35 *23*	53 *3*	381.9	(9/2$^+$)	M1+E2	0.195 *24*	0.257	α(K)=0.217 *4*; α(L)=0.0312 *5*; α(M)=0.00669 *11*; α(N+..)=0.00174 *3* α(N)=0.001505 *25*; α(O)=0.000226 *4*; α(P)=1.383×10^{-5} *21*
		357.42 *19*	100 *4*	214.2	(7/2$^+$)	E2		0.0318	α(K)=0.0255 *4*; α(L)=0.00495 *7*; α(M)=0.001086 *16*; α(N+..)=0.000277 *4* α(N)=0.000241 *4*; α(O)=3.40×10^{-5} *5*; α(P)=1.424×10^{-6} *20*
653.4	(9/2$^+$)	271.6 *10*	24 *3*	381.9	(9/2$^+$)				
		281.6 *2*	89 *8*	371.9	(7/2$^+$)				
		439.1 *2*	100 *8*	214.2	(7/2$^+$)				
802.5	(13/2$^+$)	230.80 *21*	32.7 *18*	571.6	(11/2$^+$)	M1+E2	0.18 *3*	0.1492 *22*	α(K)=0.1266 *19*; α(L)=0.0178 *3*; α(M)=0.00381 *6*; α(N+..)=0.000996 *15* α(N)=0.000859 *13*; α(O)=0.0001292 *19*; α(P)=8.06×10^{-6} *12*

$^{133}_{61}Pm_{72}$-4

Adopted Levels, Gammas (continued)

γ(^{133}Pm) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[‡]	α[†]	Comments
802.5	(13/2$^+$)	420.73 *16*	100 *4*	381.9	(9/2$^+$)	E2		0.0198	α(K)=0.01611 *23*; α(L)=0.00289 *4*; α(M)=0.000631 *9*; α(N+..)=0.0001613 *23* α(N)=0.0001404 *20*; α(O)=2.01×10^{-5} *3*; α(P)=9.19×10^{-7} *13*
810.1	(11/2$^+$)	156.35 *21*	100	653.4	(9/2$^+$)	M1+E2	0.23 *3*	0.439	α(K)=0.369 *6*; α(L)=0.0551 *12*; α(M)=0.0118 *3*; α(N+..)=0.00308 *7* α(N)=0.00266 *6*; α(O)=0.000396 *8*; α(P)=2.34×10^{-5} *4*
812.0	(19/2$^-$)	429.86 *17*	100	382.1	(15/2$^-$)	E2		0.0186	α(K)=0.01519 *22*; α(L)=0.00270 *4*; α(M)=0.000589 *9*; α(N+..)=0.0001506 *22* α(N)=0.0001310 *19*; α(O)=1.87×10^{-5} *3*; α(P)=8.68×10^{-7} *13*
815.9	(15/2$^-$)	405.1 *4*	56 *6*	410.4	(13/2$^-$)				
		433.9 *3*	100 *13*	382.1	(15/2$^-$)				
820.3	(17/2$^-$)	409.96 *17*	100 *6*	410.4	(13/2$^-$)				
		438.09 *17*	36 *3*	382.1	(15/2$^-$)				
991.1	(13/2$^+$)	180.45 *25*	100 *5*	810.1	(11/2$^+$)	M1+E2	0.25 *3*	0.293	α(K)=0.247 *4*; α(L)=0.0365 *7*; α(M)=0.00784 *16*; α(N+..)=0.00204 *4* α(N)=0.00176 *4*; α(O)=0.000263 *5*; α(P)=1.566×10^{-5} *25*
		338.4 *3*	25.2 *25*	653.4	(9/2$^+$)				
1025.3	(15/2$^+$)	222.4 *4*	23.8 *10*	802.5	(13/2$^+$)	M1+E2	0.15 *3*	0.1653 *25*	α(K)=0.1403 *21*; α(L)=0.0197 *3*; α(M)=0.00421 *7*; α(N+..)=0.001100 *17* α(N)=0.000948 *15*; α(O)=0.0001428 *22*; α(P)=8.94×10^{-6} *14*
		453.73 *17*	100 *3*	571.6	(11/2$^+$)	E2		0.01601	α(K)=0.01311 *19*; α(L)=0.00228 *4*; α(M)=0.000496 *7*; α(N+..)=0.0001271 *18* α(N)=0.0001105 *16*; α(O)=1.586×10^{-5} *23*; α(P)=7.54×10^{-7} *11*
		643 *1*	14.8 *14*	382.1	(15/2$^-$)	E1		0.00237 *4*	α(K)=0.00204 *3*; α(L)=0.000265 *4*; α(M)=5.60×10^{-5} *8*; α(N+..)=1.458×10^{-5} *21* α(N)=1.258×10^{-5} *19*; α(O)=1.89×10^{-6} *3*; α(P)=1.181×10^{-7} *17*
1196.5	(15/2$^+$)	205.0 *3*	100 *4*	991.1	(13/2$^+$)	M1+E2	0.23 *3*	0.206	α(K)=0.174 *3*; α(L)=0.0251 *5*; α(M)=0.00538 *9*; α(N+..)=0.001403 *23* α(N)=0.001211 *21*; α(O)=0.000181 *3*; α(P)=1.105×10^{-5} *17*
		386.7 *3*	33 *3*	810.1	(11/2$^+$)				
1226.9	(19/2$^-$)	406.6 *3*	92 *7*	820.3	(17/2$^-$)				
		411.0 *3*	95 *9*	815.9	(15/2$^-$)				
		415.0 *3*	100 *10*	812.0	(19/2$^-$)				
1294.9	(17/2$^+$)	269.45 *21*	23.3 *14*	1025.3	(15/2$^+$)	M1+E2	0.12 *4*	0.0986 *15*	α(K)=0.0839 *13*; α(L)=0.01162 *17*; α(M)=0.00248 *4*; α(N+..)=0.000648 *10* α(N)=0.000559 *8*; α(O)=8.43×10^{-5} *12*; α(P)=5.34×10^{-6} *8*
		492.45 *21*	100 *5*	802.5	(13/2$^+$)	E2		0.01280	α(K)=0.01055 *15*; α(L)=0.001774 *25*; α(M)=0.000385 *6*; α(N+..)=9.89×10^{-5} *14* α(N)=8.59×10^{-5} *12*; α(O)=1.240×10^{-5} *18*; α(P)=6.11×10^{-7} *9*
1334.2	(21/2$^-$)	514.4 *5*	100 *7*	820.3	(17/2$^-$)	E2		0.01139	α(K)=0.00941 *14*; α(L)=0.001558 *23*; α(M)=0.000338 *5*; α(N+..)=8.68×10^{-5} *13* α(N)=7.53×10^{-5} *11*; α(O)=1.091×10^{-5} *16*; α(P)=5.48×10^{-7} *8*

$^{133}_{61}Pm_{72}$-5

Adopted Levels, Gammas (continued)

γ(^{133}Pm) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[‡]	α[†]	Comments
1334.2	(21/2$^-$)	522.20 *24*	23.2 *15*	812.0	(19/2$^-$)				
1383.4	(23/2$^-$)	571.33 *16*	100	812.0	(19/2$^-$)	E2		0.00867 *13*	α(K)=0.00721 *11*; α(L)=0.001150 *17*; α(M)=0.000248 *4*; α(N+..)=6.40×10^{-5} *9* α(N)=5.55×10^{-5} *8*; α(O)=8.09×10^{-6} *12*; α(P)=4.23×10^{-7} *6*
1425.4	(17/2$^+$)	228.55 *25*	100 *6*	1196.5	(15/2$^+$)	M1+E2	0.24 *3*	0.1527 *23*	α(K)=0.1292 *19*; α(L)=0.0185 *3*; α(M)=0.00396 *7*; α(N+..)=0.001033 *16* α(N)=0.000891 *14*; α(O)=0.0001337 *20*; α(P)=8.20×10^{-6} *13*
		434.4 *3*	65 *5*	991.1	(13/2$^+$)				
1534.8	(19/2$^+$)	239.5 *7*	13.4 *8*	1294.9	(17/2$^+$)	M1+E2	0.12 *4*	0.1354 *22*	α(K)=0.1150 *19*; α(L)=0.0160 *3*; α(M)=0.00342 *6*; α(N+..)=0.000894 *15* α(N)=0.000771 *13*; α(O)=0.0001162 *19*; α(P)=7.34×10^{-6} *13*
		509.49 *17*	100 *4*	1025.3	(15/2$^+$)	E2		0.01169	α(K)=0.00965 *14*; α(L)=0.001602 *23*; α(M)=0.000347 *5*; α(N+..)=8.93×10^{-5} *13* α(N)=7.75×10^{-5} *11*; α(O)=1.122×10^{-5} *16*; α(P)=5.61×10^{-7} *8*
		723 *1*	14.4 *11*	812.0	(19/2$^-$)	E1		0.00186 *3*	α(K)=0.001596 *23*; α(L)=0.000206 *3*; α(M)=4.36×10^{-5} *7*; α(N+..)=1.137×10^{-5} *17* α(N)=9.80×10^{-6} *14*; α(O)=1.473×10^{-6} *21*; α(P)=9.28×10^{-8} *14*
1677.4	(19/2$^+$)	251.82 *27*	100 *7*	1425.4	(17/2$^+$)				
		480.96 *19*	85 *6*	1196.5	(15/2$^+$)				
1758.4	(23/2$^-$)	374.9 *3*	25.5 *20*	1383.4	(23/2$^-$)				
		424.1 *3*	28.9 *20*	1334.2	(21/2$^-$)				
		531.4 *3*	100 *5*	1226.9	(19/2$^-$)				
1830.6	(21/2$^+$)	295.60 *27*	19.1 *10*	1534.8	(19/2$^+$)	M1+E2	0.13 *6*	0.0770 *12*	α(K)=0.0655 *10*; α(L)=0.00905 *13*; α(M)=0.00193 *3*; α(N+..)=0.000505 *8* α(N)=0.000435 *7*; α(O)=6.57×10^{-5} *10*; α(P)=4.16×10^{-6} *7*
		535.80 *21*	100 *5*	1294.9	(17/2$^+$)				
1927.9	(25/2$^-$)	544.6 *3*	22.9 *18*	1383.4	(23/2$^-$)				
		593.80 *21*	100 *9*	1334.2	(21/2$^-$)	E2		0.00786 *11*	α(K)=0.00655 *10*; α(L)=0.001032 *15*; α(M)=0.000223 *4*; α(N+..)=5.74×10^{-5} *8* α(N)=4.98×10^{-5} *7*; α(O)=7.27×10^{-6} *11*; α(P)=3.85×10^{-7} *6*
1952.0	(21/2$^+$)	274.46 *24*	92 *7*	1677.4	(19/2$^+$)	M1+E2	0.23 *5*	0.0931 *15*	α(K)=0.0790 *13*; α(L)=0.01111 *17*; α(M)=0.00237 *4*; α(N+..)=0.000620 *9* α(N)=0.000534 *8*; α(O)=8.04×10^{-5} *12*; α(P)=5.01×10^{-6} *9*
		526.74 *26*	100 *7*	1425.4	(17/2$^+$)				
2058.9	(27/2$^-$)	675.47 *17*	100	1383.4	(23/2$^-$)				
2081.4	(23/2$^+$)	250.8 *3*	9.6 *6*	1830.6	(21/2$^+$)				
		546.63 *17*	100 *4*	1534.8	(19/2$^+$)				
		698 *1*	9.8 *11*	1383.4	(23/2$^-$)	E1		0.00200 *3*	α(K)=0.001716 *25*; α(L)=0.000222 *4*; α(M)=4.70×10^{-5} *7*; α(N+..)=1.224×10^{-5} *18* α(N)=1.055×10^{-5} *16*; α(O)=1.586×10^{-6} *23*; α(P)=9.97×10^{-8} *15*

$^{133}_{61}Pm_{72}$-6

Adopted Levels, Gammas (continued)

γ(^{133}Pm) (continued)

E_i(level)	J_i^π	E_γ‡	I_γ‡	E_f	J_f^π
2249.1	(23/2$^+$)	296.99 *24*	75 *10*	1952.0	(21/2$^+$)
		571.9 *4*	100 *8*	1677.4	(19/2$^+$)
2388.9	(27/2$^-$)	329.9 *3*	10.9 *16*	2058.9	(27/2$^-$)
		461.1 *2*	19.8 *21*	1927.9	(25/2$^-$)
		630.3 *3*	100 *5*	1758.4	(23/2$^-$)
2397.1	(25/2$^+$)	315.8 *3*	17.6 *15*	2081.4	(23/2$^+$)
		566.4 *4*	100 *6*	1830.6	(21/2$^+$)
2567.5	(25/2$^+$)	318.53 *26*	55 *13*	2249.1	(23/2$^+$)
		615.46 *19*	100 *8*	1952.0	(21/2$^+$)
2598.5	(29/2$^-$)	539.7 *3*	20 *4*	2058.9	(27/2$^-$)
		670.69 *24*	100 *12*	1927.9	(25/2$^-$)
2674.4	(27/2$^+$)	277.4 *3*	7.3 *6*	2397.1	(25/2$^+$)
		592.95 *21*	100 *6*	2081.4	(23/2$^+$)
2805.4	(31/2$^-$)	746.50 *21*	100	2058.9	(27/2$^-$)
2909.2	(27/2$^+$)	341.66 *28*	53 *11*	2567.5	(25/2$^+$)
		660.2 *5*	100 *11*	2249.1	(23/2$^+$)
2991.6	(29/2$^+$)	317.3 *5*	10.9 *14*	2674.4	(27/2$^+$)
		594.46 *24*	100 *9*	2397.1	(25/2$^+$)
3114.9	(31/2$^-$)	309.5 *3*	13.6 *19*	2805.4	(31/2$^-$)
		516.6 *3*	9.9 *19*	2598.5	(29/2$^-$)
		725.9 *3*	100 *10*	2388.9	(27/2$^-$)
3271.9	(29/2$^+$)	362.58 *19*	33 *7*	2909.2	(27/2$^+$)
		704.4 *4*	100 *10*	2567.5	(25/2$^+$)
3338.1	(31/2$^+$)	663.68 *18*	100	2674.4	(27/2$^+$)
3348.5	(33/2$^-$)	749.95 *23*	100	2598.5	(29/2$^-$)
3609.1	(35/2$^-$)	803.65 *21*	100	2805.4	(31/2$^-$)
3655.3	(31/2$^+$)	383.0 *6*	43 *11*	3271.9	(29/2$^+$)
		746.13 *20*	100 *16*	2909.2	(27/2$^+$)
3671.8	(33/2$^+$)	680.18 *18*	100	2991.6	(29/2$^+$)
3911.0	(35/2$^-$)	796 *1*	100	3114.9	(31/2$^-$)
4059.5	(33/2$^+$)	404 *1*	33 *13*	3655.3	(31/2$^+$)
		787.67 *25*	100 *20*	3271.9	(29/2$^+$)
4089.2	(35/2$^+$)	751.07 *24*	100	3338.1	(31/2$^+$)
4180.8	(37/2$^-$)	832.30 *24*	100	3348.5	(33/2$^-$)
4457.7	(37/2$^+$)	785.9 *4*	100	3671.8	(33/2$^+$)
4474.8	(39/2$^-$)	865.70 *21*	100	3609.1	(35/2$^-$)
4480.0	(35/2$^+$)	824.7 *3*	100	3655.3	(31/2$^+$)
4773.0	(39/2$^-$)	862 *1*	100	3911.0	(35/2$^-$)
4926.2	(37/2$^+$)	866.7 *3*	100	4059.5	(33/2$^+$)
4927.6	(39/2$^+$)	838.4 *5*	100	4089.2	(35/2$^+$)
5096.8	(41/2$^-$)	916.0 *6*	100	4180.8	(37/2$^-$)
5337.4	(41/2$^+$)	879.7 *6*	100	4457.7	(37/2$^+$)
5390.0	(39/2$^+$)	910 *1*	100	4480.0	(35/2$^+$)
5409.1	(43/2$^-$)	934.30 *21*	100	4474.8	(39/2$^-$)
5838.3	(43/2$^+$)	910.7 *4*	100	4927.6	(39/2$^+$)
5872.2	(41/2$^+$)	946 *1*	100	4926.2	(37/2$^+$)
6099.8	(45/2$^-$)	1003 *1*	100	5096.8	(41/2$^-$)
6290.7	(45/2$^+$)	953.3 *6*	100	5337.4	(41/2$^+$)
6414.0	(47/2$^-$)	1004.9 *7*	100	5409.1	(43/2$^-$)
6796.8	(47/2$^+$)	958.5 *5*	100	5838.3	(43/2$^+$)
7137.3	(49/2$^-$)	1037.5 *12*	100	6099.8	(45/2$^-$)
7278.6	(49/2$^+$)	987.9 *8*	100	6290.7	(45/2$^+$)
7492.1	(51/2$^-$)	1078.1 *7*	100	6414.0	(47/2$^-$)
7768.8	(51/2$^+$)	972.0 *6*	100	6796.8	(47/2$^+$)
8290.5	(53/2$^+$)	1011.9 *10*	100	7278.6	(49/2$^+$)
8646.6	(55/2$^-$)	1154.5 *14*	100	7492.1	(51/2$^-$)
8767.3	(55/2$^+$)	998.5 *7*	100	7768.8	(51/2$^+$)
9361.5	(57/2$^+$)	1071.0 *15*	100	8290.5	(53/2$^+$)
9877.7	(59/2$^-$)	1231.1 *15*	100	8646.6	(55/2$^-$)

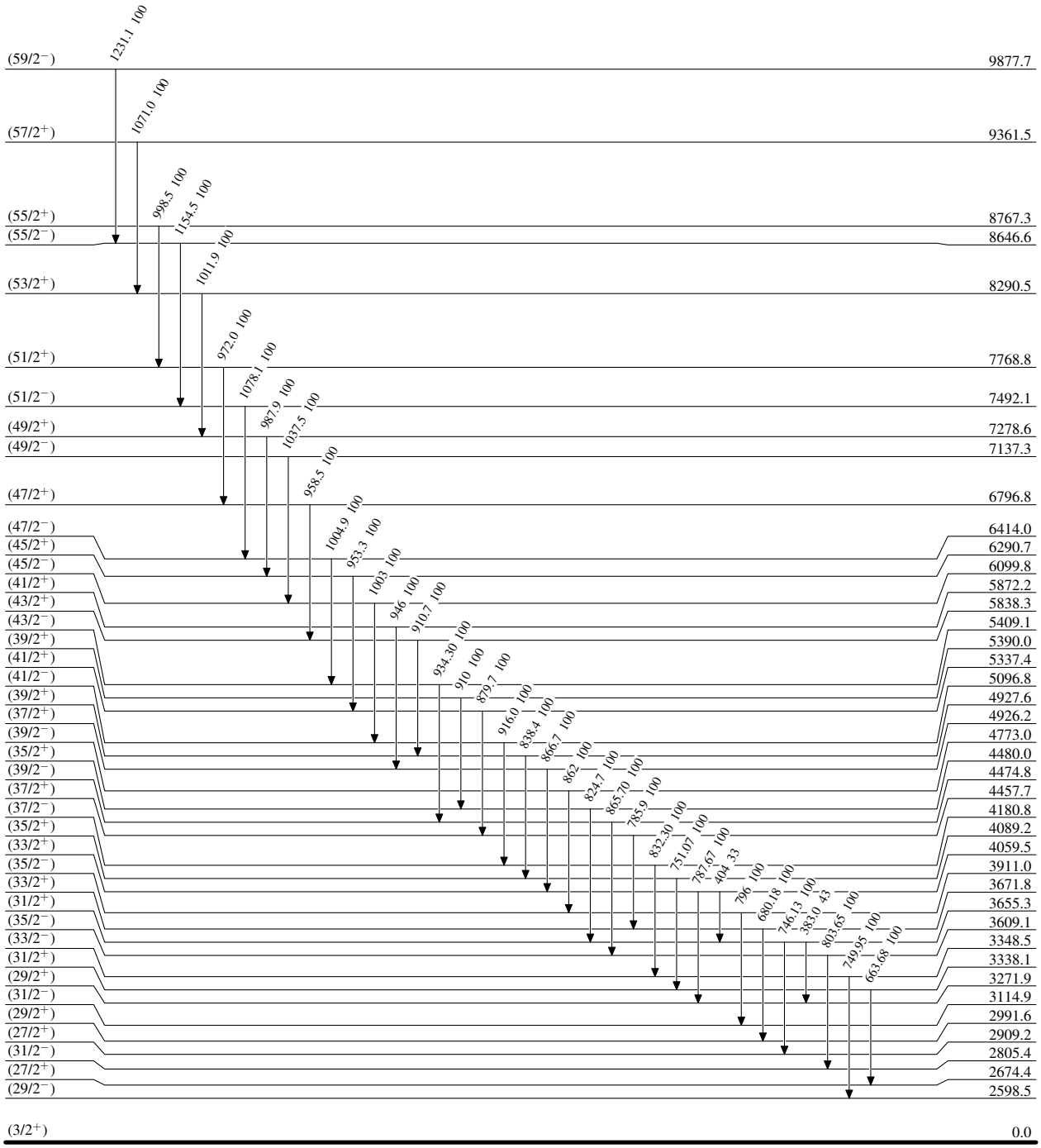
† Additional information 2.
‡ From ^{96}Ru(^{40}Ca,3pγ), except as noted.
# From DCO values and the observed apparent band structures with ΔJ=2 cascade transitions or with ΔJ=1 cascade and ΔJ=2 crossover transitions in ^{96}Ru(^{40}Ca,3pγ).
@ From ^{133}Sm ε decay (2.89 s).
& From ^{133}Sm ε decay (3.5 s).

$^{133}_{61}Pm_{72}$-7

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



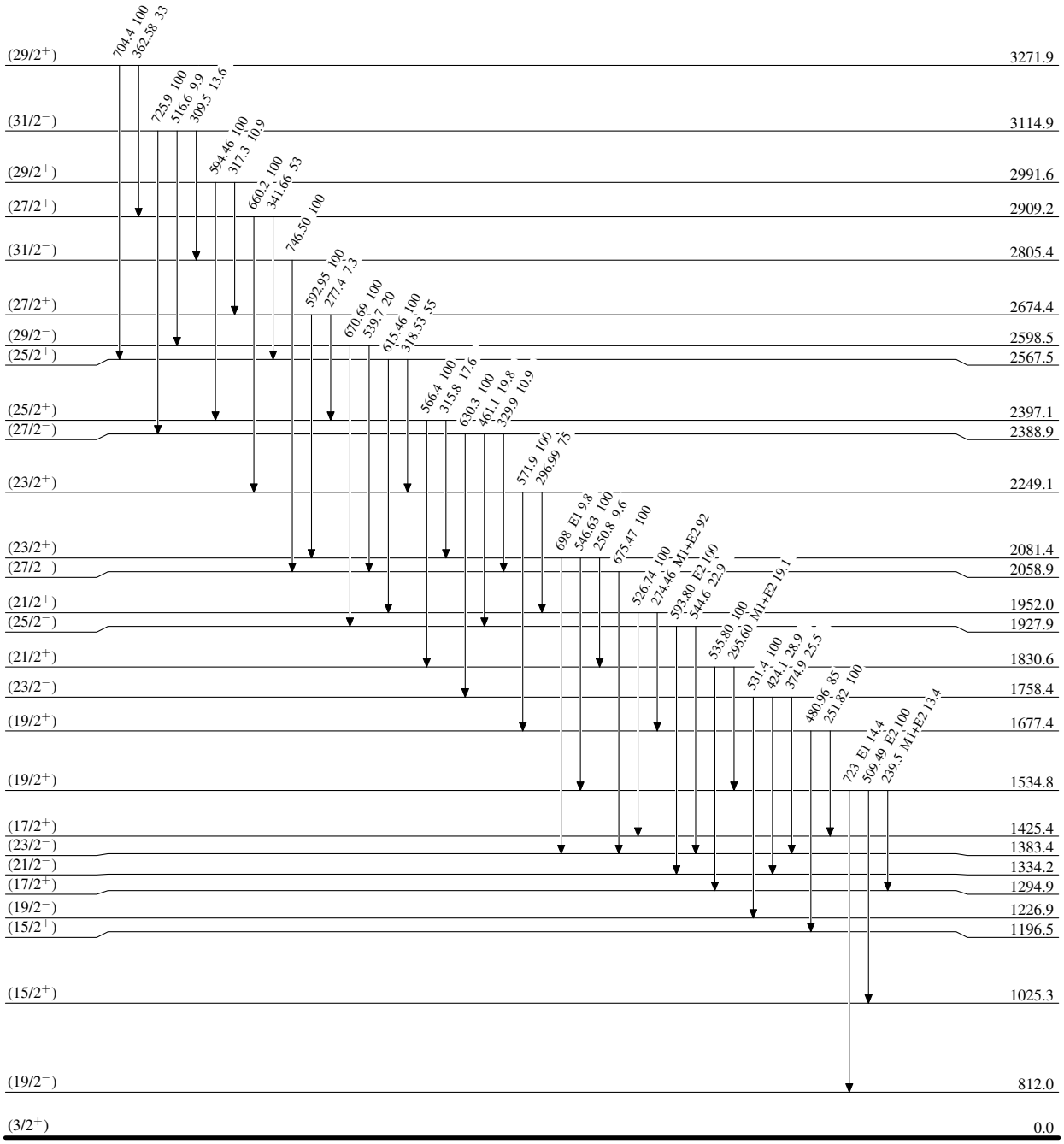
13.5 s *21*

$^{133}_{61}Pm_{72}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

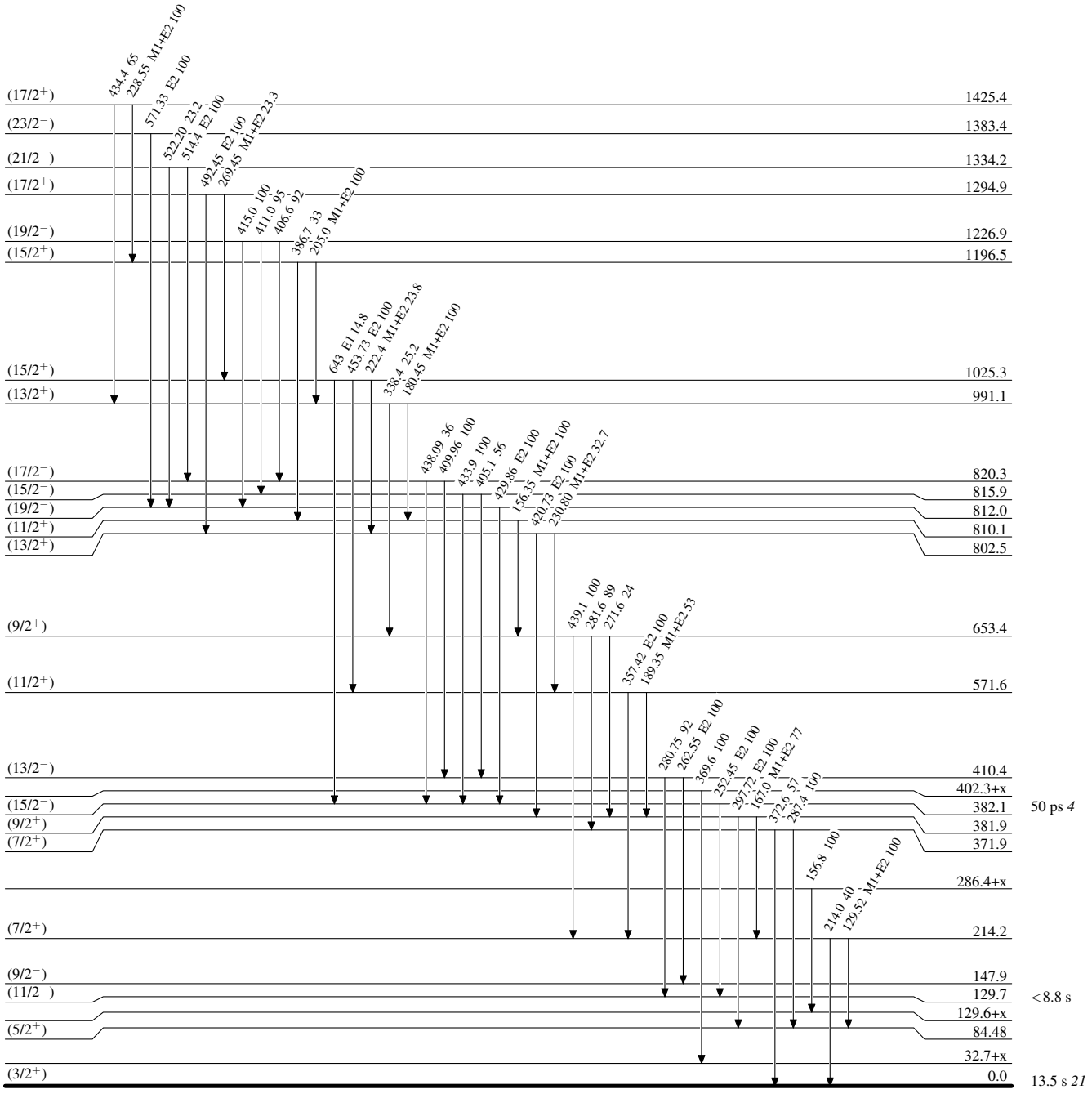


$^{133}_{61}Pm_{72}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{133}_{61}Pm_{72}$

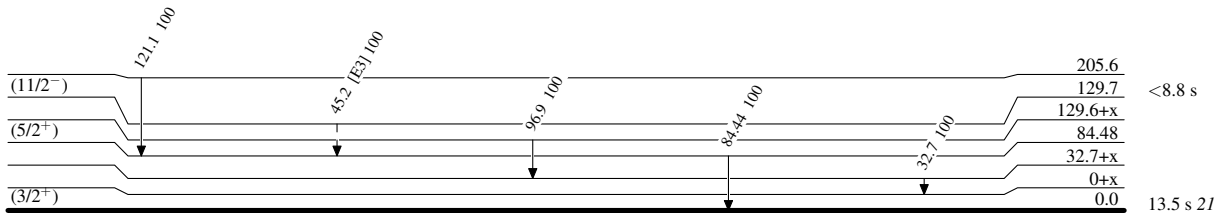
Adopted Levels, Gammas

Legend

Level Scheme (continued)

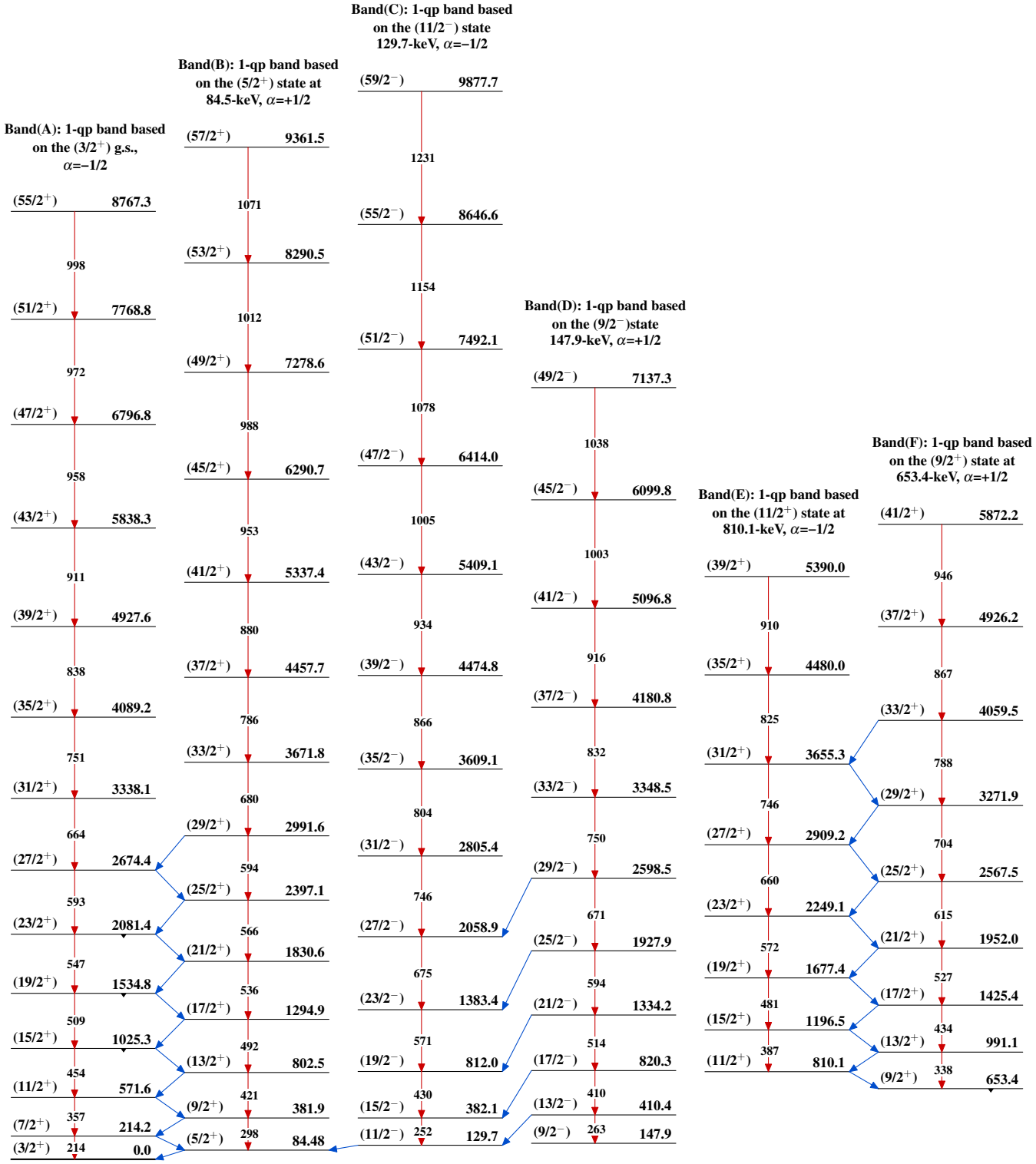
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



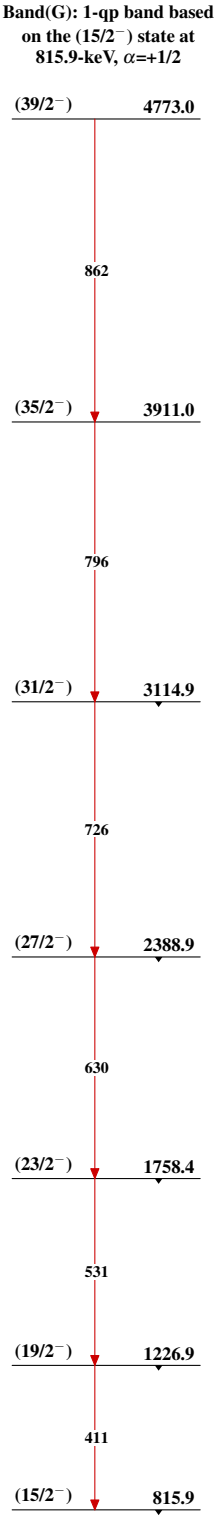
$^{133}_{61}Pm_{72}$

Adopted Levels, Gammas



$^{133}_{61}Pm_{72}$

Adopted Levels, Gammas (continued)



$^{133}_{61}Pm_{72}$