Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 107,791 (2006)	15-Sep-2005

Q(β^-)=1194.2 *9*; S(n)=6287.98 *15*; S(p)=5976.6 *13*; Q(α)=1566 *6* 2012Wa38
Note: Current evaluation has used the following Q record $ 1190.2 *8* 6287.98 *155975.7* *13* 1568 6 2003Au03.

^{176}Lu Levels

Cross Reference (XREF) Flags

A	^{175}Lu(n,γ) E=thermal	F	^{175}Lu(d,p)
B	^{175}Lu(n,γ) E=2,24 keV res: av	G	^{177}Hf(t,α)
C	^{175}Lu(n,γ) E=res	H	^{176}Lu(d,d′)
D	^{176}Yb(p,nγ)	I	^{176}Yb(^{7}Li,xγ)
E	Coulomb excitation		

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	XREF	Comments
0.0[&]	7$^-$	3.76×10^{10} y *7*	A DE GHI	%β^-=100 μ=+3.1692 *45*; Q=+4.92 *3* J$^\pi$: J=7, atomic beam (1962Sp03); π=−, L=4 in (t,α). No ε (<0.36% (2004No09)). Other value: <0.9% (2005Am04) and <10% (1954Ar03). μ: atomic beam (direct) (1985Br09). Others: 3.162 *12* (1998Ge13), 3.1 *3* (1962Sp03). Q: atomic beam (1985Br09). Other value: +5.07 *7* hyperfine structure of pionic x−rays (1983Ol03), +4.92 *5* laser spectroscopy (1998Ge13). Isotope shift: Δ<r^2>(^{175}Lu, ^{176}Lu)=0.022 fm^2 *5* (1980Zi03), 1979Nu01, 1994Ji02. T$_{1/2}$: Weighted average (reduced χ^2=16.2) of 3.68×10^{10} y *6* (1965Br15), 5.0×10^{10} y *3* (1967Sa05), 3.79×10^{10} y *3* (1972Ko50), 4.08×10^{10} y *24* (1980No01), 3.59×10^{10} y *5* (1982Sg01), 3.78×10^{10} y *2* (1983Sa44), 4.05×10^{10} y *9* (1990Ge05), 3.73×10^{10} y *5* (1992Da03), 3.69×10^{10} y *2* (1998Ni07), 3.72×10^{10} y *2* (2001Sc58 – considered 1 sigma uncertainty), 3.50×10^{10} y *6* (2003Bi06), 4.08×10^{10} y *3* (2003Gr02), and 3.677×10^{10} y *75* (2003Ni11), using the *Limitation of Relative Statistical Weights* method (1988WoZO). The uncertainty in the average value was expanded to include the most precise value of 3.69×10^{10} y *2* (1998Ni07). The input values were measured by γ-ray counting, γ-γ coincidence, γ-sum coincidence with good energy resolution for isotope identification, multiple-collector inductively coupled plasma mass spectrometry (α(M)-ICP-ms) for Lu-Hf ratio in 2001Sc58 and 2003Bi06. No uncertainty is reported in 2005Am04 for T$_{1/2}$=3.71-3.73×10^{10} y and T$_{1/2}$=~ 3.57×10^{10} y. The following results may have significant systematic errors because they were measured using β counting on weak natural Lu_2O_3 sources, which may have been contaminated with thorium or determined with less reliable methods (1990Ge05):7.3×10^{10} y *2* (1939Li13), 2.15×10^{10} y *10* (1954Ar03), 4.56×10^{10} y *30* (1954Di18), 2.1×10^{10} y *2* (1957Gl84), 2.17×10^{10} y *35* (1958He42), 3.6×10^{10} y *1* (1961Mc12), 2.18×10^{10} y *6* (1964Do01), 3.27×10^{10} y *5* (1969Pr11), 3.57×10^{10} y *14* (1983Pa11).
122.845[a] *4*	1$^-$	3.664 h *19*	A D FG I	%β^-=99.905 *16*; %ε=0.095 *16* μ=+0.318 *3*; Q=−1.47 *1* J$^\pi$: J=1, atomic beam (1965Wh03). ft ratio (0.49) to 0$^+$ at 1149.78 keV

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Adopted Levels, Gammas (continued)

^{176}Lu Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	Comments
				and 2^+ at 1226.65 keV states in ^{176}Lu IT decay agrees with Alaga rule for $K^\pi=0^-$. %ε from 1978He06. μ: Atomic beam, recalculated in 1989Ra17. Q: Atomic beam, recalculated in 1979Er12, 1989Ra17. Other value: −2.39 *4* (1978LeZA,1965Wh03). $T_{1/2}$: weighted average (reduced χ^2=29) of 3.6832 h *7* (1990Ab02), 3.635 h *12* (1982La25), 3.635 h *3* (1981Lo12), 3.66 h *4* (1978He06), 3.5 h *2* (1965Av01), 3.684 h *6* (1963Sc22), 3.7 h *5* (1960Wi10), 3.71 h *4* (1958Be41), 3.67 h *3* (1945At02), and 3.6 h *4* (1935Mc06), using the *Limitation of Relative Statistical Weights method* (1988WoZO). The following results may have significant systematic errors because of less reliable used method: 3.63 h (1991Ca03), 3.8 h (1963Ra14), 4.0 h 1 (1935Ma03), 1970Ve04, 1943Fl02.
184.1302& *10*	8^-	80 ps *6*	A DEFGHI	Jπ: 184.13γ M1+E2 to the 7^- state. g.s. rotational band member. $T_{1/2}$: from Coulomb excitation.
194.358c *4*	1^+	35.0 ns *10*	A D G I	Jπ: 71.5γ E1+M2 to 1^- state. $T_{1/2}$: from γγ(t) in ^{175}Lu(n,γ) E=thermal (1974An12).
233.100c *4*	2^+		A D G I	Jπ: 38.7γ M1+E2 to 1^+ state.
235.767a *4*	3^-		ABCD F	Jπ: 112.9γ E2 to 1^- state.
236.908a *4*	0^-		A D G	Jπ: 114.1γ M1 to 1^- state.
299.349c *4*	3^+		AB D FG I	Jπ: 66.2 M1+E2 to 2^+ state.
305.260a *4*	2^-		ABCD FG	Jπ: 182.4γ M1 to 1^- state.
338.844b *4*	1^+		A D F	Jπ: 144.5γ M1+E2 to 1^+ state.
372.492c *4*	4^+		AB D FG I	Jπ: 73.1γ M1+E2 to 3^+ state.
381.342b *4*	2^+		AB D G	Jπ: 186.9γ M1 to 1^+ state.
386.571e *4*	1^-		A D FG	Jπ: 192.2γ E1 to 1^+ state.
388.877& *4*	9^-	7.5 ps *11*	A DE HI	Jπ: 204.7γ M1+E2 to 8^- state. $T_{1/2}$: from Coulomb excitation.
424.8908u *20*	8^+	≤2 ns	A D F I	$T_{1/2}$: From (^{7}Li,Xγ). Jπ: 240.8γ to 8^- state, 424.9γ to 7^- state.
433.037e *4*	2^-		ABCD fG	Jπ: 310.2γ M1 to 1^- state.
437.324a *4*	5^-		ABCD f	Jπ: 201.6γ E2 to 3^- state.
450.108b *4*	3^+		ABCD FG	Jπ: 217γ M1 to 2^+ state.
463.763a *4*	4^-		ABCD F	Jπ: 278γ M1+E2 to 3^- state.
487.635c *4*	5^+		AB D f	Jπ: 188.3γ E2 to 3^+ state.
487.840v *11*	8^+	≤6.9 ns	A fG I	Jπ: L=5 in (t,α). $K^\pi=8^+$ bandhead. $T_{1/2}$: From (^{7}Li,Xγ).
504.861e *4*	3^-		ABCD FG	Jπ: 71.8γ M1 to 2^- state.
533.085b *4*	4^+		ABCD FG	Jπ: 233.7γ M1 to 3^+ state.
563.9283k *25* ≈578	$(6)^-$		A D G E	Jπ: L=2 in (t,α). 563.9γ M1(+E2) to 7^-.
591.773c *4*	6^+		A D	Jπ: 219.3γ E2 to 4^+ state.
595.745e *4*	4^-		ABCD FG	Jπ: 359.9γ M1+E2 to 3^- state.
613.45& *6*	10^-		E GHI	Jπ: $K^\pi=7^-$ g.s. band member.
615.1u *5*	9^+		F I	Jπ: Band assignment.
635.196p *4*	4^+	7.8 ns *4*	AB D I	Jπ: 335.8γ M1+E2 to 3^+ state, 147.5γ M1 to 5^+ state. $T_{1/2}$: weighted average of 7.8 ns *5* (1991Kl02) and 8.0 ns *10* (1974An12) in ^{175}Lu(n,γ) E=thermal.
637.760f *4*	1^-		A D F	Jπ: 204.7γ M1 to 2^-, 251.2γ M1 to 1^-.
650.175b *4*	5^+		AB D Fg	XREF: g(653)

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Adopted Levels, Gammas (continued)

^{176}Lu Levels (continued)

E(level)[†]	Jπ[‡]	T$_{1/2}$[#]	XREF	Comments
				Jπ: 277.7γ M1 to 4$^+$ state.
657.130[p] *4*	5$^+$	<0.5 ns	A D g I	XREF: g(653) E(level): Adopted as a member of 4$^+$ band, not as a bandhead of K^π=5$^+$ band [(n,γ) E=thermal], from observed coincidences between in-band transitions and the 336.0 keV transition which depopulates the 635.2 keV state, in-band branching ratios, and expected alignments for K^π=4$^+$ band in (^{7}Li,Xγ). Jπ: 284.6γ M1 to 4$^+$, 65.4γ (M1+E2) to 6$^+$.
658.434[i] *4*	3$^-$	6.3 ns *3*	ABCD Fg	XREF: g(653) Jπ: 225.4γ M1+E2 to 2$^-$, 153.6γ M1 to 3$^-$. T$_{1/2}$: weighted average of 6.5 ns *+3−10* (1991Kl02), 6.3 ns *5* (1974An12), and 6.3 ns *4* (1992Pe13).
682.6[v] *5*	9$^+$		FG I	XREF: I(683) Jπ: L=5 in (t,α). Band assignment.
687.854[f] *4*	2$^-$		AB D F	Jπ: 301.3γ M1 to 1$^-$ state.
688.2 *17*	3,4		C	E(level): From (n,γ) E=res. Jπ: populated in ^{175}Lu(n,γ) E=res.
693.794 *4*	(5)$^+$		A	Jπ: 58.6γ M1(+E2) to 4$^+$ state.
695.7 *10*			D	
709.226[w] *11*	(7)$^+$		A	Jπ: 221.4γ M1 to (8)$^+$ state, 709.2γ to 7$^-$ state.
709.5[p] *8*	6$^+$		I	Jπ: Band assignment.
710.060[a] *5*	6$^-$		A D F	Jπ: 272.7γ M1 to 5$^-$ state.
714.9 *6*	3,4		BC	E(level): Weighted average from (n,γ) E=res and (n,γ) E=2-, 24-keV. Jπ: populated in ^{175}Lu(n,γ) E=res.
715.419[e] *4*	5$^-$		A D	Jπ: 210.5γ E2 to 3$^-$ state.
722.901[g] *4*	4$^-$	3.0 ns *7*	ABCD FG	Jπ: L=2 in (t,α). 64.5γ M1+E2 to 3$^-$ state. Band assignment. T$_{1/2}$: from 1992Pe13. Other value: <2 ns (1991Kl02).
724.689[a] *6*	7$^-$		A D	Jπ: 287.4γ E2 to 5$^-$ state.
725.206[k] *5*	(7)$^-$		A D	Jπ: 161.3γ (M1) to (6)$^-$ state.
734.033[x] *4*	(7$^+$)		A D	Jπ: 309.1γ (M1) to 8$^+$ state.
734.358[q] *4*	3$^+$		AB D	Jπ: 99.1γ M1+E2 to 4$^+$.
751.878[i] *4*	4$^-$		ABCD F	Jπ: 93.4γ M1 to 3$^-$ state.
757 *4*	(7)$^-$		G	E(level): From (t,α). Jπ: L=4 in (t,α).
758.389[c] *6*	7$^+$		A D	Jπ: Band assignment.
763.626[f] *4*	3$^-$		ABCD	Jπ: 330.6γ M1 to 2$^-$ state.
765.671[l] *5*	(6)$^-$		A D F	Jπ: 765.7γ M1 to 7$^-$ state, 201.7γ M1 to (6)$^-$ state.
772.051[b] *5*	(6)$^+$		A D G	Jπ: 284.4γ M1 to 5$^+$ state.
780.177[@] *24*	0$^-$		A	Jπ: 657.3γ (M1,E2) to 1$^-$ state.
786.251[q] *4*	4$^+$		A	Jπ: 51.9γ M1+E2 to 3$^+$ state.
787.4[p] *7*	7$^+$		I	Jπ: Band assignment.
788.213[j] *4*	4$^-$		ABCD FG	Jπ: 129.8γ M1 to 3$^-$ state. K^π=4$^-$ band head assignment.
792.227 *6*	(2)$^+$		A D	Jπ: 410.9γ M1 to 2$^+$ state, 259.2γ (E2) to 4$^+$ state.
796.632[@] *8*	1$^-$		A D	Jπ: 491.4γ M1 to 2$^-$ state, 559.7γ M1 to 0$^-$ state.
827.0[u] *5*	10$^+$		F I	Jπ: Band assignment.
832.394[@] *6*	2$^-$		A D	Jπ: 709.6γ M1(+E2) to 1$^-$ state, 596.6γ M1 to 3$^-$ state.
833.7 *3*	3,4		BC	E(level): Weighted average from (n,γ) E=res and (n,γ) E=2-, 24-keV. Jπ: populated in ^{175}Lu(n,γ) E=res.
834.800[m] *4*	(5)$^-$		A D F	Jπ: 270.9γ M1 to (6)$^-$, 834.8γ E2 to 7$^-$.
838.624[g] *3*	5$^-$	≤0.2 ns	A D	Jπ: 838.6γ E2 to 7$^-$ g.s. 274.7γ M1 to (6)$^-$ state. Band assignment. T$_{1/2}$: Using gamma ray induced Doppler broadening (GRID) technique − lower limit determined to be ≥6.9 ps in 1999Do03. Other value: 2.5 ps<T$_{1/2}$>0.3 ns

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Adopted Levels, Gammas (continued)

^{176}Lu Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	Comments
				in 1991Kl02, upper limit of 0.3 ns determined from delayed coincidences and a lower limit of 2.5 ps deduced from line shape of a high resolution measurement; <10 ns in (p,nγ); 6.0 ps +10.0 −4.0 for either 838.64 or 921.47 or collective 870.00 keV level in Coulomb excitation (2000Va15).
843.407[h] *4*	3^-		ABCD G	Jπ: 410.4γ M1 to 2^-, 120.5γ M1(+E2) to 4^-. L=2 in (t,α).
848.228[e] *6*	6^-		A D	Jπ: 410.9γ M1 to 5^- state.
851.219[q] *5*	5^+		A	Jπ: 64.9γ M1 to 4^+ state.
854.661[y] *6*	$(7)^+$		A	Jπ: 854.6γ E1 to 7^-, 428.8γ (M1) to 8^+.
857.1[&] *6*	11^-		I	Jπ: $K^\pi=7^-$ g.s. band member.
860.544[f] *4*	4^-		ABCD F	Jπ: 355.7γ M1+E2 to 3^- state. 624.8γ M1 to 3^- state.
866.356[o] *4*	2^+		A D	Jπ: 672.0γ M1(+E2) to 1^+ state, 567.0γ (M1,E2) to 3^+ state.
868.090[i] *4*	5^-		Ab D fg	Jπ: L=2 in (t,α).
869.996[n] *6*	$(5)^-$		Ab D fg	Jπ: 306.1γ (M1,E2) to $(6)^-$ state, 870.0γ E2 to 7^- state.
871.260[t] *4*	$(4)^+$		A CD	Jπ: 214.1γ M1 to 5^+ state, 236.1γ M1,E2 to 4^+ state.
883.460[@] *5*	3^-		ABCD	Jπ: 578.2γ M1 to 2^- state, 419.7γ M1 to 4^- state.
888.6[p] *8*	8^+		I	Jπ: Band assignment.
897.0[v] *5*	10^+		FG I	Jπ: Band assignment.
903.4 *10*			B D	
908.237[s] *4*	$(4)^-$		ABCD F	Jπ: 185.3γ M1+E2 to 4^- state.
909.64?[1] *5*	(2^-)		A G	Jπ: 672.7γ to 0^- state, 673.9γ to 3^- state.
921.464[j] *5*	$(5)^-$	<0.2 ns	ABCD F	Jπ: 357.5γ (M1) to state $(6)^-$. Band assignment.
928.5 *10*	5^+,(2^+)		B	E(level): from (n,γ) E=2-, 24-keV. Jπ: populated in ^{175}Lu(n,γ) E=2,24 keV res:av.
930.756[o] *5*	3^+		A D	Jπ: 549.4γ M1 to 2^+ state. 631.4γ M1 to 3^+ state.
938.396[b] *7*	$(7)^+$		A D	Jπ: 346.6γ (M1) to 6^+ state. Band assignment.
941.065[l] *6*	$(7)^-$		A F	Jπ: 175.4γ M1 to $(6)^-$ state. Band assignment.
945.012[h] *4*	4^-		ABCD G	Jπ: L=2 in (t,α). 222.1γ M1 to 4^- state.
957.732[@] *8*	4^-		AbcD	Jπ: 721.9γ M1 to 3^- state.
957.879[r] *4*	3^-		AbcD fG	Jπ: 299.5γ M1 to 3^- state, 169.7γ M1 to 4^- state.
959.2 *10*			b D	
960.180 *4*	$(3)^-$	0.7 ns *2*	A D fG	Jπ: 527.2γ M1 to 2^- state, 301.7γ M1 to 3^- state.
962.873[g] *16*	(6^-)		A	Jπ: Band assignment.
972.506[m] *7*	$(6)^-$		A F	Jπ: Band assignment.
973.750 *5*	$(5)^+$		AB D	Jπ: 338.6γ M1 to 4^+ state, 316.6γ to 5^+ state.
985.555[z] *4*	4^+	1.2 ns *3*	A D	Jπ: 251.2γ M1 to 3^+ state, 328.4γ M1 to 5^+ state.
988.147[f] *6*	5^-		ABCD F	Jπ: 392.4γ M1 to 4^- state.
990.4 *10*	(3^+)		D	Jπ: 124.0γ to 2^+ state, 617.9γ to 4^+ state in (p,nγ).
1000.851[n] *18*	$(6)^-$		A Fg	XREF: g(1006) Jπ: Band assignment.
1002.742[i] *8*	(6^-)		A g	XREF: g(1006) Jπ: Band assignment.
1013.4[p] *9*	9^+		I	Jπ: Band assignment.
1015.343[o] *7*	4^+		A D	Jπ: 565.2γ M1 to 3^+ state.
1018.1 *3*	$(3^+,4^+)$		B	E(level): from (n,γ) E=2-, 24-keV. Jπ: populated in ^{175}Lu(n,γ) E=2,24 keV res:av.
1019.938 *4*	(4^+)		A D	Jπ: 362.8γ (M1,E2) to 5^+ state.
1029.661[d] *6*	$(2)^-$		A D F	Jπ: 524.8γ M1 to 3^- state, 643.1γ M1(+E2) to 1^- state.
1031.0 *3*	$(3^-,4^-)$		BC	E(level): Weighted average from (n,γ) E=res and (n,γ) E=2-, 24-keV. Jπ: populated in ^{175}Lu(n,γ) E=2,24 keV res:av.
1032.369 *7*	$(5)^-$		A G	Jπ: 197.5γ (M1) to $(5)^-$ state, 1032.4γ to 7^- g.s.
1042.516[@] *11*	5^-		ABCD	Jπ: 578.7γ M1 to 4^- state.
1046.3 *10*			D	

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Adopted Levels, Gammas (continued)

^{176}Lu Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
1054.3 *2*	(3,4)		bC	E(level): Weighted average from (n,γ) E=res and (n,γ) E=2-, 24-keV. Jπ: populated in ^{175}Lu(n,γ) E=res.
1057[2] *8*	(0+)		G	E(level): From (t,α). Jπ: Band assignment.
1060.5[u] *6*	11+		F I	XREF: F(1054.1) Jπ: Band assignment.
1061.1 *16*	(2−,5−)		B F	Jπ: populated in ^{175}Lu(n,γ) E=2,24 keV res:av.
1067.411[r] *6*	4−		AbCD	Jπ: 109.5γ M1 to (3)− state. Band assignment.
1068.975[h] *6*	(5−)		Ab G	Jπ: 346.1γ (M1) to 4− state. Band assignment.
1071.7 *3*			FG	
1079.9 *3*	(5−,2−)		BC G	Jπ: populated in ^{175}Lu(n,γ) E=2,24 keV res:av.
1100.402[d] *18*	(3)−		ABCD F	Jπ: 667.4γ M1(+E2) to 2− state.
1104.5 *7*			CD G	
1118.8[&] *6*	12−		I	Jπ: K^{π}=7− g.s. band member.
1120.3 *7*			D	
1129.7 *16*			C	E(level): from (n,γ) E=res.
1131.8[v] *6*	11+		I	Jπ: Band assignment.
1142.5 *10*			D	
1159.7[p] *8*	10+		I	Jπ: Band assignment.
1164.1 *10*			D G	
1167.0 *17*	(3,4)		C	Jπ: populated in ^{175}Lu(n,γ) E=res.
1182 *5*			G	E(level): From (t,α).
1227.9 *10*			CD G	
1237.4 *10*			CD G	
1241.1 *10*			D	
1274.5[3] *10*	(7+)		D G	Jπ: L=5 in (t,α). Band assignment.
1277.8 *10*			D	
1294[2] *2*	(4+)		G	E(level): From (t,α). Jπ: Band assignment.
1301.4 *10*			D	
1314.0[u] *7*	12+		I	Jπ: Band assignment.
1326 *3*			G	E(level): From (t,α).
1329.2[p] *14*	11+		I	Jπ: Band assignment.
1349 *5*			G	E(level): From (t,α).
1351.7[5] *4*	(10+)	≤2 ns	I	Jπ: 162.4γ (E2) feeding this level from 12+ state at 1514.4 keV and possible two quasiparticle state configuration.
1370.7 *10*			D	
1395.0[4] *14*	(5−)		G	Jπ: L=2 in (t,α). E(level): From (t,α).
1398.6[&] *9*	13−		I	Jπ: K^{π}=7− g.s. band member.
1426.0 *1*			D G	
1462.0[3] *14*	(8+)		G	Jπ: L=5 in (t,α). Band assignment. E(level): From (t,α).
1510[2] *2*	(3+)		G	Jπ: Band assignment. E(level): From (t,α).
1514.5[6] *5*	12+	312 ns *69*	I	Jπ: 200.3γ M1 to 12+ state. Four-quasiparticle isomeric state configuration. E. $T_{1/2}$: From time difference spectra in (^{7}Li,Xγ).
1518.6[p] *13*	12+		I	Jπ: Band assignment.
1533[4] *2*	(6−)		G	Jπ: L=2 in (t,α). E(level): From (t,α).
1569 *5*			G	E(level): From (t,α).
1587.5[7] *11*	(14+)	40 μs *3*	I	Jπ: 73.0γ (E2) to 12+ state. Consistent with the spin and parity at

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Adopted Levels, Gammas (continued)

^{176}Lu Levels (continued)

E(level)[†]	Jπ[‡]	XREF	Comments
			near-degeneracy between the 13^+ member of the $K^\pi=8^+_1$ band at 1589 keV and the (14^+) isomer at 1588 keV (^{7}Li,Xγ).
			$T_{1/2}$: From time spectrum gated on the 162, 184, 241, 258, 402, 487, and 617 keV transitions in (^{7}Li,Xγ).
1588.7[u] *9*	13^+	G I	XREF: G(1593) Jπ: Band assignment.
1617 *5*		G	E(level): From (t,α).
1655[3] *2*	(9^+)	G	Jπ: L=5 in (t,α). Band assignment. E(level): From (t,α).
1679 *10*		G	E(level): From (t,α).
1689[4] *7*	(7^-)	G	E(level): From (t,α).
1693.5[&] *12*	14^-	I	Jπ: $K^\pi=7^-$ g.s. band member.
1730[2] *7*	(5^+)	G	E(level): From (t,α). Jπ: Band assignment.
1730.3[p] *17*	13^+	I	Jπ: Band assignment.
1960.7[p] *17*	14^+	I	Jπ: Band assignment.
2005.3[&] *14*	15^-	I	Jπ: $K^\pi=7^-$ g.s. band member.
2329.4[&] *16*	16^-	I	Jπ: $K^\pi=7^-$ g.s. band member.
2671.3[&] *17*	(17^-)	I	Jπ: $K^\pi=7^-$ g.s. band member.
3021.3[&] *19*	(18^-)	I	Jπ: $K^\pi=7^-$ g.s. band member.

[†] Deduced by evaluator from a least squares fit to the adopted γ-ray energies, except otherwise noted.

[‡] Assignments are based on rotational structure, on γ-ray multipolarities and decay patterns, and on L-transfers and experimental cross sections for the ^{177}Hf(t,α) (1981De28), and from 2-, 24-keV average neutron capture resonance in ^{175}Lu (1985Ho08). Specific arguments are given for bandheads. Configuration assignments are from ^{175}Lu(n,γ) E=thermal (1991Kl02).

[#] From ^{175}Lu(n,γ) E=thermal (1991Kl02), unless otherwise specified.

[@] Band(A): $K^\pi=0^-$. Configuration=((π 9/2(514))-(ν 9/2(924))). Rotational parameters: A=8.76, B=−9.94. Spin members of the band used in the fit: 0, 1, 2, 3.

[&] Band(B): $K^\pi=7^-$ g.s. rotational band. Configuration=((π 7/2(404))+(ν 7/2(514))). Rotational parameters: A=12.0, B=−3.91. Spin members of the band used in the fit: 7 to 10.

[a] Band(C): $K^\pi=0^-$. Configuration=((π 7/2(404))-(ν 7/2(514))). Rotational parameters: A=11.3, B=−3.36. Spin members of the band used in the fit: 1, 3, 5.

[b] Band(D): $K^\pi=1^+$. Configuration=((π 7/2(404))-(ν 9/2(624))). Rotational parameters: A=10.6, B=16.3. Spin members of the band used in the fit: 1 to 4.

[c] Band(E): $K^\pi=1^+$. Configuration=((π 9/2(514))-(ν 7/2(514))). Rotational parameters: A=10.8, B=−17.0. Spin members of the band used in the fit: 1 to 6.

[d] Band(F): $K^\pi=2^-$. Configuration=((π 7/2(404))-(ν 3/2(512))). Rotational parameters: A=11.8. Spin members of the band used in the fit: 2, 3.

[e] Band(G): $K^\pi=1^-$. Configuration=((π 5/2(402))-(ν 7/2(514))). Rotational parameters: A=12.0, B=−9.00. Spin members of the band used in the fit: 1 to 6.

[f] Band(H): $K^\pi=1^-$. Configuration=((π 7/2(404))-(ν 5/2(512))). Rotational parameters: A=12.3, B=4.90. Spin members of the band used in the fit: 1 to 5.

[g] Band(I): $K^\pi=4^-$. Configuration=((π 1/2(411))+(ν 7/2(514))). Rotational parameters: A=14.3, B=−55.5. Spin members of the band used in the fit: 4 to 6.

[h] Band(J): $K^\pi=3^-$. Configuration=((π 1/2(411))-(ν 7/2(514))). Rotational parameters: A=13.2, B=−17.0. Spin members of the band used in the fit: 3 to 5.

[i] Band(K): $K^\pi=3^-$. Configuration=((π 7/2(404))-(ν 1/2(510))). Rotational parameters: A=11.8, B=−3.35. Spin members of the band used in the fit: 3 to 5.

[j] Band(L): $K^\pi=4^-$. Configuration=((π 7/2(404))+(ν 1/2(510))). Rotational parameters: A=13.3. Spin members of the band used in

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{176}Lu Levels (continued)

the fit: 4, 5.

[k] Band(M): $K^{\pi}=6^{-}$. Configuration=((π 5/2(402))+(ν 7/2(514))). Rotational parameters: A=11.5. Spin members of the band used in the fit: 6, 7.

[l] Band(N): $K^{\pi}=6^{-}$. Configuration=((π 7/2(404))+(ν 5/2(512))). Rotational parameters: A=12.5. Spin members of the band used in the fit: 6, 7.

[m] Band(O): $K^{\pi}=5^{-}$. Configuration=((π 7/2(404))+(ν 3/2(512))). Rotational parameters: A=11.5. Spin members of the band used in the fit: 5, 6.

[n] Band(P): $K^{\pi}=5^{-}$, γ-vibrational band Rotational parameters: A=10.9. Spin members of the band used in the fit: 5, 6.

[o] Band(Q): $K^{\pi}=2^{+}$. Configuration=((π 5/2(402))-(ν 9/2(624))). Rotational parameters: A=10.9, B=−11.1. Spin members of the band used in the fit: 2 to 4.

[p] Band(R): $K^{\pi}=4^{+}$. Configuration=((π 1/2(541))+(ν 7/2(514))). Rotational parameters: A=5.86. Spin members of the band used in the fit: 4, 5.

[q] Band(S): $K^{\pi}=3^{+}$. Configuration=((π 1/2(541))-(ν 7/2(514))). Rotational parameters: A=6.47, B=0.53. Spin members of the band used in the fit: 3 to 5.

[r] Band(T): $K^{\pi}=3^{-}$. Configuration=((π 7/2(404))-(ν 1/2(521))). Rotational parameters: A=13.7. Spin members of the band used in the fit: 3, 4.

[s] Band(u): $K^{\pi}=4^{-}$. Configuration=((π 7/2(404))+(ν 1/2(521))).

[t] Band(v): $K^{\pi}=4^{+}$. Configuration=((π 9/2(514))-(ν 1/2(510))).

[u] Band(w): $K^{\pi}=8^{+}$. Configuration=((π 7/2(404))+(ν 9/2(624))). Rotational parameters: A=11.2, B=−3.24. Spin members of the band used in the fit: 8 to 11.

[v] Band(X): $K^{\pi}=8^{+}$. Configuration=((π 9/2(514))+(ν 7/2(514))). Rotational parameters: A=11.1, B=−2.24. Spin members of the band used in the fit: 8 to 10.

[w] Band(a): $K^{\pi}=7^{+}$. Configuration=((π 9/2(514))+(ν 5/2(512))).

[x] Band(b): $K^{\pi}=7^{+}$. Configuration=((π 5/2(402))+(ν 9/2(624))).

[y] Band(c): $K^{\pi}=7^{+}$. Configuration=((π 7/2(404))+(ν 7/2(633))).

[z] Band(d): $K^{\pi}=4^{+}$. Configuration=((π 1/2(411))-(ν 9/2(624))).

[1] Band(e): $K^{\pi}=2^{-}$, γ-vibrational band.

[2] Band(U): $K^{\pi}=(0^{+})$. Configuration=((π 7/2(523))-(ν 7/2(514))).

[3] Band(V): $K^{\pi}=7^{+}$. Configuration=((π 7/2(523))+(ν 7/2(514))).

[4] Band(W): $K^{\pi}=5^{-}$. Configuration=((π 3/2(411))+(ν 7/2(514))).

[5] $K^{\pi}=10^{+}$, configuration=((π 9/2[514])+(ν 11/2[505])).

[6] $K^{\pi}=12^{+}$, possible configuration=((π,7/2[402])$\otimes$(ν^3, 9/2[624], 7/2[514],1/2[521])).

[7] $K^{\pi}=(14^{+})$, possible configuration=((π,7/2[402])$\otimes$(ν^3, 9/2[624], 7/2[514],5/2[512])).

Adopted Levels, Gammas (continued)

$\gamma(^{176}Lu)$

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	δ[†]	α[a]	Comments
184.1302	8^-	184.130 *1*	100	0.0	7^-	M1+E2	1.15 *9*	0.500	B(M1)(W.u.)=0.051 *6*; B(E2)(W.u.)=8.8×10^2 *8* δ: other value: 0.42 *12*, Coulomb excitation.
194.358	1^+	71.516 *1*	100	122.845	1^-	E1+M2	0.047 *2*	1.12	B(E1)(W.u.)=7.9×10^{-6} *3*; B(M2)(W.u.)=15.7 *15*
233.100	2^+	38.745 *1*	100	194.358	1^+	M1+E2	0.128 *4*	13.7	
235.767	3^-	112.922 *1*	100	122.845	1^-	E2		2.14	
236.908	0^-	114.070 *2*	100	122.845	1^-	M1		2.59	
299.349	3^+	66.238 *1*	100 *12*	233.100	2^+	M1+E2	0.13 *2*	12.5	
		104.985 *2*	23 *3*	194.358	1^+	E2		2.83	
305.260	2^-	69.498 *2*	10.7 *24*	235.767	3^-	(M1)		10.8	
		182.422 *1*	100 *10*	122.845	1^-	M1		0.687	
338.844	1^+	105.738 *2*	36 *6*	233.100	2^+	M1		3.22	
		144.486 *2*	100 *11*	194.358	1^+	M1+E2	0.35 *6*	1.27	
		216.015[b] *9*	12.8[b] *19*	122.845	1^-				
372.492	4^+	73.140 *1*	64 *6*	299.349	3^+	M1+E2	0.16 *3*	9.40	
		139.383 *1*	100 *12*	233.100	2^+	E2		0.982	
381.342	2^+	81.996[c] *4*	10 *3*	299.349	3^+				
		148.241 *1*	28 *3*	233.100	2^+	M1		1.23	
		186.986 *1*	100 *10*	194.358	1^+	M1		0.642	
		258.51[c] *5*	3.7 *9*	122.845	1^-				
386.571	1^-	81.301 *4*	0.8 *3*	305.260	2^-	M1		6.86	
		150.815 *4*	1.41 *23*	235.767	3^-				
		153.466 *1*	38 *4*	233.100	2^+	E1		0.114	
		192.212 *1*	100 *10*	194.358	1^+	E1		0.0638	
		263.733 *2*	49 *4*	122.845	1^-	M1+E2	0.9 *1*	0.189 *8*	
388.877	9^-	204.746[b] *3*	100[b] *11*	184.1302	8^-	M1+E2	0.54 *17*	0.44 *3*	B(M1)(W.u.)=0.07 *+9−7*; B(E2)(W.u.)=2.1×10^2 *+28−21* δ: from Coulomb excitation.
		388.901 *19*	40 *5*	0.0	7^-	(E2)		0.0358	B(E2)(W.u.)=27 *19*
424.8908	8^+	240.760 *2*	100 *9*	184.1302	8^-				
		424.893 *4*	44 *6*	0.0	7^-				
433.037	2^-	46.458 *1*	31 *7*	386.571	1^-	M1+E2	0.074 *10*	6.42	
		133.683 *2*	6.5 *7*	299.349	3^+	E1		0.164	
		197.265 *1*	16.3 *17*	235.767	3^-	M1		0.553	
		199.926 *1*	3.9 *4*	233.100	2^+				
		238.671 *1*	15.9 *17*	194.358	1^+	E1		0.0366	
		310.188 *2*	100 *9*	122.845	1^-	M1		0.160	
437.324	5^-	201.567 *1*	100 *11*	235.767	3^-	E2		0.275	
		437.48[c] *4*	1.43 *25*	0.0	7^-				
450.108	3^+	77.623[c] *4*	7.0 *18*	372.492	4^+				
		150.763 *2*	12.0 *14*	299.349	3^+	M1		1.17	
		214.349 *3*	39 *4*	235.767	3^-	E1		0.0482	

$^{176}_{71}Lu_{105}$-8

Adopted Levels, Gammas (continued)

γ(^{176}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	δ[†]	α[a]	Comments
450.108	3+	217.002 *1*	100 *10*	233.100	2+	M1		0.424	
463.763	4−	158.496 *5*	2.7 *6*	305.260	2−				
		227.997 *1*	100 *10*	235.767	3−	M1+E2	0.30 *6*	0.355	
487.635	5+	115.144 *2*	32 *4*	372.492	4+	M1(+E2)			
		188.287 *1*	100 *10*	299.349	3+	E2		0.345	
487.840	8+	65[#]	100	424.8908	8+				I_γ: Not reported.
		487.819 *23*	100 *16*	0.0	7−				E_γ: Not present in (^{7}Li,Xγ).
504.861	3−	71.840 *1*	100 *14*	433.037	2−	M1		9.85	
		118.295 *6*	5.8 *13*	386.571	1−	(E2)		1.80	
		132.364 *9*	5.8 *23*	372.492	4+				
		205.531 *6*	10.1 *13*	299.349	3+				
		269.125 *13*	5.8 *12*	235.767	3−	(M1)		0.235	
		271.772[@] *6*	36 *4*	233.100	2+				
		382.030 *6*	18.8 *20*	122.845	1−	(E2)			Mult.: Measured (M1,E2) multipolarity (n,γ). Level scheme requires (E2).
533.085	4+	160.589 *2*	5.5 *6*	372.492	4+	(M1,E2)			
		233.741 *1*	100 *10*	299.349	3+	M1		0.346	
563.9283	(6)−	563.944 *3*	100	0.0	7−	M1(+E2)			
591.773	6+	219.282 *2*	100	372.492	4+	E2		0.208	
595.745	4−	90.867 *1*	70 *7*	504.861	3−	M1(+E2)			
		131.99[bc] *3*	4.9[b] *17*	463.763	4−				
		158.403[c] *6*	≈5	437.324	5−				
		162.713 *4*	9.8 *11*	433.037	2−				
		296.397 *5*	8.5 *10*	299.349	3+				Mult.: Measured (M1,E2) multipolarity in (n,γ). Level scheme requires E1.
		359.985 *4*	100 *10*	235.767	3−	M1+E2			
613.45	10−	224.71[‡] *9*	54[‡] *15*	388.877	9−				
		429.24[‡] *7*	100[‡] *10*	184.1302	8−				
615.1	9+	126.3[#]		487.840	8+				
		190.2[#]		424.8908	8+				
		226.9[#]		388.877	9−				
635.196	4+	147.553 *2*	16.2 *19*	487.635	5+	M1		1.24	B(M1)(W.u.)=9.9×10^{-5} *16*
		185.080 *3*	2.6 *5*	450.108	3+	(M1)		0.660	B(M1)(W.u.)=8.0×10^{-6} *18*
		253.858 *7*	2.1 *3*	381.342	2+	E2		0.129	B(E2)(W.u.)=0.017 *3*
		335.851 *1*	100 *11*	299.349	3+	M1+E2			B(M1)(W.u.)=3.7×10^{-5} *5*; B(E2)(W.u.)=0.145 *18*
		402.109[c] *15*	≈0.9	233.100	2+				
637.760	1−	204.746[b] *3*	20.8[b] *24*	433.037	2−	M1		0.499	
		251.195[b] *2*	100[b] *10*	386.571	1−	M1		0.284	

$^{176}_{71}Lu_{105}$-9

Adopted Levels, Gammas (continued)

γ(^{176}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	δ[†]	α[a]	Comments
650.175	5+	277.683 *1*	100	372.492	4+	M1		0.216	
657.130	5+	65.353[c] *5*	3.8 *14*	591.773	6+	(M1+E2)			
		169.500 *4*	3.4 *4*	487.635	5+	(M1,E2)			
		206.994[c] *13*	2.1 *4*	450.108	3+				
		284.641 *1*	100 *10*	372.492	4+	M1		0.202	B(M1)(W.u.)=0.001475 *8*
658.434	3−	153.557 *2*	3.9 *4*	504.861	3−	M1		1.11	B(M1)(W.u.)=2.2×10^{-5} *3*
		194.656[c] *12*	≈0.4	463.763	4−				
		225.403 *1*	100 *10*	433.037	2−	M1+E2	0.27 *8*	0.369	B(M1)(W.u.)=0.000163 *24*; B(E2)(W.u.)=0.10 *6*
		271.863[@] *4*	8.1 *9*	386.571	1−	(E2)		0.104	B(E2)(W.u.)=0.048 *7*
		285.948 *6*	0.57 *9*	372.492	4+				
		353.158 *7*	0.86 *10*	305.260	2−	(M1)		0.113	B(M1)(W.u.)=3.9×10^{-7} *6*
		359.083 *3*	4.0 *4*	299.349	3+				
		422.670 *2*	5.6 *6*	235.767	3−	M1		0.0701	B(M1)(W.u.)=1.48×10^{-6} *21*
		425.333 *2*	8.6 *9*	233.100	2+				
682.6	9+	193.8[#]		487.840	8+				
		258.0[#]		424.8908	8+				
687.854	2−	182.981 *2*	37 *4*	504.861	3−	M1		0.682	
		254.824 *4*	31 *3*	433.037	2−	M1		0.273	
		301.284 *2*	100 *10*	386.571	1−	M1		0.173	
		452.105 *8*	14.3 *16*	235.767	3−				
693.794	(5)+	58.597 *1*	100	635.196	4+	M1(+E2)			
695.7		262.7[&]	100	433.037	2−				
709.226	(7)+	221.386 *4*	44 *5*	487.840	8+	M1		0.402	
		709.230[@] *12*	100 *15*	0.0	7−				
709.5	6+	52.0[#]		657.130	5+				
		336.0[#c]		372.492	4+				
710.060	6−	246.305 *5*	27 *3*	463.763	4−				
		272.729 *3*	100 *9*	437.324	5−	M1		0.227	
715.419	5−	119.678 *1*	100 *10*	595.745	4−	M1		2.26	
		210.550 *3*	26 *3*	504.861	3−	E2		0.238	
		342.923 *11*	17.9 *23*	372.492	4+				
722.901	4−	64.474 *1*	100 *12*	658.434	3−	M1+E2	0.15 *2*	13.7	B(M1)(W.u.)=0.0017 *5*; B(E2)(W.u.)=4.1 *16*
		218.040 *3*	47 *5*	504.861	3−				
		259.154[bc] *11*	24[b] *3*	463.763	4−	(M1,E2)			
		285.571[b] *4*	32[b] *4*	437.324	5−				
		487.15 *3*	14.7 *21*	235.767	3−				
724.689	7−	287.364 *4*	100	437.324	5−	E2			Mult.: measured M1,E2 multipolarity in (n,γ). Level scheme requires E2.
725.206	(7)−	161.277 *4*	100	563.9283	(6)−	(M1)		0.969	

$^{176}_{71}Lu_{105}$-10

Adopted Levels, Gammas (continued)

γ(^{176}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	δ[†]	α[a]	Comments
734.033	(7$^+$)	309.142 *3*	100	424.8908	8$^+$	(M1)		0.161	
734.358	3$^+$	99.163 *1*	100 *12*	635.196	4$^+$	M1+E2	0.19 *4*	3.85	
		435.07 *3*	10 *3*	299.349	3$^+$				
751.878	4$^-$	93.449 *1*	100 *11*	658.434	3$^-$	M1		4.59	
		246.994 *12*	13 *5*	504.861	3$^-$				
758.389	7$^+$	166.671[c] *21*	18 *8*	591.773	6$^+$				
		270.756 *4*	100 *12*	487.635	5$^+$				
763.626	3$^-$	167.876[c] *4*	≈25	595.745	4$^-$				
		258.744 *8*	10.9 *13*	504.861	3$^-$	M1		0.262	
		330.597 *2*	100 *9*	433.037	2$^-$	M1(+E2)			
765.671	(6)$^-$	201.742 *5*	19.2 *21*	563.9283	(6)$^-$	M1		0.519	
		581.61 *5*	15 *3*	184.1302	8$^-$				
		765.684 *9*	100 *10*	0.0	7$^-$	M1		0.0155	
772.051	(6)$^+$	284.418 *3*	100 *11*	487.635	5$^+$	M1		0.202	
		399.56[c] *9*	≈7	372.492	4$^+$				
780.177	0$^-$	657.334 *23*	100	122.845	1$^-$	(M1,E2)			
786.251	4$^+$	51.896 *1*	100	734.358	3$^+$	M1+E2	0.14 *1*	5.25 *14*	
787.4	7$^+$	77.5[#]		709.5	6$^+$				
		129.5[#]		657.130	5$^+$				
788.213	4$^-$	129.773 *1*	100	658.434	3$^-$	M1		1.79	
792.227	(2)$^+$	259.154[bc] *11*	67[b] *8*	533.085	4$^+$	(E2)			Mult.: (M1,E2) from conversion electron data in (N<γ). Level scheme requires E2.
		342.16 *4*	33 *7*	450.108	3$^+$				
		410.892[b] *5*	100[b] *11*	381.342	2$^+$	M1		0.0754	
		559.16 *3*	75 *10*	233.100	2$^+$				
		597.88 *3*	92 *11*	194.358	1$^+$				
		669.33 *13*	42 *9*	122.845	1$^-$				
796.632	1$^-$	491.365 *8*	100 *12*	305.260	2$^-$	M1		0.0476	
		559.714 *15*	100 *12*	236.908	0$^-$	M1		0.0343	
		673.88[b] *6*	94[b] *24*	122.845	1$^-$				
827.0	10$^+$	144.1[#]		682.6	9$^+$				
		212.0[#]		615.1	9$^+$				
		402.4[#]		424.8908	8$^+$				
832.394	2$^-$	527.174[b] *20*	23[b] *4*	305.260	2$^-$	M1		0.0400	
		595.57[b] *4*	10.8[b] *15*	236.908	0$^-$				
		596.627[b] *6*	54[b] *7*	235.767	3$^-$	M1		0.0291	
		709.555[@] *6*	100 *11*	122.845	1$^-$	M1(+E2)			
834.800	(5)$^-$	270.869 *3*	14.3 *15*	563.9283	(6)$^-$	M1		0.231	

Adopted Levels, Gammas (continued)

γ(^{176}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	α[a]	Comments
834.800	(5)$^-$	834.810 *7*	100 *10*	0.0	7$^-$	E2	0.00573	
838.624	5$^-$	115.722 *3*	2.6 *4*	722.901	4$^-$	(M1)	2.49	B(M1)(W.u.)=0.00145 *4*
		181.489 *4*	3.5 *4*	657.130	5$^+$			
		203.413 *2*	6.5 *6*	635.196	4$^+$			E$_\gamma$: Placement of 203.4γ is from a questionable (6$^+$) state at 838.61 keV in (n,γ) thermal. In (p,nγ), it is placed from 5$^-$ state at 838.64 keV. Evaluator adopts this Eγ from 5$^-$ state, based on relocation of the bandhead 5$^+$ at 657.13 keV, of which (+6) state was a member in (n,γ) thermal, and questionable (6$^+$) level.
		242.929[c] *25*	0.6 *2*	595.745	4$^-$			
		274.702 *2*	12.9 *11*	563.9283	(6)$^-$	M1	0.223	B(M1)(W.u.)=0.000530 *3*
		838.624 *7*	100 *9*	0.0	7$^-$	E2	0.00567	B(E2)(W.u.)=0.089736 *16*
843.407	3$^-$	120.499 *1*	100 *9*	722.901	4$^-$	M1(+E2)		
		184.980 *2*	88 *9*	658.434	3$^-$	M1	0.661	
		247.660 *5*	25 *3*	595.745	4$^-$	M1	0.295	
		410.381 *5*	38 *4*	433.037	2$^-$	M1	0.0757	
848.228	6$^-$	132.815[c] *2*	≈80	715.419	5$^-$			
		252.524 *17*	50 *13*	595.745	4$^-$			
		410.892[b] *5*	100[b] *11*	437.324	5$^-$	M1	0.0754	
851.219	5$^+$	64.970 *4*	100 *31*	786.251	4$^+$	M1	13.2	
		216.015[b] *9*	46[b] *7*	635.196	4$^+$			
854.661	(7)$^+$	429.772 *5*	21 *3*	424.8908	8$^+$	(M1)	0.0671	
		854.614 *23*	100 *9*	0.0	7$^-$	E1	0.00212	
857.1	11$^-$	243.9[#]		613.45	10$^-$			
		468.4[#]		388.877	9$^-$			
860.544	4$^-$	145.117[c] *7*	≈12	715.419	5$^-$			
		355.682 *2*	100 *10*	504.861	3$^-$	M1+E2		
		423.217 *4*	22 *3*	437.324	5$^-$	(M1)	0.0698	
		561.25 *3*	20 *3*	299.349	3$^+$			
		624.834 *22*	78 *10*	235.767	3$^-$	M1	0.0259	
866.356	2$^+$	131.99[bc] *3*	4.0[b] *14*	734.358	3$^+$			
		228.544 *18*	3.0 *6*	637.760	1$^-$			
		361.485 *5*	13.0 *13*	504.861	3$^-$			
		433.325 *3*	32 *4*	433.037	2$^-$	E1	0.00865	
		479.756[c] *6*	12.0 *13*	386.571	1$^-$			
		485.006 *6*	11.0 *11*	381.342	2$^+$	M1	0.0492	
		527.501 *8*	100 *13*	338.844	1$^+$	M1	0.0399	
		566.990 *15*	41 *5*	299.349	3$^+$	(M1,E2)		
		633.249 *8*	53 *6*	233.100	2$^+$	M1+E2		
		671.992 *7*	48 *5*	194.358	1$^+$	M1(+E2)		
868.090	5$^-$	116.206 *1*	100 *11*	751.878	4$^-$	M1	2.46	

$^{176}_{71}Lu_{105}$-12

Adopted Levels, Gammas (continued)

γ(^{176}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	δ[†]	α[a]	Comments
868.090	5⁻	145.170 *7*	28 *7*	722.901	4⁻				
		868.13[c] *12*	≈39	0.0	7⁻				
869.996	(5)⁻	306.069 *6*	7.1 *8*	563.9283	(6)⁻	(M1,E2)			
		869.994 *11*	100 *10*	0.0	7⁻	E2		0.00524	
871.260	(4)⁺	136.887 *7*	4.7 *9*	734.358	3⁺				
		214.132 *1*	100 *10*	657.130	5⁺	M1		0.440	
		236.075 *2*	31 *4*	635.196	4⁺	M1,E2			
		421.01[c] *7*	≈4	450.108	3⁺				
883.460	3⁻	419.701 *3*	45 *4*	463.763	4⁻	M1		0.0714	
		578.198 *8*	100 *11*	305.260	2⁻	M1		0.0315	
888.6	8⁺	101.5[#]		787.4	7⁺				
		179.0[#]		709.5	6⁺				
897.0	10⁺	214.0[#]		682.6	9⁺				
		282.4[#]		615.1	9⁺				
		408.0[#]		487.840	8⁺				
903.4		64.8[&]	100	838.624	5⁻				
908.237	(4)⁻	156.362 *3*	22 *3*	751.878	4⁻	(E2,M1)			
		185.331 *1*	100 *10*	722.901	4⁻	M1+E2	0.50 *19*	0.60 *4*	
909.64?	(2⁻)	672.66 *10*	44 *8*	236.908	0⁻				
		673.88[b] *6*	100[b] *25*	235.767	3⁻				
		786.81 *14*	63 *19*	122.845	1⁻				
921.464	(5)⁻	133.252 *9*	4.8 *11*	788.213	4⁻				
		169.574 *5*	13 *5*	751.878	4⁻				
		357.539 *10*	11.3 *13*	563.9283	(6)⁻	(M1)		0.109	B(M1)(W.u.)=0.0002089 *7*
		921.464 *13*	100 *10*	0.0	7⁻				
930.756	3⁺	64.369[c] *6*	17 *7*	866.356	2⁺	(M1+E2)			
		196.400[c] *11*	≈6	734.358	3⁺				
		335.007 *6*	20.4 *22*	595.745	4⁻				
		397.653[c] *13*	≈7	533.085	4⁺				
		425.884 *3*	39 *4*	504.861	3⁻				
		480.661 *13*	14.8 *17*	450.108	3⁺	(M1)		0.0503	
		549.389 *11*	100 *11*	381.342	2⁺	M1		0.0359	
		558.237 *19*	39 *4*	372.492	4⁺	(M1,E2)			
		631.396 *13*	57 *6*	299.349	3⁺	M1		0.0252	
		697.61 *4*	22 *7*	233.100	2⁺	(M1)		0.0196	
		736.422 *21*	33 *9*	194.358	1⁺	(E2)		0.00753	
938.396	(7)⁺	346.618 *5*	100 *10*	591.773	6⁺	(M1)		0.118	
		938.36[c] *6*	56 *11*	0.0	7⁻				
941.065	(7)⁻	175.395 *2*	100	765.671	(6)⁻	M1		0.767	

$^{176}_{71}Lu_{105}$-13

Adopted Levels, Gammas (continued)

γ(^{176}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	α[a]	Comments
945.012	4⁻	222.106 *2*	100 *10*	722.901	4⁻	M1	0.398	
		286.56[c] *5*	3.8 *15*	658.434	3⁻			
		381.16[c] *3*	9.6 *13*	563.9283	(6)⁻			
957.732	4⁻	520.40 *4*	20.8 *25*	437.324	5⁻	(M1)	0.0413	
		652.57[c] *4*	≈13	305.260	2⁻			
		658.38 *4*	15.3 *19*	299.349	3⁺			
		721.968 *7*	100 *10*	235.767	3⁻	M1	0.0180	
		724.64[c] *5*	18.1 *24*	233.100	2⁺			
957.879	3⁻	169.671 *2*	74 *8*	788.213	4⁻	M1	0.841	
		194.258 *6*	11 *4*	763.626	3⁻	M1	0.577	
		234.977 *4*	21 *3*	722.901	4⁻	(M1)	0.341	
		270.035 *5*	18 *2*	687.854	2⁻	(M1)	0.233	
		299.449 *1*	100 *10*	658.434	3⁻	M1	0.176	
		452.990 *11*	21 *3*	504.861	3⁻	(M1)	0.0586	
959.2		91.1[&]	100	868.090	5⁻			
960.180	(3)⁻	116.763[c] *4*	15 *3*	843.407	3⁻	(M1)	2.42	B(M1)(W.u.)=0.0008 *3*
		125.350[c] *17*	13 *3*	834.800	(5)⁻			
		171.976 *2*	43 *4*	788.213	4⁻			
		301.749 *2*	38 *4*	658.434	3⁻	M1	0.172	B(M1)(W.u.)=0.00011 *4*
		303.06[c] *4*	10.0 *23*	657.130	5⁺			
		527.174[b] *20*	43[b] *8*	433.037	2⁻	M1	0.0400	B(M1)(W.u.)=1.4×10^{-5} *14*
		573.56 *3*	20.0 *25*	386.571	1⁻			
		660.80 *3*	73 *8*	299.349	3⁺			
		727.094 *13*	100 *15*	233.100	2⁺			
962.873	(6⁻)	114.593[c] *8*	≈80	848.228	6⁻			
		239.96 *3*	100 *48*	722.901	4⁻			
		398.942 *18*	80 *12*	563.9283	(6)⁻			
972.506	(6)⁻	137.712 *6*	18 *6*	834.800	(5)⁻			
		972.48 *4*	100 *18*	0.0	7⁻			
973.750	(5)⁺	239.383[c] *11*	≈12	734.358	3⁺			
		316.630 *6*	23 *3*	657.130	5⁺			
		338.556 *3*	100 *9*	635.196	4⁺	M1	0.126	
985.555	4⁺	142.146[c] *9*	≈7	843.407	3⁻			
		251.195[b] *2*	100[b] *10*	734.358	3⁺	M1	0.284	B(M1)(W.u.)=0.0004 *4*
		327.099 *12*	6.9 *11*	658.434	3⁻			
		328.432 *5*	19.4 *19*	657.130	5⁺	M1	0.137	B(M1)(W.u.)=6
		350.364 *2*	58 *6*	635.196	4⁺	M1	0.115	B(M1)(W.u.)=0.00014 *7*
		497.898[c] *11*	≈8	487.635	5⁺			
988.147	5⁻	118.190[c] *21*	3 *3*	869.996	(5)⁻			
		392.413 *5*	100 *10*	595.745	4⁻	M1	0.0851	

$^{176}_{71}Lu_{105}$-14

Adopted Levels, Gammas (continued)

γ(^{176}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	α[a]
990.4	(3$^+$)	124.0[&]		866.356	2$^+$		
		617.9[&c]		372.492	4$^+$		
		691.0[&c]		299.349	3$^+$		
1000.851	(6)$^-$	816.719 *18*	100 *13*	184.1302	8$^-$	(E2,M1)	
		1000.75[c] *7*	≈42	0.0	7$^-$		
1002.742	(6$^-$)	134.679[c] *19*	50 *13*	868.090	5$^-$		
		164.120[b] *7*	40[b] *11*	838.624	5$^-$		
		818.91[c] *11*	100 *17*	184.1302	8$^-$		
		1002.5[c] *3*	≈70	0.0	7$^-$		
1013.4	9$^+$	124.4[#]		888.6	8$^+$		
		226.0[#]		787.4	7$^+$		
1015.343	4$^+$	164.120[b] *7*	14[b] *4*	851.219	5$^+$		
		565.241 *9*	100 *11*	450.108	3$^+$	M1	0.0334
		642.890[@] *14*	71 *11*	372.492	4$^+$	(E2)	0.0102
1019.938	(4$^+$)	148.676 *10*	15 *4*	871.260	(4)$^+$		
		181.316 *6*	23 *5*	838.624	5$^-$		
		285.571[b] *4*	42[b] *5*	734.358	3$^+$		
		362.789 *4*	100 *12*	657.130	5$^+$	(M1,E2)	
		384.726 *9*	31 *4*	635.196	4$^+$	(M1,E2)	
1029.661	(2)$^-$	391.909[c] *22*	≈15	637.760	1$^-$		
		524.817 *13*	40 *5*	504.861	3$^-$	M1	0.0404
		596.627[b] *6*	100[b] *13*	433.037	2$^-$	M1	0.0291
		643.115[@] *10*	70 *10*	386.571	1$^-$	M1(+E2)	
		730.26 *4*	30 *4*	299.349	3$^+$		
		792.75 *5*	≈25	236.908	0$^-$		
		906.78[c] *5*	≈33	122.845	1$^-$		
1032.369	(5)$^-$	197.547[c] *10*	17 *4*	834.800	(5)$^-$	(M1)	0.551
		244.219 *18*	13 *5*	788.213	4$^-$		
		309.421 *8*	38 *5*	722.901	4$^-$		
		468.500 *12*	17 *4*	563.9283	(6)$^-$		
		1032.36 *4*	100 *13*	0.0	7$^-$		
1042.516	5$^-$	332.462 *12*	20 *3*	710.060	6$^-$	(M1,E2)	
		578.743 *17*	100 *12*	463.763	4$^-$	M1	0.0315
1046.3		207.7[&]	100	838.624	5$^-$		
1060.5	11$^+$	233.7[#]		827.0	10$^+$		
		445.0[#]		615.1	9$^+$		
1067.411	4$^-$	109.541 *6*	56 *11*	957.879	3$^-$	M1	2.91

Adopted Levels, Gammas (continued)

γ(^{176}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	α[a]
1067.411	4⁻	303.793[c] *6*	44 *8*	763.626	3⁻		
		344.493 *7*	89 *10*	722.901	4⁻	(M1)	0.120
		408.946 *12*	67 *11*	658.434	3⁻		
		471.652 *16*	44 *7*	595.745	4⁻		
		562.56 *3*	100 *12*	504.861	3⁻		
1068.975	(5⁻)	147.518 *3*	100 *27*	921.464	(5)⁻		
		317.099 *16*	23 *4*	751.878	4⁻		
		346.093 *11*	27 *5*	722.901	4⁻	(M1)	0.119
		473.28[c] *4*	≈14	595.745	4⁻		
1100.402	(3)⁻	239.91 *5*	6 *3*	860.544	4⁻		
		595.57[b] *4*	24[b] *3*	504.861	3⁻		
		667.356 *21*	100 *9*	433.037	2⁻	M1(+E2)	
1104.5		118.8[&]		985.555	4⁺		
		144.4[&]		960.180	(3)⁻		
1118.8	12⁻	262.1[#]		857.1	11⁻		
		505.6[#]		613.45	10⁻		
1120.3		470.2[&]		650.175	5⁺		
		587.1[&]		533.085	4⁺		
1131.8	11⁺	71.0[#]		1060.5	11⁺		
		234.6[#]		897.0	10⁺		
		305.0[#]		827.0	10⁺		
		449.2[#]		682.6	9⁺		
1142.5		112.8[&]	100	1029.661	(2)⁻		
1159.7	10⁺	146.0[#]		1013.4	9⁺		
		271.5[#]		888.6	8⁺		
1164.1		320.7[&]	100	843.407	3⁻		
1227.9		493.5[&]	100	734.358	3⁺		
1237.4		292.4[&]	100	945.012	4⁻		
1241.1		402.5[&]	100	838.624	5⁻		
1274.5	(7⁺)	902.0[&]	100	372.492	4⁺		
1277.8		439.2[&]	100	838.624	5⁻		
1301.4		567.0[&]	100	734.358	3⁺		
1314.0	12⁺	253.9[#]		1060.5	11⁺		
		486.8[#]		827.0	10⁺		

$^{176}_{71}Lu_{105}$-16

Adopted Levels, Gammas (continued)

γ(^{176}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	α[a]	Comments
1329.2	11^+	315.8[#]	100	1013.4	9^+			
1351.7	(10^+)	454.6[#]		897.0	10^+			
		524.8[#]		827.0	10^+			
		669.0[#]		682.6	9^+			
		736.0[#]		615.1	9^+			
		738.3[#]		613.45	10^-			
		863.2[#]		487.840	8^+			
		927.1[#]		424.8908	8^+			
		963.0[#]		388.877	9^-			
1370.7		735.5[&]	100	635.196	4^+			
1398.6	13^-	280.2[#]		1118.8	12^-			
		541.1[#]		857.1	11^-			
1514.5	12^+	162.4[#]		1351.7	(10^+)	(E2)	0.9 *4*	Mult.: consistent with either M1(0.969) or E2 (0.576) in (^{7}Li,Xγ). Decay scheme requires E2.
		200.3[#]		1314.0	12^+	M1	0.24 *40*	Mult.: From (^{7}Li,Xγ).
		355.0[#]		1159.7	10^+			
		382.3[#]		1131.8	11^+			
		396.0[#]		1118.8	12^-			
		454.2[#]		1060.5	11^+			
		617.0[#]		897.0	10^+	(E2)		Mult.: (E2) or mixed (E1+M2), α(K)exp=0.010 *3* in (^{7}Li,Xγ). Decay scheme requires (E2).
		658.0[#]		857.1	11^-			
		687.1[#]		827.0	10^+			
		1126.5[#]		388.877	9^-			
1518.6	12^+	358.9[#]	100	1159.7	10^+			
1587.5	(14^+)	73.0[#]	100	1514.5	12^+	(E2)	9 *4*	B(E2)(W.u.)=0.012 *5* Mult.: α(exp)=9 *4* is consist with both M1(9.51) and E2(12.2). The M1 alternative would imply a reduced transition strength of 1.3 x 10^{-7} W.u., more than two orders of magnitude weaker than expected for a K-allowed M1 transition. In contrast, the assumption of E2 multipolarity implies a reduced transition strength within the expected range.
1588.7	13^+	275.0[#]		1314.0	12^+			
		527.9[#]		1060.5	11^+			
1693.5	14^-	574.7[#]	100	1118.8	12^-			

$^{176}_{71}Lu_{105}$-17

Adopted Levels, Gammas (continued)

$\gamma(^{176}Lu)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π
1730.3	13^+	401.1[#]	100	1329.2	11^+
1960.7	14^+	442.1[#]	100	1518.6	12^+
2005.3	15^-	606.7[#]	100	1398.6	13^-
2329.4	16^-	635.9[#]	100	1693.5	14^-
2671.3	(17^-)	666.0[#]	100	2005.3	15^-
3021.3	(18^-)	692.0[#c]	100	2329.4	16^-

[†] From ^{175}Lu(n,γ) E=thermal, unless otherwise specified.
[‡] From Coulomb excitation.
[#] From ^{176}Yb(^{7}Li,Xγ).
[@] Unresolved doublet.
[&] From ^{176}Yb(p,nγ).
[a] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with "Frozen Orbitals" approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[b] Multiply placed with undivided intensity.
[c] Placement of transition in the level scheme is uncertain.

$^{176}_{71}Lu_{105}$-18

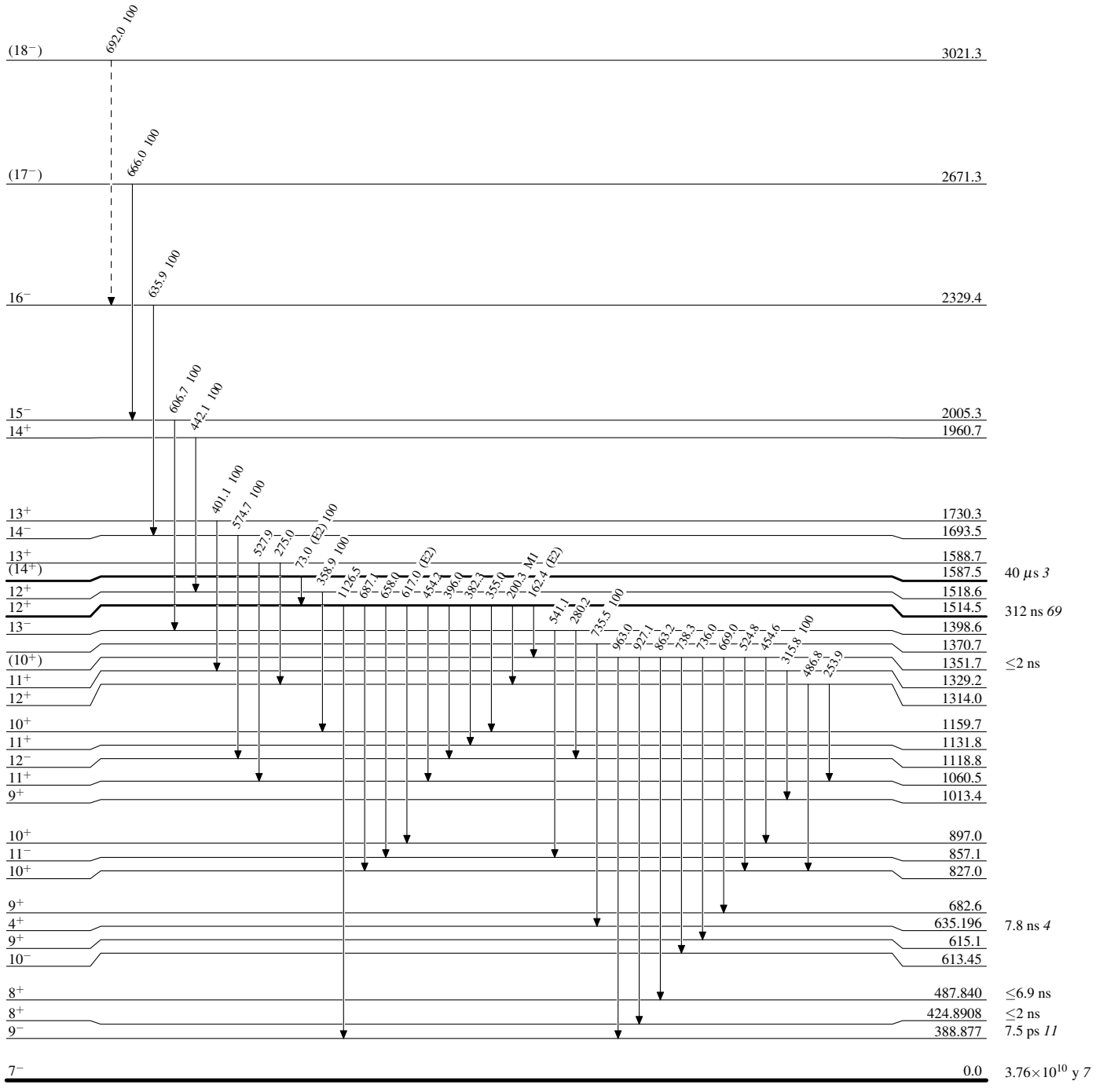
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

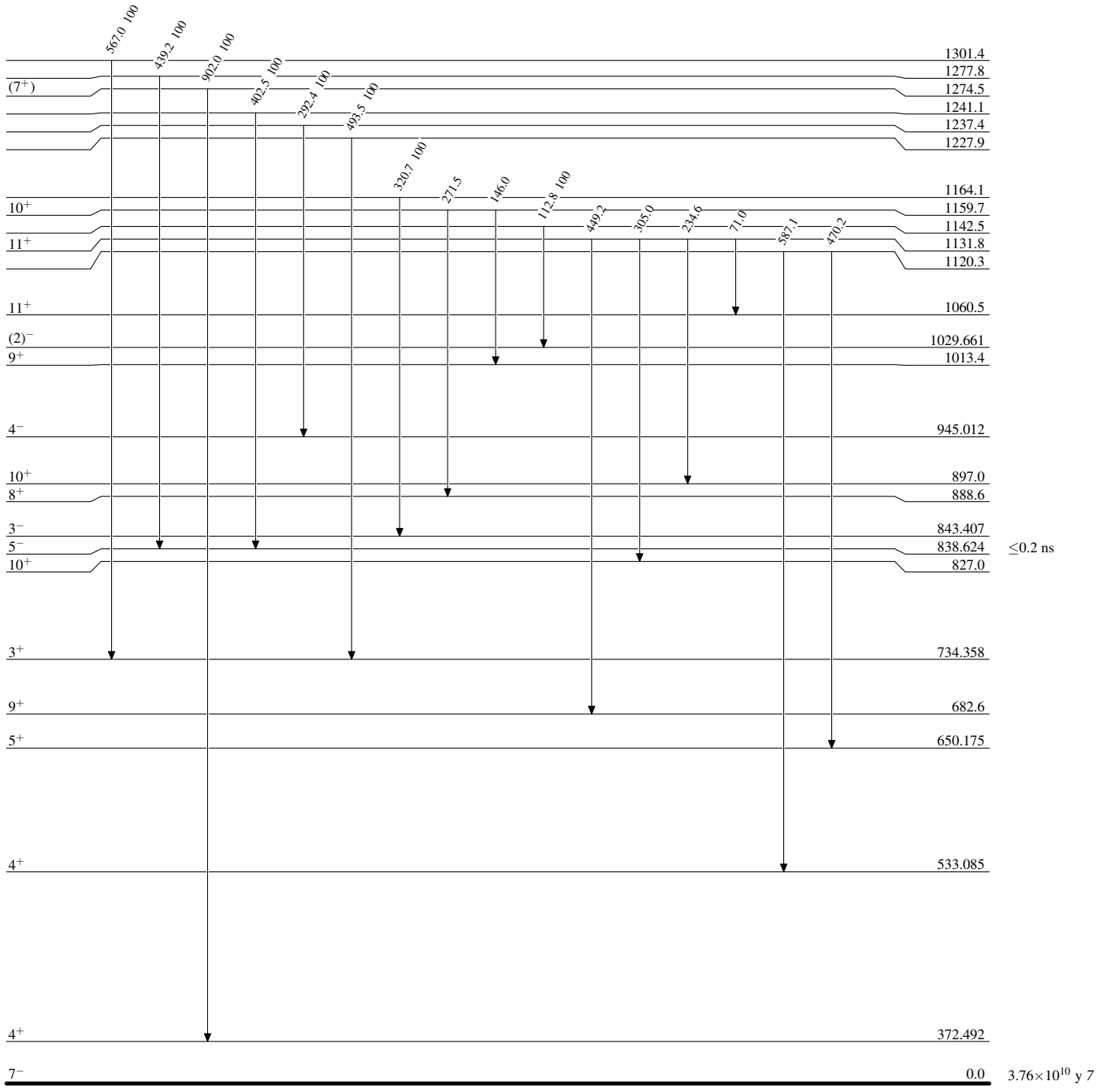


$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{176}_{71}Lu_{105}$

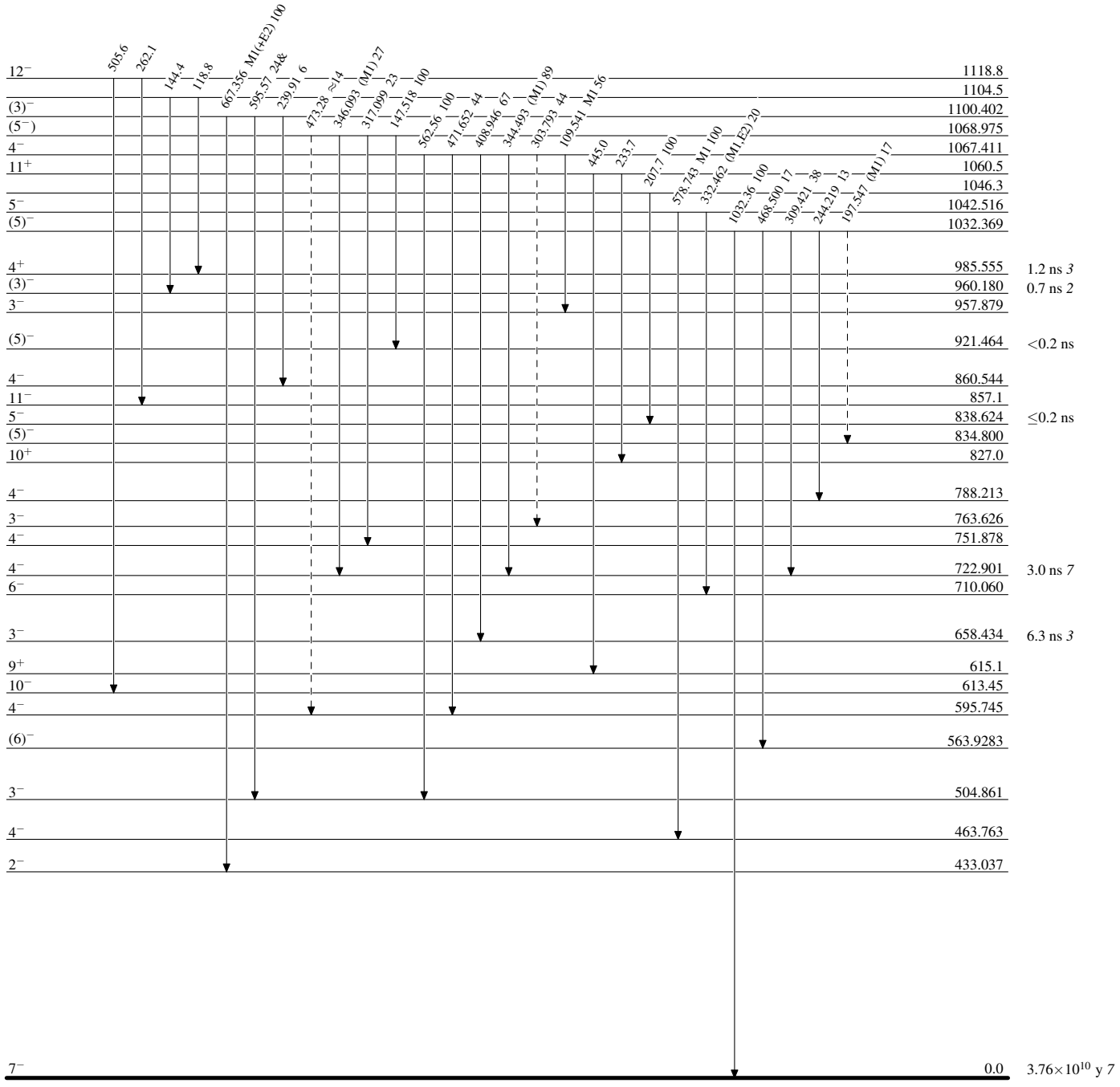
Adopted Levels, Gammas

Legend

Level Scheme (continued)

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

– – – – – – ► γ Decay (Uncertain)



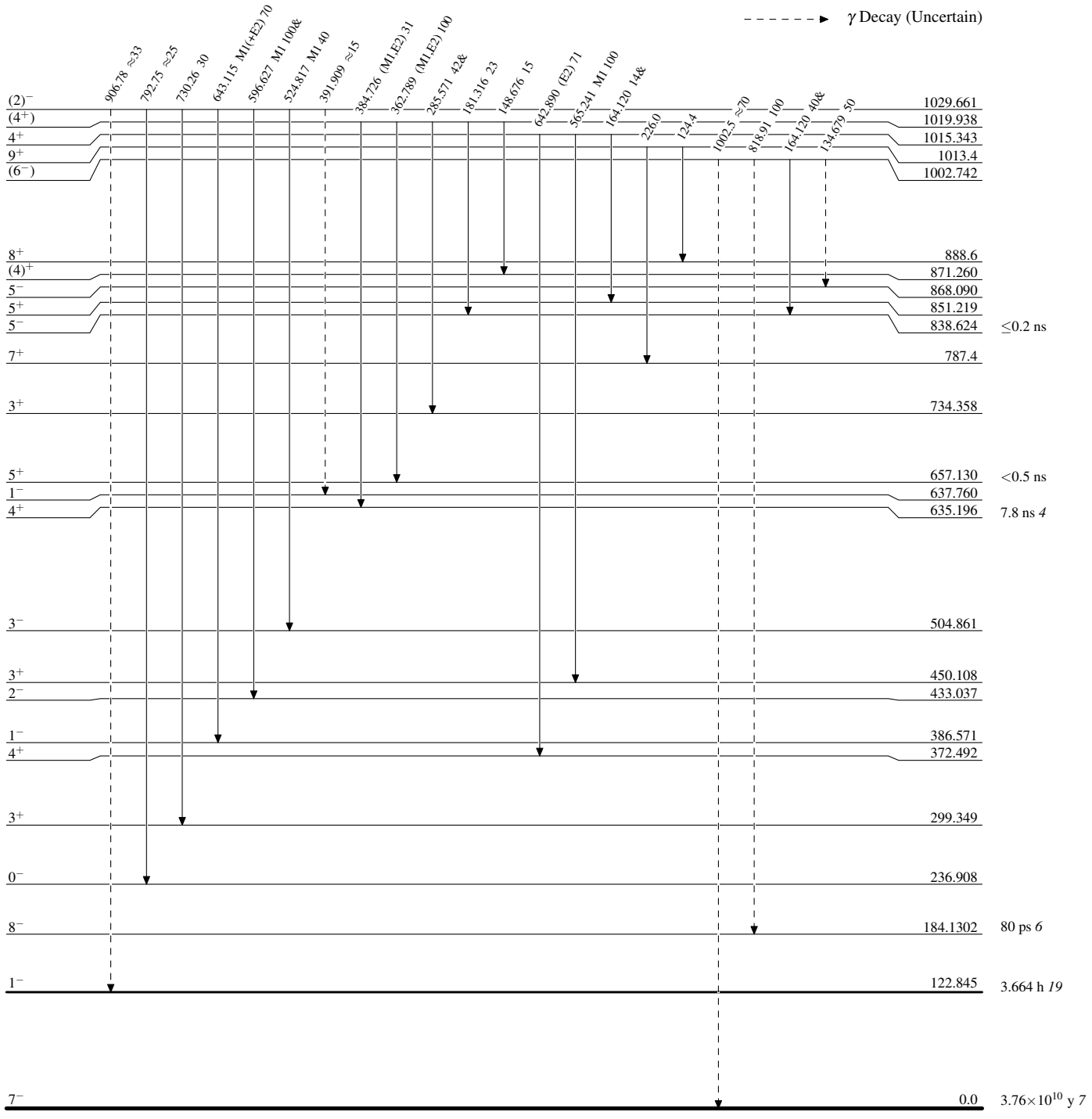
$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas

Level Scheme (continued)

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

Legend



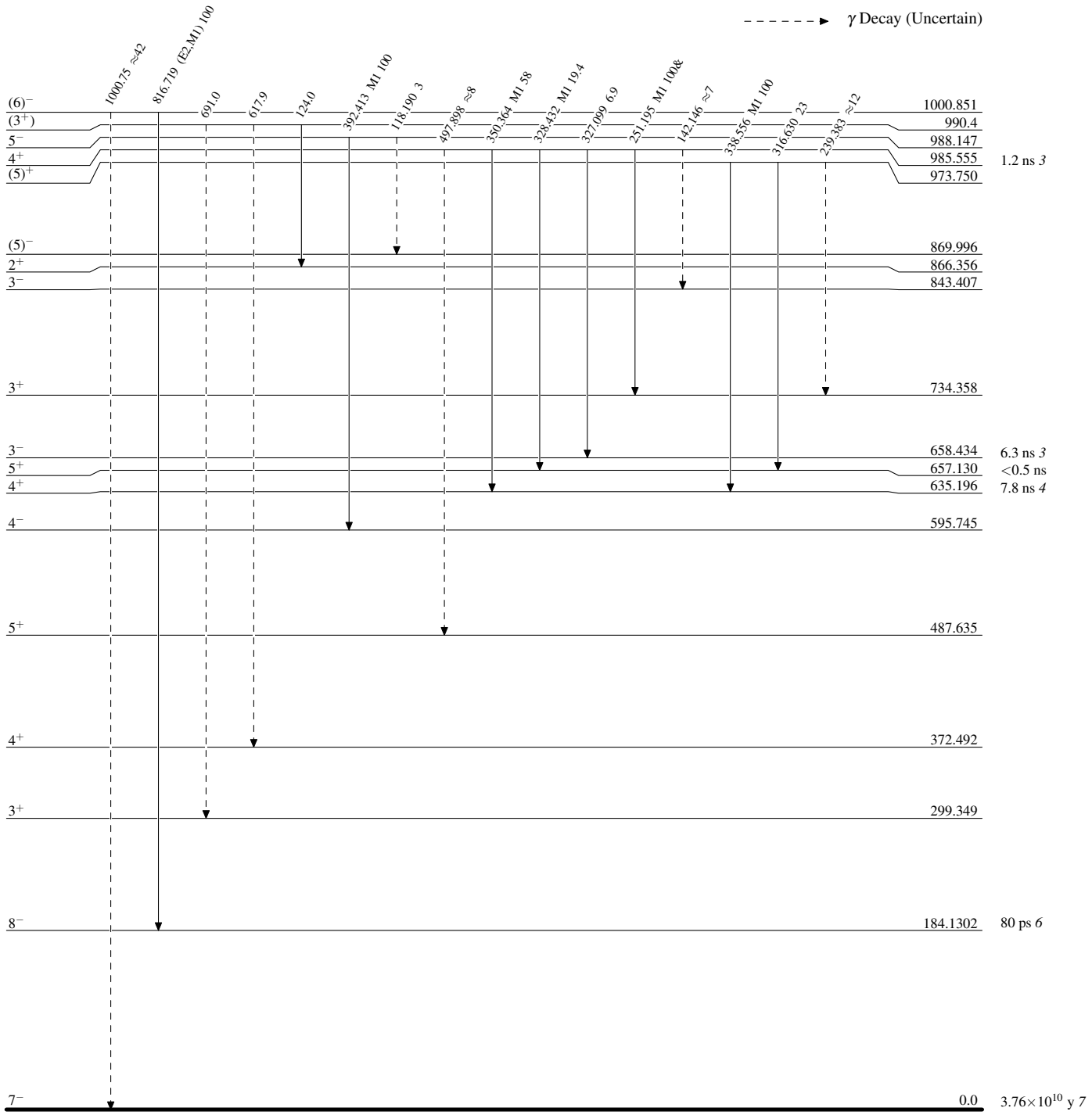
$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas

Level Scheme (continued)

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

Legend



$^{176}_{71}Lu_{105}$

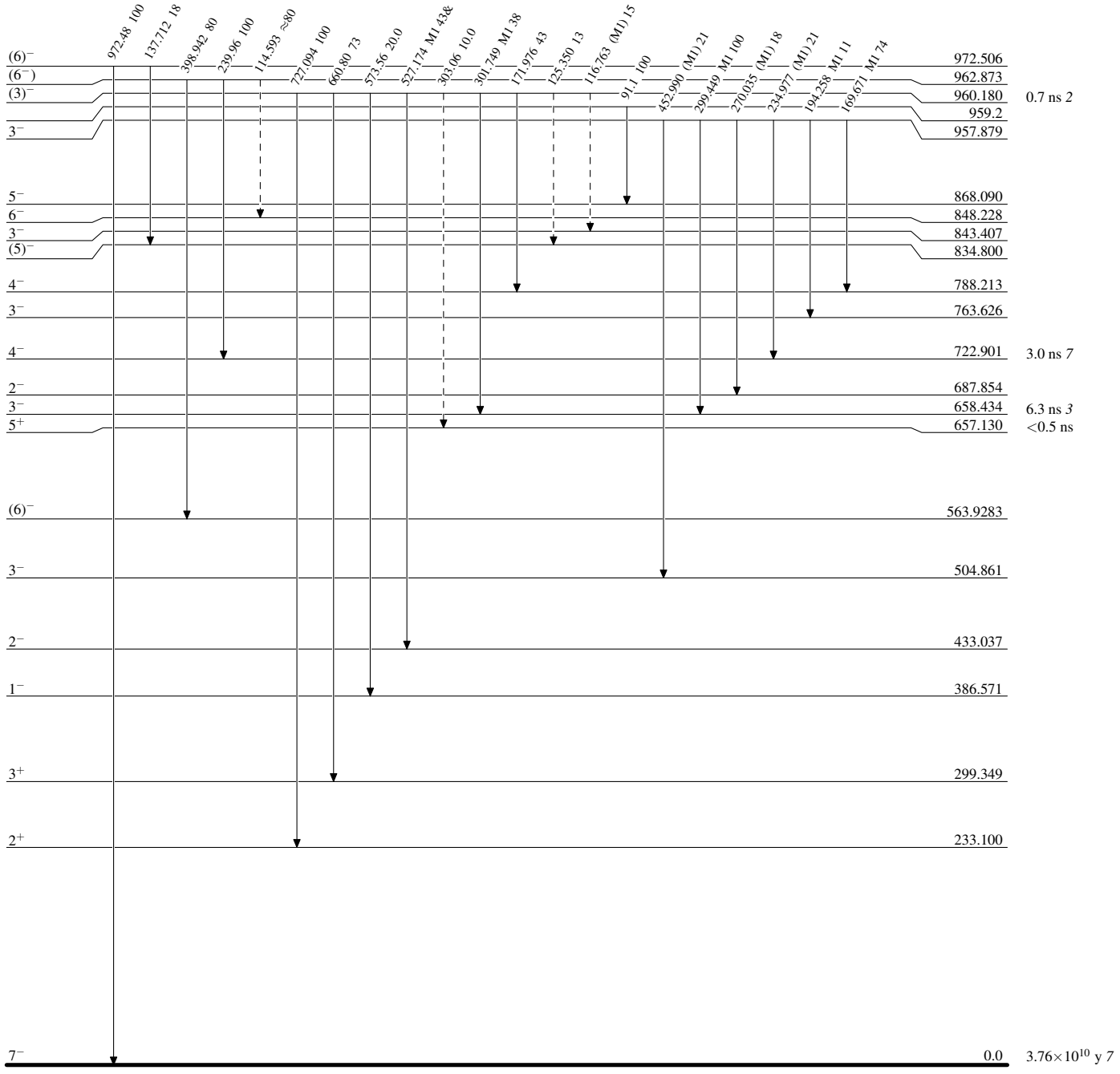
Adopted Levels, Gammas

Legend

Level Scheme (continued)

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

– – – – – – ► γ Decay (Uncertain)



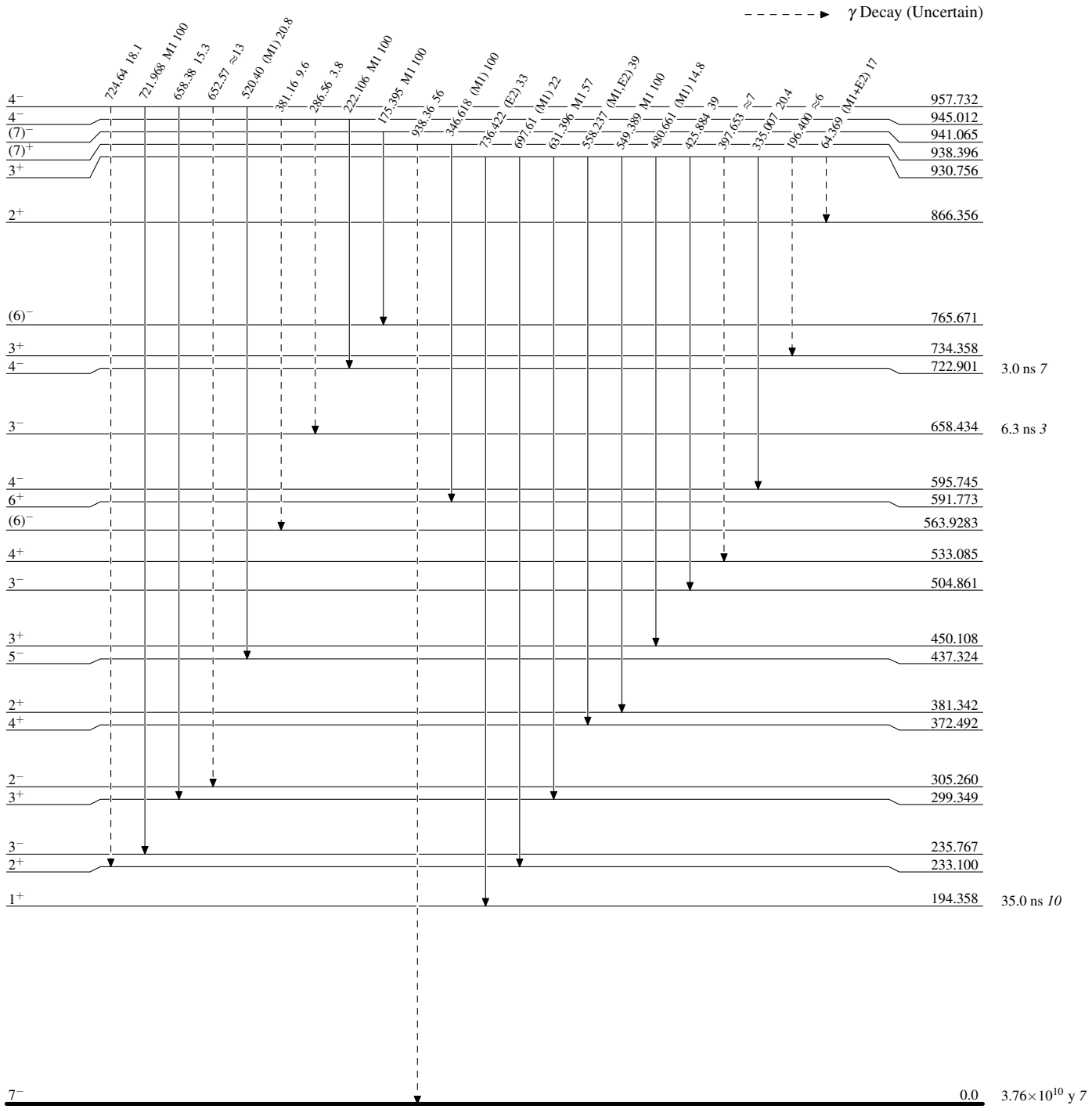
$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas

Level Scheme (continued)

Legend

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

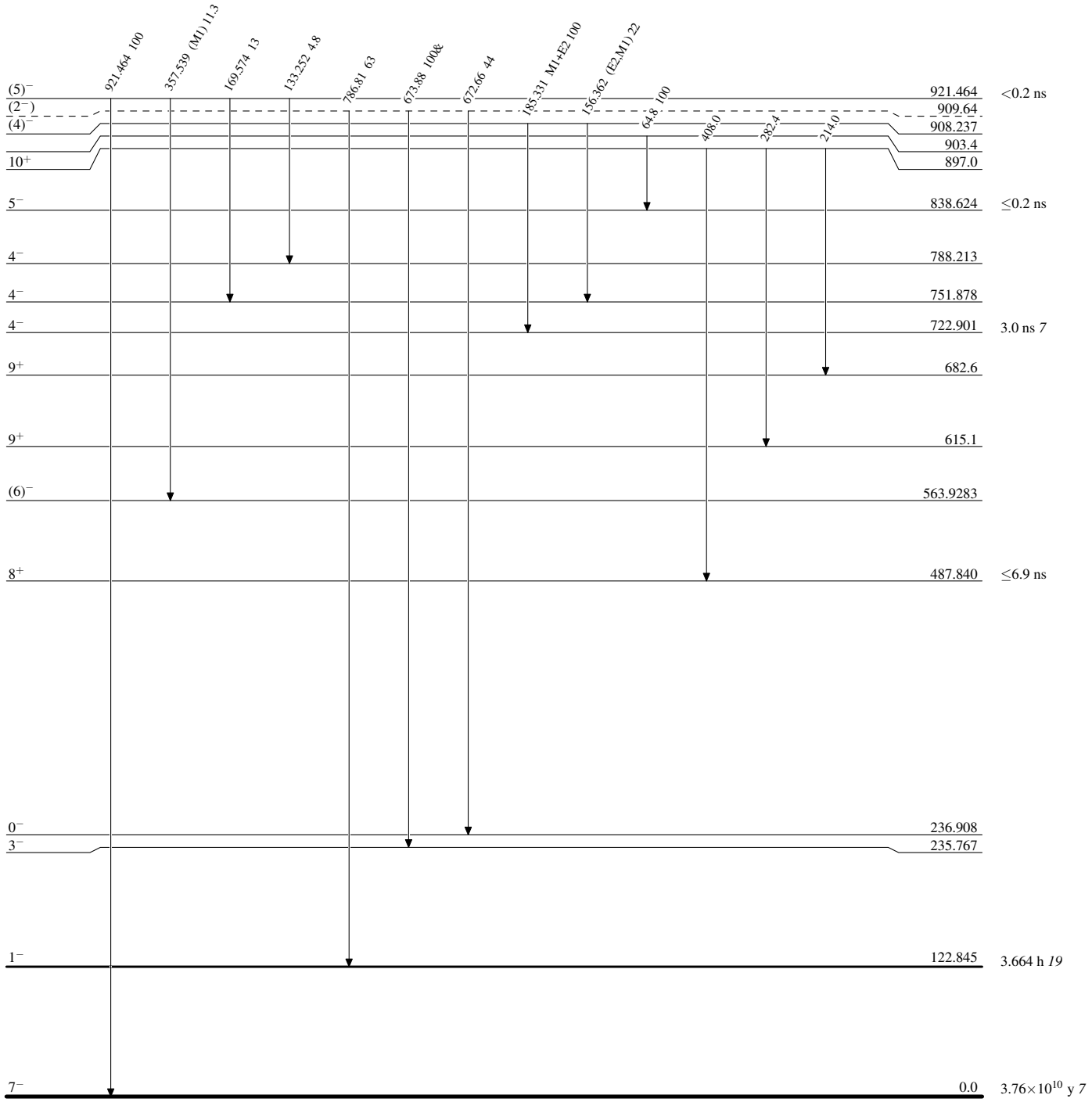


$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas

Level Scheme (continued)

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



$^{176}_{71}Lu_{105}$

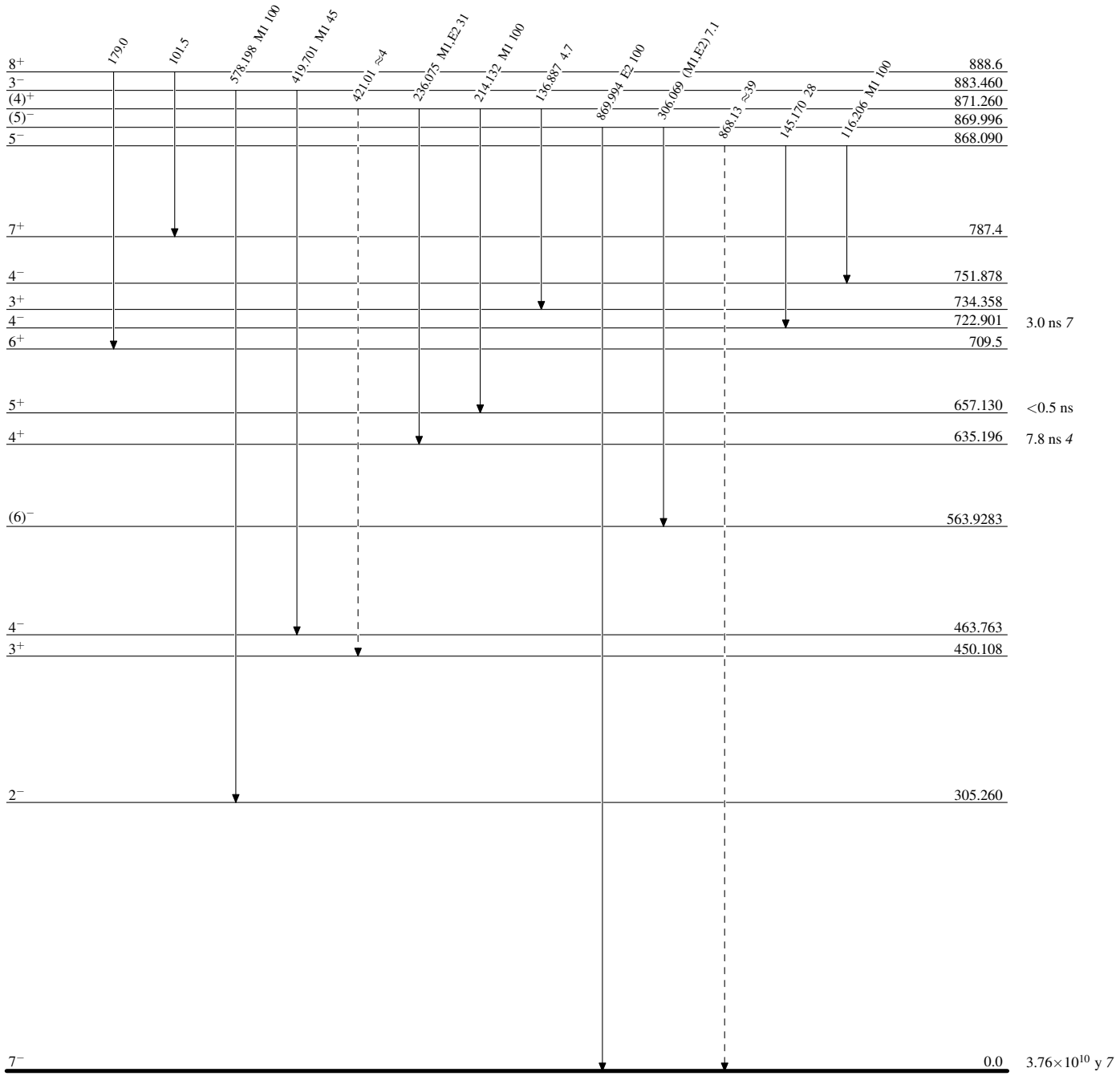
Adopted Levels, Gammas

Legend

Level Scheme (continued)

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

- - - - - - ► γ Decay (Uncertain)



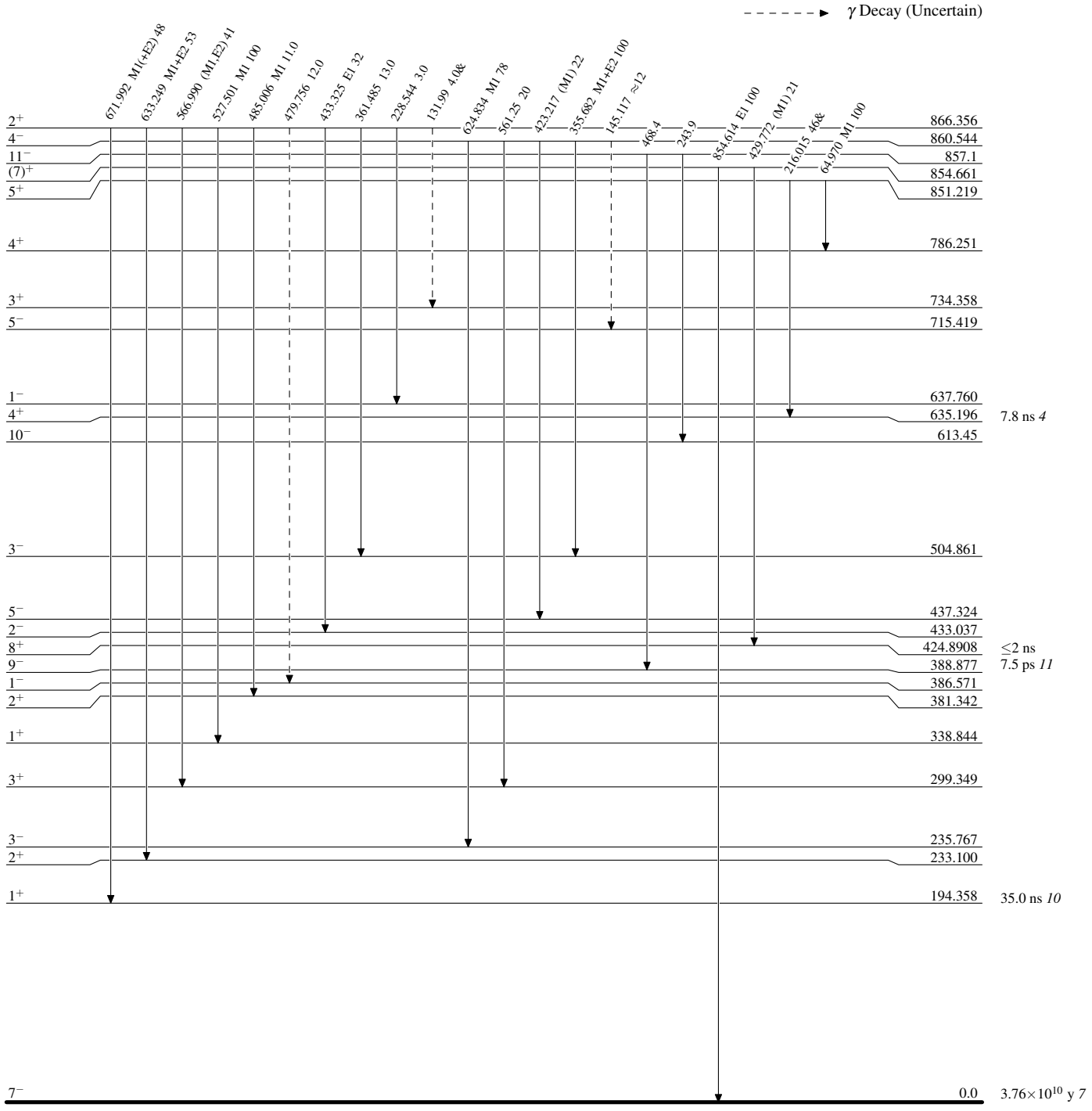
$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

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



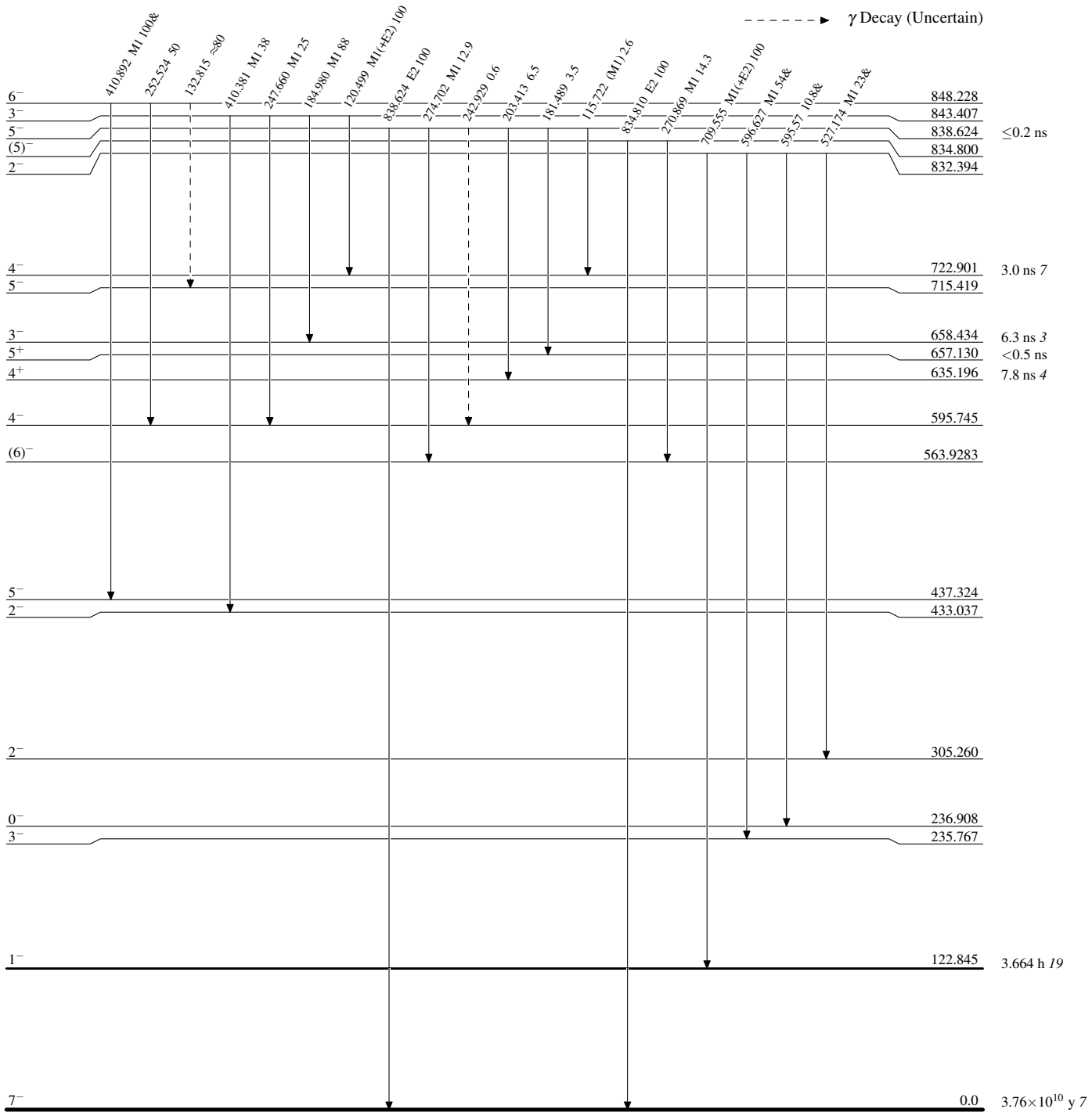
$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas

Level Scheme (continued)

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

Legend



$^{176}_{71}Lu_{105}$

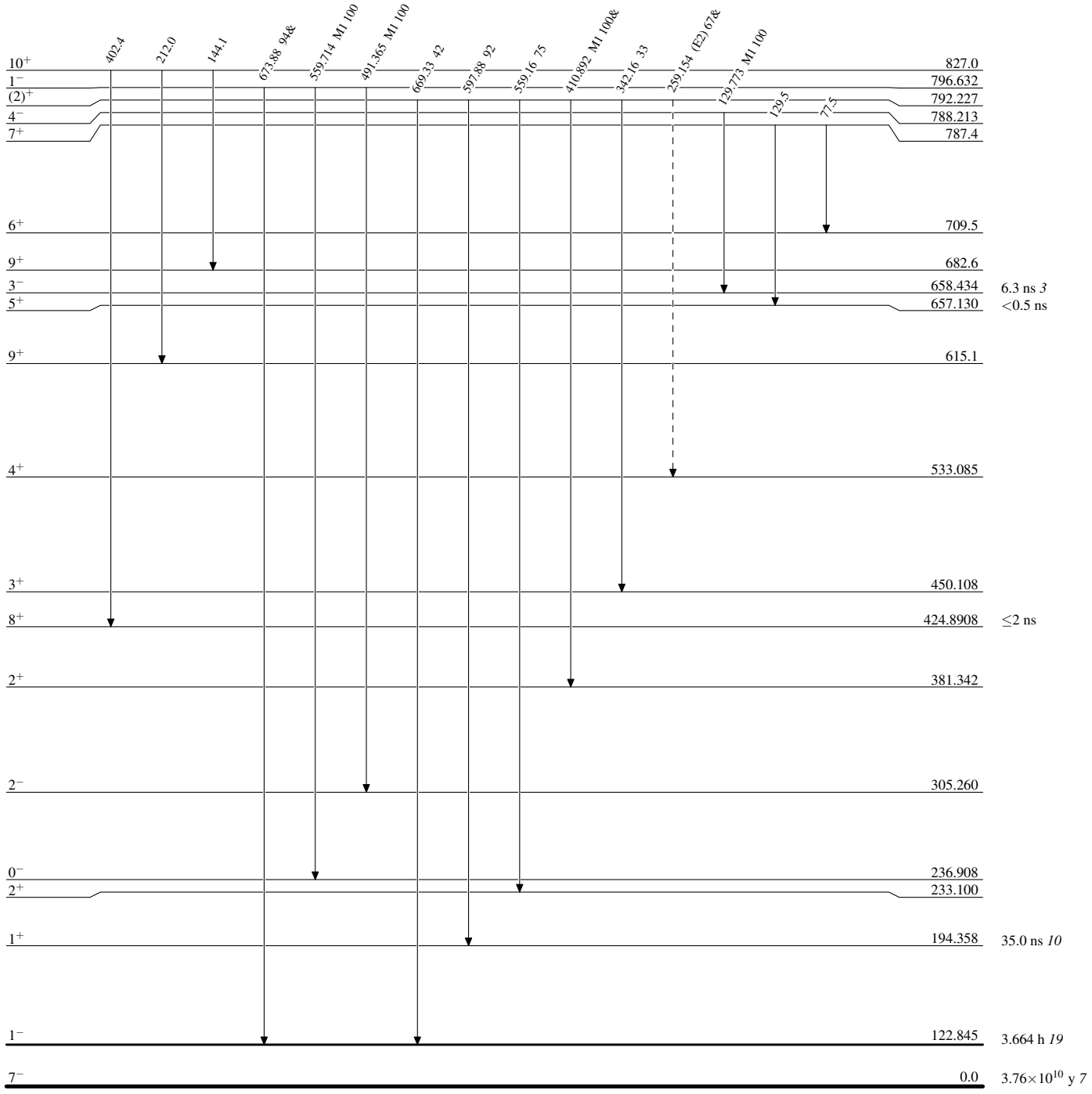
Adopted Levels, Gammas

Legend

Level Scheme (continued)

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

γ Decay (Uncertain)

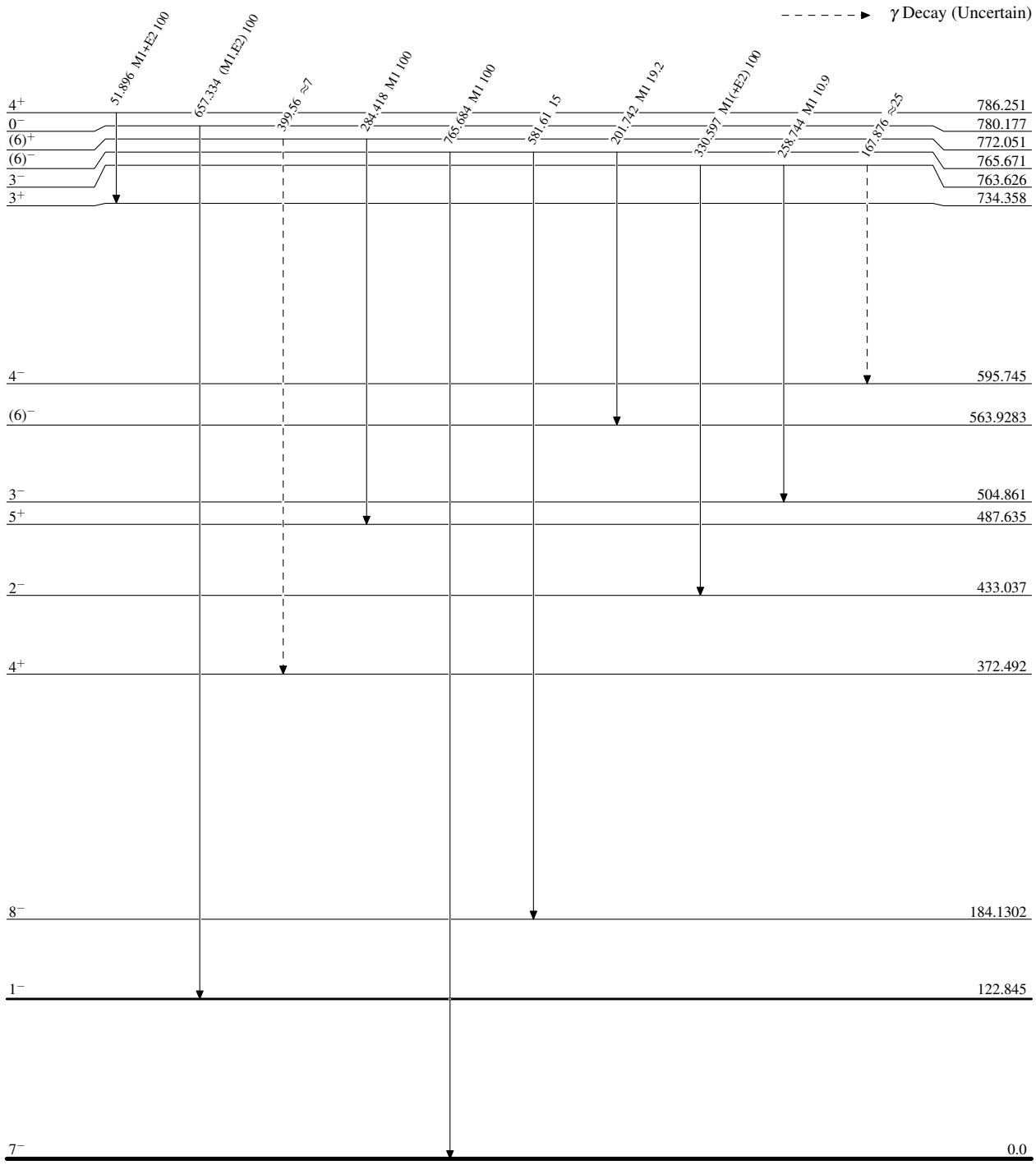


$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas

Level Scheme (continued)

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



$^{176}_{71}Lu_{105}$

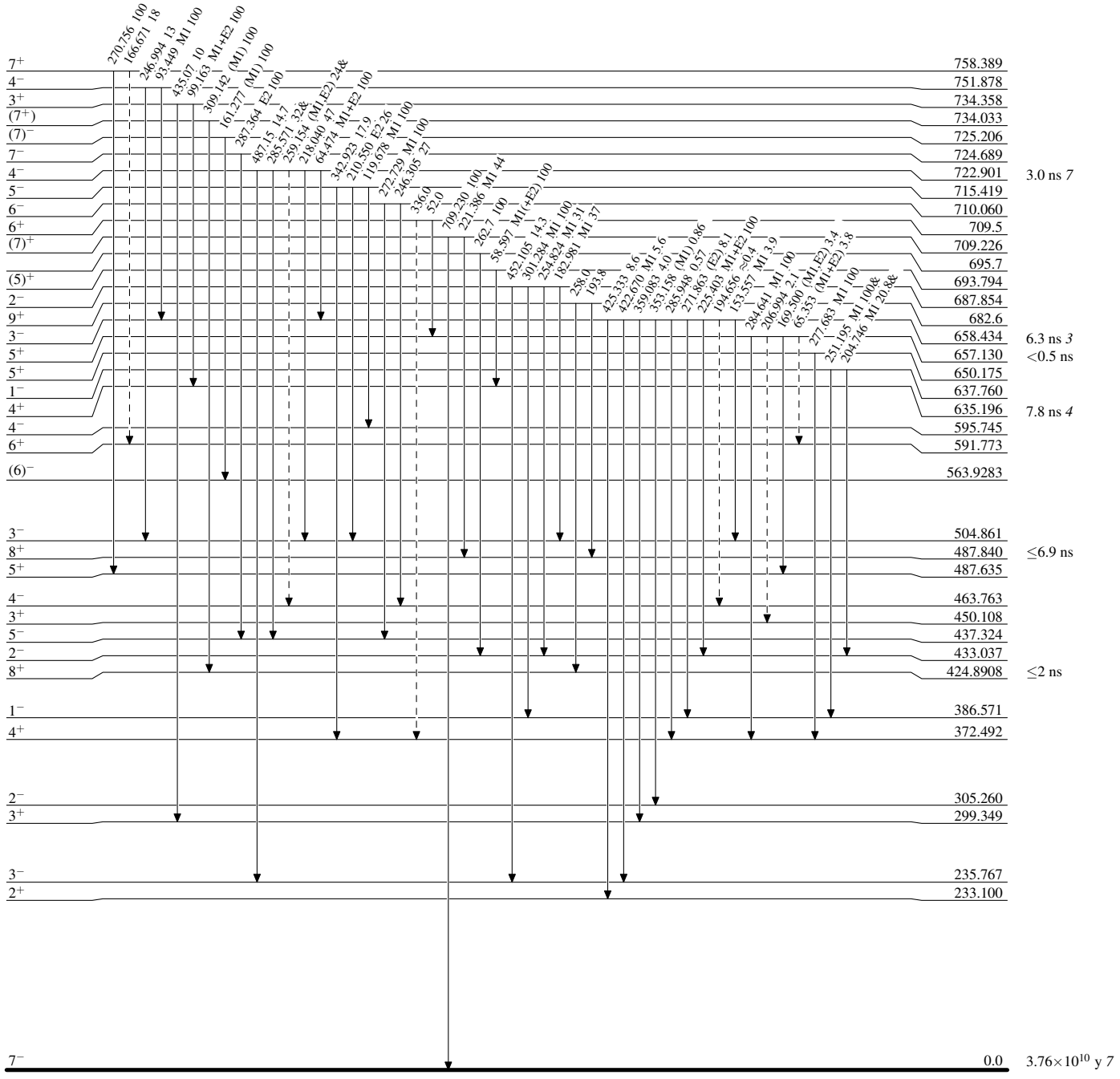
Adopted Levels, Gammas

Legend

Level Scheme (continued)

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

– – – – – – ► γ Decay (Uncertain)



$^{176}_{71}Lu_{105}$

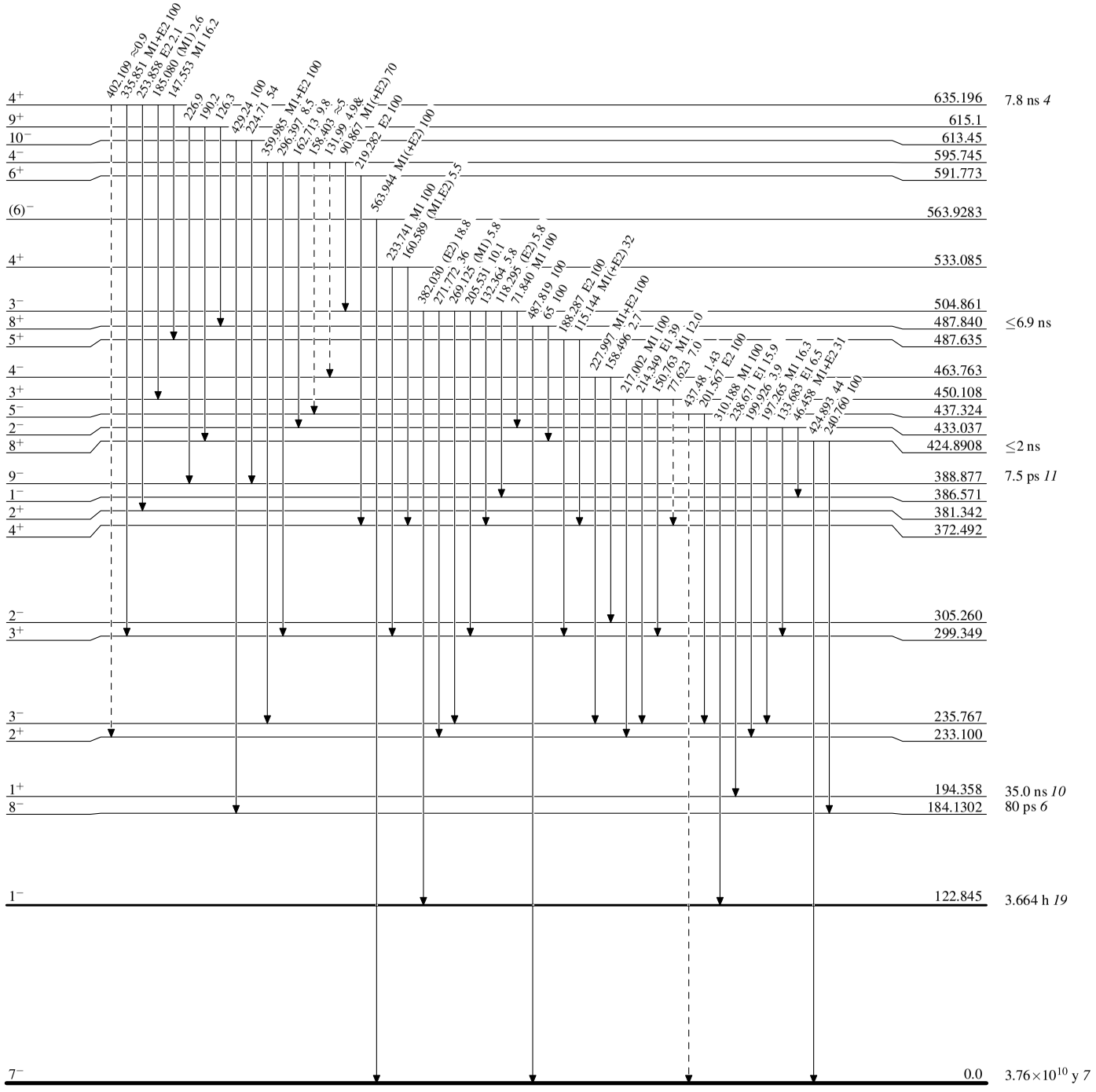
Adopted Levels, Gammas

Legend

Level Scheme (continued)

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

– – – – – – ► γ Decay (Uncertain)



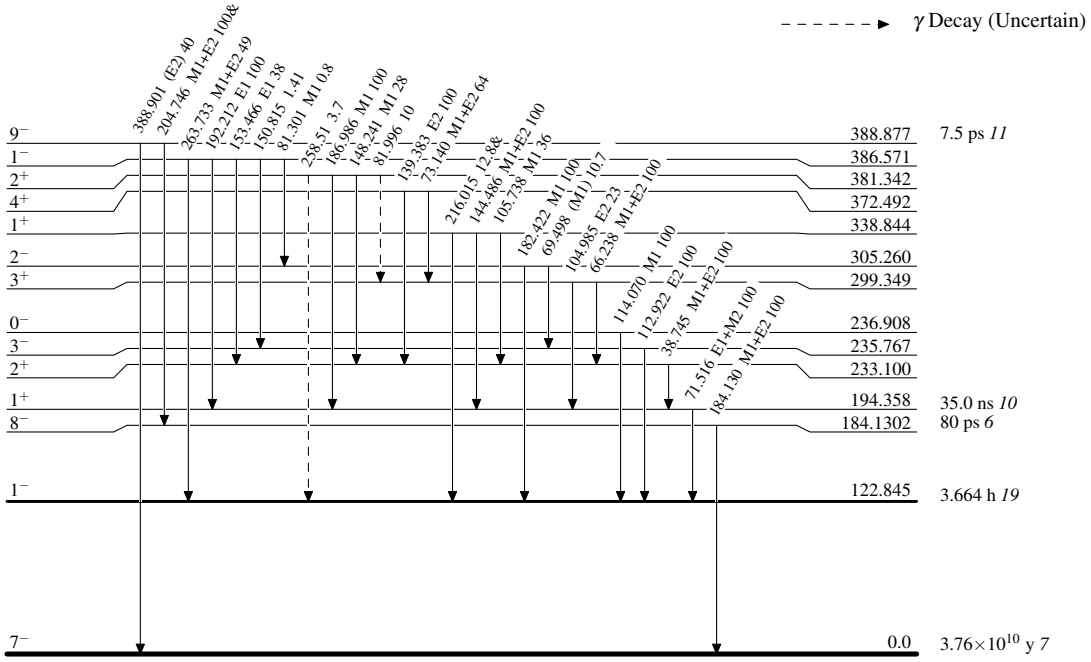
$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas

Level Scheme (continued)

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

Legend



$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas

Band(A): $K^{\pi}=0^{-}$

5^{-} 1042.516

4^{-} 957.732

3^{-} 883.460

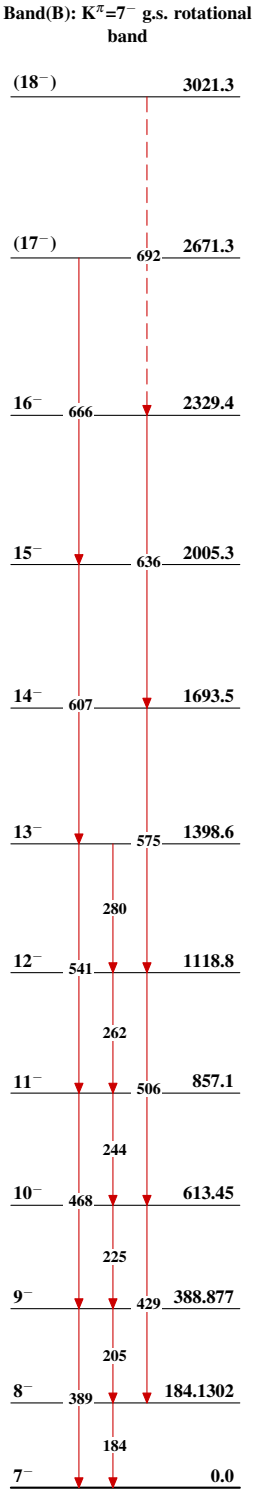
2^{-} 832.394

1^{-} 796.632

0^{-} 780.177

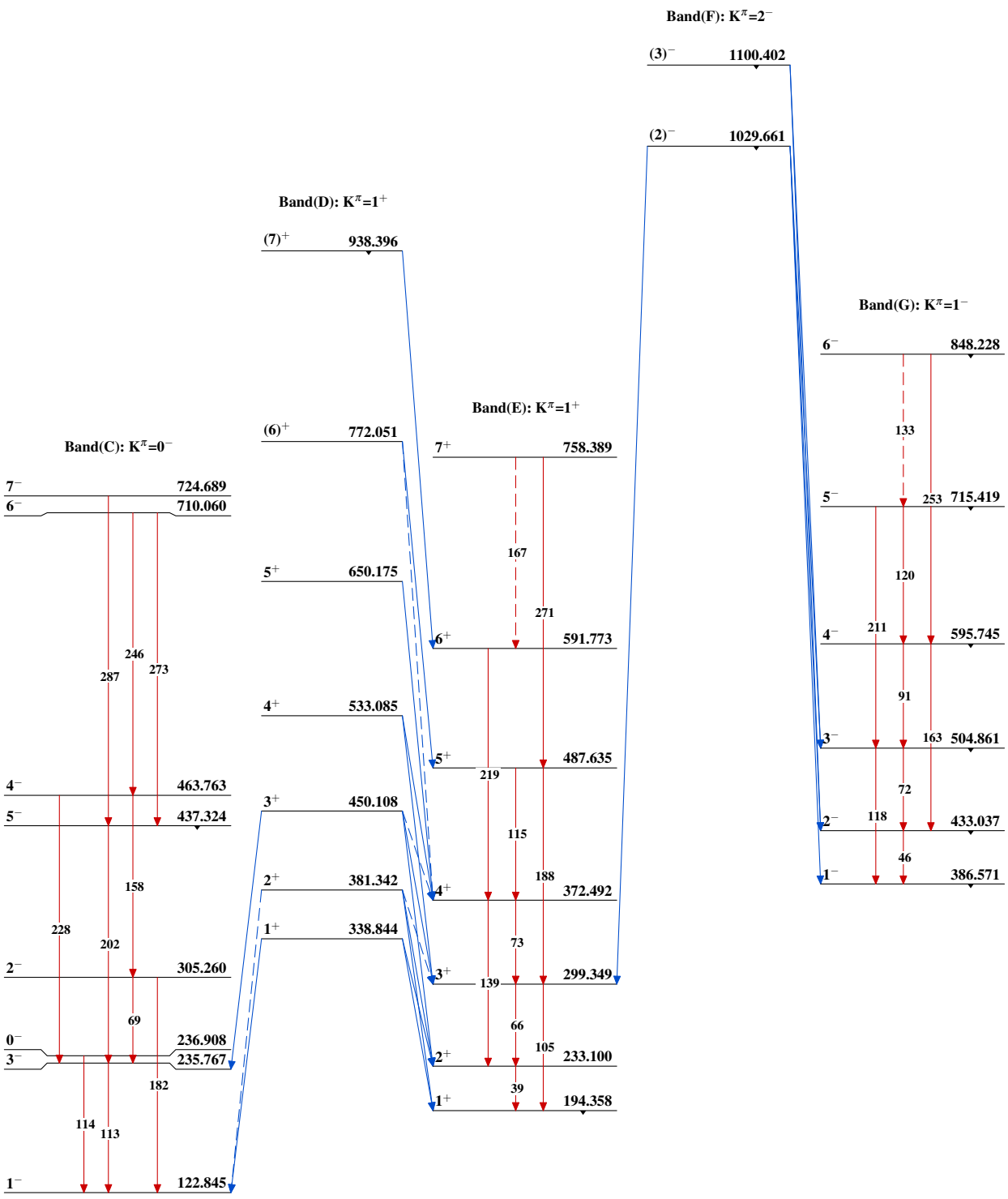
$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas (continued)



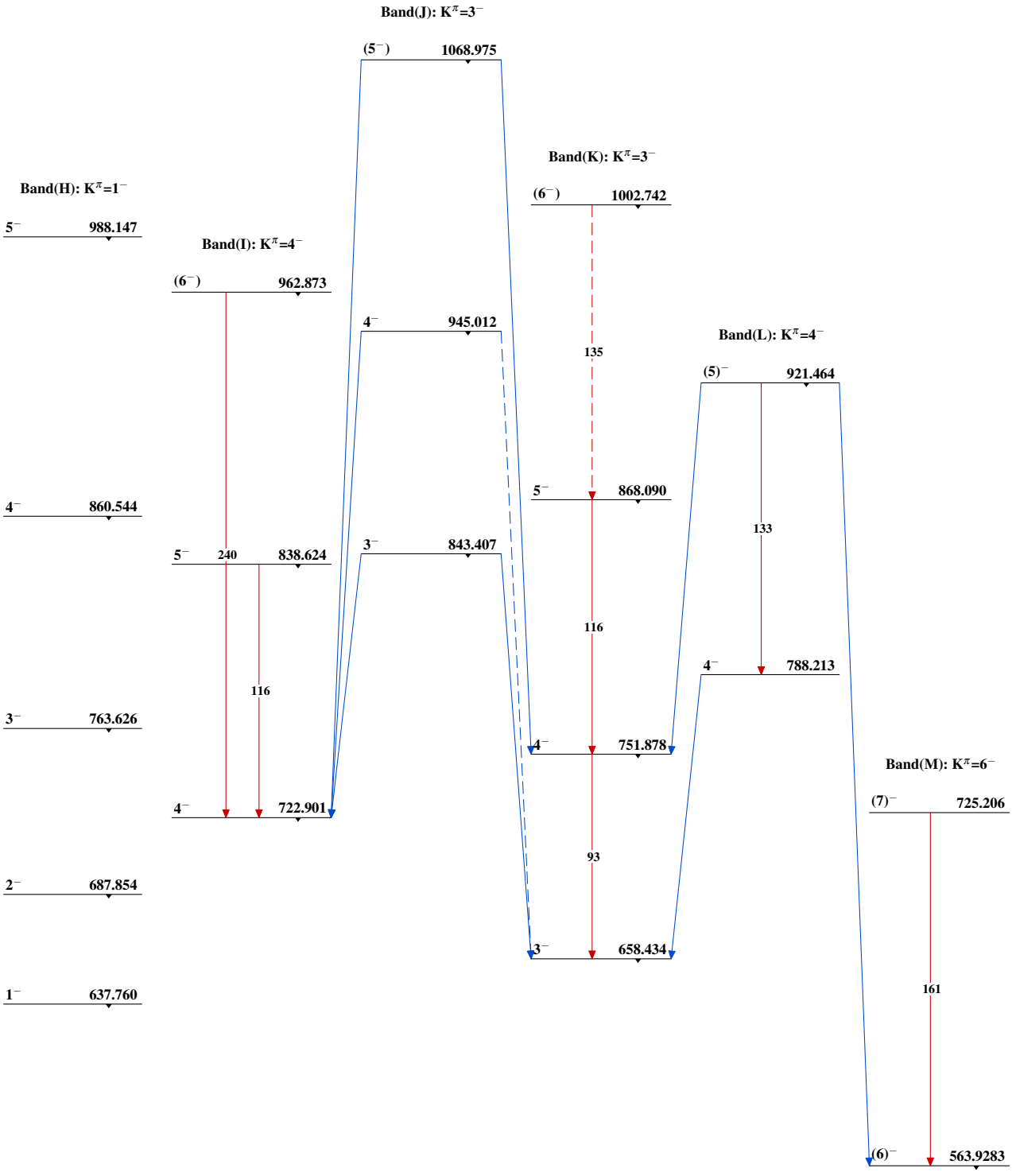
$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas (continued)



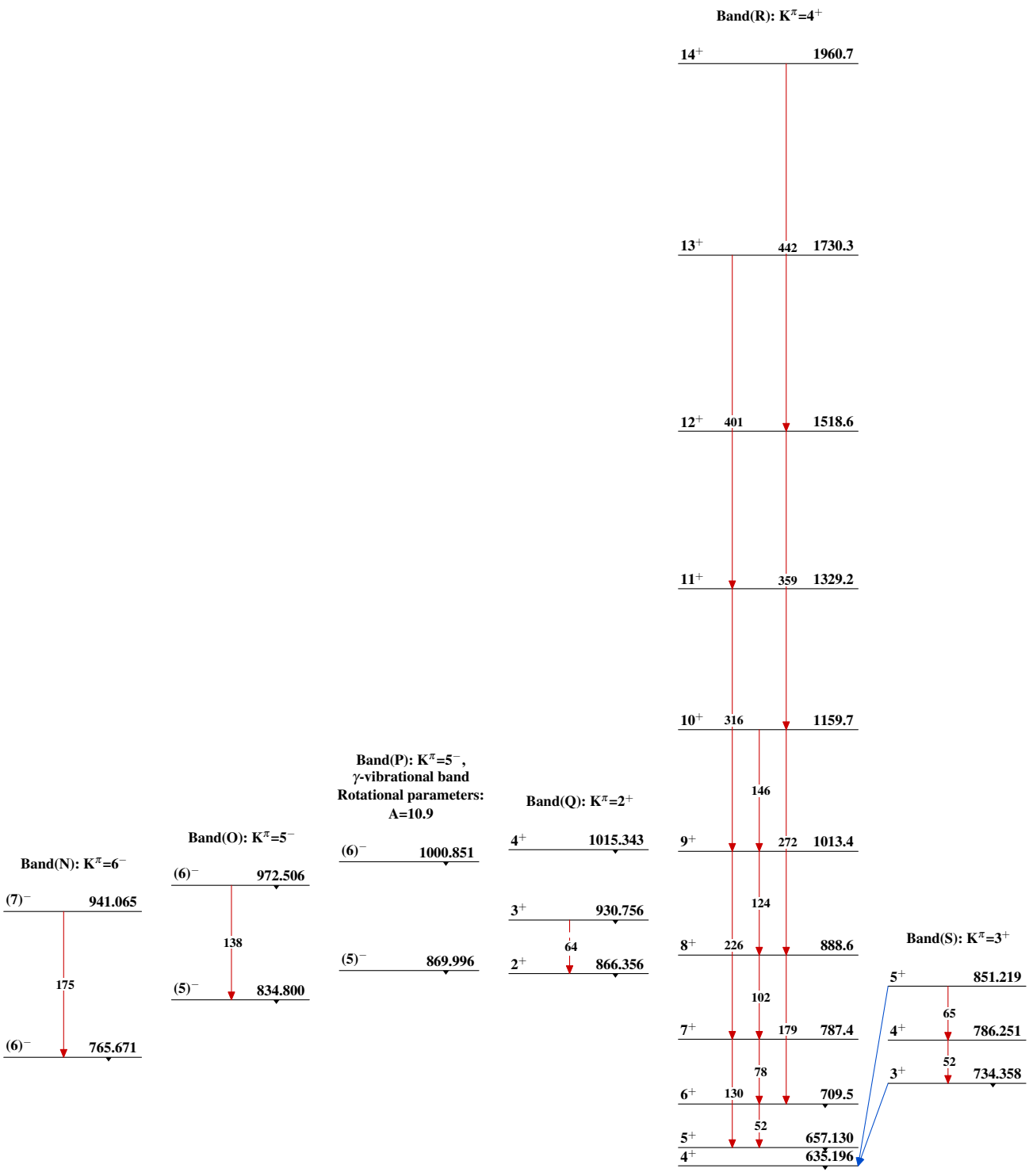
$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas (continued)



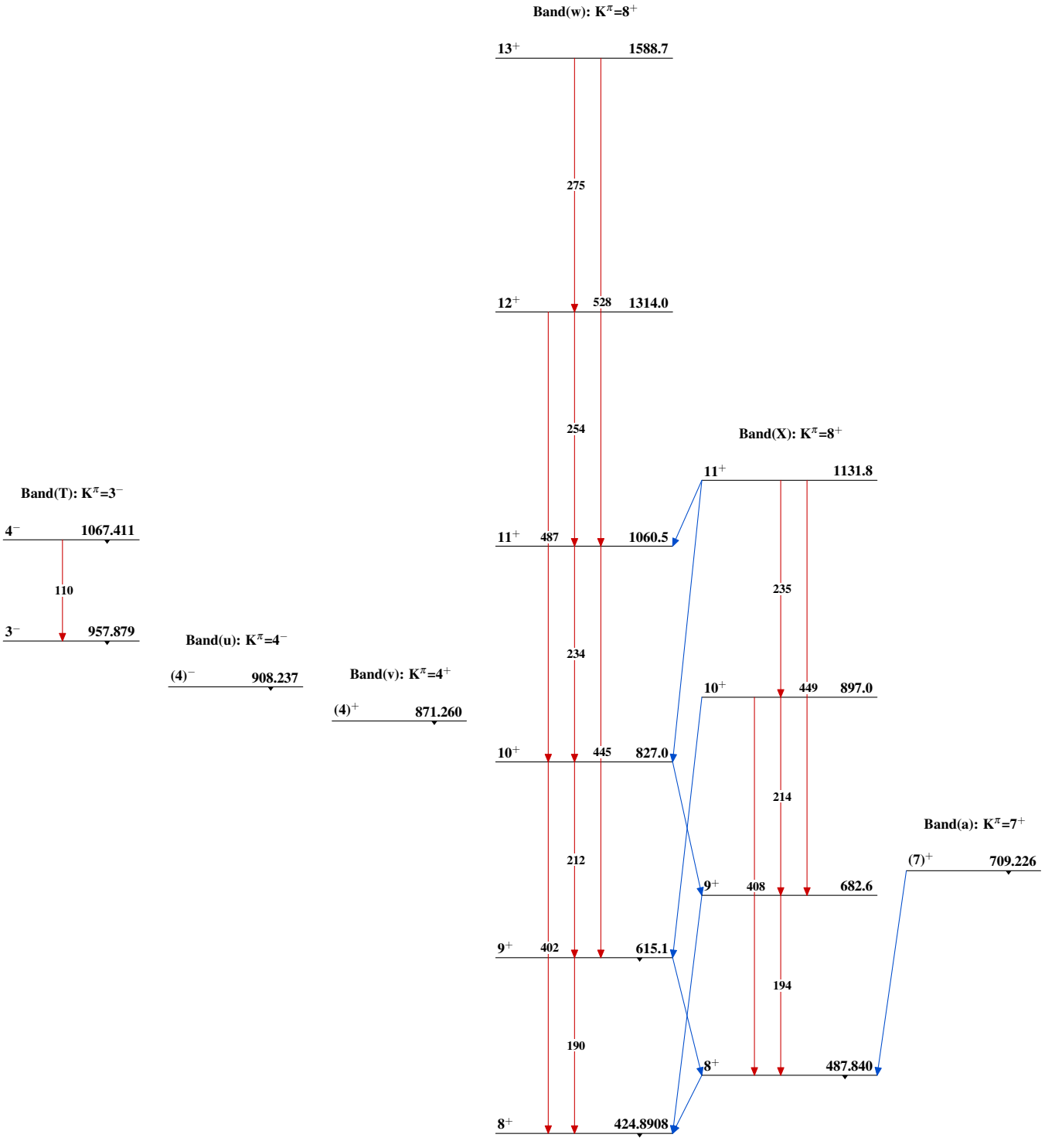
$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas (continued)



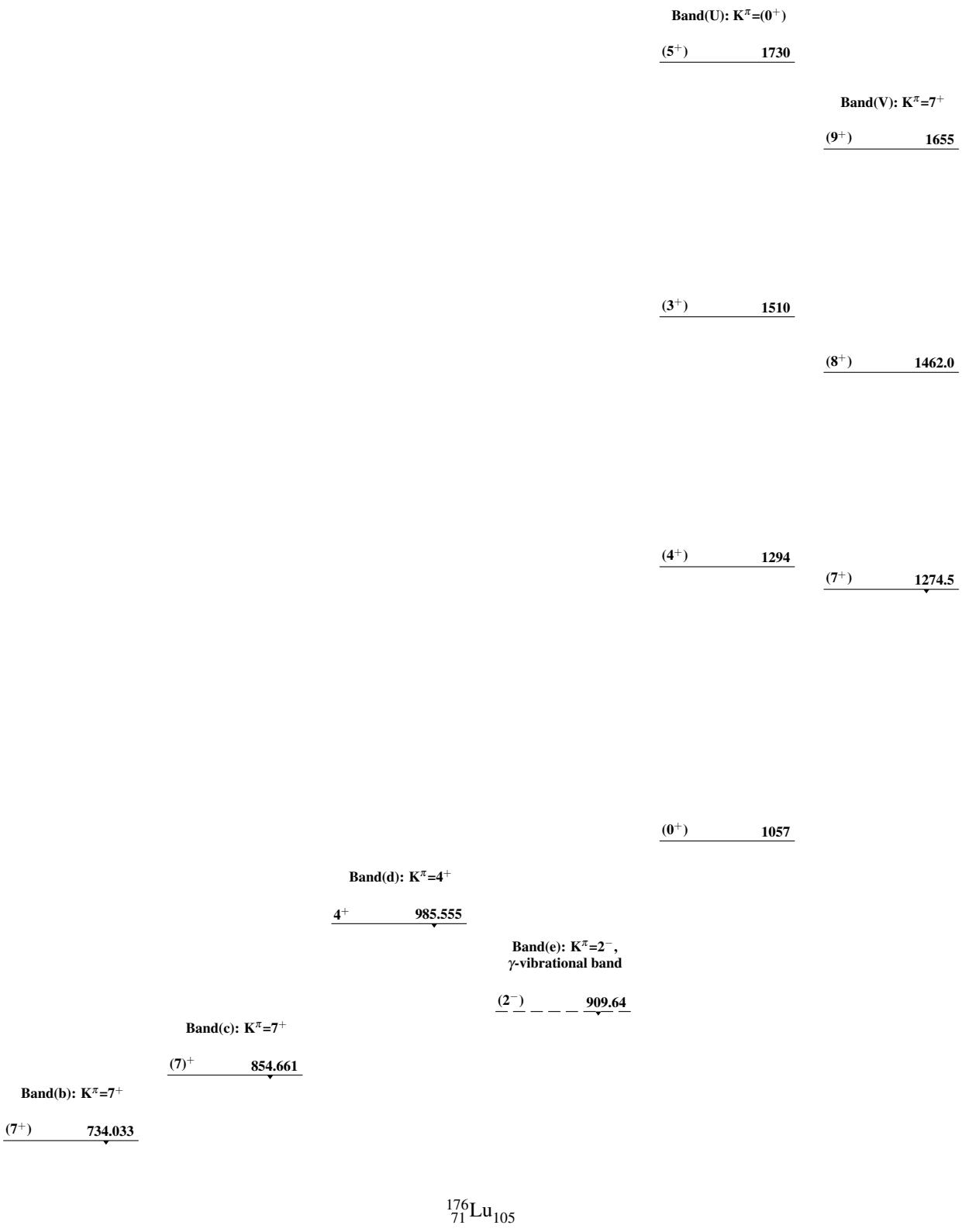
$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas (continued)



$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas (continued)



$^{176}_{71}Lu_{105}$

Adopted Levels, Gammas (continued)

Band(W): $K^{\pi}=5^{-}$

(7^{-}) 1689

(6^{-}) 1533

(5^{-}) 1395.0

$^{176}_{71}Lu_{105}$