Adopted Levels, Gammas

Type	Author	Citation	Literature Cutoff Date
	History		
Full Evaluation	C. M. Baglin[1], E. A. Mccutchan[2], S. Basunia[1]	NDS 153, 1 (2018)	1-Oct-2018

Q(β^-)=968.1 *8*; S(n)=6591.96 *17*; S(p)=6161.7 *11*; Q(α)=850.6 *11* 2017Wa10
S(2n)=14625.6 *15*; S(2p)=14313 *30* (2017Wa10).

^{170}Tm Levels

For neutron resonance parameters and thermal cross sections see 2006MuZX.
For nuclear band configurations see 1981De29 and 1996Ho12.

Cross Reference (XREF) Flags

A	^{169}Tm(n,γ) E=0-136 eV	F	^{170}Tm(d,d′)
B	^{169}Tm(n,γ) E=thermal: γ coin	G	^{170}Er(^{3}He,t)
C	^{169}Tm(n,γ) E=res	H	Coulomb excitation
D	^{169}Tm(n,γ) E=2, 24 keV	I	^{171}Yb(t,α)
E	^{169}Tm(d,p)		

E(level)†	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0[b]	1$^-$[c]	128.6 d *3*	AB DEF HI	%ε=0.131 *10*; %β^-=99.869 *10* μ=+0.2468 *12* Q=+0.74 *2* J$^\pi$: J=1 from atomic beam magnetic resonance (1976Fu06); L(d,p)=1. T$_{1/2}$: from 1968Re04. Others: 125 d *2* (1962Bo12), 134.2 d *8* (1965Fl02), 128 d *1* (1967Ke13), 127.1 d *9* (1969La34). %ε,%β^-: see ^{170}Tm ε decay. μ: weighted average of 0.2476 *16* (1990Sh18, β radiation detected optical pumping) and +0.2458 *17* (1988Dy02, atomic beam resonance fluorescence). Q: from resonance ionization mass spectroscopy (1988Al04, 1987Mi31). Others: 0.72 *5* (1988Dy02, atomic beam resonance fluorescence).
38.7139[b] *5*	2$^-$[c]	1.71 ns *17*	AB DEF HI	J$^\pi$: L(d,p)=1; g.s. band member. T$_{1/2}$: from B(E2)=3.2 *3* in Coulomb excitation (1968Fr01)..
114.5440[b] *6*	3$^-$[c]	0.60 ns *3*	AB EF HI	J$^\pi$: E2 γ to 1$^-$; L(d,p)=3; band assignment. T$_{1/2}$: from B(E2)=2.38 *10* in Coulomb excitation (1968Fr01) and adopted branching.
149.7180[d] *6*	0$^-$[e]		AB DE I	J$^\pi$: M1 149γ to 1$^-$; J=0 from $\sigma(\theta)$ and expected band structure in (t,α); band assignment.
183.1897[b] *14*	4$^-$[c]		A EF HI	J$^\pi$: L(d,p)=3; J=4 from $\sigma(\theta)$ and expected band structure in (t,α); band assignment.
183.197[x] *4*	(3)$^+$	4.12 μs *13*	AB	J$^\pi$: E1 69γ to 3$^-$; E1 144γ to 2$^-$; band assignment in (n,γ) E=0-136 eV. T$_{1/2}$: from γ(t) and pulsed beam technique in (n,γ), (d,pγ).
204.4486[h] *7*	2$^-$	<1 ns	AB DE I	XREF: I(194). J$^\pi$: M1 gammas to 1$^-$ and 3$^-$. T$_{1/2}$: from γ(t) measurement in (n,γ) E=0-136 eV.
219.7060[d] *6*	2$^-$[e]	0.25 ns *3*	AB DEF HI	J$^\pi$: 220γ to 1$^-$ and 105γ to 3$^-$ are M1+E2. T$_{1/2}$: from B(E2)=0.085 *10* in Coulomb excitation (1968Fr01) and adopted δ and branching.
237.2396[d] *6*	1$^-$[e]		AB DE I	J$^\pi$: M1 88γ to 0$^-$; band assignment.
247.147[x] *6*	(4)$^+$		A E	J$^\pi$: M1+E2 64γ to (3)$^+$; E1 γ to (4)$^-$; band assignment.
270.5466[h] *8*	(3)$^-$		AB E I	J$^\pi$: M1 231γ to (2)$^-$; M1+E2 156γ to (3)$^-$; J=3 from $\sigma(\theta)$ and expected

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Adopted Levels, Gammas (continued)

^{170}Tm Levels (continued)

E(level)[†]	Jπ	XREF	Comments
			band structure in (t,α).
319.3260[b] 12	5⁻[c]	A EF HI	Jπ: E2 205γ to (3)⁻ 115; J=5 from σ(θ) and expected band structure in (t,α).
327.1[x] 7	(5⁺)	E I	Jπ: band assignment in (d,p).
349.7330[d] 8	3⁻[e]	AB E I	Jπ: M1 235γ to 3⁻; M1(+E2) 311γ to (2)⁻; J=3 from σ(θ) and expected band structure in (t,α); 0⁻ band member.
355.047[z] 6	(4)⁺	A	Jπ: M1+E2 108γ to (4)⁺; M1(+E2) 172γ to (3)⁺; possible configuration=(π 1/2[411])+(ν 7/2[633]) bandhead from (n,γ) E=0-136 eV.
358.1163[h] 9	(4)⁻	A E	Jπ: M1+E2 γ's to (4)⁻ and (3)⁻; band assignment.
381.4258[d] 8	4⁻[e]	A EF I	Jπ: E2 γ to (2)⁻; M1+E2 γ to (4)⁻; σ(θ) and expected band structure in (t,α).
402.7281 19	(3,4)⁻	A	Jπ: M1+E2 γ to (3)⁻; not fed by primary in (n,γ) E=2, 24 keV.
409.4[b] 8	6⁻[c]	EF	Jπ: σ(θ) in (d,d′) and E(level) are consistent with expectations for J=6 member of g.s. band.
419.2 5		E I	
426.5[x] 3	(6⁺)	E	Jπ: band assignment in (d,p).
439.8[z] 4	(5⁺)	E	Jπ: band assignment in (d,p).
447.0707[k] 8	(3)⁻	AB E I	Jπ: M1(+E2) 242γ to (2)⁻; M1 89γ to (4)⁻.
456.8 8		E	
467.8607[h] 12	(5)⁻	A E	Jπ: E2 197γ to (3)⁻; band assignment.
476.9 5		E	
539.7223[k] 17	(4)⁻	A E	Jπ: M1+E2 γ to (3)⁻; band assignment.
544.050 8	(3⁺)	A E	XREF: E(545.05). Jπ: absence of state in (n,γ) E=2, 24 keV suggests J>2; Δπ=no 667γ from level for which (n,γ) E=2, 24 keV implies π=+. However, placement of M1+E2 544γ to 1⁻ is inconsistent with this.
550.7473[d] 17	5⁻[e]	A E I	Jπ: M1 193γ to (4)⁻; σ(θ) and expected band structure in (t,α); 0⁻ band member.
590.2286[f] 17	1⁻	AB D	Jπ: M1 441γ to 0⁻.
594.2 4		B	
598.8[h] 8	(6⁻)	E	Jπ: band assignment in (d,p).
603.9897[r] 14	1⁺	AB D i	Jπ: E1 454γ to 0⁻.
607.8862[r] 16	3⁺	A i	Jπ: E1 425γ to 2⁻; E1 569γ to 4⁻.
616.6[b] 4	7⁻[c]	EF I	Jπ: σ(θ) in (d,d′) and E(level) are consistent with expectations for J=7 member of g.s. band.
626.8 8		E	
637.9062[f] 21	2⁻	AB D	Jπ: M1+E2 523γ to 3⁻; M1(+E2) 401γ to 1⁻.
644 5	(4⁻)	F I	Jπ: σ(θ) and possible Kπ=4⁻, configuration=(π 7/2[404])+(ν 1/2[521]) bandhead assignment in (t,α). However, E is also consistent with that for 2⁻ member of configuration=(π 3/2[411])-(ν 1/2[521]) band.
648.7467[t] 14	1⁻	AB De	XREF: e(649.7). Jπ: M1 499γ to 0⁻; band assignment.
650.3735[r] 14	2⁺	A e	XREF: e(649.7). Jπ: E1 535γ to 3⁻; E1 650γ to 1⁻.
655.598[k] 20	(5⁻)	A E	Jπ: 541γ to 3⁻; band assignment.
661.8564[y] 12	1⁺	A D	Jπ: E1 512γ to 0⁻.
677.6 6		E	
683.569[v] 3	(0)⁻	A D	Jπ: M1 446γ to 1⁻; band assignment.
687[‡] 5		I	
693.2864[t] 13	2⁻	AB DE	Jπ: M1+E2 456γ to 1⁻; M1(+E2) 344γ to 3⁻.
703.6284[y] 13	2⁺	AB D	XREF: D(705.3). Jπ: E1 704γ to 1⁻; E1 589γ to 3⁻.
708.370[f] 4	3⁻[#]	AB i	XREF: i(716). Jπ: M1+E2 670γ to 2⁻; M1+E2 525γ 4⁻.

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Adopted Levels, Gammas (continued)

^{170}Tm Levels (continued)

E(level)[†]	Jπ	XREF	Comments
709.474 *4*	(1,2,3)$^{-}$[#]	A i	XREF: i(716). Jπ: M1+E2 505γ to (2)$^{-}$.
715.6207[g] *18*	(3)$^{-}$[#]	A i	XREF: i(716). Jπ: M1+E2 269γ to (3)$^{-}$; band assignment.
719.2627[s] *23*	1^{+}	A D f	XREF: f(726). Jπ: E1 570γ to 0^{-}.
733.8128[v] *21*	(2)$^{-}$	AB D f	XREF: f(726). Jπ: M1+E2 γ's to (1)$^{-}$ and (3)$^{-}$.
742.4[&] *9*	(≤2^{+})	D	Jπ: based on primary Iγ in (n,γ) E=2, 24 keV.
743.6 *23*	1^{-},2^{-},3^{-}	I	Jπ: L(t,α)=2. Assigned as J=2 member of configuration=(π 3/2[411])-(ν 1/2[521]) in (t,α) but, in (n,γ), the 637.9 level is so assigned. J=3 is favored based on absence of this level in (n,γ) E=2, 24 keV.
749.8482[t] *16*	3^{-}	A E	Jπ: M1 368γ to 4^{-}; M1+E2 711γ to 2^{-}.
756.215[g] *6*	(4)$^{-}$	A	Jπ: E1 573γ to (3)$^{+}$; possible band assignment in (n,γ) E=0-136 eV.
758.3294 *17*	(2)$^{+}$	A D	XREF: D(756.4). Jπ: M1 108γ to 2^{+}; possible Kπ=2^{+} configuration=(π 1/2[541])-(ν 5/2[512]) bandhead from (n,γ) E=0-136 eV.
760.4 *8*		B	
774[l] *4*	(3)$^{-}$[a]	I	
775.2299[i] *14*	(0)$^{+}$	A D	Jπ: E1 538γ to 1^{-}; band assignment (1996Ho12).
782.1520[v] *22*	(1)$^{-}$	AB D	Jπ: M1 99γ to (0)$^{-}$; band assignment.
790.1[k] *8*	(6^{-})	E	Jπ: band assignment.
801[f] *6*	(4^{-})	I	Jπ: band assignment in (t,α). However, J=3 favored in (t,α) based on σ(θ).
806.4274 *24*	(4)$^{-}$	A E	Jπ: E2 448γ to (4)$^{-}$; 602γ to 2^{-}; absence of level in (n,γ) E=2, 24 keV disfavors J=2; assignment by 1996Ho12 as configuration=(π 3/2[411])+(ν 5/2[512]) bandhead supports J=4.
818.5072[i] *15*	(2)$^{+}$	A d	Jπ: E1 581γ to 1^{-}; 469γ to 3^{-}; band assignment.
822.3935[s] *15*	2^{+}	AB d	XREF: B(821.3). Jπ: E1 585γ to 1^{-}; E1 473γ to 3^{-}; M1(+E2) 218γ to 1^{+}.
829[q] *7*	(5^{+})	I	Jπ: σ(θ) and possible assignment to configuration=(π 7/2[523])+(ν 1/2[521]) in (t,α).
832.6 *5*		B	
835.4[t] *9*	(4^{-})	E	Jπ: band assignment in (d,p).
839.131 *4*	(3)$^{-}$	A	Jπ: M1+E2 725γ to 3^{-}; M1+E2 619γ to 2^{-}; J≠2 based on absence of level in (n,γ) E=2, 24 keV.
841.3[&] *8*	(≤2^{+})	D	Jπ: based on primary Iγ in (n,γ) E=2, 24 keV.
850.2 *19*		B	
854.335[‡u] *4*	2^{-}	AB DEf I	Jπ: M1+E2 854γ to 1^{-}; M1+E2 740γ to 3^{-}.
860.484[i] *3*	1^{+}	AB f	Jπ: E1 711γ to 0^{-}.
862.7765[v] *21*	(3)$^{-}$	AB f	Jπ: M1 481γ to 4^{-}; band assignment.
863.364[p] *5*	(1)$^{-}$	AB DEf	Jπ: M1+E2 659γ to 2^{-}; band assignment.
867[m] *6*	(3^{-})	I	Jπ: σ(θ) and possible Kπ=3^{-} ((π 5/2[402])+(ν 1/2[521])) bandhead in (t,α). However, see comment on 868.0 level.
868.0 *8*		B	Jπ: fed by primary γ in (n,γ) E=thermal: γ coin, so Jπ≤2 or 3^{+}. Level differs from E=867 *6* level in (t,α) only if configuration suggested for latter level is correct. Jπ not adopted.
891[n] *4*	(5)$^{+}$[a]	I	E(level): also consistent with that expected for 3^{+} member of (π 1/2[541])-(ν 1/2[521]) band, but J=3 is inconsistent with L(t,α)=5.
908.448[p] *3*	(2^{-})	AB DE	Jπ: 704γ to 2^{-}; 638γ to (3)$^{-}$; band assignment.
921[f] *2*	(5^{-})	f I	Jπ: band assignment in (t,α). However, L(t,α)=2.
925.2722[u] *22*	(3)$^{-}$	A Ef	Jπ: M1+E2 887γ to 2^{-}; M1+E2 812γ to 3^{-}; possible γ to (5)$^{-}$; not excited in (n,γ) E=2, 24 keV.
948[q] *4*	(6)$^{+}$[a]	I	

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Adopted Levels, Gammas (continued)

^{170}Tm Levels (continued)

E(level)†	Jπ	XREF	Comments
955.8[k] *13*	(7⁻)	E	Jπ: band assignment in (t,α).
959.218 *8*	(3)⁻	A F i	Jπ: E2(+M1) 921γ to 2⁻; γ to (3)⁻; possible γ to 1⁻; 1⁻,2⁻ inconsistent with absence of state in (n,γ) E=2, 24 keV. J=2 suggested in (d,d′), based on a tentative γ vibrational band assignment in that reaction, but bandhead not established.
964.474 *7*	(3,4)⁻	A i	Jπ: M1+E2 781γ to (4)⁻; γ to (2)⁻. However, (2⁻) suggested In (d,d′).
964.8 *10*		B	
979.929[p] *4*	(3)⁻	AB E	XREF: E(977.4). Jπ: E2 622γ to (4)⁻; 709γ to (3)⁻; band assignment in (d,p).
984.981 *7*	(3,4,5)⁻	A	Jπ: E2(+M1) 714γ to (3)⁻; γ to (4)⁻; not fed by primary γ in (n,γ) E=2, 24 keV, so J>2.
1011[n] *1*	(6)+[a]	I	
1014.0[u] *10*	(4⁻)	E	Jπ: from band assignment in (d,p).
1017.5[&] *8*	(≤2⁺)	D	Jπ: based on primary Iγ in (n,γ) E=2, 24 keV.
1025.0 *10*		E	
1046.5 *9*		EF	XREF: F(1052). J 3⁻ suggested in (d,d′), based on a tentative γ vibrational band assignment in that reaction, but bandhead not established.
1057.3 *9*		B	Jπ: 788γ to (3)⁻; 873γ to (3)⁺. Jπ not adopted.
1061[f] *9*	(6⁻)	I	Jπ: band assignment in (t,α).
1064.4579 *14*	(1)⁺	A E	XREF: E(1066.8). Jπ: M1 289γ to (0)⁺.
1070.975 *6*	(2)⁻	A DE i	XREF: i(1081). Jπ: M1+E2 867γ to 2⁻; M1+E2 1071γ to 1⁻; J<3 from (n,γ) E=2, 24 keV; γ-rays to (3)⁺ and (3)⁻.
1072.7 *4*		B	
1078.8484 *15*	(1)⁺	A	Jπ: M1 304γ to (0)⁺; E1 1040 to 2⁻.
1087.8 *10*		B	
1091.583 *3*	(1,2)	A D f i	XREF: i(1081). Jπ: ≤2⁺ based on primary Iγ in (n,γ) E=2, 24 keV; E2 942γ to 0⁻. However, multipolarities of deexciting gammas are mutually inconsistent: M1+E2 231γ to 1⁺, but E2 1092γ to 1⁻ and E2 942γ to 0⁻.
1101.999 *4*	(2⁺)	AB D f I	Jπ: ≤2⁺ based on primary Iγ in (n,γ) E=2, 24 keV; gammas to 1⁻ and 1⁺ and 3⁻ and 3⁺.
1111.1 *4*		E	
1131.1[u] *8*	(5⁻)	E	Jπ: band assignment in (d,p).
1139.951 *4*	(2)⁻	AB DE	Jπ: M1+E2 790γ to 3⁻; M1+E2 231γ to (2)⁻; fed by primary γ from 0⁺ and/or 1⁺ resonances in (n,γ); Jπ<2⁻ from (n,γ) E=2, 24 keV. However, mult(782γ) to (4)⁻ may include an M1 component.
1141.9 *5*	(1,2,3)	B	Jπ: 1142γ to 1⁻; 1027γ to 3⁻.
1147.974 *4*	(1,2)⁻	AB DE	XREF: E(1149.2). Jπ: M1+E2 558γ to 1⁻; M1+E2 929γ to 2⁻.
1160.597 *3*	(1)⁻	A DE	Jπ: M1+E2 427γ to (2)⁻; M1 477γ to (0)⁻.
1168.779 *5*	(2)⁻	AB D	Jπ: ≤2⁻ from primary Iγ in (n,γ) E=2, 24 keV; (0⁻,2⁻) from absence of primary γ from 0⁺ resonances in (n,γ) to (0)⁻.
1178.910 *3*	(2)⁻	AB DE	XREF: E(1176.0). Jπ: M1+E2 961γ to 2⁻; 1179γ to 1⁻; 517γ to 1⁺; E2(+M1) 996γ to 4⁻ rules out J=1.
1182.3 *15*	(≤3)	B	Jπ: 944γ to 1⁻; 980γ to 2⁻.
1192.828 *10*	2⁻	AB DE I	Jπ: E2 1043γ to 0⁻.
1200.7 *15*	(≤2)	B	Jπ: 595γ to 1⁺; 611γ to 1⁻.
1210.679 *11*	(2⁺)	AB D	Jπ: ≤2⁺ from primary Iγ in (n,γ) E=2, 24 keV; M1+E2 667γ to (3⁺); 1201γ to 1⁻; 1095γ to 3⁻. However, 1⁻ favored based on primary γ feeding from a 0⁺ and a 1⁺ resonance in (n,γ).
1213.1[o] *8*	(3)−[a]	E I	
1219.8 *4*		E	
1224.0[&] *3*	(≤2⁻)	D	Jπ: based on primary Iγ in (n,γ) E=2, 24 keV.
1230[f] *5*	(7⁻)	I	Jπ: band assignment in (t,α).

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Adopted Levels, Gammas (continued)

^{170}Tm Levels (continued)

E(level)[†]	Jπ	XREF	Comments
1232.4 *4*	(≤3)	B	Jπ: 1194γ to 2⁻; 1233γ to 1⁻.
1238.144 *10*	(0,1,2)⁻	AB D	Jπ: M1+E2 1001γ to 1⁻; E2 1018γ to 2⁻. 1⁻ favored based on primary γ feeding intensities from 0⁺ and 1⁺ resonances in (n,γ); however, possible 694γ to (3⁺) does not favor 0⁻ or 1⁻.
1245.1 *4*		E	
1258.2 *4*		E	
1265.075 *12*	(0,1,2)⁻	AB D	Jπ: E2(+M1) 1045γ to 2⁻; J≤2 based on primary Iγ in (n,γ) E=2, 24 keV. Possible 1081γ to (3)⁺ and 996γ to (3)⁻ render 0⁻ and 1⁻ unlikely.
1269.2 *4*		E	
1279.5[&] *3*	(1⁻,2⁻)	B DE	XREF: E(1277.0). Jπ: ≤2⁻ based on primary Iγ in (n,γ) E=2, 24 keV. 1131γ to 0⁻ inconsistent with J=0.
1291[o] *6*	(4⁻)	I	Jπ: σ(θ) and possible band assignment in (t,α).
1295.3 *4*		E	
1299.107 *13*	(2)⁻	AB D	Jπ: 1062γ to 1⁻; 695γ to 1⁺; 941γ to (4)⁻; J≤2 based on primary Iγ in (n,γ) E=2, 24 keV.
1309.3 *17*	(≤2)	B	Jπ: 663γ to 1⁻; 705γ to 1⁺.
1315.9[&w] *13*	(1)⁻[a]	B D I	XREF: B(1317.0)D(1314.3). E(level): weighted average of 1314.3 *5* and 1317.0 *4* (unweighted average is 1315.7 *14*). Jπ: 1167γ to 0⁻; 867γ to (3)⁻.
1324.2[&] *3*	(≤2⁻)	DE	XREF: E(1326.0). Jπ: based on primary Iγ in (n,γ) E=2, 24 keV.
1334.9 *5*	(1⁻,2,3⁻)	B	Jπ: 1335γ to 1⁻; 1220γ to 3⁻.
1354.6[&] *2*	(1,2)⁻[a]	AB DE I	E(level): 1354.73 *7* if 1355γ is correctly placed in (n,γ) E=0-136 eV. Jπ: 1134γ to 2⁻; 1203γ to 0⁻.
1363.5 *5*	(1⁺,2⁻)	B E	XREF: B(1360.4). E(level): from (d,p); 1360 *3* from (n,γ) E=thermal: γ coin. Jπ: 1208γ to 0⁻; 1179γ to (3)⁺.
1375.1[&] *2*	(1⁻)[@]	AB D	XREF: A(1381). E(level): 1381 *3* in (n,γ) E=0-136 eV. Jπ: (≤2⁻) based on primary Iγ in (n,γ) E=2, 24 keV;. 1227γ to 0⁻ 150.
1382.2[j] *9*	(2)⁻[a]	B I	Jπ: band assignment in (t,α). If Jπ≤2⁻, level should have been seen in (n,γ) E=2, 24 keV; it was not. 1178γ to 2⁻ implies J≤(4).
1395.0[&] *2*	(2⁻)	B DE	XREF: E(1394.1). Jπ: (≤2⁻) based on primary Iγ in (n,γ) E=2, 24 keV; 1211γ to (3)⁺; 1394γ to 1⁻; 1281γ to 3⁻.
1413.1 *19*	(1⁻,2,3⁻)	B	Jπ: 1178γ to 1⁻; 1238γ to 3⁻.
1433.2[&] *3*	(1⁻)[@]	AB D	Additional information 1.
1437.2 *11*	(≤2)	B	Jπ: 1199γ to 1⁻; 835γ to 1⁺.
1442.0 *4*	(≤4)	B	Jπ: 1238γ to 2⁻.
1443.1[&] *4*	(1⁻)[@]	AB DE	Additional information 2.
1448[j] *1*	(3)⁻[a]	I	
1453.1[&] *6*	(≤2)	DE	Jπ: based on primary Iγ in (n,γ) E=2, 24 keV.
1460.5 *5*		E	
1466.3[&] *2*	(1⁻,2⁻)	B DE	XREF: B(1468.1). Jπ: (≤2⁻) based on primary Iγ in (n,γ) E=2, 24 keV; 1318γ to 0⁻; 1117γ to 3⁻; 867γ to 1⁺.
1472 *3*	(1⁻)[@]	A	E(level): possibly THE 1466.3 LEVEL, BUT ENERGY DOES NOT OVERLAP.
1478.0 *10*	(1,2⁻)	B	Jπ: 1328γ to 0⁻; 1259γ to 2⁻.
1481.3[&] *5*	(≤2)	DE	XREF: E(1483.6). Jπ: based on primary Iγ in (n,γ) E=2, 24 keV.
1491.4 *2*		E I	XREF: I(1488).
1501.1[&] *4*	(≤2⁻)	B DE	Jπ: based on primary Iγ in (n,γ) E=2, 24 keV.

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Adopted Levels, Gammas (continued)

^{170}Tm Levels (continued)

E(level)[†]	Jπ	XREF	Comments
1515.4[&] *3*	(0⁻,2⁻)	AB DE	E(level): 1517 *3* from (n,γ) E=0-136 eV. Jπ: 910γ to 1⁺; 1397γ to 3⁻; 929γ to 1⁻; (0⁻,2⁻) from (n,γ) E=res primary-transition intensities to level from various 1⁺ and/or 0⁺ resonances, assuming E1 primaries.
1518.1 *10*	(1⁻,2,3⁻)	B	Jπ: 1280γ to 1⁻; 1168γ to 3⁻.
1526.0[&] *13*	(≤2⁻)	D	Jπ: based on primary Iγ in (n,γ) E=2, 24 keV.
1532.1[&] *16*	(≤2⁻)	D	Jπ: based on primary Iγ in (n,γ) E=2, 24 keV.
1537.2[&] *9*	(1⁻)[@]	AB D	E(level): 1543 *5* in (n,γ) E=0-136 eV. Jπ: (≤2⁻) based on primary Iγ in (n,γ) E=2, 24 keV; 932γ to 1⁺; 1317γ to 2⁻.
1539[j] *13*	(4⁻)	I	Jπ: σ(θ) and possible band assignment in (t,α).
1549.1 *13*	(≤3)	B	Jπ: 1550γ to 1⁻; 1509γ to 2⁻.
1566 *8*		I	
1586.7 *25*	(1⁻,2,3⁻)	B I	Jπ: 1471γ to 3⁻; 998γ to 1⁻.
1590.3 *5*	(≤3)	B	Jπ: 1590γ to 1⁻; 1552γ to 2⁻.
1603.5 *14*	(≤3)	B	Jπ: 1013γ to 1⁻; 1563γ to 2⁻.
1609.3 *11*	(0⁻,1⁻,2⁻)[@]	AB	XREF: A(1612). Additional information 3.
1639.2 *5*	(1 to 4)	aB i	XREF: a(1644)i(1640). Additional information 4. Jπ: 1525γ to 3⁻; 1601γ to 2⁻.
1646.3 *11*	(2⁻,3⁺)	aB i	XREF: a(1644)i(1640). Jπ: 1043γ to 1⁺; 1001γ to (4⁻).
1658.7 *12*	(≤3)	B	Jπ: 1659γ to 1⁻; 1619γ to 2⁻.
1669.2 *4*	(≤2)	B i	Jπ: 1521γ to 0⁻; 1465γ to 2⁻.
1676 *3*	(1⁻)[@]	A i	Additional information 5.
1690 *8*		F i	Jπ: postulated in (d,d′) to be bandhead of a Kπ=3⁻ γ-vibrational band. Jπ not adopted.
1704.8 *4*	(≤3)	B i	Jπ: 1705γ to 1⁻; 1666γ to 2⁻.
1726.7 *15*	(1 to 4)	B	Jπ: 1279γ to (3)⁻; 1688γ to 2⁻.
1733.7 *4*	(≤3)	B	Jπ: 1734γ to 1⁻; 1695γ to 2⁻.
1747.7 *11*	(≤3)	B I	XREF: I(1742). Jπ: 1748γ to 1⁻; 1710γ to 2⁻.
1758.4 *4*	(≤3)	B	Jπ: 1758γ to 1⁻; 1720γ to 2⁻.
1768.7 *12*	(1 to 3)	B	Jπ: 1179γ to 1⁻; 1318γ to (3)⁻.
1793 *3*	(1⁻)[@]	A	
1818.1 *14*	(≤3)	B	Jπ: 1612γ to 2⁻; 1582γ to 1⁻.
1823.2 *6*	(1⁻,2⁻)[@]	AB I	XREF: I(1829). Additional information 6. Jπ: 1674γ to 0⁻ eliminates J=0.
1846 *3*	(1⁻)[@]	A i	XREF: i(1847). Additional information 7.
1855.0 *5*	(1 to 3)	B i	XREF: i(1847). Jπ: 1211γ to 1⁻; 1672γ to (3)⁺.
1859.3 *15*	(1⁻)[@]	AB	Jπ: 1708γ to 0⁻; 1413γ to (3)⁻.
1870.6 *8*	(≤2)	B I	Jπ: 1666γ to 2⁻; 1633γ to 1⁻; 1266γ to 1⁺.
1909.8 *5*	(≤3)	B	Jπ: 1910γ to 1⁻; 1871γ to 2⁻.
1921.3 *14*	(1⁻,2)	B	Jπ: 1806γ to 3⁻; 1315γ to 1⁺; 1271γ to 1⁻.
1932.7 *12*	(1⁻,2,3⁻)	B	Jπ: 1933γ to 1⁻; 1583γ to 3⁻.
1944 *3*	(0⁻,2⁻)[@]	A	
1951.0 *8*	(2,3⁻)	AB	XREF: A(1955). Jπ: 1951γ to 1⁻; 1679γ to (3)⁻; 1767γ to (3)⁺.
1979.0 *14*	(1⁻,2,3⁻)	B	Jπ: 1978γ to 1⁻; 1711γ to (3)⁻.
2013.4 *17*	(2,3⁻)	B	Jπ: 2012γ to 1⁻; 1830γ to (3)⁺; 1900γ to 3⁻.
2039.5 *13*	(≤3)	B	Jπ: 2041γ to 1⁻; 1819γ to 2⁻.
2072.8 *9*	(1⁻,2,3⁻)	B	Jπ: 2073γ to 1⁻; 1722γ to 3⁻.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{170}Tm Levels (continued)

E(level)†	Jπ	XREF	Comments
2084.1 *14*	(≤3)	B	Jπ: 2082γ to 1⁻.
2098.0 *12*	(1,2)	B	Jπ: 1950γ to 0⁻; 1748γ to 3⁻.
2101.0 *17*	(1⁻,2,3⁻)	B	Jπ: 2098γ to 1⁻; 1831γ to (3)⁻.
2116.3 *10*	(≤2)	B	Jπ: 1965γ to 0⁻; 1912γ to 2⁻.
2134.6 *15*	(2,3⁻)	B	Jπ: 1899γ to 1⁻; 2019γ to 3⁻; 1534γ to 3⁺.
2145.4 *8*	(≤3)	B	Jπ: 2145γ to 1⁻.
2161.1 *21*	(1⁻,2,3⁻)	B	Jπ: 2158γ to 1⁻; 1893γ to (3)⁻.
2168.1 *7*	(1⁻,2,3⁻)	B	Jπ: 2167γ to 1⁻; 1898γ to (3)⁻.
2192.0 *23*	(1⁺,2,3⁻)	B	Jπ: 2189γ to 1⁻; 1591γ to 3⁺.
2258.2 *20*	(0⁻,1,2⁻)	B	Jπ: 2111γ to 0⁻; 2039γ to 2⁻.
2264.9 *7*	(2⁻,3⁺)	B	Jπ: 1664γ to 1⁺; 1619γ to (4⁻).
2272.4 *5*	(≤3)	B	Jπ: 2068γ to 2⁻, 1669γ to 1⁺.
2281.5 *5*	(≤3)	B	Jπ: 2045γ to 1⁻.
2283.1 *11*	(1⁻,2)	B	Jπ: 1933γ to 3⁻; 2291γ to 1⁻; 1681γ to 1⁺.
2289.8 *12*	(≤3)	B	Jπ: 2289γ to 1⁻.
2307.4 *13*	(1⁻,2,3⁻)	B	Jπ: 2072γ to 1⁻; 1858γ to (3)⁻.
2340.8 *7*	(1⁻,2,3⁻)	B	Jπ: 2103γ to 1⁻; 1892γ to (3)⁻.
2347.1 *15*	(≤3)	B	Jπ: 1742γ to 1⁺.
2364.8 *13*	(2⁻,3,4⁻)	B	Jπ: 2327γ to 2⁻; 1719γ to (4⁻).
2388.2 *5*	(≤3)	B	Jπ: 2388γ to 1⁻.
2439.1 *19*	(1⁻,2⁻)	B	Jπ: 2289γ to 0⁻; 2089γ to 3⁻.
2458.3 *4*	(≤2)	B	Jπ: 2458γ to 1⁻; 1855γ to 1⁺.
2478.0 *7*	(≤2)	B	Jπ: 2478γ to 1⁻; 2294γ to (3)⁺.
2482.0 *5*	(≤3)	B	Jπ: 2482γ to 1⁻.
2528.5 *6*	(1 to 4)	B	Jπ: 2415γ to 3⁻; 2324γ to 2⁻.
2536.3 *20*	(1⁻,2,3⁻)	B	Jπ: 2534γ to 1⁻; 2065γ to (3)⁻.
2540.5 *6*	(1⁻,2,3⁻)	B	Jπ: 2541γ to 1⁻; 2270γ to (3)⁻.
2553.9 *20*	(≤3)	B	Jπ: 1965γ to 1⁻.
2573.2 *7*	(≤3)	B	Jπ: 2336γ to 1⁻.
2587.6 *9*	(≤3)	B	Jπ: 2587γ to 1⁻.
2592.3 *18*	(1⁻,2⁻)	B	Jπ: 2443γ to 0⁻; 2322γ to (3)⁻.
2598.9 *21*	(2⁻)	B	Jπ: 2597γ to 1⁻; 1955γ to (4⁻); 1996γ to 1⁺.
2606.8 *17*	(1⁻,2⁻)	B	Jπ: 2458γ to 0⁻; 2492γ to 3⁻.
2618.3 *13*	(2⁻,3⁻)	B	Jπ: 2617γ to 1⁻; 1972γ to (4⁻).
2625.7 *7*	(≤3)	B	Jπ: 2022γ to 1⁺.
2634.6 *16*	(1⁻,2)	B	Jπ: 2522γ to 3⁻; 2396γ to 1⁻; 2020γ to 1⁺.
2671.9 *7*	(1⁻,2,3⁻)	B	Jπ: 2028γ to 1⁻; 2401γ to (3)⁻.
2702.3 *19*	(≤3)	B	Jπ: 2480γ to 1⁻.
2721.3 *15*	(≤3)	B	Jπ: 2482γ to 1⁻.
2727.4 *5*		B	Jπ: 2613γ to 3⁻ so J=(1 to 5).
2767.9 *5*	(1⁺,2,3⁻)	B	Jπ: 2177γ to 1⁻; 2585γ to (3)⁺.
2778.6 *15*	(1⁻,2,3⁻)	B	Jπ: 2777γ to 1⁻; 2666γ to 3⁻.
2802.4 *5*	(≤3)	B	Jπ: 2803γ to 1⁻.
2807.8 *14*	(2⁻,3⁻)	B	Jπ: 2808γ to 1⁻; 2163γ to (4⁻).
2813.6 *15*	(1⁻,2⁻)	B	Jπ: 2542γ to (3)⁻; 2664γ to 0⁻.
2846.2 *5*	(≤3)	B	Jπ: 2846γ to 1⁻.
2867.0 *13*	(1⁻,2,3⁻)	B	Jπ: 2223γ to 1⁻; 2595γ to (3)⁻.
2874.5 *5*	(1⁻,2,3⁻)	B	Jπ: 2874γ to 1⁻; 2605γ to (3)⁻.
2881.0 *5*	(≤3)	B	Jπ: 2881γ to 1⁻.
2911.9 *21*	(≤3)	B	Jπ: 2914γ to 1⁻.
2925.4 *6*	(1⁻,2,3⁻)	B	Jπ: 2281γ to 1⁻; 2655γ to (3)⁻.
2952.7 *5*	(1⁻,2,3⁻)	B	Jπ: 2603γ to 3⁻; 2716γ to 1⁻.
2995.9 *6*	(1⁻,2,3⁻)	B	Jπ: 2996γ to 1⁻; 2646γ to 3⁻.
3030.8 *13*	(≤2)	B	Jπ: 2426γ to 1⁻; 2441γ to 1⁺.
3099.4 *9*	(≤2)	B	Jπ: 2456γ to 1⁺; 2649γ to 1⁻.
3206.9 *7*	(1 to 4)	B	Jπ: 3092γ to 3⁻; 3169γ to 2⁻.

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Adopted Levels, Gammas (continued)

^{170}Tm Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$	XREF	Comments
3215.9 *9*	(≤3)		B	Jπ: 2626γ to 1⁻.
3272.7 *6*	(≤3)		B	Jπ: 2682γ to 1⁻.
3470.8 *5*	(≤4)		B	Jπ: 3432γ to 2⁻.
3491.5 *11*	(≤3)		B	Jπ: 3253γ to 1⁻.
3557.3 *7*	(≤4)		B	Jπ: 3519γ to 2⁻.
3623.7 *6*			B	Jπ: 3419γ to 2⁻ and 3274γ to 3⁻ so Jπ=(1⁻,2,3,4⁻) Jπ not adopted.
3630.0 *6*	(≤3)		B	Jπ: 3393γ to 1⁻.
3760.5 *11*	(≤3)		B	Jπ: 3541γ to 1⁻.
3806.2 *6*	(≤3)		B	Jπ: 3806γ to 1⁻.
3864.1 *20*	(≤3)		B	Jπ: 3624γ to 1⁻.
6591.97	0⁺,1⁺		A	E(level): cf. S(n)=6591.96 *17* (2017Wa10). Jπ: L=0 neutron capture by Jπ=1/2⁺ target.
15492 *7*	0⁺	104 keV *8*	G	Jπ: IAS of ^{170}Er g.s.

[†] From least-squares fit to Eγ from (n,γ) E=0-136 eV whenever γ deexcitation of level has been observed in that reaction. For levels reported only in (n,γ) E=thermal: γ coin, authors′ E(level) values are adopted.

[‡] Configuration=(π 3/2[411])+(ν 1/2[521]) was suggested in (t,α) (1981De29).

[#] L(t,α)=2 for E=716 *4* level, with J=2 favored by σ(θ) and possible configuration=((π 5/2[402])-(ν 1/2[521])). However, if J≤2, level should have been populated in (n,γ) E=2, 24 keV and it was not, so J=3 seems more likely. 1996Ho12 suggest that this level is the J=3 member of the (π 3/2[411])-(ν 1/2[521]) band; however, its energy is a little high for that.

[@] Based on (n,γ) E=res primary-transition intensities to state from various 1⁺ and/or 0⁺ resonances for which E(n)≤136 eV, assuming mult=E1 for primary γ.

[&] From (n,γ) E=2, 24 keV.

[a] π from L transfer; J from L and/or σ(θ) in (t,α) and plausible band structure.

[b] Band(A): Kπ=1⁻ g.s. band. Configuration=(π 1/2[411])+(ν 1/2[521]). Rotational parameters: α=11.4 (for J odd), 10.3 (for J even).

[c] Definite Jπ assigned to members of g.s. band based on smooth progression of level energies and independently established Jπ(g.s.)=1⁻ and mult=M1+E2 for J=2 to 1 intraband 38γ.

[d] Band(B): Kπ=0⁻ band. Configuration=(π 1/2[411])-(ν 1/2[521]). Rotational parameters: α=11.67 (for J even), 11.25 (for J odd); Newby shift is +32 keV (1996Ho12).

[e] Definite Jπ assigned to members of 0⁻ band based on smooth progression of level energies and independently established Jπ(220)=2⁻ and mult=E2 for J=3 to 1 intraband 112γ.

[f] Band(C): Kπ=1⁻ band. Configuration=(π 3/2[411])-(ν 1/2[521]) plus (π 7/2[404])-(ν 5/2[512]). Rotational parameter: α=11.8 (for J odd).

[g] Band(D): Kπ=(3)⁻ band. Configuration=(π 1/2[541])-(ν 7/2[633]) from (n,γ); rotational parameter: α=5.1.

[h] Band(E): Kπ=2⁻ band. Configuration=(π 1/2[411])-(ν 5/2[512]). Rotational parameter: α=11.0. Band is anomalously populated in (t,α).

[i] Band(F): Kπ=(0)⁺ band. Configuration=(π 7/2[404])-(ν 7/2[633]). Rotational parameter: α=7.2 (J=even); +36 keV Newby shift.

[j] Band(G): Kπ=(2)⁻ band. Configuration=(π 5/2[413])-(ν 1/2[521]). Rotational parameter: α=11.0.

[k] Band(H): Kπ=(3)⁻ band. Configuration=(π 1/2[411])+(ν 5/2[512]). Band is anomalously populated in (t,α). Rotational parameter: α=11.58.

[l] Band(I): Kπ=(3)⁻ band. Configuration=(π 7/2[404])-(ν 1/2[521]).

[m] Band(J): Kπ=(3⁻) band. Configuration=(π 5/2[402])+(ν 1/2[521]) suggested in (t,α), but level′s excitation is stronger than expected for this configuration.

[n] Band(K): Kπ=(3)⁺ band. Configuration=(π 7/2[523])-(ν 1/2[521]). Rotational parameter: α=10.0.

[o] Band(L): Kπ=(3)⁻ band. Configuration=(π 5/2[413])+(ν 1/2[521]). Rotational parameter: α=9.75.

[p] Band(M): Kπ=(1)⁻ band. Configuration=(π 3/2[411])-(ν 5/2[512]) plus (π 1/2[411])+(ν 1/2[510]) plus ((π 1/2[411])-(ν 5/2[512])-γ vibration. Rotational parameter: α=11.3.

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Adopted Levels, Gammas (continued)

^{170}Tm Levels (continued)

[q] Band(N): $K^{\pi}=(4)^{+}$ band. Configuration=(π 7/2[523])+(ν 1/2[521]). Rotational parameter: α=9.9.
[r] Band(O): $K^{\pi}=1^{+}$ band. Configuration=(π 1/2[541])+(ν 1/2[521]). Coriolis-mixed band.
[s] Band(P): $K^{\pi}=(0)^{+}$ band. Configuration=(π 1/2[541])-(ν 1/2[521]). Coriolis-mixed band. −44 keV Newby shift.
[t] Band(Q): $K^{\pi}=1^{-}$ band. Configuration=(π 1/2[411])-(ν 3/2[521]) plus (π 7/2[404])-(ν 5/2[512]) plus (π 3/2[411])-(ν 1/2[521]). Rotational parameter: α=10.1 (for J=odd).
[u] Band(R): $K^{\pi}=2^{-}$ band. Configuration=(π 1/2[411])+(ν 3/2[521]) plus (π 3/2[411])+(ν 1/2[521]) plus ((π 1/2[411])+(ν 1/2[521])-γ vibration). Rotational parameter: α=11.4 (for J=even).
[v] Band(S): $K^{\pi}=(0)^{-}$ band. Configuration=(π 7/2[523])-(ν 7/2[633]). Rotational parameter: α=8.4 (even J), 8.2 (odd J); band exhibits Newby shift of +41 keV (1996Ho12).
[w] Band(T): $K^{\pi}=(1)^{-}$ band. γ-vibration built on $K^{\pi}=1^{-}$ g.s. band. Rotational parameter: α=10.1.
[x] Band(U): $K^{\pi}=(3)^{+}$ band. Configuration=(π 1/2[411])-(ν 7/2[633]). Rotational parameter: α=8.0.
[y] Band(b): $K^{\pi}=1^{+}$ band. Configuration=(π 7/2[523])-(ν 5/2[512]). Rotational parameter: α=10.4.
[z] Band(a): $K^{\pi}=(4)^{+}$ band. Configuration=(π 1/2[411])+(ν 7/2[633]). Rotational parameter: α=8.5.

Adopted Levels, Gammas (continued)

γ(^{170}Tm)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	δ[†]	α[#]	Comments
38.7139	2⁻	38.714 *1*	100	0.0	1⁻	E2+M1	1.43 *6*	132 *4*	B(M1)(W.u.)=0.00055 *7*; B(E2)(W.u.)=3.4×10^2 *4*
114.5440	3⁻	75.831 *1*	20.2 *17*	38.7139	2⁻	M1+E2	0.85 *4*	7.82 *13*	B(M1)(W.u.)=0.00214 *24*; B(E2)(W.u.)=123 *15*
		114.544 *1*	100.0 *4*	0.0	1⁻	E2		1.84	B(E2)(W.u.)=182 *8*
149.7180	0⁻	111.005 *1*	5.48 *25*	38.7139	2⁻	E2		2.07	
		149.718 *1*	100 *8*	0.0	1⁻	M1		0.983	
183.1897	4⁻	68.6491[&]	0.9[&] *4*	114.5440	3⁻	E2		13.73	
		144.480[&]	100[&] *12*	38.7139	2⁻	E2		0.795	E_γ: 144.480 *1* for doublet.
183.197	(3)⁺	68.6491[&] *4*	41.6[&] *20*	114.5440	3⁻	E1		0.890	B(E1)(W.u.)=3.6×10^{-8} *3*
		144.4797[&] *5*	100[&] *6*	38.7139	2⁻	E1		0.1260	B(E1)(W.u.)=0.93×10^{-8} *8* E_γ: 144.4797 *5* for doublet.
204.4486	2⁻	89.906 *3*	0.85 *9*	114.5440	3⁻	M1		4.21	
		165.735 *1*	43.6 *24*	38.7139	2⁻	M1(+E2)	≤0.7	0.70 *5*	
		204.448 *1*	100.0 *6*	0.0	1⁻	M1		0.412	
219.7060	2⁻	69.988 *1*	4.2 *6*	149.7180	0⁻	E2		12.67	B(E2)(W.u.)=240 *50*
		105.162 *1*	28.6 *3*	114.5440	3⁻	M1+E2	0.4 *3*	2.66 *5*	B(M1)(W.u.)=0.0045 *11*; B(E2)(W.u.)<70
		180.994 *1*	100 *9*	38.7139	2⁻	M1+E2	0.27 *3*	0.562 *9*	B(M1)(W.u.)=0.0033 *6*; B(E2)(W.u.)=3.4 *9*
		219.705 *1*	77.2 *6*	0.0	1⁻	M1+E2	1.18 *+17−14*	0.246 *7*	B(M1)(W.u.)=0.00065 *14*; B(E2)(W.u.)=9.1 *11*
237.2396	1⁻	17.554 *8*	0.294 *25*	219.7060	2⁻	(M1(+E2))	≤0.23	3.3×10^2 *25*	
		87.521 *1*	31.6 *7*	149.7180	0⁻	M1		4.55	
		198.524 *1*	13.9 *4*	38.7139	2⁻	M1		0.447	
		237.241 *1*	100.0 *20*	0.0	1⁻	M1		0.274	
247.147	(4)⁺	63.959[&] *4*	100[&] *13*	183.197	(3)⁺	M1+E2	0.65	13.38	
		63.960[&] *4*	15.3[&] *23*	183.1897	4⁻	E1		1.063	
270.5466	(3)⁻	66.098 *1*	99 *10*	204.4486	2⁻	M1(+E2)	0.305 *22*	10.71 *17*	
		87.5		183.1897	4⁻				
		156.003 *1*	29.6 *23*	114.5440	3⁻	M1+E2	0.32 *7*	0.850 *16*	
		231.834 *2*	100 *6*	38.7139	2⁻	M1		0.291	
319.3260	5⁻	204.782 *1*	100	114.5440	3⁻	E2		0.240	
349.7330	3⁻	112.494 *2*	1.64 *15*	237.2396	1⁻	E2		1.97	
		130.027 *1*	50.7 *15*	219.7060	2⁻	M1+E2	0.55 *9*	1.39 *3*	
		145		204.4486	2⁻				
		235.193 *2*	46.9 *12*	114.5440	3⁻	M1		0.280	
		311.018 *2*	100 *4*	38.7139	2⁻	M1(+E2)	0.28 *+14−28*	0.1298 *25*	
355.047	(4)⁺	107.901 *2*	14.1 *11*	247.147	(4)⁺	E2+M1	1.3 *+3−4*	2.37 *5*	
		171.855[&] *1*	21[&] *3*	183.1897	4⁻	E1		0.0798	
		171.855[&] *1*	100[&] *11*	183.197	(3)⁺	M1(+E2)	0.20	0.658	
358.1163	(4)⁻	87.571 *2*	100 *3*	270.5466	(3)⁻	M1+E2	0.27 *5*	4.58	
		153.667 *1*	46 *4*	204.4486	2⁻	E2		0.640	Mult.: E2 from α(K)exp in (n,γ) E=0-136 eV; possible M1 component implied by α(L1)exp would be inconsistent with placement.
		174.927 *2*	12.8 *14*	183.1897	4⁻	M1+E2		0.52 *12*	

Adopted Levels, Gammas (continued)

γ(^{170}Tm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	δ[†]	α[#]	Comments
358.1163	(4)$^-$	243.573 *3*	16.4 *23*	114.5440	3$^-$	M1+E2	0.9 *+4−3*	0.202 *22*	
381.4258	4$^-$	31.713 *9*	5.7 *4*	349.7330	3$^-$	(M1(+E2))	≤0.82	1.2×10^2 *10*	
		161.721 *1*	100 *5*	219.7060	2$^-$	E2		0.536	Mult.,δ: E2(+M1), δ≥2.2 from (n,γ) consistent with pure E2 as required by placement.
		198.237 *2*	31.1 *18*	183.1897	4$^-$	E2+M1	1.18 *+13−12*	0.340 *16*	
		266.881 *1*	57 *6*	114.5440	3$^-$	M1+E2	0.87 *+30−24*	0.157 *15*	
		342.711 *4*	46.5 *22*	38.7139	2$^-$	E2		0.0481	
402.7281	(3,4)$^-$	288.185 *2*	100 *8*	114.5440	3$^-$	M1+E2	0.60 *20*	0.140 *11*	
		364.012 *4*	14.7 *11*	38.7139	2$^-$				
447.0707	(3)$^-$	88.954 *1*	3.8 *8*	358.1163	(4)$^-$	M1		4.34	
		176.525 *1*	32.3 *10*	270.5466	(3)$^-$	M1+E2	0.60 *12*	0.560 *19*	
		242.623 *1*	100.0 *18*	204.4486	2$^-$	M1(+E2)	0.23 *+17−23*	0.251 *11*	
		263.877 *5*	1.76 *11*	183.1897	4$^-$				
		332.522 *5*	3.85 *11*	114.5440	3$^-$	M1(+E2)	≤0.55	0.103 *8*	
		408.348 *3*	15.71 *22*	38.7139	2$^-$	M1+E2	0.41 *+13−15*	0.059 *3*	
467.8607	(5)$^-$	109.744 *3*	75 *14*	358.1163	(4)$^-$				
		197.314 *1*	100 *11*	270.5466	(3)$^-$	E2		0.272	
539.7223	(4)$^-$	92.654 *3*	100 *7*	447.0707	(3)$^-$	M1+E2	0.22 *16*	3.87	
		269.173 *2*	86 *11*	270.5466	(3)$^-$	M1+E2	0.9 *+4−3*	0.152 *18*	
		335.274 *8*	16.4 *27*	204.4486	2$^-$				
544.050	(3$^+$)	505.344 *15*	100 *7*	38.7139	2$^-$				
		544.043 *11*	57 *3*	0.0	1$^-$				Mult.,δ: E2+M1 (δ=0.95 *+33−15*) from α(K)exp is inconsistent with this ΔJ=2 placement; either γ is complex or misplaced or mult is incorrect (1986Ho12).
550.7473	5$^-$	169.321 *2*	26 *4*	381.4258	4$^-$	M1+E2	0.4 *4*	0.66 *6*	
		192.633 *3*	19.0 *12*	358.1163	(4)$^-$	M1		0.486	
		231.418 *6*	11.9 *12*	319.3260	5$^-$				
		367.556 *4*	100 *5*	183.1897	4$^-$	M1(+E2)	0.28 *+17−28*	0.081 *5*	
590.2286	1$^-$	352.997 *9*	38.0 *25*	237.2396	1$^-$	M1+E2	0.59 *14*	0.081 *5*	
		370.530 *4*	7.3 *3*	219.7060	2$^-$	M1(+E2)	0.31 *+17−31*	0.079 *5*	I_γ: other: 18 *4* from (n,γ) E=thermal: γ coin.
		440.516 *5*	3.97 *25*	149.7180	0$^-$	M1		0.0525	I_γ: other: 21 *5* from (n,γ) E=thermal: γ coin.
		476.1 *4*	8.8 *25*	114.5440	3$^-$				E_γ,I_γ: from (n,γ) E=thermal: γ coin.
		551.514 *3*	80.4 *12*	38.7139	2$^-$	M1+E2	0.65 *11*	0.0246 *12*	
		590.226 *6*	100.0 *25*	0.0	1$^-$	M1(+E2)		0.018 *7*	I_γ: other: Iγ(552γ)=85 *5*:100 *6* in (n,γ) E=thermal: γ coin.
594.2		324.5[‡] *5*	100[‡] *25*	270.5466	(3)$^-$				
		444.3[‡] *4*	94[‡] *19*	149.7180	0$^-$				
		594.0[‡] *3*	69[‡] *13*	0.0	1$^-$				
603.9897	1$^+$	384.287 *5*	9.87 *14*	219.7060	2$^-$				
		454.276 *3*	14.6 *3*	149.7180	0$^-$	E1			
		565.268 *4*	100.0 *16*	38.7139	2$^-$	E1			
		603.978 *6*	75.4 *14*	0.0	1$^-$	E1			

$^{170}_{69}Tm_{101}$-11

Adopted Levels, Gammas (continued)

γ(^{170}Tm) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.†	δ†	α#	Comments
607.8862	3+	226.468 *4*	1.7 *3*	381.4258	4−				
		388.177 *2*	11.47 *14*	219.7060	2−				
		424.692 *6*	53.3 *11*	183.1897	4−	E1			
		493.344 *4*	6.9 *3*	114.5440	3−				
		569.177 *5*	100 *3*	38.7139	2−	E1			
637.9062	2−	400.668 *5*	10.9 *8*	237.2396	1−	M1(+E2)	0.40 *+23−40*	0.062 *6*	
		418.197 *3*	4.19 *15*	219.7060	2−	M1+E2	0.5 *3*	0.054 *7*	
		523.358 *4*	31.2 *7*	114.5440	3−	M1+E2	0.64 *12*	0.0283 *15*	
		599.206 *6*	9.4 *5*	38.7139	2−	M1+E2	0.81 *+15−14*	0.0187 *12*	
		637.899@ *4*	100.0@ *17*	0.0	1−				
648.7467	1−	378.203 *4*	1.00 *5*	270.5466	(3)−				
		411.506 *2*	100 *3*	237.2396	1−	M1+E2	0.47 *+12−13*	0.057 *3*	
		429.037 *3*	11.79 *10*	219.7060	2−	M1+E2	0.50 *+12−13*	0.050 *3*	
		499.040 *4*	14.93 *20*	149.7180	0−	M1		0.0380	Mult.: ce data in (n,γ) consistent with pure M1.
		532.6‡ *7*	3.4‡ *13*	114.5440	3−				
		610.032 *6*	7.3 *3*	38.7139	2−	M1(+E2)	≤0.45	0.0217 *11*	I_γ: other: 10.1 *13* from (n,γ) E=thermal: γ coin.
		648.731 *6*	16.1 *3*	0.0	1−	M1+E2	0.70 *+13−12*	0.0160 *9*	I_γ: other: 12.8 *13* from (n,γ).
650.3735	2+	300.642 *2*	2.7 *3*	349.7330	3−				
		413.131 *3*	5.93 *15*	237.2396	1−	(E1)			
		535.831 *3*	79.9 *14*	114.5440	3−	E1			
		611.659 *5*	39.5 *13*	38.7139	2−				
		650.366 *4*	100.0 *10*	0.0	1−	E1			
655.598	(5−)	541.053 *20*	100	114.5440	3−				
661.8564	1+	442.148 *2*	32.0 *5*	219.7060	2−	E1			
		457.410& *2*	29.5& *25*	204.4486	2−	E1			
		512.133 *3*	100.0 *25*	149.7180	0−	E1			
		623.144 *5*	14.6 *4*	38.7139	2−	(E1)			
683.569	(0)−	446.333 *9*	100	237.2396	1−	M1		0.0507	Mult.: ce data in (n,γ) consistent with pure M1.
693.2864	2−	343.553 *2*	17.6 *8*	349.7330	3−	M1(+E2)	0.29 *+14−29*	0.097 *5*	
		456.045 *2*	100.0 *10*	237.2396	1−	M1+E2	0.38 *+13−16*	0.0447 *22*	
		473.605 *8*	26.0 *19*	219.7060	2−	M1+E2	0.53 *+22−24*	0.038 *4*	
		489		204.4486	2−				
		510.8‡ *4*	80‡ *18*	183.1897	4−				
		693.287 *5*	40 *3*	0.0	1−	M1+E2	1.06 *+19−16*	0.0119 *8*	I_γ: other: 17.5 *25* from (n,γ) E=thermal: γ coin.
703.6284	2+	41.775 *9*	3.2 *3*	661.8564	1+	(M1(+E2))	<1.1	$4.\times10^{1}$ *4*	
		99.639 *2*	7.0 *5*	603.9897	1+	M1+E2	0.68 *13*	3.13	
		433.082 *3*	8.56 *23*	270.5466	(3)−	(E1)			
		466.393 *4*	4.5 *3*	237.2396	1−				
		483.926 *4*	6.31 *11*	219.7060	2−				
		499		204.4486	2−				
		589.085 *7*	62.2 *10*	114.5440	3−	E1			I_γ: other: 100 *23* from (n,γ) E=thermal: γ coin.
		664.897 *5*	31.6 *6*	38.7139	2−	(E1)			

$^{170}_{69}Tm_{101}$-12

Adopted Levels, Gammas (continued)

γ(^{170}Tm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	δ[†]	α[#]	Comments
703.6284	2^+	703.626 *6*	100 *3*	0.0	1^-	E1			I_γ: other: 15 *8* from (n,γ) E=thermal: γ coin.
708.370	3^-	525.180 *5*	19.1 *3*	183.1897	4^-	M1+E2	0.88 *+21−18*	0.0254 *20*	
		593.93 *7*	3.6 *3*	114.5440	3^-				
		669.654 *5*	100.0 *9*	38.7139	2^-	M1+E2	1.03 *+13−12*	0.0131 *7*	
		709.8[‡] *7*	20[‡] *10*	0.0	1^-				
709.474	$(1,2,3)^-$	505.010 *10*	100 *3*	204.4486	2^-	M1+E2	0.59 *11*	0.0316 *15*	
		670.760[a] *9*	19 *10*	38.7139	2^-				E_γ: assignment to ^{170}Tm is not certain.
715.6207	$(3)^-$	175.894 *4*	4.2 *3*	539.7223	$(4)^-$	E2(+M1)	≥1.9	0.43 *3*	
		268.551 *2*	39 *5*	447.0707	$(3)^-$	M1+E2	0.86 *+30−24*	0.155 *15*	
		365.887 *6*	3.1 *6*	349.7330	3^-				
		468.473 *5*	20.0 *8*	247.147	$(4)^+$				
		532.421 *4*	100 *3*	183.197	$(3)^+$	E1			
719.2627	1^+	499.559 *4*	42.1 *7*	219.7060	2^-	E1			
		569.549 *8*	27.2 *7*	149.7180	0^-	E1			
		680.543 *4*	37.4 *10*	38.7139	2^-	E1			
		719.262 *5*	100.0 *25*	0.0	1^-	E1			
733.8128	$(2)^-$	384.079 *3*	100 *8*	349.7330	3^-	M1+E2	0.62 *17*	0.064 *5*	
		496.572 *3*	45.6 *8*	237.2396	1^-	M1+E2	0.34 *+14−19*	0.0363 *19*	I_γ: other: 27 *4* from (n,γ) E=thermal: γ coin.
		733.79 *3*	2.56 *13*	0.0	1^-				
749.8482	3^-	368.424 *2*	14.2 *5*	381.4258	4^-	M1		0.0838	
		400.113 *2*	100 *4*	349.7330	3^-	M1+E2	0.54 *12*	0.059 *3*	
		512.620 *24*	10.2 *7*	237.2396	1^-				
		711.127 *7*	57 *3*	38.7139	2^-	M1+E2	1.07 *+33−24*	0.0111 *11*	
756.215	$(4)^-$	573.017 *4*	100	183.197	$(3)^+$	E1			
758.3294	$(2)^+$	107.957 *1*	100 *5*	650.3735	2^+	M1		2.49	
		409		349.7330	3^-				E_γ: see comment on 410γ from 760 level.
		487.773 *7*	24.1 *17*	270.5466	$(3)^-$				
		538.622 *7*	54.3 *26*	219.7060	2^-				
		554		204.4486	2^-				
		575.115 *17*	22.4 *9*	183.197	$(3)^+$				
760.4		410.3[‡] *6*	≤120	349.7330	3^-				E_γ,I_γ: possibly includes the 409γ from γγ coin in (n,γ) E=0-136 eV which deexcites the adopted 758.3 level; the 758.3 and 760.4 levels would not have been resolved in (n,γ) E=thermal: γ coin.
		609.8[‡] *8*	100[‡] *33*	149.7180	0^-				
		646.8[‡] *6*	83[‡] *33*	114.5440	3^-				
775.2299	$(0)^+$	185.006 *3*	1.84 *23*	590.2286	1^-				
		537.992 *3*	100.0 *16*	237.2396	1^-	E1			
782.1520	$(1)^-$	98.583 *2*	7.7 *9*	683.569	$(0)^-$	M1		3.23	Mult.: ce data in (n,γ) consistent with pure M1.
		562.444 *3*	100.0 *19*	219.7060	2^-	M1+E2	0.55 *12*	0.0244 *13*	I_γ: other: 33 *11* from (n,γ) E=thermal: γ coin.
		632.430 *4*	91.3 *17*	149.7180	0^-				Mult.,δ: M1+E2, δ=0.55 *12* from α(K)exp in (n,γ); inconsistent with transition to J=0.

Adopted Levels, Gammas (continued)

γ(^{170}Tm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	δ[†]	α[#]	Comments
806.4274	(4)$^-$	359.359 *3*	39.3 *24*	447.0707	(3)$^-$				
		448.308 *5*	48.8 *12*	358.1163	(4)$^-$	E2		0.0228	
		601.974 *5*	100.0 *24*	204.4486	2$^-$				
818.5072	(2)$^+$	214.517 *4*	2.50 *21*	603.9897	1$^+$	M1+E2	0.5 *+3−4*	0.329 *25*	
		468.777 *4*	32.3 *10*	349.7330	3$^-$				
		581.268 *5*	41.5 *11*	237.2396	1$^-$	E1			
		703.975[@] *12*	100[@] *3*	114.5440	3$^-$				
		779.775 *16*	6.5 *4*	38.7139	2$^-$				
		818.502 *9*	32.8 *4*	0.0	1$^-$	(E1)			
822.3935	2$^+$	218.409 *4*	2.3 *3*	603.9897	1$^+$	M1(+E2)	0.2 *+6−3*	0.34 *6*	
		472.663 *3*	59.4 *14*	349.7330	3$^-$	E1			
		552		270.5466	(3)$^-$				
		585.152 *4*	100.0 *23*	237.2396	1$^-$	E1			
		707.849 *5*	66.0 *7*	114.5440	3$^-$	(E1)			
832.6		595.2[‡] *5*	50[‡] *17*	237.2396	1$^-$				
		649.9[‡] *7*	100[‡] *33*	183.197	(3)$^+$				
839.131	(3)$^-$	619.423 *5*	23.0 *6*	219.7060	2$^-$	M1+E2	0.47 *+12−13*	0.0197 *10*	
		634.661 *18*	4.74 *22*	204.4486	2$^-$				
		724.588 *5*	100.0 *20*	114.5440	3$^-$	M1+E2	0.89 *+14−13*	0.0113 *6*	
		800.406[@] *18*	<11.0[@]	38.7139	2$^-$				
850.2		613.4[‡] *5*	55[‡] *9*	237.2396	1$^-$				
		632.5[‡] *5*	100[‡] *27*	219.7060	2$^-$				
		643.9[‡] *7*	36[‡] *18*	204.4486	2$^-$				
		663.8[‡] *7*	100[‡] *36*	183.197	(3)$^+$				
		702.4[‡] *5*	91[‡] *27*	149.7180	0$^-$				
		734.8[‡] *6*	64[‡] *18*	114.5440	3$^-$				
854.335	2$^-$	144.861 *1*	1.89 *21*	709.474	(1,2,3)$^-$	E2+M1	1.6 *5*	0.87 *6*	
		617		237.2396	1$^-$				
		635		219.7060	2$^-$				
		650		204.4486	2$^-$				
		739.800 *7*	11.63 *21*	114.5440	3$^-$	M1+E2	1.24 *+18−15*		I_γ: other: 41 *4* from (n,γ) E=thermal: γ coin.
		815.621 *7*	57.5 *4*	38.7139	2$^-$	M1+E2	1.12 *+15−13*		I_γ: other: 74 *4* from (n,γ) E=thermal: γ coin.
		854.336 *6*	100.0 *16*	0.0	1$^-$	M1+E2	0.98 *+18−15*		
860.484	1$^+$	640.774 *5*	100.0 *19*	219.7060	2$^-$	E1			
		710.772 *6*	98.7 *20*	149.7180	0$^-$	E1			
		745		114.5440	3$^-$				
862.7765	(3)$^-$	415.703 *3*	9.79 *26*	447.0707	(3)$^-$				
		481.349 *3*	28.8 *8*	381.4258	4$^-$	M1		0.0417	
		658		204.4486	2$^-$				
		679.584 *6*	31.0 *5*	183.197	(3)$^+$				
		748.240 *14*	20.4 *5*	114.5440	3$^-$				

Adopted Levels, Gammas (continued)

γ(^{170}Tm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	δ[†]	α[#]	Comments
862.7765	(3)$^-$	824.067 *7*	100.0 *16*	38.7139	2$^-$				Mult.: E1 from α(K)exp in (n,γ) E=0-136 eV; M1 required by placement.
863.364	(1)$^-$	416.301 *8*	0.80 *7*	447.0707	(3)$^-$				
		626		237.2396	1$^-$				
		644		219.7060	2$^-$				
		658.91 *4*	100 *3*	204.4486	2$^-$	M1+E2	0.69 *13*	0.0155 *9*	
868.0		647.5[‡] *7*	100[‡] *40*	219.7060	2$^-$				
		868.8[‡] *7*	40[‡] *20*	0.0	1$^-$				
908.448	(2$^-$)	637.899[@] *4*	100.0[@] *17*	270.5466	(3)$^-$				
		703.975[@] *12*	70.6[@] *22*	204.4486	2$^-$				I_γ: other: 21 *9* from (n,γ) E=thermal: γ coin.
		724.4[‡] *8*	33[‡] *12*	183.197	(3)$^+$				
		792		114.5440	3$^-$				
		867.3[‡] *5*	9[‡] *3*	38.7139	2$^-$				
925.2722	(3)$^-$	457.410[&] *2*	6[&] *5*	467.8607	(5)$^-$				Mult.: E1 for doublet.
		576		349.7330	3$^-$				
		720.803 *12*	100.0 *8*	204.4486	2$^-$				Mult.: E1 from (n,γ) E=0-136 eV; inconsistent with placement.
		810.730 *8*	39.1 *6*	114.5440	3$^-$	M1+E2	1.27 *+18–15*		
		886.583 *12*	38.4 *8*	38.7139	2$^-$	M1+E2	1.03 *+18–15*		
959.218	(3)$^-$	844.682 *12*	48.4 *9*	114.5440	3$^-$				
		920.53 *3*	30.3 *12*	38.7139	2$^-$	E2(+M1)	≥1.2		
		959.202 *11*	100.0 *15*	0.0	1$^-$	E2			
964.474	(3,4)$^-$	517.428 *16*	15.4 *14*	447.0707	(3)$^-$	E2(+M1)	≥1.5	0.019 *3*	
		561.753 *13*	18.9 *21*	402.7281	(3,4)$^-$				
		606.346 *10*	41 *3*	358.1163	(4)$^-$	M1+E2	0.76 *+27–23*	0.0185 *19*	
		744.747 *15*	78 *6*	219.7060	2$^-$				
		760.05 *3*	24.4 *14*	204.4486	2$^-$				
		781.299 *25*	100.0 *14*	183.1897	4$^-$	E2+M1	1.7 *+7–4*		
964.8		694.5[‡] *6*	55[‡] *18*	270.5466	(3)$^-$				
		814.3[‡] *4*	100[‡] *27*	149.7180	0$^-$				
979.929	(3)$^-$	532.860 *4*	100 *4*	447.0707	(3)$^-$				
		621.805 *8*	99 *5*	358.1163	(4)$^-$	E2		0.01002	
		709.377 *14*	86.2 *21*	270.5466	(3)$^-$				
		864.0[‡] *7*	63[‡] *25*	114.5440	3$^-$				
984.981	(3,4,5)$^-$	582.258 *11*	57 *15*	402.7281	(3,4)$^-$				
		626.857 *9*	73.1 *15*	358.1163	(4)$^-$				
		714.438 *13*	100 *6*	270.5466	(3)$^-$	E2(+M1)		0.011 *4*	
1057.3		788.0[‡] *6*	21[‡] *7*	270.5466	(3)$^-$				
		873.3[‡] *3*	100[‡] *17*	183.197	(3)$^+$				
1064.4579	(1)$^+$	203.970 *4*	45 *3*	860.484	1$^+$				

Adopted Levels, Gammas (continued)

γ(^{170}Tm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	δ[†]	α[#]	Comments
1064.4579	(1)$^+$	242.064 *3*	73 *11*	822.3935	2$^+$	M1+E2	0.7 *+4−3*	0.22 *3*	
		245.947 *3*	72 *9*	818.5072	(2)$^+$	M1(+E2)	≤0.8	0.225 *23*	
		289.229 *1*	47 *4*	775.2299	(0)$^+$	M1		0.1599	Mult.: M1(+E2) (δ≤0.6) from α(K)exp; level scheme requires ΔJ=1.
		345.192 *9*	30.3 *5*	719.2627	1$^+$				
		360.825 *3*	81.3 *13*	703.6284	2$^+$				
		371.171 *3*	32.0 *5*	693.2864	2$^-$				
		460.464 *3*	100 *3*	603.9897	1$^+$	E2+M1	1.2 *+12−5*	0.032 *7*	
		914.75 *6*	48 *11*	149.7180	0$^-$				
1070.975	(2)$^-$	422.224 *10*	2.66 *20*	648.7467	1$^-$				
		526.89 *3*	3.48 *20*	544.050	(3$^+$)				
		800.406[@] *18*	<20.5[@]	270.5466	(3)$^-$				
		866.531 *9*	100.0 *16*	204.4486	2$^-$	E2+M1	1.41 *+27−21*		
		1070.971 *16*	47.1 *14*	0.0	1$^-$	E2+M1	2.0 *+19−6*		
1072.7		835.7[‡] *2*	85[‡] *12*	237.2396	1$^-$				
		854.0[‡] *3*	50[‡] *8*	219.7060	2$^-$				
		868.2[‡] *1*	100[‡] *12*	204.4486	2$^-$				E_γ: possibly deexcites the known 1070.98 level.
		958.3[‡] *8*	19[‡] *8*	114.5440	3$^-$				
1078.8484	(1)$^+$	256.455 *1*	22 *3*	822.3935	2$^+$	M1+E2	1.0 *+4−3*	0.169 *19*	
		260.341 *1*	18.7 *22*	818.5072	(2)$^+$	M1+E2	0.5 *3*	0.192 *20*	
		303.617 *2*	30 *3*	775.2299	(0)$^+$	M1		0.1403	Mult.: M1(+E2) (δ≤0.7) from α(K)exp; level scheme requires ΔJ=1.
		1040.142 *19*	100.0 *24*	38.7139	2$^-$	E1			
1087.8		851.8[‡] *8*	100[‡] *50*	237.2396	1$^-$				
		867.3[‡] *6*	83[‡] *17*	219.7060	2$^-$				
1091.583	(1,2)	231.099 *1*	32 *3*	860.484	1$^+$	M1+E2	1.07 *+29−22*	0.223 *16*	
		941.85 *5*	47 *5*	149.7180	0$^-$	E2			Mult.: E2(+M1) from α(K)exp, but level scheme requires ΔJ=2.
		1091.51 *3*	100.0 *24*	0.0	1$^-$	E2			
1101.999	(2$^+$)	382.737 *3*	5.9 *11*	719.2627	1$^+$				
		494.124 *22*	2.96 *27*	607.8862	3$^+$				
		655[‡] *3*	67[‡] *83*	447.0707	(3)$^-$				
		867.2[‡] *5*	67[‡] *17*	237.2396	1$^-$				
		987.443 *11*	100.0 *16*	114.5440	3$^-$				
		1101.95 *4*	41.7 *16*	0.0	1$^-$				E_γ: other: 1103.3 *6* from (n,γ). I_γ: other: 33 *17* from (n,γ) E=thermal: γ coin.
1139.951	(2)$^-$	231.499 *4*	10.9 *16*	908.448	(2$^-$)	E2+M1	1.3 *+10−5*	0.21 *4*	
		276.592 *5*	3.7 *5*	863.364	(1)$^-$				
		491.206 *9*	8.9 *5*	648.7467	1$^-$				
		781.83 *3*	35.4 *21*	358.1163	(4)$^-$	(E2)			Mult.,δ: M1+E2 with δ=0.9 *+9−4* from α(K)exp; M1 component inconsistent with ΔJ=2 placement.

$^{170}_{69}Tm_{101}$-16

Adopted Levels, Gammas (continued)

γ(^{170}Tm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	δ[†]	α[#]	Comments
1139.951	(2)$^-$	790.200 *15*	100.0 *16*	349.7330	3$^-$	M1+E2	1.17 *+27−20*		I_γ: other: 48 *12* in (n,γ) E=thermal: γ coin.
		869.417 *14*	96 *3*	270.5466	(3)$^-$	(E2)			Mult.: E1,E2 from α(K)exp in (n,γ); level scheme requires Δπ=no.
		902.5[‡] *3*	27[‡] *7*	237.2396	1$^-$				
1141.9	(1,2,3)	1027.1[‡] *4*	100[‡] *18*	114.5440	3$^-$				
		1142.1[‡] *7*	18[‡] *9*	0.0	1$^-$				
1147.974	(1,2)$^-$	454.684 *6*	5.43 *19*	693.2864	2$^-$	M1		0.0483	
		464.36 *5*	1.50 *19*	683.569	(0)$^-$				
		557.749 *5*	17.04 *19*	590.2286	1$^-$	M1+E2	1.46 *+19−16*	0.0180 *9*	
		876.9 *8*		270.5466	(3)$^-$				
		928.270 *18*	100.0 *15*	219.7060	2$^-$	M1+E2	1.26 *+18−15*		
		943.514 *14*	58.4 *9*	204.4486	2$^-$	E2			
		998.248 *14*	47.8 *7*	149.7180	0$^-$				
1160.597	(1)$^-$	252.149 *5*	3.36 *22*	908.448	(2$^-$)	M1		0.232	
		297.222 *11*	1.79 *22*	863.364	(1)$^-$				
		426.782 *4*	33.0 *4*	733.8128	(2)$^-$	M1+E2	0.33 *+14−20*	0.054 *3*	
		467.317 *7*	3.6 *7*	693.2864	2$^-$				
		477.030 *7*	17.3 *13*	683.569	(0)$^-$	M1		0.0427	Mult.: M1(+E2) from α(K)exp in (n,γ); γ feeds J=(0) level so level scheme requires ΔJ=1.
		713.505 *23*	10.8 *7*	447.0707	(3)$^-$				
		890.02 *3*	29.6 *9*	270.5466	(3)$^-$				
		956.144 *12*	100.0 *22*	204.4486	2$^-$	(E2)			Mult.: E1,E2 from α(K)exp in (n,γ); level scheme requires Δπ=no.
1168.779	(2)$^-$	485.210 *4*	96 *4*	683.569	(0)$^-$	(E2)		0.0185	Mult=M1+E2, δ=0.50 *+14−15* from α(K)exp; however, level scheme requires ΔJ=2.
		931.2[‡] *1*	172[‡] *21*	237.2396	1$^-$				
		964.329 *18*	100 *3*	204.4486	2$^-$				
1178.910	(2)$^-$	396.739 *8*	1.35 *11*	782.1520	(1)$^-$				
		463.286 *5*	2.70 *11*	715.6207	(3)$^-$				
		517.059 *4*	12.6 *4*	661.8564	1$^+$				
		908.5[‡] *10*	22[‡] *10*	270.5466	(3)$^-$				
		939.9[‡] *6*	8.2[‡] *20*	237.2396	1$^-$				
		960.567 *24*	13.9 *4*	219.7060	2$^-$	M1+E2	1.0 *+4−3*		
		975.1[‡] *7*	10[‡] *4*	204.4486	2$^-$				
		995.71 *6*	11.3 *11*	183.1897	4$^-$	(E2)			Mult.,δ: E2+M1, δ=1.6 *+77−7* from α(K)exp; M1 component inconsistent with other branching information for 1179 level.
		1064.3[‡] *3*	27[‡] *6*	114.5440	3$^-$				
		1140.191 *15*	53.0 *16*	38.7139	2$^-$				I_γ: other: 67 *6* from (n,γ) E=thermal: γ coin.
		1178.887 *25*	100 *3*	0.0	1$^-$				
1182.3	(≤3)	944.4[‡] *6*	100[‡] *20*	237.2396	1$^-$				

$^{170}_{69}Tm_{101}$-17

Adopted Levels, Gammas (continued)

γ(^{170}Tm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	δ[†]	α[#]	Comments
1182.3	(≤3)	979.9[‡] *9*	60[‡] *20*	204.4486	2⁻				
1192.828	2⁻	588.8[‡a] *5*	53[‡] *13*	603.9897	1⁺				E_γ: should have been seen in (n,γ) E=0-136 eV, but was not.
		602.598 *14*	11.9 *11*	590.2286	1⁻				
		955.1[‡a] *6*	20[‡] *7*	237.2396	1⁻				E_γ: should have been seen in (n,γ) E=0-136 eV, but was not.
		973.087 *19*	56.1 *18*	219.7060	2⁻	E2+M1	1.6 *+9−4*		
		1043.144 *22*	100 *3*	149.7180	0⁻	E2			
		1154.19 *6*	48 *3*	38.7139	2⁻				
		1193.2[‡] *6*	13[‡] *7*	0.0	1⁻				
1200.7	(≤2)	594.8[‡] *8*	56[‡] *22*	603.9897	1⁺				
		610.6[‡] *5*	100[‡] *33*	590.2286	1⁻				
1210.679	(2⁺)	618.1[‡] *7*	44[‡] *19*	594.2					
		666.627 *11*	10.7 *4*	544.050	(3⁺)	M1+E2	1.3 *+6−4*	0.0121 *18*	
		1095.4[‡] *6*	38[‡] *13*	114.5440	3⁻				
		1171.93 *3*	35.1 *14*	38.7139	2⁻				I_γ: other: 56 *13* from (n,γ) E=thermal: γ coin.
		1210.687 *19*	100.0 *16*	0.0	1⁻				
1232.4	(≤3)	1193.5[‡] *4*	100[‡] *20*	38.7139	2⁻				
		1232.5[‡] *5*	60[‡] *20*	0.0	1⁻				
1238.144	(0,1,2)⁻	504.325 *24*	9.4 *3*	733.8128	(2)⁻				
		694.100[a] *21*	30 *23*	544.050	(3⁺)				
		1000.891 *14*	100.0 *23*	237.2396	1⁻	M1+E2	0.98 *+25−20*		
		1018.49 *3*	70 *3*	219.7060	2⁻	E2			I_γ: other: 93 *14* from (n,γ) E=thermal: γ coin.
		1238.05 *9*	36 *6*	0.0	1⁻				
1265.075	(0,1,2)⁻	659.0[‡] *4*	45[‡] *10*	603.9897	1⁺				
		996.3[‡] *6*	100[‡] *35*	270.5466	(3)⁻				
		1027.820 *13*	100 *3*	237.2396	1⁻				
		1045.44 *3*	29.2 *11*	219.7060	2⁻	E2+M1	1.7 *+29−6*		
		1062.3[‡] *2*	90[‡] *10*	204.4486	2⁻				
		1081.0[‡] *4*	65[‡] *15*	183.197	(3)⁺				
		1226.30 *6*	50.1 *17*	38.7139	2⁻				E_γ: other: 1228.0 *3* from (n,γ) E=thermal: γ coin. I_γ: other: 30 *5* from (n,γ) E=thermal: γ coin.
		1265.13 *10*	36 *5*	0.0	1⁻				E_γ: other: 1266.2 *1* from (n,γ) E=thermal: γ coin.
1279.5	(1⁻,2⁻)	1061.7[‡] *5*	83[‡] *17*	219.7060	2⁻				
		1130.5[‡] *7*	100[‡] *33*	149.7180	0⁻				
1299.107	(2)⁻	438.62 *4*	2.5 *3*	860.484	1⁺				
		650.5 *7*		648.7467	1⁻				
		695.16 *3*	17.5 *8*	603.9897	1⁺				
		940.94 *3*	24.2 *22*	358.1163	(4)⁻	(E2)			Mult.: M1+E2 from α(K)exp; M1 component inconsistent with level scheme.

$^{170}_{69}Tm_{101}$-18

Adopted Levels, Gammas (continued)

γ(^{170}Tm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	Comments
1299.107	(2)$^-$	1061.869 *19*	100 *4*	237.2396	1$^-$	E2	
		1079.1[‡] *2*	100[‡] *17*	219.7060	2$^-$		
		1093.9[‡] *5*	42[‡] *8*	204.4486	2$^-$		
		1184.55 *4*	80 *6*	114.5440	3$^-$		E_γ: other: 1183.2 *4* from (n,γ) E=thermal: γ coin.
		1300.7[‡] *4*	17[‡] *8*	0.0	1$^-$		
1309.3	(≤2)	662.9[‡] *9*	100[‡] *38*	648.7467	1$^-$		
		704.8[‡] *9*	50[‡] *25*	603.9897	1$^+$		
		720.3[‡] *8*	75[‡] *38*	590.2286	1$^-$		
1315.9	(1)$^-$	866.9[‡] *4*	100[‡] *25*	447.0707	(3)$^-$		
		1167.9[‡] *6*	56[‡] *13*	149.7180	0$^-$		
		1316.9[‡] *6*	13	0.0	1$^-$		
1334.9	(1$^-$,2,3$^-$)	1220.2[‡] *8*	100[‡] *50*	114.5440	3$^-$		
		1335.0[‡] *5*	50[‡]	0.0	1$^-$		
1354.6	(1,2)$^-$	1134.2[‡] *5*	88[‡] *25*	219.7060	2$^-$		
		1203.4[‡] *6*	100[‡] *25*	149.7180	0$^-$		
		1354.72[a] *7*	100	0.0	1$^-$		E_γ: reported in (n,γ) E=0-136 eV only. Possibly the 1354.7γ that deexcites a 1395 level In (n,γ) E=thermal: γ coin.
1363.5	(1$^+$,2$^-$)	720.7[‡] *9*	40[‡] *15*	637.9062	2$^-$		
		1138.9[‡] *3*	65[‡] *10*	219.7060	2$^-$		
		1179.2[‡] *4*	75[‡] *15*	183.197	(3)$^+$		
		1208.3[‡] *3*	100[‡] *15*	149.7180	0$^-$		
		1321.9[‡] *8*	10[‡] *5*	38.7139	2$^-$		
1375.1	(1$^-$)	1139.1[‡] *6*	44[‡] *11*	237.2396	1$^-$		
		1227.3[‡] *5*	100[‡] *22*	149.7180	0$^-$		
1382.2	(2)$^-$	1178.2[‡] *4*	100[‡] *29*	204.4486	2$^-$		
		1342.3[‡] *9*	29[‡] *14*	38.7139	2$^-$		
1395.0	(2$^-$)	1157.2[‡] *5*	38[‡] *13*	237.2396	1$^-$		
		1177.9[‡] *4*	63[‡] *13*	219.7060	2$^-$		
		1211.4[‡] *6*	100[‡] *25*	183.197	(3)$^+$		
		1280.6[‡] *7*	63[‡] *25*	114.5440	3$^-$		
		1354.7[‡] *5*	38[‡] *13*	38.7139	2$^-$		E_γ: placement differs In (n,γ) E=0-136 eV.
		1393.8[‡] *3*	38[‡] *13*	0.0	1$^-$		
1413.1	(1$^-$,2,3$^-$)	1061.0[‡] *7*	86[‡] *29*	349.7330	3$^-$		
		1178.1[‡] *5*	100[‡] *29*	237.2396	1$^-$		
		1298.1[‡] *6*	71[‡] *29*	114.5440	3$^-$		

$^{170}_{69}Tm_{101}$-19

Adopted Levels, Gammas (continued)

γ(^{170}Tm) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π
1433.2	(1$^-$)	1082.8‡ *1*	100‡ *6*	349.7330	3$^-$
		1212.7‡ *2*	19.2‡ *26*	219.7060	2$^-$
1437.2	(≤2)	834.6‡ *6*	22‡ *7*	603.9897	1$^+$
		1198.8‡ *2*	100‡ *11*	237.2396	1$^-$
		1217.8‡ *10*	15‡ *4*	219.7060	2$^-$
1442.0	(≤4)	1237.8‡ *4*	100	204.4486	2$^-$
1443.1	(1$^-$)	1093.7‡ *6*	21‡ *6*	349.7330	3$^-$
		1208.8‡ *9*	12‡ *6*	237.2396	1$^-$
		1223.2‡ *2*	100‡ *9*	219.7060	2$^-$
		1237.8‡ *4*	18‡ *3*	204.4486	2$^-$
		1291.9‡ *6*	18‡ *6*	149.7180	0$^-$
		1404.8‡ *6*	6‡ *3*	38.7139	2$^-$
1466.3	(1$^-$,2$^-$)	866.9‡ *7*	10‡ *4*	603.9897	1$^+$
		1020.3‡ *2*	61‡ *8*	447.0707	(3)$^-$
		1117.2‡ *7*	12‡ *4*	349.7330	3$^-$
		1229.9‡ *3*	16‡ *4*	237.2396	1$^-$
		1247.3‡ *5*	11.8‡ *20*	219.7060	2$^-$
		1318.0‡ *1*	100‡ *10*	149.7180	0$^-$
1478.0	(1,2$^-$)	872.6‡ *10*	75‡ *50*	603.9897	1$^+$
		1259.1‡ *6*	100‡ *25*	219.7060	2$^-$
		1327.6‡ *10*	100‡ *50*	149.7180	0$^-$
1501.1	(≤2$^-$)	1265.7‡ *6*	30‡ *10*	237.2396	1$^-$
		1282.2‡ *5*	50‡ *10*	219.7060	2$^-$
		1297.3‡ *2*	100‡ *20*	204.4486	2$^-$
1515.4	(0$^-$,2$^-$)	909.8‡ *10*	44‡ *22*	603.9897	1$^+$
		923.2‡ *8*	89‡ *33*	590.2286	1$^-$
		1276.2‡ *7*	56‡ *22*	237.2396	1$^-$
		1298.0‡ *3*	100‡ *22*	219.7060	2$^-$
		1397.3‡ *10*	33‡ *22*	114.5440	3$^-$
		1516.3‡ *11*	11	0.0	1$^-$
1518.1	(1$^-$,2,3$^-$)	928.6‡ *7*	53‡ *16*	590.2286	1$^-$
		1168.3‡ *3*	79‡ *16*	349.7330	3$^-$
		1280.1‡ *2*	100‡ *11*	237.2396	1$^-$
1537.2	(1$^-$)	932.1‡ *6*	100‡ *33*	603.9897	1$^+$
		1316.8‡ *8*	50‡ *17*	219.7060	2$^-$
1549.1	(≤3)	1509.1‡ *5*	100‡ *33*	38.7139	2$^-$
		1550.4‡ *3*	100‡ *33*	0.0	1$^-$
1586.7	(1$^-$,2,3$^-$)	998.0‡ *5*	100‡ *20*	590.2286	1$^-$
		1140.3‡ *6*	80‡ *27*	447.0707	(3)$^-$
		1378.7‡ *5*	27‡ *7*	204.4486	2$^-$
		1470.6‡ *6*	40‡ *13*	114.5440	3$^-$
		1548‡ *3*	7 *7*	38.7139	2$^-$
1590.3	(≤3)	1551.7‡ *8*	100‡ *33*	38.7139	2$^-$
		1590.2‡ *5*	67‡ *33*	0.0	1$^-$
1603.5	(≤3)	1013.7‡ *8*	40‡ *15*	590.2286	1$^-$
		1367.5‡ *1*	100‡ *10*	237.2396	1$^-$
		1563.0‡ *3*	20‡ *5*	38.7139	2$^-$
1609.3	(0$^-$,1$^-$,2$^-$)	1019.4‡ *7*	100‡ *38*	590.2286	1$^-$
		1608.3‡ *7*	13‡	0.0	1$^-$
1639.2	(1 to 4)	1524.7‡ *6*	100‡ *40*	114.5440	3$^-$
		1600.5‡ *7*	40 *20*	38.7139	2$^-$
1646.3	(2$^-$,3$^+$)	1000.5‡ *11*	100‡ *57*	644	(4$^-$)
		1043.0‡ *8*	57‡ *29*	603.9897	1$^+$
1658.7	(≤3)	1016.0‡ *7*	100‡ *36*	648.7467	1$^-$
		1438.7‡ *4*	64‡ *9*	219.7060	2$^-$
		1618.5‡ *6*	18‡ *9*	38.7139	2$^-$
		1659.3‡ *2*	55‡ *9*	0.0	1$^-$
1669.2	(≤2)	1078.9‡ *2*	100‡ *16*	590.2286	1$^-$
		1432.0‡ *4*	16‡ *4*	237.2396	1$^-$
		1464.9‡ *2*	72‡ *8*	204.4486	2$^-$
		1520.7‡ *6*	24‡ *8*	149.7180	0$^-$
		1669.3‡ *5*	8‡ *4*	0.0	1$^-$
1704.8	(≤3)	1666.0‡ *5*	100‡ *33*	38.7139	2$^-$
		1705.0‡ *4*	100‡ *33*	0.0	1$^-$
1726.7	(1 to 4)	1279.3‡ *5*	88‡ *19*	447.0707	(3)$^-$
		1455.3‡ *3*	100‡ *13*	270.5466	(3)$^-$
		1520.7‡ *6*	25‡ *6*	204.4486	2$^-$
		1688.1‡ *8*	13‡ *6*	38.7139	2$^-$
1733.7	(≤3)	1695.2‡ *3*	100‡ *20*	38.7139	2$^-$
		1733.5‡ *3*	100‡ *20*	0.0	1$^-$

$^{170}_{69}Tm_{101}$-20

Adopted Levels, Gammas (continued)

γ(^{170}Tm) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π
1747.7	(≤3)	1509.2‡ *6*	57‡ *14*	237.2396	1^-
		1710.3‡ *3*	100‡ *14*	38.7139	2^-
		1747.5‡ *4*	57‡ *14*	0.0	1^-
1758.4	(≤3)	1643.7‡ *7*	100‡ *40*	114.5440	3^-
		1719.8‡ *5*	80‡ *20*	38.7139	2^-
		1758.4‡ *5*	60‡ *20*	0.0	1^-
1768.7	(1 to 3)	1178.7‡ *8*	78‡ *33*	590.2286	1^-
		1317.8‡ *9*	100‡ *33*	447.0707	$(3)^-$
1818.1	(≤3)	1582.0‡ *3*	100‡ *13*	237.2396	1^-
		1611.9‡ *7*	38‡ *13*	204.4486	2^-
1823.2	$(1^-,2^-)$	1602.9‡ *4*	75‡ *13*	219.7060	2^-
		1674.2‡ *6*	100‡ *25*	149.7180	0^-
1855.0	(1 to 3)	1210.9‡ *7*	100‡ *38*	648.7467	1^-
		1671.6‡ *5*	46‡ *8*	183.197	$(3)^+$
1859.3	(1^-)	1214.0‡ *5*	100‡ *26*	648.7467	1^-
		1257.9‡ *7*	11‡ *3*	603.9897	1^+
		1412.6‡ *5*	43‡ *11*	447.0707	$(3)^-$
		1508.7‡ *4*	26‡ *6*	349.7330	3^-
		1623.3‡ *2*	43‡ *6*	237.2396	1^-
		1638.5‡ *4*	14‡ *3*	219.7060	2^-
		1708.1‡ *5*	29‡ *6*	149.7180	0^-
		1744.5‡ *6*	17‡ *6*	114.5440	3^-
		1819.9‡ *3*	23‡ *3*	38.7139	2^-
		1859.0‡ *3*	17‡ *3*	0.0	1^-
1870.6	(≤2)	1226.8‡ *10*	100‡ *14*	648.7467	1^-
		1265.7‡ *7*	57‡ *14*	603.9897	1^+
		1281.0‡ *8*	100‡ *43*	590.2286	1^-
		1633.1‡ *5*	57‡ *14*	237.2396	1^-
		1666.3‡ *6*	71‡ *14*	204.4486	2^-
1909.8	(≤3)	1871.1‡ *7*	75‡ *25*	38.7139	2^-
		1909.8‡ *3*	100‡ *25*	0.0	1^-
1921.3	$(1^-,2)$	1279.4‡ *6*	38‡ *10*	648.7467	1^-
		1315.5‡ *4*	24‡ *3*	603.9897	1^+
		1471.5‡ *9*	31‡ *14*	447.0707	$(3)^-$
		1571.7‡ *2*	100‡ *10*	349.7330	3^-
1921.3	$(1^-,2)$	1806.4‡ *4*	34‡ *7*	114.5440	3^-
1932.7	$(1^-,2,3^-)$	1285.9‡ *16*	100‡ *60*	648.7467	1^-
		1582.8‡ *8*	100‡ *40*	349.7330	3^-
		1894.3‡ *4*	100‡ *20*	38.7139	2^-
		1933.0‡ *5*	40‡ *20*	0.0	1^-
1951.0	$(2,3^-)$	1501.5‡ *7*	100‡ *36*	447.0707	$(3)^-$
		1679.0‡ *11*	64‡ *27*	270.5466	$(3)^-$
		1731.3‡ *5*	36‡ *9*	219.7060	2^-
		1767.3‡ *9*	55‡ *18*	183.197	$(3)^+$
		1951.4‡ *5*	18‡ *9*	0.0	1^-
1979.0	$(1^-,2,3^-)$	1710.7‡ *8*	100‡ *33*	270.5466	$(3)^-$
		1940.5‡ *5*	67‡ *22*	38.7139	2^-
		1977.7‡ *6*	22‡ *11*	0.0	1^-
2013.4	$(2,3^-)$	1777.6‡ *6*	25‡ *8*	237.2396	1^-
		1805.7‡ *7*	25‡ *8*	204.4486	2^-
		1830.1‡ *9*	50‡ *17*	183.197	$(3)^+$
		1900.2‡ *4*	100‡ *17*	114.5440	3^-
		1975.2‡ *8*	17‡ *8*	38.7139	2^-
		2011.8‡ *9*	8 *8*	0.0	1^-
2039.5	(≤3)	1819.3‡ *4*	100‡ *17*	219.7060	2^-
		2041.3‡ *12*	17‡ *17*	0.0	1^-
2072.8	$(1^-,2,3^-)$	1722.0‡ *7*	100 *33*	349.7330	3^-
		2073.4‡ *6*	33‡ *17*	0.0	1^-
2084.1	(≤3)	1847.4‡ *7*	100‡ *33*	237.2396	1^-
		2082.2‡ *13*	33 *33*	0.0	1^-
2098.0	(1,2)	1747.5‡ *6*	100‡ *29*	349.7330	3^-
		1949.9‡ *8*	86‡ *29*	149.7180	0^-
2101.0	$(1^-,2,3^-)$	1830.5‡ *3*	100‡ *17*	270.5466	$(3)^-$
		1864.9‡ *4*	28‡ *6*	237.2396	1^-
		1896.9‡ *7*	22‡ *6*	204.4486	2^-
		2062.9‡ *6*	17 *6*	38.7139	2^-
		2097.5 *9*	6 *6*	0.0	1^-
2116.3	(≤2)	1897.8‡ *6*	57‡ *14*	219.7060	2^-
		1912.0‡ *6*	71‡ *14*	204.4486	2^-
		1965.3‡ *6*	100‡ *29*	149.7180	0^-

$^{170}_{69}Tm_{101}$-21

Adopted Levels, Gammas (continued)

γ(^{170}Tm) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π
2134.6	(2,3$^-$)	1533.6‡ *7*	40‡ *10*	603.9897	1$^+$
		1863.1‡ *6*	100‡ *30*	270.5466	(3)$^-$
		1899.0‡ *9*	30‡ *10*	237.2396	1$^-$
		1914.8‡ *6*	50‡ *10*	219.7060	2$^-$
		2019.3‡ *5*	92‡ *20*	114.5440	3$^-$
		2095.5‡ *4*	50‡ *10*	38.7139	2$^-$
2145.4	(≤3)	2107.3‡ *7*	100‡ *33*	38.7139	2$^-$
		2144.5‡ *8*	67‡ *33*	0.0	1$^-$
2161.1	(1$^-$,2,3$^-$)	1892.6‡ *5*	100‡ *23*	270.5466	(3)$^-$
		1955.9‡ *4*	46‡ *8*	204.4486	2$^-$
		2158.0 *10*	15 *7*	0.0	1$^-$
2168.1	(1$^-$,2,3$^-$)	1898.2‡ *5*	68‡ *16*	270.5466	(3)$^-$
		1964.1‡ *2*	100‡ *11*	204.4486	2$^-$
		2167.1‡ *5*	16‡ *5*	0.0	1$^-$
2192.0	(1$^+$,2,3$^-$)	1547.5‡ *5*	100‡ *25*	648.7467	1$^-$
		1590.8‡ *4*	58‡ *8*	603.9897	1$^+$
		2189.1‡ *5*	17‡ *8*	0.0	1$^-$
2258.2	(0$^-$,1,2$^-$)	1610.4‡ *8*	70‡ *30*	648.7467	1$^-$
		2019.9‡ *8*	20‡ *10*	237.2396	1$^-$
		2039.2‡ *7*	30‡ *10*	219.7060	2$^-$
		2110.5‡ *6*	100‡ *20*	149.7180	0$^-$
2264.9	(2$^-$,3$^+$)	1619.4‡ *7*	100‡ *33*	648.7467	1$^-$
		1664.4‡ *5*	67‡ *11*	603.9897	1$^+$
2272.4	(≤3)	1668.5‡ *5*	100‡ *17*	603.9897	1$^+$
		2067.9‡ *7*	67‡ *17*	204.4486	2$^-$
2281.5	(≤3)	2044.9‡ *6*	40‡ *20*	237.2396	1$^-$
		2061.4‡ *5*	100‡ *20*	219.7060	2$^-$
2283.1	(1$^-$,2)	1680.6‡ *5*	38‡ *6*	603.9897	1$^+$
		1833.9‡ *5*	100‡ *25*	447.0707	(3)$^-$
		1933.4‡ *7*	44‡ *13*	349.7330	3$^-$
		2244.3‡ *4*	38‡ *6*	38.7139	2$^-$
		2281.3‡ *4*	25‡ *6*	0.0	1$^-$
2289.8	(≤3)	2071.7‡ *7*	100‡ *25*	219.7060	2$^-$
		2250.8‡ *7*	75‡ *25*	38.7139	2$^-$
		2288.5‡ *7*	50‡ *25*	0.0	1$^-$
2307.4	(1$^-$,2,3$^-$)	1857.7‡ *7*	100‡ *27*	447.0707	(3)$^-$
		2071.9‡ *8*	18‡ *9*	237.2396	1$^-$
		2267.3‡ *8*	27‡ *9*	38.7139	2$^-$
2340.8	(1$^-$,2,3$^-$)	1749.2‡ *5*	77‡ *23*	590.2286	1$^-$
		1892.1‡ *6*	100‡ *31*	447.0707	(3)$^-$
		2103.2‡ *7*	23‡ *8*	237.2396	1$^-$
2347.1	(≤3)	1741.9‡ *8*	100‡ *40*	603.9897	1$^+$
		2310.1‡ *9*	40‡ *20*	38.7139	2$^-$
2364.8	(2$^-$,3,4$^-$)	1718.9‡ *6*	100‡ *25*	648.7467	1$^-$
		2016.9‡ *9*	50‡ *17*	349.7330	3$^-$
		2326.7‡ *6*	33‡ *8*	38.7139	2$^-$
2388.2	(≤3)	2168.4‡ *5*	100‡ *29*	219.7060	2$^-$
		2388.4‡ *9*	14	0.0	1$^-$
2439.1	(1$^-$,2$^-$)	1796.1‡ *11*	64‡ *27*	648.7467	1$^-$
		1833.9‡ *3*	91‡ *27*	603.9897	1$^+$
		2089.4‡ *8*	64‡ *18*	349.7330	3$^-$
		2289.3‡ *4*	100‡ *18*	149.7180	0$^-$
		2442.9‡ *13*	9	0.0	1$^-$
2458.3	(≤2)	1854.8‡ *11*	43‡ *29*	603.9897	1$^+$
		2419.6‡ *3*	100‡ *14*	38.7139	2$^-$
		2458.1‡ *3*	71‡ *14*	0.0	1$^-$
2478.0	(≤2)	2208.6‡ *7*	90‡ *30*	270.5466	(3)$^-$
		2294.4‡ *7*	100‡ *30*	183.197	(3)$^+$
		2477.6‡ *6*	40‡ *10*	0.0	1$^-$
2482.0	(≤3)	2443.4‡ *5*	100‡ *25*	38.7139	2$^-$
		2481.9‡ *10*	50‡ *25*	0.0	1$^-$
2528.5	(1 to 4)	2323.7‡ *5*	100‡ *20*	204.4486	2$^-$
		2414.7‡ *9*	80‡ *40*	114.5440	3$^-$
2536.3	(1$^-$,2,3$^-$)	1932.1‡ *6*	60‡ *10*	603.9897	1$^+$
		1946.6‡ *8*	70‡ *30*	590.2286	1$^-$
		2084.9‡ *8*	100‡ *30*	447.0707	(3)$^-$
		2302.2‡ *5*	30‡ *10*	237.2396	1$^-$
		2533.8‡ *3*	60‡ *10*	0.0	1$^-$
2540.5	(1$^-$,2,3$^-$)	2269.6‡ *7*	100‡ *30*	270.5466	(3)$^-$
		2541.2‡ *7*	20‡ *10*	0.0	1$^-$

$^{170}_{69}Tm_{101}$-22

Adopted Levels, Gammas (continued)

γ(^{170}Tm) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π
2553.9	(≤3)	1965.1‡ *7*	100‡ *33*	590.2286	1^-
		2331.7‡ *6*	44‡ *11*	219.7060	2^-
		2349.9‡ *5*	56‡ *11*	204.4486	2^-
2573.2	(≤3)	2335.9‡ *7*	60‡ *20*	237.2396	1^-
		2369.3‡ *5*	100‡ *20*	204.4486	2^-
		2533.4‡ *8*	40‡ *20*	38.7139	2^-
2587.6	(≤3)	1995.8‡ *7*	100‡ *38*	590.2286	1^-
		2550.2‡ *8*	25‡ *13*	38.7139	2^-
		2587.3‡ *7*	25‡ *13*	0.0	1^-
2592.3	(1^-,2^-)	1948.9‡ *9*	80‡ *30*	648.7467	1^-
		2321.6‡ *8*	90‡ *30*	270.5466	$(3)^-$
		2375.3‡ *8*	30‡ *10*	219.7060	2^-
		2442.6‡ *6*	100‡ *20*	149.7180	0^-
		2474.8‡ *8*	40‡ *20*	114.5440	3^-
2598.9	(2^-)	1954.6‡ *8*	47‡ *16*	648.7467	1^-
		1996.1‡ *9*	21‡ *11*	603.9897	1^+
		2152.0‡ *8*	53‡ *16*	447.0707	$(3)^-$
		2249.2‡ *6*	53‡ *16*	349.7330	3^-
		2328.0‡ *4*	100‡ *21*	270.5466	$(3)^-$
		2393.3‡ *2*	63‡ *11*	204.4486	2^-
		2481.9‡ *6*	32‡ *11*	114.5440	3^-
		2564.4‡ *6*	16‡ *5*	38.7139	2^-
		2596.8‡ *4*	16‡ *5*	0.0	1^-
2606.8	(1^-,2^-)	2001.1‡ *5*	88‡ *25*	603.9897	1^+
		2339.7‡ *9*	100‡ *38*	270.5466	$(3)^-$
		2457.9‡ *9*	63‡ *25*	149.7180	0^-
		2491.6‡ *7*	63‡ *25*	114.5440	3^-
		2607.5‡ *7*	25‡ *13*	0.0	1^-
2618.3	(2^-,3^-)	1972.1‡ *7*	83‡ *25*	648.7467	1^-
		2169.0‡ *7*	92‡ *25*	447.0707	$(3)^-$
		2347.6‡ *5*	100‡ *25*	270.5466	$(3)^-$
		2413.2‡ *5*	33‡ *8*	204.4486	2^-
		2506.0‡ *5*	58‡ *8*	114.5440	3^-
		2617.1‡ *8*	17‡ *8*	0.0	1^-
2625.7	(≤3)	2022.2‡ *1*	100‡ *8*	603.9897	1^+
2625.7	(≤3)	2420.4‡ *7*	11‡ *3*	204.4486	2^-
2634.6	(1^-,2)	2030.3‡ *5*	100‡ *14*	603.9897	1^+
		2395.9‡ *10*	29‡ *14*	237.2396	1^-
		2522.3‡ *10*	43‡ *14*	114.5440	3^-
2671.9	(1^-,2,3^-)	2027.5‡ *8*	100‡ *33*	648.7467	1^-
		2401.3‡ *10*	78‡ *33*	270.5466	$(3)^-$
2702.3	(≤3)	2479.8‡ *8*	75‡ *25*	219.7060	2^-
		2554.4‡ *5*	100‡ *25*	149.7180	0^-
		2587.2‡ *7*	63‡ *25*	114.5440	3^-
2721.3	(≤3)	2482.4‡ *9*	50‡ *25*	237.2396	1^-
		2518.0‡ *7*	100‡ *25*	204.4486	2^-
2727.4		2456.7‡ *6*	100‡ *27*	270.5466	$(3)^-$
		2613.1‡ *6*	55‡ *18*	114.5440	3^-
2767.9	(1^+,2,3^-)	2176.9‡ *6*	92‡ *25*	590.2286	1^-
		2584.6‡ *6*	100‡ *33*	183.197	$(3)^+$
2778.6	(1^-,2,3^-)	2509.4‡ *10*	100‡ *38*	270.5466	$(3)^-$
		2665.5‡ *8*	75‡ *25*	114.5440	3^-
		2776.9‡ *7*	25‡ *13*	0.0	1^-
2802.4	(≤3)	2763.7‡ *8*	100‡ *38*	38.7139	2^-
		2802.5‡ *6*	67‡ *33*	0.0	1^-
2807.8	(2^-,3^-)	2163.4‡ *9*	69‡ *23*	648.7467	1^-
		2219.3‡ *9*	62‡ *23*	590.2286	1^-
		2355.9‡ *7*	100‡ *31*	447.0707	$(3)^-$
		2457.6‡ *10*	46‡ *15*	349.7330	3^-
		2588.0‡ *6*	38‡ *15*	219.7060	2^-
		2808.4‡ *4*	31‡ *8*	0.0	1^-
2813.6	(1^-,2^-)	2366.2‡ *13*	67‡ *33*	447.0707	$(3)^-$
		2542.1‡ *9*	100‡ *33*	270.5466	$(3)^-$
		2596‡ *3*	33‡ *50*	219.7060	2^-
		2664.3‡ *16*	33‡ *25*	149.7180	0^-
		2773.8‡ *4*	58‡ *17*	38.7139	2^-
		2814.5‡ *4*	25‡ *8*	0.0	1^-
2846.2	(≤3)	2254.9‡ *10*	100‡ *38*	590.2286	1^-
		2846.3‡ *3*	63‡ *13*	0.0	1^-
2867.0	(1^-,2,3^-)	2223.2‡ *6*	100‡ *23*	648.7467	1^-

$^{170}_{69}Tm_{101}$-23

Adopted Levels, Gammas (continued)

γ(^{170}Tm) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π
2867.0	(1⁻,2,3⁻)	2594.9‡ *8*	69‡ *23*	270.5466	(3)⁻
2874.5	(1⁻,2,3⁻)	2604.6‡ *8*	100‡ *33*	270.5466	(3)⁻
		2874.2‡ *5*	33‡ *11*	0.0	1⁻
2881.0	(≤3)	2676.6‡ *8*	100‡ *40*	204.4486	2⁻
		2881.0‡ *5*	80‡ *20*	0.0	1⁻
2911.9	(≤3)	2672.3‡ *9*	100‡ *33*	237.2396	1⁻
		2913.6‡ *7*	67‡ *33*	0.0	1⁻
2925.4	(1⁻,2,3⁻)	2281.0‡ *8*	100‡ *33*	648.7467	1⁻
		2654.7‡ *9*	89‡ *33*	270.5466	(3)⁻
2952.7	(1⁻,2,3⁻)	2603.0‡ *6*	100‡ *33*	349.7330	3⁻
		2715.5‡ *6*	44‡ *11*	237.2396	1⁻
2995.9	(1⁻,2,3⁻)	2645.7‡ *9*	100‡ *33*	349.7330	3⁻
		2996.3‡ *8*	33‡ *17*	0.0	1⁻
3030.8	(≤2)	2425.5‡ *9*	56‡ *22*	603.9897	1⁺
		2441.1‡ *9*	100‡ *33*	590.2286	1⁻
3099.4	(≤2)	2455.7‡ *10*	82‡ *36*	648.7467	1⁻
		2648.9‡ *9*	100‡ *45*	447.0707	(3)⁻
3206.9	(1 to 4)	3092.0‡ *9*	100‡ *40*	114.5440	3⁻
		3168.5‡ *9*	80‡ *20*	38.7139	2⁻
3215.9	(≤3)	2570.7‡ *6*	100‡ *29*	648.7467	1⁻
		2626.0‡ *9*	64‡ *29*	590.2286	1⁻
3272.7	(≤3)	2681.5‡ *8*	100‡ *36*	590.2286	1⁻
		3068.5‡ *9*	36‡ *18*	204.4486	2⁻
3470.8	(≤4)	3266.9‡ *6*	100‡ *20*	204.4486	2⁻
		3432.2‡ *7*	40‡ *10*	38.7139	2⁻
3491.5	(≤3)	2847.8‡ *9*	100‡ *40*	648.7467	1⁻
		3253.2‡ *9*	40‡ *20*	237.2396	1⁻
3557.3	(≤4)	3207.1‡ *10*	100‡ *38*	349.7330	3⁻
		3519.0‡ *9*	50‡ *13*	38.7139	2⁻
3623.7		3274.4‡ *8*	100‡ *33*	349.7330	3⁻
		3419.0‡ *8*	56‡ *22*	204.4486	2⁻
3630.0	(≤3)	3392.9‡ *7*	100‡ *33*	237.2396	1⁻
		3591.0‡ *10*	100‡ *33*	38.7139	2⁻
3760.5	(≤3)	3117.3‡ *7*	100‡ *33*	648.7467	1⁻
		3541.2‡ *8*	50‡ *17*	219.7060	2⁻
3806.2	(≤3)	3456.8‡ *11*	100‡ *43*	349.7330	3⁻
		3806.1‡ *6*	29‡ *14*	0.0	1⁻
3864.1	(≤3)	3272.7 *10*	38 *17*	590.2286	1⁻
		3623.7‡ *8*	13‡ *4*	237.2396	1⁻
		3646.3‡ *10*	17‡ *8*	219.7060	2⁻
		3682.0‡ *4*	100‡ *21*	183.197	(3)⁺
6591.97	0⁺,1⁺	4641.48 *25*	20.8 *21*	1951.0	(2,3⁻)
		4732.63 *22*	38 *3*	1859.3	(1⁻)
		4774.2 *5*	10.4 *21*	1818.1	(≤3)
		4922.2 *3*	17.4 *21*	1676	(1⁻)
		4987.1 *4*	10.4 *21*	1609.3	(0⁻,1⁻,2⁻)
		5053.7 *6*	6.8 *15*	1537.2	(1⁻)
		5061.7 *5*	6.8 *14*	1532.1	(≤2⁻)
		5077 *3*	26 *3*	1515.4	(0⁻,2⁻)
		5124.2 *3*	19 *3*	1472	(1⁻)
		5149.2 *4*	21 *3*	1443.1	(1⁻)
		5158.2 *4*	31 *3*	1433.2	(1⁻)
		5216.9 *6*	6.1 *17*	1375.1	(1⁻)
		5325.7 *3*	11.8 *21*	1265.075	(0,1,2)⁻
		5353.5 *4*	12.5 *21*	1238.144	(0,1,2)⁻
		5381.4 *3*	11.8 *21*	1210.679	(2⁺)
		5398.0 *4*	9.4 *17*	1192.828	2⁻
		5412.47 *24*	26 *3*	1178.910	(2)⁻
		5422.9 *3*	16.0 *21*	1168.779	(2)⁻
		5431.9 *3*	15.3 *21*	1160.597	(1)⁻
		5443.5 *3*	9.9 *17*	1147.974	(1,2)⁻
		5451.4 *4*	9.8 *17*	1139.951	(2)⁻
		5518 *6*	8.3 *11*	1070.975	(2)⁻
		5682.6 *4*	3.4 *14*	908.448	(2⁻)
		5728.6 *3*	17.4 *21*	860.484	1⁺
		5737.50 *20*	94 *5*	854.335	2⁻
		5809.5 *4*	9.7 *13*	782.1520	(1)⁻
		5858.3 *3*	27 *3*	733.8128	(2)⁻
		5898.3 *3*	23 *3*	693.2864	2⁻
		5908.3 *3*	33 *3*	683.569	(0)⁻

$^{170}_{69}Tm_{101}$-24

Adopted Levels, Gammas (continued)

$\gamma(^{170}Tm)$ (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π
6591.97	$0^+,1^+$	5943.14 *20*	100 *5*	648.7467	1^-	6591.97	$0^+,1^+$	6387.49 *22*	98 *5*	204.4486	2^-
		6001.51 *22*	65 *7*	590.2286	1^-			6442.19 *23*	31.3 *21*	149.7180	0^-
		6354.5 *3*	28 *3*	237.2396	1^-			6556.4 *5*	34.0 *10*	38.7139	2^-
		6371.5 *4*	5.6 *13*	219.7060	2^-			6594 *3*	1.5 *7*	0.0	1^-

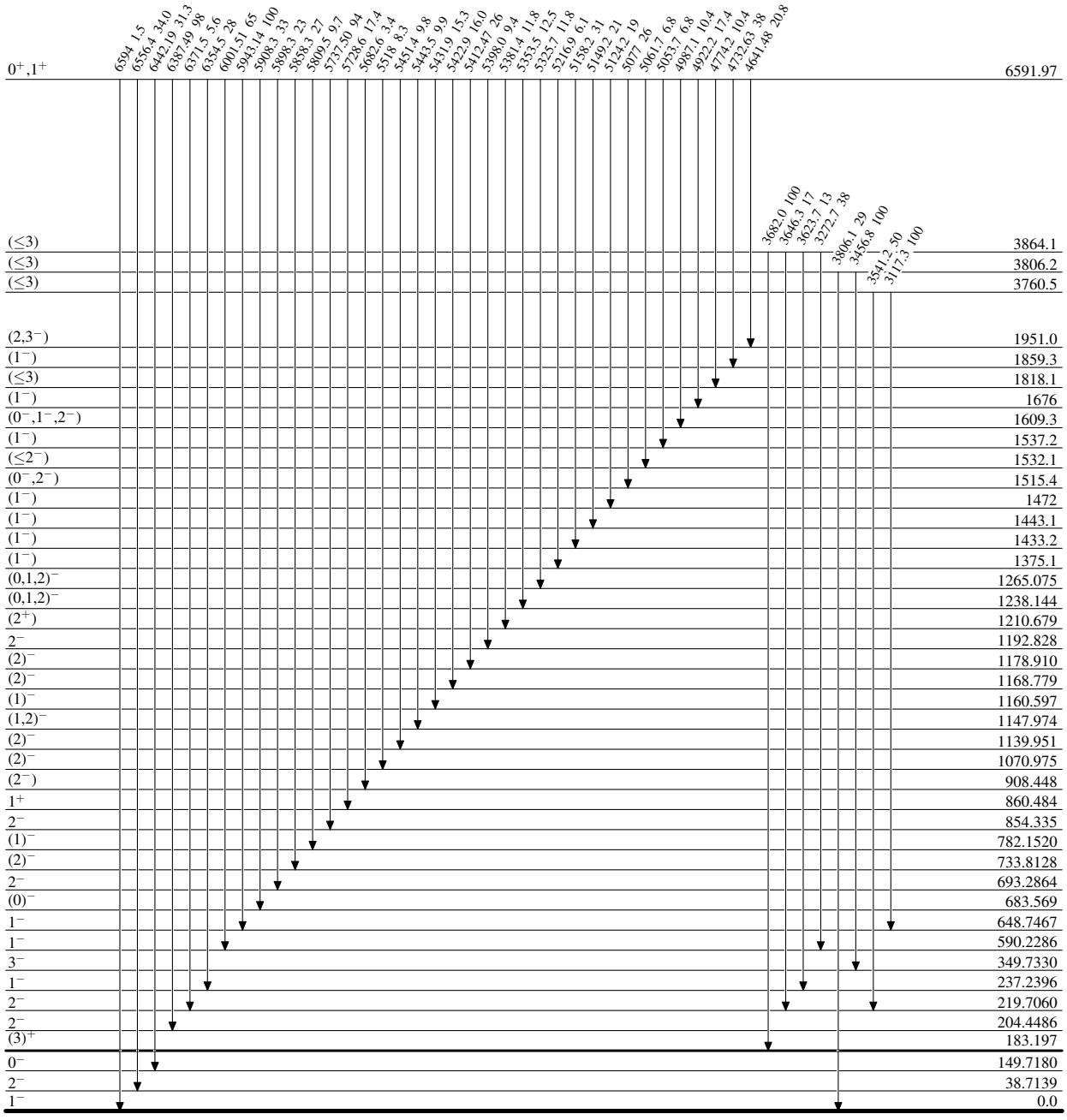
† Data are from (n,γ) E=0-136 eV, unless noted otherwise.
‡ From (n,γ) E=thermal: γ coin. Uncertainty in Eγ may be underestimated.
# Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
@ Multiply placed with undivided intensity.
& Multiply placed with intensity suitably divided.
a Placement of transition in the level scheme is uncertain.

$^{170}_{69}Tm_{101}$-25

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

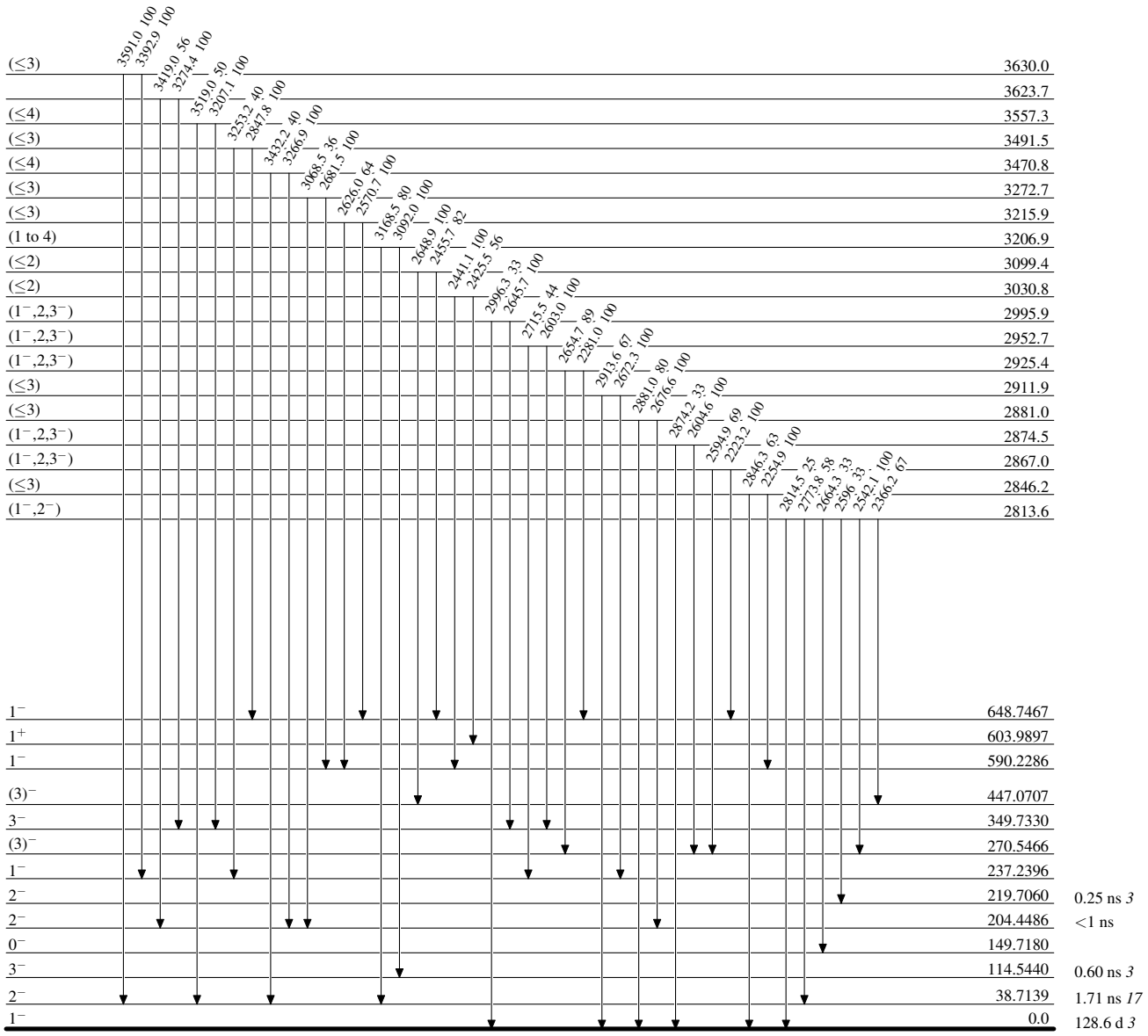


$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

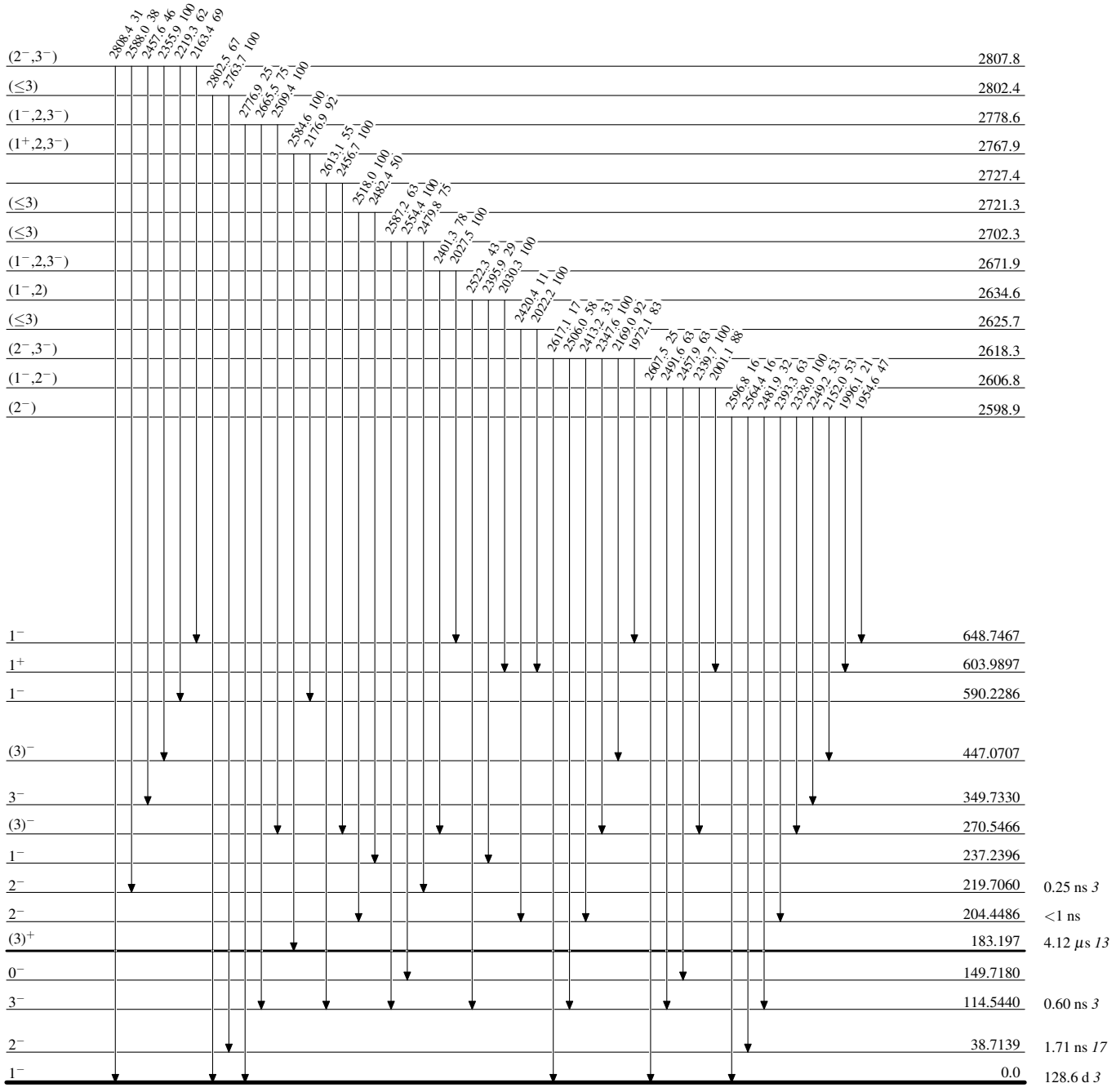


$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

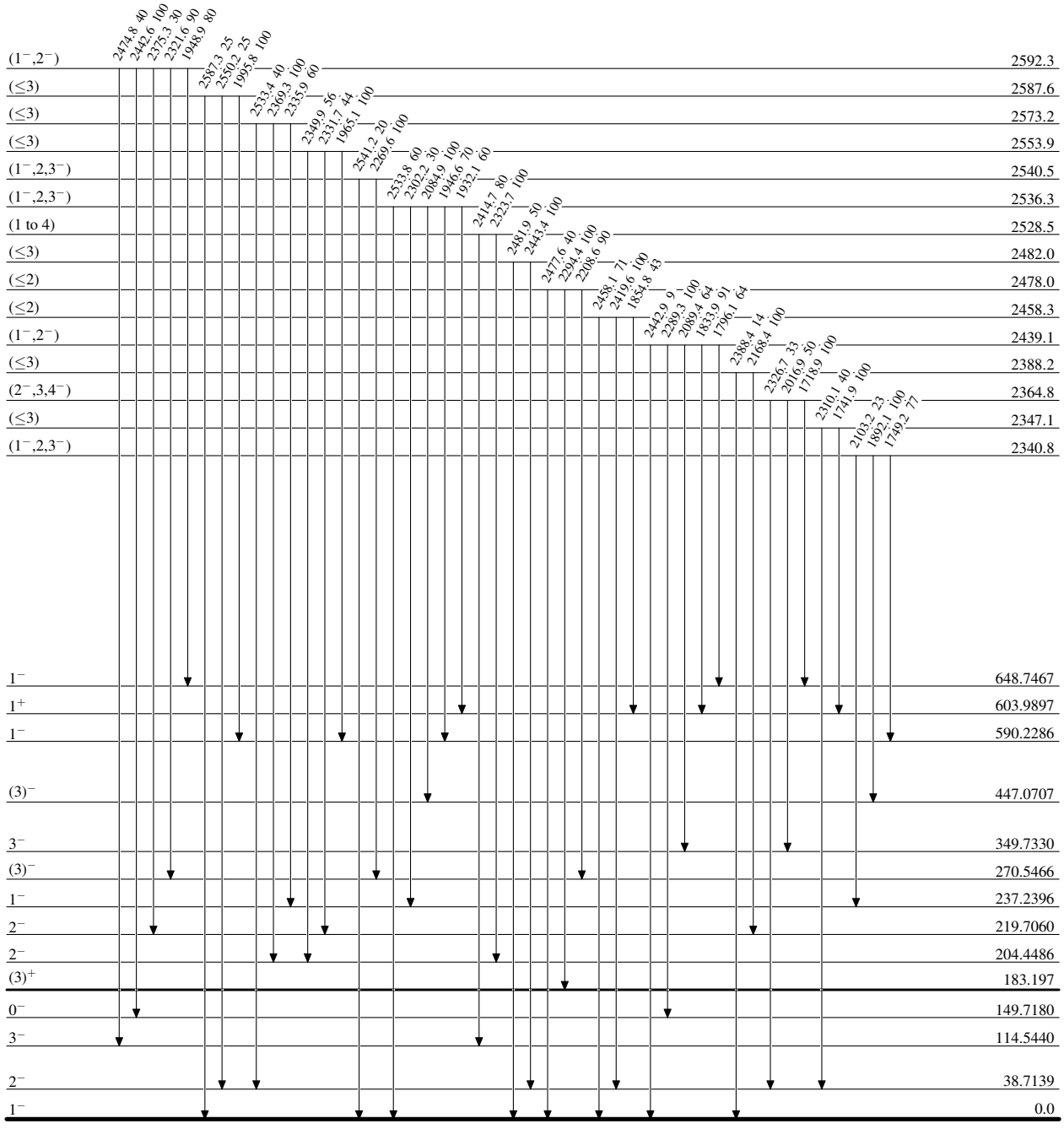


$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

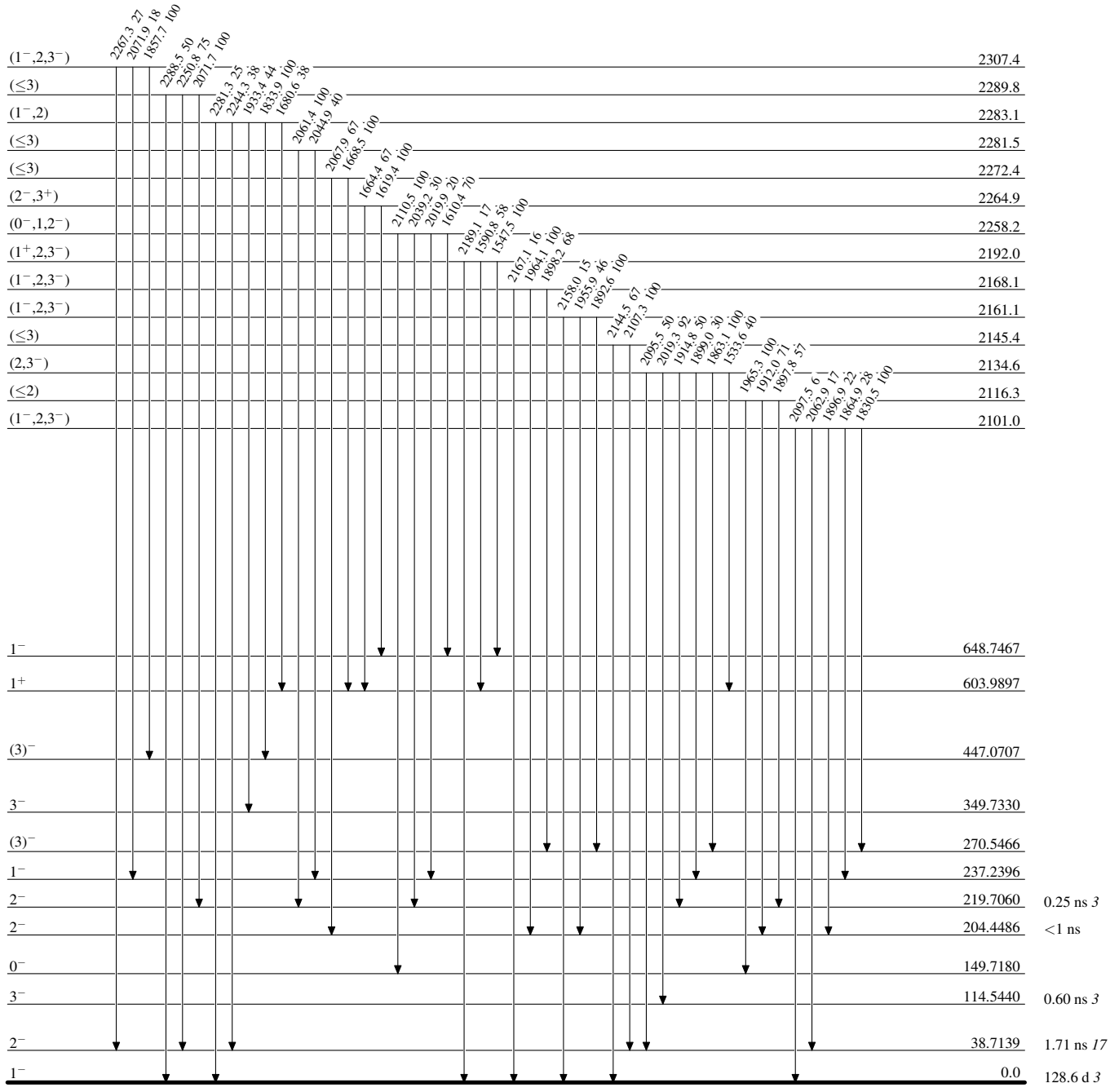


$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

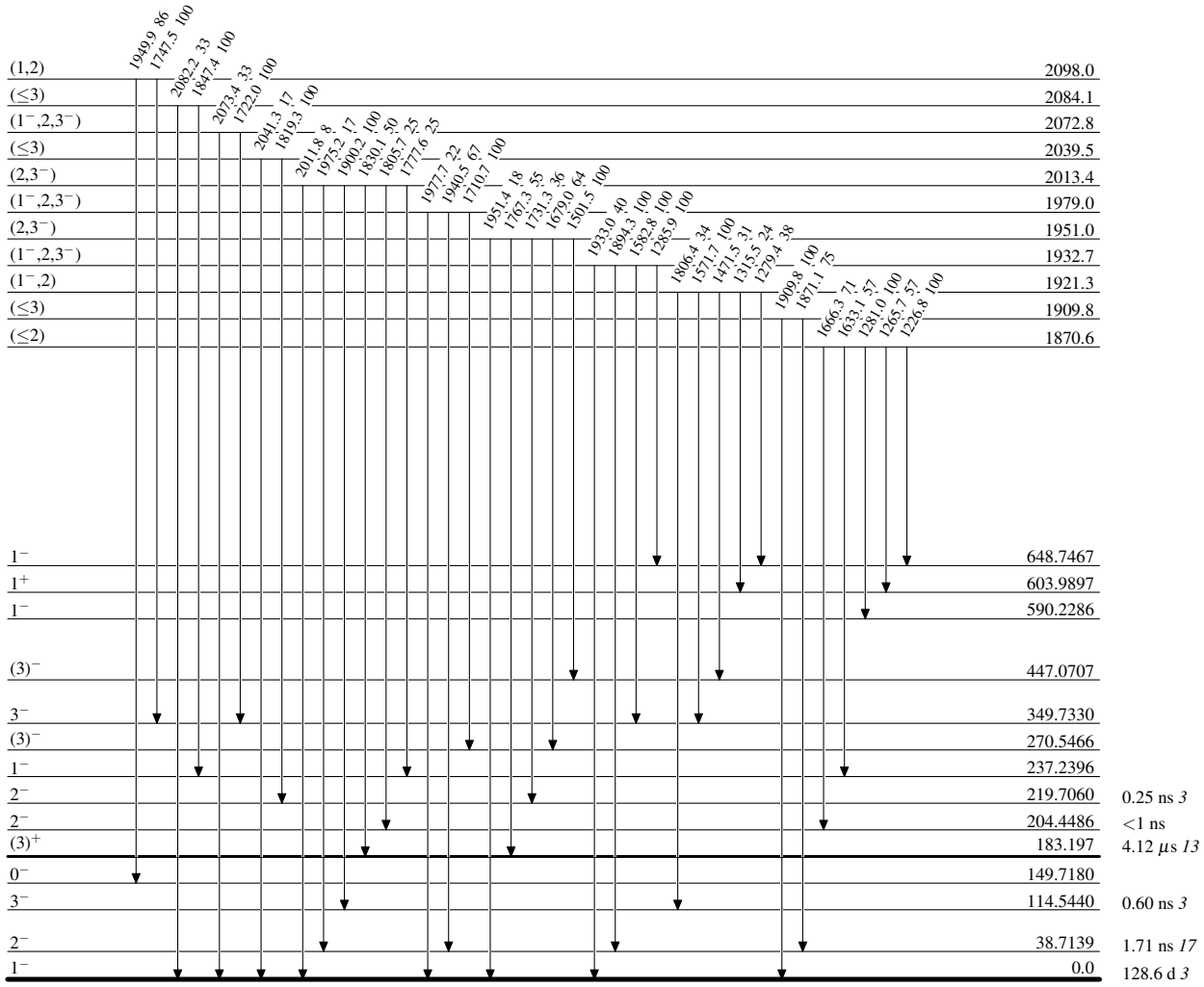


$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

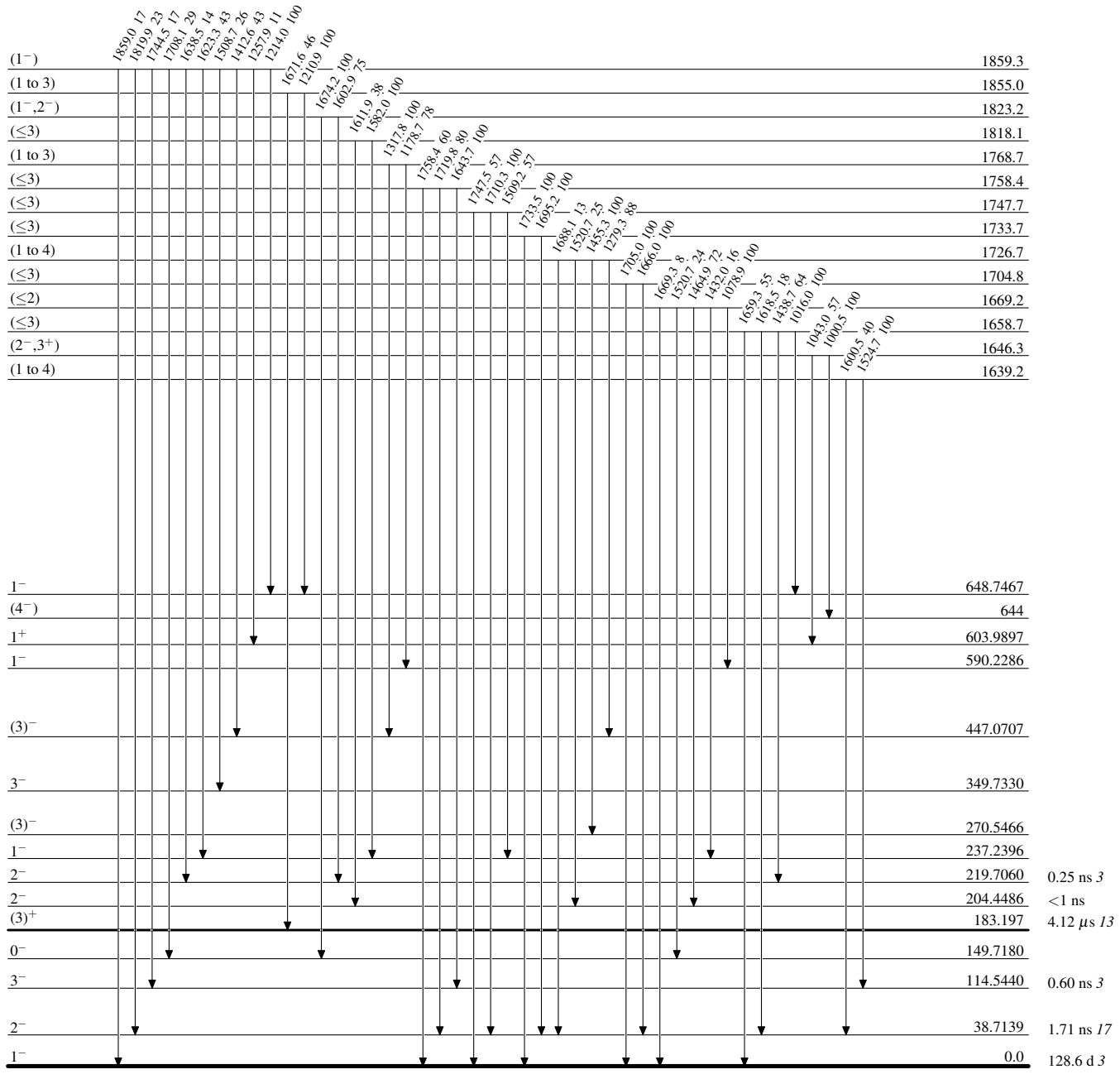


$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

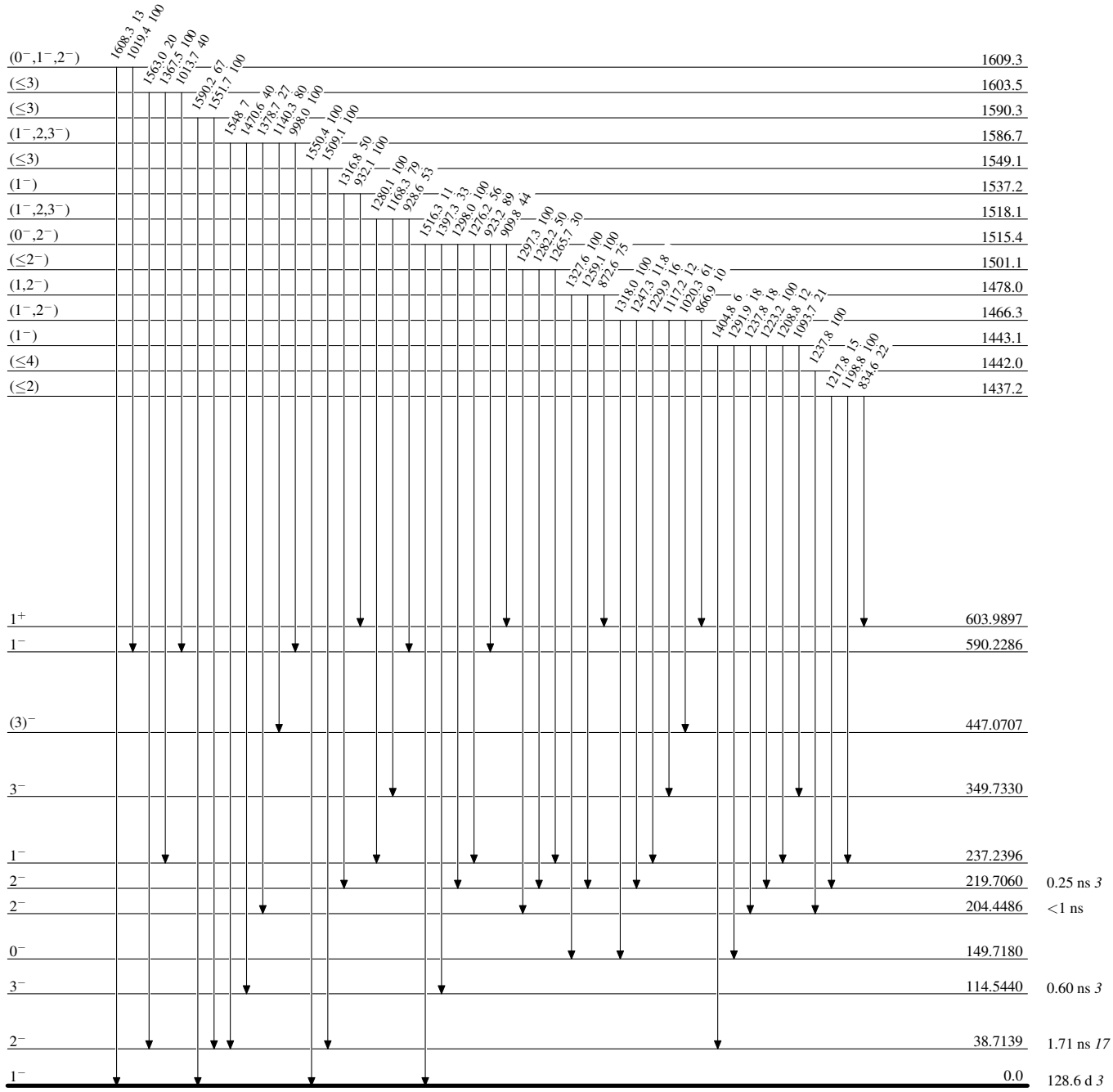


$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{170}_{69}Tm_{101}$

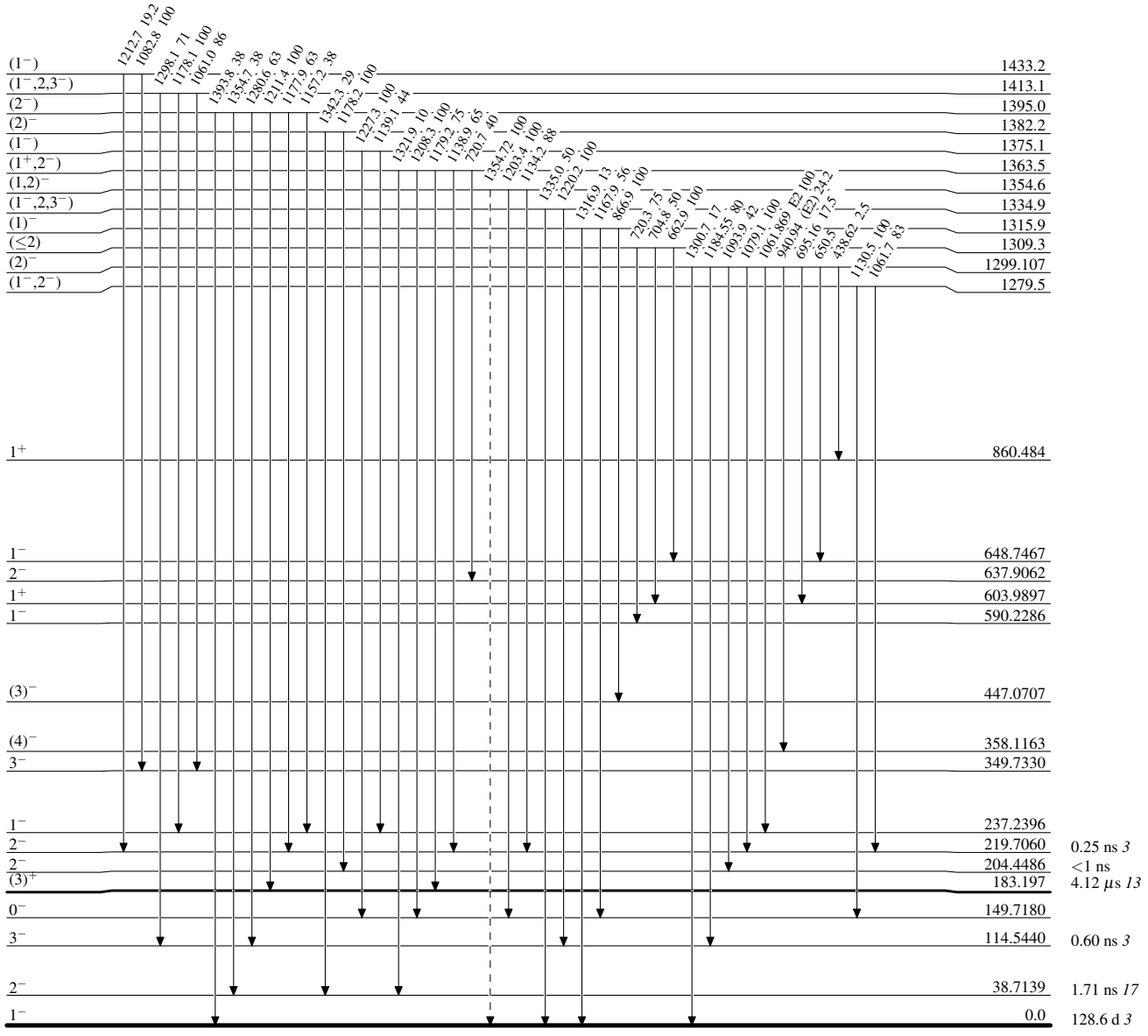
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)



$^{170}_{69}Tm_{101}$

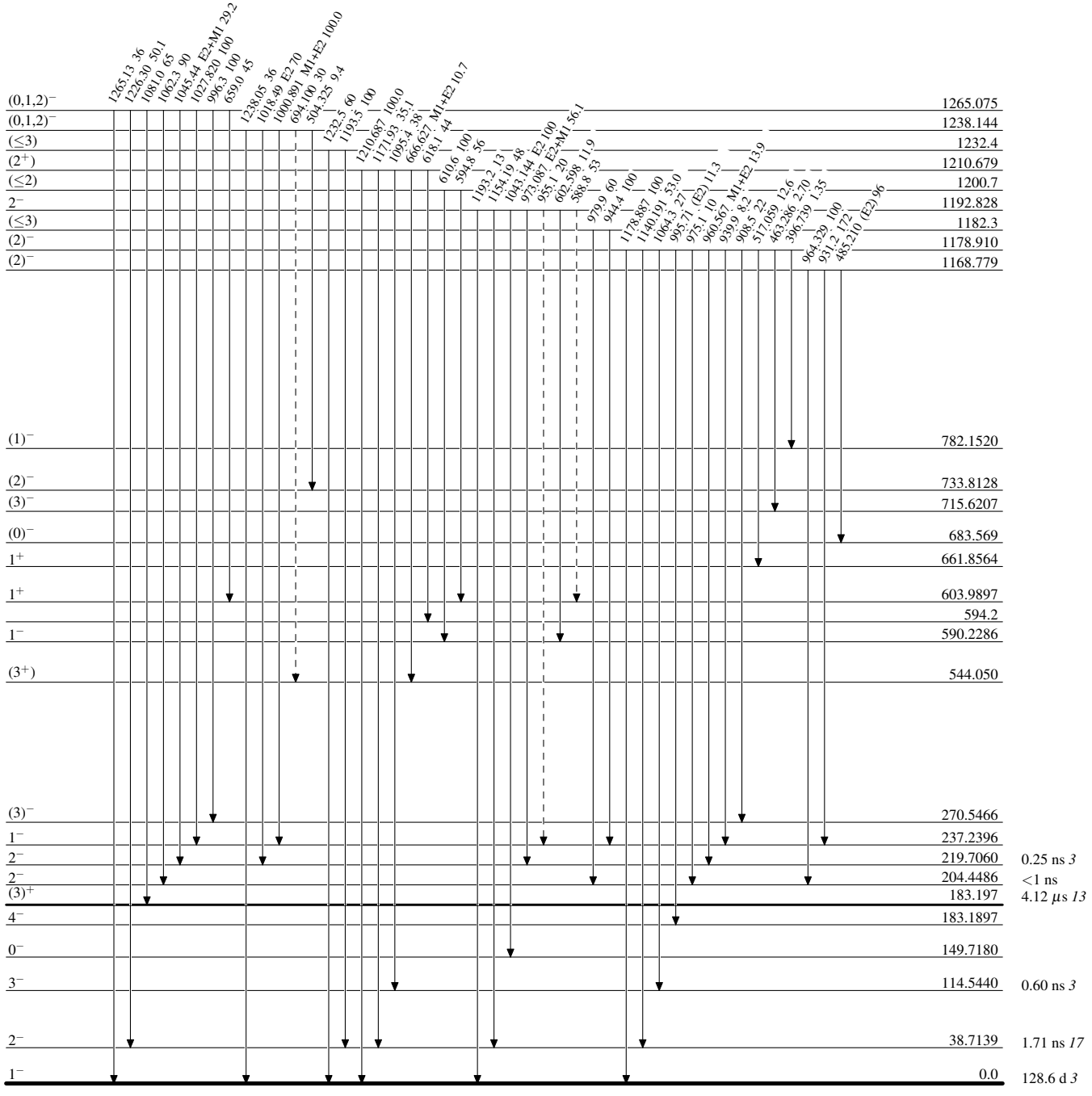
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

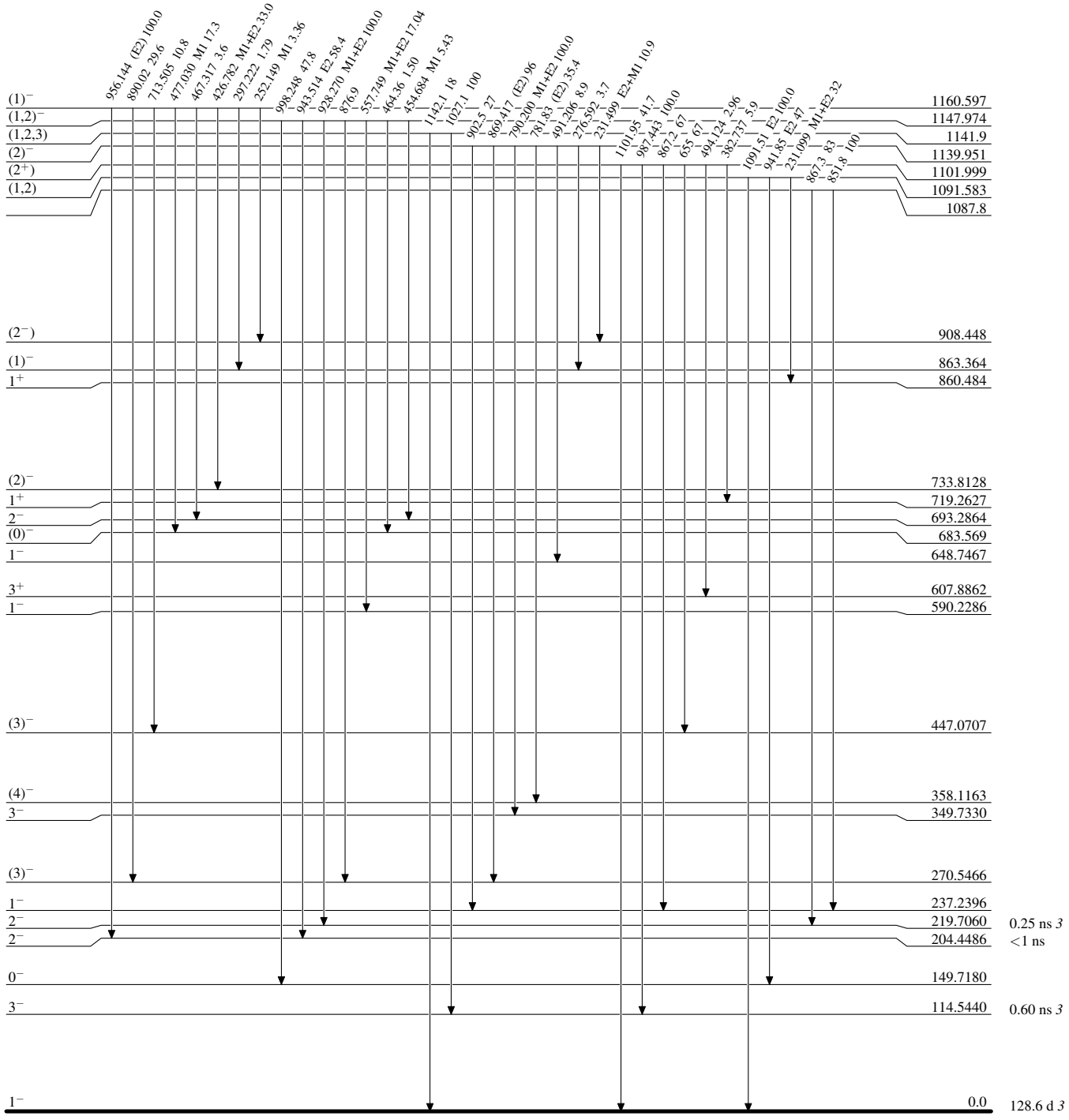


$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

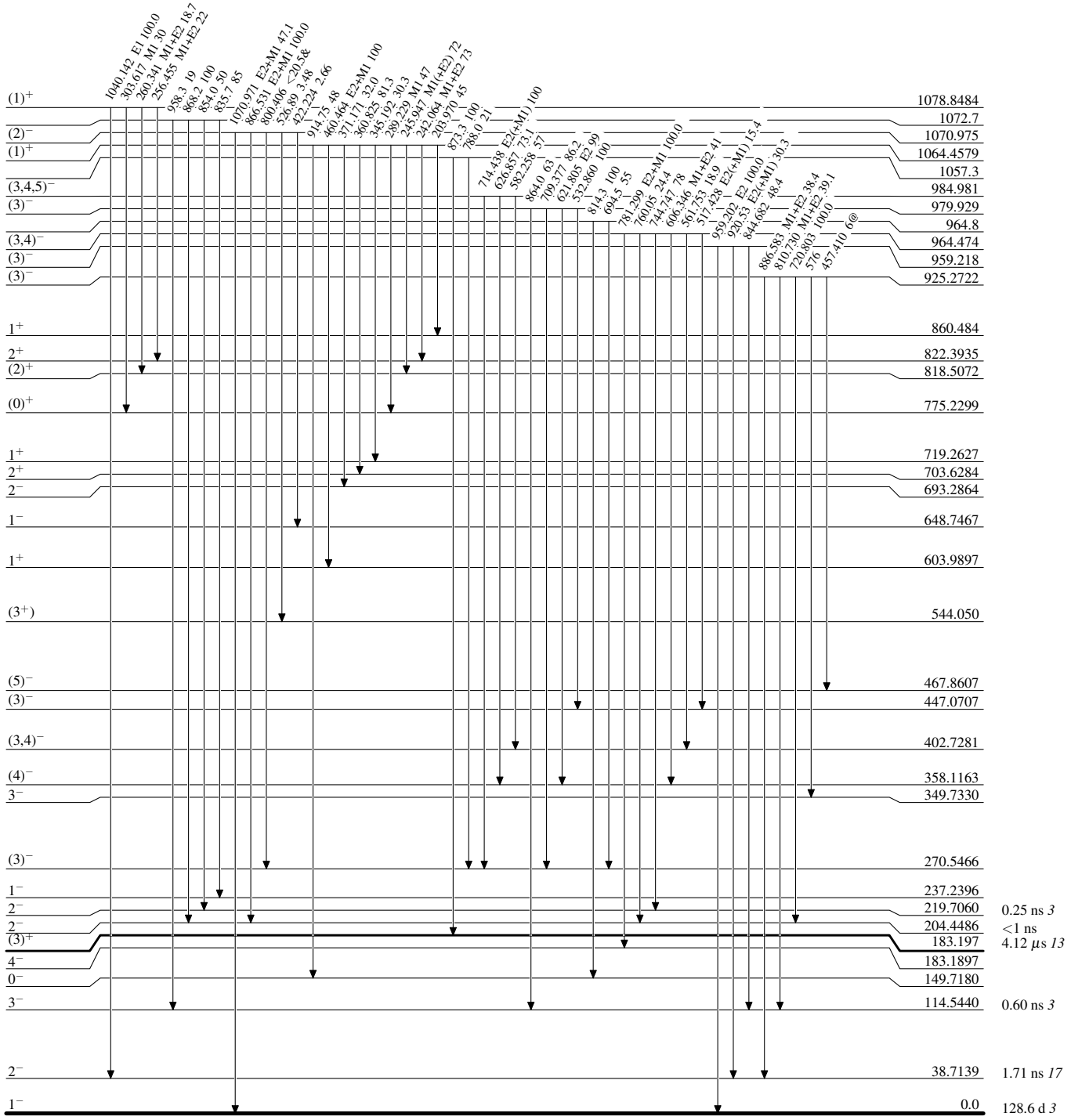


$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas

Level Scheme (continued)

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

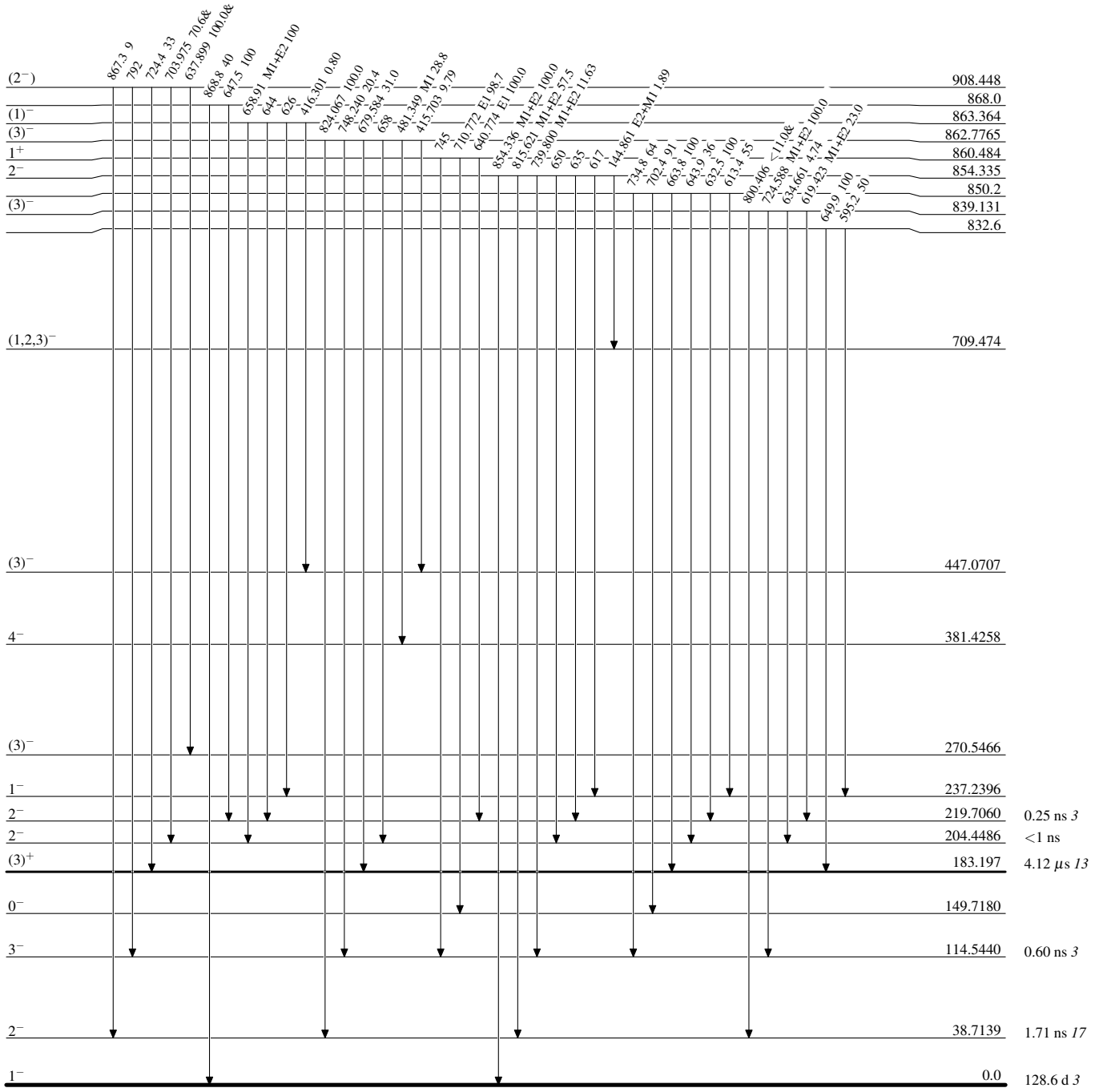


$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas

Level Scheme (continued)

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

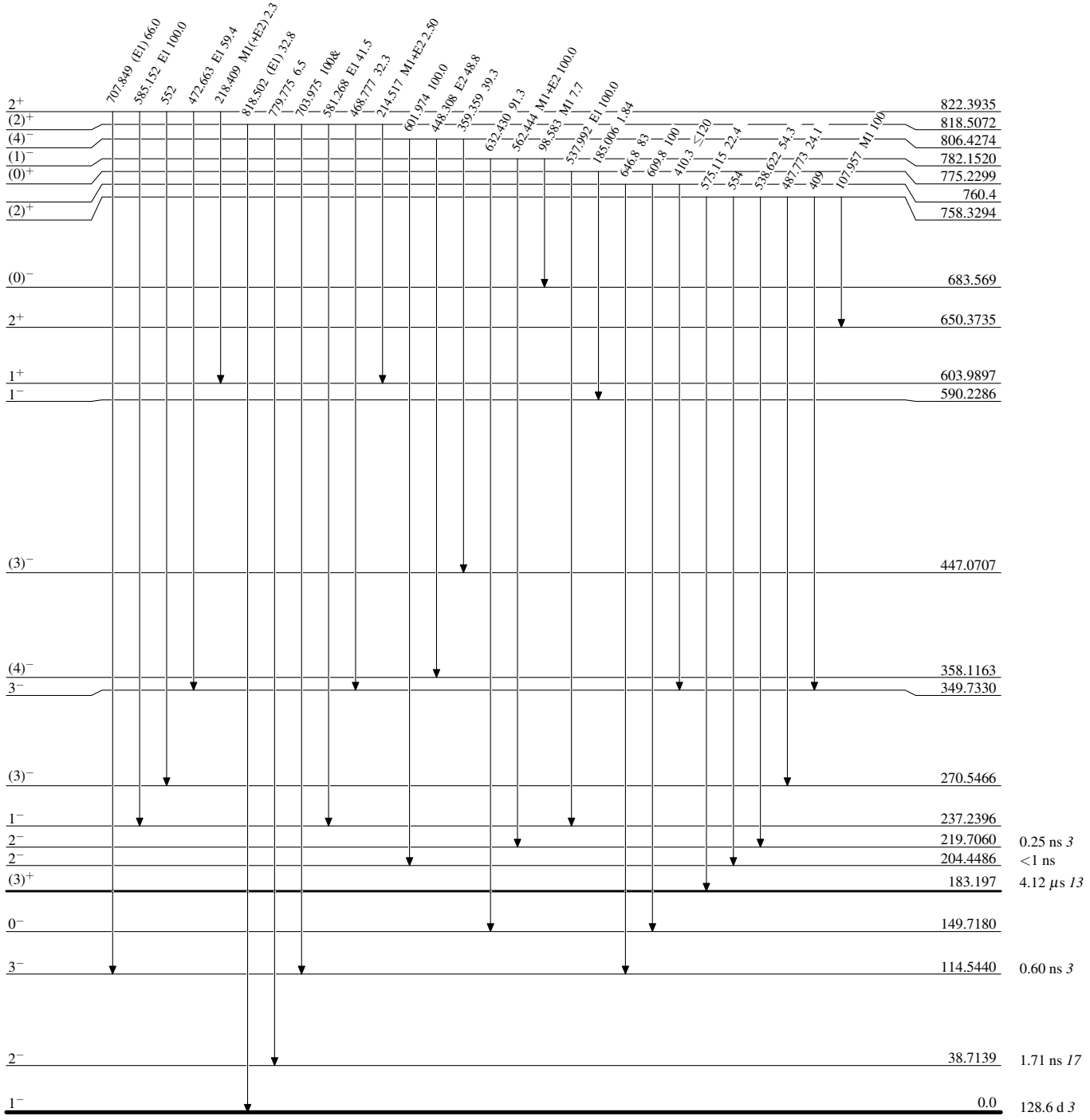


$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas

Level Scheme (continued)

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



$^{170}_{69}Tm_{101}$

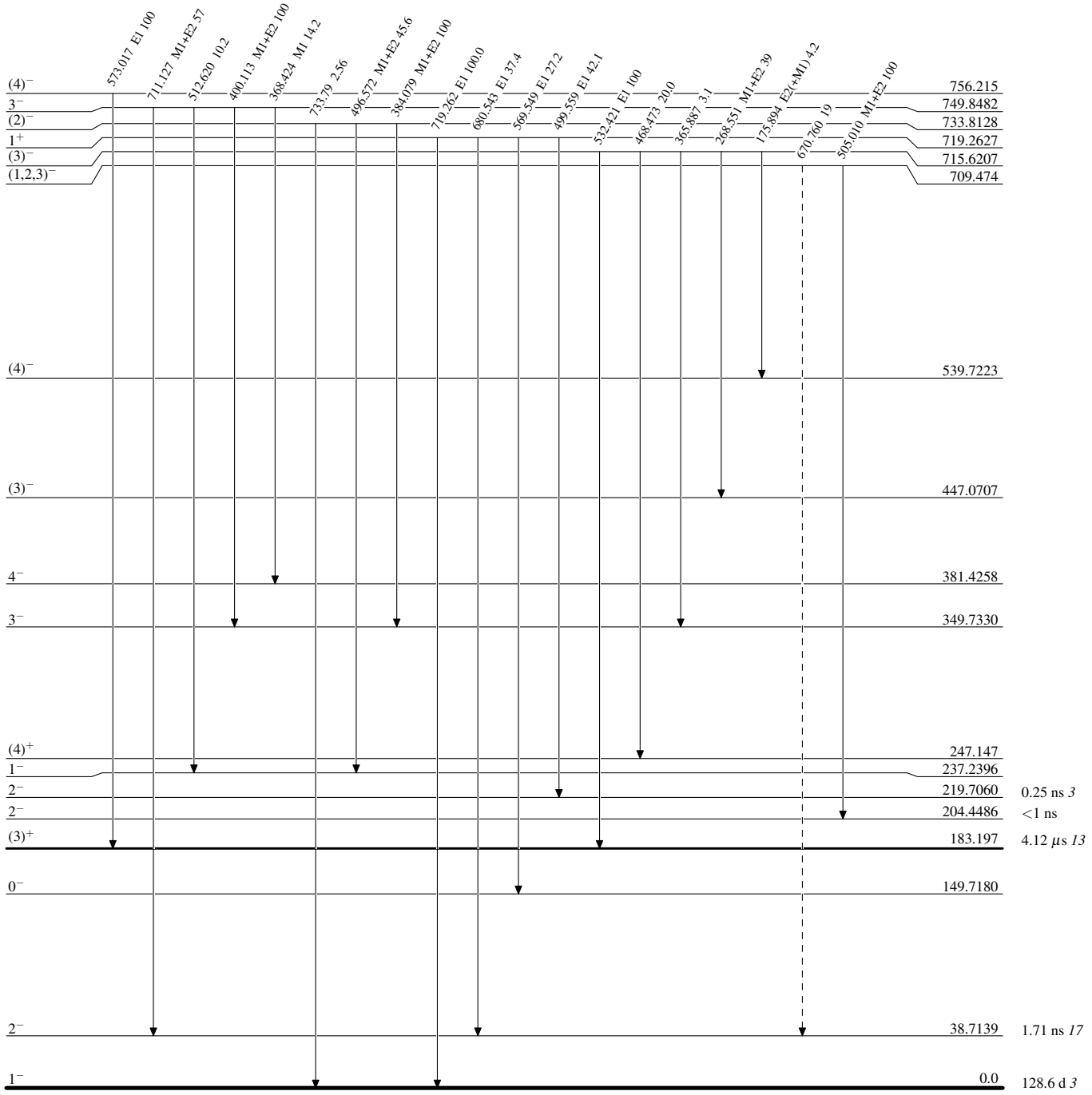
Adopted Levels, Gammas

Level Scheme (continued)

Legend

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

γ Decay (Uncertain)

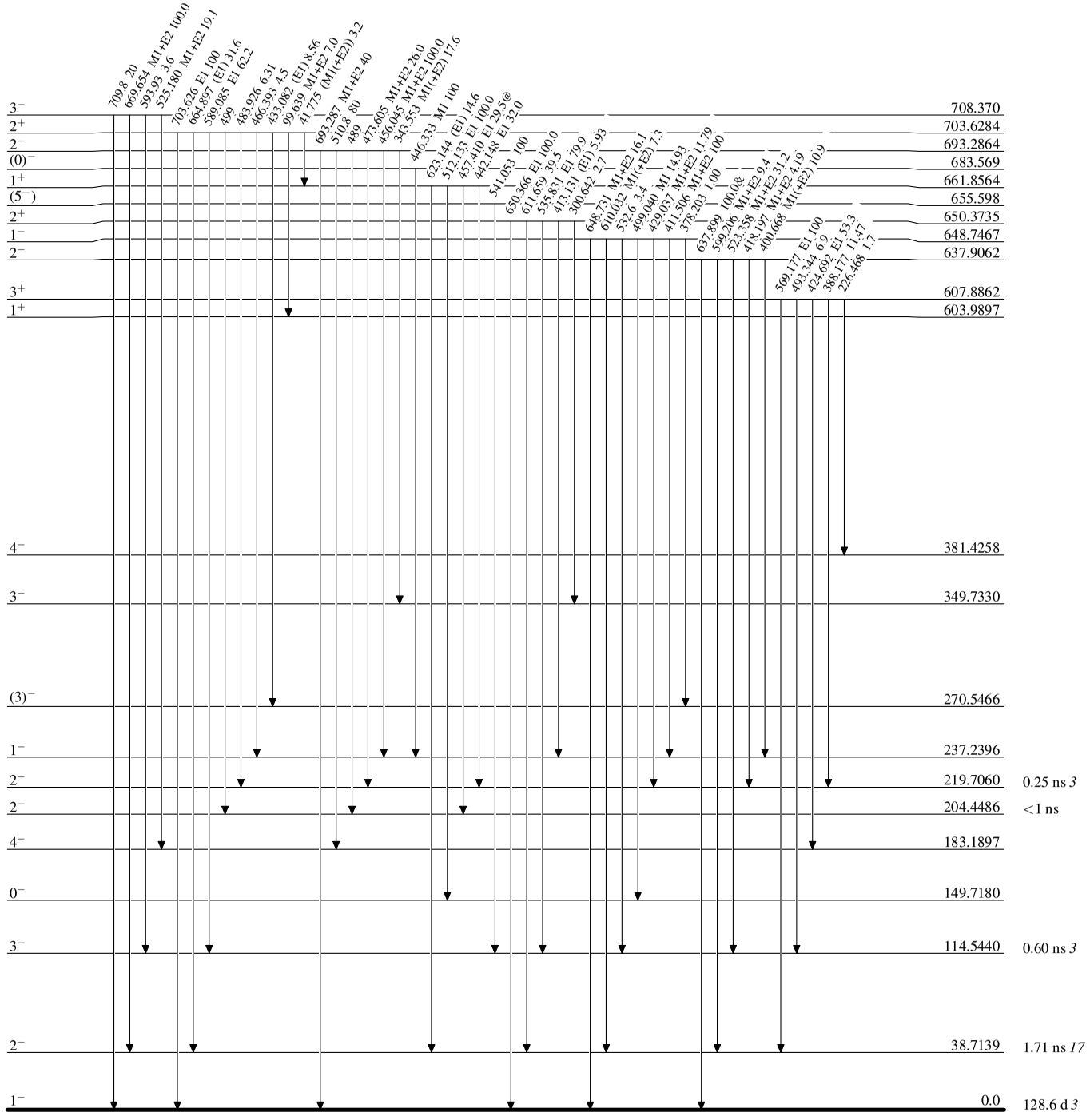


$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas

Level Scheme (continued)

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

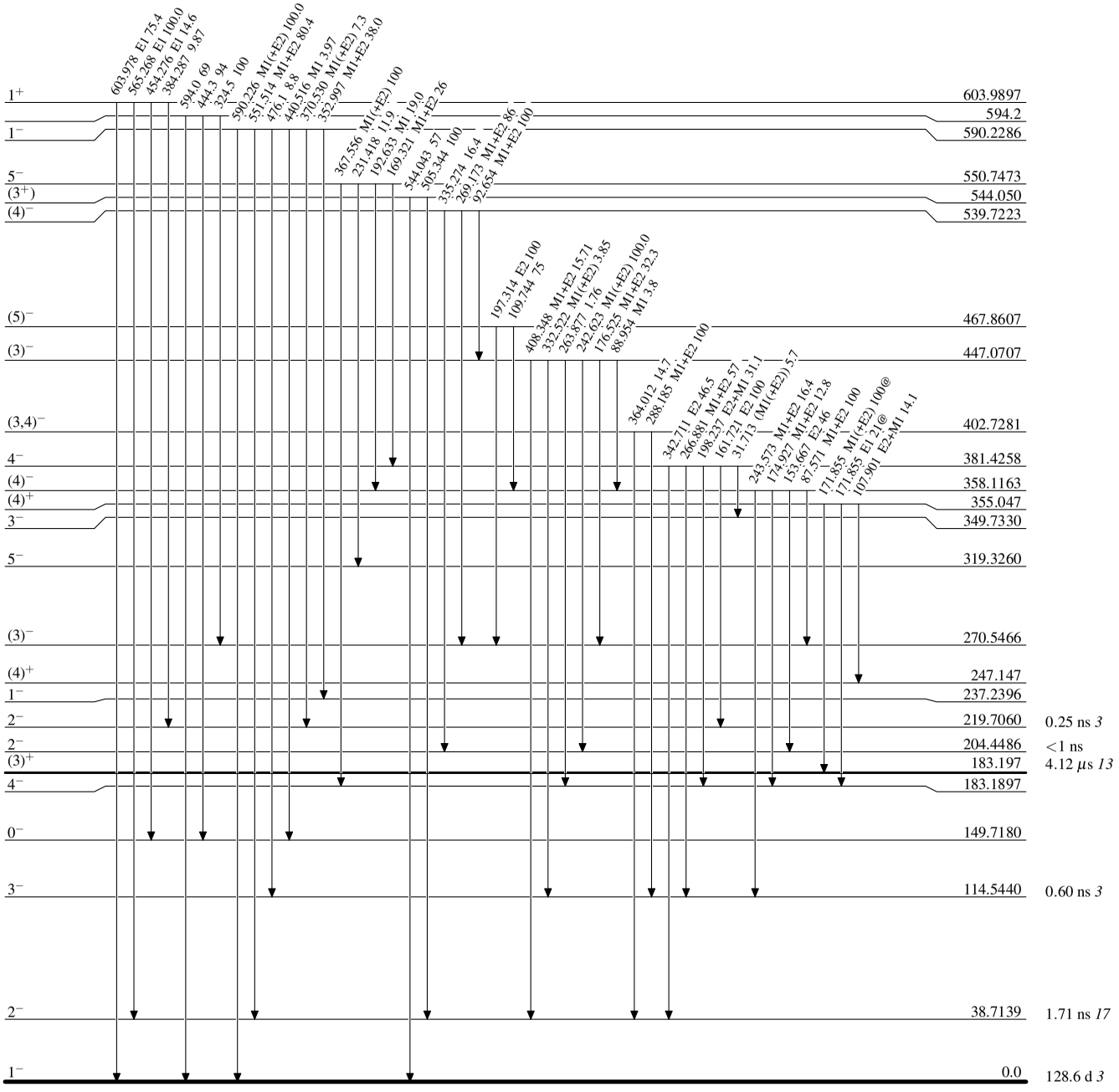


$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas

Level Scheme (continued)

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

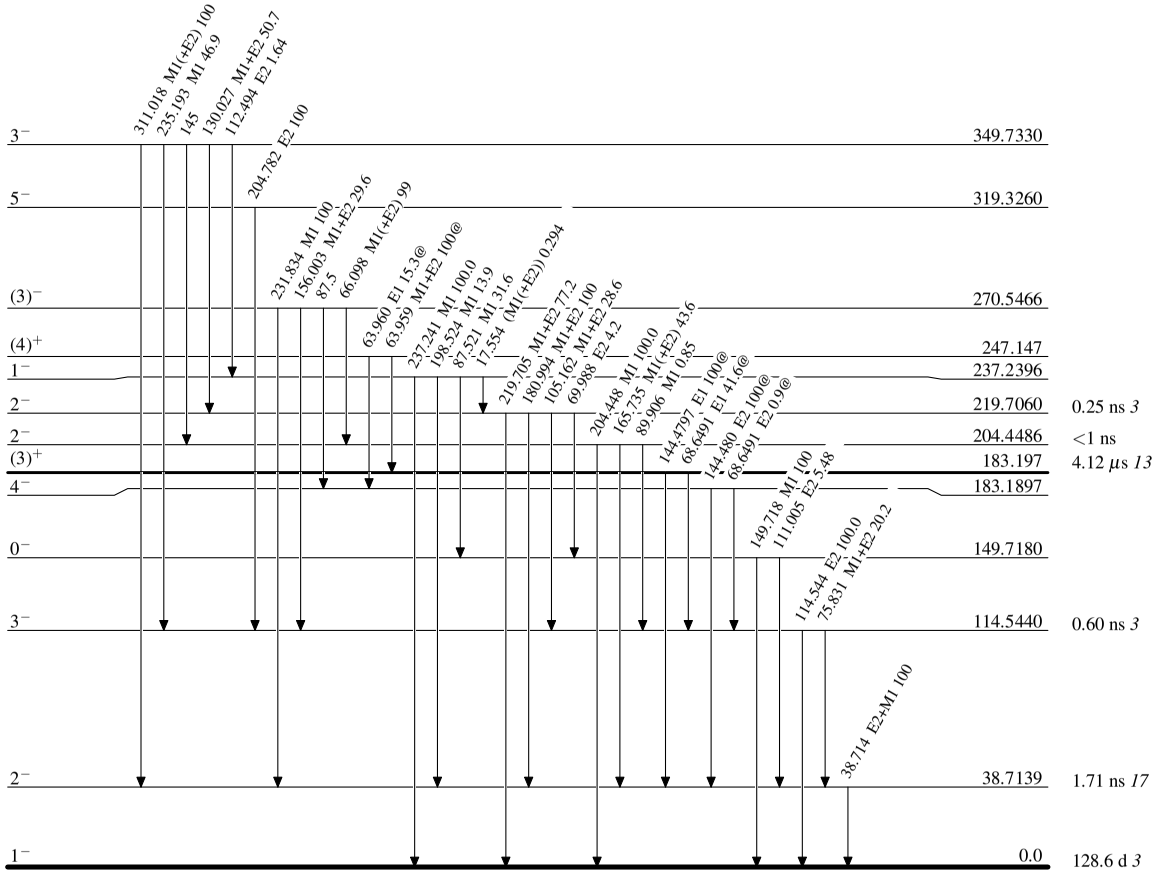


$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas

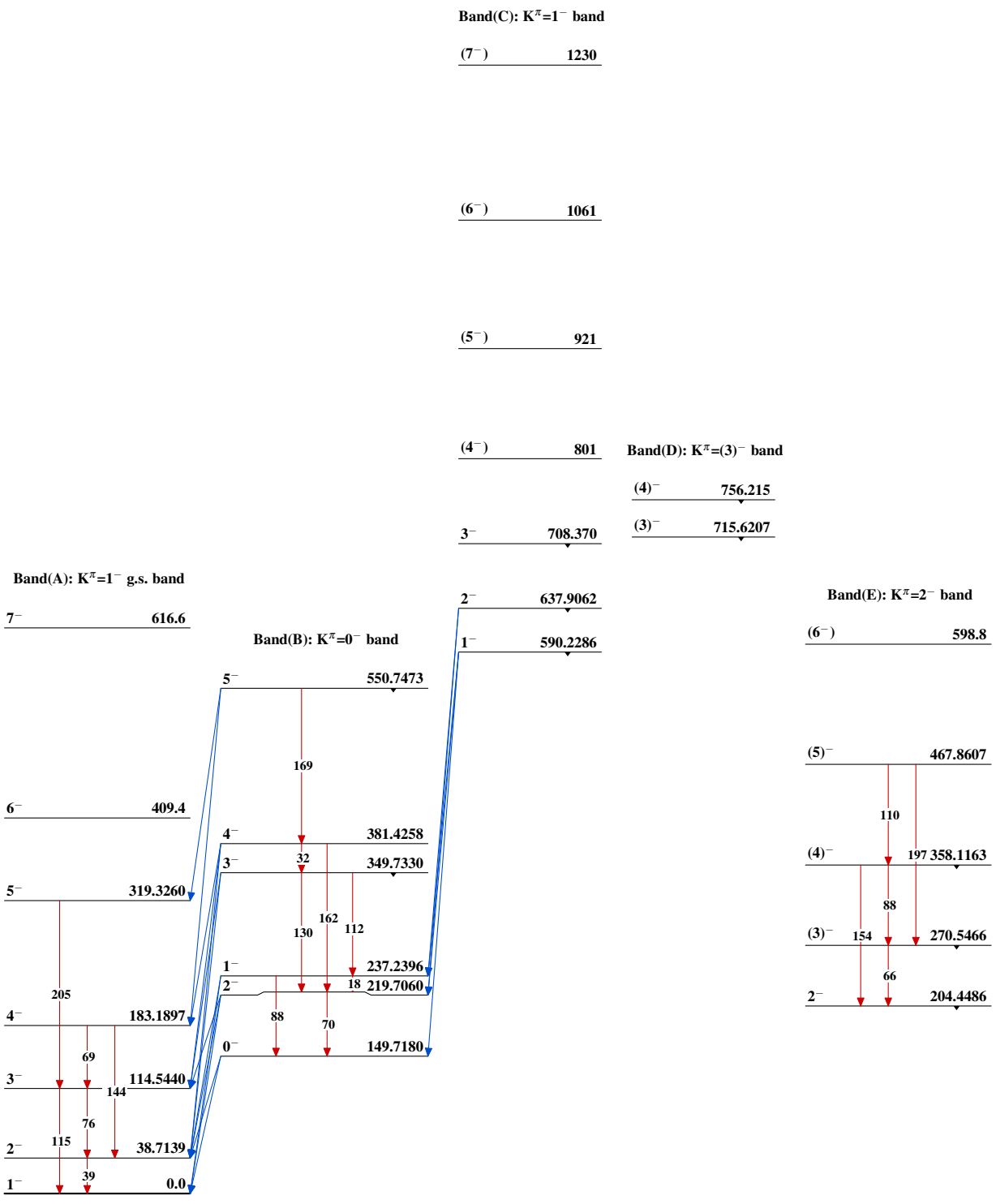
Level Scheme (continued)

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



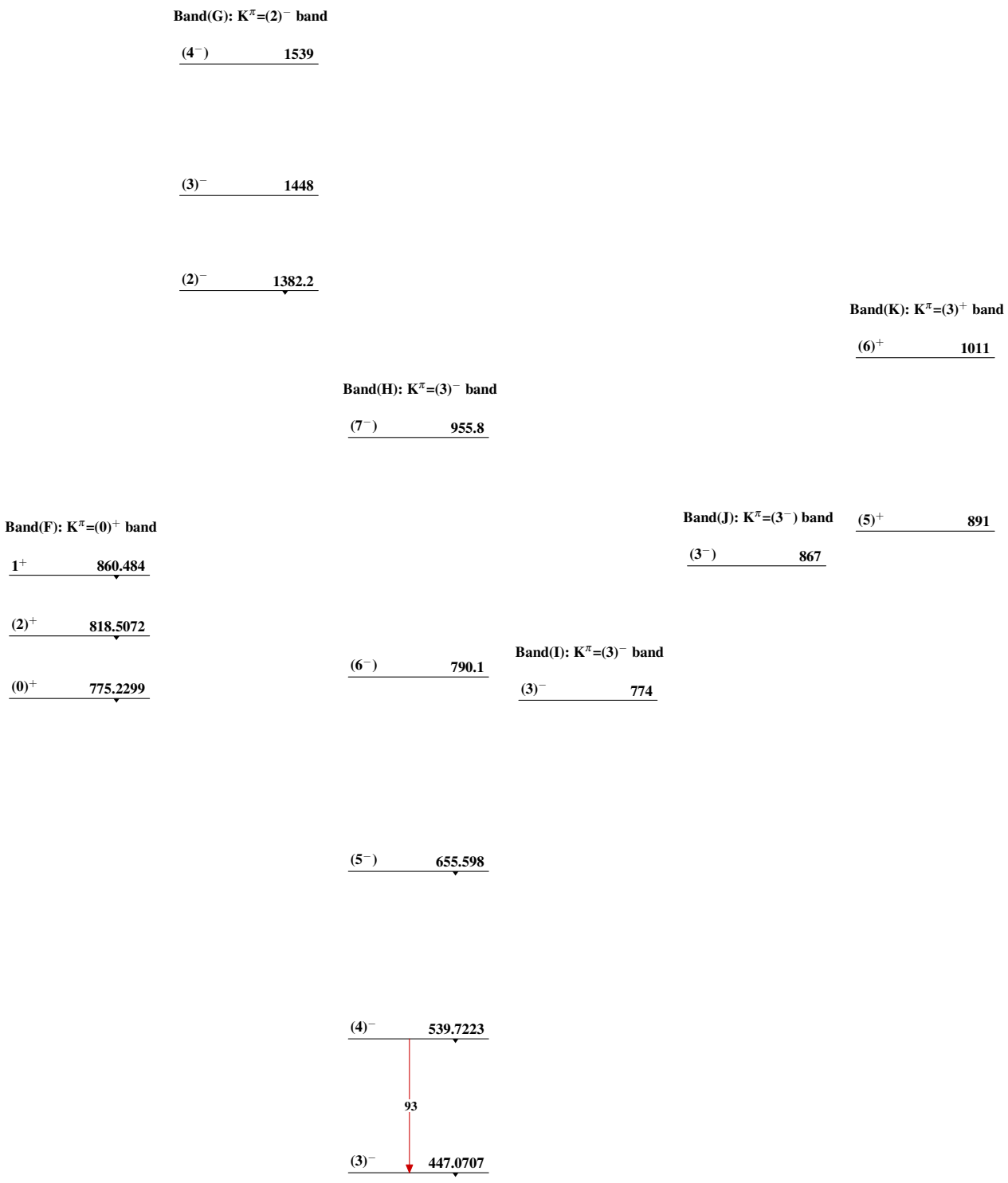
$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas



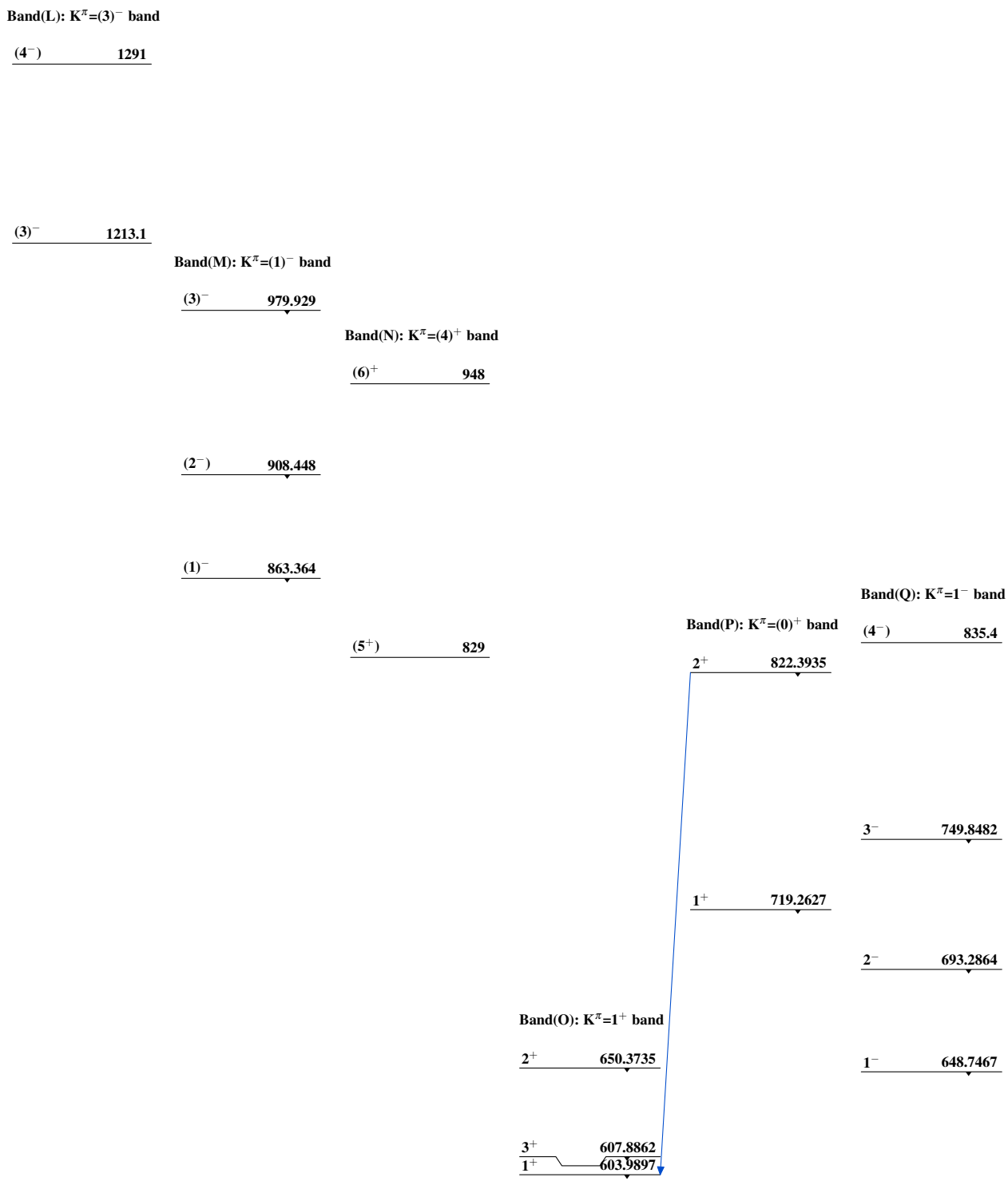
$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas (continued)



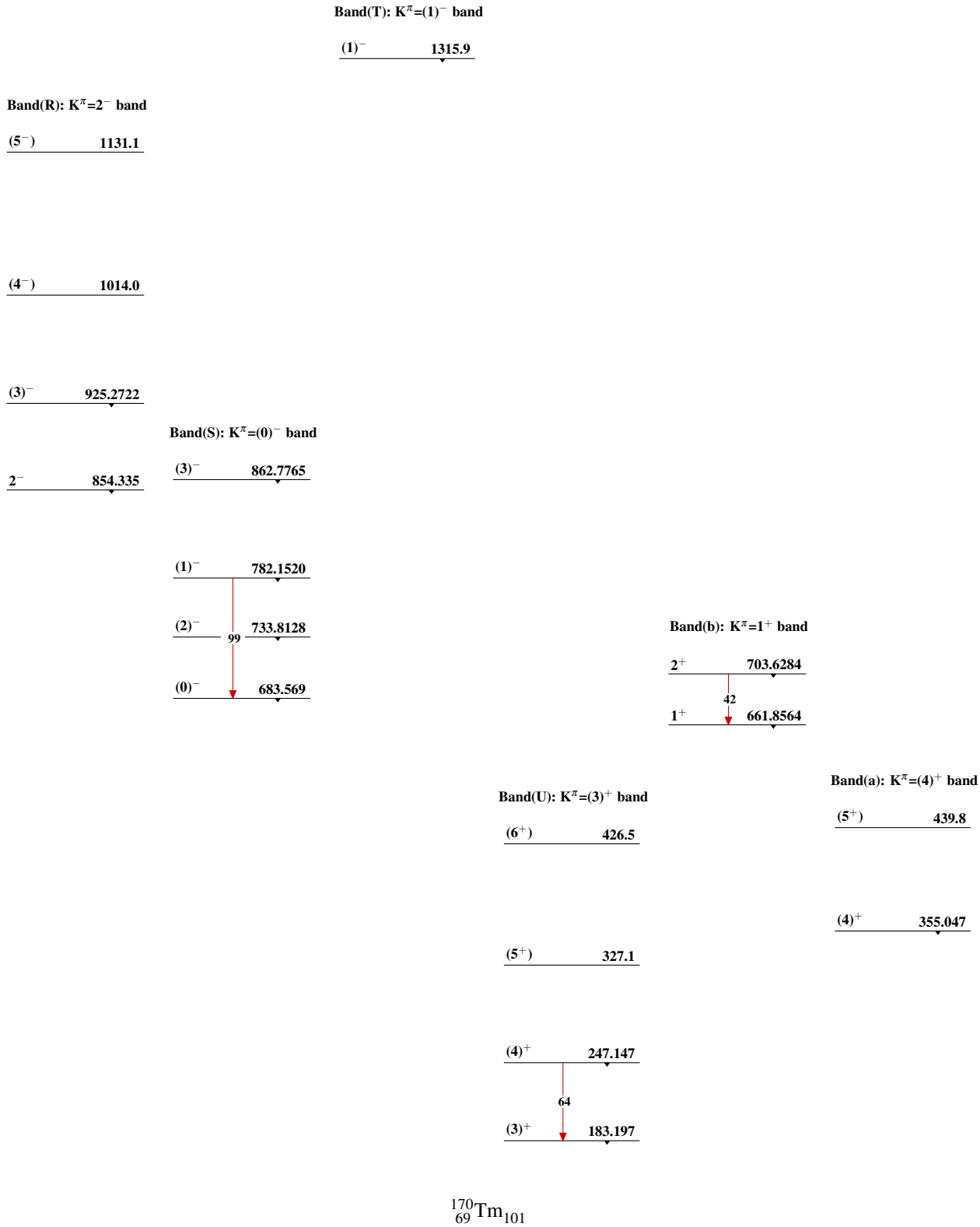
$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas (continued)



$^{170}_{69}Tm_{101}$

Adopted Levels, Gammas (continued)



$^{170}_{69}Tm_{101}$