Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich	NDS 113, 157 (2012)	31-Dec-2010

Q(β^-)=−4.73×10^3 *3*; S(n)=9.94×10^3 *4*; S(p)=2.56×10^3 *4*; Q(α)=3.04×10^3 *3* 2017Wa10
Q(ε)=3.99×10^3 *3*; S(2n)=1.800×10^4 *4*; S(2p)=8.32×10^3 *4* 2017Wa10
Additional information 1.
Additional information 2.
Data are from ^{159}Yb ε decay and (HI,xnγ) studies.

^{159}Tm Levels

Cross Reference (XREF) Flags

A (HI,xnγ)
B ^{159}Yb ε decay

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	XREF	Comments
0[@]	5/2$^+$	9.13 min *16*	AB	%ε+%β^+=100 μ=+3.42 *3*; Q=+1.93 *7* J$^\pi$: J from atomic beam (1971Ek01). π=+, from μ in comparison with values expected for π5/2[402] Nilsson orbital (1989Be04). T$_{1/2}$: Weighted average of 9.0 min *4* (1975St07) and 9.15 min *17* (1982By03). Others: 9 min (1975Ag03); 12 min *1* (1970DeZF); and 11 min *3* (1968GrZX). μ: From the evaluation by 1989Ra17, based on the value 3.804 *34* from 1988Al04, but recomputed by 1989Ra17. See also the compilation by 2005St24. Others: 3.44 *3* (1986Al32) and 3.41 *3* (1987Mi31), both by the same authors as 1988Al04. Q: From the evaluation by 1989Ra17, based on data of 1988Al04. See also the compilation by 2005St24. Other: 1.93 *7* (1987Mi31), by same authors as 1988Al04. δ<r^2> results are given by 1985AlZR, 1986Al32, 1987Mi31, and 1988Al04; these all have authors in common. From 1987Mi31 (and 1988Al04) δ<r^2>(^{159}Tm−^{169}Tm)=0.850 fm^2 *4* directly from table and by subtraction of two values δ<r^2>(^{159}Tm−^{160}Tm)=0.109 fm^2 *6*. From an evaluation of data on nuclear rms charge radii, 2004An14 report <r^2>$^{1/2}$=5.140 fm *6*.
52.98[a] *8*	(7/2)$^+$		AB	J$^\pi$: From M1 γ to 5/2$^+$ and expected presence of the π7/2[404] Nilsson state.
62.18[&]	(1/2)$^+$		B	J$^\pi$: From E2 γ to 5/2$^+$ level and proposed π1/2[411] bandhead.
77.76[&] *7*	(3/2$^+$)		B	J$^\pi$: From (E2+M1) γ to 5/2$^+$ level and proposed band structure.
166.17[c] *5*	(7/2$^-$)	37.5 ns *13*	AB	T$_{1/2}$: Weighted average of 37 ns *5* from $\gamma\gamma$(t) in (HI,xnγ) (1985An09) and 37.5 ns *13* from $\gamma\gamma$(t) in ^{159}Yb ε decay (1992Tl01). J$^\pi$: From γ's to 5/2$^+$ and (7/2)$^+$ levels and expected presence of the π7/2[523] Nilsson orbital.
177.12[@] *5*	(7/2)$^+$		B	J$^\pi$: From M1 γ to 5/2$^+$ level and band structure.
182.7[d]	(9/2$^-$)		A	J$^\pi$: From (E2) γ from (13/2$^-$) level and band structure.
232.6[c]	(11/2$^-$)		A	E(level): Energy from 1985An09 in (HI,xnγ). See the comment in the (HI,xnγ) source data set. J$^\pi$: From expected band structure.
246.70[a] *11*	(9/2)$^+$		AB	J$^\pi$: From M1 γ to (7/2)$^+$ level and proposed band structure.
253.79[&] *8*	(5/2$^+$)		B	J$^\pi$: From γ to 5/2$^+$ level, E2 γ to (3/2$^+$), and band structure.
316.89[&] *8*	(7/2$^+$)		B	J$^\pi$: From E2 γ to (3/2$^+$) level, γ to (7/2)$^+$, and band structure.
374.52[@] *18*	(9/2)$^+$		B	J$^\pi$: From E2 γ to (7/2)$^+$ level and band structure.

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Adopted Levels, Gammas (continued)

^{159}Tm Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
456.7[a]	(11/2+)	7.7 ps *23*	A	Jπ: From γ to (7/2)+ level, γ to (9/2+), and proposed band structure.
463.6[d]	(13/2−)	14.8 ps *11*	A	Jπ: From M1 component in the γ to (11/2−) and proposed band structure.
479.88[e] *9*	(3/2+)		B	Jπ: From γ's to (3/2+), (7/2−), (7/2)+, and (5/2+) levels and expected presence of the π3/2[411] Nilsson orbital.
496.38 *7*			B	
556.31 *9*	(5/2−,7/2−,9/2−)		B	
563.4[c]	(15/2−)	10.5 ps *5*	A	
572.66 *9*			B	
584.31 *10*			B	
638.93 *13*			B	
644.67 *10*			B	
691.3[b]	(13/2+)	3 ps *3*	A	
773.31 *13*			B	
813.19 *14*			B	
835.20 *17*			B	
902.90 *13*			B	
908.8[d]	(17/2−)	1.2 ps *3*	A	
946.3[a]	(15/2+)	3.5 ps *7*	A	
1018.02 *15*			B	
1025.1[c]	(19/2−)	2.6 ps *2*	A	
1062.73 *14*			B	
1212.82 *19*			B	
1217.5[b]	(17/2+)	<3.5 ps	A	
1296.45 *16*			B	
1392.68 *20*			B	
1399.84 *22*			B	
1458.2[d]	(21/2−)	1.5 ps *3*	A	
1507.0[a]	(19/2+)	0.7 ps *3*	A	
1551.65 *24*			B	
1583.3[c]	(23/2−)	1.25 ps *14*	A	
1800.8[b]	(21/2+)	0.6 ps *5*	A	
2076.4[d]	(25/2−)	0.6 ps *5*	A	
2110.0[a]	(23/2+)	0.8 ps *2*	A	
2176.0	(23/2+)		A	
2212.8[c]	(27/2−)	0.6 ps *2*	A	
2374.4[b]	(25/2+)	0.3 ps *3*	A	
2422.9	(25/2+)		A	
2549.2[a]	(27/2+)	9 ps *4*	A	
2703.5[b]	(29/2+)	4.4 ps *17*	A	
2709.6[d]	(29/2−)	0.4 ps *4*	A	
2862.3[c]	(31/2−)	0.6 ps *2*	A	
2911.1[a]	(31/2+)	5.1 ps *8*	A	
3139.9[d]	(33/2−)	0.8 ps *2*	A	
3158.7[b]	(33/2+)	1.1 ps *5*	A	
3348.6[c]	(35/2−)	1.2 ps *2*	A	
3402.4[a]	(35/2+)	1.2 ps *3*	A	
3582.7[d]	(37/2−)	1.1 ps *3*	A	
3733.6[b]	(37/2+)	0.35 ps *14*	A	
3859.2[c]	(39/2−)	1.3 ps *2*	A	
4019.4[a]	(39/2+)	0.42 ps *14*	A	
4135.2[d]	(41/2−)	0.35 ps *14*	A	

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Adopted Levels, Gammas (continued)

^{159}Tm Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	E(level)†	Jπ‡	XREF
4404.6[b]	(41/2+)	<1.0 ps	A	5906.9[c]	(51/2−)	A
4458.8[c]	(43/2−)	0.48 ps *14*	A	6302.7[d]	(53/2−)	A
4742?[a]	(43/2+)		A	6740.5[c]	(55/2−)	A
4778.7[d]	(45/2−)	0.28 ps *14*	A	7172.2[d]	(57/2−)	A
5144.0[c]	(47/2−)	0.35 ps *14*	A	7649.5[c]	(59/2−)	A
5503.7[d]	(49/2−)	0.2 ps *2*	A	8132.2[d]	(61/2−)	A

† Values are from the individual source data sets.
‡ For levels below 490 keV, explicit arguments are given. Above this energy, they are all from the (HI,xnγ) studies and are based on $\gamma(\theta)$ measurements and the proposed band structure.
# From (HI,xnγ) study of 1987Ga09 by the recoil-distance method, unless otherwise noted.
@ Band(A): $K^\pi=5/2^+$, $\pi5/2[402]$ band.
& Band(B): $K^\pi=1/2^+$, $\pi1/2[411]$ band. α=22.1 keV, a=−0.59.
a Band(C): $K^\pi=7/2^+$, $\pi7/2[404]$ band, $\alpha=-1/2$ branch.
b Band(D): $K^\pi=7/2^+$, $\pi7/2[404]$ band, $\alpha=+1/2$ branch.
c Band(E): $K^\pi=7/2^-$, $\pi7/2[523]$ band, $\alpha=-1/2$ branch. See the comment on the $\alpha=+1/2$ branch.
d Band(F): $K^\pi=7/2^-$, $\pi7/2[523]$ band, $\alpha=+1/2$ branch. Alignment of a pair of $i_{13/2}$ neutrons is observed near the $29/2^-$ state.
e Band(G): $K^\pi=3/2^+$, $\pi3/2[411]$ bandhead.

Adopted Levels, Gammas (continued)

$\gamma(^{159}Tm)$

E_i(level)	J_i^π	E_γ [†‡]	I_γ	E_f	J_f^π	Mult.[#]	δ[@]	α[&]	Comments
52.98	$(7/2)^+$	52.8	100	0	$5/2^+$	M1+E2	0.11 *2*		
62.18	$(1/2)^+$	62.18	100	0	$5/2^+$	E2			
77.76	$(3/2^+)$	77.70 *10*	100	0	$5/2^+$	(E2,M1)		7.5 *9*	Mult.: From intensity balance considerations.
166.17	$(7/2^-)$	113.18 *6*	13.2 *7*	52.98	$(7/2)^+$	E1		0.242	B(E1)(W.u.)=4.5×10^{-7} *3*
		166.16 *5*	100	0	$5/2^+$	[E1]		0.088	B(E1)(W.u.)=1.07×10^{-6} *4*
177.12	$(7/2)^+$	177.12 *5*	100	0	$5/2^+$	M1			
232.6	$(11/2^-)$	50.0		182.7	$(9/2^-)$				
		66.2		166.17	$(7/2^-)$				E_γ: Eγ deduced from the 232 and 166 level energies.
246.70	$(9/2)^+$	193.72 *8*	100	52.98	$(7/2)^+$	M1			
253.79	$(5/2^+)$	176.01 *5*	100 *9*	77.76	$(3/2^+)$	E2			
		253.4 *3*	21 *7*	0	$5/2^+$				
316.89	$(7/2^+)$	139.77 *9*	5.5 *10*	177.12	$(7/2)^+$				
		239.17 *11*	100 *7*	77.76	$(3/2^+)$	E2			
374.52	$(9/2)^+$	197.5 *2*	100	177.12	$(7/2)^+$	E2			
456.7	$(11/2^+)$	210.3	38 *3*	246.70	$(9/2)^+$	E2+M1		0.30 *8*	
		403.9	100 *3*	52.98	$(7/2)^+$	E2		0.0302	B(E2)(W.u.)=9.E+1 *3*
463.6	$(13/2^-)$	230.93 *3*	100 *2*	232.6	$(11/2^-)$	E2+M1	0.32 *2*	0.282 *5*	B(M1)(W.u.)=0.070 *6*; B(E2)(W.u.)=68 *10*
		280.9 *2*	26 *2*	182.7	$(9/2^-)$	E2		0.0873	B(E2)(W.u.)=71 *8*
479.88	$(3/2^+)$	225.85 *14*	81 *11*	253.79	$(5/2^+)$				
		302.7 *2*	30 *5*	177.12	$(7/2)^+$				
		314.1 *4*	14 *8*	166.17	$(7/2^-)$				
		402.15 *10*	100 *11*	77.76	$(3/2^+)$				
496.38		330.24 *8*	100 *7*	166.17	$(7/2^-)$				
		496.30[a] *11*	37 *3*	0	$5/2^+$				
556.31	$(5/2^-,7/2^-,9/2^-)$	390.20 *8*	100	166.17	$(7/2^-)$	M1			
563.4	$(15/2^-)$	99.9 *3*	18.1 *16*	463.6	$(13/2^-)$	E2+M1	<0.40	3.11 *6*	B(M1)(W.u.)>0.16; B(E2)(W.u.)<1.6×10^3 B(M1)(W.u.): For δ=0, B(M1)(W.u.)=0.212 *25*, representing a sort of upper limit for this value.
		330.80 *3*	100 *7*	232.6	$(11/2^-)$	E2		0.0534	B(E2)(W.u.)=148 *15*
572.66		319.1 *3*	16 *4*	253.79	$(5/2^+)$				
		395.7 *2*	23 *7*	177.12	$(7/2)^+$				
		406.54[c] *13*	73[c] *16*	166.17	$(7/2^-)$				
		572.46 *14*	100 *7*	0	$5/2^+$				
584.31		267.42 *14*	100 *9*	316.89	$(7/2^+)$				
		330.50 *10*	100 *36*	253.79	$(5/2^+)$				
638.93		322.08 *11*	100 *8*	316.89	$(7/2^+)$				
		638.6 *3*	23 *7*	0	$5/2^+$				
644.67		467.6 *3*	28 *6*	177.12	$(7/2)^+$				
		478.38[c] *13*	93[c] *19*	166.17	$(7/2^-)$				
		644.83 *16*	100 *7*	0	$5/2^+$				
691.3	$(13/2^+)$	234.2	14 *10*	456.7	$(11/2^+)$	E2+M1		0.22 *7*	
		445.2	100 *12*	246.70	$(9/2)^+$	E2		0.0232	B(E2)(W.u.)=1.8×10^2 *18*

$^{159}_{69}Tm_{90}$-4

Adopted Levels, Gammas (continued)

γ(^{159}Tm) (continued)

E_i(level)	J_i^π	E_γ[†‡]	I_γ	E_f	J_f^π	Mult.[#]	δ[@]	α[&]	Comments
773.31		293.34 *10*	100 *6*	479.88	(3/2$^+$)				
		774.1 *3*	23 *6*	0	5/2$^+$				
813.19		496.30[a] *11*	100	316.89	(7/2$^+$)				
835.20		340.2 *7*	21 *11*	496.38					
		580.3 *10*	14 *7*	253.79	(5/2$^+$)				
		668.98 *17*	100 *7*	166.17	(7/2$^-$)				
902.90		406.54[c] *13*	88[c] *31*	496.38					
		736.7 *2*	100 *12*	166.17	(7/2$^-$)				
908.8	(17/2$^-$)	345.35 *4*	100 *6*	563.4	(15/2$^-$)	E2+M1	0.36 *3*	0.0935 *16*	B(M1)(W.u.)=0.21 *6*; B(E2)(W.u.)=1.1×10^2 *4*
		445.15 *3*	77 *6*	463.6	(13/2$^-$)	E2		0.0232	B(E2)(W.u.)=2.2×10^2 *6*
946.3	(15/2$^+$)	255.1	14 *2*	691.3	(13/2$^+$)	E2+M1		0.17 *6*	
		489.6	100 *2*	456.7	(11/2$^+$)	E2		0.0181	B(E2)(W.u.)=95 *20*
1018.02		461.9 *2*	100 *14*	556.31	(5/2$^-$,7/2$^-$,9/2$^-$)				
		764.1 *3*	27 *8*	253.79	(5/2$^+$)				
		940.0 *3*	36 *5*	77.76	(3/2$^+$)				
1025.1	(19/2$^-$)	116.4 *2*	7.5 *10*	908.8	(17/2$^-$)	E2+M1	0.35 *25*	1.98 *6*	B(M1)(W.u.)=0.29 *7*; B(E2)(W.u.)=1.3×10^3 *+17−13*
		461.69 *3*	100 *3*	563.4	(15/2$^-$)	E2		0.0211	B(E2)(W.u.)=163 *15*
1062.73		478.38[c] *13*	94[c] *38*	584.31					
		885.7 *2*	100 *14*	177.12	(7/2)$^+$				
1212.82		656.8 *3*	29 *7*	556.31	(5/2$^-$,7/2$^-$,9/2$^-$)				
		838.38 *19*	100 *13*	374.52	(9/2)$^+$				
		1034.8 *4*	39 *9*	177.12	(7/2)$^+$				
1217.5	(17/2$^+$)	271.1	11 *4*	946.3	(15/2$^+$)	E2+M1		0.145	
		526.2	100 *6*	691.3	(13/2$^+$)	E2		0.01505	B(E2)(W.u.)>68
1296.45		740.2 *3*	67 *11*	556.31	(5/2$^-$,7/2$^-$,9/2$^-$)				
		799.6 *3*	41 *11*	496.38					
		1243.3 *3*	41 *8*	52.98	(7/2)$^+$				
		1297.0 *3*	100 *20*	0	5/2$^+$				
1392.68		374.7 *3*	100 *21*	1018.02					
		1225.4 *4*	27 *7*	166.17	(7/2$^-$)				
		1340.3 *5*	29 *8*	52.98	(7/2)$^+$				
		1393.3 *4*	34 *6*	0	5/2$^+$				
1399.84		1233.1 *3*	100 *13*	166.17	(7/2$^-$)				
		1400.4 *3*	86 *12*	0	5/2$^+$				
1458.2	(21/2$^-$)	433.22 *5*	80 *4*	1025.1	(19/2$^-$)	E2+M1	0.23 *2*	0.0533	B(M1)(W.u.)=0.074 *16*; B(E2)(W.u.)=10 *3*
		549.43 *3*	100 *4*	908.8	(17/2$^-$)	E2		0.01351	B(E2)(W.u.)=79 *17*
1507.0	(19/2$^+$)	289.5	64 *2*	1217.5	(17/2$^+$)	E2+M1		0.12 *4*	
		560.5	100 *2*	946.3	(15/2$^+$)	E2		0.01286	B(E2)(W.u.)=1.7×10^2 *7*
1551.65		1385.3 *3*	89 *14*	166.17	(7/2$^-$)				
		1499.0 *5*	100 *14*	52.98	(7/2)$^+$				
		1551.8 *5*	93 *14*	0	5/2$^+$				
1583.3	(23/2$^-$)	125.0[d] *1*	3.3 *19*	1458.2	(21/2$^-$)	E2+M1	<0.10	1.637 *24*	B(M1)(W.u.)>0.11; B(E2)(W.u.)<1.4×10^2

$^{159}_{69}Tm_{90}$-5

Adopted Levels, Gammas (continued)

γ(^{159}Tm) (continued)

E_i(level)	J_i^π	E_γ[†‡]	I_γ	E_f	J_f^π	Mult.[#]	δ[@]	α[&]	Comments
									B(M1)(W.u.): For δ=0, B(M1)(W.u.)=0.27 *16*, representing a sort of upper limit for this value.
1583.3	(23/2$^-$)	558.26 *3*	100 *5*	1025.1	(19/2$^-$)	E2		0.01299	B(E2)(W.u.)=148 *21*
1800.8	(21/2$^+$)	293.7	9.0 *20*	1507.0	(19/2$^+$)	E2+M1		0.11 *4*	
		583.5	100 *2*	1217.5	(17/2$^+$)	E2		0.01166	B(E2)(W.u.)=2.5×10^2 *21*
2076.4	(25/2$^-$)	493.3 *2*	76 *7*	1583.3	(23/2$^-$)	E2+M1	0.34 *7*	0.0369 *10*	B(M1)(W.u.)=0.12 *10*; B(E2)(W.u.)=3.E+1 *3*
		618.2 *1*	100 *7*	1458.2	(21/2$^-$)	E2		0.01015	B(E2)(W.u.)=1.1×10^2 *10*
2110.0	(23/2$^+$)	309.2	13 *2*	1800.8	(21/2$^+$)	E2+M1		0.10 *4*	
		603.1	100 *2*	1507.0	(19/2$^+$)	E2		0.01077	B(E2)(W.u.)=1.5×10^2 *4*
2176.0	(23/2$^+$)	717.4		1458.2	(21/2$^-$)				
2212.8	(27/2$^-$)	136.3	3.2 *9*	2076.4	(25/2$^-$)	[M1+E2]		1.13 *16*	
		629.44 *3*	100.0 *18*	1583.3	(23/2$^-$)	E2		0.00973	B(E2)(W.u.)=1.7×10^2 *6*
2374.4	(25/2$^+$)	198.3	38 *21*	2176.0	(23/2$^+$)	[M1+E2]		0.36 *9*	
		264.3	7×10^1 *4*	2110.0	(23/2$^+$)	E2+M1		0.15 *5*	
		573.5	6×10^1 *3*	1800.8	(21/2$^+$)	E2		0.01216	B(E2)(W.u.)=1.2×10^2 *+14−12*
		791.0	1.0×10^2 *6*	1583.3	(23/2$^-$)	[E1]		0.00224	B(E1)(W.u.)=0.0005 *+7−5*
2422.9	(25/2$^+$)	313.0		2110.0	(23/2$^+$)	E2+M1			
		622.1		1800.8	(21/2$^+$)	E2			
		839.7		1583.3	(23/2$^-$)				
2549.2	(27/2$^+$)	125.9		2422.9	(25/2$^+$)	E2+M1		1.45 *16*	
		174.7	8×10^1 *3*	2374.4	(25/2$^+$)	E2+M1		0.52 *12*	
		373.0	1×10^2 *5*	2176.0	(23/2$^+$)	E2		0.0377	B(E2)(W.u.)=6.E1 +30-6 B(E2)(W.u.): Value computed neglecting the contribution of the 125.9 γ. Including this will tend to reduce it.
		439.5	8×10^1 *5*	2110.0	(23/2$^+$)	E2		0.0240	B(E2)(W.u.)=19.5 *+365−20* B(E2)(W.u.): Value computed neglecting the contribution of the 125.9 γ. Including this will tend to reduce it.
2703.5	(29/2$^+$)	154.3		2549.2	(27/2$^+$)	E2+M1		0.77 *14*	
		280.5		2422.9	(25/2$^+$)	E2		0.0877	
		329.2	1.0×10^2 *3*	2374.4	(25/2$^+$)	E2			B(E2)(W.u.)=7.E+2 *4* B(E2)(W.u.): Value computed neglecting contributions from the 154.3 and 280.5 γ's. Including these may reduce it.
2709.6	(29/2$^-$)	496.9 *1*	46 *6*	2212.8	(27/2$^-$)	E2+M1	0.25 *8*	0.0372 *10*	B(M1)(W.u.)=0.13 *+14−13*; B(E2)(W.u.)=17 *+20−17*
		633.3 *1*	100 *6*	2076.4	(25/2$^-$)	E2		0.00959	B(E2)(W.u.)=1.8×10^2 *18*
2862.3	(31/2$^-$)	152.71 *6*	8.5 *35*	2709.6	(29/2$^-$)	E2+M1	<0.20	0.924 *14*	B(M1)(W.u.)>0.33; B(E2)(W.u.)<9.5×10^2 B(M1)(W.u.): For δ=0, B(M1)(W.u.)=0.7 *4*, representing a sort of upper limit for this quantity.
		649.51 *3*	100 *7*	2212.8	(27/2$^-$)	E2		0.00904	B(E2)(W.u.)=1.4×10^2 *5*
2911.1	(31/2$^+$)	206.5	100 *21*	2703.5	(29/2$^+$)	E2+M1		0.32 *9*	
		361.0	60 *27*	2549.2	(27/2$^+$)	E2		0.0414	B(E2)(W.u.)=1.1×10^2 *6*
3139.9	(33/2$^-$)	277.5 *1*	100 *6*	2862.3	(31/2$^-$)	E2+M1	<0.10	0.178 *3*	B(M1)(W.u.)>0.60; B(E2)(W.u.)<67 B(M1)(W.u.): for δ=0, B(M1)(W.u.)=0.82 *22*, representing a sort of upper limit for this quantity.

$^{159}_{69}Tm_{90}$-6

Adopted Levels, Gammas (continued)

γ(^{159}Tm) (continued)

E_i(level)	J_i^π	E_γ [†‡]	I_γ	E_f	J_f^π	Mult.[#]	δ[@]	α[&]	$I_{(\gamma+ce)}$	Comments
3139.9	(33/2⁻)	430.3 *1*	38 *8*	2709.6	(29/2⁻)	E2		0.0254		B(E2)(W.u.)=2.3×10^2 *8*
3158.7	(33/2⁺)	247.6	74 *6*	2911.1	(31/2⁺)	E2+M1		0.19 *6*		
		454.3	100 *8*	2703.5	(29/2⁺)	E2		0.0220		B(E2)(W.u.)=2.7×10^2 *13*
3348.6	(35/2⁻)	208.78 *5*	93 *7*	3139.9	(33/2⁻)	E2+M1	0.13 *2*	0.386		B(M1)(W.u.)=0.80 *16*; B(E2)(W.u.)=1.6×10^2 *6*
		486.32 *4*	100 *9*	2862.3	(31/2⁻)	E2		0.0184		B(E2)(W.u.)=1.5×10^2 *3*
3402.4	(35/2⁺)	243.9	64 *5*	3158.7	(33/2⁺)	E2+M1		0.19 *6*		
		491.3	100 *5*	2911.1	(31/2⁺)	E2		0.0179		B(E2)(W.u.)=1.8×10^2 *5*
3582.7	(37/2⁻)	234.2 *1*	100 *5*	3348.6	(35/2⁻)	E2+M1	0.08 *2*	0.283		B(M1)(W.u.)=0.86 *25*; B(E2)(W.u.)=5.E+1 *3*
		442.82 *5*	50 *5*	3139.9	(33/2⁻)	E2		0.0235		B(E2)(W.u.)=1.6×10^2 *5*
3733.6	(37/2⁺)	331	78 *17*	3402.4	(35/2⁺)	E2+M1		0.08 *3*		
		575	100 *19*	3158.7	(33/2⁺)	E2		0.01208		B(E2)(W.u.)=2.7×10^2 *13*
3859.2	(39/2⁻)	276.1[b] *2*	59[b] *12*	3582.7	(37/2⁻)	E2+M1		0.14 *5*		
		510.6 *3*	100 *14*	3348.6	(35/2⁻)	E2		0.01624		B(E2)(W.u.)=1.7×10^2 *7*
4019.4	(39/2⁺)	285[d]		3733.6	(37/2⁺)					
		616.0	1.0×10^2 *4*	3402.4	(35/2⁺)	E2		0.01024		B(E2)(W.u.)=2.9×10^2 *20* B(E2)(W.u.): Value neglects any contribution from the 285 γ.
4135.2	(41/2⁻)	276.1[b] *2*	52[b] *11*	3859.2	(39/2⁻)	E2+M1	<0.10	0.181		B(M1)(W.u.)=0.7 *+8−7*; B(E2)(W.u.)<94 B(M1)(W.u.): Value computed for δ=0.
		552.5 *1*	100 *13*	3582.7	(37/2⁻)	E2		0.01333		B(E2)(W.u.)=4.4×10^2 *23*
4404.6	(41/2⁺)	385[d]		4019.4	(39/2⁺)					
		671	1.0×10^2 *4*	3733.6	(37/2⁺)	E2		0.00838		B(E2)(W.u.)>80
4458.8	(43/2⁻)	323.7 *1*	92 *6*	4135.2	(41/2⁻)	E2+M1	<0.20	0.1170 *21*		B(M1)(W.u.)>0.41; B(E2)(W.u.)<1.5×10^2 B(M1)(W.u.): For δ=0, B(M1)(W.u.)=0.61 *19*, representing a sort of upper limit for this quantity.
		599.5 *1*	100 *8*	3859.2	(39/2⁻)	E2		0.01093		B(E2)(W.u.)=1.5×10^2 *5*
4742?	(43/2⁺)	722[d]	100	4019.4	(39/2⁺)					
4778.7	(45/2⁻)	319.8 *2*	57 *3*	4458.8	(43/2⁻)	E2+M1	0.08 *4*	0.1217 *18*		B(M1)(W.u.)=0.8 *5*; B(E2)(W.u.)=3.E+1 *3*
		643.6 *2*	100 *3*	4135.2	(41/2⁻)	E2		0.00924		B(E2)(W.u.)=2.2×10^2 *11*
5144.0	(47/2⁻)	365.3 *2*	66 *5*	4778.7	(45/2⁻)	E2+M1	<0.20	0.0849		B(M1)(W.u.)>0.28; B(E2)(W.u.)<1.0×10^2 B(M1)(W.u.): For δ=0, B(M1)(W.u.)=0.49 *21*, representing a sort of upper limit for this quantity.
		685.3 *1*	100 *5*	4458.8	(43/2⁻)	E2		0.00799		B(E2)(W.u.)=1.2×10^2 *5*
5503.7	(49/2⁻)	359.9 *3*	43 *4*	5144.0	(47/2⁻)	E2+M1	0.2 *1*	0.0874 *25*		B(M1)(W.u.)=0.7 *7*; B(E2)(W.u.)=1.0×10^2 *+15−10*
		724.6 *3*	100 *4*	4778.7	(45/2⁻)	E2		0.00704		B(E2)(W.u.)=1.9×10^2 *19*
5906.9	(51/2⁻)	403.2 *3*	100 *25*	5503.7	(49/2⁻)	E2+M1	0.17 *7*			
		763.2 *5*	96 *14*	5144.0	(47/2⁻)	E2				
6302.7	(53/2⁻)	395.9 *4*	39 *21*	5906.9	(51/2⁻)	E2+M1	<0.20		3.0 *16*	
		799.0 *3*	100 *28*	5503.7	(49/2⁻)	E2			7.3 *20*	
6740.5	(55/2⁻)	438 *1*	85 *31*	6302.7	(53/2⁻)	E2+M1			4.6 *15*	
		833.5 *6*	1.×10^2 *4*	5906.9	(51/2⁻)	E2			5.1 *20*	
7172.2	(57/2⁻)	432 *1*	<64	6740.5	(55/2⁻)	E2+M1			<2	

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Adopted Levels, Gammas (continued)

$\gamma(^{159}Tm)$ (continued)

E_i(level)	J_i^π	E_γ[†‡]	I_γ	E_f	J_f^π	Mult.[#]	$I_{(\gamma+ce)}$
7172.2	(57/2$^-$)	869.4 *5*	100	6302.7	(53/2$^-$)	E2	3.1 *15*
7649.5	(59/2$^-$)	909[d] *1*	100	6740.5	(55/2$^-$)	E2	
8132.2	(61/2$^-$)	960 *1*	100	7172.2	(57/2$^-$)	E2	

† From ^{159}Yb ε decay (1992Tl01) and (HI,xnγ) (1983Ho10, 1984La11, 1985An09, and 1987Ga09); others: 1985Ho04, 1981La24.
‡ Unplaced γ's are not given here, see ^{159}Yb ε decay.
# Assignments from α(K)exp values (1995AdZS) are included here. See (HI,xnγ) data for assignments by evaluator from general statements of 1984La11 based on $\gamma(\theta)$ and $\gamma\gamma(\theta)$ measurements and $\gamma(\theta)$ coefficients of 1985Ho04.
@ From 1985Ho04 in (HI,xnγ) study or ^{159}Yb ε decay.
& For the (HI,xnγ) data, these values (including those for mixed-multipolarity γ's where no δ values are given) were used to deduce branching ratios for the γ-decay of the various levels. However, no B(M1)(W.u.) and B(E2)(W.u.) values are listed here for these mixed transitions.
a Multiply placed.
b Multiply placed with undivided intensity.
c Multiply placed with intensity suitably divided.
d Placement of transition in the level scheme is uncertain.

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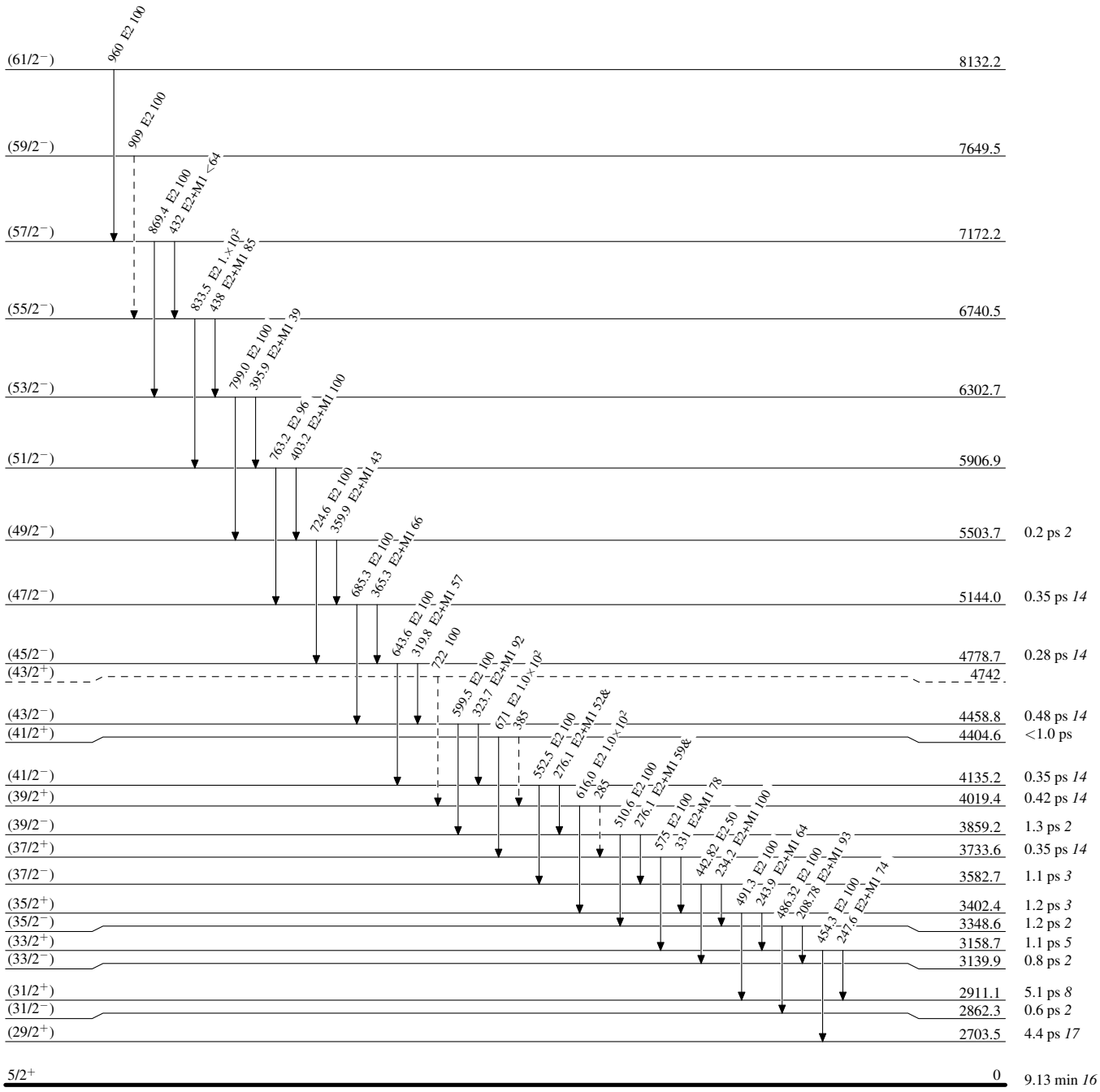
Adopted Levels, Gammas

Legend

Level Scheme

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

γ Decay (Uncertain)



$^{159}_{69}Tm_{90}$

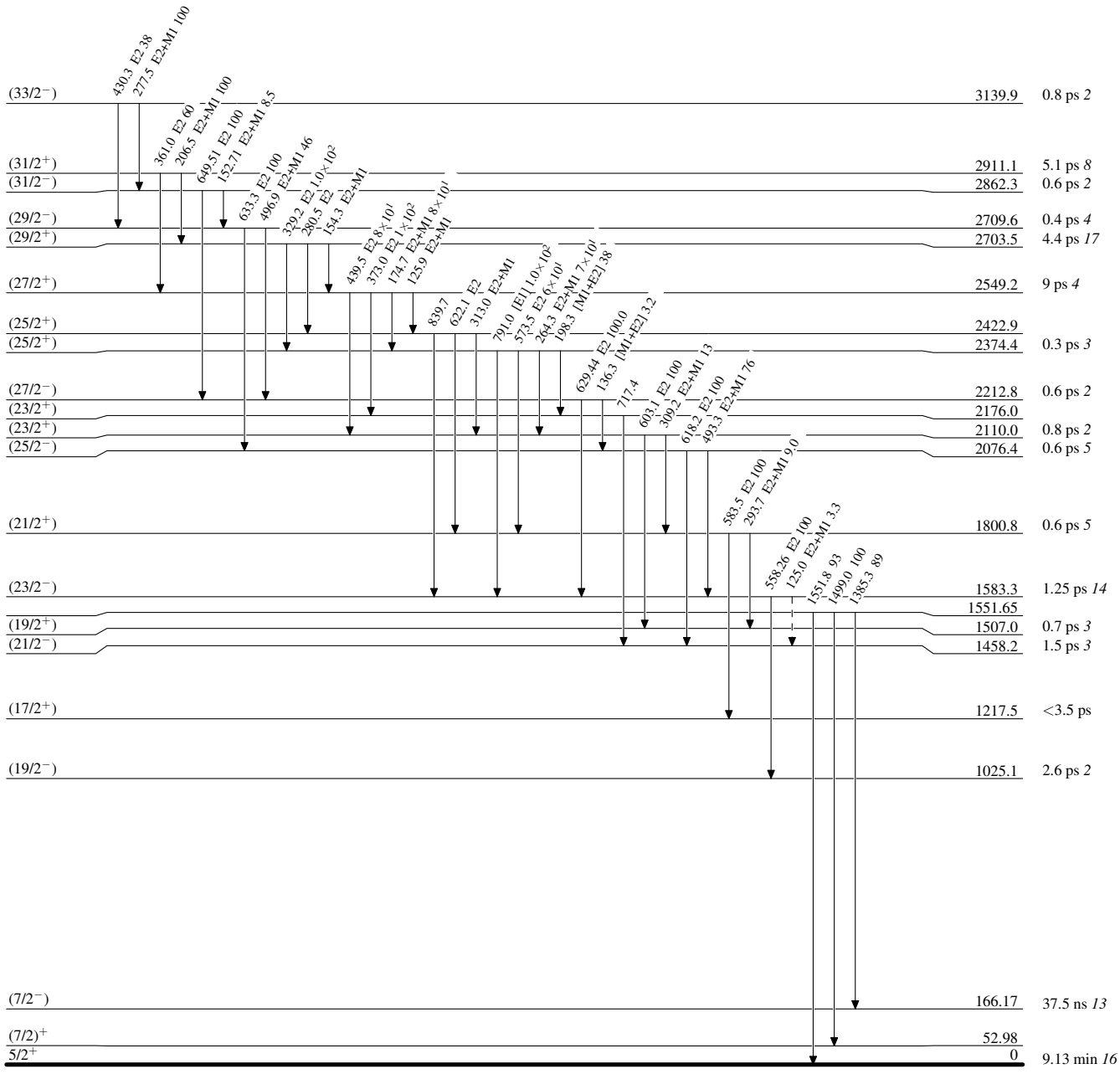
Adopted Levels, Gammas

Legend

Level Scheme (continued)

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

- - - - - - ► γ Decay (Uncertain)

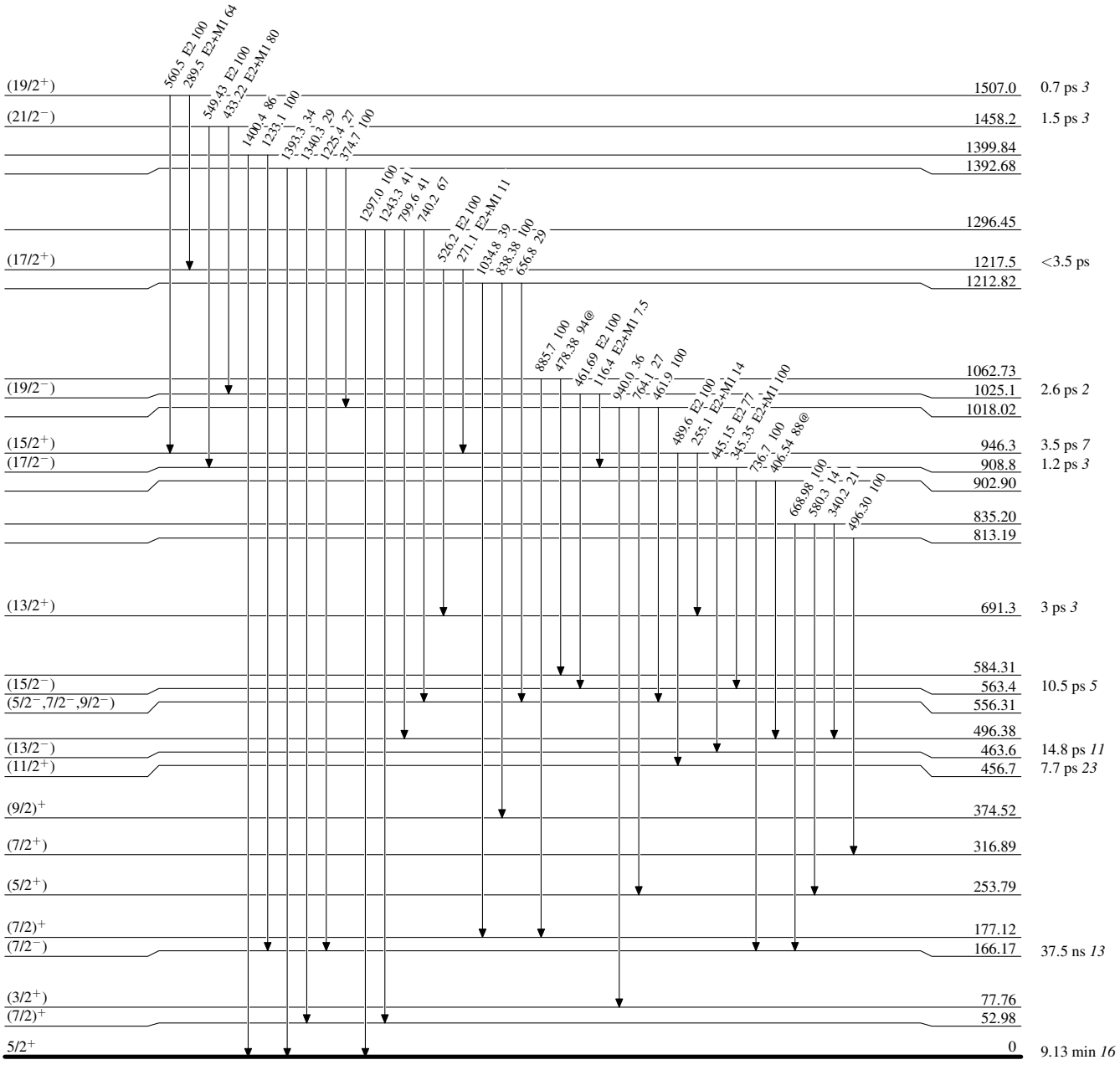


$^{159}_{69}Tm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

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

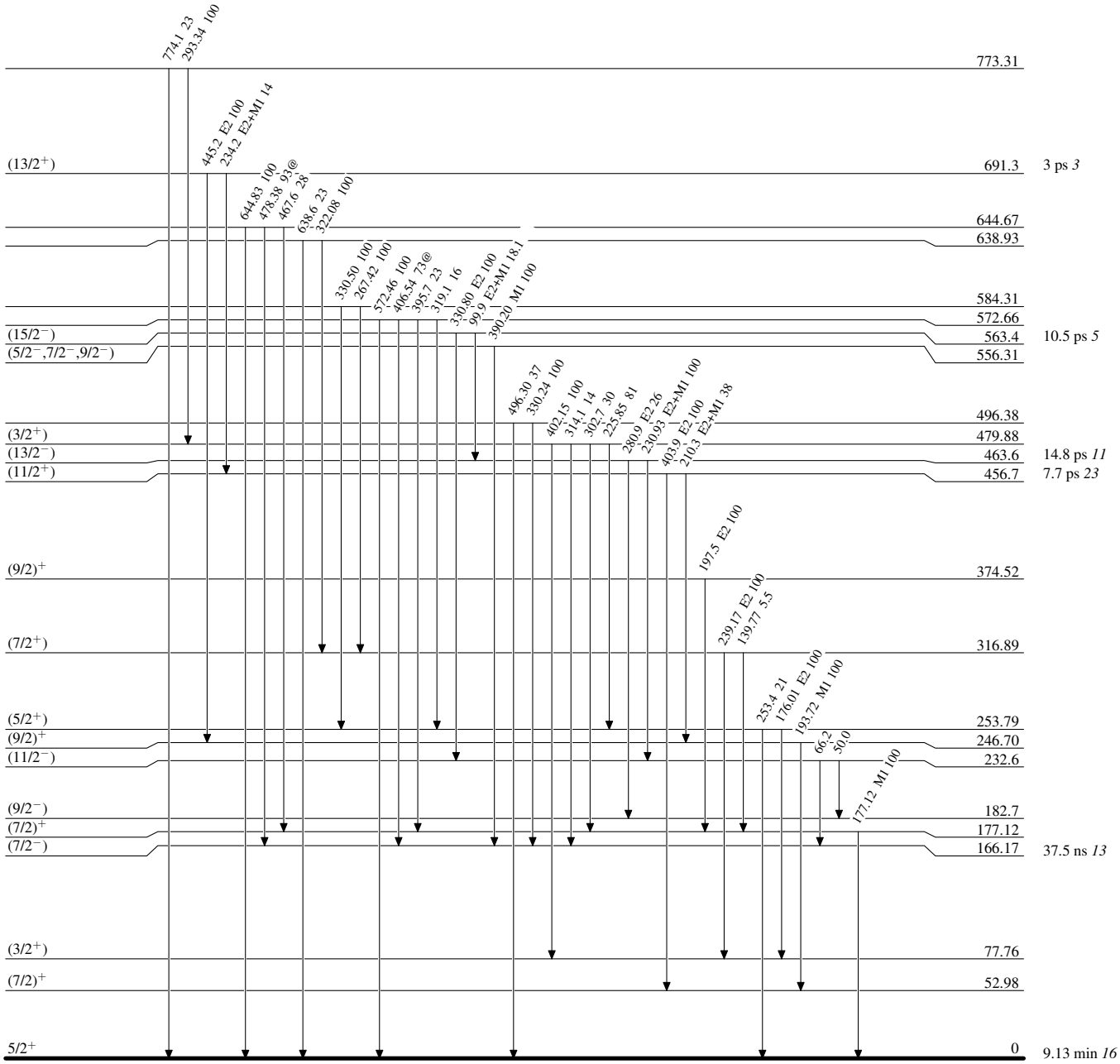


$^{159}_{69}Tm_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

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

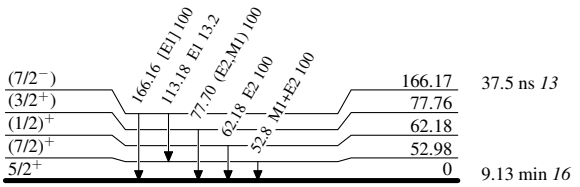


$^{159}_{69}Tm_{90}$

Adopted Levels, Gammas

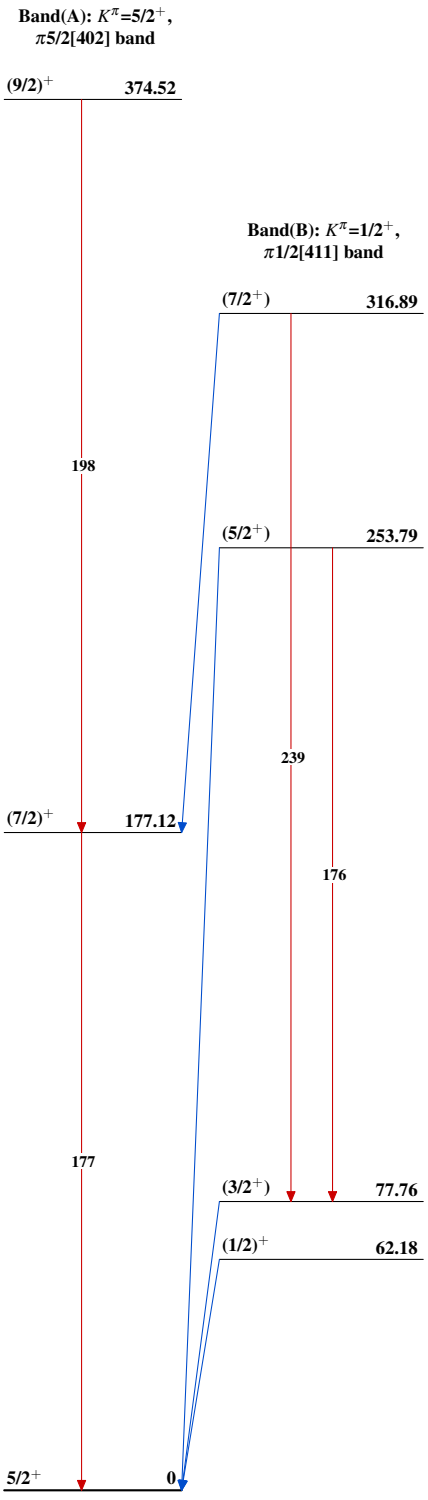
Level Scheme (continued)

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



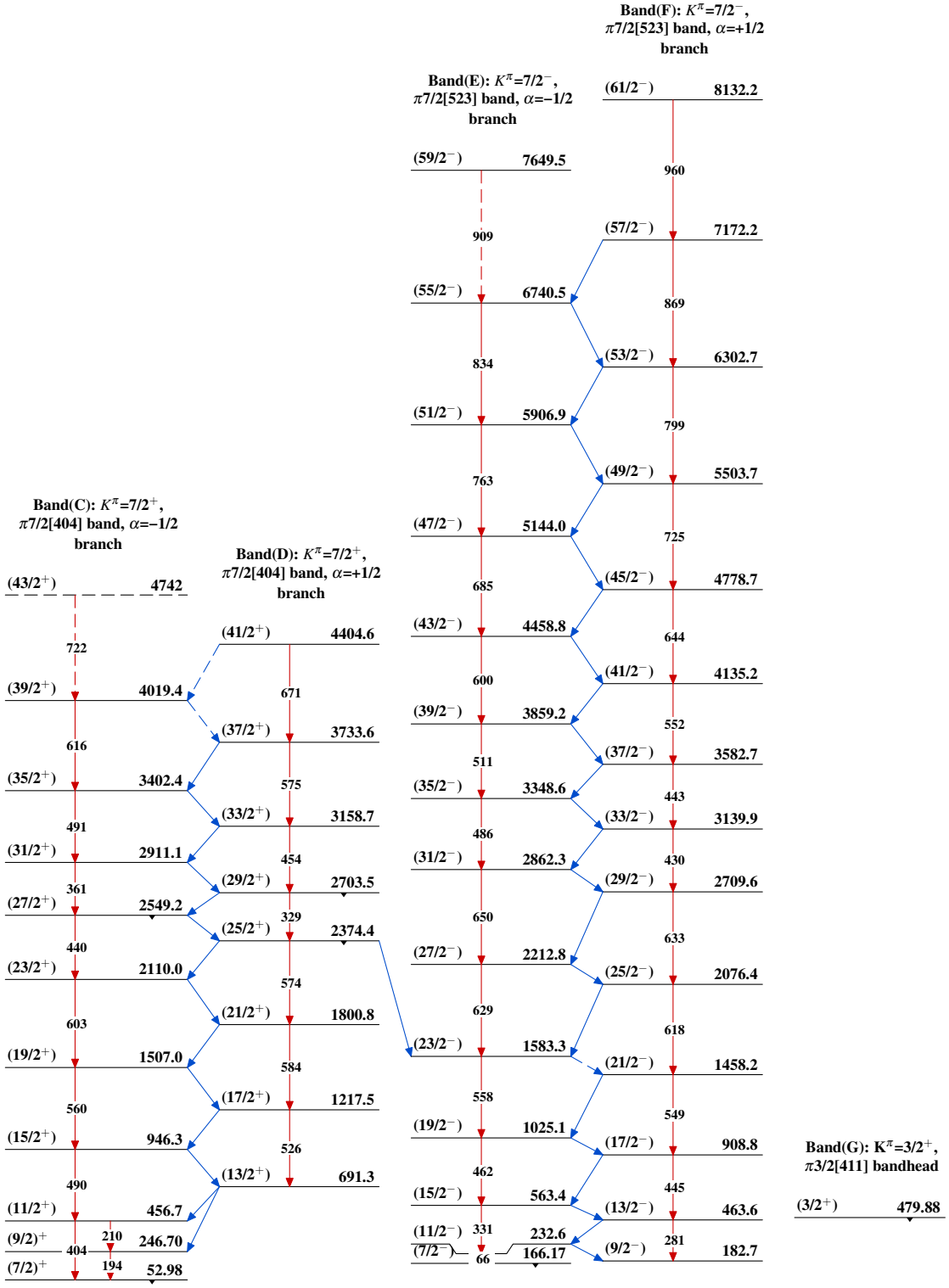
$^{159}_{69}Tm_{90}$

Adopted Levels, Gammas



$^{159}_{69}Tm_{90}$

Adopted Levels, Gammas (continued)



$^{159}_{69}Tm_{90}$