^{165}Ho(α,2nγ), ^{167}Er(p,nγ) 1976Sv01,1980Ol05

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 90, 431 (2000)	5-Jul-2000

Others: 1970No02, 1970Wi09, 1973Wi02, 1981Io06, 1982Fi02, 1995Si18 (excitation functions for (α,2nγ), E≈10-40 MeV).

1980Ol05: E(α)=21-27 MeV; θ=90°; metallic holmium targets; measured Eγ, Iγ (Ge(Li) (FWHM=700 eV at 100 keV), Compton suppression spectrometer), $\gamma\gamma$ coin, γ-ray angular distributions, relative excitation functions. Further analysis of these data is presented in 1981Io06.

1976Sv01: E(p)=8-12 MeV; erbium targets enriched to 91.5% in ^{167}Er; measured Eγ, Iγ (low-energy photon spectrometer (FWHM=500 eV at 80 keV) for Eγ<300, Ge(Li)), E(ce), Ice (mag spect (FWHM=1.5 keV at 200 keV)), $\gamma\gamma$ coin, delayed ce-ce coin; used ^{167}Er(p,2nγ) for a few measurements. See also 1976Li07.

The level scheme and all data are from 1980Ol05, except where noted; reference citations are given with data from 1976Sv01 and from other sources.

^{167}Tm Levels

Band(AJ) 1/2[411] band.

E(level)[†]	J^{π}[‡]	$T_{1/2}$	E(level)[†]	J^{π}[‡]	E(level)[†]	J^{π}[‡]
0.0	1/2$^+$		779.091[@] *18*	15/2$^+$	1378.26[&] *3*	21/2$^-$
10.501 *14*	3/2$^+$		780.58?[b] *5*	9/2$^+$	1381.12[#] *4*	19/2$^-$
116.689 *10*	5/2$^+$	66[f] ps *7*	787.880[&] *22*	15/2$^-$	1424.71[@] *4*	21/2$^+$
142.546 *20*	7/2$^+$	343[f] ps *15*	840.31[a] *4*	11/2$^+$	1429.60 *3*	21/2$^+$
171.76[#] *5*	1/2$^-$		852.62[c] *17*	3/2$^-$	1470.29[e] *6*	17/2$^+$
179.599[@] *14*	7/2$^+$		882.22[c] *18*	5/2$^-$	1487.41?[b] *8*	17/2$^+$
187.763[#] *20*	5/2$^-$		927.96[b] *4*	11/2$^+$	1524.98[c] *4*	17/2$^-$
286.009[#] *20*	9/2$^-$		929.83?[d] *7*	9/2$^-$	1528.75[#] *4*	25/2$^-$
291.03[#] *4*	3/2$^-$		935.37[c] *4*	7/2$^-$	1550.08 *4*	23/2$^+$
292.940[&] *15*	7/2$^-$		944.95[e] *3*	11/2$^+$	1562.99[a] *6*	19/2$^+$
296.310[@] *16*	9/2$^+$		965.843[&] *22*	17/2$^-$	1606.87[&] *3*	23/2$^-$
326.61 *3*	9/2$^+$		978.594[@] *18*	17/2$^+$	1668.98[@] *4*	23/2$^+$
371.105 *21*	11/2$^+$		993.661 *24*	17/2$^+$	1678.94[e] *5*	19/2$^+$
383.778[&] *18*	9/2$^-$		1001.25[a] *4*	13/2$^+$	1691.30[c] *4*	19/2$^-$
436.154[@] *16*	11/2$^+$		1007.71[#] *3*	15/2$^-$	1705.59[b] *6*	19/2$^+$
460.00[#] *4*	7/2$^-$		1008.61[c] *4*	9/2$^-$	1808.74[#] *4*	23/2$^-$
470.317[#] *22*	13/2$^-$		1044.14[d] *6*	11/2$^-$	1814.03[a] *6*	21/2$^+$
471.26[a] *4*	3/2$^+$		1086.626 *24*	19/2$^+$	1858.71[&] *4*	25/2$^-$
496.709[&] *22*	11/2$^-$		1096.283[#] *25*	21/2$^-$	1901.29[e] *9*	21/2$^+$
522.43[a] *4*	5/2$^+$		1096.52[b] *4*	13/2$^+$	1915.44 *5*	25/2$^+$
557.919?[b] *24*	5/2$^+$		1101.42[e] *4*	13/2$^+$	1916.66[c] *6*	21/2$^-$
597.571[@] *17*	13/2$^+$		1105.39[c] *4*	11/2$^-$	1922.49[@] *6*	25/2$^+$
602.13[a] *5*	7/2$^+$		1161.028[&] *24*	19/2$^-$	2022.25[a] *9*	23/2$^+$
622.20 *3*	13/2$^+$		1164.04[a] *5*	15/2$^+$	2030.84[#] *6*	29/2$^-$
631.893[&] *20*	13/2$^-$		1194.880[@] *24*	19/2$^+$	2065.65 *15*	27/2$^+$
657.60?[b] *10*	7/2$^+$		1223.17[c] *4*	13/2$^-$	2098.14[c] *6*	23/2$^-$
689.246 *22*	15/2$^+$		1276.87[e] *3*	15/2$^+$	2113.86[&] *7*	27/2$^-$
699.26[#] *4*	11/2$^-$		1281.49?[b] *7*	15/2$^+$	2135.98[e] *7*	23/2$^+$
709.25[a] *5*	9/2$^+$		1358.81[c] *4*	15/2$^-$	2186.51[@] *5*	27/2$^+$
741.426[#] *23*	17/2$^-$		1372.82[a] *4*	17/2$^+$	2279.75[#] *8*	27/2$^-$

Continued on next page (footnotes at end of table)

^{165}Ho(α,2nγ), ^{167}Er(p,nγ) 1976Sv01,1980Ol05 (continued)

^{167}Tm Levels (continued)

E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]
2321.13?[a] *6*	25/2+	2396.47[c] *8*	25/2−	2573.35[c] *16*	27/2−	2670.62[&] *8*	31/2−
2382.08?[e] *18*	25/2+	2440.51 *7*	29/2+	2593.52[#] *12*	33/2−	2735.91[@] *9*	31/2+
2394.49[&] *5*	29/2−	2455.70[@] *9*	29/2+	2620.31 *13*	31/2+	2799.12[#] *22*	31/2−

[†] From least-squares adjustment of Eγ, omitting the 639.89γ (which fits its placement poorly) and allowing 1 keV uncertainty in values for which no uncertainty was stated by authors.
[‡] From relative excitation functions, multipolarities of transitions, and fits of cascades of coincident γ rays into an interconnected set of rotational bands (authors′ values).
[#] Band(A): 1/2[541] band.
[@] Band(B): 7/2[404] band.
[&] Band(C): 7/2[523] band.
[a] Band(D): 3/2[411] band.
[b] Band(E): 5/2[402] band.
[c] Band(F): 3/2[532]+(1/2[541];K-2) band.
[d] Band(G): 9/2[514] band.
[e] Band(H): 7/2[404];K+2 band.
[f] From (ce)(ce)(t) (1976Li07,1976Sv01).

γ(^{167}Tm)

Eγ	Iγ[†]	Ei(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
(10.51 *2*)		10.501	$3/2^+$	0.0	$1/2^+$			Eγ: from energy difference between 116.7γ and 106.2γ.
25.80[d] *20*	≈1.8[#]	142.546	$7/2^+$	116.689	$5/2^+$			Iγ: deduced from Iγ(132.0γ) and adopted I(26γ):I(132γ)=1.6 *5*:100 *3* from 143 level.
(37.05[@] *2*)		179.599	$7/2^+$	142.546	$7/2^+$			
44.5[k]		371.105	$11/2^+$	326.61	$9/2^+$			Added from level scheme in 1976Sv01 (transition not mentioned in table 1 or text, obscured by x rays in singles spectrum); Eγ from level energy difference. Evaluator considers placement to be tentative.
62.91 *1*	12.2 *13*	179.599	$7/2^+$	116.689	$5/2^+$			
67.02[d] *5*	3.0[e] *15*	689.246	$15/2^+$	622.20	$13/2^+$			
79.56 *9*	0.4 *1*	602.13	$7/2^+$	522.43	$5/2^+$			
[x]80.53 *3*	1.0 *1*							
85.10 *1*	11.0[#] *10*	371.105	$11/2^+$	286.009	$9/2^-$	E1		Mult.: A_2=−0.16 *3* (1980Ol05).
[x]89.10 *15*	0.8 *1*							
90.84 *1*	22.0[#] *20*	383.778	$9/2^-$	292.940	$7/2^-$	M1+E2		Mult.: A_2=+0.016 *4* (1980Ol05).
[x]93.32 *20*	0.5 *1*							
98.25 *2*	3.3[#] *3*	286.009	$9/2^-$	187.763	$5/2^-$			Mult.: A_2=+0.07 *3*, A_4=−0.01 *4* (1980Ol05).
99.21 *1*	26.0[#] *20*	470.317	$13/2^-$	371.105	$11/2^+$	(E1)		Mult.: A_2=−0.218 *13* (1980Ol05).
[x]100.37 *16*	0.5 *1*							
103.32 *5*	2.2 *3*	291.03	$3/2^-$	187.763	$5/2^-$			
105.14 *7*	5.2 *3*	292.940	$7/2^-$	187.763	$5/2^-$			
106.18 *1*	94[#] *8*	116.689	$5/2^+$	10.501	$3/2^+$	(M1+E2)		Mult.: A_2=−0.110 *5*, A_4=+0.008 *7* (1980Ol05).
107.13 *4*	2.0 *10*	709.25	$9/2^+$	602.13	$7/2^+$			
112.88 *4*	36[#] *3*	496.709	$11/2^-$	383.778	$9/2^-$	(M1+E2)[g]	+0.16 *1*	Mult.: A_2=0.000 *14*, A_4=+0.001 *2* (1980Ol05).
113.34 *1*	83[#] *7*	292.940	$7/2^-$	179.599	$7/2^+$	D		Mult.: A_2=−0.037 *17* (1980Ol05).
114.32 *5*	3.1 *13*	1044.14	$11/2^-$	929.83?	$9/2^-$			
116.69[j] *1*	11.8[j#] *12*	116.689	$5/2^+$	0.0	$1/2^+$			Iγ: deduced from Iγ(106.2γ) and adopted I(106γ):I(117γ)=100 *5*:12.5 *3* from 117 level. Mult.: A_2=+0.162 *6*, A_4=+0.001 *8* (1980Ol05).
116.69[j] *1*	33[j#] *4*	296.310	$9/2^+$	179.599	$7/2^+$			Iγ: from difference between Iγ=45 *4* for both placements of 116.7γ and Iγ=11.8 *12* deduced for component placed from 116.7 level. Mult.: A_2=+0.162 *6*, A_4=+0.001 *8* (1980Ol05).
[x]118.40 *4*	1.0 *2*							
[x]120.11 *9*	0.6 *1*							
[x]121.06 *3*	1.7 *1*							
[x]124.59 *6*	0.4 *1*							
[x]128.60 *13*	1.2 *2*							
[x]130.21 *3*	1.7 *2*							
131.06[i] *4*	4.3[i] *15*	602.13	$7/2^+$	471.26	$3/2^+$			
131.06[i] *4*	4.3[i] *15*	840.31	$11/2^+$	709.25	$9/2^+$			

γ(^{167}Tm) (continued)

$E_γ$	$I_γ$[†]	E_i(level)	$J^π_i$	E_f	$J^π_f$	Mult.[‡]	δ[‡]	α[h]	Comments
132.05 2	115[#] 6	142.546	7/2$^+$	10.501	3/2$^+$	E2			Mult.: α(K)exp=0.43 4 (1976Sv01); A_2=+0.164 2, A_4=−0.033 3 (1980Ol05).
[x]133.15 10	2.5 10								
[x]133.81 6	1.6 6								
135.20 1	37.0[#] 20	631.893	13/2$^-$	496.709	11/2$^-$	M1+E2	+0.13 2		Mult.: α(K)exp=0.44 6 (1976Sv01); A_2=−0.023 8, A_4=−0.004 7 (1980Ol05).
[x]137.72 5	0.9 2								
139.83 1	26.0[#] 12	436.154	11/2$^+$	296.310	9/2$^+$	M1+E2	+0.46 3		Mult.: α(K)exp=1.01 10 (1976Sv01); A_2=+0.243 7, A_4=+0.031 9 (1980Ol05).
[x]141.44 8	1.6 6								
[x]142.41 3	3.7 13								
143.46 1	103[#] 4	286.009	9/2$^-$	142.546	7/2$^+$	E1			Mult.: α(K)exp=0.07 3 (1976Sv01); A_2=−0.206 3 (1980Ol05).
[x]144.70 3	2.5 8								
[x]148.48 10	0.6 2								
[x]154.58 7	0.8 1								
156.03 2	32.5[#] 12	787.880	15/2$^-$	631.893	13/2$^-$	(M1+E2)	+0.11 2	0.892	Mult.: A_2=−0.026 13, A_4=−0.030 17 (1980Ol05).
156.33[&]		1101.42	13/2$^+$	944.95	11/2$^+$				
[x]156.92 26	1.4 2								
160.98[&k]		1001.25	13/2$^+$	840.31	11/2$^+$				
161.25[&]	1.1 5	171.76	1/2$^-$	10.501	3/2$^+$				$I_γ$: deduced from Iγ(171.8γ) and adopted I(161γ):I(172γ)=94 28:100 28 from 172 level.
161.40 1	17.6[#] 7	597.571	13/2$^+$	436.154	11/2$^+$	(M1+E2)	+0.40 +1−3		Mult.: α(K)exp=0.46 5 (1976Sv01) for doublet; A_2=+0.229 18, A_4=+0.016 24 (1980Ol05).
162.82 9	2.1[#] 1	1164.04	15/2$^+$	1001.25	13/2$^+$				
[x]165.51 9	0.9 3								
[x]166.34 13	0.7 1								
[x]167.45 8	1.0 1								
168.66 4	2.4 2	1096.52	13/2$^+$	927.96	11/2$^+$				
169.12[&k]		460.00	7/2$^-$	291.03	3/2$^-$				
171.76 5	1.1 2	171.76	1/2$^-$	0.0	1/2$^+$	E1			Mult.: from α(K)exp=0.053 20 (1976Sv01).
174.02[&k]		460.00	7/2$^-$	286.009	9/2$^-$	(M1)			Mult.: α(K)exp=0.70 20, mult=M1 (1976Sv01) for doublet; level scheme requires E1 for other placement, so M1 is favored for this placement.
174.25 7	1.6 2	291.03	3/2$^-$	116.689	5/2$^+$	(E1)[f]			Mult.: α(K)exp=0.70 20, mult=M1 for 174.0γ+174.3γ doublet (1976Sv01); since the level scheme requires E1 for this placement, the alternative placement presumably dominates that doublet in (p,nγ).
175.34 6	2.8[#] 2	1276.87	15/2$^+$	1101.42	13/2$^+$				
176.26 2	25.5[#] 9	292.940	7/2$^-$	116.689	5/2$^+$	E1			Mult.: α(K)exp=0.073 13 (1976Sv01), A_2=−0.071 13 (1980Ol05).

$^{167}_{69}Tm_{98}$-4

γ(^{167}Tm) (continued)

E_γ	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	δ[‡]	α[h]	Comments
177.27 2	25.8[#] 9	187.763	5/2−	10.501	3/2+	E1			Mult.: α(K)exp=0.060 10 (1976Sv01), A_2=−0.152 11 (1980Ol05) for doublet.
177.95 2	23.3[#] 8	965.843	17/2−	787.880	15/2−	(M1+E2)[g]	+0.12 1		Mult.: A_2=−0.058 16, A_4=+0.031 25 (1980Ol05).
[x]179.14 6	1.7 2								
181.50 2	9.7[#] 4	779.091	15/2+	597.571	13/2+	(M1+E2)[g]	+0.45 11	0.549 16	Mult.: A_2=+0.30 5, A_4=−0.03 7 (1980Ol05).
[x]182.84 17	2.0 7								
184.01 15	32.5[#] 15	326.61	9/2+	142.546	7/2+	(M1+E2)	−0.12 +11−18		Mult.: A_2=−0.28 4, A_4=−0.01 7 (1980Ol05).
184.33 4	68.0[#] 20	470.317	13/2−	286.009	9/2−	(E2)			Mult.: A_2=+0.248 9, A_4=−0.01 5 (1980Ol05).
185.11[k] 17	3.3 12	1281.49?	15/2+	1096.52	13/2+				
186.68 11	1.4 5	709.25	9/2+	522.43	5/2+				
190.14 9	0.9 2	1562.99	19/2+	1372.82	17/2+				
193.45 7	2.0[#] 1	1470.29	17/2+	1276.87	15/2+				Mult.: A_2=+0.08 4 (1980Ol05).
195.20 1	16.0[#] 5	1161.028	19/2−	965.843	17/2−	(M1+E2)	≈0.15[c]		Mult.: A_2=−0.056 15, A_4=+0.001 21 (1980Ol05).
199.56 2	5.7[#] 3	978.594	17/2+	779.091	15/2+	(M1+E2)[g]	+0.46 +7−9		Mult.: A_2=+0.277 26, A_4=−0.04 3 (1980Ol05).
203.75 4	4.0[#] 2	496.709	11/2−	292.940	7/2−	E2			Mult.: α(K)exp=0.13 3 (1976Sv01); A_2=+0.30 7, A_4=−0.13 10 (1980Ol05).
[x]205.45 9	1.4 2								
206.18[k] 10	1.3[#] 2	1487.41?	17/2+	1281.49?	15/2+				
208.86[i] 7	2.1[i] 6	1372.82	17/2+	1164.04	15/2+				
208.86[i] 7	2.1[i] 6	1678.94	19/2+	1470.29	17/2+				
209.92 20	14.5[#] 4	326.61	9/2+	116.689	5/2+	E2			Mult.: Q from A_2=+0.24 6, A_4=−0.11 6 (1980Ol05); α(K)exp normalized to α(K)(E2)=0.143 in 1976Sv01 leads to α(K)exp values consistent with known multipolarity for several other transitions, whereas normalization to α(K)(M2) would not do so.
[x]212.60 16	0.7 2								
[x]213.44 5	1.7[#] 2								
216.29 4	3.0[#] 4	1194.880	19/2+	978.594	17/2+	(M1+E2)[g]	≈0.46[c]		Mult.: A_2=+0.33 8, A_4=−0.01 10 (1980Ol05).
217.27 2	10.4[#] 4	1378.26	21/2−	1161.028	19/2−	(M1+E2)[g]	≈0.17[c]		Mult.: A_2=−0.02 3, A_4=+0.06 5 (1980Ol05).
218.07[i] 17	1.7[i] 6	840.31	11/2+	622.20	13/2+				
218.07[ik] 17	1.7[i] 6	1705.59	19/2+	1487.41?	17/2+				
218.90 2	11.8[#] 3	689.246	15/2+	470.317	13/2−	E1			Mult.: α(K)exp=0.021 18 (1976Sv01); A_2=−0.18 3 (1980Ol05).
222.50[ik] 19	0.5[i] 2	780.58?	9/2+	557.919?	5/2+				
222.50[i] 19	0.5[i] 2	1901.29	21/2+	1678.94	19/2+				
[x]227.35 5	3.3 10								
228.61[i] 1	114[i#] 3	371.105	11/2+	142.546	7/2+	[E2]			Mult.: α(K)exp=0.11 2 (1976Sv01); A_2=+0.205 7, A_4=−0.055 9 (1980Ol05) for doublet.
228.61[i] 1	114[i#] 3	1606.87	23/2−	1378.26	21/2−				Mult.: α(K)exp=0.11 2 (1976Sv01); A_2=+0.205 7,

$^{167}_{69}$Tm$_{98}$-5

$\gamma(^{167}$Tm) (continued)

E_γ	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	δ[‡]	α[h]	Comments
									A_4=−0.055 *9* (1980Ol05) for doublet.

γ(^{167}Tm) (continued)

E_γ	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	δ[‡]	Comments
228.92[&]		699.26	11/2⁻	470.317	13/2⁻			
229.85 4	2.8[#] 1	1424.71	21/2⁺	1194.880	19/2⁺	(M1+E2)[g]	≈0.30[c]	Mult.: A_2=+0.40 5, A_4=−0.11 6 (1980Ol05).
234.68 7	0.4 1	2135.98	23/2⁺	1901.29	21/2⁺			
[x]236.37 3	1.1 1							
238.13 4	1.2 1	840.31	11/2⁺	602.13	7/2⁺			
239.26 2	1.9 1	699.26	11/2⁻	460.00	7/2⁻			
[x]243.69 17	1.0 3							
244.27 3	1.2 4	1668.98	23/2⁺	1424.71	21/2⁺			
246.10 16	0.3 1	2382.08?	25/2⁺	2135.98	23/2⁺			
248.12 1	9.5[#] 4	631.893	13/2⁻	383.778	9/2⁻	E2		Mult.: α(K)exp=0.07 2 (1976Sv01); A_2=+0.226 13, A_4=−0.045 18 (1980Ol05).
[x]249.44 5	0.8 1							
251.03[i] 1	20.5[i#] 20	622.20	13/2⁺	371.105	11/2⁺	(M1+E2)	−0.13 3	Mult.: α(K)exp=0.19 2 (1976Sv01); A_2=−0.320 15, A_4=+0.03 3 (1980Ol05) for doubly-placed G.
251.03[i] 1	20.5[i#] 20	1814.03	21/2⁺	1562.99	19/2⁺			Mult.: A_2=−0.320 15, A_4=+0.03 3 (1980Ol05).
251.84 2	4.4[#] 6	1858.71	25/2⁻	1606.87	23/2⁻			
253.43[i] 4	2.1[i#] 2	1358.81	15/2⁻	1105.39	11/2⁻			Mult.: A_2=−0.11 9 (1980Ol05) for doublet.
253.43[i] 4	2.1[i#] 2	1922.49	25/2⁺	1668.98	23/2⁺			Mult.: A_2=−0.11 9 (1980Ol05) for doublet.
255.12 6	2.2 3	2113.86	27/2⁻	1858.71	25/2⁻			
256.57 1	20.1[#] 4	436.154	11/2⁺	179.599	7/2⁺	E2		Mult.: α(K)exp=0.079 8 (1976Sv01); A_2=+0.216 12, A_4=−0.050 17 (1980Ol05).
264.02 8	1.0 1	2186.51	27/2⁺	1922.49	25/2⁺			
[x]265.13 18	0.6 1							
266.40 11	1.0 1	1007.71	15/2⁻	741.426	17/2⁻			
269.17 11	1.7 2	2455.70	29/2⁺	2186.51	27/2⁺			
270.14[&]		927.96	11/2⁺	657.60?	7/2⁺			
271.12 1	80.0[#] 15	741.426	17/2⁻	470.317	13/2⁻	(E2)		Mult.: α(K)exp=0.063 7 (1976Sv01) for doublet dominated by this component; A_2=+0.266 10, A_4=−0.074 12 (1980Ol05).
272.29 8	1.7 5	460.00	7/2⁻	187.763	5/2⁻			Mult.: α(K)exp=0.063 7 (1976Sv01) for doublet.
[x]274.96 6	0.6 1							
275.57[&]		602.13	7/2⁺	326.61	9/2⁺			
276.22[i] 11	0.7[i] 2	1705.59	19/2⁺	1429.60	21/2⁺			
276.22[i] 11	0.7[i] 2	2670.62	31/2⁻	2394.49	29/2⁻			
279.96[&]		1808.74	23/2⁻	1528.75	25/2⁻			
280.21 2	2.5 1	2735.91	31/2⁺	2455.70	29/2⁺			
280.56[&]		2394.49	29/2⁻	2113.86	27/2⁻			
280.60[d] 20	0.77 25	291.03	3/2⁻	10.501	3/2⁺			I_γ: from I(174γ) (1980Ol05) and I(281γ):I(174γ)=1.8 5:3.7 4 (1976Sv01).
[x]283.58[b] 9	1.2 2							

$^{167}_{69}$Tm$_{98}$-7

γ(^{167}Tm) (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
284.73[a] *16*	0.8 *2*	1381.12	19/2−	1096.283	21/2−			
286.25 *17*	1.0 *3*	1372.82	17/2+	1086.626	19/2+			
287.70 *11*	0.7 *2*	1281.49?	15/2+	993.661	17/2+			
291.02 *9*	7 *3*	291.03	3/2−	0.0	1/2+	(E1)		I_γ: Iγ=7 *3* is expected for this placement based in I(174γ) and adopted I(291γ)/I(281γ)=9.3 *24*. 1976Sv01 report transition to be a doublet with Iγ=6.0 *7*. So the second component has Iγ<3 in (p,nγ). Mult.: α(K)exp=0.022 *4* (1976Sv01) for doublet dominated by this transition in (p,nγ). A_2=+0.226 *13*, A_4=−0.072 *17* (1980Ol05).
291.15 *1*	15.3[#] *10*	787.880	15/2−	496.709	11/2−	(E2)		Mult.,I_γ: A_2=+0.226 *13*, A_4=−0.072 *17* (1980Ol05) for γ which may include contribution from nearby gammas whose existence was suggested only by γγ coin. Iγ<14 based on Iγ limit for this component of doublet in (p,nγ) (see comment on 291.0γ).
292.07[&]		1001.25	13/2+	709.25	9/2+			
295.59 *1*	24.2[#] *4*	622.20	13/2+	326.61	9/2+	E2		Mult.: α(K)exp=0.048 *5* (1976Sv01); A_2=+0.243 *19*, A_4=−0.062 *8* (1980Ol05).
301.26 *1*	28.3[#] *5*	597.571	13/2+	296.310	9/2+	E2		Mult.: α(K)exp=0.052 *6* (1976Sv01); A_2=+0.244 *11*, A_4=−0.063 *15* (1980Ol05).
301.84[&]		1524.98	17/2−	1223.17	13/2−			
304.41 *1*	9.3[#] *2*	993.661	17/2+	689.246	15/2+	(M1+E2)[g]	−0.23 *+16−17*	Mult.: A_2=−0.410 *18*, A_4=−0.03 *4* (1980Ol05).
305.9 *3*	0.4 *1*	927.96	11/2+	622.20	13/2+			
308.46 *2*	3.0[#] *2*	1007.71	15/2−	699.26	11/2−	(E2)[g]		Mult.: A_2=+0.26 *6*, A_4=−0.04 *7* (1980Ol05).
312.11 *11*	0.8 *1*	1001.25	13/2+	689.246	15/2+			
[x]313.48 *14*	0.5 *1*							
315.79 *17*	0.4 *1*	1096.52	13/2+	780.58?	9/2+			
318.14 *1*	47.0[#] *20*	689.246	15/2+	371.105	11/2+	E2		Mult.: α(K)exp=0.043 *5* (1976Sv01); A_2=+0.256 *9*, A_4=−0.067 *10* (1980Ol05).
[x]320.89 *8*	0.5 *1*							
323.34 *19*	0.6 *1*	1164.04	15/2+	840.31	11/2+			
330.99 *9*	0.7 *1*	657.60?	7/2+	326.61	9/2+	(M1+E2)		Mult.: from α(K)exp=0.049 *15* (1976Sv01).
332.11 *6*	1.5 *2*	1276.87	15/2+	944.95	11/2+			
332.36 *6*	2.2 *2*	1691.30	19/2−	1358.81	15/2−			
333.96 *1*	15.5[#] *15*	965.843	17/2−	631.893	13/2−	E2		Mult.: α(K)exp=0.033 *10* (1976Sv01); A_2=+0.270 *20*, A_4=−0.10 *5* (1980Ol05).
338.01 *22*	0.7 *2*	709.25	9/2+	371.105	11/2+			
[x]339.63 *17*	0.8 *3*							
[x]341.29 *3*	0.5 *1*							
342.95[i] *1*	36.3[i#] *15*	779.091	15/2+	436.154	11/2+			Mult.: A_2=+0.120 *20*, A_4=−0.044 *16* (1980Ol05) for doublet.
342.95[i] *1*	36.3[i#] *15*	1429.60	21/2+	1086.626	19/2+			Mult.: A_2=+0.120 *20*, A_4=−0.044 *16* (1980Ol05) for doublet.
343.37[&]		460.00	7/2−	116.689	5/2+			Mult.: α(K)exp=0.017 *3* (1976Sv01).

γ(^{167}Tm) (continued)

E_γ	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	Comments
345.20 2	7.4[#] 2	1086.626	19/2$^+$	741.426	17/2$^-$	(E1)[g]	Mult.: D from A_2=−0.225 20 (1980Ol05), $\Delta\pi$ from level scheme.
[x]350.71 2	3.3 10						
[x]352.93 15	1.4 5						
353.42 15	2.6 9	1281.49?	15/2$^+$	927.96	11/2$^+$		
354.85 1	46.2[#] 15	1096.283	21/2$^-$	741.426	17/2$^-$	(E2)	Mult.: A_2=+0.303 18, A_4=−0.101 22 (1980Ol05).
356.40 14	1.2 2	978.594	17/2$^+$	622.20	13/2$^+$		
365.35 3	1.4[#] 1	1915.44	25/2$^+$	1550.08	23/2$^+$		
368.99 12	1.5 2	1470.29	17/2$^+$	1101.42	13/2$^+$		
371.52[i] 1	23.6[i#] 13	993.661	17/2$^+$	622.20	13/2$^+$		Mult.: α(K)exp=0.025 5 (1976Sv01); A_2=+0.239 21, A_4=−0.071 26 (1980Ol05) for doublet.
371.52[i] 1	23.6[i#] 13	1372.82	17/2$^+$	1001.25	13/2$^+$		Mult.: α(K)exp=0.025 5 (1976Sv01); A_2=+0.239 21, A_4=−0.071 26 (1980Ol05) for doublet.
372.70[&] 10		699.26	11/2$^-$	326.61	9/2$^+$		Mult.: α(K)exp=0.010 2 (1976Sv01).
372.96 5	23.7[#] 6	1161.028	19/2$^-$	787.880	15/2$^-$	(E2)[g]	Mult.: A_2=+0.149 13, A_4=−0.042 16 (1980Ol05).
373.42 12	4.4 14	1381.12	19/2$^-$	1007.71	15/2$^-$		
375.02[&]		2440.51	29/2$^+$	2065.65	27/2$^+$		
379.15[i] 2	4.9[i#] 3	1001.25	13/2$^+$	622.20	13/2$^+$		Mult.: A_2=+0.18 4 (1980Ol05) for triply-placed G.
379.15[i] 2	4.9[i#] 3	1372.82	17/2$^+$	993.661	17/2$^+$		Mult.: A_2=+0.18 4 (1980Ol05) for triply-placed G.
379.15[i] 2	4.9[i#] 3	1808.74	23/2$^-$	1429.60	21/2$^+$		Mult.: A_2=+0.18 4 (1980Ol05) for triply-placed G.
379.84[&]		522.43	5/2$^+$	142.546	7/2$^+$	M1	Mult.: from α(K)exp=0.071 12 (1976Sv01).
381.01 1	23.5[#] 5	978.594	17/2$^+$	597.571	13/2$^+$	E2	Mult.: α(K)exp=0.033 7 (1976Sv01); A_2=+0.254 12, A_4=−0.058 14 (1980Ol05).
382.4 3	0.6 3	709.25	9/2$^+$	326.61	9/2$^+$		
384.44[&k]		1814.03	21/2$^+$	1429.60	21/2$^+$		
385.50 2	5.4[#] 3	1007.71	15/2$^-$	622.20	13/2$^+$	(E1+M2)[g]	Mult.: A_2=−0.22 4 (1980Ol05).
386.67[&]		1915.44	25/2$^+$	1528.75	25/2$^-$		Mult.: α(K)exp=0.061 9 (1976Sv01) implies M1, but placement requires E1.
387.26 5	3.2[#] 2	1381.12	19/2$^-$	993.661	17/2$^+$	(E1+M2)[g]	Mult.: A_2=−0.18 8 (1980Ol05).
390.61 12	0.9 2	1487.41?	17/2$^+$	1096.52	13/2$^+$		
391.72 5	2.0 2	1916.66	21/2$^-$	1524.98	17/2$^-$		
397.38 1	27.0[#] 5	1086.626	19/2$^+$	689.246	15/2$^+$	E2	Mult.: α(K)exp=0.016 4 (1976Sv01); A_2=+0.234 15, A_4=−0.048 14 (1980Ol05).
398.65 13	1.2 3	1562.99	19/2$^+$	1164.04	15/2$^+$		
400.56[b] 15	0.6 2	1487.41?	17/2$^+$	1086.626	19/2$^+$		
402.07 5	1.2 2	1678.94	19/2$^+$	1276.87	15/2$^+$		
405.69[i] 4	1.5[i] 4	522.43	5/2$^+$	116.689	5/2$^+$		Mult.: α(K)exp=0.059 8 (1976Sv01) for doublet.
405.69[i] 4	1.5[i] 4	2321.13?	25/2$^+$	1915.44	25/2$^+$		Mult.: α(K)exp=0.059 8 (1976Sv01) for doublet.
406.84 4	4.0[#] 3	2098.14	23/2$^-$	1691.30	19/2$^-$		Mult.: A_2=+0.19 6, A_4=−0.04 8 (1980Ol05).
407.27[&k]		1096.52	13/2$^+$	689.246	15/2$^+$		
412.39 2	13.0[#] 3	1378.26	21/2$^-$	965.843	17/2$^-$	(E2)[g]	Mult.: A_2=+0.168 15, A_4=−0.070 20 (1980Ol05).
413.39 12	2.2 3	699.26	11/2$^-$	286.009	9/2$^-$	M1+E2	Mult.: from α(K)exp=0.03 1 (1976Sv01).

γ(^{167}Tm) (continued)

E_γ	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	Comments
415.60[d] 20		557.919?	5/2+	142.546	7/2+		E_γ: for doublet. Mult.: α(K)exp=0.03 1 (1976Sv01) for multiplet.
415.79 2	19.7[#] 4	1194.880	19/2+	779.091	15/2+	(E2)[g]	Mult.: A_2=+0.264 10, A_4=−0.07 3 (1980Ol05). α(K)exp=0.03 1 (1976Sv01) for multiplet.
[x]418.31 3	0.4 1						
[x]421.82 3	0.5 1						
424.05 5	0.9 1	1705.59	19/2+	1281.49?	15/2+		
427.66 3	3.0[#] 1	1808.74	23/2−	1381.12	19/2−	(E2)[g]	Mult.: A_2=+0.18 9, A_4=−0.05 9 (1980Ol05).
[x]428.44 3	0.9 4						
431.11[i] 4	1.9[i] 2	1424.71	21/2+	993.661	17/2+		
431.11[i] 4	1.9[i] 2	1901.29	21/2+	1470.29	17/2+		
432.47 2	20.3[#] 5	1528.75	25/2−	1096.283	21/2−	(E2)[g]	Mult.: A_2=+0.255 22, A_4=−0.12 3 (1980Ol05).
435.94 2	13.0[#] 4	1429.60	21/2+	993.661	17/2+	(E2)[g]	Mult.: A_2=+0.32 4, A_4=−0.07 5 (1980Ol05).
[x]439.59 4	0.8 1						
441.22[i] 3	2.7[i#] 2	557.919?	5/2+	116.689	5/2+		Mult.: α(K)exp=0.044 7 (1976Sv01), mult=M1; A_2=−0.06 7 (1980Ol05) for doublet.
441.22[i] 3	2.7[i#] 2	1814.03	21/2+	1372.82	17/2+		Mult.: A_2=−0.06 7 (1980Ol05).
[x]443.70 3	1.2 1						
445.82 4	8 4	1606.87	23/2−	1161.028	19/2−		
446.11 5	10 5	1424.71	21/2+	978.594	17/2+	(E2)[g]	Mult.: A_2=+0.28 4, A_4=−0.07 5 (1980Ol05).
450.81 21	0.4 1	1429.60	21/2+	978.594	17/2+		
[x]451.57 12	0.6 2						
[x]453.38 8	2.2 4						
453.77[&]		1550.08	23/2+	1096.283	21/2−	(E1)	Mult.: A_2=−0.24 4 (1981Io06); Δπ from level scheme.
453.97 4	4.1[#] 2	780.58?	9/2+	326.61	9/2+	(M1+E2)[g]	Mult.: A_2=−0.24 4 (1980Ol05).
[x]456.20 7	0.9 3					M1	Mult.: from α(K)exp=0.044 9 (1976Sv01).
457.05 6	1.7[#] 2	2135.98	23/2+	1678.94	19/2+		
459.63[i] 19	1.4[i] 1	602.13	7/2+	142.546	7/2+		
459.63[i] 19	1.4[i] 1	2022.25	23/2+	1562.99	19/2+		
460.77 3	3.1[#] 3	471.26	3/2+	10.501	3/2+	M1	Mult.: from α(K)exp=0.038 4 (1976Sv01).
463.44 3	12.3[#] 3	1550.08	23/2+	1086.626	19/2+	(E2)[g]	Mult.: A_2=+0.31 3, A_4=−0.12 4 (1980Ol05).
[x]464.63 13	0.6 2						
469.26 4	2.4 6	840.31	11/2+	371.105	11/2+	M1	Mult.: from α(K)exp=0.042 6 (1976Sv01).
470.40[d] 25	2.6[#] 5	471.26	3/2+	0.0	1/2+	M1	I_γ: deduced from Iγ(460.8γ) and adopted relative branching from 471 level. Mult.: from α(K)exp=0.034 5 (1976Sv01).
471.01 7	2.1 5	2279.75	27/2−	1808.74	23/2−		
472.17 8	1.7 4	2022.25	23/2+	1550.08	23/2+		
474.09 3	9.6 13	1668.98	23/2+	1194.880	19/2+		
474.38[&]		1096.52	13/2+	622.20	13/2+		Mult.: α(K)exp=0.034 7, mult=M1 (1976Sv01) for Eγ=474.71 25 multiplet.
474.77[&]		1164.04	15/2+	689.246	15/2+		Mult.: α(K)exp=0.034 7, mult=M1 (1976Sv01) for Eγ=474.71 25 multiplet.

γ(^{167}Tm) (continued)

E$_\gamma$	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[‡]	Comments
475.25[i] *6*	4.0[i] *6*	935.37	7/2$^-$	460.00	7/2$^-$		Mult.: α(K)exp=0.034 *7*, mult=M1 (1976Sv01) for Eγ=474.71 *25* multiplet.
475.25[i] *6*	4.0[i] *6*	2573.35	27/2$^-$	2098.14	23/2$^-$		
476.35 *9*	2.2 *4*	1562.99	19/2$^+$	1086.626	19/2$^+$		
479.88 *6*	5.0 *6*	2396.47	25/2$^-$	1916.66	21/2$^-$		
480.50[i] *17*	3.6[i] *7*	1858.71	25/2$^-$	1378.26	21/2$^-$		
480.50[i] *17*	3.6[i] *7*	2382.08?	25/2$^+$	1901.29	21/2$^+$		
[x]482.1 *3*	0.7 *2*						
484.08[b] *11*	1.0 *3*	1678.94	19/2$^+$	1194.880	19/2$^+$		
485.39 *12*	2.3 *4*	602.13	7/2$^+$	116.689	5/2$^+$		
485.98 *13*	4.3 *4*	1915.44	25/2$^+$	1429.60	21/2$^+$		
[x]486.48 *5*	2.2 *7*					M1	Mult.: from α(K)exp=0.045 *8* (1976Sv01).
491.02 *26*	1.5[#] *2*	1915.44	25/2$^+$	1424.71	21/2$^+$		
491.70[&]		1470.29	17/2$^+$	978.594	17/2$^+$		
492.89 *6*	1.5[#] *2*	1922.49	25/2$^+$	1429.60	21/2$^+$		
[x]495.70 *11*	0.6 *2*						
497.71[i] *4*	4.2[i#] *3*	1276.87	15/2$^+$	779.091	15/2$^+$		Mult.: A$_2$=+0.34 *5*, A$_4$=−0.05 *6* (1980Ol05) for doublet.
497.71[i] *4*	4.2[i#] *3*	1922.49	25/2$^+$	1424.71	21/2$^+$		Mult.: A$_2$=+0.34 *5*, A$_4$=−0.05 *6* (1980Ol05) for doublet.
502.09 *4*	5.5[#] *4*	2030.84	29/2$^-$	1528.75	25/2$^-$	(E2)[g]	Mult.: A$_2$=+0.36 *7*, A$_4$=−0.12 *9* (1980Ol05).
503.84[b] *13*	0.7 *2*	1101.42	13/2$^+$	597.571	13/2$^+$		
507.14[i] *4*	3.2[i] *2*	2113.86	27/2$^-$	1606.87	23/2$^-$		
507.14[ik] *4*	3.2[i] *2*	2321.13?	25/2$^+$	1814.03	21/2$^+$		
508.81[a] *14*	1.1 *2*	944.95	11/2$^+$	436.154	11/2$^+$		
[x]510.25[a] *13*	1.3 *2*						
[x]511.65 *8*	2.8 *2*						
513.66 *5*	1.8 *2*	840.31	11/2$^+$	326.61	9/2$^+$		
515.42[i] *4*	6.0[i] *10*	657.60?	7/2$^+$	142.546	7/2$^+$		
515.42[i] *4*	6.0[i] *10*	2065.65	27/2$^+$	1550.08	23/2$^+$		
517.34[&]		1524.98	17/2$^-$	1007.71	15/2$^-$		
517.53 *3*	3.3 *6*	2186.51	27/2$^+$	1668.98	23/2$^+$		
518.17[&k]		2440.51	29/2$^+$	1922.49	25/2$^+$		
519.31[&]		2799.12	31/2$^-$	2279.75	27/2$^-$		
[x]523.39 *25*	0.6 *2*						
523.93[&]		1223.17	13/2$^-$	699.26	11/2$^-$		
525.07 *5*	2.2 *3*	2440.51	29/2$^+$	1915.44	25/2$^+$		
533.18 *12*	1.7[#] *2*	2455.70	29/2$^+$	1922.49	25/2$^+$		
535.61[&]		1916.66	21/2$^-$	1381.12	19/2$^-$		
535.79 *3*	4.5[#] *4*	2394.49	29/2$^-$	1858.71	25/2$^-$		
536.72[&]		2065.65	27/2$^+$	1528.75	25/2$^-$		

γ(^{167}Tm) (continued)

Eγ	Iγ[†]	Ei(level)	J^π_i	Ef	J^π_f	Mult.[‡]	Comments
537.39 3	3.9[#] 3	1007.71	15/2−	470.317	13/2−	M1	Mult.: from α(K)exp=0.030 10 (1976Sv01).
541.28[d] 25		657.60?	7/2+	116.689	5/2+		Eγ: for doublet. Mult.: α(K)exp=0.035 8 (1976Sv01) for doublet.
541.87 7	1.2 3	1164.04	15/2+	622.20	13/2+		Mult.: α(K)exp=0.035 8 (1976Sv01) for doublet.
542.51 15	1.2 3	2573.35	27/2−	2030.84	29/2−		
547.42[i] 3	2.7[i#] 3	557.919?	5/2+	10.501	3/2+		Mult.: α(K)exp=0.025 4 (1976Sv01) for multiply-placed G.
547.42[i] 3	2.7[i#] 3	1044.14	11/2−	496.709	11/2−		Mult.: α(K)exp=0.025 4 (1976Sv01) for multiply-placed G.
549.50 19	0.8 2	2735.91	31/2+	2186.51	27/2+		
554.66 7	1.4[#] 2	2620.31	31/2+	2065.65	27/2+		
556.74[i] 5	2.8[i] 4	927.96	11/2+	371.105	11/2+		Mult.: α(K)exp=0.021 4, mult=M1 (1976Sv01) for doubly-placed G.
556.74[i] 5	2.8[i] 4	2670.62	31/2−	2113.86	27/2−		Mult.: α(K)exp=0.021 4, mult=M1 (1976Sv01) for doubly-placed G.
[x]560.23 7	0.8 1						
562.68 10	1.0 1	2593.52	33/2−	2030.84	29/2−		
566.83 11	0.6 1	709.25	9/2+	142.546	7/2+		
569.35[i] 6	1.6[i] 2	1562.99	19/2+	993.661	17/2+		
569.35[i] 6	1.6[i] 2	2098.14	23/2−	1528.75	25/2−		
[x]570.90 3	2.9[#] 4					M1	Mult.: from α(K)exp=0.022 4 (1976Sv01).
[x]577.10 8	0.6 1						
587.45 15	0.5 1	2396.47	25/2−	1808.74	23/2−		
589.47 12	1.4 2	2620.31	31/2+	2030.84	29/2−		
[x]591.45 8	1.8 2						
592.27[&]		1281.49?	15/2+	689.246	15/2+		
[x]593.21 18	1.0 2						
595.05 3	3.6 2	1691.30	19/2−	1096.283	21/2−		
[x]597.16 16	0.4 1						
[x]600.14 4	2.6 2					M1	Mult.: from α(K)exp=0.019 3 (1976Sv01).
601.48 5	1.7 2	927.96	11/2+	326.61	9/2+		
[x]615.95 11	0.7 2						
617.33 4	4.0 4	1358.81	15/2−	741.426	17/2−		
619.04 7	1.1 2	1705.59	19/2+	1086.626	19/2+		
[x]621.69 6	0.5 1						
630.14 3	3.0 2	1001.25	13/2+	371.105	11/2+	M1	Mult.: from α(K)exp=0.017 8 (1976Sv01).
635.07 3	2.8 2	1105.39	11/2−	470.317	13/2−		
636.95 20	1.3 5	929.83?	9/2−	292.940	7/2−		
639.89 4	6.2 3	1381.12	19/2−	741.426	17/2−	M1	Mult.: from α(K)exp=0.019 5 (1976Sv01).
[x]640.89 10	1.2 2						
648.43 11	1.1 2	944.95	11/2+	296.310	9/2+		
649.38 4	2.2 7	935.37	7/2−	286.009	9/2−	M1	Mult.: from α(K)exp=0.015 3 (1976Sv01).
[x]652.54 14	0.5 1						
[x]654.65[b] 20	0.4 1						
659.18[b] 24	0.5 1	1281.49?	15/2+	622.20	13/2+		Mult.: α(K)exp=0.015 4 (1976Sv01) for doubly-placed G.

γ(^{167}Tm) (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
660.36 5	2.0 2	1044.14	11/2⁻	383.778	9/2⁻		Mult.: α(K)exp=0.015 4 (1976Sv01) for doubly-placed G.
665.13[i] 3	2.1[i] 1	852.62	3/2⁻	187.763	5/2⁻		Mult.: α(K)exp=0.008 3 (1976Sv01) for doubly-placed G.
665.13[i] 3	2.1[i] 1	1101.42	13/2⁺	436.154	11/2⁺		Mult.: α(K)exp=0.008 3 (1976Sv01) for doubly-placed G.
[x]670.69 5	0.5 1						
679.43 7	2.0 2	1276.87	15/2⁺	597.571	13/2⁺		
680.86 16	0.8 2	852.62	3/2⁻	171.76	1/2⁻		
683.54 4	2.1 2	1372.82	17/2⁺	689.246	15/2⁺		
[x]688.83 4	1.7 2						
691.20[&]		1470.29	17/2⁺	779.091	15/2⁺		
[x]691.60[b] 5	2.7 2						
[x]693.24[b] 5	4.4 3						Mult.: α(K)exp=0.011 3, mult=M1+E2 (1976Sv01) for doublet.
694.46 17	3.5 3	882.22	5/2⁻	187.763	5/2⁻		Mult.: α(K)exp=0.011 3, mult=M1+E2 (1976Sv01) for doublet.
700.36[b] 7	1.7 2	1678.94	19/2⁺	978.594	17/2⁺		
706.35[b] 15	0.8 2	1901.29	21/2⁺	1194.880	19/2⁺		
711.34[&k]		2135.98	23/2⁺	1424.71	21/2⁺		
712.41 3	4.6 2	1808.74	23/2⁻	1096.283	21/2⁻		
[x]719.56 4	1.8 2						Mult.: α(K)exp=0.007 3 (1976Sv01).
722.60 3	2.7 2	1008.61	9/2⁻	286.009	9/2⁻	(E2)	Mult.: from α(K)exp=0.007 2 (1976Sv01).
725.35 3	1.8 3	1096.52	13/2⁺	371.105	11/2⁺		
727.63 11	0.7 2	1814.03	21/2⁺	1086.626	19/2⁺		
[x]735.6 3	0.3 1						
[x]737.47 17	0.4 1						
747.50 9	0.4 1	935.37	7/2⁻	187.763	5/2⁻		
751.21[i] 10	2.3[i] 3	1044.14	11/2⁻	292.940	7/2⁻		Mult.: α(K)exp=0.007 4 (1976Sv01) for doublet.
751.21[i] 10	2.3[i] 3	2279.75	27/2⁻	1528.75	25/2⁻		Mult.: α(K)exp=0.007 4 (1976Sv01) for doublet.
752.85 3	5.5 4	1223.17	13/2⁻	470.317	13/2⁻		
[x]757.6 3	0.6 2						
[x]759.29 18	0.5 2						
[x]763.6 4	0.3 1						
765.42 3	2.3 2	944.95	11/2⁺	179.599	7/2⁺	E2	Mult.: from α(K)exp=0.007 3 (1976Sv01).
768.28 22	0.5 1	2799.12	31/2⁻	2030.84	29/2⁻		
[x]774.88 18	2.3 2						
783.57 3	5.8 2	1524.98	17/2⁻	741.426	17/2⁻		
[x]786.54 9	0.6 2						
798.46 10	0.7 1	1487.41?	17/2⁺	689.246	15/2⁺		
805.07 4	2.5 2	1101.42	13/2⁺	296.310	9/2⁺		
819.41[&]		1105.39	11/2⁻	286.009	9/2⁻		
[x]819.70 10	1.1 2						
820.44[&]		1916.66	21/2⁻	1096.283	21/2⁻		
[x]826.01 6	1.3 2						
[x]829.52 13	0.4 1						

$^{167}_{69}$Tm$_{98}$-13

γ(^{167}Tm) (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π
^{x}835.54 *21*	0.3 *1*				
840.70 *6*	1.9 *2*	1276.87	15/2$^+$	436.154	11/2$^+$
^{x}861.28 *20*	0.5 *1*				
^{x}863.08 *12*	1.0 *2*				
867.36 *26*	0.4 *1*	2396.47	25/2$^-$	1528.75	25/2$^-$
^{x}869.44 *15*	0.7 *1*				
872.62 *8*	1.6 *2*	1470.29	17/2$^+$	597.571	13/2$^+$
^{x}874.92 *12*	2.1 *2*				
^{x}877.13 *13*	1.1 *2*				
^{x}880.62 *14*	0.6 *1*				
^{x}884.12 *9*	1.2 *1*				
^{x}886.5 *3*	0.3 *1*				
888.37 *12*	1.5 *2*	1358.81	15/2$^-$	470.317	13/2$^-$
^{x}891.03 *10*	0.9 *1*				
^{x}895.64[b] *22*	0.4 *1*				
^{x}900.32 *21*	0.6 *1*				
^{x}903.14 *14*	0.5 *1*				
^{x}908.77 *11*	0.4 *1*				
^{x}911.93[b] *13*	0.5 *1*				
^{x}912.9 *3*	0.4 *1*				
^{x}914.25 *13*	0.6 *2*				
^{x}931.11 *18*	0.5 *1*				
^{x}932.9 *4*	0.4 *1*				
^{x}934.36 *19*	0.6 *2*				
^{x}937.04 *12*	0.7 *2*				
^{x}937.9 *3*	1.0 *4*				
^{x}940.19 *26*	0.4 *1*				
^{x}947.19 *26*	0.4 *1*				
950.11 *21*	1.6 *1*	1691.30	19/2$^-$	741.426	17/2$^-$
^{x}954.5 *3*	0.3 *1*				
^{x}968.15 *27*	0.4 *1*				
^{x}970.55 *17*	0.4 *1*				
^{x}973.18 *16*	0.5 *1*				
^{x}982.24 *8*	1.9 *2*				
^{x}988.54 *11*	1.4 *2*				
^{x}990.50 *18*	0.9 *2*				
1001.70 *23*	0.6 *1*	2098.14	23/2$^-$	1096.283	21/2$^-$
^{x}1004.4 *3*	0.3 *1*				
^{x}1007.5 *3*	0.6 *1*				
^{x}1009.69 *11*	1.3 *2*				
^{x}1014.74[b] *24*	0.6 *1*				
1016.6 *3*	0.6 *1*	1705.59	19/2$^+$	689.246	15/2$^+$
^{x}1018.33 *24*	0.6 *1*				
^{x}1024.69 *15*	1.1 *2*				
^{x}1027.0 *3*	0.4 *1*				
^{x}1033.49 *15*	0.5 *1*				
^{x}1037.73 *13*	0.7 *1*				
1044.60[&]		2573.35	27/2$^-$	1528.75	25/2$^-$
^{x}1047.36 *12*	0.8 *1*				
^{x}1050.4 *4*	0.4 *1*				
^{x}1051.34 *19*	0.6 *2*				
^{x}1053.95 *23*	0.4 *1*				
^{x}1061.21 *22*	0.6 *1*				
^{x}1068.89 *15*	0.5 *1*				
^{x}1074.1 *3*	0.5 *1*				
^{x}1077.36 *17*	0.9 *3*				
^{x}1079.3[a] *3*	0.7 *2*				
^{x}1080.77 *16*	0.6 *1*				
^{x}1090.6 *6*	0.6 *1*				
^{x}1099.9 *3*	0.7 *1*				
^{x}1101.75[b] *18*	0.9 *1*				
^{x}1103.1 *4*	0.7 *1*				
^{x}1108.91 *17*	0.5 *1*				
^{x}1111.66 *18*	0.6 *1*				
^{x}1118.1 *4*	0.5 *1*				
^{x}1127.0 *3*	0.6 *1*				
^{x}1128.36 *20*	0.9 *2*				
^{x}1134.23 *15*	0.8 *1*				
^{x}1138.9 *3*	0.4 *1*				
^{x}1140.14[b] *25*	0.7 *1*				
^{x}1152.05 *17*	0.9 *1*				
^{x}1162.9 *3*	0.9 *2*				
^{x}1170.2 *3*	0.5 *1*				
^{x}1177.95 *26*	0.5 *1*				
^{x}1180.26 *22*	0.6 *2*				
^{x}1183.39 *23*	0.5 *1*				
^{x}1189.8 *3*	0.3 *1*				
^{x}1195.57 *23*	0.5 *1*				
^{x}1214.28 *15*	0.8 *2*				
^{x}1232.6 *5*	0.4 *1*				
^{x}1235.69 *14*	1.2 *2*				
^{x}1238.5 *4*	0.4 *1*				
^{x}1240.9 *3*	0.6 *2*				

$^{167}_{69}$Tm$_{98}$-14

γ(^{167}Tm) (continued)

[†] For E(α)=27 MeV and θ=90°, relative to I(106γ, 90°)=100 (1980Ol05), except as noted.
[‡] From γ-ray angular distributions (1980Ol05,1981Io06), except where noted. ce data, normalized so α(K)exp(210γ)=α(K)(E2)=0.143 (1976Sv01) have been used to establish magnetic or electric nature of transitions, when available. Intraband D+Q and stretched Q transitions were assigned as (M1+E2) and (E2), respectively.
[#] Average intensities over all angles (relative to I(106γ, 90°)=100) (1980Ol05).
[@] From adopted gammas.
[&] Seen in coincidence spectra only; ΔE unstated by 1980Ol05.
[a] Seen at E(α)=25 MeV only.
[b] Seen at E(α)=23 MeV only.
[c] Estimated by 1980Ol05 from relative photon branching assuming pure rotational states.
[d] From ^{167}Er(p,nγ) (1976Sv01).
[e] From ^{167}Er(p,nγ) (1976Sv01); values are normalized to those of 1980Ol05 at each level.
[f] From (p,2nγ)/(p,nγ) excitation-strength ratios (1976Sv01).
[g] From γ(θ) (1980Ol05); stretched Q assignments were based on large positive A_2, and intraband D+Q assignments, on rotational-band structure and negative A_2.
[h] 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.
[i] Multiply placed with undivided intensity.
[j] Multiply placed with intensity suitably divided.
[k] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

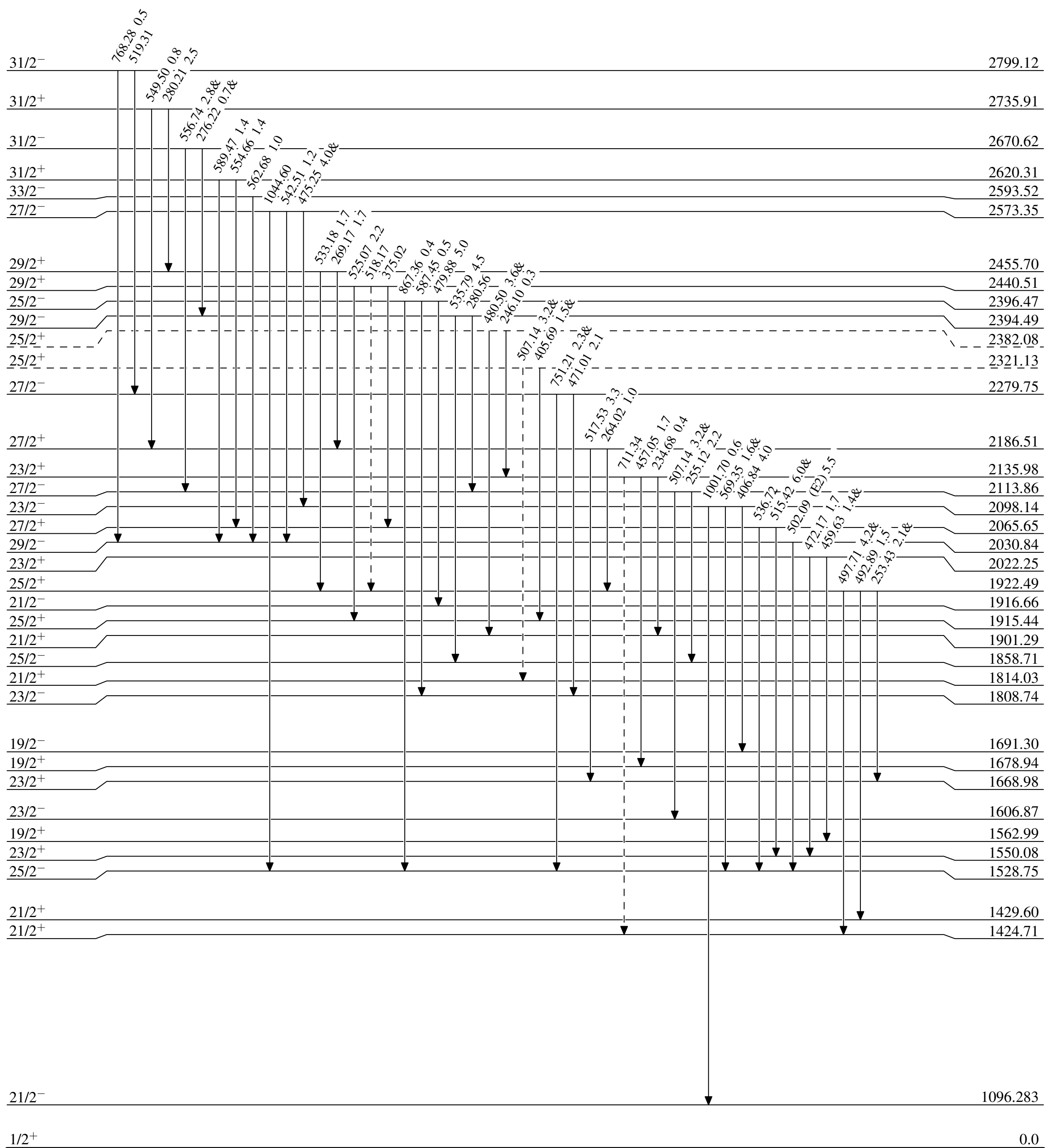
^{165}Ho(α,2nγ), ^{167}Er(p,nγ) 1976Sv01,1980Ol05

Level Scheme

Intensities: Relative Iγ from (α,2nγ) At Eα=27 MeV.
& Multiply placed: undivided intensity given

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



$^{167}_{69}Tm_{98}$

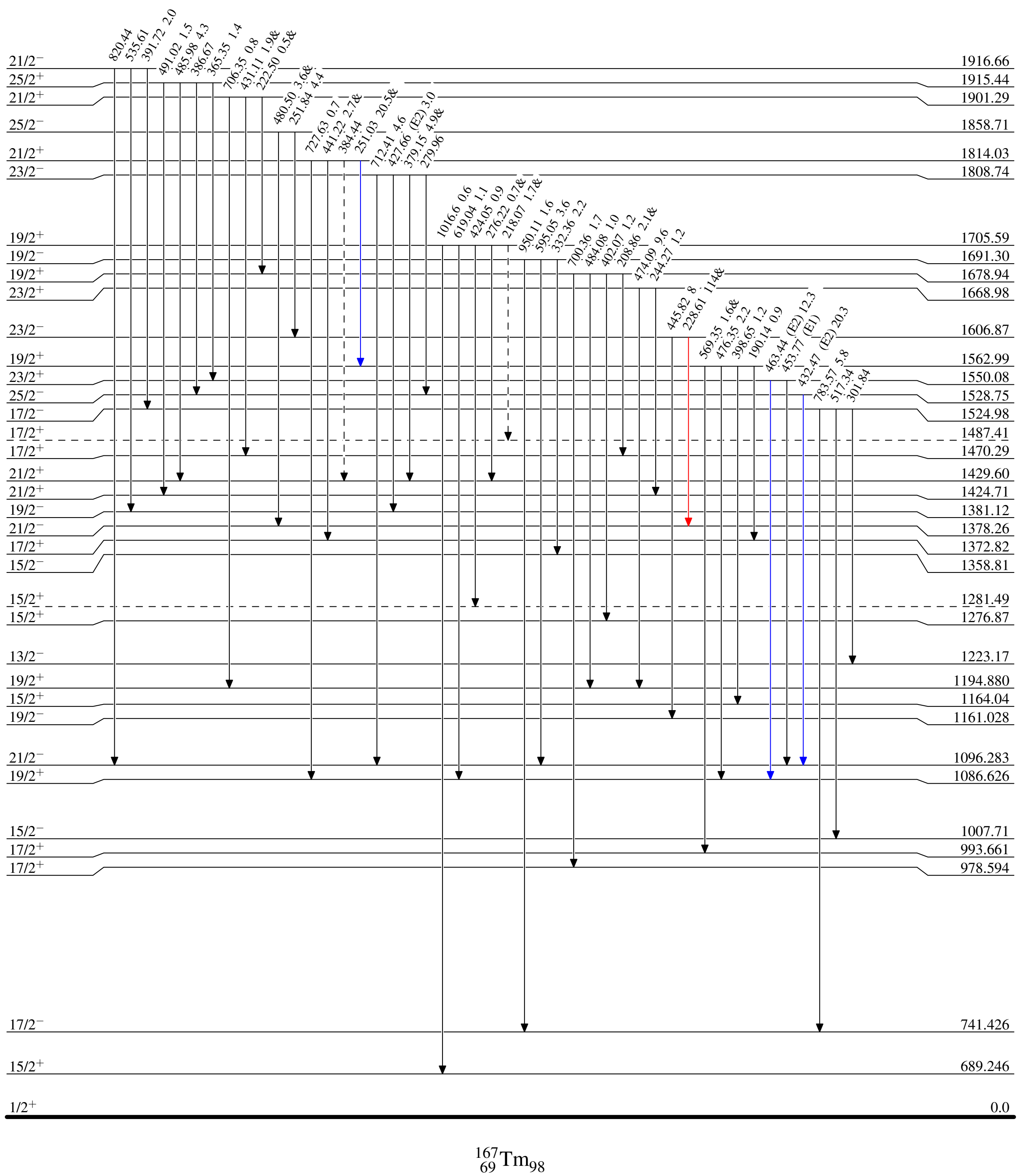
^{165}Ho(α,2nγ), ^{167}Er(p,nγ) 1976Sv01,1980Ol05

Level Scheme (continued)

Intensities: Relative Iγ from (α,2nγ) At Eα=27 MeV.
& Multiply placed: undivided intensity given

Legend

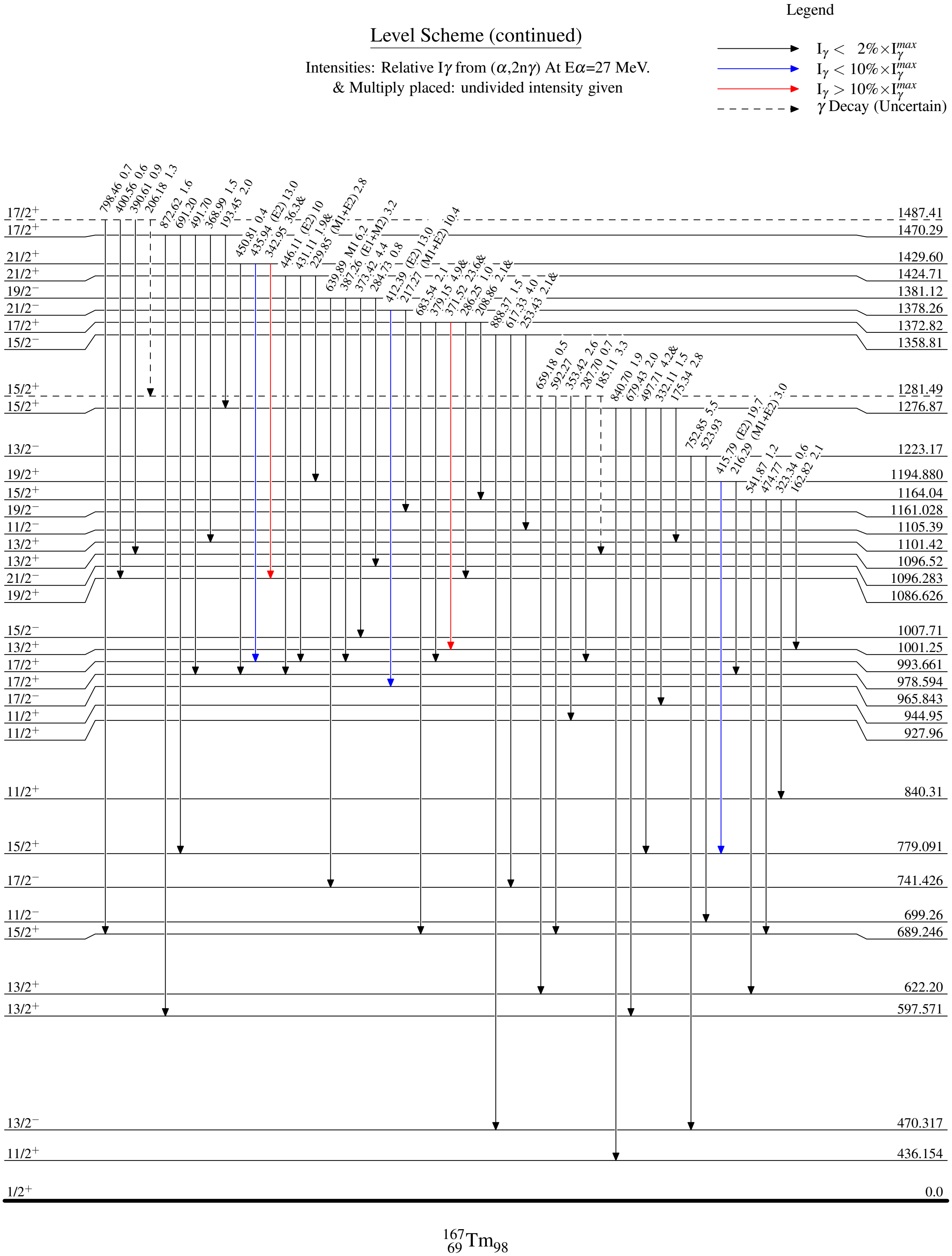
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



^{165}Ho(α,2nγ), ^{167}Er(p,nγ) 1976Sv01,1980Ol05

Level Scheme (continued)

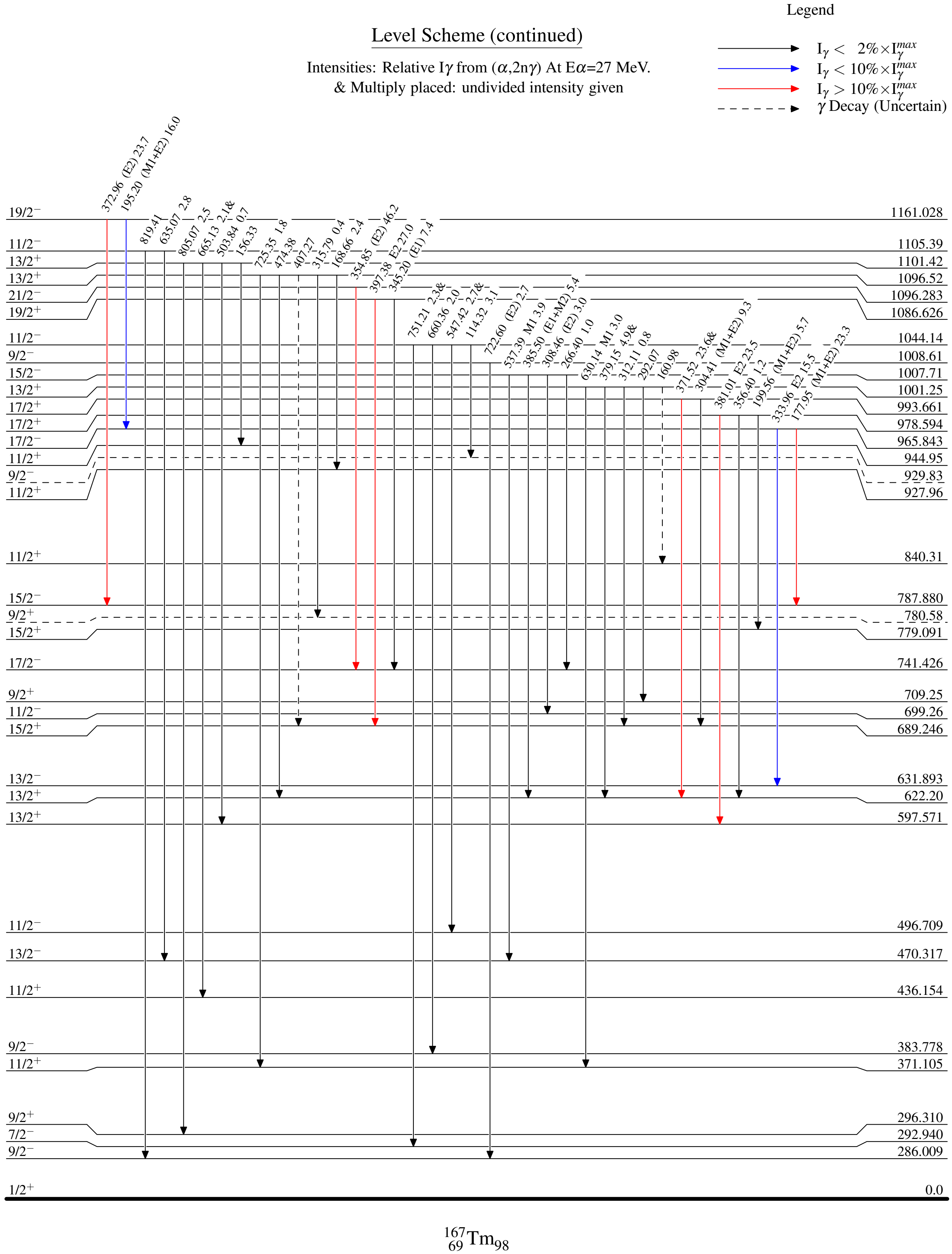
Intensities: Relative Iγ from (α,2nγ) At Eα=27 MeV.
& Multiply placed: undivided intensity given



^{165}Ho(α,2nγ), ^{167}Er(p,nγ) 1976Sv01,1980Ol05

Level Scheme (continued)

Intensities: Relative Iγ from (α,2nγ) At Eα=27 MeV.
& Multiply placed: undivided intensity given



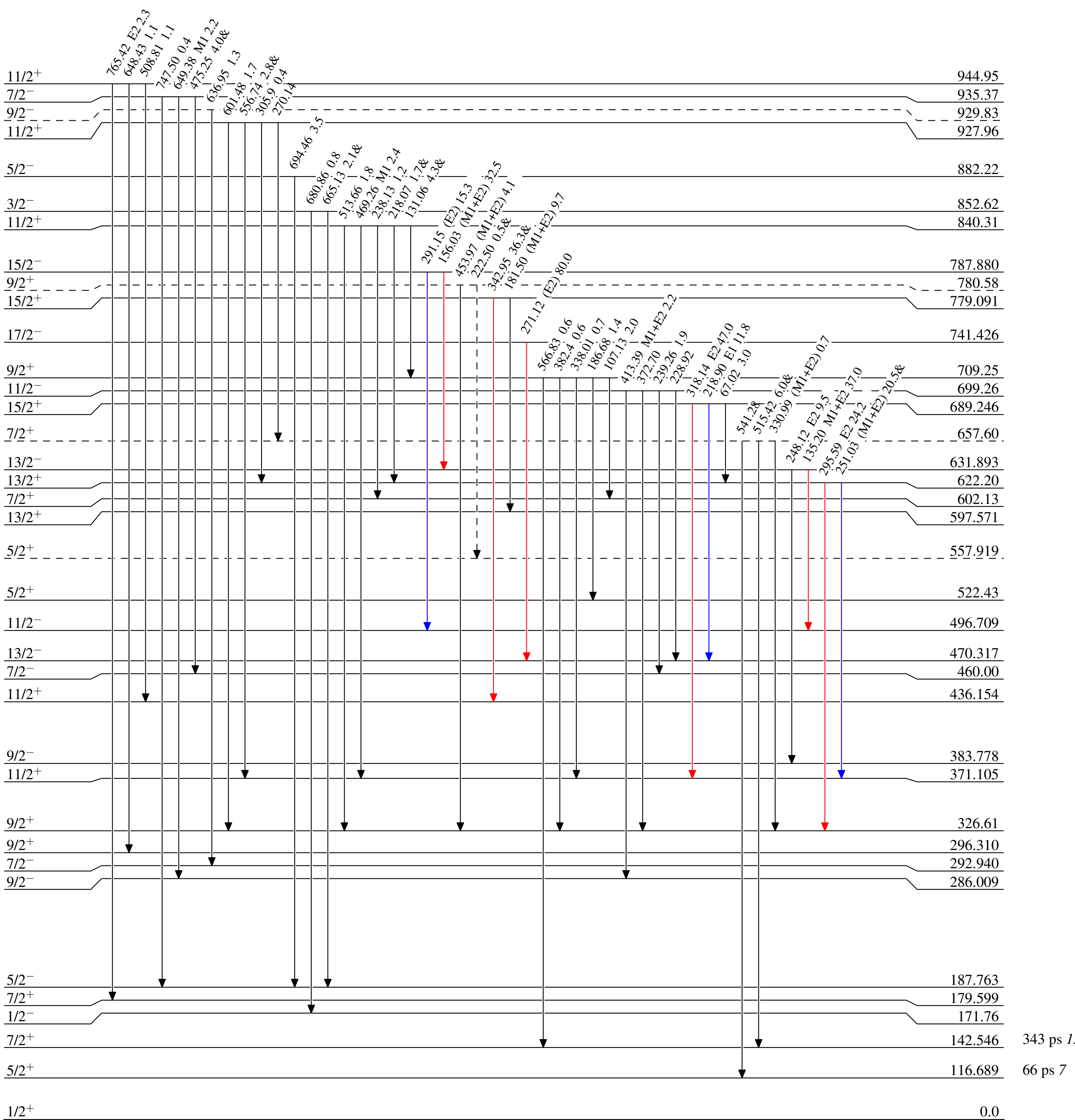
^{165}Ho(α,2nγ), ^{167}Er(p,nγ) 1976Sv01,1980Ol05

Level Scheme (continued)

Intensities: Relative Iγ from (α,2nγ) At Eα=27 MeV.
& Multiply placed: undivided intensity given

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



$^{167}_{69}Tm_{98}$

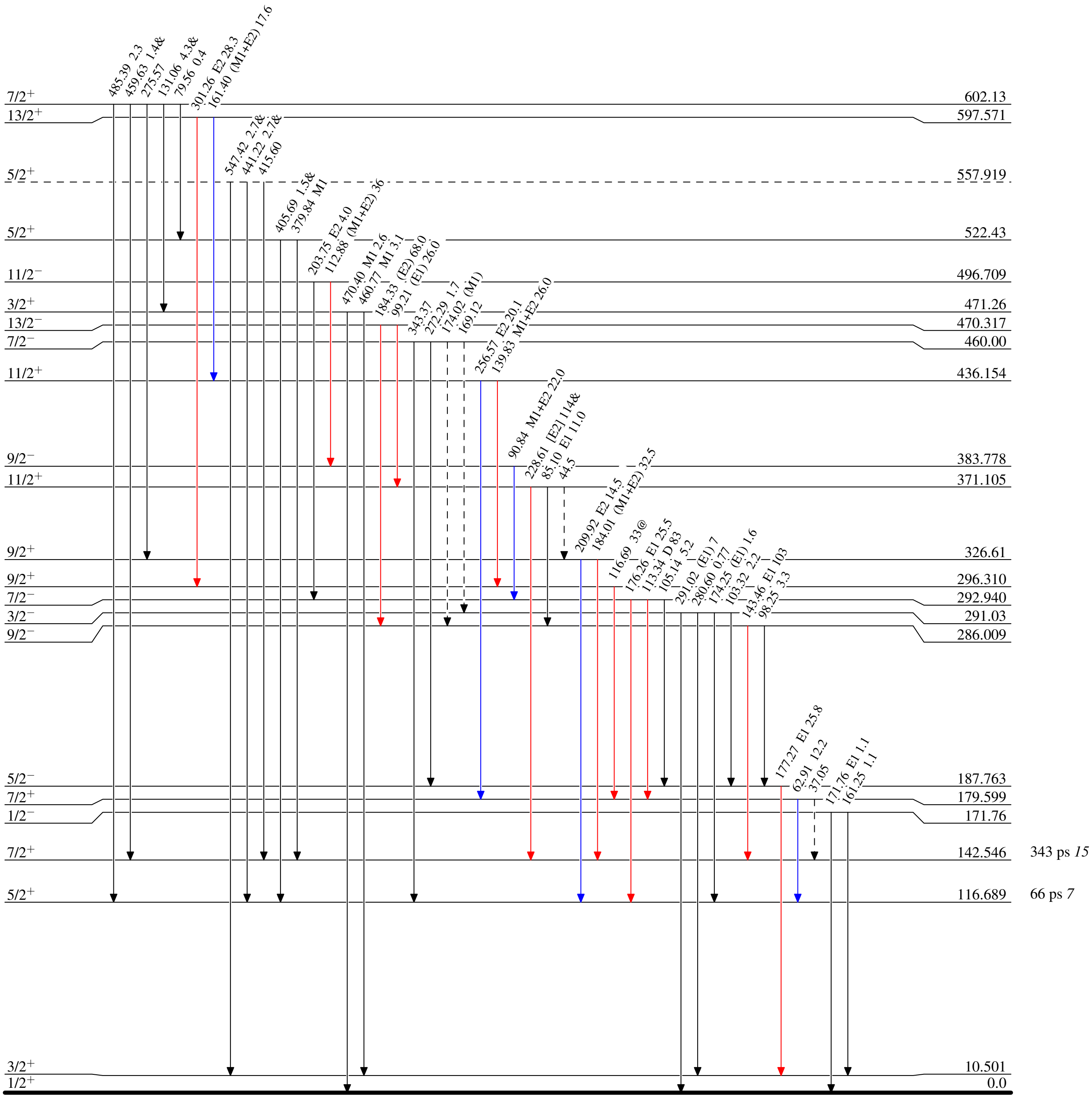
^{165}Ho(α,2nγ), ^{167}Er(p,nγ) 1976Sv01,1980Ol05

Level Scheme (continued)

Intensities: Relative Iγ from (α,2nγ) At Eα=27 MeV.
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)

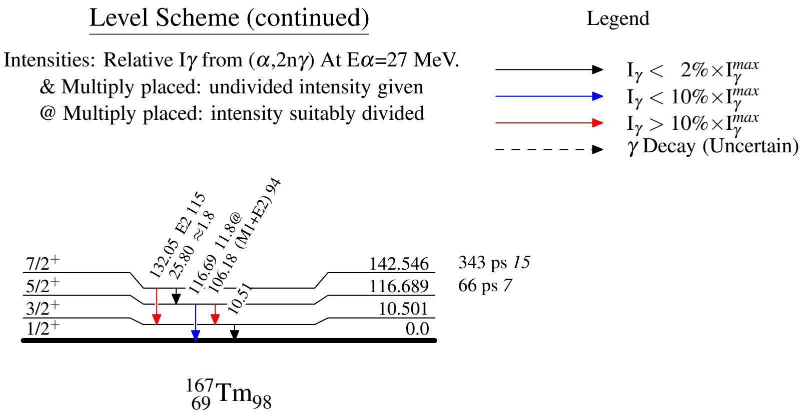


$^{167}_{69}Tm_{98}$

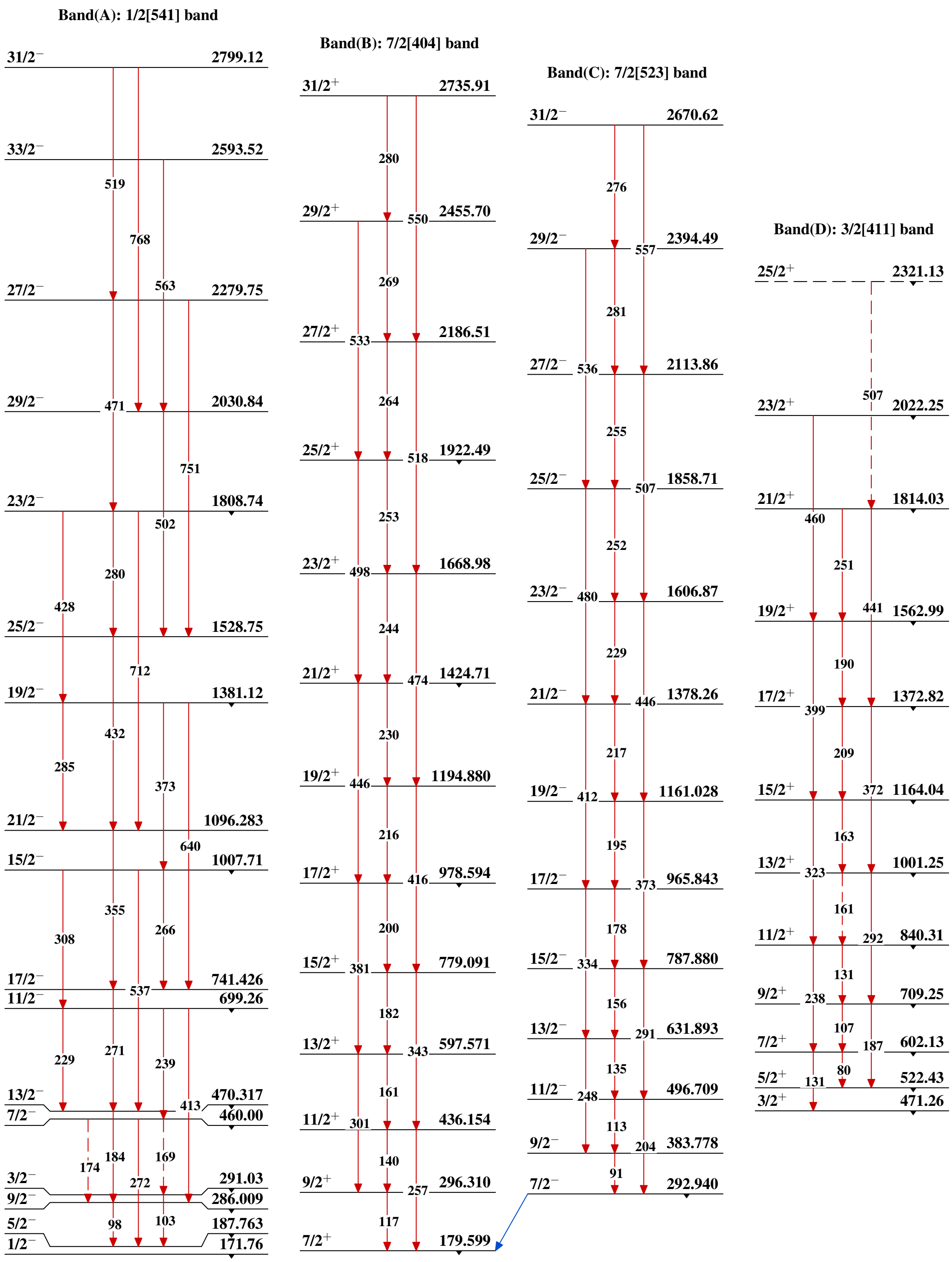
^{165}Ho(α,2nγ), ^{167}Er(p,nγ) 1976Sv01,1980Ol05

Level Scheme (continued)

Intensities: Relative Iγ from (α,2nγ) At Eα=27 MeV.
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

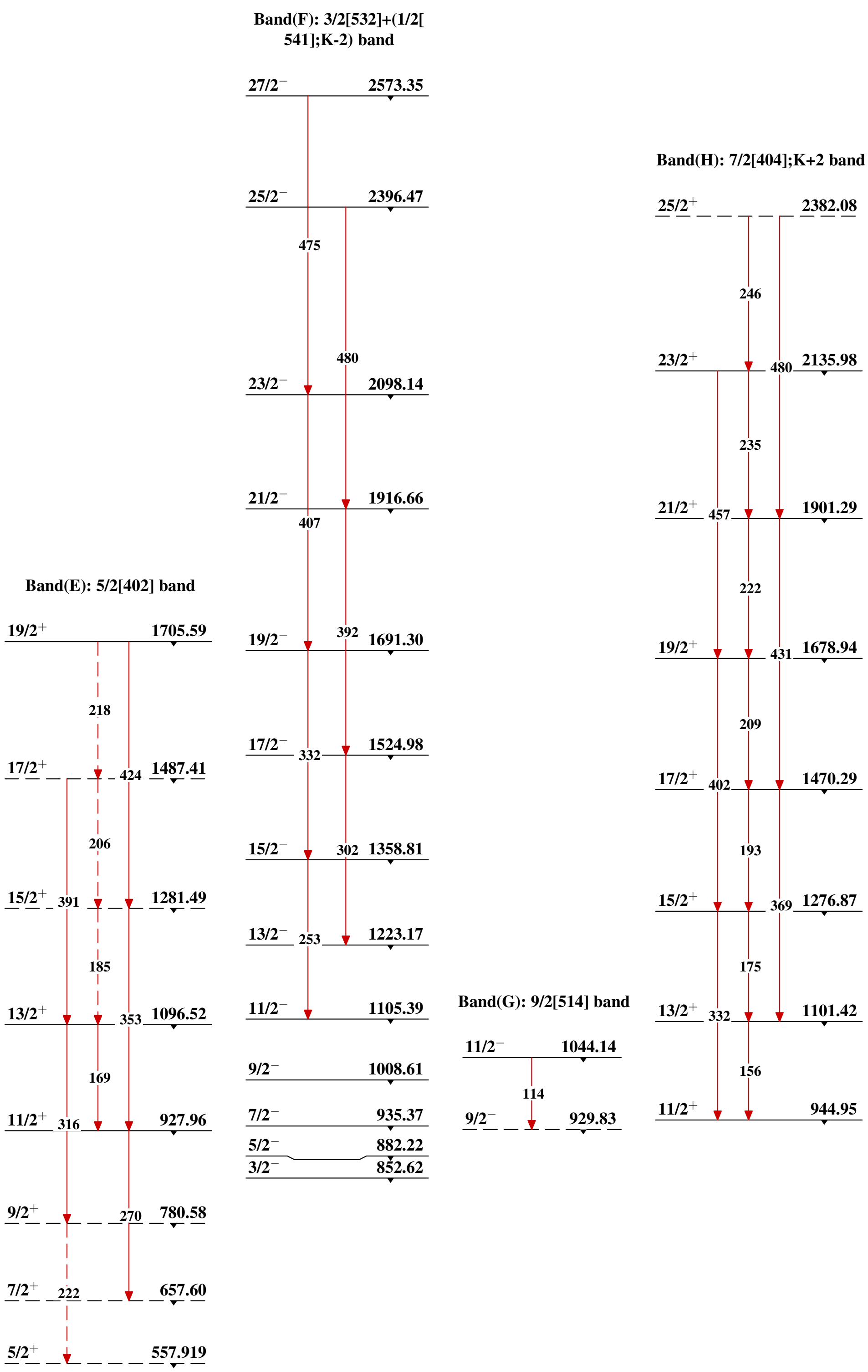


^{165}Ho(α,2nγ), ^{167}Er(p,nγ) 1976Sv01,1980Ol05



$^{167}_{69}Tm_{98}$

^{165}Ho(α,2nγ), ^{167}Er(p,nγ) 1976Sv01,1980Ol05 (continued)



$^{167}_{69}Tm_{98}$