^{163}Tm ε decay (1.810 h) 1982Vy07

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich, Balraj Singh	NDS 111,1211 (2010)	12-Apr-2010

Parent: ^{163}Tm: E=0; $J^\pi=1/2^+$; $T_{1/2}$=1.810 h *5*; Q(ε)=2439 *3*; %ε+%$β^+$ decay=100
^{163}Tm-J^π,$T_{1/2}$: From the ^{163}Tm Adopted Levels.
^{163}Tm-Q(ε): From 2009AuZZ, 2003Au03.
^{163}Tm-Configuration=π1/2[411].
Additional information 1.
1982Vy07 (also 1982Vy08): measured K x ray, γ, ce, $β^+$ (spect), ceγ. Chem, mass separation. Level scheme given by 1982Vy08.
1980Ab18 (also 1980Ab22): measured γ, ce. Chem. 47 γ rays measured up to 400 keV.
1976Ab09: measured γ, ce.
Others:
γ: 1963Gr14, 1967Gn01, 1975Gr44.
ce: 1962Ha24, 1963Gr14, 1967Gn01, 1987BaZB, 1991GaZZ.
ceγ(t): 1974An04.
(x ray)γ(t)): 1969Ve05.
Eε,Iε: 1960Bo29, 1964Gr37, 1982By03.
$T_{1/2}$ of ^{163}Tm g.s.: 1961Bj02, 1963Ra15, 1963Gr14, 1969Ve05. Others: 1959Ha09, 1960Bo29, 1960Bu27.
The decay scheme is from 1982Vy07 and 1982Vy08, superseding the level schemes of 1980Ab18, 1976Ab09, 1967Gn01 and 1963Gr14.

^{163}Er Levels

Bands: band structure suggested by 1976Ab09 and 1970Hj02 extended and confirmed by 1982Vy08.
Fragmentation of three-quasiparticle states: ≈75% of the decay of ^{163}Tm goes to levels above 1 MeV. Of the 19 levels, seven have $J^\pi=3/2^+$ and for most of the others the large ε feedings make J>3/2 very unlikely. This observed high density of $3/2^+$ levels may be related to the fact that the three-quasiparticle states are highly fragmented due to the interaction of the quasiparticle and collective degrees of freedom. Note, however, that theory predicts this fragmentation to be in the 2^- to 3-MeV range.

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0.0[#]	$5/2^-$		
69.23[@] *1*	$5/2^+$	8.3 ns *5*	E(level): from Eγ. Level held fixed in least-squares analysis. $T_{1/2}$: weighted average of 8.8 ns *5* (1969Ve05,γγ(t)) and 7.7 ns *6* (1974An04,γce(t)).
83.96[#] *1*	$7/2^-$	0.92 ns *8*	$T_{1/2}$: ceγ(t) (1974An04).
91.55[@] *1*	$7/2^+$		
104.32[&] *1*	$3/2^-$	0.52 ns *5*	$T_{1/2}$: ceγ(t) (1974An04). Additional information 2.
120.35[@] *2*	$9/2^+$		
164.42[&] *1*	$5/2^-$		
190.01[#] *8*	$9/2^-$		
249.53[&] *1*	$7/2^-$		
345.62[a] *1*	$1/2^-$		
404.00[a] *1*	$3/2^-$		
439.54[a] *1*	$5/2^-$		
462.48[b] *2*	$3/2^+$		
526.33[b] *4*	$5/2^+$		
531.07 *3*	$3/2^+$		
540.56[c] *3*	$1/2^+$		
574.08 *3*	$3/2^+$		

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^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

^{163}Er Levels (continued)

E(level)[†]	Jπ[‡]	Comments
619.36[d] 2	3/2+	1976Ab09 assigned the 619 level as a member of the 1/2[400] band.
664.86[d] 3	5/2+	
683.75[e] 2	(1/2)−	
717.39[e] 3	3/2−	
735.38 2	1/2+,3/2+	
779.63[e] 4	5/2−	
856.22 4	(3/2)−	
963.29 8	(3/2)+	
985.67 8	5/2−	
1059.75 4	3/2−	
1281.16 5	1/2+,3/2+	
1369.46 3	3/2+	
1514.61 3	3/2+	
1538.79 3	3/2+	Probable configuration=(ν5/2[523])⊗(π7/2[523])⊗(π1/2[411]), with $K^{\pi}=3/2^{+}$.
1569.80 2	3/2+	
1593.03 4	3/2+	
1653.15 6	3/2+	
1722.39 5	3/2+	
1801.56 4	3/2+	Probable configuration=(ν5/2[523])⊗(π7/2[523])⊗(π1/2[411]), with $K^{\pi}=1/2^{+}$.
1826.49 3	3/2+	
1853.54 4	3/2+	
1872.79 6	(3/2)+	
1917.48 7	(3/2)+	
2040.68 8	3/2+	
2052.50 6	3/2−	
2122.21 11	1/2(−),3/2	
2243.21 19	3/2−	
2274.5 10	1/2(−),3/2	

[†] From least-squares fit to Eγ′s by assuming double the uncertainties quoted by 1982Vy07. Least-squares analysis with the uncertainties given by 1982Vy07 resulted in a poor fit with about 60 γ rays out of a total of 225 γ rays deviating in energy by more than 2 σ′s. Doubling each uncertainty improved the fit in that only 19 γ rays deviated by more 2 σ′s. All the discrepant cases are noted under comments. This suggests that the uncertainties quoted by 1982Vy07 are underestimated. The level energies are further rounded-off to nearest 0.01 keV in view of poor fit to Eγ′s.

[‡] From Adopted Levels. Assignments proposed by 1982Vy08 based on multipolarities and band structure are consistent.

[#] Band(A): ν5/2[523] band.

[@] Band(B): ν5/2[642] band. This is probably the dominant configuration, but this band most likely also contains sizeable components of other orbitals originating from the $i_{13/2}$ spherical-shell-model state that are introduced by the expected strong Coriolis coupling among these orbitals.

[&] Band(C): ν3/2[521] band.

[a] Band(D): ν1/2[521] band.

[b] Band(E): ν3/2[402] band (?).

[c] Band(F): ν1/2[400] band.

[d] Band(G): ν3/2[651] band.

[e] Band(H): K-2 γ vibration built on the ν5/2[523] g.s. The small value of the decoupling parameter excludes other interpretations for this K=1/2 band. This band may have some admixture of ν1/2[510].

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

ε,β+ radiations

Iγ(γ±)=4.7 *6* relative to Iγ(104γ)=100 (1982Vy07) compared to 6.2 *5* (5.4 *3* excluding Iε′s with upper limits and Iε(to 91.6)) from the decay scheme.

Iγ(104γ)/Iγ(K x ray)=0.135 *3* (1982Vy07), compared to 0.208 *6* from the decay scheme, is indicative of a substantive ε feeding which has not been placed. The measured Iβ+=0.047 *6* to levels above 720 compared to 0.00074 *5* also suggests that the ε feeding to levels between 735 and 1060 has been underestimated. The total-absorption γ spectroscopy measurements (NaI,Si(Li)) of 1982By03 also show a higher population of levels than observed in the present decay scheme.

Intensity balance gives apparent ε feedings (none expected from ΔJ and Δπ) to the following levels, resulting in anomalously low log *ft* values. Such feedings have been omitted from the level scheme given here: 91.5,7/2+ level (%ε=0.7 *2*); 120.3,9/2+ level (%ε=0.14 *6*); 190.0,9/2− level (%ε=0.11 *4*); 664.78,5/2+ (%ε=0.24 *6*). This discrepancy is due either to misplaced γ rays or to missing γ rays, or both.

Additional information 3.

TI,IE(E) From decay scheme, except as noted. Uncertainties include estimate of those caused by uncertain or multiply-placed γ rays.

E(decay)	E(level)	Iβ+ &	Iε&	Log *ft*	I(ε+β+)&	Comments
(164.5 *32*)	2274.5		0.008 *4*	7.1 *2*		εK=0.707 *4*; εL=0.221 *3*; εM+=0.0718 *11*
(195.8 *30*)	2243.21		0.15 *2*	6.06 *6*		εK=0.7373 *23*; εL=0.1991 *17*; εM+=0.0637 *7*
(316.8 *30*)	2122.21		0.16 *2*	6.55 *6*		εK=0.7849; εL=0.1642 *5*; εM+=0.05094 *17*
(386.5 *30*)	2052.50		1.15 *7*	5.90 *3*		εK=0.7963; εL=0.1558 *3*; εM+=0.04790 *11*
(398.3 *30*)	2040.68		0.85 *5*	6.06 *3*		εK=0.7978; εL=0.1547 *3*; εM+=0.04751 *10*
(521.5 *30*)	1917.48		0.75 *4*	6.38 *3*		εK=0.8086; εL=0.1467; εM+=0.04466 *6*
(566.2 *30*)	1872.79		2.48 *14*	5.93 *3*		εK=0.8112; εL=0.1448; εM+=0.04397
(585.5 *30*)	1853.54		2.06 *8*	6.05 *2*		εK=0.8122; εL=0.1441; εM+=0.04371
(612.5 *30*)	1826.49		5.33 *17*	5.68 *2*		εK=0.8135; εL=0.1431; εM+=0.04337
(637.4 *30*)	1801.56		12.9 *4*	5.33 *2*		εK=0.8146; εL=0.1424; εM+=0.04309
(716.6 *30*)	1722.39		2.86 *11*	6.09 *2*		εK=0.8174; εL=0.1402; εM+=0.04234
(785.9 *30*)	1653.15		1.11 *5*	6.59 *2*		εK=0.8194; εL=0.1388; εM+=0.04182
(846.0 *30*)	1593.03		2.46 *9*	6.31 *2*		εK=0.8208; εL=0.1377; εM+=0.04145
(869.2 *30*)	1569.80		9.7 *3*	5.74 *2*		εK=0.8213; εL=0.1374; εM+=0.04132
(900.2 *30*)	1538.79		16.9 *6*	5.53 *2*		εK=0.8219; εL=0.1369; εM+=0.04115
(924.4 *30*)	1514.61		2.72 *12*	6.35 *2*		εK=0.8224; εL=0.1366; εM+=0.04104
(1069.5 *30*)	1369.46		7.84 *26*	6.02 *2*		εK=0.8247; εL=0.1349; εM+=0.04044
(1157.8 *30*)	1281.16		0.62 *5*	7.20 *4*		εK=0.8257; εL=0.1341; εM+=0.04016
(1379.3 *30*)	1059.75		0.79 *5*	7.25 *3*		εK=0.8274; εL=0.1325; εM+=0.03960
(1453.3 *30*)	985.67		0.75 *14*	8.2 1*u* *2*	0.75 *14*	εK=0.8165; εL=0.1407; εM+=0.04257
1475 *9*	963.29		0.37 *15*	7.6 *2*	0.37 *15*	av Eβ=219.7 *14*; εK=0.8274; εL=0.1319; εM+=0.03938 Iβ+: Iβ(Emax=453)=0.0146 *13* compared to ΣIβ(to ≥963)=0.0005 *2* from decay scheme.
(1582.8 *30*)	856.22		0.18 *4*	8.0 *1*	0.18 *4*	av Eβ=267.0 *14*; εK=0.8265; εL=0.1311; εM+=0.03913
(1659.4[a] *30*)	779.63		0.14 *8*	9.2 1*u* *3*	0.14 *8*	εK=0.8189; εL=0.1384; εM+=0.04174
1693 *7*	735.38	0.0064 *6*	0.92 *9*	7.37 *5*	0.93 *9*	av Eβ=320.4 *14*; εK=0.8242; εL=0.1302; εM+=0.03882 Iβ+: Iβ(Emax=671)=0.032 *4* compared to ΣIβ(to 735 and 856)=0.0069 *8* from decay scheme.
(1721.6 *30*)	717.39	0.0107 *6*	1.41 *7*	7.20 *2*	1.42 *7*	av Eβ=328.3 *14*; εK=0.8237; εL=0.1300; εM+=0.03877
(1755.3 *30*)	683.75	0.0047 *6*	0.52 *7*	7.65 *6*	0.52 *7*	av Eβ=343.1 *14*; εK=0.8226; εL=0.1297; εM+=0.03867
(1774.1[a] *30*)	664.86	0.0024 *6*	0.24 *6*	8.0 *1*	0.24 *6*	av Eβ=351.4 *14*; εK=0.8220; εL=0.1295; εM+=0.03862 Transition is suspect since log *ft* is too low for a 1/2+ to 5/2+ transition.
(1819.6 *30*)	619.36	0.031 *2*	2.54 *10*	6.99 *2*	2.57 *10*	av Eβ=371.3 *14*; εK=0.8202; εL=0.1291; εM+=0.03847
(1864.9 *30*)	574.08	0.012 *1*	0.78 *8*	7.53 *5*	0.79 *8*	av Eβ=391.2 *14*; εK=0.8182; εL=0.1286; εM+=0.03832
1906 *3*	540.56	0.062 *3*	3.54 *17*	6.89 *2*	3.60 *17*	av Eβ=405.9 *14*; εK=0.8165; εL=0.1282; εM+=0.03820 Iβ+: Iβ(Emax=884)=0.136 *7* compared to ΣIβ(to ≥540 and ≤735)=0.0122 *5* from decay scheme.
(1907.9 *30*)	531.07	0.011 *1*	0.63 *4*	7.64 *3*	0.64 *4*	av Eβ=410.1 *14*; εK=0.8160; εL=0.1281; εM+=0.03816

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^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

ε,β+ radiations (continued)

E(decay)	E(level)	Iβ+ &	Iε&	Log *ft*	I(ε+β+)&	Comments
(1976.5 *30*)	462.48	0.045 *3*	1.91 *12*	7.19 *3*	1.96 *12*	av Eβ=440.2 *14*; εK=0.8119; εL=0.1272; εM+=0.03789
(1999.5 *30*)	439.54	0.0056 *9*	0.98 *15*	8.65[1u] *7*	0.99 *15*	av Eβ=466.3 *13*; εK=0.8185; εL=0.1353; εM+=0.04064
(2035.0 *30*)	404.00	0.054 *9*	1.8 *3*	7.23 *7*	1.9 *3*	av Eβ=465.9 *14*; εK=0.8077; εL=0.1264; εM+=0.03764
2091 *2*	345.62	0.19† *2*	5.3‡ *5*	6.80 *4*	5.5‡ *5*	av Eβ=491.5 *14*; εK=0.8030; εL=0.1255; εM+=0.03736 I(ε+β+): 5.5 *5* from decay scheme.
(2274.6 *30*)	164.42	0.027 *12*	1.8 *8*	8.6[1u] *2*	1.8 *8*	av Eβ=585.3 *13*; εK=0.8127; εL=0.1326; εM+=0.03974
2267 *22*	104.32	0.058† *11*	0.83‡ *16*	7.7 *1*	0.89‡ *17*	av Eβ=597.9 *14*; εK=0.7774; εL=0.1209; εM+=0.03596 I(ε+β+): 2.0 *20* from intensity balance.
(2369.8[a] *30*)	69.23	≤0.04#	≤0.52@	≥7.9	≤0.56@	av Eβ=613.4 *14*; εK=0.7728; εL=0.1201; εM+=0.03573 I(ε+β+): 0.7 *6* from intensity balance.
(2439.0[a] *30*)	0.0	≤0.04#	≤1.64@	≥8.8[1u]	≤1.68@	av Eβ=656.2 *13*; εK=0.8064; εL=0.1307; εM+=0.03914

† Relative intensities obtained by 1982Vy07 from Fermi-Kurie analysis and normalized to Iβ=0.41 *3* from ce(K)(104.3γ)/β+=98.9 *35* and Iβ=0.332 *24* from β+/ce(K)(655.8γ+666.1γ)=13.0 *6*. Renormalized by the evaluators from Iγ normalization=0.188 *9* to 0.186 *5*.

‡ From Iβ+ and theoretical ε/β+.

Upper limit estimated (evaluators) from Fermi-Kurie analysis of 1982Vy07 and theoretical ε/β+ ratios.

@ From estimated upper limit on Iβ+ and theoretical ε/β+ ratios.

& Absolute intensity per 100 decays.

a Existence of this branch is questionable.

γ(^{163}Er)

Iγ normalization: from ΣIγ(1+α)(to g.s.)=98.2 *18* (I(ε+β$^+$)≤3.6 from log $f^{1u}t$≥8.5 for first-forbidden unique transition). Other: 0.188 *9* from Iγ(104γ)/Iγ(K x ray)=0.135 *3* (1982Vy07); 0.187 *5* from ΣIγ(1+α)(to g.s.)=99.2 *8* from estimated Iβ$^+$(to g.s.)≤0.04.

α(K)exp: from 1982Vy07, except as noted. α(K)exp′s available from 1976Ab09 and from 1980Ab18 (for Eγ<400) are in general agreement with those from 1982Vy07. Relative Iγ′s and Ice(K)′s normalized to α(K)(104γ; M1)=0.218 by 1982Vy07, 1980Ab18, and 1976Ab09.

Subshell ratios are from 1980Ab18 or 1976Ab09.

ceγ-coincidences from 1982Vy07 and γγ-coincidences are from 1976Ab09.

The following unplaced γ rays reported by 1976Ab09 only have been omitted, since these are not confirmed by 1982Vy07 or 1980Ab18. (Iγ renormalized by evaluators to Iγ(104γ)=100 from Iγ=1940 *37*)

Eγ	Iγ	Mult.	α(K)exp	Eγ	Iγ	Mult.	α(K)exp
63.67 *5*	0.53 *8*	(E1)	≈ 0.7	755.4 *3*	1.2 *1*	E2,(M1)	0.007
96.35 *10*	0.21 *7*	E1	<0.3	872.5 *5*	0.3 *1*		
97.41 *7*	0.55 *9*	(M1)	≈ 4	906.9 *2*	1.4 *2*	E2	0.003
98.29 *7*	0.47 *9*	E1	0.14	936.4 *4*	0.5 *1*	E2	0.003
111.10 *15*	0.07 *4*	M1		957.3 *8*	0.10 *5*		
118.65 *5*	0.61 *10*	E1	0.1	1011.3 *6*	0.4 *1*	E1,E2	<0.003
147.7 *2*	0.08 *3*	(M1)	1.0	1014.8 *6*	0.4 *1*	E2,(M1)	≈0.003
152.7 *1*	0.38 *7*	E1	≈ 0.06	1018.8 *6*	0.4 *1*		
153.37 *10*	0.49 *8*	E2	0.33	1022.5 *7*	0.3 *1*	M1,E2	0.004
287.6 *4*	0.2 (I1			1039.2			
289.8 *3*	0.35 *18*			1108.0 *7*	0.22 *10*	(E2)	≈0.002
697.0 *6*	0.6 *2*			1113.0 *7*	0.5 *2*		
727.3 *3*	0.4 *2*			1212.4 *6*	0.4 *2*	E2,(M1)	0.002
732.0 *4*	0.4 *2*	M1	0.013	1302.9 *5*	1.1 *21*	E1,(E2)	<0.001
742.5 *5*	0.3 *1*	E2,(M1)	≈ 0.007	1889.5 *4*	0.15 *5*		
747.0 *5*	0.3 *1*	M1	≈ 0.014	2038.5 *6*	0.03 *1*		

E_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[h]	$I_{(\gamma+ce)}$[†g]	Comments
14.72[j] *2*	83.96	7/2$^-$	69.23	5/2$^+$	E1	11.13	1.2[b] *3*	ce(L)/(γ+ce)=0.713 *7*; ce(M)/(γ+ce)=0.165 *3*; ce(N+)/(γ+ce)=0.0394 *8* ce(N)/(γ+ce)=0.0357 *7*; ce(O)/(γ+ce)=0.00360 *7*; ce(P)/(γ+ce)=7.75×10^{-5} *15* α(M1):α(M2):α(M3)=0.46:0.44:0.72. Eγ: γ from 1980Ab18 only. Placement is doubtful due to intensity balance problems (evaluators). M1:M2:M3=5 *2*:5 *2*:6 *2*.

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ ‡	I_γ ‡ f	E_i(level)	J_i^π	E_f	J_f^π	Mult. #	δ @	α h	$I_{(\gamma+ce)}$ † g	Comments
20.34 & j 2	&	104.32	3/2⁻	83.96	7/2⁻	E2		4.33×10³	0.241 b 21	ce(N)/(γ+ce)=0.0414 9; ce(O)/(γ+ce)=0.00473 10; ce(P)/(γ+ce)=1.78×10⁻⁶ 4 L2/L3=0.58 10.
22.358 10		91.55	7/2⁺	69.23	5/2⁺	M1+E2	0.19 2	130 20	2.80 10	ce(L)/(γ+ce)=0.77 8; ce(M)/(γ+ce)=0.18 4; ce(N+)/(γ+ce)=0.046 10 ce(N)/(γ+ce)=0.041 9; ce(O)/(γ+ce)=0.0050 11; ce(P)/(γ+ce)=8.9×10⁻⁵ 14 α(L1):α(L2):α(L3)=26 5:34 7:42 9. L1:L2:L3=60 6:78 8:94 9.
28.835 12		120.35	9/2⁺	91.55	7/2⁺	M1+E2	0.090 11	23.6 16	0.24 5	ce(L)/(γ+ce)=0.75 4; ce(M)/(γ+ce)=0.169 15; ce(N+)/(γ+ce)=0.045 4 ce(N)/(γ+ce)=0.039 4; ce(O)/(γ+ce)=0.0053 5; ce(P)/(γ+ce)=0.000227 15 α(L1):α(L2):α(L3)=12.63 2:3.3 6:2.8 7. L1:L2:L3=18 2:6.0 6:2.0 3.
35.05 & j 3	&	104.32	3/2⁻	69.23	5/2⁺	E1		1.027	0.23 b 5	ce(L)/(γ+ce)=0.396 4; ce(M)/(γ+ce)=0.0887 13; ce(N+)/(γ+ce)=0.0223 4 ce(N)/(γ+ce)=0.0198 4; ce(O)/(γ+ce)=0.00239 4; ce(P)/(γ+ce)=7.29×10⁻⁵ 12 α(L1)=0.342 α(L1)exp=0.33 7 (1980Ab18).
35.56 3		439.54	5/2⁻	404.00	3/2⁻	M1+E2	0.090 11	11.5 6	0.10 2	ce(L)/(γ+ce)=0.716 23; ce(M)/(γ+ce)=0.162 10; ce(N+)/(γ+ce)=0.043 3 ce(N)/(γ+ce)=0.0374 25; ce(O)/(γ+ce)=0.0052 4; ce(P)/(γ+ce)=0.000239 12 Placement from 1976Ab09. L1/L2=5.0 10.
58.35 2		404.00	3/2⁻	345.62	1/2⁻	M1+E2	0.73 17	18 8	0.25 4	ce(K)/(γ+ce)=0.4 4; ce(L)/(γ+ce)=0.40 19; ce(M)/(γ+ce)=0.09 5; ce(N+)/(γ+ce)=0.026 13 Placement from 1976Ab09. α: near threshold for α(K). α(K) estimated as 8 8 (evaluators). L1:L2:L3=1.5 5:6.0 6:3.0 3. ce(L1) from complex line.
60.105 3	7.76 14	164.42	5/2⁻	104.32	3/2⁻	M1+E2	0.222 8	12.77 19		α(L1):α(L2):α(L3)=1.1 2:3.1 9:3.4 10. α(K)=9.87 14; α(L)=2.25 6; α(M)=0.514 14; α(N+..)=0.135 4 α(N)=0.119 3; α(O)=0.0159 4; α(P)=0.000621 9 α(L1):α(L2):α(L3)=1.40:0.476 24:0.41 3. L1:L2:L3=100:34.5 12:28.6 17 (1987BaZB).
69.229 3	62.4 14	69.23	5/2⁺	0.0	5/2⁻	E1		0.853		α(K)=0.699 10; α(L)=0.1202 17; α(M)=0.0267 4;

$^{163}_{68}Er_{95}$-6

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	$I_{(\gamma+ce)}$[† g]	Comments
										α(N+..)=0.00689 *10* α(N)=0.00607 *9*; α(O)=0.000791 *11*; α(P)=3.00×10^{-5} *5* α(L1):α(L2):α(L3)=0.0701:0.0228:0.0286. L1:L2:L3=100:31.0 *6*:38.5 *8* (1987BaZB). Mult.,δ: from adopted gammas. δ<0.05 from L-subshell ratios.
72.875 *8*	0.79 *3*	164.42	5/2$^-$	91.55	7/2$^+$	E1(+M2)	<0.08	1.0 *3*		α(K)=0.81 *20*; α(L)=0.17 *7*; α(M)=0.039 *16*; α(N+..)=0.010 *5* α(N)=0.009 *4*; α(O)=0.0012 *6*; α(P)=5.0×10^{-5} *24* α(K)exp=0.78 *14* (1980Ab18).
78.041 *24*	0.42 *6*	540.56	1/2$^+$	462.48	3/2$^+$	M1(+E2)	<0.6	6.1 *3*		α(K)=4.5 *5*; α(L)=1.2 *5*; α(M)=0.29 *13*; α(N+..)=0.08 *4* α(N)=0.07 *3*; α(O)=0.009 *4*; α(P)=0.00027 *3* α(K)exp=5.0 *9*.
78.93[& j] *2*	&	619.36	3/2$^+$	540.56	1/2$^+$	(M1,E2)		6.5 *9*	0.014[b] *7*	ce(K)/(γ+ce)=0.43 *15*; ce(L)/(γ+ce)=0.34 *20*; ce(M)/(γ+ce)=0.08 *6*; ce(N+)/(γ+ce)=0.021 *15* ce(N)/(γ+ce)=0.018 *14*; ce(O)/(γ+ce)=0.0022 *15*; ce(P)/(γ+ce)=2.5×10^{-5} *15* K/L1≈7.3 *20*. ce(L1) from complex line. Additional information 5.
80.460 *7*	2.80 *8*	164.42	5/2$^-$	83.96	7/2$^-$	M1+E2	0.048 *10*	5.32		α(K)=4.45 *7*; α(L)=0.680 *11*; α(M)=0.1510 *23*; α(N+..)=0.0405 *6* α(N)=0.0352 *6*; α(O)=0.00507 *8*; α(P)=0.000276 *4* α(L1):α(L2):α(L3)=0.623:0.060:0.013. α(K)exp=4.8 *2*. K:L1:L2:L3=251 *30*:34 *4*:3.4 *4*:0.70 *7*.
83.968 *4*	4.03 *9*	83.96	7/2$^-$	0.0	5/2$^-$	M1+E2	1.61 *9*	5.47		α(K)=2.22 *7*; α(L)=2.49 *8*; α(M)=0.603 *18*; α(N+..)=0.153 *5* α(N)=0.137 *4*; α(O)=0.0162 *5*; α(P)=0.000116 *5* α(L1):α(L2):α(L3)=0.20 *6*:1.33 *21*:1.35 *22*. α(K)exp=2.47 *9*. α(L3)exp=0.82 *16* (1991GaZZ). L1:L2:L3=100:435 *38*:435 *38* (1987BaZB).
85.118 *4*	2.08 *6*	249.53	7/2$^-$	164.42	5/2$^-$	M1+E2	0.19 *2*	4.56		α(K)=3.71 *6*; α(L)=0.656 *21*; α(M)=0.148 *5*; α(N+..)=0.0393 *13* α(N)=0.0343 *12*; α(O)=0.00479 *13*; α(P)=0.000229 *4* α(L1):α(L2):α(L3)=0.518 *4*:0.090 *15*:0.053 *16*. α(K)exp=3.7 *3*. K:L1:L2:L3=135 *15*:21 *2*:3.7 *4*:2.3 *3*.
91.550 *8*	1.26 *7*	91.55	7/2$^+$	0.0	5/2$^-$	E1		0.411		α(K)=0.340 *5*; α(L)=0.0552 *8*; α(M)=0.01223 *18*; α(N+..)=0.00318 *5* α(N)=0.00279 *4*; α(O)=0.000371 *6*; α(P)=1.515×10^{-5} *22* α(K)exp=0.33 *8*.
93.88[& j] *3*	0.12[&]	439.54	5/2$^-$	345.62	1/2$^-$	[E2]		3.74		α(K)=1.240 *18*; α(L)=1.91 *3*; α(M)=0.466 *7*; α(N+..)=0.1178 *17*

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	Comments
									α(N)=0.1054 *15*; α(O)=0.01234 *18*; α(P)=5.18×10^{-5} *8* α(K)exp=0.9 (1976Ab09).
104.320 *3*	100.0 *19*	104.32	3/2$^-$	0.0	5/2$^-$	M1(+E2)	<0.05	2.52	α(K)=2.11 *3*; α(L)=0.318 *5*; α(M)=0.0706 *11*; α(N+..)=0.0190 *3* α(N)=0.01646 *24*; α(O)=0.00238 *4*; α(P)=0.0001303 *19* α(L1):α(L2):α(L3)=0.294:0.028:0.006. δ: other: 0.11 *6* from L1/L2=8.8 *11* (1987BaZB). K:L1:L2:L3=4263 *400*:575 *60*:43 *5*:8.2 *10*.
106.05 *4*	0.17 *5*	190.01	9/2$^-$	83.96	7/2$^-$	M1		2.40	α(K)=2.02 *3*; α(L)=0.302 *5*; α(M)=0.0671 *10*; α(N+..)=0.0180 *3* α(N)=0.01564 *22*; α(O)=0.00226 *4*; α(P)=0.0001244 *18* Mult.: from adopted gammas. α(K)exp=4.4 *14*. Additional information 4.
129.21 *3*	0.48 *8*	249.53	7/2$^-$	120.35	9/2$^+$	E1		0.1646	α(K)=0.1375 *20*; α(L)=0.0212 *3*; α(M)=0.00470 *7*; α(N+..)=0.001231 *18* α(N)=0.001078 *16*; α(O)=0.0001464 *21*; α(P)=6.43×10^{-6} *9* α(K)exp≈0.1 (1976Ab09).
145.213 *11*	0.67 *3*	249.53	7/2$^-$	104.32	3/2$^-$	E2		0.755	α(K)=0.406 *6*; α(L)=0.268 *4*; α(M)=0.0645 *9*; α(N+..)=0.01641 *23* α(N)=0.01463 *21*; α(O)=0.001758 *25*; α(P)=1.774×10^{-5} *25* α(L1):α(L2):α(L3)=0.041:0.12:0.11. α(K)exp=0.50 *6*. K:L1:L2:L3=5.2 *8*:0.50 *5*:1.7 *2*:1.5 *2*.
161.31 *3*	0.86 *6*	735.38	1/2$^+$,3/2$^+$	574.08	3/2$^+$	[M1,E2]		0.63 *11*	α(K)=0.46 *16*; α(L)=0.13 *4*; α(M)=0.031 *11*; α(N+..)=0.0079 *25* α(N)=0.0070 *23*; α(O)=0.00090 *22*; α(P)=2.6×10^{-5} *13* Mult.: α(K)exp=0.12 (1976Ab09) gives E1 but ΔJ^π requires M1,E2. 1980Ab18 note that the peak is complex.
164.419 *8*	4.86 *17*	164.42	5/2$^-$	0.0	5/2$^-$	M1+E2	0.135 *21*	0.690	α(K)=0.577 *9*; α(L)=0.0880 *13*; α(M)=0.0196 *3*; α(N+..)=0.00525 *8* α(N)=0.00456 *7*; α(O)=0.000656 *10*; α(P)=3.54×10^{-5} *6* α(L1):α(L2)=0.080:0.008. α(K)exp=0.59 *3*; K:L1:L2=56 *8*:7.6 *8*:0.8 *1*.
165.60 *6*	0.38 *8*	249.53	7/2$^-$	83.96	7/2$^-$	M1+E2	0.26 *4*	0.667 *11*	α(K)=0.553 *10*; α(L)=0.0893 *18*; α(M)=0.0200 *5*; α(N+..)=0.00534 *11* α(N)=0.00464 *10*; α(O)=0.000660 *12*; α(P)=3.37×10^{-5} *7* α(L1):α(L2):α(L3)=0.076 *1*:0.010 *1*:0.0044 *11*. α(K)exp=0.58 *17*. K:L1:L2:L3=4.2 *9*:0.56 *12*:0.08 *2*:0.04 *1*.
190.006 *6*	7.68 *16*	439.54	5/2$^-$	249.53	7/2$^-$	M1+E2	0.18 *3*	0.458	α(K)=0.383 *6*; α(L)=0.0587 *9*; α(M)=0.01307 *20*; α(N+..)=0.00350 *6* α(N)=0.00304 *5*; α(O)=0.000437 *7*; α(P)=2.34×10^{-5} *4*

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	Comments
									α(L1):α(L2):α(L3)=0.053:0.0055 *4*:0.0014 *3*. α(K)exp=0.393 *15*. K:L1:L2:L3=58 *6*:7.9 *10*:0.8 *1*:<0.3.
225.4[&aj] *3*	0.18[&] *7*	664.86	5/2$^+$	439.54	5/2$^-$	E1(+M2)	<0.23	0.07 *4*	α(K)=0.06 *3*; α(L)=0.010 *6*; α(M)=0.0024 *14*; α(N+..)=0.0006 *4* α(N)=0.0006 *4*; α(O)=8.E−5 *5*; α(P)=3.9×10^{-6} *23* α(K)exp=0.06 *3*.
239.585 *5*	23.7 *9*	404.00	3/2$^-$	164.42	5/2$^-$	M1+E2	0.21 *3*	0.241	α(K)=0.201 *4*; α(L)=0.0306 *5*; α(M)=0.00680 *10*; α(N+..)=0.00182 *3* α(N)=0.001584 *23*; α(O)=0.000228 *4*; α(P)=1.228×10^{-5} *20* α(L1):α(L2):α(L3)=0.0278 *2*:0.00275 *14*:0.00071 *11*. α(K)exp=0.188 *7* for 239.6γ+241.3γ. K:L1:L2:L3=98 *10*:13.2 *15*:1.30 *15*:0.33 *4*.
241.305 *5*	58.4 *15*	345.62	1/2$^-$	104.32	3/2$^-$	M1		0.240	α(K)=0.202 *3*; α(L)=0.0299 *5*; α(M)=0.00662 *10*; α(N+..)=0.001779 *25* α(N)=0.001543 *22*; α(O)=0.000223 *4*; α(P)=1.237×10^{-5} *18* α(L1):α(L2)=0.0280:0.0022. K:L1:L2=200:30:3. α(K)exp=0.188 *7* for 239.6γ+241.3γ.
249.498 *6*	0.47 *3*	249.53	7/2$^-$	0.0	5/2$^-$	M1+E2	0.53 *7*	0.198 *6*	α(K)=0.163 *5*; α(L)=0.0275 *4*; α(M)=0.00619 *10*; α(N+..)=0.001648 *24* α(N)=0.001437 *21*; α(O)=0.000202 *3*; α(P)=9.7×10^{-6} *4* α(L1):α(L2)=0.022:0.0038 *5*. α(K)exp=0.092 *21*. K:L1:L2=1.6 *3*:0.22 *3*:0.040 *3*. ce(L2) derived from a complex line.
275.125 *8*	14.4 *4*	439.54	5/2$^-$	164.42	5/2$^-$	M1+E2	0.31 *7*	0.161 *4*	α(K)=0.135 *4*; α(L)=0.0208 *3*; α(M)=0.00462 *7*; α(N+..)=0.001238 *18* α(N)=0.001075 *15*; α(O)=0.0001542 *23*; α(P)=8.18×10^{-6} *24* α(L1):α(L2):α(L3)=0.019:0.0018 *1*:0.00045 *9*. α(K)exp=0.124 *5*. K:L1:L2:L3=43 *5*:5.8 *6*:0.50 *4*:0.20 *2*.
297.87[c] *3*	2.57 *9*	462.48	3/2$^+$	164.42	5/2$^-$	(E1)		0.0189	α(K)=0.01592 *23*; α(L)=0.00230 *4*; α(M)=0.000507 *7*; α(N+..)=0.0001344 *19* α(N)=0.0001172 *17*; α(O)=1.646×10^{-5} *23*; α(P)=8.22×10^{-7} *12* Level-energy difference=298.07. α(K)exp=0.110 *4* for 297.9γ+299.7γ.
299.667 *8*	24.5 *5*	404.00	3/2$^-$	104.32	3/2$^-$	M1+E2	0.21 *6*	0.1310 *25*	α(K)=0.1099 *23*; α(L)=0.01645 *24*; α(M)=0.00365 *6*; α(N+..)=0.000980 *14* α(N)=0.000851 *13*; α(O)=0.0001227 *19*; α(P)=6.69×10^{-6} *15* α(L1):α(L2):α(L3)=0.015:0.0014 *1*:0.00031 *6*. α(K)exp=0.110 *4* for 297.9γ+299.7γ. δ: from K:L1:L2:L3=58 *6*:8.0 *8*:0.70 *7*:0.16 *4*, assuming insignificant contribution from 297.9γ (E1).
303.06 *9*	0.38 *4*	1872.79	(3/2)$^+$	1569.80	3/2$^+$	(E2)		0.0670	α(K)=0.0491 *7*; α(L)=0.01377 *20*; α(M)=0.00322 *5*; α(N+..)=0.000834 *12*

$^{163}_{68}Er_{95}$-9

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	Comments
									α(N)=0.000737 *11*; α(O)=9.48×10^{-5} *14*; α(P)=2.53×10^{-6} *4* α(K)exp≈0.05 (1976Ab09).
320.057 *18*	1.66 *7*	404.00	3/2$^-$	83.96	7/2$^-$	E2		0.0568	α(K)=0.0422 *6*; α(L)=0.01131 *16*; α(M)=0.00264 *4*; α(N+..)=0.000684 *10* α(N)=0.000604 *9*; α(O)=7.82×10^{-5} *11*; α(P)=2.20×10^{-6} *3* α(L1):α(L2)=0.0050:0.0039. α(K)exp=0.042 *6* (1980Ab18). K:L1:L2=1.5 *2*:0.20 *5*:0.15 *5*.
324.49 *15*	0.28 *3*	574.08	3/2$^+$	249.53	7/2$^-$				Mult.: α(K)exp=0.100 *19* (1980Ab18) gives M1(+E2) with δ≤0.55, but ΔJ^π requires M2. No ce data available from 1982Vy07. α(K)exp=0.100 *19* (1980Ab18).
331.355 *19*	1.25 *4*	735.38	1/2$^+$,3/2$^+$	404.00	3/2$^-$	E1		0.01452	α(K)=0.01227 *18*; α(L)=0.001760 *25*; α(M)=0.000388 *6*; α(N+..)=0.0001031 *15* α(N)=8.98×10^{-5} *13*; α(O)=1.265×10^{-5} *18*; α(P)=6.39×10^{-7} *9* α(K)exp=0.033 *3*.
335.219 *12*	3.18 *8*	439.54	5/2$^-$	104.32	3/2$^-$	M1+E2	0.66 *14*	0.084 *5*	α(K)=0.069 *5*; α(L)=0.0114 *3*; α(M)=0.00256 *6*; α(N+..)=0.000683 *17* α(N)=0.000595 *14*; α(O)=8.4×10^{-5} *3*; α(P)=4.1×10^{-6} *3* α(L1):α(L2)=0.0094 *5*:0.00159 *17*. α(K)exp=0.085 *4*. K:L1:L2=4.9 *6*:0.65 *7*:0.11 *2*.
338.28 *8*	0.72 *5*	683.75	(1/2)$^-$	345.62	1/2$^-$	M1		0.0968	α(K)=0.0815 *12*; α(L)=0.01194 *17*; α(M)=0.00264 *4*; α(N+..)=0.000711 *10* α(N)=0.000616 *9*; α(O)=8.93×10^{-5} *13*; α(P)=4.96×10^{-6} *7* α(L1):α(L2)=0.011:0.0008. α(K)exp=0.059 *9*. K:L1:L2=1.1 *2*:0.15 *3*:<0.05.
345.608 *9*	5.89 *13*	345.62	1/2$^-$	0.0	5/2$^-$	E2		0.0453	α(K)=0.0342 *5*; α(L)=0.00862 *12*; α(M)=0.00200 *3*; α(N+..)=0.000521 *8* α(N)=0.000459 *7*; α(O)=5.99×10^{-5} *9*; α(P)=1.80×10^{-6} *3* α(L1)=0.0041 α(K)exp=0.036 *3*, K/L1(from complex lines)=6.1 *4*.
355.624 *13*	2.57 *7*	439.54	5/2$^-$	83.96	7/2$^-$	M1		0.0848	α(K)=0.0714 *10*; α(L)=0.01044 *15*; α(M)=0.00231 *4*; α(N+..)=0.000621 *9* α(N)=0.000539 *8*; α(O)=7.81×10^{-5} *11*; α(P)=4.35×10^{-6} *6* α(L1)=0.0098 α(K)exp=0.082 *4*. K/L1=7.1 *22*.
358.174 *10*	3.92 *9*	462.48	3/2$^+$	104.32	3/2$^-$	E1		0.01204	α(K)=0.01018 *15*; α(L)=0.001454 *21*; α(M)=0.000320 *5*; α(N+..)=8.51×10^{-5} *12* α(N)=7.41×10^{-5} *11*; α(O)=1.047×10^{-5} *15*; α(P)=5.34×10^{-7} *8* α(L1)=0.00121 α(K)exp=0.0100 *11*. K/L1=6.9 *19*.
361.97 *4*	0.42 *4*	526.33	5/2$^+$	164.42	5/2$^-$	E1		0.01174	α(K)=0.00993 *14*; α(L)=0.001417 *20*; α(M)=0.000312 *5*; α(N+..)=8.30×10^{-5} *12*

$^{163}_{68}Er_{95}$-10

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	Comments
									α(K)=0.00993 *14*; α(L)=0.001417 *20*; α(M)=0.000312 *5*; α(N+..)=8.30×10^{-5} *12* α(N)=7.23×10^{-5} *11*; α(O)=1.021×10^{-5} *15*; α(P)=5.21×10^{-7} *8* α(K)exp=0.006 *2*.
371.07 *9*	0.24 *3*	462.48	3/2$^+$	91.55	7/2$^+$	(E2)		0.0369	α(K)=0.0282 *4*; α(L)=0.00675 *10*; α(M)=0.001563 *22*; α(N+..)=0.000408 *6* α(N)=0.000359 *5*; α(O)=4.72×10^{-5} *7*; α(P)=1.506×10^{-6} *22* α(K)exp=0.023 *4*.
375.87 *5*	0.83 *7*	1059.75	3/2$^-$	683.75	(1/2)$^-$	M1+E2	1.1 *3*	0.053 *6*	α(K)=0.043 *6*; α(L)=0.0076 *5*; α(M)=0.00172 *9*; α(N+..)=0.000456 *24* α(N)=0.000398 *20*; α(O)=5.5×10^{-5} *4*; α(P)=2.5×10^{-6} *4* α(L1)=0.00565 Mult.: from α(K)exp=0.043 *4*. K/L1=7.3 *17*.
380.57[c] *17*	0.19 *4*	1917.48	(3/2)$^+$	1538.79	3/2$^+$	(E2)		0.0344	α(K)=0.0264 *4*; α(L)=0.00620 *9*; α(M)=0.001433 *21*; α(N+..)=0.000374 *6* α(N)=0.000329 *5*; α(O)=4.34×10^{-5} *7*; α(P)=1.413×10^{-6} *20* Level-energy difference=378.69. α(K)exp=0.036 *9*.
389.59 *3*	1.65 *11*	735.38	1/2$^+$,3/2$^+$	345.62	1/2$^-$	E1		0.00987	α(K)=0.00835 *12*; α(L)=0.001186 *17*; α(M)=0.000261 *4*; α(N+..)=6.95×10^{-5} *10* α(N)=6.05×10^{-5} *9*; α(O)=8.57×10^{-6} *12*; α(P)=4.40×10^{-7} *7* α(K)exp=0.029 *3*. Other: 0.0071 *15* (1980Ab18).
393.261 *11*	7.37 *15*	462.48	3/2$^+$	69.23	5/2$^+$	M1+E2	0.44 *7*	0.0596 *17*	α(K)=0.0499 *16*; α(L)=0.00760 *16*; α(M)=0.00169 *4*; α(N+..)=0.000453 *9* α(N)=0.000393 *8*; α(O)=5.64×10^{-5} *13*; α(P)=3.00×10^{-6} *10* α(L1):α(L2)=0.0068:0.00074 *5*. α(K)exp=0.050 *2*. K:L1:L2=8.0 *15*:1.0 *1*:0.10 *1*.
400.74 *17*	0.35 *6*	2122.21	1/2$^{(-)}$,3/2	1722.39	3/2$^+$				
403.989 *10*	5.66 *14*	404.00	3/2$^-$	0.0	5/2$^-$	E2		0.0291	α(K)=0.0225 *4*; α(L)=0.00508 *8*; α(M)=0.001172 *17*; α(N+..)=0.000306 *5* α(N)=0.000270 *4*; α(O)=3.57×10^{-5} *5*; α(P)=1.217×10^{-6} *17* α(L1):α(L2):α(L3)=0.0027:0.0015:0.0009. α(K)exp=0.0266 *15*; K:L1:L2:L3=44:8:4:2.
406.06 *15*	0.28 *6*	1369.46	3/2$^+$	963.29	(3/2)$^+$	E2(+M1)	≥2.0	0.032 *4*	α(K)=0.025 *3*; α(L)=0.00523 *25*; α(M)=0.00120 *5*; α(N+..)=0.000315 *15* α(N)=0.000276 *12*; α(O)=3.71×10^{-5} *21*; α(P)=1.39×10^{-6} *19* α(K)exp=0.022 *6*.
409.77 *5*	0.82 *6*	574.08	3/2$^+$	164.42	5/2$^-$				
411.66 *7*	0.53 *4*	985.67	5/2$^-$	574.08	3/2$^+$				Mult.: α(K)exp=0.04 (1976Ab09) suggests M1,E2 but ΔJ$^\pi$ requires E1.
415.15 *6*	0.47 *4*	664.86	5/2$^+$	249.53	7/2$^-$	E1		0.00851	α(K)=0.00721 *10*; α(L)=0.001020 *15*; α(M)=0.000224 *4*;

$^{163}_{68}Er_{95}$-11

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	Comments
									α(N+..)=5.98×10^{-5} *9* α(N)=5.20×10^{-5} *8*; α(O)=7.38×10^{-6} *11*; α(P)=3.82×10^{-7} *6* α(K)exp=0.0064 *13*.
417.89[a j] *9*	0.31 *5*	2243.21	3/2$^-$	1826.49	3/2$^+$				
421.92 *3*	0.90 *6*	526.33	5/2$^+$	104.32	3/2$^-$	(E1)[d]		0.00820	α(K)=0.00694 *10*; α(L)=0.000981 *14*; α(M)=0.000216 *3*; α(N+..)=5.75×10^{-5} *8* α(N)=5.01×10^{-5} *7*; α(O)=7.10×10^{-6} *10*; α(P)=3.68×10^{-7} *6* α(K)exp=0.018 *2*.
433.2 *3*	0.48 *10*	1801.56	3/2$^+$	1369.46	3/2$^+$	M1+E2	1.1 *8*	0.036 *13*	α(K)=0.030 *11*; α(L)=0.0050 *10*; α(M)=0.00113 *21*; α(N+..)=0.00030 *6* α(N)=0.00026 *5*; α(O)=3.7×10^{-5} *9*; α(P)=1.7×10^{-6} *8* α(K)exp=0.030 *8*.
434.72 *3*	2.82 *9*	526.33	5/2$^+$	91.55	7/2$^+$	M1+E2	0.58 *19*	0.043 *4*	α(K)=0.036 *3*; α(L)=0.0056 *3*; α(M)=0.00125 *6*; α(N+..)=0.000334 *16* α(N)=0.000290 *14*; α(O)=4.15×10^{-5} *22*; α(P)=2.17×10^{-6} *19* α(K)exp=0.037 *3*. L1/L2=3.
436.24 *6*	0.85 *5*	540.56	1/2$^+$	104.32	3/2$^-$				
439.575 *17*	1.99 *17*	439.54	5/2$^-$	0.0	5/2$^-$	M1		0.0487	α(K)=0.0410 *6*; α(L)=0.00596 *9*; α(M)=0.001318 *19*; α(N+..)=0.000354 *5* α(N)=0.000307 *5*; α(O)=4.46×10^{-5} *7*; α(P)=2.49×10^{-6} *4* α(K)exp=0.04 (1976Ab09).
447.90 *16*	0.41 *10*	2040.68	3/2$^+$	1593.03	3/2$^+$	[M1,E2]		0.034 *13*	α(K)=0.028 *11*; α(L)=0.0047 *11*; α(M)=0.00105 *21*; α(N+..)=0.00028 *6* α(N)=0.00024 *5*; α(O)=3.4×10^{-5} *9*; α(P)=1.7×10^{-6} *8*
454.954 *17*	1.71 *6*	619.36	3/2$^+$	164.42	5/2$^-$				α(K)exp=0.02 (1976Ab09) gives M1,E2 but ΔJ^π requires E1.
457.07 *5*	0.74 *7*	1826.49	3/2$^+$	1369.46	3/2$^+$	M1,E2		0.032 *12*	α(K)=0.027 *11*; α(L)=0.0044 *10*; α(M)=0.00099 *21*; α(N+..)=0.00026 *6* α(N)=0.00023 *5*; α(O)=3.2×10^{-5} *8*; α(P)=1.6×10^{-6} *7* α(K)exp=0.027 *12*.
461.845 *12*	3.34 *14*	531.07	3/2$^+$	69.23	5/2$^+$	M1+E2	0.90 *16*	0.0327 *22*	α(K)=0.0271 *20*; α(L)=0.00438 *19*; α(M)=0.00098 *4*; α(N+..)=0.000261 *11* α(N)=0.000227 *10*; α(O)=3.21×10^{-5} *16*; α(P)=1.60×10^{-6} *13* α(K)exp=0.0276 *18*.
469.65 *4*	2.39 *10*	574.08	3/2$^+$	104.32	3/2$^-$	E1		0.00642	α(K)=0.00545 *8*; α(L)=0.000765 *11*; α(M)=0.0001683 *24*; α(N+..)=4.48×10^{-5} *7* α(N)=3.90×10^{-5} *6*; α(O)=5.55×10^{-6} *8*; α(P)=2.90×10^{-7} *4* α(K)exp=0.008 (1976Ab09).
471.330 *17*	21.8 *5*	540.56	1/2$^+$	69.23	5/2$^+$	E2		0.0192	α(K)=0.01516 *22*; α(L)=0.00311 *5*; α(M)=0.000713 *10*; α(N+..)=0.000187 *3*

$^{163}_{68}Er_{95}$-12

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	Comments
									α(N)=0.0001642 *23*; α(O)=2.21×10^{-5} *3*; α(P)=8.34×10^{-7} *12* α(L1):α(L2):α(L3)=0.0019:0.008:0.00044. α(K)exp=0.0130 *6*. K:L1:L2:L3=98:15:5:2.4.
473.76[a j] *5*	1.08 *10*	2274.5	1/2$^{(-)}$,3/2	1801.56	3/2$^+$				Mult.: α(K)exp=0.025 *5* gives M1+E2, δ=1.0 *5*.
478.49 *14*	0.26 *8*	1538.79	3/2$^+$	1059.75	3/2$^-$				
484.03 *4*	1.41 *14*	1853.54	3/2$^+$	1369.46	3/2$^+$	M1(+E2)	≤0.94	0.033 *5*	α(K)=0.028 *5*; α(L)=0.0042 *5*; α(M)=0.00094 *9*; α(N+..)=0.000251 *25* α(N)=0.000218 *21*; α(O)=3.1×10^{-5} *4*; α(P)=1.7×10^{-6} *3* α(K)exp=0.028 *4*.
[x]491.64 *5*	0.43 *3*					M1+E2	1.2 *3*	0.025 *3*	α(K)=0.0207 *25*; α(L)=0.00344 *25*; α(M)=0.00077 *6*; α(N+..)=0.000205 *15* α(N)=0.000179 *13*; α(O)=2.51×10^{-5} *20*; α(P)=1.21×10^{-6} *16* α(K)exp=0.021 *2*.
[x]493.83 *4*	0.74 *4*					M1+E2	1.7 *3*	0.0219 *16*	α(K)=0.0178 *14*; α(L)=0.00314 *15*; α(M)=0.00071 *3*; α(N+..)=0.000188 *9* α(N)=0.000164 *8*; α(O)=2.27×10^{-5} *12*; α(P)=1.03×10^{-6} *9* α(K)exp=0.0180 *14*.
500.51 *2*	0.76 *12*	664.86	5/2$^+$	164.42	5/2$^-$				E_γ: uncertainty from table in 1982Vy08. 1982Vy07 quote 0.12. Mult.: α(K)exp=0.021 *4* gives δ(E2/M1)=1.1 *+8−4* but ΔJ^π requires E1.
504.878 *14*	6.3 *3*	574.08	3/2$^+$	69.23	5/2$^+$	M1+E2	0.8 *5*	0.027 *6*	α(K)=0.023 *5*; α(L)=0.0035 *5*; α(M)=0.00078 *11*; α(N+..)=0.00021 *3* α(N)=0.00018 *3*; α(O)=2.6×10^{-5} *4*; α(P)=1.3×10^{-6} *4* α(K)exp=0.023 *2*.
515.012 *16*	4.50 *22*	619.36	3/2$^+$	104.32	3/2$^-$	E1+M2	0.186 *18*	0.0084 *7*	α(K)=0.0071 *6*; α(L)=0.00107 *9*; α(M)=0.000237 *20*; α(N+..)=6.4×10^{-5} *6* α(N)=5.5×10^{-5} *5*; α(O)=7.9×10^{-6} *7*; α(P)=4.2×10^{-7} *4* α(K)exp=0.0071 *5*.
520.1 *2*	0.28 *6*	683.75	(1/2)$^-$	164.42	5/2$^-$	E2		0.01487	α(K)=0.01189 *17*; α(L)=0.00231 *4*; α(M)=0.000527 *8*; α(N+..)=0.0001388 *20* α(N)=0.0001216 *17*; α(O)=1.652×10^{-5} *24*; α(P)=6.60×10^{-7} *10* Mult.: α(K)exp=0.012 *4* gives δ(E2/M1)≥1.7. ΔJ^π requires E2.
528.18 *14*	0.82 *11*	619.36	3/2$^+$	91.55	7/2$^+$	(E2)		0.01430	α(K)=0.01145 *16*; α(L)=0.00221 *4*; α(M)=0.000503 *7*; α(N+..)=0.0001326 *19* α(N)=0.0001162 *17*; α(O)=1.580×10^{-5} *23*; α(P)=6.37×10^{-7} *9* Mult.: α(K)exp=0.030 *5* gives M1(+E2), δ<0.3 but ΔJ^π requires E2.
529.75 *7*	1.78 *19*	779.63	5/2$^-$	249.53	7/2$^-$	M1+E2	0.8 *4*	0.024 *4*	α(K)=0.020 *4*; α(L)=0.0031 *4*; α(M)=0.00069 *8*;

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	Comments
									α(N+..)=0.000184 *22* α(N)=0.000160 *19*; α(O)=2.3×10^{-5} *3*; α(P)=1.18×10^{-6} *23* α(K)exp=0.020 *3*.
[x]540.98 *12*	0.23 *5*					M1		0.0285	α(K)=0.0241 *4*; α(L)=0.00347 *5*; α(M)=0.000767 *11*; α(N+..)=0.000206 *3* α(N)=0.000179 *3*; α(O)=2.60×10^{-5} *4*; α(P)=1.453×10^{-6} *21* α(K)exp=0.037 *12*.
547.96 *14*	0.47 *7*	1917.48	(3/2)$^+$	1369.46	3/2$^+$	[M1,E2]		0.020 *8*	α(K)=0.017 *7*; α(L)=0.0027 *7*; α(M)=0.00060 *15*; α(N+..)=0.00016 *4* α(N)=0.00014 *4*; α(O)=2.0×10^{-5} *6*; α(P)=1.0×10^{-6} *5*
550.154 *16*	8.26 *21*	619.36	3/2$^+$	69.23	5/2$^+$	M1(+E2)	≤0.27	0.0268 *7*	α(K)=0.0226 *6*; α(L)=0.00328 *7*; α(M)=0.000724 *14*; α(N+..)=0.000195 *4* α(N)=0.000169 *4*; α(O)=2.45×10^{-5} *5*; α(P)=1.36×10^{-6} *4* α(K)exp=0.0240 *13*.
552.948 *23*	3.69 *13*	717.39	3/2$^-$	164.42	5/2$^-$	M1		0.0270	α(K)=0.0228 *4*; α(L)=0.00328 *5*; α(M)=0.000725 *11*; α(N+..)=0.000195 *3* α(N)=0.0001690 *24*; α(O)=2.45×10^{-5} *4*; α(P)=1.374×10^{-6} *20* α(K)exp=0.0272 *17*, possible contamination from ce(L)(504.9γ) (evaluators).
560.51 *5*	0.66 *16*	664.86	5/2$^+$	104.32	3/2$^-$	E1+M2	0.27 *10*	0.009 *4*	α(K)=0.008 *4*; α(L)=0.0012 *6*; α(M)=0.00027 *13*; α(N+..)=7.E−5 *4* α(N)=6.E−5 *3*; α(O)=9.E−6 *4*; α(P)=4.8×10^{-7} *22* α(K)exp=0.0080 *26*.
[x]563.80 *5*	0.69 *16*					M1(+E2)	≤0.99	0.022 *4*	α(K)=0.019 *3*; α(L)=0.0028 *4*; α(M)=0.00062 *7*; α(N+..)=0.000167 *19* α(N)=0.000145 *17*; α(O)=2.1×10^{-5} *3*; α(P)=1.12×10^{-6} *19* α(K)exp=0.022 *6*.
573.23 *4*	1.51 *6*	664.86	5/2$^+$	91.55	7/2$^+$	M1(+E2)	≤0.61	0.0229 *18*	α(K)=0.0192 *16*; α(L)=0.00282 *18*; α(M)=0.00062 *4*; α(N+..)=0.000168 *11* α(N)=0.000146 *9*; α(O)=2.10×10^{-5} *14*; α(P)=1.15×10^{-6} *10* α(K)exp=0.021 *3*.
575.1 *3*	0.25 *7*	1538.79	3/2$^+$	963.29	(3/2)$^+$	[M1,E2]		0.018 *7*	α(K)=0.015 *6*; α(L)=0.0023 *7*; α(M)=0.00052 *14*; α(N+..)=0.00014 *4* α(N)=0.00012 *4*; α(O)=1.7×10^{-5} *5*; α(P)=9.E−7 *4*
579.510 *13*	8.53 *19*	683.75	(1/2)$^-$	104.32	3/2$^-$	M1(+E2)	≤0.51	0.0226 *14*	α(K)=0.0191 *12*; α(L)=0.00278 *14*; α(M)=0.00062 *3*; α(N+..)=0.000165 *8* α(N)=0.000143 *7*; α(O)=2.07×10^{-5} *11*; α(P)=1.15×10^{-6} *8* α(L1):α(L2)=0.0028:0.00018. α(K)exp=0.0195 *12*; K:L1:L2=50:8:<2 (1976Ab09).
584.86[c] *9*	0.49 *4*	1569.80	3/2$^+$	985.67	5/2$^-$				Level-energy difference=584.13.
589.13[c] *11*	0.37 *6*	1369.46	3/2$^+$	779.63	5/2$^-$				Level-energy difference=589.84.

$^{163}_{68}Er_{95}$-14

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	Comments
595.35 *5*	1.28 *9*	664.86	$5/2^+$	69.23	$5/2^+$	E2		0.01064	α(K)=0.00862 *12*; α(L)=0.001571 *22*; α(M)=0.000356 *5*; α(N+..)=9.40×10^{-5} *14* α(N)=8.22×10^{-5} *12*; α(O)=1.129×10^{-5} *16*; α(P)=4.83×10^{-7} *7* α(K)exp=0.0075 *5*.
598.12[c] *3*	1.36 *7*	1281.16	$1/2^+,3/2^+$	683.75	$(1/2)^-$	(E1)		0.00379	α(K)=0.00322 *5*; α(L)=0.000446 *7*; α(M)=9.80×10^{-5} *14*; α(N+..)=2.61×10^{-5} *4* α(N)=2.27×10^{-5} *4*; α(O)=3.25×10^{-6} *5*; α(P)=1.738×10^{-7} *25* Level-energy difference=597.41. α(K)exp≈0.003 (1976Ab09).
606.4 *2*	0.64 *4*	856.22	$(3/2)^-$	249.53	$7/2^-$	[E2]		0.01018	α(K)=0.00826 *12*; α(L)=0.001493 *21*; α(M)=0.000338 *5*; α(N+..)=8.93×10^{-5} *13* α(N)=7.81×10^{-5} *11*; α(O)=1.074×10^{-5} *15*; α(P)=4.64×10^{-7} *7* Mult.: α(K)exp=0.0285 *24* gives M1 but ΔJ^π requires E2.
613.054 *18*	3.60 *9*	717.39	$3/2^-$	104.32	$3/2^-$	M1+E2	0.39 *16*	0.0193 *12*	α(K)=0.0163 *10*; α(L)=0.00238 *12*; α(M)=0.000526 *24*; α(N+..)=0.000141 *7* α(N)=0.000123 *6*; α(O)=1.77×10^{-5} *9*; α(P)=9.8×10^{-7} *7* α(K)exp=0.0166 *9*.
615.18 *3*	1.78 *12*	779.63	$5/2^-$	164.42	$5/2^-$	M1+E2	0.56 *21*	0.0180 *15*	α(K)=0.0151 *13*; α(L)=0.00224 *15*; α(M)=0.00050 *3*; α(N+..)=0.000133 *9* α(N)=0.000116 *8*; α(O)=1.67×10^{-5} *12*; α(P)=9.0×10^{-7} *8* α(K)exp=0.0154 *13*.
619.44 *10*	0.35 *5*	619.36	$3/2^+$	0.0	$5/2^-$	E1+M2	0.17 *8*	0.0051 *17*	α(K)=0.0043 *14*; α(L)=0.00062 *23*; α(M)=0.00014 *6*; α(N+..)=3.7×10^{-5} *14* α(N)=3.2×10^{-5} *13*; α(O)=4.6×10^{-6} *18*; α(P)=2.5×10^{-7} *10* α(K)exp=0.0043 *9*.
633.77 *9*	0.78 *7*	717.39	$3/2^-$	83.96	$7/2^-$				Mult.: α(K)exp=0.0203 *24* gives M1 but ΔJ^π requires E2.
640.4 *2*	0.40 *6*	985.67	$5/2^-$	345.62	$1/2^-$				
655.760 *20*	4.25 *10*	1059.75	$3/2^-$	404.00	$3/2^-$	M1(+E2)	≤0.38	0.0169 *7*	α(K)=0.0143 *6*; α(L)=0.00206 *7*; α(M)=0.000456 *14*; α(N+..)=0.000123 *4* α(N)=0.000106 *4*; α(O)=1.54×10^{-5} *5*; α(P)=8.6×10^{-7} *4* α(K)exp=0.0151 *10*.
662.67 *11*	1.42 *16*	1722.39	$3/2^+$	1059.75	$3/2^-$				
666.178 *19*	11.04 *25*	735.38	$1/2^+,3/2^+$	69.23	$5/2^+$	(E2)		0.00815	α(K)=0.00666 *10*; α(L)=0.001158 *17*; α(M)=0.000261 *4*; α(N+..)=6.91×10^{-5} *10* α(N)=6.04×10^{-5} *9*; α(O)=8.37×10^{-6} *12*; α(P)=3.76×10^{-7} *6* α(K)exp=0.0074 *4*.
675.20 *11*	0.91 *8*	779.63	$5/2^-$	104.32	$3/2^-$	M1+E2	0.8 *4*	0.0130 *22*	α(K)=0.0109 *19*; α(L)=0.00164 *22*; α(M)=0.00036 *5*; α(N+..)=9.7×10^{-5} *13*

$^{163}_{68}Er_{95}$-15

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	Comments
									α(K)=0.0109 *19*; α(L)=0.00164 *22*; α(M)=0.00036 *5*; α(N+..)=9.7×10^{-5} *13* α(N)=8.5×10^{-5} *11*; α(O)=1.21×10^{-5} *17*; α(P)=6.5×10^{-7} *12* α(K)exp=0.0112 *19*.
683.87 *3*	2.66 *17*	683.75	(1/2)$^-$	0.0	5/2$^-$	(E2)		0.00767	α(K)=0.00628 *9*; α(L)=0.001081 *16*; α(M)=0.000243 *4*; α(N+..)=6.45×10^{-5} *9* α(N)=5.63×10^{-5} *8*; α(O)=7.82×10^{-6} *11*; α(P)=3.55×10^{-7} *5* Mult.: α(K)exp=0.0082 *7* gives δ(E2/M1)=1.7 *+6−3* but ΔJ^π requires E2.
688.12 *11*	1.09 *11*	779.63	5/2$^-$	91.55	7/2$^+$	(E1)		0.00283	α(K)=0.00241 *4*; α(L)=0.000331 *5*; α(M)=7.27×10^{-5} *11*; α(N+..)=1.94×10^{-5} *3* α(N)=1.687×10^{-5} *24*; α(O)=2.42×10^{-6} *4*; α(P)=1.307×10^{-7} *19* α(K)exp=0.006 (1976Ab09).
691.736 *22*	3.23 *12*	856.22	(3/2)$^-$	164.42	5/2$^-$	M1		0.01532	α(K)=0.01295 *19*; α(L)=0.00185 *3*; α(M)=0.000409 *6*; α(N+..)=0.0001099 *16* α(N)=9.53×10^{-5} *14*; α(O)=1.384×10^{-5} *20*; α(P)=7.78×10^{-7} *11* α(K)exp=0.0137 *8*.
695.81 *12*	0.70 *8*	779.63	5/2$^-$	83.96	7/2$^-$	M1+E2	0.7 *4*	0.0126 *19*	α(K)=0.0106 *17*; α(L)=0.00156 *20*; α(M)=0.00035 *5*; α(N+..)=9.3×10^{-5} *12* α(N)=8.1×10^{-5} *10*; α(O)=1.16×10^{-5} *16*; α(P)=6.3×10^{-7} *11* α(K)exp=0.0107 *18*.
710.81 *11*	0.51 *5*	779.63	5/2$^-$	69.23	5/2$^+$				
714.04 *10*	0.41 *4*	1059.75	3/2$^-$	345.62	1/2$^-$	M1[e]		0.01415	α(K)=0.01196 *17*; α(L)=0.001708 *24*; α(M)=0.000377 *6*; α(N+..)=0.0001014 *15* α(N)=8.79×10^{-5} *13*; α(O)=1.277×10^{-5} *18*; α(P)=7.18×10^{-7} *10* α(K)exp=0.020 *2*.
717.42 *3*	0.92 *8*	717.39	3/2$^-$	0.0	5/2$^-$	M1+E2	1.5 *4*	0.0091 *11*	α(K)=0.0075 *9*; α(L)=0.00118 *11*; α(M)=0.000263 *24*; α(N+..)=7.0×10^{-5} *7* α(N)=6.1×10^{-5} *6*; α(O)=8.7×10^{-6} *9*; α(P)=4.4×10^{-7} *6* α(K)exp=0.0077 *8*.
733.6[c] *2*	0.35 *3*	1514.61	3/2$^+$	779.63	5/2$^-$				Level-energy difference=734.98.
735.97 *10*	0.61 *8*	985.67	5/2$^-$	249.53	7/2$^-$	E2(+M1)	≥2.46	0.0070 *5*	α(K)=0.0058 *5*; α(L)=0.00094 *5*; α(M)=0.000211 *11*; α(N+..)=5.6×10^{-5} *3* α(N)=4.9×10^{-5} *3*; α(O)=6.9×10^{-6} *4*; α(P)=3.3×10^{-7} *3* α(K)exp=0.0054 *8*.
749.6 *3*	0.32 *9*	1369.46	3/2$^+$	619.36	3/2$^+$				
752.04 *5*	2.01 *9*	856.22	(3/2)$^-$	104.32	3/2$^-$	M1[e]		0.01244	α(K)=0.01052 *15*; α(L)=0.001499 *21*; α(M)=0.000331 *5*; α(N+..)=8.90×10^{-5} *13* α(N)=7.71×10^{-5} *11*; α(O)=1.120×10^{-5} *16*; α(P)=6.31×10^{-7} *9* α(K)exp=0.0129 *9*.

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	Comments
[x]756.17 *7*	1.17 *9*					M1		0.01227	α(K)=0.01037 *15*; α(L)=0.001479 *21*; α(M)=0.000326 *5*; α(N+..)=8.78×10^{-5} *13* α(N)=7.61×10^{-5} *11*; α(O)=1.105×10^{-5} *16*; α(P)=6.22×10^{-7} *9* α(K)exp=0.0121 *12*.
759.41 *9*	1.25 *7*	1538.79	3/2$^+$	779.63	5/2$^-$	*d*			Mult.: α(K)exp=0.0060 *7* gives M1,E2 but ΔJ$^\pi$ requires E1.
[x]779.93 *5*	3.54 *13*					M1		0.01136	α(K)=0.00961 *14*; α(L)=0.001368 *20*; α(M)=0.000302 *5*; α(N+..)=8.12×10^{-5} *12* α(N)=7.04×10^{-5} *10*; α(O)=1.022×10^{-5} *15*; α(P)=5.76×10^{-7} *8* α(K)exp=0.0116 *7*. 780γ+782γ in coin with ce(K)(69γ), ce(K)(80γ), and ceγ(104γ).
[x]781.88 *9*	2.03 *9*					E1,E2			α(K)=0.0033 *14* α(K)exp=0.0029 *7*.
[x]785.72 *14*	0.46 *6*					E2(+M1)	≥2.2	0.0061 *5*	α(K)=0.0050 *5*; α(L)=0.00081 *6*; α(M)=0.000181 *11*; α(N+..)=4.8×10^{-5} *3* α(N)=4.2×10^{-5} *3*; α(O)=5.9×10^{-6} *4*; α(P)=2.9×10^{-7} *3* α(K)exp=0.0045 *10*.
790.12 *6*	1.65 *11*	1569.80	3/2$^+$	779.63	5/2$^-$	E1		0.00215	α(K)=0.00183 *3*; α(L)=0.000249 *4*; α(M)=5.47×10^{-5} *8*; α(N+..)=1.464×10^{-5} *21* α(N)=1.271×10^{-5} *18*; α(O)=1.83×10^{-6} *3*; α(P)=9.96×10^{-8} *14* α(K)exp=0.0022 *5*.
796.2 *2*	0.35 *6*	1653.15	3/2$^+$	856.22	(3/2)$^-$				
798.74 *9*	0.92 *5*	963.29	(3/2)$^+$	164.42	5/2$^-$				Mult.: α(K)exp=0.010 (1976Ab09) gives M1,E2 but ΔJ$^\pi$ requires E1.
803.469 *22*	1.44 *5*	1538.79	3/2$^+$	735.38	1/2$^+$,3/2$^+$	M1		0.01055	α(K)=0.00893 *13*; α(L)=0.001270 *18*; α(M)=0.000280 *4*; α(N+..)=7.53×10^{-5} *11* α(N)=6.53×10^{-5} *10*; α(O)=9.49×10^{-6} *14*; α(P)=5.35×10^{-7} *8* α(K)exp=0.0098 *7*.
813.32 *10*	0.81 *13*	1593.03	3/2$^+$	779.63	5/2$^-$	E1		0.00203	α(K)=0.001727 *25*; α(L)=0.000235 *4*; α(M)=5.16×10^{-5} *8*; α(N+..)=1.381×10^{-5} *20* α(N)=1.199×10^{-5} *17*; α(O)=1.724×10^{-6} *25*; α(P)=9.42×10^{-8} *14* α(K)exp=0.0020 *4*.
821.3 *2*	0.36 *10*	985.67	5/2$^-$	164.42	5/2$^-$				
828.8 *3*	0.31 *5*	1369.46	3/2$^+$	540.56	1/2$^+$	M1		0.00978	α(K)=0.00827 *12*; α(L)=0.001175 *17*; α(M)=0.000259 *4*; α(N+..)=6.97×10^{-5} *10* α(N)=6.04×10^{-5} *9*; α(O)=8.78×10^{-6} *13*; α(P)=4.95×10^{-7} *7* α(K)exp=0.0116 *28*.
833.96[c] *4*	2.75 *10*	1569.80	3/2$^+$	735.38	1/2$^+$,3/2$^+$	M1+E2	1.2 *3*	0.0069 *7*	α(K)=0.0057 *6*; α(L)=0.00086 *8*; α(M)=0.000191 *16*; α(N+..)=5.1×10^{-5} *5* α(N)=4.4×10^{-5} *4*; α(O)=6.4×10^{-6} *6*; α(P)=3.4×10^{-7} *4*

$^{163}_{68}Er_{95}$-17

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[h]	Comments
								Level-energy difference=834.42.
								α(K)exp=0.0058 *4*.
837.94 *13*	0.32 *11*	1801.56	3/2$^+$	963.29	(3/2)$^+$	(M1)	0.00951	α(K)=0.00805 *12*; α(L)=0.001143 *16*; α(M)=0.000252 *4*; α(N+..)=6.78×10^{-5} *10* α(N)=5.88×10^{-5} *9*; α(O)=8.54×10^{-6} *12*; α(P)=4.82×10^{-7} *7* α(K)exp=0.009 *3*.
844.69[c] *13*	0.45 *10*	1369.46	3/2$^+$	526.33	5/2$^+$			Level-energy difference=843.15.
[x]846.57 *12*	0.83 *12*					E2	0.00477	α(K)=0.00396 *6*; α(L)=0.000633 *9*; α(M)=0.0001416 *20*; α(N+..)=3.77×10^{-5} *6* α(N)=3.28×10^{-5} *5*; α(O)=4.62×10^{-6} *7*; α(P)=2.25×10^{-7} *4* α(K)exp=0.0030 *5*.
[x]852.9 *3*	0.29 *8*							
858.72 *6*	1.92 *13*	963.29	(3/2)$^+$	104.32	3/2$^-$	(E1)	0.00183	α(K)=0.001555 *22*; α(L)=0.000211 *3*; α(M)=4.63×10^{-5} *7*; α(N+..)=1.240×10^{-5} *18* α(N)=1.077×10^{-5} *15*; α(O)=1.549×10^{-6} *22*; α(P)=8.50×10^{-8} *12* α(K)exp=0.0026 *3*.
863.2 *3*	0.29 *10*	1826.49	3/2$^+$	963.29	(3/2)$^+$	M1,E2	0.0067 *22*	α(K)=0.0056 *19*; α(L)=0.00083 *23*; α(M)=0.00018 *5*; α(N+..)=4.9×10^{-5} *14* α(N)=4.3×10^{-5} *12*; α(O)=6.2×10^{-6} *18*; α(P)=3.3×10^{-7} *12* α(K)exp=0.0064 *25*.
873.88 *17*	0.47 *7*	1538.79	3/2$^+$	664.86	5/2$^+$	(E2)[d]	0.00446	α(K)=0.00370 *6*; α(L)=0.000587 *9*; α(M)=0.0001311 *19*; α(N+..)=3.49×10^{-5} *5* α(N)=3.04×10^{-5} *5*; α(O)=4.29×10^{-6} *6*; α(P)=2.11×10^{-7} *3* α(K)exp=0.0028 *12*.
881.4 *3*	0.25 *6*	985.67	5/2$^-$	104.32	3/2$^-$	(M1)	0.00840	α(K)=0.00711 *10*; α(L)=0.001008 *15*; α(M)=0.000222 *4*; α(N+..)=5.98×10^{-5} *9* α(N)=5.18×10^{-5} *8*; α(O)=7.53×10^{-6} *11*; α(P)=4.25×10^{-7} *6* α(K)exp=0.014 *4*.
886.06 *3*	2.00 *10*	1569.80	3/2$^+$	683.75	(1/2)$^-$	E1	1.72×10^{-3}	α(K)=0.001465 *21*; α(L)=0.000199 *3*; α(M)=4.35×10^{-5} *6*; α(N+..)=1.166×10^{-5} *17* α(N)=1.012×10^{-5} *15*; α(O)=1.457×10^{-6} *21*; α(P)=8.01×10^{-8} *12* α(K)exp=0.00183 *21*.
[x]892.8 *2*	0.65 *13*							
894.26[i] *11*	1.4[i] *7*	963.29	(3/2)$^+$	69.23	5/2$^+$	[M1,E2]	0.0062 *20*	α(K)=0.0052 *17*; α(L)=0.00076 *21*; α(M)=0.00017 *5*; α(N+..)=4.5×10^{-5} *13* α(N)=3.9×10^{-5} *11*; α(O)=5.7×10^{-6} *16*; α(P)=3.1×10^{-7} *11* I_γ: Iγ=2.10 *10* divided (evaluators) using α(K)exp and assumed mults. α(K)exp=0.0040 *4*.
894.26[i] *11*	0.7[i] *7*	985.67	5/2$^-$	91.55	7/2$^+$	[E1]	1.69×10^{-3}	α(K)=0.001439 *21*; α(L)=0.000195 *3*; α(M)=4.28×10^{-5} *6*;

$^{163}_{68}Er_{95}$-18

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	Comments
									α(N+..)=1.145×10^{-5} *16* α(N)=9.94×10^{-6} *14*; α(O)=1.431×10^{-6} *20*; α(P)=7.87×10^{-8} *11*
902.18 *14*	0.55 *13*	985.67	5/2$^-$	83.96	7/2$^-$	M1+E2	0.9 *7*	0.0062 *16*	α(K)=0.0053 *14*; α(L)=0.00077 *17*; α(M)=0.00017 *4*; α(N+..)=4.6×10^{-5} *10* α(N)=4.0×10^{-5} *9*; α(O)=5.7×10^{-6} *13*; α(P)=3.1×10^{-7} *9* α(K)exp=0.0054 *13*.
905.6 *2*	1.16 *18*	1569.80	3/2$^+$	664.86	5/2$^+$	M1(+E2)	≤0.61	0.0074 *6*	α(K)=0.0062 *5*; α(L)=0.00089 *6*; α(M)=0.000196 *13*; α(N+..)=5.3×10^{-5} *4* α(N)=4.6×10^{-5} *3*; α(O)=6.6×10^{-6} *5*; α(P)=3.7×10^{-7} *3* α(K)exp=0.0075 *16*.
908.18[c] *18*	1.10 *21*	1872.79	(3/2)$^+$	963.29	(3/2)$^+$	E2(+M1)	≥2.0	0.0045 *4*	α(K)=0.0037 *4*; α(L)=0.00058 *4*; α(M)=0.000128 *9*; α(N+..)=3.42×10^{-5} *25* α(N)=2.98×10^{-5} *21*; α(O)=4.2×10^{-6} *4*; α(P)=2.15×10^{-7} *21* Level-energy difference=909.50. α(K)exp=0.0034 *7*.
916.81 *9*	1.10 *11*	985.67	5/2$^-$	69.23	5/2$^+$	E1		1.61×10^{-3}	α(K)=0.001373 *20*; α(L)=0.000186 *3*; α(M)=4.07×10^{-5} *6*; α(N+..)=1.091×10^{-5} *16* α(N)=9.47×10^{-6} *14*; α(O)=1.364×10^{-6} *20*; α(P)=7.51×10^{-8} *11* α(K)exp=0.00151 *24*.
[x]923.1 *3*	0.45 *12*					E2(+M1)	≥1.6	0.0045 *5*	α(K)=0.0037 *5*; α(L)=0.00057 *6*; α(M)=0.000127 *12*; α(N+..)=3.4×10^{-5} *4* α(N)=2.9×10^{-5} *3*; α(O)=4.2×10^{-6} *5*; α(P)=2.2×10^{-7} *3* α(K)exp=0.0032 *10*.
928.06 *11*	0.74 *11*	1593.03	3/2$^+$	664.86	5/2$^+$	M1(+E2)	≤1.0	0.0065 *9*	α(K)=0.0055 *8*; α(L)=0.00079 *10*; α(M)=0.000175 *21*; α(N+..)=4.7×10^{-5} *6* α(N)=4.1×10^{-5} *5*; α(O)=5.9×10^{-6} *8*; α(P)=3.3×10^{-7} *5* α(K)exp=0.0058 *10*.
940.62 *3*	2.72 *9*	1514.61	3/2$^+$	574.08	3/2$^+$	E2		0.00382	α(K)=0.00318 *5*; α(L)=0.000494 *7*; α(M)=0.0001102 *16*; α(N+..)=2.94×10^{-5} *5* α(N)=2.56×10^{-5} *4*; α(O)=3.62×10^{-6} *5*; α(P)=1.81×10^{-7} *3* α(K)exp=0.0026 *2*.
945.27 *3*	4.67 *12*	1801.56	3/2$^+$	856.22	(3/2)$^-$	E1		1.52×10^{-3}	α(K)=0.001296 *19*; α(L)=0.0001752 *25*; α(M)=3.84×10^{-5} *6*; α(N+..)=1.028×10^{-5} *15* α(N)=8.93×10^{-6} *13*; α(O)=1.287×10^{-6} *18*; α(P)=7.10×10^{-8} *10* α(K)exp=0.00146 *12*.
950.85 *7*	1.03 *7*	1569.80	3/2$^+$	619.36	3/2$^+$	M1+E2	0.9 *3*	0.0055 *6*	α(K)=0.0047 *6*; α(L)=0.00068 *7*; α(M)=0.000150 *15*;

$^{163}_{68}Er_{95}$-19

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	Comments
									α(N+..)=4.0×10^{-5} *4* α(N)=3.5×10^{-5} *4*; α(O)=5.0×10^{-6} *5*; α(P)=2.7×10^{-7} *4* α(K)exp=0.0047 *5*.
961.61 *12*	0.65 *12*	2243.21	3/2$^-$	1281.16	1/2$^+$,3/2$^+$	E1		1.47×10^{-3}	α(K)=0.001255 *18*; α(L)=0.0001696 *24*; α(M)=3.72×10^{-5} *6*; α(N+..)=9.95×10^{-6} *14* α(N)=8.64×10^{-6} *12*; α(O)=1.245×10^{-6} *18*; α(P)=6.87×10^{-8} *10* α(K)exp=0.0012 *4*.
975.19[a j] *4*	2.00 *10*	1059.75	3/2$^-$	83.96	7/2$^-$	(E2)		0.00354	α(K)=0.00296 *5*; α(L)=0.000455 *7*; α(M)=0.0001013 *15*; α(N+..)=2.70×10^{-5} *4* α(N)=2.35×10^{-5} *4*; α(O)=3.33×10^{-6} *5*; α(P)=1.683×10^{-7} *24* α(K)exp=0.0038 *3*. Level-energy difference=84.56.
987.74[c] *10*	1.32 *11*	1722.39	3/2$^+$	735.38	1/2$^+$,3/2$^+$	M1+E2	1.1 *4*	0.0048 *7*	α(K)=0.0040 *6*; α(L)=0.00059 *7*; α(M)=0.000130 *16*; α(N+..)=3.5×10^{-5} *5* α(N)=3.0×10^{-5} *4*; α(O)=4.3×10^{-6} *6*; α(P)=2.4×10^{-7} *4* Level-energy difference=987.01. α(K)exp=0.0040 *5*.
991.0 *4*	0.31 *9*	1059.75	3/2$^-$	69.23	5/2$^+$	(E1)[d]		1.39×10^{-3}	α(K)=0.001187 *17*; α(L)=0.0001601 *23*; α(M)=3.51×10^{-5} *5*; α(N+..)=9.39×10^{-6} *14* α(N)=8.15×10^{-6} *12*; α(O)=1.176×10^{-6} *17*; α(P)=6.50×10^{-8} *10* α(K)exp<0.003 (1976Ab09).
995.8 *2*	1.08 *12*	1569.80	3/2$^+$	574.08	3/2$^+$	M1(+E2)	≤0.43	0.00601 *24*	α(K)=0.00509 *21*; α(L)=0.00072 *3*; α(M)=0.000159 *6*; α(N+..)=4.27×10^{-5} *16* α(N)=3.71×10^{-5} *14*; α(O)=5.38×10^{-6} *21*; α(P)=3.03×10^{-7} *13* α(K)exp=0.0058 *8*.
997.67 *19*	0.47 *9*	1538.79	3/2$^+$	540.56	1/2$^+$	M1+E2	1.3 *9*	0.0044 *14*	α(K)=0.0037 *12*; α(L)=0.00055 *16*; α(M)=0.00012 *4*; α(N+..)=3.2×10^{-5} *9* α(N)=2.8×10^{-5} *8*; α(O)=4.1×10^{-6} *12*; α(P)=2.2×10^{-7} *8* α(K)exp=0.0038 *8*.
1005.01 *9*	1.03 *15*	1722.39	3/2$^+$	717.39	3/2$^-$	E1		1.36×10^{-3}	α(K)=0.001156 *17*; α(L)=0.0001559 *22*; α(M)=3.41×10^{-5} *5*; α(N+..)=9.15×10^{-6} *13*

$^{163}_{68}Er_{95}$-20

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	Comments
									α(K)=0.001156 *17*; α(L)=0.0001559 *22*; α(M)=3.41×10^{-5} *5*; α(N+..)=9.15×10^{-6} *13* α(N)=7.94×10^{-6} *12*; α(O)=1.145×10^{-6} *16*; α(P)=6.34×10^{-8} *9* α(K)exp=0.0013 *3*.
1029.18 *6*	0.81 *10*	1569.80	3/2$^+$	540.56	1/2$^+$	E2		0.00317	α(K)=0.00265 *4*; α(L)=0.000403 *6*; α(M)=8.96×10^{-5} *13*; α(N+..)=2.39×10^{-5} *4* α(N)=2.08×10^{-5} *3*; α(O)=2.96×10^{-6} *5*; α(P)=1.510×10^{-7} *22* α(K)exp=0.0022 *4*.
1033.95 *11*	0.70 *12*	1653.15	3/2$^+$	619.36	3/2$^+$				Mult.: α(K)exp=0.001 (1976Ab09) gives E1 but ΔJ^π requires M1,E2.
1037.1 *4*	0.67 *7*	1722.39	3/2$^+$	683.75	(1/2)$^-$				Mult.: α(K)exp=0.003 (1976Ab09) gives M1,E2 but ΔJ^π requires E1.
1042.66[c] *9*	0.74 *12*	1569.80	3/2$^+$	526.33	5/2$^+$	M1(+E2)	≤1.2	0.0048 *8*	α(K)=0.0041 *7*; α(L)=0.00058 *9*; α(M)=0.000129 *18*; α(N+..)=3.5×10^{-5} *5* α(N)=3.0×10^{-5} *5*; α(O)=4.4×10^{-6} *7*; α(P)=2.4×10^{-7} *4* Level-energy difference=1043.46. α(K)exp=0.0044 *9*.
1046.9 *2*	0.69 *8*	1826.49	3/2$^+$	779.63	5/2$^-$				Mult.: α(K)exp=0.0024 *5* gives E2 but ΔJ^π requires E1.
1052.37 *13*	0.56 *8*	1593.03	3/2$^+$	540.56	1/2$^+$	(M1)[e]		0.00545	α(K)=0.00462 *7*; α(L)=0.000651 *10*; α(M)=0.0001434 *20*; α(N+..)=3.86×10^{-5} *6* α(N)=3.34×10^{-5} *5*; α(O)=4.86×10^{-6} *7*; α(P)=2.75×10^{-7} *4* α(K)exp=0.0149 *22*.
1066.49 *8*	1.06 *9*	1801.56	3/2$^+$	735.38	1/2$^+$,3/2$^+$	M1+E2	1.0 *4*	0.0041 *6*	α(K)=0.0035 *5*; α(L)=0.00050 *6*; α(M)=0.000111 *14*; α(N+..)=3.0×10^{-5} *4* α(N)=2.6×10^{-5} *4*; α(O)=3.7×10^{-6} *5*; α(P)=2.0×10^{-7} *3* α(K)exp=0.0035 *4*.
1075.13 *3*	4.28 *20*	1514.61	3/2$^+$	439.54	5/2$^-$	E1		1.20×10^{-3}	α(K)=0.001022 *15*; α(L)=0.0001373 *20*; α(M)=3.01×10^{-5} *5*; α(N+..)=8.06×10^{-6} *12* α(N)=6.99×10^{-6} *10*; α(O)=1.010×10^{-6} *15*; α(P)=5.61×10^{-8} *8* α(K)exp=0.00123 *17*.
1091.01 *4*	1.78 *18*	1826.49	3/2$^+$	735.38	1/2$^+$,3/2$^+$	M1+E2	1.0 *4*	0.0039 *6*	α(K)=0.0033 *5*; α(L)=0.00047 *6*; α(M)=0.000105 *13*; α(N+..)=2.8×10^{-5} *4* α(N)=2.4×10^{-5} *3*; α(O)=3.5×10^{-6} *5*; α(P)=1.9×10^{-7} *3* α(K)exp=0.0034 *4*.
1099.38 *3*	2.82 *17*	1538.79	3/2$^+$	439.54	5/2$^-$	E1		1.15×10^{-3}	α(K)=0.000981 *14*; α(L)=0.0001318 *19*; α(M)=2.88×10^{-5} *4*; α(N+..)=7.73×10^{-6} *11* α(N)=6.71×10^{-6} *10*; α(O)=9.69×10^{-7} *14*; α(P)=5.39×10^{-8} *8* α(K)exp=0.00104 *12*.

$^{163}_{68}Er_{95}$-21

γ(^{163}Er) (continued)

E_γ ‡	I_γ ‡ f	E_i(level)	J_i^π	E_f	J_f^π	Mult. #	δ @	α h	Comments
1130.224 *23*	12.3 *4*	1569.80	3/2$^+$	439.54	5/2$^-$	E1		1.10×10^{-3}	α(K)=0.000933 *13*; α(L)=0.0001252 *18*; α(M)=2.74×10^{-5} *4*; α(N+..)=1.162×10^{-5} *17* α(N)=6.37×10^{-6} *9*; α(O)=9.21×10^{-7} *13*; α(P)=5.13×10^{-8} *8*; α(IPF)=4.28×10^{-6} *6* α(K)exp=0.00096 *6*.
1135.28 *9*	1.81 *17*	1538.79	3/2$^+$	404.00	3/2$^-$	E1		1.09×10^{-3}	α(K)=0.000926 *13*; α(L)=0.0001242 *18*; α(M)=2.72×10^{-5} *4*; α(N+..)=1.227×10^{-5} *18* α(N)=6.32×10^{-6} *9*; α(O)=9.13×10^{-7} *13*; α(P)=5.09×10^{-8} *8*; α(IPF)=4.99×10^{-6} *8* α(K)exp=0.0013 *2*.
1137.10 *10*	2.01 *11*	1872.79	(3/2)$^+$	735.38	1/2$^+$,3/2$^+$	M1(+E2)	≤0.57	0.00428 *25*	α(K)=0.00363 *21*; α(L)=0.00051 *3*; α(M)=0.000113 *6*; α(N+..)=3.15×10^{-5} *17* α(N)=2.63×10^{-5} *14*; α(O)=3.82×10^{-6} *21*; α(P)=2.15×10^{-7} *14*; α(IPF)=1.19×10^{-6} *4* α(K)exp=0.0039 *4*.
1142.51 *5*	4.33 *15*	1826.49	3/2$^+$	683.75	(1/2)$^-$	E1		1.08×10^{-3}	α(K)=0.000915 *13*; α(L)=0.0001227 *18*; α(M)=2.69×10^{-5} *4*; α(N+..)=1.335×10^{-5} *19* α(N)=6.25×10^{-6} *9*; α(O)=9.03×10^{-7} *13*; α(P)=5.03×10^{-8} *7*; α(IPF)=6.15×10^{-6} *9* α(K)exp=0.00072 *7*.
x1147.36 *15*	0.39 *10*								
1153.45 *3*	5.64 *16*	1593.03	3/2$^+$	439.54	5/2$^-$	E1		1.06×10^{-3}	α(K)=0.000900 *13*; α(L)=0.0001206 *17*; α(M)=2.64×10^{-5} *4*; α(N+..)=1.534×10^{-5} *22* α(N)=6.14×10^{-6} *9*; α(O)=8.87×10^{-7} *13*; α(P)=4.94×10^{-8} *7*; α(IPF)=8.27×10^{-6} *12* α(K)exp=0.00077 *5*.
1158.0 a j *2*	0.29 *16*	2122.21	1/2$^{(-)}$,3/2	963.29	(3/2)$^+$				Mult.: α(K)exp=0.0028 *16* consistent with E2.
1165.6 *2*	0.76 *12*	1569.80	3/2$^+$	404.00	3/2$^-$				
1168.97 *5*	2.3 *3*	1514.61	3/2$^+$	345.62	1/2$^-$	E1		1.04×10^{-3}	α(K)=0.000879 *13*; α(L)=0.0001177 *17*; α(M)=2.58×10^{-5} *4*; α(N+..)=1.90×10^{-5} *3* α(N)=5.99×10^{-6} *9*; α(O)=8.66×10^{-7} *13*; α(P)=4.83×10^{-8} *7*; α(IPF)=1.208×10^{-5} *17* α(K)exp=0.00088 *14*.
1176.09 c *3*	2.60 *16*	1281.16	1/2$^+$,3/2$^+$	104.32	3/2$^-$	E1		1.03×10^{-3}	α(K)=0.000869 *13*; α(L)=0.0001164 *17*; α(M)=2.55×10^{-5} *4*; α(N+..)=2.10×10^{-5} *3* α(N)=5.92×10^{-6} *9*; α(O)=8.56×10^{-7} *12*; α(P)=4.78×10^{-8} *7*; α(IPF)=1.414×10^{-5} *20* Level-energy difference=1176.83. α(K)exp=0.00087 *18*.

$^{163}_{68}Er_{95}$-22

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ ‡	I_γ ‡ f	E_i(level)	J_i^π	E_f	J_f^π	Mult. #	α h	Comments
1181.94 *16*	0.81 *11*	1722.39	3/2+	540.56	1/2+	(E2)	0.00240	α(K)=0.00202 *3*; α(L)=0.000298 *5*; α(M)=6.60×10^{-5} *10*; α(N+..)=2.11×10^{-5} *3* α(N)=1.534×10^{-5} *22*; α(O)=2.19×10^{-6} *3*; α(P)=1.149×10^{-7} *16*; α(IPF)=3.49×10^{-6} *5* α(K)exp=0.0024 *6*.
1189.00 i *13*	0.42 i *11*	1593.03	3/2+	404.00	3/2−	(E1)	1.02×10^{-3}	α(K)=0.000852 *12*; α(L)=0.0001141 *16*; α(M)=2.50×10^{-5} *4*; α(N+..)=2.51×10^{-5} *4* α(N)=5.81×10^{-6} *9*; α(O)=8.40×10^{-7} *12*; α(P)=4.68×10^{-8} *7*; α(IPF)=1.84×10^{-5} *3* I_γ: total Iγ=0.85 *11*. 1982Vy07 place this γ from the 1593 level only. Least-squares analysis suggests double placement (evaluators). Equal intensity assigned, arbitrarily, in each place. α(K)exp=0.0013 *5*.
1189.00 i *13*	0.42 i *11*	1872.79	(3/2)+	683.75	(1/2)−	(E1)		α(K)=0.000852 α(K)exp=0.0013 *5*.
1192.34 *19*	0.86 *8*	1538.79	3/2+	345.62	1/2−	(E1)	1.01×10^{-3}	α(K)=0.000848 *12*; α(L)=0.0001135 *16*; α(M)=2.48×10^{-5} *4*; α(N+..)=2.62×10^{-5} *4* α(N)=5.78×10^{-6} *8*; α(O)=8.35×10^{-7} *12*; α(P)=4.66×10^{-8} *7*; α(IPF)=1.96×10^{-5} *3* α(K)exp=0.0007 *3*.
1205.019 *24*	13.1 *3*	1369.46	3/2+	164.42	5/2−	E1		α(K)=0.000832 α(K)exp=0.00083 *5*.
1213.52 *15*	0.72 *10*	1653.15	3/2+	439.54	5/2−			
x1218.89 *19*	0.47 *7*							
1224.152 *24*	11.2 *3*	1569.80	3/2+	345.62	1/2−	E1		α(K)=0.000809 α(K)exp=0.00072 *4*.
x1240.27 *12*	0.74 *5*					E2	0.00219	α(K)=0.00184 *3*; α(L)=0.000269 *4*; α(M)=5.95×10^{-5} *9*; α(N+..)=2.58×10^{-5} *4* α(N)=1.384×10^{-5} *20*; α(O)=1.98×10^{-6} *3*; α(P)=1.047×10^{-7} *15*; α(IPF)=9.90×10^{-6} *14* α(K)exp=0.00174 *26*.
1247.44 *3*	4.87 *13*	1593.03	3/2+	345.62	1/2−	E1		α(K)=0.000783 α(K)exp=0.00066 *5*.
1251.90 c *10*	1.08 *5*	1917.48	(3/2)+	664.86	5/2+	E2	0.00215	α(K)=0.00180 *3*; α(L)=0.000264 *4*; α(M)=5.84×10^{-5} *9*; α(N+..)=2.71×10^{-5} *4* α(N)=1.357×10^{-5} *19*; α(O)=1.94×10^{-6} *3*; α(P)=1.028×10^{-7} *15*; α(IPF)=1.149×10^{-5} *17* Level-energy difference=1252.62. α(K)exp=0.0019 *3*.

$^{163}_{68}Er_{95}$-23

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	Comments
1261.20 *8*	1.30 *14*	1801.56	3/2$^+$	540.56	1/2$^+$	(M1)[e]		0.00354	α(K)=0.00299 *5*; α(L)=0.000418 *6*; α(M)=9.21×10^{-5} *13*; α(N+..)=4.03×10^{-5} *6* α(N)=2.15×10^{-5} *3*; α(O)=3.13×10^{-6} *5*; α(P)=1.775×10^{-7} *25*; α(IPF)=1.548×10^{-5} *22* α(K)exp=0.0049 *6*.
1265.116 *25*	27.8 *5*	1369.46	3/2$^+$	104.32	3/2$^-$	E1			α(K)=0.000764 α(K)exp=0.00071 *4*.
1273.17 *14*	0.97 *18*	2052.50	3/2$^-$	779.63	5/2$^-$	M1(+E2)	≤0.68	0.00324 *23*	α(K)=0.00274 *19*; α(L)=0.000385 *25*; α(M)=8.5×10^{-5} *6*; α(N+..)=4.00×10^{-5} *20* α(N)=1.98×10^{-5} *13*; α(O)=2.87×10^{-6} *19*; α(P)=1.62×10^{-7} *12*; α(IPF)=1.72×10^{-5} *6* α(K)exp=0.0033 *7*.
1285.82 *5*	1.80 *14*	1826.49	3/2$^+$	540.56	1/2$^+$	M1+E2	0.7 *4*	0.0029 *4*	α(K)=0.0025 *3*; α(L)=0.00035 *4*; α(M)=7.7×10^{-5} *9*; α(N+..)=4.0×10^{-5} *3* α(N)=1.80×10^{-5} *19*; α(O)=2.6×10^{-6} *3*; α(P)=1.46×10^{-7} *18*; α(IPF)=1.89×10^{-5} *9* α(K)exp=0.0025 *3*.
1300.41 *6*	2.78 *17*	1369.46	3/2$^+$	69.23	5/2$^+$	M1+E2	1.0 *4*	0.0027 *3*	α(K)=0.0022 *3*; α(L)=0.00032 *4*; α(M)=7.0×10^{-5} *8*; α(N+..)=4.0×10^{-5} *3* α(N)=1.62×10^{-5} *18*; α(O)=2.3×10^{-6} *3*; α(P)=1.30×10^{-7} *17*; α(IPF)=2.11×10^{-5} *10* α(K)exp=0.00224 *21*.
[x]1303.80 *12*	1.06 *7*								
1307.26 *11*	0.94 *7*	1653.15	3/2$^+$	345.62	1/2$^-$				Mult.: α(K)exp=0.002 (1976Ab09) gives M1,E2 but ΔJ^π requires E1.
1318.34 *3*	8.27 *17*	1722.39	3/2$^+$	404.00	3/2$^-$	(E1)[d]			α(K)=0.00071 α(K)exp=0.00118 *8*.
1323.64 *18*	0.49 *12*	2040.68	3/2$^+$	717.39	3/2$^-$	(E1)[d]			α(K)=0.000706 α(K)exp<0.002 (1976Ab09).
1332.13 *7*	0.70 *12*	1872.79	(3/2)$^+$	540.56	1/2$^+$	M1(+E2)	≤0.91	0.0029 *3*	α(K)=0.00239 *24*; α(L)=0.00034 *3*; α(M)=7.4×10^{-5} *7*; α(N+..)=4.9×10^{-5} *3* α(N)=1.73×10^{-5} *16*; α(O)=2.51×10^{-6} *24*; α(P)=1.41×10^{-7} *15*; α(IPF)=2.93×10^{-5} *13* α(K)exp=0.0028 *6*.
1338.62 *14*	0.49 *12*	1801.56	3/2$^+$	462.48	3/2$^+$				
1345.82 *19*	0.36 *7*	1872.79	(3/2)$^+$	526.33	5/2$^+$	M1,E2			α(K)=0.0021 *5* α(K)exp=0.0040 *20*.
1350.15 *3*	2.29 *9*	1514.61	3/2$^+$	164.42	5/2$^-$	E1		8.94×10^{-4}	α(K)=0.000682 *10*; α(L)=9.08×10^{-5} *13*;

γ(^{163}Er) (continued)

E_γ ‡	I_γ ‡ f	E_i(level)	J_i^π	E_f	J_f^π	Mult. #	δ @	α h	Comments
									α(M)=1.99×10^{-5} *3*; α(N+..)=0.0001011 *15* α(N)=4.62×10^{-6} *7*; α(O)=6.69×10^{-7} *10*; α(P)=3.75×10^{-8} *6*; α(IPF)=9.58×10^{-5} *14* α(K)exp=0.00077 (1976Ab09).
1365.6 *5*	0.34 *11*	1826.49	3/2$^+$	462.48	3/2$^+$	M1 e		0.00295	α(K)=0.00247 *4*; α(L)=0.000345 *5*; α(M)=7.60×10^{-5} *11*; α(N+..)=6.03×10^{-5} *9* α(N)=1.773×10^{-5} *25*; α(O)=2.58×10^{-6} *4*; α(P)=1.467×10^{-7} *21*; α(IPF)=3.98×10^{-5} *6* α(K)exp=0.0032 *14*.
1374.34 *3*	23.0 *6*	1538.79	3/2$^+$	164.42	5/2$^-$	E1			α(K)=0.000661 α(K)exp=0.00066 *4*.
1376.79 *10*	1.83 *18*	1722.39	3/2$^+$	345.62	1/2$^-$				
1386.99 *3*	5.83 *14*	1826.49	3/2$^+$	439.54	5/2$^-$	E1			α(K)=0.000651 α(K)exp=0.00063 *5*.
1397.52 *3*	37.8 *8*	1801.56	3/2$^+$	404.00	3/2$^-$	E1			α(K)=0.000643 α(K)exp=0.00065 *4*.
1405.36 *3*	4.11 *14*	1569.80	3/2$^+$	164.42	5/2$^-$	E1			α(K)=0.000636 α(K)exp=0.00068 *8*.
1410.19 *3*	2.47 *9*	1514.61	3/2$^+$	104.32	3/2$^-$	E1			α(K)=0.000633 α(K)exp=0.00070 *9*.
1422.58 *12*	0.58 *7*	1826.49	3/2$^+$	404.00	3/2$^-$				α(K)exp=0.002 (1976Ab09).
1434.45 *3*	42.8 *10*	1538.79	3/2$^+$	104.32	3/2$^-$	E1			α(K)=0.000614 α(K)exp=0.00062 *4*.
1446.88 *13*	0.49 *6*	1538.79	3/2$^+$	91.55	7/2$^+$				
1455.94 *3*	19.5 *6*	1801.56	3/2$^+$	345.62	1/2$^-$	E1			α(K)=0.000599 α(K)exp=0.00057 *4*.
1465.73 c *3*	10.3 *3*	1569.80	3/2$^+$	104.32	3/2$^-$	E1			α(K)=0.000592 Level-energy difference=1465.47. α(K)exp=0.00078 *6*.
1469.42 *3*	15.6 *3*	1538.79	3/2$^+$	69.23	5/2$^+$	M1+E2	0.65 *20*	0.00226 *12*	α(K)=0.00186 *10*; α(L)=0.000260 *14*; α(M)=5.7×10^{-5} *3*; α(N+..)=8.7×10^{-5} *3* α(N)=1.33×10^{-5} *7*; α(O)=1.94×10^{-6} *11*; α(P)=1.09×10^{-7} *7*; α(IPF)=7.15×10^{-5} *20* α(K)exp=0.00189 *10*.
1480.94 *3*	3.33 *22*	1826.49	3/2$^+$	345.62	1/2$^-$	E1			α(K)=0.000582 α(K)exp=0.00046 *14*.
1489.04 *10*	0.41 *7*	1593.03	3/2$^+$	104.32	3/2$^-$				
1500.61 *4*	2.00 *12*	1569.80	3/2$^+$	69.23	5/2$^+$	M1+E2	0.9 *4*	0.00204 *21*	α(K)=0.00166 *18*; α(L)=0.000234 *24*; α(M)=5.1×10^{-5} *6*; α(N+..)=9.5×10^{-5} *6*

$^{163}_{68}Er_{95}$-25

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[h]	Comments
									α(K)=0.00166 *18*; α(L)=0.000234 *24*; α(M)=5.1×10^{-5} *6*; α(N+..)=9.5×10^{-5} *6* α(N)=1.20×10^{-5} *12*; α(O)=1.74×10^{-6} *18*; α(P)=9.7×10^{-8} *11*; α(IPF)=8.1×10^{-5} *4* α(K)exp=0.00169 *15*.
1514.3 *4*	0.34 *5*	1514.61	3/2$^+$	0.0	5/2$^-$				
1525.97 *4*	4.04 *20*	2052.50	3/2$^-$	526.33	5/2$^+$	E1			α(K)=0.000553 α(K)exp=0.00054 *9*.
[x]1531.90 *13*	0.39 *5*					M1,E2		0.0019 *4*	α(K)=0.0016 *4*; α(L)=0.00022 *5*; α(M)=4.8×10^{-5} *10*; α(N+..)=0.000105 *12* α(N)=1.12×10^{-5} *23*; α(O)=1.6×10^{-6} *4*; α(P)=9.1×10^{-8} *21*; α(IPF)=9.2×10^{-5} *9* α(K)exp=0.0016 *4*.
1561.60 *5*	1.11 *7*	1653.15	3/2$^+$	91.55	7/2$^+$	E2		1.49×10^{-3}	α(K)=0.001186 *17*; α(L)=0.0001679 *24*; α(M)=3.70×10^{-5} *6*; α(N+..)=0.0001031 *15* α(N)=8.61×10^{-6} *12*; α(O)=1.241×10^{-6} *18*; α(P)=6.76×10^{-8} *10*; α(IPF)=9.32×10^{-5} *13* α(K)exp=0.00141 *15*.
1569.65 *10*	0.43 *6*	1569.80	3/2$^+$	0.0	5/2$^-$				
1577.66 *15*	0.28 *3*	2040.68	3/2$^+$	462.48	3/2$^+$				
1583.95 *4*	2.13 *7*	1653.15	3/2$^+$	69.23	5/2$^+$	M1		0.00218	α(K)=0.001742 *25*; α(L)=0.000242 *4*; α(M)=5.33×10^{-5} *8*; α(N+..)=0.0001383 *20* α(N)=1.243×10^{-5} *18*; α(O)=1.81×10^{-6} *3*; α(P)=1.031×10^{-7} *15*; α(IPF)=0.0001240 *18* α(K)exp=0.00158 *11*.
1593.05 *11*	0.22 *6*	1593.03	3/2$^+$	0.0	5/2$^-$				
1618.20 *19*	0.19 *7*	1722.39	3/2$^+$	104.32	3/2$^-$				
[x]1626.58 *16*	0.26 *5*								
1631.4 *4*	0.16 *5*	1722.39	3/2$^+$	91.55	7/2$^+$				
1637.46 *12*	0.45 *10*	1801.56	3/2$^+$	164.42	5/2$^-$				
1649.3 *3*	0.29 *11*	2052.50	3/2$^-$	404.00	3/2$^-$				
[x]1654.47 *8*	0.58 *7*					E2(+M1)	>1	0.00154 *16*	α(K)=0.00119 *13*; α(L)=0.000167 *18*; α(M)=3.7×10^{-5} *4*; α(N+..)=0.000146 *9* α(N)=8.6×10^{-6} *9*; α(O)=1.24×10^{-6} *14*; α(P)=6.9×10^{-8} *9*; α(IPF)=0.000136 *8* α(K)exp=0.00113 *19*.
1662.12 *5*	5.35 *20*	1826.49	3/2$^+$	164.42	5/2$^-$	E1			α(K)=0.000480 α(K)exp=0.00063 *4*.
[x]1673.48 *12*	0.61 *5*					E1(+M2)	<0.25	0.00098 *10*	α(K)=0.00056 *9*; α(L)=7.6×10^{-5} *13*; α(M)=1.7×10^{-5} *3*; α(N+..)=0.000322 *8*

$^{163}_{68}Er_{95}$-26

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[h]	Comments
								α(N)=3.9×10^{-6} *7*; α(O)=5.6×10^{-7} *10*; α(P)=3.2×10^{-8} *6*; α(IPF)=0.000317 *9* α(K)exp=0.00055 *10*.
1689.15 *4*	1.98 *12*	1853.54	3/2$^+$	164.42	5/2$^-$	E1		α(K)=0.000467 α(K)exp=0.00046 *7*.
1697.22 *4*	2.60 *12*	1801.56	3/2$^+$	104.32	3/2$^-$	E1		α(K)=0.000463 α(K)exp=0.00050 *7*.
1709.03[c] *6*	0.73 *4*	1872.79	(3/2)$^+$	164.42	5/2$^-$	(E1)		α(K)=0.000458 Level-energy difference=1708.36. α(K)exp=0.00034 *15*.
1722.37 *5*	2.80 *10*	1826.49	3/2$^+$	104.32	3/2$^-$	E1		α(K)=0.000452 α(K)exp=0.00037 *4*.
[x]1729.7 *3*	0.18 *4*							
1732.92 *15*	0.87 *4*	1801.56	3/2$^+$	69.23	5/2$^+$	(M1)	0.00186	α(K)=0.001412 *20*; α(L)=0.000196 *3*; α(M)=4.31×10^{-5} *6*; α(N+..)=0.000209 *3* α(N)=1.004×10^{-5} *14*; α(O)=1.463×10^{-6} *21*; α(P)=8.34×10^{-8} *12*; α(IPF)=0.000197 *3* α(K)exp≈0.002 (1976Ab09).
1741.75[c] *9*	0.45 *3*	1826.49	3/2$^+$	83.96	7/2$^-$			Level-energy difference=1742.52. α(K)exp=0.001 (1976Ab09) gives M1,E2 but ΔJ^π requires M2.
1749.22 *4*	5.53 *19*	1853.54	3/2$^+$	104.32	3/2$^-$	E1		α(K)=0.000441 α(K)exp=0.000361 *23*.
1753.45 *8*	0.79 *7*	1917.48	(3/2)$^+$	164.42	5/2$^-$			
1757.25 *14*	0.34 *3*	1826.49	3/2$^+$	69.23	5/2$^+$			
1767.65[c] *10*	0.99 *5*	1872.79	(3/2)$^+$	104.32	3/2$^-$			Level-energy difference=1768.46.
1784.29 *4*	2.03 *9*	1853.54	3/2$^+$	69.23	5/2$^+$	E2	1.28×10^{-3}	α(K)=0.000927 *13*; α(L)=0.0001293 *18*; α(M)=2.84×10^{-5} *4*; α(N+..)=0.000192 *3* α(N)=6.62×10^{-6} *10*; α(O)=9.56×10^{-7} *14*; α(P)=5.28×10^{-8} *8*; α(IPF)=0.000184 *3* α(K)exp=0.00109 *8*.
[x]1790.12 *5*	0.83 *7*							
[x]1793.38 *7*	1.01 *3*							
1803.55 *5*	6.96 *19*	1872.79	(3/2)$^+$	69.23	5/2$^+$	E2	1.26×10^{-3}	α(K)=0.000909 *13*; α(L)=0.0001266 *18*; α(M)=2.79×10^{-5} *4*; α(N+..)=0.000200 *3* α(N)=6.48×10^{-6} *9*; α(O)=9.37×10^{-7} *14*; α(P)=5.17×10^{-8} *8*; α(IPF)=0.000192 *3* α(K)exp=0.00096 *6*.
1813.60[c] *7*	0.249 *21*	1917.48	(3/2)$^+$	104.32	3/2$^-$			Level-energy difference=1813.15.
1825.23[c] *7*	1.05 *4*	1917.48	(3/2)$^+$	91.55	7/2$^+$	E2	1.25×10^{-3}	α(K)=0.000889 *13*; α(L)=0.0001237 *18*; α(M)=2.72×10^{-5} *4*; α(N+..)=0.000209 *3* α(N)=6.33×10^{-6} *9*; α(O)=9.15×10^{-7} *13*; α(P)=5.06×10^{-8} *7*;

$^{163}_{68}Er_{95}$-27

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

γ(^{163}Er) (continued)

E_γ[‡]	I_γ[‡ f]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[h]	Comments
								α(IPF)=0.000202 *3* Level-energy difference=1825.92. α(K)exp=0.00103 *10*.
[x]1835.69 *20*	0.125 *19*							
1848.22 *9*	0.20 *6*	1917.48	$(3/2)^+$	69.23	$5/2^+$	(M1)	1.69×10^{-3}	α(K)=0.001216 *17*; α(L)=0.0001682 *24*; α(M)=3.70×10^{-5} *6*; α(N+..)=0.000270 *4* α(N)=8.63×10^{-6} *12*; α(O)=1.257×10^{-6} *18*; α(P)=7.17×10^{-8} *10*; α(IPF)=0.000260 *4* α(K)exp=0.0015 *8*.
1853.33 *12*	0.15 *3*	1853.54	$3/2^+$	0.0	$5/2^-$			
1876.23 *6*	1.20 *11*	2040.68	$3/2^+$	164.42	$5/2^-$	E1		α(K)=0.000393 α(K)exp=0.00041 *8*.
[x]1879.6 *2*	0.146 *18*							
1888.1 *3*	0.11 *6*	2052.50	$3/2^-$	164.42	$5/2^-$			
[x]1913.88 *14*	0.090 *14*							
1936.38 *6*	1.96 *5*	2040.68	$3/2^+$	104.32	$3/2^-$	E1		α(K)=0.000374 α(K)exp=0.00029 *3*.
1948.40 *5*	0.36 *3*	2052.50	$3/2^-$	104.32	$3/2^-$			
1957.57 *7*	0.29 *4*	2122.21	$1/2^{(-)},3/2$	164.42	$5/2^-$			
1971.2 *2*	0.050 *13*	2040.68	$3/2^+$	69.23	$5/2^+$			
1983.24 *8*	0.35 *3*	2052.50	$3/2^-$	69.23	$5/2^+$			
2017.96 *9*	0.249 *16*	2122.21	$1/2^{(-)},3/2$	104.32	$3/2^-$			
2040.76 *16*	0.174 *26*	2040.68	$3/2^+$	0.0	$5/2^-$			
2052.8 *2*	0.086 *8*	2052.50	$3/2^-$	0.0	$5/2^-$			
2079.0 *4*	0.077 *10*	2243.21	$3/2^-$	164.42	$5/2^-$			
2159.98 *16*	0.083 *12*	2243.21	$3/2^-$	83.96	$7/2^-$			
2274.5 *5*	0.042 *18*	2274.5	$1/2^{(-)},3/2$	0.0	$5/2^-$			

[†] Absolute intensities obtained by 1982Vy07 from Ice′s and theoretical α′s, except as noted. Renormalized by the evaluators from Iγ normalization=0.188 *9* to 0.186 *5*.
[‡] From 1982Vy07, unless otherwise stated. Least-squares analysis of γ rays suggests that the uncertainties quoted by 1982Vy07 are too low to be realistic. These should at least be doubled.
[#] From α(K)exp′s and subshell ratios given in comments. 1982Vy07 appear to give only the dominant component when there is only α(K)exp. δ′s added in these cases by the evaluators.
[@] From subshell ratios when available, otherwise from α(K)exp.
[&] γ from 1980Ab18 only. It is considered as uncertain (evaluators) due to lack of confirmation by 1982Vy07. Intensity is renormalized to 100 for 104γ.
[a] Tentative placement (evaluators) based on approximate (within <1 keV) level-energy difference.
[b] Deduced (evaluators) from renormalized ce′s of 1980Ab18 and α′s.
[c] Poor fit, deviates by more than 2 σ′s in the least-squares analysis. It is possible that some of the γ rays in this category are misplaced.

$^{163}_{68}Er_{95}$-28

$\gamma(^{163}\text{Er})$ (continued)

[d] E1,E2 from α(K)exp. Multipolarity further restricted by adopted ΔJ^{π}.
[e] Large value of α(K)exp suggests possibility of some E0 admixture.
[f] For absolute intensity per 100 decays, multiply by 0.186 *5*.
[g] Absolute intensity per 100 decays.
[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 intensity suitably divided.
[j] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

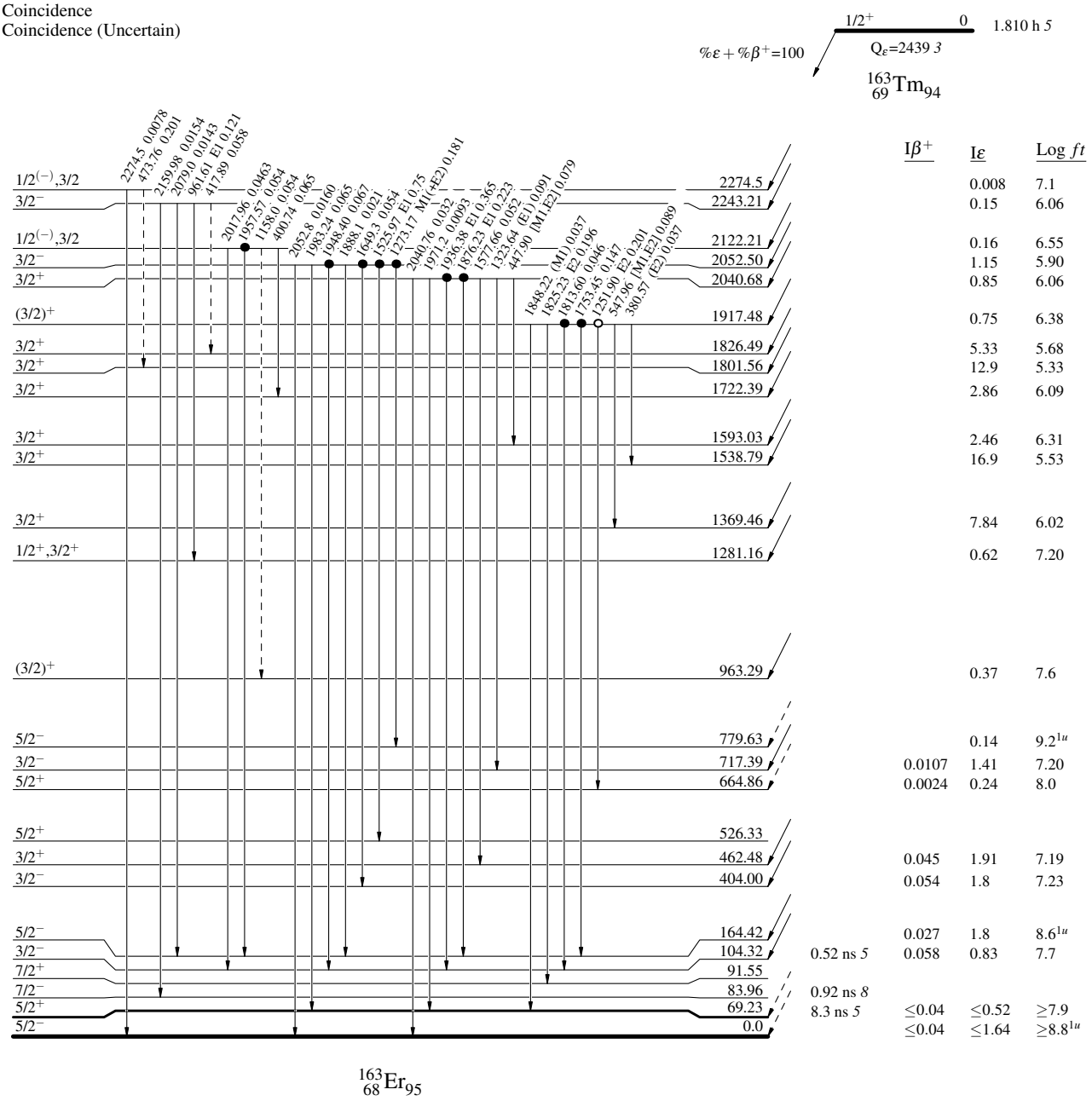
^{163}Tm ε decay (1.810 h) 1982Vy07

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)
- Coincidence
- Coincidence (Uncertain)

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

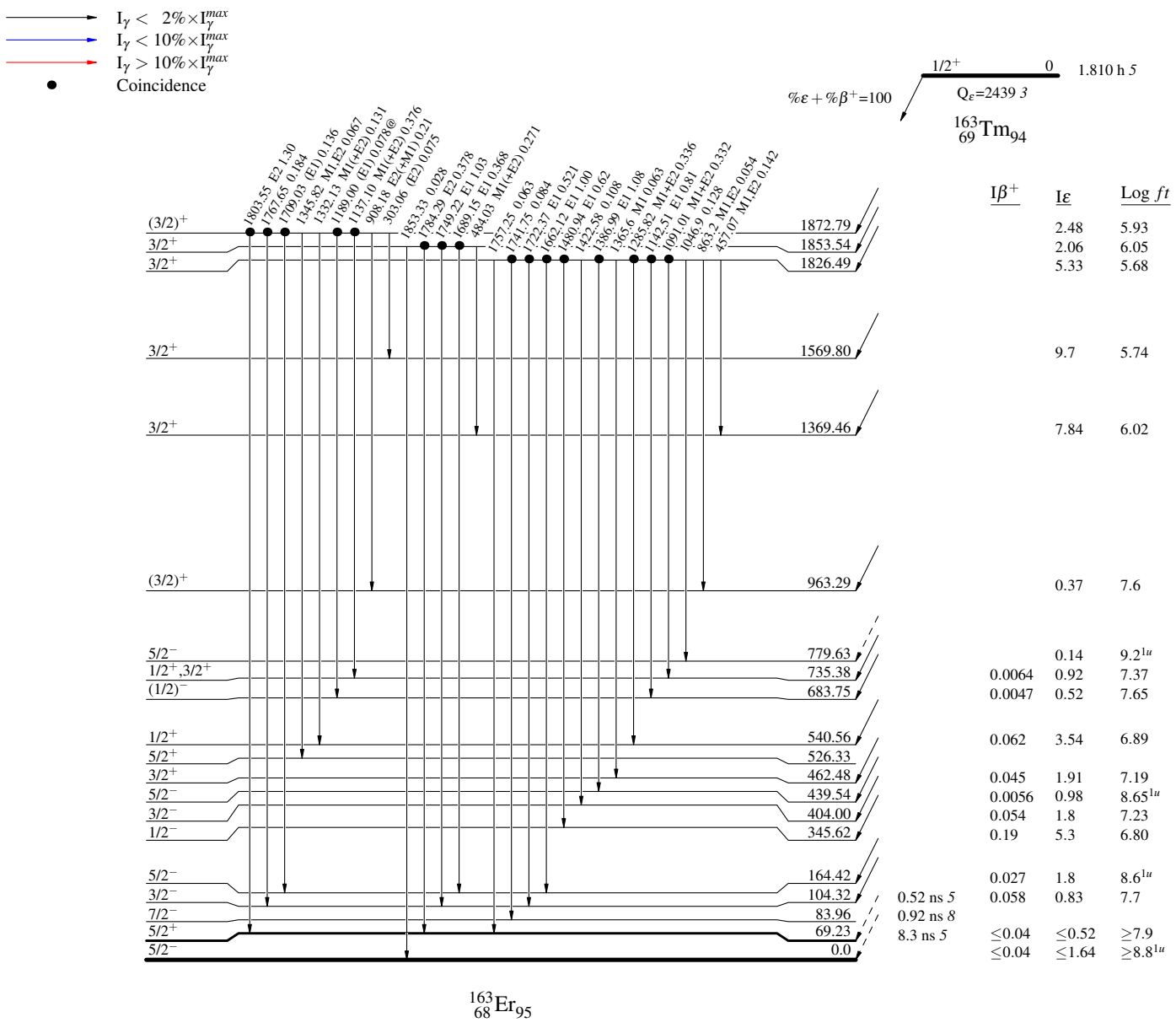


	Iβ+	Iε	Log *ft*
2274.5		0.008	7.1
2243.21		0.15	6.06
2122.21		0.16	6.55
2052.50		1.15	5.90
2040.68		0.85	6.06
1917.48		0.75	6.38
1826.49		5.33	5.68
1801.56		12.9	5.33
1722.39		2.86	6.09
1593.03		2.46	6.31
1538.79		16.9	5.53
1369.46		7.84	6.02
1281.16		0.62	7.20
963.29		0.37	7.6
779.63		0.14	9.2[1u]
717.39	0.0107	1.41	7.20
664.86	0.0024	0.24	8.0
526.33			
462.48	0.045	1.91	7.19
404.00	0.054	1.8	7.23
164.42	0.027	1.8	8.6[1u]
104.32	0.058	0.83	7.7
91.55			
83.96			
69.23	≤0.04	≤0.52	≥7.9
0.0	≤0.04	≤1.64	≥8.8[1u]

^{163}Tm ε decay (1.810 h) 1982Vy07

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided

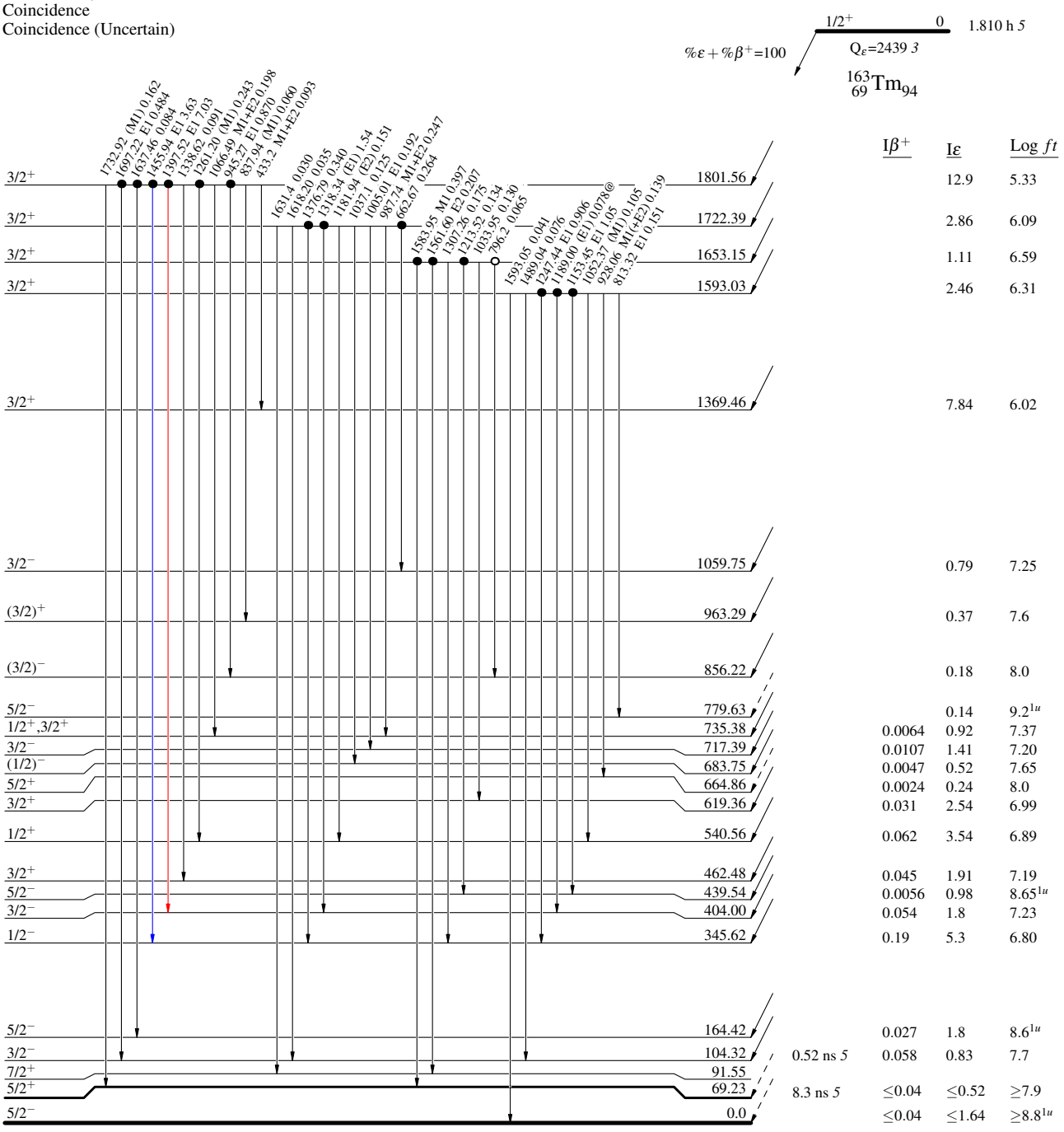


^{163}Tm ε decay (1.810 h) 1982Vy07

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided

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



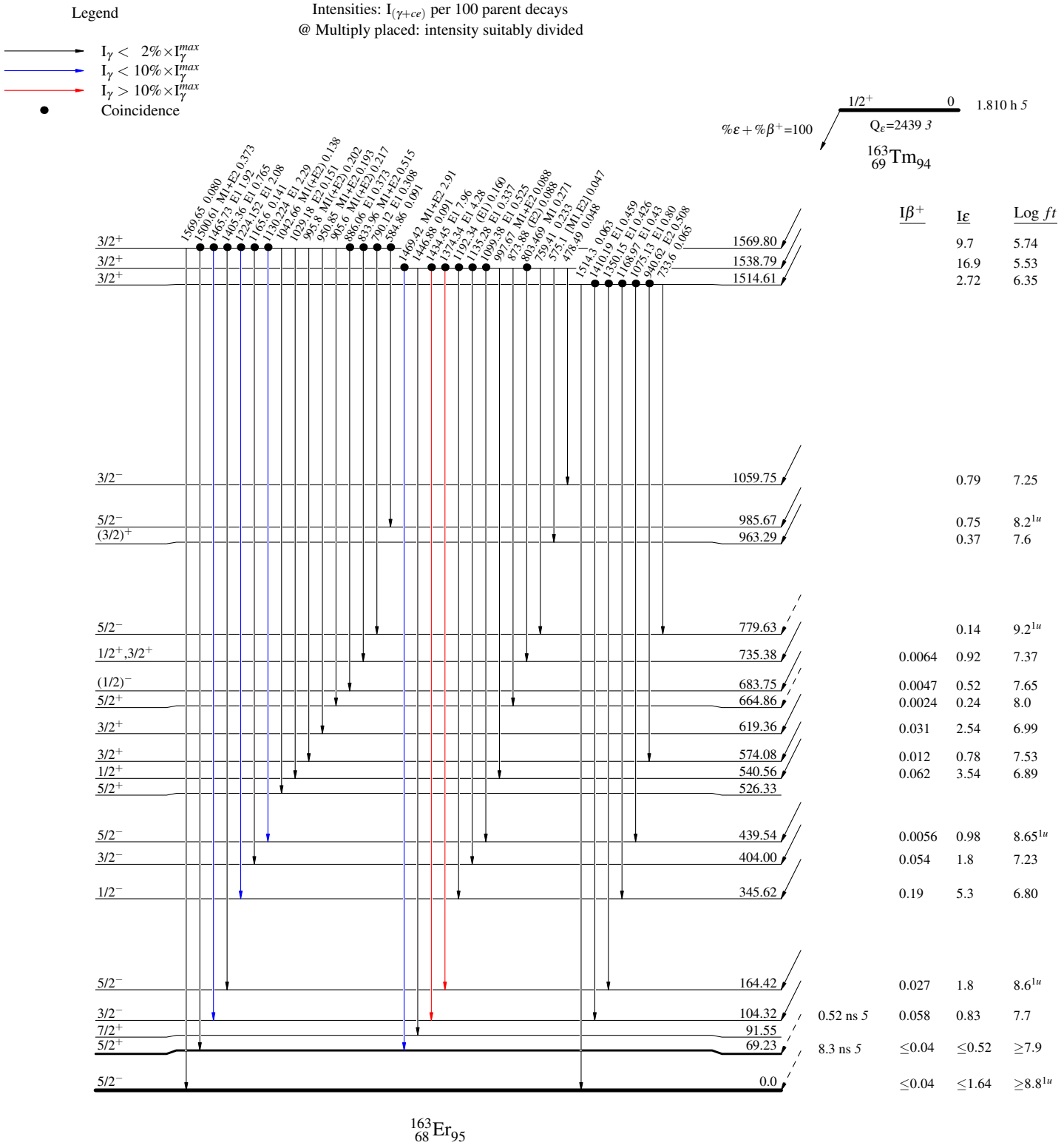
	Iβ+	Iε	Log *ft*
1801.56		12.9	5.33
1722.39		2.86	6.09
1653.15		1.11	6.59
1593.03		2.46	6.31
1369.46		7.84	6.02
1059.75		0.79	7.25
963.29		0.37	7.6
856.22		0.18	8.0
779.63		0.14	9.2[1u]
735.38	0.0064	0.92	7.37
717.39	0.0107	1.41	7.20
683.75	0.0047	0.52	7.65
664.86	0.0024	0.24	8.0
619.36	0.031	2.54	6.99
540.56	0.062	3.54	6.89
462.48	0.045	1.91	7.19
439.54	0.0056	0.98	8.65[1u]
404.00	0.054	1.8	7.23
345.62	0.19	5.3	6.80
164.42	0.027	1.8	8.6[1u]
104.32	0.058	0.83	7.7
91.55			
69.23	≤0.04	≤0.52	≥7.9
0.0	≤0.04	≤1.64	≥8.8[1u]

$^{163}_{68}Er_{95}$

^{163}Tm ε decay (1.810 h) 1982Vy07

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided

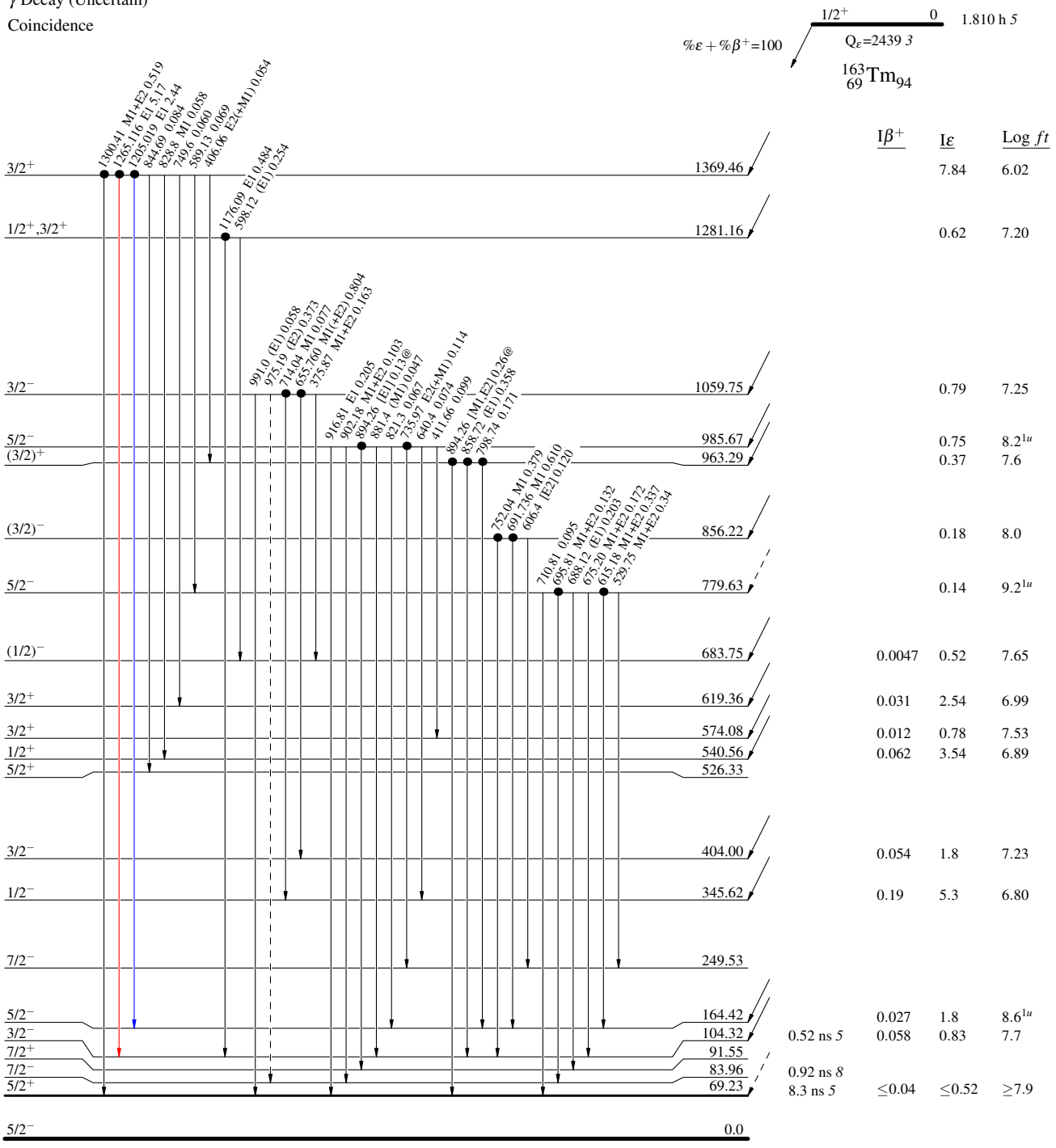


^{163}Tm ε decay (1.810 h) 1982Vy07

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ 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)
- Coincidence



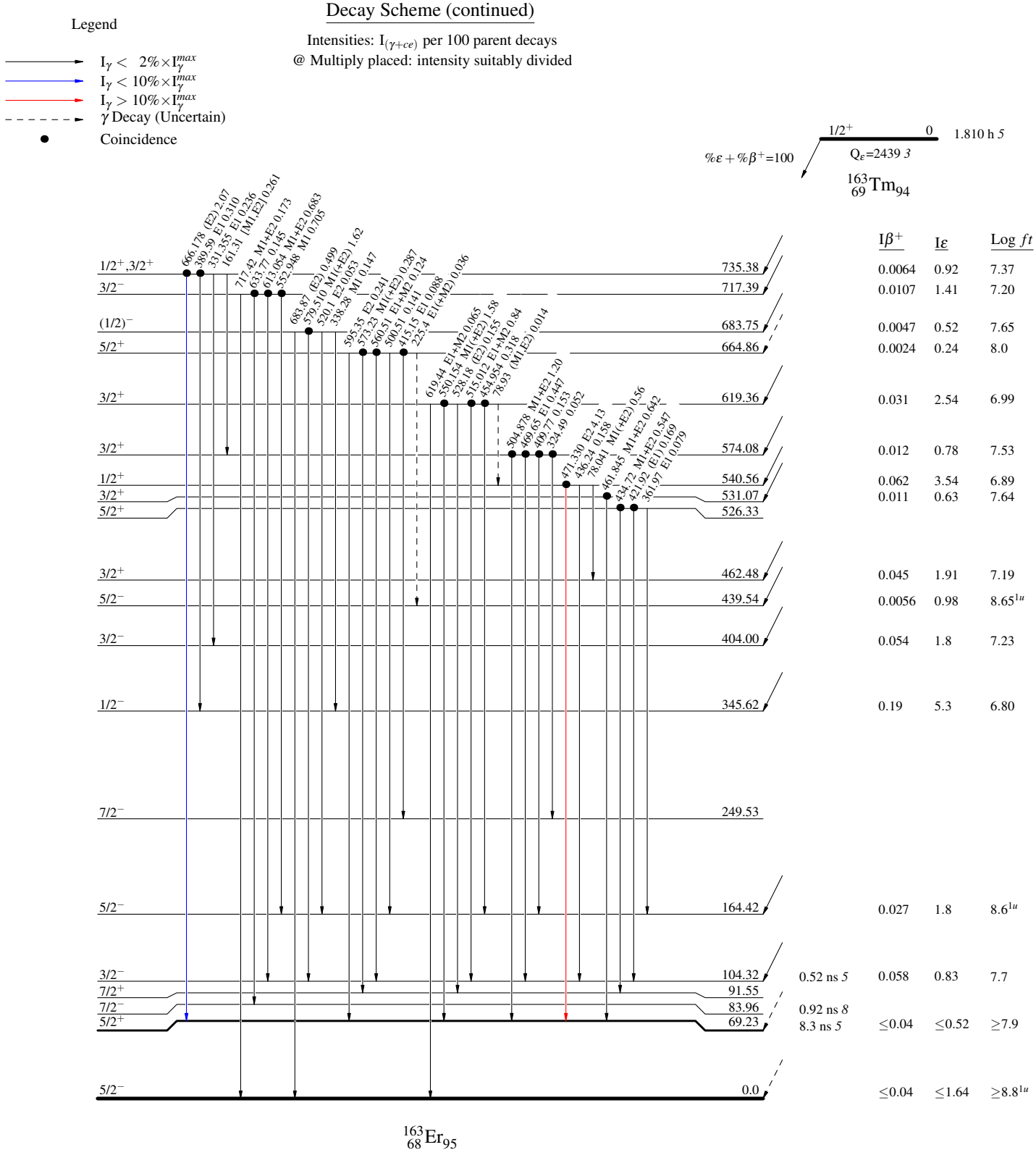
	Iβ+	Iε	Log *ft*
1369.46		7.84	6.02
1281.16		0.62	7.20
1059.75		0.79	7.25
985.67		0.75	8.2 1u
963.29		0.37	7.6
856.22		0.18	8.0
779.63		0.14	9.2 1u
683.75	0.0047	0.52	7.65
619.36	0.031	2.54	6.99
574.08	0.012	0.78	7.53
540.56	0.062	3.54	6.89
526.33			
404.00	0.054	1.8	7.23
345.62	0.19	5.3	6.80
249.53			
164.42	0.027	1.8	8.6 1u
104.32	0.058	0.83	7.7
91.55			
83.96			
69.23	≤0.04	≤0.52	≥7.9
0.0			

$^{163}_{68}Er_{95}$

^{163}Tm ε decay (1.810 h) 1982Vy07

Decay Scheme (continued)

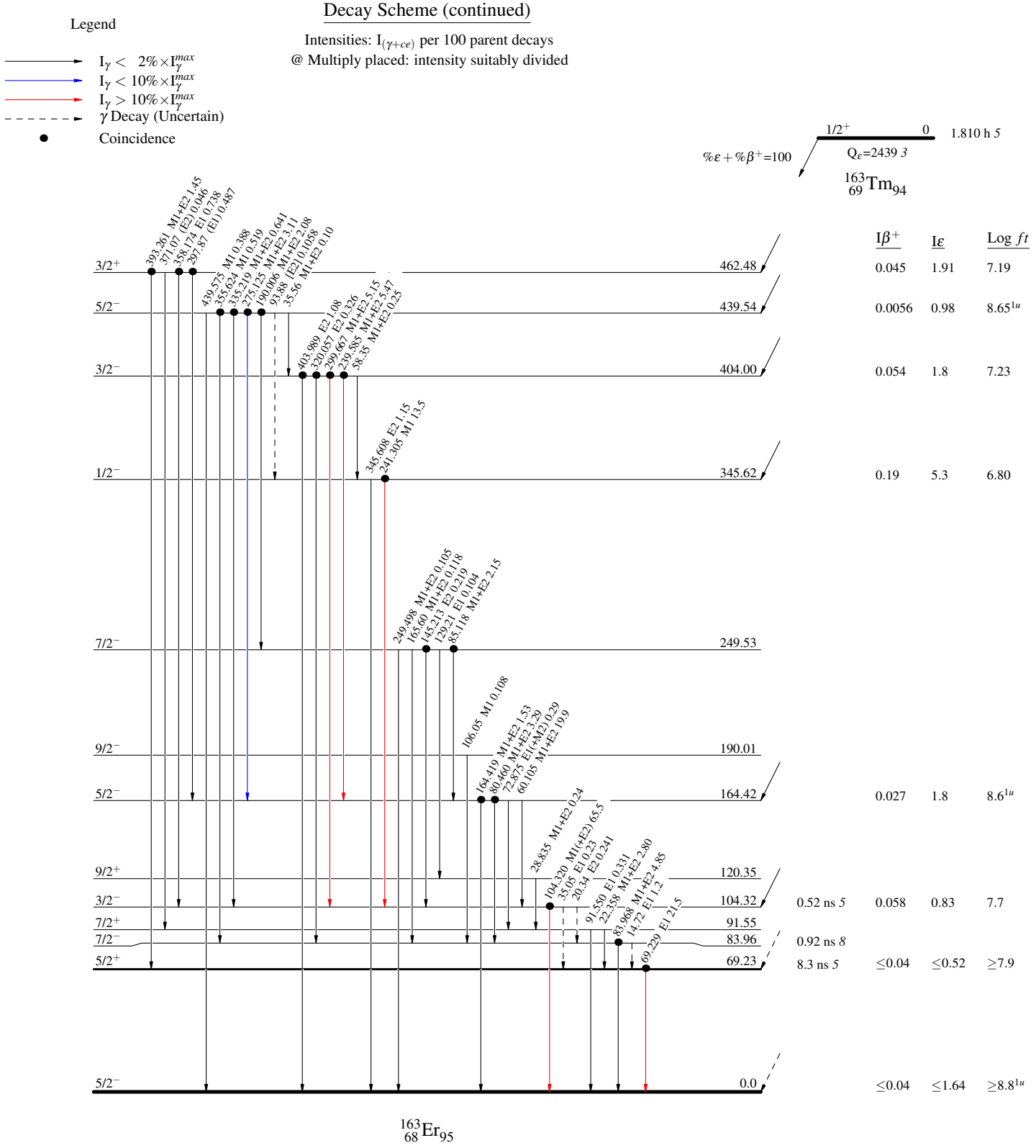
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided



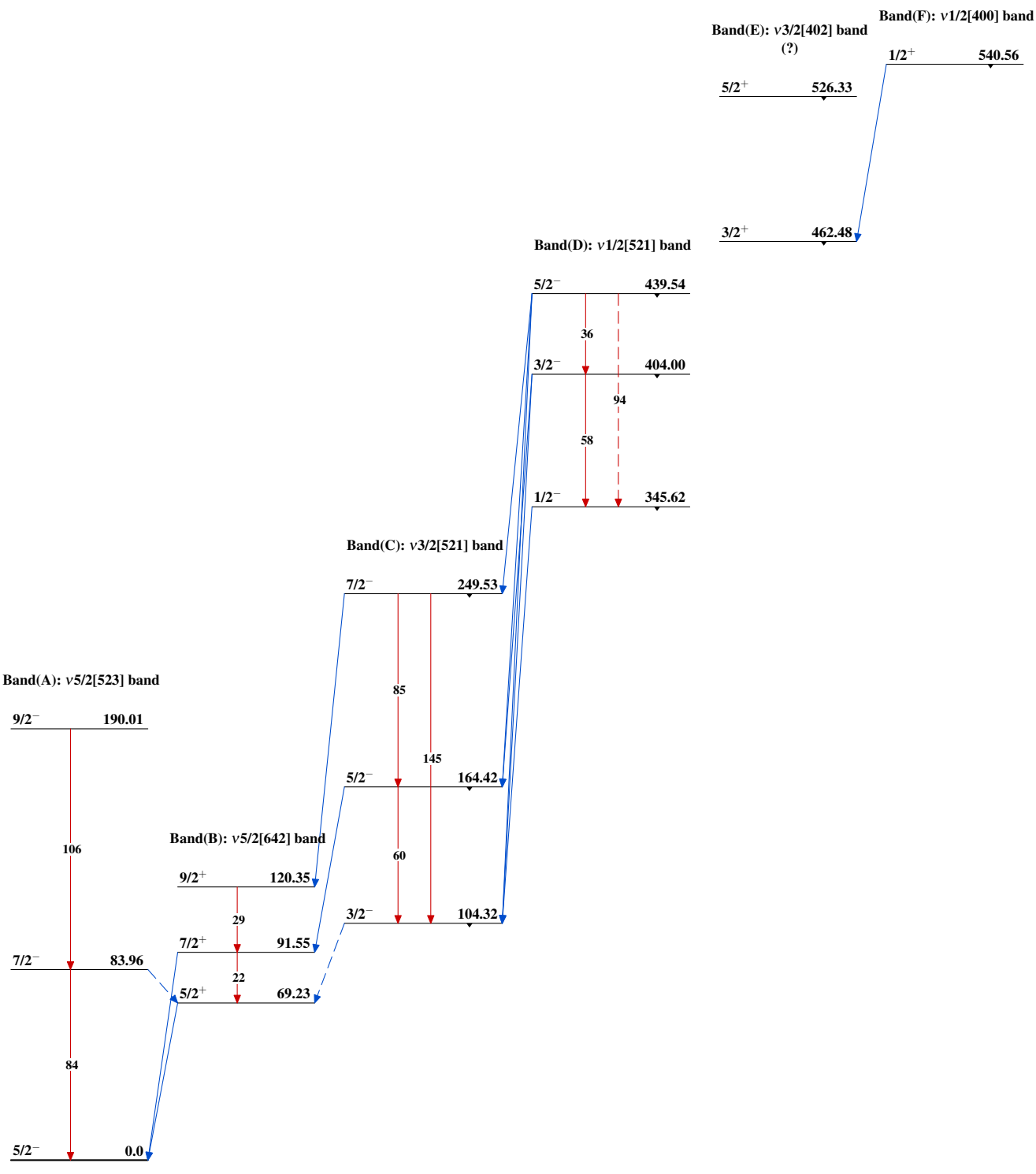
^{163}Tm ε decay (1.810 h) 1982Vy07

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided



^{163}Tm ε decay (1.810 h) 1982Vy07



$^{163}_{68}Er_{95}$

^{163}Tm ε decay (1.810 h) 1982Vy07 (continued)

Band(H): K-2 γ vibration built on the *ν*5/2[523] g.s. The small value of the decoupling parameter excludes other interpretations for this K=1/2 band

5/2⁻ 779.63

3/2⁻ 717.39

(1/2)⁻ 683.75

Band(G): *ν*3/2[651] band

5/2⁺ 664.86

3/2⁺ 619.36

$^{163}_{68}Er_{95}$