Adopted Levels, Gammas

History

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

Q(β^-)=−2439 *3*; S(n)=6905 *5*; S(p)=6415 *6*; Q(α)=1575 *5* 2012Wa38

Note: Current evaluation has used the following Q record $ −2439 3 6903 5 6416 6 1574 5 2009AuZZ,2003Au03.

Additional information 1.

Additional information 2.

Other reactions:

^{159}Tb(^{14}N,^{10}Be) E=140 MeV: 1980Wi10 measured particle-γ coincidences and deduced σ.

^{161}Dy(^{58}Ni,Xγ) E=270 MeV; ^{162}Dy(^{58}Ni,Xγ) E=285, 345 MeV: 1985JuZZ measured γ's and γ-multiplicity.

^{164}Dy(α,xnγ) E=50-120 MeV: 1983Ma32 measured σ and neutron multiplicity.

Structure calculations (selected references): 1996Du06, 1995Ly04, 1995Do10, 1993Ha11, 1989Hs01, 1982En02, 1974Ka12, 1970Ba02.

A total of 17 neutron resonances in the energy range 5.48 eV to 228.5 eV are known, see ^{162}Er(n,γ),(n,n):resonances data set for details.

^{163}Er Levels

Fragmentation of three-quasiparticle states: see discussion in ε decay.

Bands: see ε decay, (d,p), (d,t), and (^{18}O,5nγ) for details.

Nomenclature of single quasiparticle orbitals (1997Ha23):

A: ν5/2[642], α=+1/2.
B: ν5/2[642], α=−1/2.
C: ν3/2[651], α=+1/2.
D: ν3/2[651], α=−1/2.
E: ν5/2[523], α=+1/2.
F: ν5/2[523], α=−1/2.
G: ν3/2[521], α=+1/2.
H: ν3/2[521], α=−1/2.
X: ν11/2[505], α=+1/2.
Y: ν11/2[505], α=−1/2.
a: π7/2[404], α=+1/2.
b: π7/2[404], α=−1/2.
c: π1/2[411], α=+1/2.
d: π1/2[411], α=−1/2.
e: π7/2[523], α=+1/2.
f: π7/2[523], α=−1/2.
k: π5/2[402], α=+1/2.
l: π5/2[402], α=−1/2.

Cross Reference (XREF) Flags

A	^{163}Tm ε decay (1.810 h)	D	^{162}Er(d,p)
B	^{150}Nd(^{18}O,5nγ)	E	^{164}Er(d,t)
C	^{161}Dy(α,2nγ)		

E(level)†	J$^\pi$‡	T$_{1/2}$	XREF	Comments
0.0[k]	5/2$^-$	75.0 min *4*	ABCDE	%ε+%β^+=100 μ=+0.557 *4* (1972Ek03,1989Ra17,2005St24) Q=+2.55 *3* (1972Ek03,1989Ra17,2005St24) μ,Q: atomic beam; Q includes Sternheimer correction.

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Adopted Levels, Gammas (continued)

^{163}Er Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
				Jπ: spin from atomic beam (1969St05,1969Ek01). Parity: log *ft*=5.33 *2* to 1801.56 level from 1/2+ parent; the 1801.56 level decays by E1-E2 cascade to the g.s.; "finger-print" method of measured and predicted cross sections in (d,t) and (d,p); measured μ consistent with calculated μ=+0.66 for ν5/2[523], β_2=0.2. $T_{1/2}$: weighted average of 75.1 min *4* (1963Pe16) and 73 min *2* (1965St08). Others: 1963Gr14, 1961Bj02, 1960Bu27, 1953Ha43, 1951Bu25.
69.23[i] *1*	5/2+	8.3 ns *5*	ABCDE	Jπ: E1 γ to 5/2−, M1+E2 γ's from 3/2+ (462 level) and 7/2+ (91 level). $T_{1/2}$: from ceγ(t) in ε decay.
83.96[l] *1*	7/2−[@]	0.92[#] ns *8*	ABCDE	Jπ: M1+E2 γ to 5/2−, M1+E2 γ from 7/2− (249 level). $T_{1/2}$: ceγ(t) in ε decay.
91.55[j] *1*	7/2+	#	ABC	Jπ: E1 γ to 5/2−, M1+E2 γ from 9/2+ (120 level).
104.32[t] *1*	3/2−[@]	0.52[#] ns *5*	A CDE	Jπ: M1 γ to 5/2− and possible ε feeding from 1/2+. $T_{1/2}$: ceγ(t) in ε decay (1974An04).
120.35[i] *2*	9/2+[@]		ABCDE	E(level): from ^{163}Tm ε decay. Jπ: E1 γ from 7/2− (249 level).
164.42[s] *1*	5/2−	#	ABCDE	Jπ: M1+E2 γ's to 3/2− and 7/2−. $T_{1/2}$: B(M2)(W.u.)(72.9γ)≤1 from RUL suggests $T_{1/2}$>6.3 ns.
189.7[k] *2*	9/2−[@]	#	ABCDE	Jπ: M1 γ to 7/2−.
199.3[j] *2*	11/2+	#	BC	Jπ: ΔJ=2 γ to 7/2+, ΔJ=1, M1+E2 γ to 9/2+.
247.0[i] *2*	(13/2+)	#	BC	Jπ: ΔJ=(2) γ to 9/2+.
249.53[t] *1*	7/2−		AB DE	Jπ: E1 γ to 9/2+ and M1+E2 γ to 5/2−.
319.7[l] *2*	(11/2−)	#	BC E	Jπ: γ's to 7/2−, 9/2− and 9/2+ and band member.
345.62[a] *1*	1/2−[@]		A DE	Jπ: M1 γ to 3/2−, log *ft*=6.8 from 1/2+.
359.8[s] *3*	(9/2−)[@]		B E	Jπ: γ's to 5/2− and 7/2−.
404.00[a] *1*	3/2−[@]		A DE	Jπ: M1+E2 γ to 1/2−, E2 γ to 7/2−.
411.9[j] *2*	(15/2+)	#	BC	Jπ: ΔJ=(2) γ 11/2+, ΔJ=1, M1+E2 γ to (13/2+).
439.54[a] *1*	5/2−[@]		A CD	Jπ: M1+E2 γ's to 3/2− and 7/2−.
445.5[q] *6*	(11/2−)	0.58 μs *10*	BC E	Jπ: ΔJ=1 γ to 9/2−, γ's to 11/2+ and 11/2− and σ(θ) in (d,t). Systematics of odd-A Gd nuclides and N=95, 11/2−,ν11/2[505] states support this assignment. $T_{1/2}$: γγ(t) in (α,2nγ) (1974An04).
462.48[b] *2*	3/2+		A DE	Jπ: E1 γ to 3/2−, (E2) γ to 7/2+ and log *ft*=7.2 from 1/2+. Agreement of σ(exp)/σ(predicted) in (d,t) and weak population in (d,p) is characteristic of a hole state. Dominant configuration is 3/2[402].
464.0[i] *2*	(17/2+)	#	BC	Jπ: ΔJ=2 γ to (13/2+).
466.1[k] *2*	13/2−	#	BC	Jπ: ΔJ=2, E2 γ to 9/2−, γ to 11/2+.
496.2[t] *3*	11/2−[@]		B DE	Jπ: γ's to 7/2− and (9/2−).
526.33[b] *4*	5/2+		A E	Jπ: M1+E2 γ to 7/2+, (E1) γ to 3/2−.
531.07 *3*	3/2+		A	Jπ: M1+E2 γ to 5/2+, log *ft*=7.6 from 1/2+.
540.56[c] *3*	1/2+[@]		A DE	Jπ: E2 γ to 5/2+, log *ft*=6.9 from 1/2+. Agreement of σ(exp)/σ(predicted) in (d,t) and weak population in (d,p) is characteristic of a hole state. Configuration=ν1/2[400].
553 *3*			E	
573[a] *3*	7/2−[@]		DE	
574.08 *3*	3/2+		A	Jπ: M1+E2 γ to 5/2+, E1 γ to 3/2− and log *ft*=7.5 from 1/2+.
610[d] *3*	(5/2−)[@]		DE	
616.5[w] *5*	(13/2−)	#	BC	Jπ: ΔJ=1 γ to (11/2−).
619.36[e] *2*	3/2+		A E	Jπ: E1+M2 γ to 5/2− and log *ft*=7.0 from 1/2+.
636[a] *3*	9/2−[@]		D	

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Adopted Levels, Gammas (continued)

^{163}Er Levels (continued)

E(level)[†]	Jπ[‡]	XREF	Comments
639.6[l] 2	(15/2⁻)	BC	Jπ: ΔJ=2 γ to (11/2⁻), γ to (13/2⁻).
655.3[s] 3	(13/2⁻)	B	Jπ: γ's to (9/2⁻) and 11/2⁻.
664.86[e] 3	5/2⁺	A E	Jπ: E1+M2 γ to 3/2⁻ and E1 γ to 7/2⁻.
683.75[f] 2	(1/2)⁻	A E	Jπ: M1 γ to 1/2⁻ and probable band member.
698[d] 3	(7/2⁻)	DE	Jπ: σ(θ) in (d,p) and probable band member.
717.39[f] 3	3/2⁻	A	Jπ: M1+E2 γ to 5/2⁻ and log *ft*=7.2 (log $f^{1u}t$<8.5) from 1/2⁺.
735.0[j] 2	(19/2⁺)	BC	Jπ: ΔJ=2 γ to (15/2⁺) and ΔJ=1 γ to (17/2⁺).
735.38 2	1/2⁺,3/2⁺	A E	Jπ: E1 γ to 1/2⁻.
759 3		DE	
777.1[i] 2	(21/2⁺)	BC	Jπ: ΔJ=2 γ to (17/2⁺).
779.63[f] 4	5/2⁻	A DE	Jπ: M1+E2 γ's to 3/2⁻ and 7/2⁻.
≈805[d]	(9/2⁻)[@]	D	
809.7[q] 5	(15/2⁻)	BC	Jπ: ΔJ=1 γ to (13/2⁻), γ to (11/2⁻).
820.6[k] 2	(17/2⁻)	BC	Jπ: γ's to (15/2⁺), 13/2⁻ and (15/2⁻).
827 3		D	
840.5[t] 3	(15/2⁻)	B	Jπ: γ's to 11/2⁻ and (13/2⁻).
842 3		DE	
856.22[g] 4	(3/2)⁻[@]	A DE	Jπ: M1 γ's to 3/2⁻ and 5/2⁻.
877[g] 3	(5/2⁻)[@]	DE	
963.29 8	(3/2)⁺	A	Jπ: log *ft*=7.6 (log $f^{1u}t$<8.5) from 1/2⁺ and E2(+M1) γ from 3/2⁺ (1369 level). γ to 5/2⁻.
973[g] 3	(7/2⁻)[@]	dE	
985.67 8	5/2⁻	A dE	Jπ: M1+E2 γ to 7/2⁻, γ to 1/2⁻.
1023.9[w] 5	(17/2⁻)	BC	Jπ: γ's to (13/2⁻) and (15/2⁻).
1029 5		D	
1032.3[l] 2	(19/2⁻)	BC	Jπ: γ's to (17/2⁺), (15/2⁻) and (17/2⁻).
1040.6[s] 3	(17/2⁻)	B	Jπ: γ's to (13/2⁻) and (15/2⁻).
1059.75 4	3/2⁻	A D	Jπ: M1 γ to 1/2⁻, (E1) γ to 5/2⁺.
1075[h] 5	(1/2⁻)[@]	DE	
1077.3[r] 3	(17/2⁺)	B	Jπ: γ's to (15/2⁺), (17/2⁺) and (19/2⁺).
1098[h] 5	3/2⁻[@]	D	
1163.1[j] 2	(23/2⁺)	BC	Jπ: ΔJ=2 γ to (19/2⁺), γ to (21/2⁺).
1164? 5		D	
1183[h] 5	5/2⁻[@]	D	
1184.8[i] 2	(25/2⁺)	BC	Jπ: ΔJ=2 γ to (21/2⁺).
1204 5		D	
1214.3[v] 3	(17/2⁺)	B	Jπ: γ's to (15/2⁺) and (17/2⁺).
1242.8[k] 2	(21/2⁻)	BC	Jπ: ΔJ=(2) γ to (17/2⁻), γ's to (19/2⁺) and (19/2⁻).
1245[h] 5	7/2⁻[@]	D	
1258.3[q] 5	(19/2⁻)	BC	Jπ: γ's to (15/2⁻) and (17/2⁻).
1270.6[t] 3	(19/2⁻)	B	Jπ: γ's to (15/2⁻) and (17/2⁻).
1281.16 5	1/2⁺,3/2⁺	A D	Jπ: E1 γ to 3/2⁻. log *ft*=7.2 from 1/2⁺.
1298.0[1] 5	(15/2⁻)	B	Jπ: Based on a comparison of experimental and calculated (K-allowed and K-hindered) reduced transition (E2) probabilities and K^{π}=19/2⁻ for the 1845 bandhead, 1994Br09 deduce K^{π}=15/2⁻ for the 1297 bandhead. 1994Br09 state that coupling between the available orbitals does not produce J^{π}=15/2⁻. However, a K+2 γ vibration built on ν11/2[505] would have 15/2⁻ in its ground state. $T_{1/2}$: 1 ns to 75 ns γγ(t) (1994Br09).
1316 5		D	
1344 5		D	
1352.8[u] 5	(19/2⁺)	B	

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Adopted Levels, Gammas (continued)

^{163}Er Levels (continued)

E(level)[†]	Jπ[‡]	XREF	Comments
1369.46 *3*	3/2+	A	Jπ: E1 γ to 5/2− and log *ft*=6.0 from 1/2+.
1395[h] *5*	9/2−[@]	D	
1433 *5*		D	
1473.9[s] *3*	(21/2−)	B	Jπ: γ's to (17/2−) and (19/2−).
1476.3[r] *2*	(21/2+)	B	Jπ: γ's to (17/2+) and (23/2+).
1479.8[l] *2*	(23/2−)	BC	Jπ: γ's to (21/2+) and (19/2−).
1485 *5*		D	
1510.3[1] *5*	(17/2−)	BC	$T_{1/2}$: 1 ns to 75 ns from γγ(t) (1994Br09). Jπ: γ's to (13/2−) and (15/2−).
1511.2[w] *5*	(21/2−)	B	Jπ: γ's to (17/2−) and (19/2−).
1514.61 *3*	3/2+	A	Jπ: E1 γ's to 1/2− and 5/2−.
1529 *5*		D	
1529.6[v] *3*	(21/2+)	B	Jπ: γ's to (17/2+) and (21/2+).
1538.79 *3*	3/2+	A	Jπ: E1 γ to 5/2−, log *ft*=5.5 from 1/2+. Probable configuration=(ν5/2[523])(π7/2[523])(π1/2[411]).
1562 *5*		D	
1569.80 *2*	3/2+	A	Jπ: E1 γ's to 1/2− and 5/2−.
1593.03 *4*	3/2+	A	Jπ: E1 γ's to 1/2− and 5/2−.
1607.5[o] *3*	(21/2+)	B	
1635 *5*		D	
1653.15 *6*	3/2+	A	Jπ: E2 γ to 7/2+, log *ft*=6.6 from 1/2+.
1671 *5*		D	
1681.1[i] *2*	(29/2+)	BC	
1685.7[j] *2*	(27/2+)	BC	
1686 *5*		D	
1717.2[u] *4*	(23/2+)	B	
1719.2[k] *2*	(25/2−)	BC	
1722.39 *5*	3/2+	A D	Jπ: E1 γ to 3/2−, γ to 7/2+, log *ft*=6.1 from 1/2+.
1759 *5*		D	
1776.0[t] *3*	(23/2−)	B	
1781.4[q] *5*	(23/2−)	B	
1784 *5*		D	
1801.56 *4*	3/2+	A D	Probable configuration=(ν5/2[523])(π7/2[523])(π1/2[411]), $K^{\pi}=1/2^+$. Jπ: E1 γ's to 1/2− and 5/2−.
1817 *5*		D	
1826.49 *3*	3/2+	A	Jπ: E1 γ's to 1/2− and 5/2−.
1845.2[y] *5*	(19/2−)	BC	$T_{1/2}$: 1 ns to 75 ns from γγ(t) (1994Br09). Jπ: Based on decay modes, Routhian calculations and calculated transition rates (B(M1)/B(E2)) using a tilted-axis cranking model, the best predicted configuration (1994Br09) is ν5/2[642] coupled to the 7− proton state formed by (π7/2[523])+(π7/2[404]) in ^{164}Er (1994Br09). No signature splitting is observed.
1853.54 *4*	3/2+	A D	Jπ: E1 γ to 5/2−, log *ft*=6.1 from 1/2+.
1872.79 *6*	(3/2)+	A D	Jπ: M1(+E2) γ to (1/2)+, (E1) γ to 5/2−.
1900 *5*		D	
1917.48 *7*	(3/2)+	A D	Jπ: E2 γ to 7/2+, log *ft*=6.4 from 1/2+.
1931.8[v] *2*	(25/2+)	B	
1934.9[s] *4*	(25/2−)	B	
1938 *5*		D	
1953.0[r] *3*	(25/2+)	B	
1957.9[l] *2*	(27/2−)	B	
1959? *5*		D	
1961.5[x] *5*	(21/2−)	BC	
1971 *5*		D	

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Adopted Levels, Gammas (continued)

^{163}Er Levels (continued)

E(level)†	Jπ‡	XREF	Comments
1982.4[5] 5	(19/2+)	B	$T_{1/2}$: 1 ns to 75 ns from γγ(t) (1994Br09). Jπ: Based on decay modes, Routhian calculations and calculated transition rates (B(M1)/B(E2)) using a tilted-axis cranking model, the best predicted configuration (1994Br09) is ν5/2[523] coupled to the 7− proton state (π7/2[523])+(π7/2[404]) in ^{164}Er. But, the configuration (ν11/2[505])(ν5/2[523])(ν3/2[521]), giving $K^{\pi}=19/2^{-}$, is not ruled out (1994Br09).
1984 5		D	
2019 5		D	
2031 5		D	
2040.68 8	3/2+	A	Jπ: E1 γ to 5/2−, log *ft*=6.1 from 1/2+.
2044.1[o] 3	(25/2+)	B	
2052.50 6	3/2−	A D	Jπ: E1 γ to 5/2+, log *ft*=5.9 from 1/2+.
2066.9[w] 5	(25/2−)	B	
2077 5		D	
2096 5		D	
2104.3[y] 5	(23/2−)	BC	
2113 5		D	
2120.3[3] 6	(19/2+)	B	
2122.21 11	1/2(−),3/2	A	Jπ: γ to 5/2−, log *ft*=6.6 from 1/2+.
2135? 5		D	
2144.2[4] 5	(21/2+)	B	$T_{1/2}$: 1 ns to 75 ns from γγ(t) (1994Br09).
2148 5		D	
2165 5		D	
2167.6[u] 3	(27/2+)	B	
2183 5		D	
2200 5		D	
2227.9[k] 2	(29/2−)	B	
2243.21 19	3/2−	A	Jπ: E1 γ to 1/2+,3/2+, γ to 7/2−, log *ft*=6.1 from 1/2+.
2258.3[i] 3	(33/2+)	B	
2271.0[x] 5	(25/2−)	BC	
2274.5 10	1/2(−),3/2	A	Jπ: γ to 5/2−, log *ft*=7.1 (log $f^{1u}t$<8.4) from 1/2+.
2291.4[j] 3	(31/2+)	B	
2307.8[t] 3	(27/2−)	B	
2314.0[2] 5	(21/2+)	B	
2331.6[5] 5	(23/2+)	B	
2368.1[q] 5	(27/2−)	B	
2415.4[v] 2	(29/2+)	B	
2418.0[p] 4	(27/2−)	B	
2431.7[s] 3	(29/2−)	B	
2448.2[r] 2	(29/2+)	B	
2448.9[l] 3	(31/2−)	B	
2460.9[y] 5	(27/2−)	BC	
2481.5 5	(23/2)	B	$T_{1/2}$: <≈1.4 ns (1997Ha23).
2523.7[3] 5	(23/2+)	B	
2540.9[o] 3	(29/2+)	B	
2542.1[4] 5	(25/2+)	B	
2629.3[n] 14	(29/2+)	B	
2672.6[x] 5	(29/2−)	B	
2682.7[w] 6	(29/2−)	B	
2698.7[u] 3	(31/2+)	B	
2741.8[k] 3	(33/2−)	B	
2748.6[2] 5	(25/2+)	B	

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Adopted Levels, Gammas (continued)

^{163}Er Levels (continued)

E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF
2772.7[5] 5	(27/2+)	B	4156.9[s] 4	(41/2−)	B	6034.7[i] 4	(53/2+)	B
2783.7[t] 3	(31/2−)	B	4159.3[l] 3	(43/2−)	B	6077.0[2] 5	(49/2+)	B
2890.5[p] 3	(31/2−)	B	4175.9[4] 5	(37/2+)	B	6108.5[j] 4	(51/2+)	B
2905.2[y] 4	(31/2−)	B	4292.5[2] 5	(37/2+)	B	6144.7[p] 5	(51/2−)	B
2908.7[i] 3	(37/2+)	B	4336.0[o] 5	(41/2+)	B	6146.4[u] 4	(51/2+)	B
2912.5[m] 2	(31/2+)	B	4346.5[x] 5	(41/2−)	B	6158.2[r] 4	(53/2+)	B
2928.3[r] 3	(33/2+)	B	4395.1[i] 4	(45/2+)	B	6174.1[y] 5	(51/2−)	B
2930.8[s] 3	(33/2−)	B	4438.6[n] 8	(41/2+)	B	6188.9[m] 5	(51/2+)	B
2965.0[l] 3	(35/2−)	B	4494.4[j] 4	(43/2+)	B	6287.8[4] 6	(49/2+)	B
2967.2[v] 3	(33/2+)	B	4496.0[5] 5	(39/2+)	B	6336.6[v] 5	(53/2+)	B
2969.0[j] 3	(35/2+)	B	4505.3[k] 4	(45/2−)	B	6426.6[3] 5	(51/2+)	B
2986.9[3] 5	(27/2+)	B	4529.5[t] 4	(43/2−)	B	6455.9[l] 5	(55/2−)	B
3009.2[q] 6	(31/2−)	B	4564.3[3] 5	(39/2+)	B	6463.2[s] 6	(53/2−)	B
3022.1[4] 5	(29/2+)	B	4588.5[r] 3	(45/2+)	B	6520.8[o] 5	(53/2+)	B
3074.0[o] 4	(33/2+)	B	4643.1[u] 4	(43/2+)	B	6562.4[n] 5	(53/2+)	B
3157.6[x] 5	(33/2−)	B	4683.5[y] 5	(43/2−)	B	6572.6[x] 6	(53/2−)	B
3214.4[n] 10	(33/2+)	B	4686.1[p] 4	(43/2−)	B	6682.4[5] 6	(51/2+)	B
3236.2[2] 5	(29/2+)	B	4700.1[m] 4	(43/2+)	B	6792.0[2] 6	(53/2+)	B
3274.5[k] 3	(37/2−)	B	4821.4[4] 5	(41/2+)	B	6807.3[t] 5	(55/2−)	B
3288.7[5] 5	(31/2+)	B	4825.1[v] 4	(45/2+)	B	6848.0[k] 6	(57/2−)	B
3299.1[u] 3	(35/2+)	B	4850.6[2] 5	(41/2+)	B	6914.3[i] 5	(57/2+)	B
3313.5[t] 3	(35/2−)	B	4856.4[l] 4	(47/2−)	B	6935.7[p] 5	(55/2−)	B
3339.1[w] 7	(33/2−)	B	4864.0[s] 5	(45/2−)	B	6947.0[j] 6	(55/2+)	B
3428.5[y] 5	(35/2−)	B	5017.1[o] 5	(45/2+)	B	6977.5[u] 5	(55/2+)	B
3430.2[r] 3	(37/2+)	B	5037.9[x] 5	(45/2−)	B	6988.6[y] 6	(55/2−)	B
3434.6[p] 3	(35/2−)	B	5089.0[n] 4	(45/2+)	B	7020.8[m] 6	(55/2+)	B
3469.4[m] 4	(35/2+)	B	5123.9[3] 5	(43/2+)	B	7088.2[r] 5	(57/2+)	B
3494.5[3] 5	(31/2+)	B	5182.8[5] 5	(43/2+)	B	7090.4[4] 8	(53/2+)	B
3511.9[s] 4	(37/2−)	B	5205.2[i] 4	(49/2+)	B	7173.5[3] 6	(55/2+)	B
3530.4[v] 3	(37/2+)	B	5218.9[k] 5	(49/2−)	B	7176.0[v] 5	(57/2+)	B
3530.6[l] 3	(39/2−)	B	5228.3[t] 4	(47/2−)	B	7322.9[n] 5	(57/2+)	B
3570.7[4] 5	(33/2+)	B	5305.0[j] 4	(47/2+)	B	7348.8[o] 6	(57/2+)	B
3624.2[i] 3	(41/2+)	B	5312.6[r] 4	(49/2+)	B	7351.8[s] 7	(57/2−)	B
3680.5[o] 4	(37/2+)	B	5372.2[u] 4	(47/2+)	B	7356.5[l] 5	(59/2−)	B
3707.8[j] 4	(39/2+)	B	5387.2[p] 4	(47/2−)	B	7413.5[x] 8	(57/2−)	B
3717.8[x] 5	(37/2−)	B	5403.5[y] 5	(47/2−)	B	7518.0[5] 8	(55/2+)	B
3758.3[2] 5	(33/2+)	B	5407.3[m] 4	(47/2+)	B	7573.9[2] 6	(57/2+)	B
3809.6[n] 9	(37/2+)	B	5427.7[2] 5	(45/2+)	B	7681.2[t] 5	(59/2−)	B
3858.2[k] 4	(41/2−)	B	5537.2[4] 5	(45/2+)	B	7733.7[p] 5	(59/2−)	B
3867.1[5] 5	(35/2+)	B	5553.3[v] 4	(49/2+)	B	7763.4[k] 6	(61/2−)	B
3893.0[t] 4	(39/2−)	B	5622.3[l] 4	(51/2−)	B	7831.9[y] 7	(59/2−)	B
3952.0[u] 3	(39/2+)	B	5633.4[s] 5	(49/2−)	B	7845.5[j] 9	(59/2+)	B
3968.7[r] 3	(41/2+)	B	5738.0[o] 5	(49/2+)	B	7856.7[i] 6	(61/2+)	B
4023.7[y] 5	(39/2−)	B	5744.9[3] 5	(47/2+)	B	7954.6[4] 9	(57/2+)	B
4024.8[3] 5	(35/2+)	B	5783.6[x] 5	(49/2−)	B	7988.3[3] 6	(59/2+)	B
4036.9[p] 4	(39/2−)	B	5802.7[n] 5	(49/2+)	B	8067.7[v] 6	(61/2+)	B
4067.6[m] 4	(39/2+)	B	5905.6[5] 6	(47/2+)	B	8080.2[r] 6	(61/2+)	B
4070.1[w] 8	(37/2−)	B	5988.2[t] 5	(51/2−)	B	8127.9[n] 5	(61/2+)	B
4149.9[v] 4	(41/2+)	B	5999.8[k] 5	(53/2−)	B	8195.9[o] 7	(61/2+)	B

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{163}Er Levels (continued)

E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF
8277.9[s] 8	(61/2⁻)	B	9806.5[3] 8	(67/2⁺)	B	12049.6[k] 9	(77/2⁻)	B
8306.3[x] 9	(61/2⁻)	B	9816.1[k] 7	(69/2⁻)	B	12699.4[l] 8	(79/2⁻)	B
8322.9[l] 5	(63/2⁻)	B	9845.9[i] 10	(69/2⁺)	B	12758.7[z] 12	(81/2⁻)	B
8420.1[2] 6	(61/2⁺)	B	9909.4[n] 6	(69/2⁺)	B	12881.5[i] 19	(81/2⁺)	B
8551.7[p] 5	(63/2⁻)	B	10076.3[o] 9	(69/2⁺)	B	13864.7[z] 14	(85/2⁻)	B
8636.8[t] 6	(63/2⁻)	B	10183.2[s] 11	(69/2⁻)	B	x[&6]	(25/2)[&]	B
8697.8[y] 9	(63/2⁻)	B	10229.2[r] 9	(69/2⁺)	B	612.0+x[6] 8	(29/2)	B
8745.1[k] 7	(65/2⁻)	B	10299.9[2] 10	(69/2⁺)	B	1076.5+x[6] 9	(33/2)	B
8794.5[j] 11	(63/2⁺)	B	10380.0[p] 6	(71/2⁻)	B	1624.0+x[6] 9	(37/2)	B
8847.7[i] 6	(65/2⁺)	B	10440.1[l] 6	(71/2⁻)	B	1927.9+x[7] 12	(39/2)	B
8866.8[3] 7	(63/2⁺)	B	10569.8[y] 12	(71/2⁻)	B	2236.0+x[6] 12	(41/2)	B
8986.9[n] 6	(65/2⁺)	B	10732.0[z] 8	(73/2⁻)	B	2565.4+x[7] 12	(43/2)	B
9002.2[v] 6	(65/2⁺)	B	10808.7[3] 12	(71/2⁺)	B	2915.9+x[6] 12	(45/2)	B
9106.0[o] 8	(65/2⁺)	B	10824.9[i] 13	(73/2⁺)	B	3283.8+x[7] 12	(47/2)	B
9128.2[r] 8	(65/2⁺)	B	10903.6[k] 8	(73/2⁻)	B	3671.4+x[6] 12	(49/2)	B
9212.9[s] 9	(65/2⁻)	B	10909.0[n] 7	(73/2⁺)	B	4075.6+x[7] 12	(51/2)	B
9330.3[2] 8	(65/2⁺)	B	11325.0[2] 12	(73/2⁺)	B	4495.4+x[6] 12	(53/2)	B
9352.3[l] 6	(67/2⁻)	B	11377.5[p] 8	(75/2⁻)	B	4930.7+x[7] 13	(55/2)	B
9440.6[p] 5	(67/2⁻)	B	11548.4[l] 6	(75/2⁻)	B	5393.7+x[6] 14	(57/2)	B
9607.8[y] 10	(67/2⁻)	B	11713.7[z] 11	(77/2⁻)	B	5866.5+x[7] 14	(59/2)	B
9630.0[t] 7	(67/2⁻)	B	11830.9[i] 17	(77/2⁺)	B	6357.7+x[6] 15	(61/2)	B
9779.6[z] 7	(69/2⁻)	B	11870.0[3] 13	(75/2⁺)	B			

† Low spin levels (J<9/2) are from ^{163}Tm ε decay or from (d,t), (d,p) reactions if not seen in ^{163}Tm ε decay. High-spin (J>7/2) levels are from (^{18}O,5nγ). In ^{163}Tm ε decay, the level energies and uncertainties were obtained by doubling the quoted uncertainties (by 1982Vy07) of γ-ray energies (see details in ^{163}Tm ε decay data set) in the least-squares fitting procedure.

‡ For levels of J>9/2, assignments are from 1997Ha23 and are based on selected γγ(θ)(DCO) data in (^{18}O,5nγ) and γ(θ) data in (α,2nγ). The assignments made by 1997Ha23 are also based on interband crossings, linkages and band associations. Most assignments given by 1997Ha23 are claimed as firm by the authors, but these are given in parentheses here because, in evaluators′ opinion, strong arguments (as in policies of Nuclear Data Sheets) for firm assignments still seem lacking.

<10 ns from γγ(t) in (α,2nγ).

@ J^π value assigned from comparison of relative experimental and theoretical DWBA cross sections for levels within a rotational band in (d,p) and/or (d,t). See details in (d,p) and (d,t) data sets.

& The γ rays from band 1 and band 2 are observed in coin with those of band A and band B, but no linking transitions are reported (1997Ha23). 1997Ha23 quote energy x=2074.2 and J=(25/2) based on population intensity and γ-ray energies. But in the absence of linking transitions the level energy cannot be defined precisely, it is probably near 2 MeV.

[a] Band(a): ν1/2[521] band. A=13.4, B=−13 eV, a=0.457.

[b] Band(b): ν3/2[402] band (?). A=12.8, if B=0.

[c] Band(C): ν1/2[400] band.

[d] Band(d): ν5/2[512] band (?). A=13.1, B=−43 eV.

[e] Band(e): ν3/2[651] band. A=9.1, if B=0.

[f] Band(f): K-2 γ vibration. Based on ν5/2[523]. A=11.83, a=−0.052.

[g] Band(g): ν1/2[530] band. A=8.9, a=0.53.

[h] Band(h): ν1/2[510] band (?). A=12, B=60 eV, a=−0.37.

[i] Band(I): Yrast band A: ν5/2[642], α=+1/2. Dominant configuration at low spins, but other $i_{13/2}$-related orbitals are probably present due to the expected strong Coriolis coupling among them. A band crossing at a rotational frequency of ≈400 suggests a change to ABC configuration (alignment of a pair of $i_{13/2}$ neutrons) and a second band crossing suggesting a change to ABCef (alignment of a pair of $h_{11/2}$ protons).

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Adopted Levels, Gammas (continued)

^{163}Er Levels (continued)

[j] Band(A): Band B: $\nu 5/2[642]$, $\alpha=-1/2$. A band crossing at a rotational frequency of ≈400 keV suggests a change to BAD configuration (alignment of a pair of $i_{13/2}$ neutrons). See the comment on the other signature partner for this band.

[k] Band(D): Band E: $\nu 5/2[523]$, $\alpha=+1/2$. No signature splitting is observed. A band crossing at a rotational frequency of ≈250 suggests a change to EAB configuration (alignment of a pair of $i_{13/2}$ neutrons) and a second band crossing suggests a change to EABef.

[l] Band(E): Band F: $\nu 5/2[523]$, $\alpha=-1/2$. No signature splitting is observed. A band crossing at a rotational frequency of ≈250 suggests a change to FAB configuration (alignment of a pair of $i_{13/2}$ neutrons) and a second band crossing suggests a change to FABef.

[m] Band(J): band (BEH or BFG), $\alpha=-1/2$.

[n] Band(K): band (BEG or BFH), $\alpha=+1/2$.

[o] Band(L): band (AFG), $\alpha=+1/2$.

[p] Band(M): band (EAC), $\alpha=-1/2$.

[q] Band(N): Band Y: $\nu 11/2[505]$, $\alpha=-1/2$. No signature splitting is observed. A band crossing at a rotational frequency of ≈300 is probably due to alignment of a pair of $i_{13/2}$ neutrons.

[r] Band(B): band C: $\nu 3/2[651]$, $\alpha=+1/2$.

[s] Band(F): Band G: $\nu 3/2[521]$, $\alpha=+1/2$. First band crossing suggests change to GAB (alignment of a pair of $i_{13/2}$ neutrons) and a second crossing to GABef (alignment of a pair of $h_{11/2}$ protons.).

[t] Band(G): Band H: $\nu 3/2[521]$, $\alpha=-1/2$. A band crossing at about 27/2 suggests a change to HAB.

[u] Band(H): band (AEG), $\alpha=-1/2$.

[v] Band(O): band (AEH), $\alpha=+1/2$.

[w] Band(P): Band X: $\nu 11/2[505]$, $\alpha=+1/2$. No signature splitting is observed. A band crossing at a rotational frequency of ≈300 is probably due to alignment of a pair of $i_{13/2}$ neutrons.

[x] Band(Q): Band faA, K=19/2, $\alpha=+1/2$. A band crossing at about 29/2 suggests a change to faABC. Based on decay modes, Routhian calculations and calculated transition rates (B(M1)/B(E2)) using a tilted-axis cranking model, the best predicted configuration (1994Br09) is $\nu 5/2[642]$ coupled to the 7^- state formed by $(\pi 7/2[523])+(\pi 7/2[404])$ in ^{164}Er. No signature splitting is observed.

[y] Band(R): Band eaA, K=19/2, $\alpha=-1/2$. A band crossing at about 25/2 suggests a change to eaABC. See also comment for band faA.

[z] Band(S): band EABef.

[1] Band(T): Band X,Y $+\gamma$ vibration. Based on a comparison of experimental and calculated (K-allowed and K-hindered) reduced E2 transition probabilities and $K^\pi=19/2^-$ for the 1845 bandhead, 1994Br09 deduce $K^\pi=15/2^-$ for the 1297 bandhead. 1994Br09 state that coupling between the available orbitals does not produce $J^\pi=15/2^-$. However, a γ vibration built on $\nu 11/2[505]$ would have $15/2^-$ in its ground state.

[2] Band(U): Band faE, K=19/2, $\alpha=+1/2$. A band crossing at about 33/2 suggests a change to faEAB.

[3] Band(V): Band eaE, K=19/2, $\alpha=-1/2$. A band crossing at about 33/2 suggests a change to eaEAB.

[4] Band(W): Band YAG, K=19/2, $\alpha=+1/2$. Based on decay modes, Routhian calculations and calculated transition rates (B(M1)/B(E2)) using a tilted-axis cranking model, the best predicted configuration (1994Br09) is $\nu 5/2[523]$, coupled to the 7^- state formed by $(\pi 7/2[523])+(\pi 7/2[404])$ in ^{164}Er. But the configuration $(\nu 11/2[505])+(\nu 5/2[523])+(\nu 3/2[521])$, $K^\pi=19/2^-$ is not ruled out. No signature splitting is observed.

[5] Band(X): Band XAG, K=19/2, $\alpha=-1/2$. See comment for band YAG.

[6] Band(Y): Band 1.

[7] Band(Z): Band 2.

Adopted Levels, Gammas (continued)

γ(^{163}Er)

See ε decay and (α,2nγ) for many unplaced gamma rays.

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[d]	$I_{(\gamma+ce)}$[†]	Comments
69.23	5/2+	69.229 *3*	100	0.0	5/2−	E1		0.853		B(E1)(W.u.)=4.4×10^{-5} *3* From RUL, δ(M2/E1)≤0.0050.
83.96	7/2−	14.72[f] *2*	13 *3*	69.23	5/2+	E1		11.13	160 *40*	B(E1)(W.u.)=0.0013 *4* I_γ: from I(γ+ce) and α.
		83.968 *4*	100.0 *22*	0.0	5/2−	M1+E2	1.61 *9*	5.47		B(M1)(W.u.)=0.00139 *19*; B(E2)(W.u.)=2.5×10^2 *3*
91.55	7/2+	22.358 *10*	8.8 *14*	69.23	5/2+	M1+E2	0.19 *2*	134 *20*	1190 *43*	I_γ: from I(γ+ce) and α.
		91.550 *8*	100 *6*	0.0	5/2−	E1		0.411		
104.32	3/2−	20.34[f] *2*	0.0016 *2*	83.96	7/2−	E2		4.33×10^3	6.9 *7*	B(E2)(W.u.)=26 *4* I_γ: from I(γ+ce) and α.
		35.05[f] *3*	3.1 *8*	69.23	5/2+	E1		1.027		B(E1)(W.u.)=8.6×10^{-5} *24*
		104.320 *3*	100.0 *19*	0.0	5/2−	M1(+E2)	<0.05	2.52		B(M1)(W.u.)>0.0092; B(E2)(W.u.)<1.3
120.35	9/2+	28.835 *12*		91.55	7/2+	M1+E2	0.090 *11*	23.6 *16*		ce(L)/(γ+ce)=0.770 *16*; ce(M)/(γ+ce)=0.181 *13* E_γ: from ^{163}Tm ε decay.
		51.1[f]		69.23	5/2+					E_γ: from (^{18}O,5nγ) only.
164.42	5/2−	60.105 *3*	100.0 *18*	104.32	3/2−	M1+E2	0.222 *8*	12.77 *19*		
		72.875 *8*	10.2 *4*	91.55	7/2+	E1(+M2)	<0.08	1.0 *3*		
		80.460 *7*	36.1 *11*	83.96	7/2−	M1+E2	0.048 *10*	5.32		
		164.419 *8*	62.6 *22*	0.0	5/2−	M1+E2	0.135 *21*	0.690		
189.7	9/2−	105.8 *3*	21 *11*	83.96	7/2−	M1		2.42		E_γ: from (^{18}O,5nγ). Eγ=106.05 *4* in ^{163}Tm ε for a weak γ. Mult.: ΔJ=1 γ from γ(θ) in (α,2nγ). M1 or E1+M2 from α(K)exp in ^{163}Tm ε. Comparison to RUL excludes E1+M2. I_γ: from (^{18}O,5nγ).
		189.73 *21*	100 *50*	0.0	5/2−					E_γ,I_γ: from (^{18}O,5nγ). In ^{163}Tm ε decay 190.0γ is assigned to deexcitation of the 439.5 level only, but part of the intensity (≈10% of the total intensity in ε decay) probably belongs to the decay of the 190 level.
199.3	11/2+	79.0 *4*	100	120.35	9/2+	M1+E2[a]		6.5 *9*		I_γ: from (α,2nγ).
		107.8 *3*	37	91.55	7/2+	(E2)[&]		2.22		I_γ: from (α,2nγ).
247.0	(13/2+)	126.79 *20*	100	120.35	9/2+	(E2)[&]		1.224		
249.53	7/2−	85.118 *4*	100 *3*	164.42	5/2−	M1+E2	0.19 *2*	4.56		

Adopted Levels, Gammas (continued)

γ(^{163}Er) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[d]	$I_{(\gamma+ce)}$[†]	Comments
249.53	7/2⁻	129.21 *3*	23 *4*	120.35	9/2⁺	E1		0.1646		
		145.213 *11*	32.2 *15*	104.32	3/2⁻	E2		0.755		
		165.60 *6*	18 *4*	83.96	7/2⁻	M1+E2	0.26 *4*	0.667 *11*		
		249.498 *6*	22.6 *15*	0.0	5/2⁻	M1+E2	0.53 *7*	0.198 *6*		
319.7	(11/2⁻)	130.07 *24*	40 *6*	189.7	9/2⁻	[M1,E2]		1.23 *12*		
		199.5 *4*	33 *3*	120.35	9/2⁺					
		235.68 *21*	100 *14*	83.96	7/2⁻	[E2]		0.1470		
345.62	1/2⁻	241.305 *5*	100.0 *26*	104.32	3/2⁻	M1		0.240		
		345.608 *9*	10.09 *22*	0.0	5/2⁻	E2		0.0453		
359.8	(9/2⁻)	109.6 *5*	63 *29*	249.53	7/2⁻					
		196.5 *5*	100 *37*	164.42	5/2⁻					
404.00	3/2⁻	58.35 *2*	0.3 *1*	345.62	1/2⁻	M1+E2	0.73 *17*	18 *8*	5.4 *9*	α: near threshold for α(K).
		239.585 *5*	97 *4*	164.42	5/2⁻	M1+E2	0.21 *3*	0.241		
		299.667 *8*	100.0 *20*	104.32	3/2⁻	M1+E2	0.21 *6*	0.1310 *25*		
		320.057 *18*	6.8 *3*	83.96	7/2⁻	E2		0.0568		
		403.989 *10*	23.1 *6*	0.0	5/2⁻	E2		0.0291		
411.9	(15/2⁺)	165.01 *20*	41 *2*	247.0	(13/2⁺)	M1+E2[a]		0.59 *11*		
		212.69 *20*	100 *5*	199.3	11/2⁺	(E2)[&]		0.205		
439.54	5/2⁻	35.56 *3*		404.00	3/2⁻	M1+E2	0.090 *11*	11.5 *6*	3.7 *7*	
		93.88[f] *3*	0.8	345.62	1/2⁻	[E2]		3.74		
		190.006 *6*	53.3 *11*	249.53	7/2⁻	M1+E2	0.18 *3*	0.458		
		275.125 *8*	100 *3*	164.42	5/2⁻	M1+E2	0.31 *7*	0.161 *4*		
		335.219 *12*	22.1 *6*	104.32	3/2⁻	M1+E2	0.66 *14*	0.084 *5*		
		355.624 *13*	17.8 *5*	83.96	7/2⁻	M1		0.0848		
		439.575 *17*	13.8 *12*	0.0	5/2⁻	M1		0.0487		
445.5	(11/2⁻)	125.8[@]	37	319.7	(11/2⁻)	[M1,E2]		1.37 *11*		
		198.5[@f]	61	247.0	(13/2⁺)	[E1]		0.0530		B(E1)(W.u.)=5.6×10^{-9} *14*
		246.2[@]	96	199.3	11/2⁺	[E1]		0.0304		B(E1)(W.u.)=4.6×10^{-9} *11*
		255.8[@]	100	189.7	9/2⁻	(M1)[a]		0.205		B(M1)(W.u.)=4.2×10^{-7} *10*
		325.1[@]	≈172	120.35	9/2⁺					
462.48	3/2⁺	297.87[#] *3*	34.9 *12*	164.42	5/2⁻	[E1]		0.0189		Energy-level difference=298.07.
		358.174 *10*	53.2 *12*	104.32	3/2⁻	E1		0.01204		
		371.07 *9*	3.3 *4*	91.55	7/2⁺	(E2)		0.0369		
		393.261 *11*	100.0 *21*	69.23	5/2⁺	M1+E2	0.44 *7*	0.0596 *17*		
464.0	(17/2⁺)	217.02 *20*	100	247.0	(13/2⁺)	(E2)[&]		0.192		
466.1	13/2⁻	146.43 *22*	6.9 *4*	319.7	(11/2⁻)	[M1,E2]		0.85 *12*		
		266.89 *21*	14.2 *7*	199.3	11/2⁺	[E1]		0.0248		
		276.35 *20*	100 *4*	189.7	9/2⁻	E2[&]		0.0889		
496.2	11/2⁻	136.2 *3*	88 *19*	359.8	(9/2⁻)					

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

Adopted Levels, Gammas (continued)

γ(^{163}Er) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[d]	$I_{(\gamma+ce)}$[†]	Comments
496.2	11/2$^-$	246.0 *4*	100 *25*	249.53	7/2$^-$					
526.33	5/2$^+$	361.97 *4*	14.9 *14*	164.42	5/2$^-$	E1		0.01174		
		421.92 *3*	31.9 *21*	104.32	3/2$^-$	(E1)		0.00820		
		434.72 *3*	100 *3*	91.55	7/2$^+$	M1+E2	0.58 *19*	0.043 *4*		
531.07	3/2$^+$	461.845 *12*	100	69.23	5/2$^+$	M1+E2	0.90 *16*	0.0327 *22*		
540.56	1/2$^+$	78.041 *24*	1.9 *3*	462.48	3/2$^+$	M1(+E2)	≤0.6	6.1 *3*		
		436.24 *6*	3.90 *23*	104.32	3/2$^-$					
		471.330 *17*	100.0 *23*	69.23	5/2$^+$	E2		0.0192		
574.08	3/2$^+$	324.49 *15*	4.4 *5*	249.53	7/2$^-$					
		409.77 *5*	13.0 *10*	164.42	5/2$^-$					
		469.65 *4*	37.9 *16*	104.32	3/2$^-$	E1		0.00642		
		504.878 *14*	100 *5*	69.23	5/2$^+$	M1+E2	0.8 *5*	0.027 *6*		
616.5	(13/2$^-$)	170.86 *20*	100	445.5	(11/2$^-$)	(M1+E2)[a]		0.53 *10*		
619.36	3/2$^+$	78.93[f] *2*		540.56	1/2$^+$	(M1,E2)		6.5 *9*	≈3.9	
		454.954 *17*	20.7 *7*	164.42	5/2$^-$					
		515.012 *16*	54 *3*	104.32	3/2$^-$	E1+M2	0.186 *18*	0.0084 *7*		
		528.18 *14*	9.9 *14*	91.55	7/2$^+$	[E2]		0.01430		
		550.154 *16*	100.0 *26*	69.23	5/2$^+$	M1(+E2)	≤0.27	0.0268 *7*		
		619.44 *10*	4.2 *6*	0.0	5/2$^-$	E1+M2	0.17 *8*	0.0051 *17*		
639.6	(15/2$^-$)	173.5 *4*	11 *2*	466.1	13/2$^-$					
		319.90 *21*	100 *9*	319.7	(11/2$^-$)	(E2)[&]		0.0569		
		392.6 *5*	15 *4*	247.0	(13/2$^+$)					
655.3	(13/2$^-$)	158.8 *3*	24 *2*	496.2	11/2$^-$					
		295.84 *22*	100 *11*	359.8	(9/2$^-$)					
664.86	5/2$^+$	415.15 *6*	31 *3*	249.53	7/2$^-$	E1		0.00851		
		500.51 *2*	50 *8*	164.42	5/2$^-$					
		560.51 *5*	44 *11*	104.32	3/2$^-$	E1+M2	0.27 *9*	0.009 *4*		
		573.23 *4*	100 *4*	91.55	7/2$^+$	M1(+E2)	≤0.6	0.0229 *18*		
		595.35 *5*	85 *6*	69.23	5/2$^+$	E2		0.01064		
683.75	(1/2)$^-$	338.28 *8*	8.4 *6*	345.62	1/2$^-$	M1		0.0968		
		520.1 *2*	3.3 *7*	164.42	5/2$^-$	E2		0.01487		δ(E2/M1)>1.7 but ΔJ^π requires E2.
		579.510 *13*	100.0 *22*	104.32	3/2$^-$	M1(+E2)	≤0.5	0.0227 *13*		
		683.87 *3*	31.2 *20*	0.0	5/2$^-$	(E2)		0.00767		
717.39	3/2$^-$	552.948 *23*	100 *4*	164.42	5/2$^-$	M1		0.0270		
		613.054 *18*	97.6 *24*	104.32	3/2$^-$	M1+E2	0.39 *16*	0.0193 *12*		
		633.77 *9*	21.1 *19*	83.96	7/2$^-$					
		717.42 *3*	24.9 *22*	0.0	5/2$^-$	M1+E2	1.5 *4*	0.0091 *11*		
735.0	(19/2$^+$)	271.02 *20*	20.1 *7*	464.0	(17/2$^+$)	(M1+E2)[a]		0.13 *4*		
		323.10 *20*	100 *3*	411.9	(15/2$^+$)	(E2)[&]		0.0553		
735.38	1/2$^+$,3/2$^+$	161.31 *3*	7.8 *6*	574.08	3/2$^+$	[M1,E2]		0.63 *11*		
		331.355 *19*	11.3 *4*	404.00	3/2$^-$	E1		0.01452		

Adopted Levels, Gammas (continued)

γ(^{163}Er) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[d]
735.38	1/2+,3/2+	389.59 *3*	14.9 *10*	345.62	1/2−	E1		0.00987
		666.178 *19*	100.0 *23*	69.23	5/2+	(E2)		0.00815
777.1	(21/2+)	313.10 *20*	100	464.0	(17/2+)	(E2)[&]		0.0607
779.63	5/2−	529.75 *7*	100 *11*	249.53	7/2−	M1+E2	0.8 *4*	0.024 *4*
		615.18 *3*	100 *7*	164.42	5/2−	M1+E2	0.56 *21*	0.0180 *15*
		675.20 *11*	51 *5*	104.32	3/2−	M1+E2	0.8 *4*	0.0130 *22*
		688.12 *11*	61 *6*	91.55	7/2+	(E1)		0.00283
		695.81 *12*	39 *5*	83.96	7/2−	M1+E2	0.7 *4*	0.0126 *19*
		710.81 *11*	29 *3*	69.23	5/2+			
809.7	(15/2−)	193.17 *20*	100 *4*	616.5	(13/2−)	(M1+E2)[a]		0.36 *8*
		364.38 *22*	33 *2*	445.5	(11/2−)	[E2]		0.0389
820.6	(17/2−)	181.0 *3*	2.8 *3*	639.6	(15/2−)			
		354.52 *20*	100 *4*	466.1	13/2−			
		408.77 *21*	23.2 *11*	411.9	(15/2+)			
840.5	(15/2−)	185.3 *3*	50 *4*	655.3	(13/2−)			
		344.01 *23*	100 *8*	496.2	11/2−			
856.22	(3/2)−	606.4 *2*	19.8 *13*	249.53	7/2−	[E2]		0.01018
		691.736 *22*	100 *4*	164.42	5/2−	M1		0.01532
		752.04 *5*	62 *3*	104.32	3/2−	M1[c]		0.01244
963.29	(3/2)+	798.74 *9*	48 *3*	164.42	5/2−			
		858.72 *6*	100 *7*	104.32	3/2−	(E1)		0.00183
		894.26[e] *11*	73[e] *37*	69.23	5/2+			
985.67	5/2−	411.66 *7*	48 *4*	574.08	3/2+			
		640.4 *2*	36 *6*	345.62	1/2−			
		735.97 *10*	55 *7*	249.53	7/2−	E2(+M1)	≥2.5	0.0069 *5*
		821.3 *2*	33 *9*	164.42	5/2−			
		881.4 *3*	23 *6*	104.32	3/2−	(M1)		0.00840
		894.26[e] *11*	64[e] *64*	91.55	7/2+			
		902.18 *14*	50 *12*	83.96	7/2−	M1+E2	0.9 *7*	0.0062 *16*
		916.81 *9*	100 *10*	69.23	5/2+	E1		
1023.9	(17/2−)	214.13 *21*	100 *5*	809.7	(15/2−)	[M1,E2]		0.27 *7*
		407.3 *3*	40 *3*	616.5	(13/2−)			
1032.3	(19/2−)	211.7 *6*	14 *2*	820.6	(17/2−)			
		392.61 *21*	100 *6*	639.6	(15/2−)			
		568.4 *6*	31 *4*	464.0	(17/2+)			
1040.6	(17/2−)	199.9 *3*	22 *3*	840.5	(15/2−)			
		385.31 *22*	100 *7*	655.3	(13/2−)			
1059.75	3/2−	375.87 *5*	19.5 *17*	683.75	(1/2)−	M1+E2	1.1 *3*	0.053 *6*
		655.760 *20*	100.0 *24*	404.00	3/2−	M1(+E2)	≤0.38	0.0169 *7*
		714.04 *10*	9.6 *10*	345.62	1/2−	M1		0.0115
		991.0 *4*	7.3 *21*	69.23	5/2+	(E1)		1.39×10^{-3}

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

Adopted Levels, Gammas (continued)

γ(^{163}Er) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[d]	Comments
1077.3	(17/2$^+$)	342.1 *3*	90 *16*	735.0	(19/2$^+$)				
		613.3 *4*	79 *21*	464.0	(17/2$^+$)				
		665.5 *5*	100 *26*	411.9	(15/2$^+$)				
1163.1	(23/2$^+$)	386.06 *20*	13.5 *5*	777.1	(21/2$^+$)	[M1,E2]		0.051 *18*	
		428.25 *20*	100 *3*	735.0	(19/2$^+$)	(E2)[&]		0.0248	
1184.8	(25/2$^+$)	407.66 *20*	100	777.1	(21/2$^+$)	(E2)[&]		0.0284	
1214.3	(17/2$^+$)	749.8 *8*	100 *50*	464.0	(17/2$^+$)				
		801.9 *9*	100 *50*	411.9	(15/2$^+$)				
1242.8	(21/2$^-$)	210.7 *6*	0.75 *25*	1032.3	(19/2$^-$)				
		422.37 *20*	100 *3*	820.6	(17/2$^-$)	(Q)[&]			
		507.70 *23*	17.6 *8*	735.0	(19/2$^+$)				
1258.3	(19/2$^-$)	234.25 *22*	63 *5*	1023.9	(17/2$^-$)				
		448.71 *22*	100 *5*	809.7	(15/2$^-$)				
1270.6	(19/2$^-$)	229.6 *3*	25.8 *15*	1040.6	(17/2$^-$)				
		430.08 *24*	100 *6*	840.5	(15/2$^-$)				
1281.16	1/2$^+$,3/2$^+$	598.12[#] *3*	52 *3*	683.75	(1/2)$^-$	(E1)		0.00379	Level-energy difference=597.41.
		1176.09[#] *3*	100 *6*	104.32	3/2$^-$	E1		1.03×10^{-3}	Level-energy difference=1176.83.
1298.0	(15/2$^-$)	681.3 *4*	34 *5*	616.5	(13/2$^-$)				
		852.2 *4*	100 *15*	445.5	(11/2$^-$)				
1352.8	(19/2$^+$)	889.0 *5*	100	464.0	(17/2$^+$)				
1369.46	3/2$^+$	406.06 *15*	1.00 *22*	963.29	(3/2)$^+$	E2(+M1)	≥2.0	0.032 *4*	
		589.13[#] *11*	1.33 *22*	779.63	5/2$^-$				Level-energy difference=589.84.
		749.6 *3*	1.2 *3*	619.36	3/2$^+$				
		828.8 *3*	1.12 *18*	540.56	1/2$^+$	M1		0.00978	
		844.69[#] *13*	1.6 *4*	526.33	5/2$^+$				Level-energy difference=843.15.
		1205.019 *24*	47.2 *10*	164.42	5/2$^-$	E1			
		1265.116 *25*	100.0 *18*	104.32	3/2$^-$	E1			
		1300.41 *6*	10.0 *6*	69.23	5/2$^+$	M1+E2	1.0 *4*	0.0027 *3*	
1473.9	(21/2$^-$)	202.8 *3*	30 *3*	1270.6	(19/2$^-$)				
		433.45 *23*	100 *7*	1040.6	(17/2$^-$)				
1476.3	(21/2$^+$)	313.11 *22*	100 *8*	1163.1	(23/2$^+$)				
		398.8 *3*	32 *5*	1077.3	(17/2$^+$)				
		699.0 *5*	29 *6*	777.1	(21/2$^+$)				
		741.5 *4*	41 *6*	735.0	(19/2$^+$)				
1479.8	(23/2$^-$)	447.44 *21*	100 *7*	1032.3	(19/2$^-$)				
		702.6 *3*	72 *7*	777.1	(21/2$^+$)				
1510.3	(17/2$^-$)	212.30 *20*	21 *10*	1298.0	(15/2$^-$)				
		700.9 *4*	86 *7*	809.7	(15/2$^-$)				
		894.0 *4*	100 *7*	616.5	(13/2$^-$)				
1511.2	(21/2$^-$)	252.83 *22*	53 *4*	1258.3	(19/2$^-$)				

$^{163}_{68}Er_{95}$-13

Adopted Levels, Gammas (continued)

γ(^{163}Er) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[d]	Comments
1511.2	(21/2⁻)	487.05 *22*	100 *6*	1023.9	(17/2⁻)				
1514.61	3/2⁺	733.6[#] *2*	8.2 *7*	779.63	5/2⁻				Level-energy difference=734.98.
		940.62 *3*	63.6 *21*	574.08	3/2⁺	E2		0.00382	
		1075.13 *3*	100 *5*	439.54	5/2⁻	E1		1.20×10^{-3}	
		1168.97 *5*	54 *8*	345.62	1/2⁻	E1		1.04×10^{-3}	
		1350.15 *3*	53.5 *21*	164.42	5/2⁻	E1			
		1410.19 *3*	57.7 *21*	104.32	3/2⁻	E1			
		1514.3 *4*	7.9 *12*	0.0	5/2⁻				
1529.6	(21/2⁺)	315.19 *21*	100 *29*	1214.3	(17/2⁺)				
		753.0 *4*	57 *11*	777.1	(21/2⁺)	*b*			
		794.2 *5*	74 *11*	735.0	(19/2⁺)				
		1065.6 *11*	14 *6*	464.0	(17/2⁺)				
1538.79	3/2⁺	478.49 *14*	0.61 *19*	1059.75	3/2⁻				
		575.1 *3*	0.58 *17*	963.29	(3/2)⁺	[M1,E2]		0.018 *7*	
		759.41 *9*	2.92 *17*	779.63	5/2⁻				
		803.469 *22*	3.36 *12*	735.38	1/2⁺,3/2⁺	M1		0.01055	
		873.88 *17*	1.10 *17*	664.86	5/2⁺	(E2)		0.00446	
		997.67 *19*	1.10 *21*	540.56	1/2⁺	M1+E2	1.3 *9*	0.0044 *14*	
		1099.38 *3*	6.6 *4*	439.54	5/2⁻	E1		1.15×10^{-3}	
		1135.28 *9*	4.2 *4*	404.00	3/2⁻	E1		1.09×10^{-3}	
		1192.34 *19*	2.01 *19*	345.62	1/2⁻	(E1)		1.01×10^{-3}	
		1374.34 *3*	53.7 *14*	164.42	5/2⁻	E1			
		1434.45 *3*	100.00 *24*	104.32	3/2⁻	E1			
		1446.88 *13*	1.14 *14*	91.55	7/2⁺				
		1469.42 *3*	36.4 *7*	69.23	5/2⁺	M1+E2	0.65 *20*	0.00226 *12*	
1569.80	3/2⁺	584.86[#] *9*	4.0 *3*	985.67	5/2⁻				Level-energy difference=584.13.
		790.12 *6*	13.4 *9*	779.63	5/2⁻	E1		0.00215	
		833.96[#] *4*	22.4 *8*	735.38	1/2⁺,3/2⁺	M1+E2	1.2 *3*	0.0069 *7*	Level-energy difference=834.42.
		886.06 *3*	16.3 *8*	683.75	(1/2)⁻	E1		1.72×10^{-3}	
		905.6 *2*	9.4 *15*	664.86	5/2⁺	M1(+E2)	≤0.61	0.0074 *6*	
		950.85 *7*	8.4 *6*	619.36	3/2⁺	M1+E2	0.9 *3*	0.0055 *6*	
		995.8 *2*	8.8 *10*	574.08	3/2⁺	M1(+E2)	≤0.43	0.00601 *24*	
		1029.18 *6*	6.6 *8*	540.56	1/2⁺	E2		0.00317	
		1042.66[#] *9*	6.0 *10*	526.33	5/2⁺	M1(+E2)	≤1.2	0.0048 *8*	Level-energy difference=1043.46.
		1130.224 *23*	100 *3*	439.54	5/2⁻	E1		1.10×10^{-3}	
		1165.6 *2*	6.2 *10*	404.00	3/2⁻				
		1224.152 *24*	91.1 *24*	345.62	1/2⁻	E1			
		1405.36 *3*	33.4 *11*	164.42	5/2⁻	E1			
		1465.73[#] *3*	83.7 *25*	104.32	3/2⁻	E1			Level-energy difference=1465.47.

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

Adopted Levels, Gammas (continued)

γ(^{163}Er) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[d]	Comments
1569.80	3/2+	1500.61 *4*	16.3 *10*	69.23	5/2+	M1+E2	0.9 *4*	0.00204 *21*	
		1569.65 *10*	3.5 *5*	0.0	5/2−				
1593.03	3/2+	813.32 *10*	14.4 *23*	779.63	5/2−	E1		0.00203	
		928.06 *11*	13.1 *20*	664.86	5/2+	M1(+E2)	≤1.0	0.0065 *9*	
		1052.37 *13*	9.9 *14*	540.56	1/2+	(M1)		0.00545	Mult.: large α(K)exp suggests some E0 admixture but this is not allowed by ΔJ=1.
		1153.45 *3*	100 *3*	439.54	5/2−	E1		1.03×10^{-3}	
		1189.00[e] *13*	7.4[e] *19*	404.00	3/2−	(E1)		1.02×10^{-3}	
		1247.44 *3*	86.3 *23*	345.62	1/2−	E1			
		1489.04 *10*	7.3 *13*	104.32	3/2−				
		1593.05 *11*	3.9 *11*	0.0	5/2−				
1607.5	(21/2+)	872.5 *3*	100	735.0	(19/2+)				
1653.15	3/2+	796.2 *2*	16 *3*	856.22	(3/2)−				
		1033.95 *11*	33 *6*	619.36	3/2+				
		1213.52 *15*	34 *5*	439.54	5/2−				
		1307.26 *11*	44 *3*	345.62	1/2−				
		1561.60 *5*	52 *3*	91.55	7/2+	E2		1.49×10^{-3}	
		1583.95 *4*	100 *3*	69.23	5/2+	M1		0.00218	
1681.1	(29/2+)	496.33 *20*	100	1184.8	(25/2+)	&			
1685.7	(27/2+)	500.35 *21*	15.6 *7*	1184.8	(25/2+)				
		522.84 *20*	100 *3*	1163.1	(23/2+)	&			
1717.2	(23/2+)	364.5 *5*	45 *18*	1352.8	(19/2+)				
		940.0 *5*	100 *45*	777.1	(21/2+)				
1719.2	(25/2−)	476.45 *20*	100 *3*	1242.8	(21/2−)	&			
		556.24 *20*	30.4 *11*	1163.1	(23/2+)				
1722.39	3/2+	662.67 *11*	17.2 *20*	1059.75	3/2−				
		987.74 *10*	16.0 *13*	735.38	1/2+,3/2+	M1+E2	1.1 *4*	0.0048 *7*	Level-energy difference=987.01.
		1005.01 *9*	12.5 *18*	717.39	3/2−	E1		1.36×10^{-3}	
		1037.1 *4*	8.1 *9*	683.75	(1/2)−				
		1181.94 *16*	9.8 *14*	540.56	1/2+	(E2)		0.00240	
		1318.34 *3*	100.0 *21*	404.00	3/2−	(E1)			
		1376.79 *10*	22.1 *22*	345.62	1/2−				
		1618.20 *19*	2.3 *9*	104.32	3/2−				
		1631.4 *4*	1.9 *6*	91.55	7/2+				
1776.0	(23/2−)	301.2 *6*	6.4 *13*	1473.9	(21/2−)				
		505.31 *23*	100 *5*	1270.6	(19/2−)				
1781.4	(23/2−)	270.07 *25*	63 *7*	1511.2	(21/2−)				
		523.1 *3*	100 *10*	1258.3	(19/2−)				
1801.56	3/2+	433.2 *3*	1.3 *3*	1369.46	3/2+	M1+E2	1.1 *8*	0.036 *13*	
		837.94 *13*	0.8 *3*	963.29	(3/2)+	(M1)		0.00951	

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

Adopted Levels, Gammas (continued)

γ(^{163}Er) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[d]	Comments
1801.56	3/2+	945.27 *3*	12.3 *3*	856.22	(3/2)−	E1		1.52×10^{-3}	
		1066.49 *8*	2.80 *24*	735.38	1/2+,3/2+	M1+E2	1.0 *4*	0.0041 *6*	
		1261.20 *8*	3.4 *4*	540.56	1/2+	(M1)[c]		0.00354	
		1338.62 *14*	1.3 *3*	462.48	3/2+				
		1397.52 *3*	100.0 *21*	404.00	3/2−	E1			
		1455.94 *3*	51.6 *16*	345.62	1/2−	E1			
		1637.46 *12*	1.2 *3*	164.42	5/2−				
		1697.22 *4*	6.9 *3*	104.32	3/2−	E1			
		1732.92 *15*	2.30 *11*	69.23	5/2+	(M1)		0.00186	
1826.49	3/2+	457.07 *5*	0.74 *7*	1369.46	3/2+	M1,E2		0.032 *12*	
		863.2 *3*	5.0 *17*	963.29	(3/2)+	M1,E2		0.0067 *22*	
		1046.9 *2*	11.8 *14*	779.63	5/2−				
		1091.01 *4*	31 *3*	735.38	1/2+,3/2+	M1+E2	1.0 *4*	0.0039 *6*	
		1142.51 *5*	74.3 *26*	683.75	(1/2)−	E1		1.08×10^{-3}	
		1285.82 *5*	30.9 *14*	540.56	1/2+	M1+E2	0.7 *4*	0.0029 *4*	
		1365.6 *5*	5.8 *19*	462.48	3/2+	M1[c]		0.00295	
		1386.99 *3*	100.0 *24*	439.54	5/2−	E1			
		1422.58 *12*	9.9 *12*	404.00	3/2−				
		1480.94 *3*	57 *4*	345.62	1/2−	E1			
		1662.12 *5*	92 *4*	164.42	5/2−	E1			
		1722.37 *5*	48.0 *17*	104.32	3/2−	E1			
		1741.75[#] *9*	7.7 *5*	83.96	7/2−				Level-energy difference=1742.52.
		1757.25 *14*	5.8 *5*	69.23	5/2+				
1845.2	(19/2−)	334.96 *20*	100 *5*	1510.3	(17/2−)				
		546.98 *21*	76 *4*	1298.0	(15/2−)				
		821.41 *23*	41 *2*	1023.9	(17/2−)				
		1035.7 *3*	21 *2*	809.7	(15/2−)				
1853.54	3/2+	484.03 *4*	25.5 *26*	1369.46	3/2+	M1(+E2)	≤0.94	0.033 *5*	
		1689.15 *4*	35.8 *22*	164.42	5/2−	E1			
		1749.22 *3*	100 *4*	104.32	3/2−	E1			
		1784.29 *4*	36.7 *16*	69.23	5/2+	E2		1.28×10^{-3}	
		1853.33 *12*	2.7 *6*	0.0	5/2−				
1872.79	(3/2)+	303.06 *9*	5.5 *6*	1569.80	3/2+	(E2)		0.0670	
		908.18[#] *18*	16 *3*	963.29	(3/2)+	E2(+M1)	≥2.0	0.0045 *4*	Level-energy difference=909.50.
		1137.10 *10*	28.9 *16*	735.38	1/2+,3/2+	M1(+E2)	≤0.57	0.00428 *25*	
		1189.00[e] *13*	6.0[e] *16*	683.75	(1/2)−	(E1)		1.02×10^{-3}	
		1332.13 *7*	10.1 *17*	540.56	1/2+	M1(+E2)	≤0.91	0.0029 *3*	
		1345.82 *19*	5.2 *10*	526.33	5/2+	M1,E2		0.0025 *6*	
		1709.03[#] *6*	10.5 *6*	164.42	5/2−	(E1)			Level-energy difference=1708.36.
		1767.65[#] *10*	14.2 *7*	104.32	3/2−				Level-energy difference=1768.46.

$^{163}_{68}Er_{95}$-16

Adopted Levels, Gammas (continued)

γ(^{163}Er) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[d]	Comments
1872.79	(3/2)$^+$	1803.55 *5*	100 *3*	69.23	5/2$^+$	E2		1.26×10^{-3}	
1917.48	(3/2)$^+$	380.57[#] *17*	18 *4*	1538.79	3/2$^+$	(E2)		0.0344	Level-energy difference=378.69.
		547.96 *14*	44 *7*	1369.46	3/2$^+$	[M1,E2]		0.020 *8*	
		1251.90[#] *10*	100 *5*	664.86	5/2$^+$	E2		0.00215	Level-energy difference=1252.62.
		1753.45 *8*	73 *7*	164.42	5/2$^-$				
		1813.60[#] *7*	23.1 *19*	104.32	3/2$^-$				Level-energy difference=1813.15.
		1825.23[#] *7*	97 *4*	91.55	7/2$^+$	E2		1.25×10^{-3}	Level-energy difference=1825.92.
		1848.22 *9*	19 *6*	69.23	5/2$^+$	(M1)		1.69×10^{-3}	
1931.8	(25/2$^+$)	402.16 *23*	62 *6*	1529.6	(21/2$^+$)				
		455.50 *22*	82 *9*	1476.3	(21/2$^+$)				
		747.12 *25*	100 *9*	1184.8	(25/2$^+$)				
		768.8 *5*	88 *9*	1163.1	(23/2$^+$)				
		1155.2 *5*	15 *6*	777.1	(21/2$^+$)				
1934.9	(25/2$^-$)	461.02 *22*	100	1473.9	(21/2$^-$)				
1953.0	(25/2$^+$)	423.50 *23*	47 *6*	1529.6	(21/2$^+$)				
		476.3 *4*	82 *8*	1476.3	(21/2$^+$)				
		767.9 *5*	41 *10*	1184.8	(25/2$^+$)				
		790.3 *5*	100 *10*	1163.1	(23/2$^+$)				
		1175.6 *6*	10 *4*	777.1	(21/2$^+$)				
1957.9	(27/2$^-$)	478.06 *21*	42 *2*	1479.8	(23/2$^-$)				
		773.17 *21*	100 *5*	1184.8	(25/2$^+$)				
1961.5	(21/2$^-$)	116.40 *20*	100	1845.2	(19/2$^-$)				
1982.4	(19/2$^+$)	137.33 *20*	100	1845.2	(19/2$^-$)	(E1)		0.1400	Mult.: from intensity balance (1994Br09) and γγ(θ) (1997Ha23).
2040.68	3/2$^+$	447.90 *16*	21 *5*	1593.03	3/2$^+$	[M1,E2]		0.034 *13*	
		1323.64 *18*	25 *6*	717.39	3/2$^-$	(E1)			
		1577.66 *15*	14.3 *15*	462.48	3/2$^+$				
		1876.23 *6*	61 *6*	164.42	5/2$^-$	E1			
		1936.38 *6*	100 *3*	104.32	3/2$^-$	E1			
		1971.2 *2*	2.6 *7*	69.23	5/2$^+$				
		2040.76 *16*	8.9 *13*	0.0	5/2$^-$				
2044.1	(25/2$^+$)	436.74 *25*	49 *6*	1607.5	(21/2$^+$)				
		881.0 *3*	100 *11*	1163.1	(23/2$^+$)				Mult.: γγ(θ)(DCO) gives ΔJ=1 with a large quadrupole (most likely E2) admixture.
2052.50	3/2$^-$	1273.17 *14*	24 *5*	779.63	5/2$^-$	M1(+E2)	≤0.68	0.00324 *23*	
		1525.97 *4*	100 *5*	526.33	5/2$^+$	E1			
		1649.3 *3*	7 *3*	404.00	3/2$^-$				
		1888.1 *3*	2.7 *15*	164.42	5/2$^-$				
		1948.40 *5*	8.9 *8*	104.32	3/2$^-$				
		1983.24 *8*	8.7 *8*	69.23	5/2$^+$				
		2052.8 *2*	2.13 *20*	0.0	5/2$^-$				

Adopted Levels, Gammas (continued)

γ(^{163}Er) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[d]
2066.9	(25/2$^-$)	285.40 *24*	40 *2*	1781.4	(23/2$^-$)		
		555.54 *23*	100 *6*	1511.2	(21/2$^-$)		
2104.3	(23/2$^-$)	142.72 *20*	100 *4*	1961.5	(21/2$^-$)		
		259.1 *3*	10.9 *8*	1845.2	(19/2$^-$)		
2122.21	1/2$^{(-)}$,3/2	400.74 *17*	100 *17*	1722.39	3/2$^+$		
		1957.57 *7*	83 *12*	164.42	5/2$^-$		
		2017.96 *9*	71 *5*	104.32	3/2$^-$		
2144.2	(21/2$^+$)	161.95 *20*	100 *5*	1982.4	(19/2$^+$)		
		182.85 *21*	77 *5*	1961.5	(21/2$^-$)		
2167.6	(27/2$^+$)	450.5 *5*	6.2 *31*	1717.2	(23/2$^+$)		
		982.9 *3*	100 *13*	1184.8	(25/2$^+$)		
2227.9	(29/2$^-$)	508.78 *20*	100 *3*	1719.2	(25/2$^-$)		
		542.33 *20*	24 *1*	1685.7	(27/2$^+$)	*a*	
2243.21	3/2$^-$	961.61 *12*	100 *19*	1281.16	1/2$^+$,3/2$^+$	E1	1.47×10^{-3}
		2079.0 *4*	11.8 *15*	164.42	5/2$^-$		
		2159.98 *16*	12.8 *19*	83.96	7/2$^-$		
2258.3	(33/2$^+$)	577.38 *20*	100	1681.1	(29/2$^+$)	&	
2271.0	(25/2$^-$)	166.73 *20*	100 *4*	2104.3	(23/2$^-$)		
		309.9 *3*	13.0 *7*	1961.5	(21/2$^-$)		
2274.5	1/2$^{(-)}$,3/2	2274.5 *5*	100	0.0	5/2$^-$		
2291.4	(31/2$^+$)	606.00 *20*	100 *3*	1685.7	(27/2$^+$)	&	
		609.93 *23*	12.6 *7*	1681.1	(29/2$^+$)		
2307.8	(27/2$^-$)	531.5 *3*	87 *6*	1776.0	(23/2$^-$)		
		1123.1 *3*	100 *6*	1184.8	(25/2$^+$)	*a*	
2314.0	(21/2$^+$)	193.66 *22*	100	2120.3	(19/2$^+$)		
2331.6	(23/2$^+$)	187.54 *20*	100 *5*	2144.2	(21/2$^+$)	*a*	
		227.13 *22*	54 *3*	2104.3	(23/2$^-$)		
		349.0 *3*	13.9 *15*	1982.4	(19/2$^+$)		
2368.1	(27/2$^-$)	300.7 *3*	29 *3*	2066.9	(25/2$^-$)		
		586.50 *23*	100 *7*	1781.4	(23/2$^-$)		
2415.4	(29/2$^+$)	483.64 *20*	100 *5*	1931.8	(25/2$^+$)		
		729.5 *3*	36 *3*	1685.7	(27/2$^+$)		
		734.6 *5*	27 *3*	1681.1	(29/2$^+$)		
		1230.7 *6*	12 *5*	1184.8	(25/2$^+$)		
2418.0	(27/2$^-$)	938.0 *5*	50 *19*	1479.8	(23/2$^-$)		
		1233.3 *6*	100 *50*	1184.8	(25/2$^+$)	*a*	
2431.7	(29/2$^-$)	497.0 *5*	52 *3*	1934.9	(25/2$^-$)		
		712.5 *4*	52 *3*	1719.2	(25/2$^-$)		
		745.76 *23*	100 *6*	1685.7	(27/2$^+$)	*a*	
2448.2	(29/2$^+$)	495.02 *21*	100 *5*	1953.0	(25/2$^+$)		

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

Adopted Levels, Gammas (continued)

γ(^{163}Er) (continued)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.‡
2448.2	(29/2$^+$)	516.8 *5*	16 *3*	1931.8	(25/2$^+$)	
		762.32 *22*	53 *3*	1685.7	(27/2$^+$)	
		767.0 *5*	15 *4*	1681.1	(29/2$^+$)	
		1263.4 *6*	3.0 *15*	1184.8	(25/2$^+$)	
2448.9	(31/2$^-$)	491.19 *21*	58 *2*	1957.9	(27/2$^-$)	
		767.95 *21*	100 *4*	1681.1	(29/2$^+$)	*a*
2460.9	(27/2$^-$)	189.96 *20*	100 *4*	2271.0	(25/2$^-$)	
		356.72 *23*	22 *2*	2104.3	(23/2$^-$)	
2481.5	(23/2)	1296.7 *5*	100 *23*	1184.8	(25/2$^+$)	
		1318.3 *6*	77 *23*	1163.1	(23/2$^+$)	
2523.7	(23/2$^+$)	209.8 *4*	100 *75*	2314.0	(21/2$^+$)	
		403.4 *5*	25 *25*	2120.3	(19/2$^+$)	
2540.9	(29/2$^+$)	496.77 *23*	82 *6*	2044.1	(25/2$^+$)	
		859.88 *22*	100 *6*	1681.1	(29/2$^+$)	*b*
2542.1	(25/2$^+$)	210.32 *20*	100 *7*	2331.6	(23/2$^+$)	
		271.09 *22*	69 *4*	2271.0	(25/2$^-$)	
		397.97 *24*	42 *2*	2144.2	(21/2$^+$)	
2672.6	(29/2$^-$)	211.79 *20*	100 *3*	2460.9	(27/2$^-$)	
		303.9 *3*	9.4 *9*	2368.1	(27/2$^-$)	
		401.73 *22*	30 *2*	2271.0	(25/2$^-$)	
		606.2 *6*	6.8 *17*	2066.9	(25/2$^-$)	
2682.7	(29/2$^-$)	314.6 *3*	39 *6*	2368.1	(27/2$^-$)	
		615.79 *25*	100 *8*	2066.9	(25/2$^-$)	
2698.7	(31/2$^+$)	531.11 *23*	70 *7*	2167.6	(27/2$^+$)	
		1017.63 *24*	100 *7*	1681.1	(29/2$^+$)	*a*
2741.8	(33/2$^-$)	450.41 *20*	22 *1*	2291.4	(31/2$^+$)	
		513.91 *20*	100 *3*	2227.9	(29/2$^-$)	
2748.6	(25/2$^+$)	225.4 *3*	20 *5*	2523.7	(23/2$^+$)	
		267.06 *24*	100 *20*	2481.5	(23/2)	
		434.5 *4*	10 *5*	2314.0	(21/2$^+$)	
2772.7	(27/2$^+$)	230.48 *20*	100 *4*	2542.1	(25/2$^+$)	
		441.24 *22*	47 *3*	2331.6	(23/2$^+$)	
2783.7	(31/2$^-$)	475.8 *3*	57 *5*	2307.8	(27/2$^-$)	
		825.3 *3*	82 *7*	1957.9	(27/2$^-$)	&
		1102.80 *23*	100 *7*	1681.1	(29/2$^+$)	*a*
2890.5	(31/2$^-$)	472.5 *4*	34 *7*	2418.0	(27/2$^-$)	
		932.7 *3*	100 *10*	1957.9	(27/2$^-$)	
2905.2	(31/2$^-$)	232.74 *20*	100 *4*	2672.6	(29/2$^-$)	*a*
		444.14 *21*	57 *2*	2460.9	(27/2$^-$)	
2908.7	(37/2$^+$)	650.52 *20*	100	2258.3	(33/2$^+$)	&
2912.5	(31/2$^+$)	1226.88 *10*	100 *27*	1685.7	(27/2$^+$)	
		1231.7 *10*	100 *27*	1681.1	(29/2$^+$)	
2928.3	(33/2$^+$)	480.25 *21*	87 *4*	2448.2	(29/2$^+$)	
		512.65 *21*	100 *5*	2415.4	(29/2$^+$)	
		1247.2 *6*	11 *4*	1681.1	(29/2$^+$)	
2930.8	(33/2$^-$)	498.94 *21*	100 *5*	2431.7	(29/2$^-$)	
		702.95 *24*	54 *3*	2227.9	(29/2$^-$)	&
2965.0	(35/2$^-$)	516.29 *20*	78 *3*	2448.9	(31/2$^-$)	&
		706.59 *21*	100 *4*	2258.3	(33/2$^+$)	*a*
2967.2	(33/2$^+$)	518.72 *21*	78 *5*	2448.2	(29/2$^+$)	
		551.84 *21*	100 *6*	2415.4	(29/2$^+$)	
		1285.8 *6*	3.2 *16*	1681.1	(29/2$^+$)	
2969.0	(35/2$^+$)	677.60 *20*	100	2291.4	(31/2$^+$)	&
2986.9	(27/2$^+$)	238.30 *21*	100 *7*	2748.6	(25/2$^+$)	
		462.99 *23*	67 *7*	2523.7	(23/2$^+$)	
3009.2	(31/2$^-$)	641.1 *3*	100	2368.1	(27/2$^-$)	
3022.1	(29/2$^+$)	249.37 *21*	100 *3*	2772.7	(27/2$^+$)	
		480.12 *21*	86 *3*	2542.1	(25/2$^+$)	
3074.0	(33/2$^+$)	533.14 *21*	100	2540.9	(29/2$^+$)	
3157.6	(33/2$^-$)	252.30 *20*	100 *4*	2905.2	(31/2$^-$)	
		485.08 *21*	65 *2*	2672.6	(29/2$^-$)	
3214.4	(33/2$^+$)	585.1 *9*	100	2629.3	(29/2$^+$)	
3236.2	(29/2$^+$)	249.41 *21*	100 *8*	2986.9	(27/2$^+$)	
		487.65 *22*	64 *8*	2748.6	(25/2$^+$)	
3274.5	(37/2$^-$)	305.56 *24*	3.3 *2*	2969.0	(35/2$^+$)	
		532.73 *20*	100 *3*	2741.8	(33/2$^-$)	&
3288.7	(31/2$^+$)	266.53 *21*	100 *4*	3022.1	(29/2$^+$)	
		516.10 *21*	78 *4*	2772.7	(27/2$^+$)	
3299.1	(35/2$^+$)	600.53 *21*	96 *7*	2698.7	(31/2$^+$)	
		1040.77 *22*	100 *7*	2258.3	(33/2$^+$)	*a*
3313.5	(35/2$^-$)	529.62 *21*	100 *5*	2783.7	(31/2$^-$)	
		1055.56 *25*	51 *4*	2258.3	(33/2$^+$)	*a*
3339.1	(33/2$^-$)	656.4 *3*	100	2682.7	(29/2$^-$)	
3428.5	(35/2$^-$)	270.89 *20*	100 *4*	3157.6	(33/2$^-$)	
		523.24 *21*	83 *4*	2905.2	(31/2$^-$)	
3430.2	(37/2$^+$)	462.92 *22*	26 *2*	2967.2	(33/2$^+$)	
		501.74 *20*	100 *4*	2928.3	(33/2$^+$)	
3434.6	(35/2$^-$)	544.14 *25*	63 *6*	2890.5	(31/2$^-$)	
		985.77 *24*	100 *9*	2448.9	(31/2$^-$)	&
3469.4	(35/2$^+$)	556.9 *5*	100 *17*	2912.5	(31/2$^+$)	

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

Adopted Levels, Gammas (continued)

γ(^{163}Er) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]
3469.4	(35/2$^+$)	1211.1 *6*	≈60	2258.3	(33/2$^+$)	
3494.5	(31/2$^+$)	258.42 *21*	100 *6*	3236.2	(29/2$^+$)	
		507.28 *23*	94 *6*	2986.9	(27/2$^+$)	
3511.9	(37/2$^-$)	581.10 *21*	100 *4*	2930.8	(33/2$^-$)	
		770.4 *5*	25 *2*	2741.8	(33/2$^-$)	
3530.4	(37/2$^+$)	563.08 *21*	100 *4*	2967.2	(33/2$^+$)	
		602.22 *23*	34 *3*	2928.3	(33/2$^+$)	
		1272.2 *6*	52 *6*	2258.3	(33/2$^+$)	
3530.6	(39/2$^-$)	565.65 *20*	100 *3*	2965.0	(35/2$^-$)	&
		621.85 *20*	46 *2*	2908.7	(37/2$^+$)	*a*
3570.7	(33/2$^+$)	281.85 *21*	56 *4*	3288.7	(31/2$^+$)	
		548.61 *21*	100 *5*	3022.1	(29/2$^+$)	
3624.2	(41/2$^+$)	715.59 *20*	100	2908.7	(37/2$^+$)	
3680.5	(37/2$^+$)	606.52 *22*	100	3074.0	(33/2$^+$)	
3707.8	(39/2$^+$)	738.78 *21*	100	2969.0	(35/2$^+$)	
3717.8	(37/2$^-$)	289.05 *20*	81 *3*	3428.5	(35/2$^-$)	
		560.30 *21*	100 *4*	3157.6	(33/2$^-$)	
3758.3	(33/2$^+$)	263.70 *21*	100 *5*	3494.5	(31/2$^+$)	
		522.3 *3*	87 *5*	3236.2	(29/2$^+$)	
3809.6	(37/2$^+$)	595.2 *5*	100	3214.4	(33/2$^+$)	
3858.2	(41/2$^-$)	583.65 *20*	100	3274.5	(37/2$^-$)	&
3867.1	(35/2$^+$)	296.32 *21*	49 *3*	3570.7	(33/2$^+$)	
		578.56 *21*	100 *5*	3288.7	(31/2$^+$)	
3893.0	(39/2$^-$)	579.47 *20*	100 *5*	3313.5	(35/2$^-$)	
		983.1 *8*	11 *2*	2908.7	(37/2$^+$)	
3952.0	(39/2$^+$)	652.88 *20*	100	3299.1	(35/2$^+$)	
3968.7	(41/2$^+$)	538.34 *20*	100	3430.2	(37/2$^+$)	
4023.7	(39/2$^-$)	305.66 *21*	69 *3*	3717.8	(37/2$^-$)	
		595.13 *21*	100 *4*	3428.5	(35/2$^-$)	
4024.8	(35/2$^+$)	266.29 *23*	64 *5*	3758.3	(33/2$^+$)	
		530.43 *22*	100 *7*	3494.5	(31/2$^+$)	
4036.9	(39/2$^-$)	602.33 *21*	100	3434.6	(35/2$^-$)	
4067.6	(39/2$^+$)	598.23 *21*	100	3469.4	(35/2$^+$)	
4070.1	(37/2$^-$)	731.0 *4*	100	3339.1	(33/2$^-$)	
4149.9	(41/2$^+$)	619.37 *21*	100 *5*	3530.4	(37/2$^+$)	
		1241.6 *6*	19 *3*	2908.7	(37/2$^+$)	
4156.9	(41/2$^-$)	644.96 *21*	100	3511.9	(37/2$^-$)	
4159.3	(43/2$^-$)	535.10 *22*	13 *1*	3624.2	(41/2$^+$)	
		628.87 *20*	100 *4*	3530.6	(39/2$^-$)	&
4175.9	(37/2$^+$)	308.81 *22*	96 *4*	3867.1	(35/2$^+$)	*a*
		605.05 *22*	100 *6*	3570.7	(33/2$^+$)	
4292.5	(37/2$^+$)	267.7 *3*	62 *4*	4024.8	(35/2$^+$)	
		534.14 *22*	100 *7*	3758.3	(33/2$^+$)	
4336.0	(41/2$^+$)	655.58 *21*	100	3680.5	(37/2$^+$)	
4346.5	(41/2$^-$)	322.80 *21*	80 *3*	4023.7	(39/2$^-$)	
		628.90 *21*	100 *5*	3717.8	(37/2$^-$)	
4395.1	(45/2$^+$)	771.12 *20*	100	3624.2	(41/2$^+$)	
4438.6	(41/2$^+$)	629.0 *5*	100	3809.6	(37/2$^+$)	
4494.4	(43/2$^+$)	786.49 *21*	100	3707.8	(39/2$^+$)	&
4496.0	(39/2$^+$)	319.7 *3*	25 *2*	4175.9	(37/2$^+$)	
		629.11 *22*	100 *5*	3867.1	(35/2$^+$)	
4505.3	(45/2$^-$)	647.09 *20*	100	3858.2	(41/2$^-$)	&
4529.5	(43/2$^-$)	636.50 *21*	100	3893.0	(39/2$^-$)	
4564.3	(39/2$^+$)	271.72 *22*	100 *8*	4292.5	(37/2$^+$)	
		539.50 *24*	68 *8*	4024.8	(35/2$^+$)	
4588.5	(45/2$^+$)	619.64 *21*	100 *6*	3968.7	(41/2$^+$)	
		964.5 *3*	26 *2*	3624.2	(41/2$^+$)	
4643.1	(43/2$^+$)	691.15 *22*	100	3952.0	(39/2$^+$)	
4683.5	(43/2$^-$)	337.14 *21*	70 *4*	4346.5	(41/2$^-$)	
		659.67 *22*	100 *4*	4023.7	(39/2$^-$)	
4686.1	(43/2$^-$)	649.35 *22*	100	4036.9	(39/2$^-$)	
4700.1	(43/2$^+$)	632.50 *21*	100	4067.6	(39/2$^+$)	
4821.4	(41/2$^+$)	256.97 *21*	60 *11*	4564.3	(39/2$^+$)	
		325.54 *25*	30 *2*	4496.0	(39/2$^+$)	
		645.42 *23*	100 *4*	4175.9	(37/2$^+$)	
4825.1	(45/2$^+$)	675.06 *21*	100	4149.9	(41/2$^+$)	
4850.6	(41/2$^+$)	286.06 *23*	52 *4*	4564.3	(39/2$^+$)	
		558.3 *3*	57 *4*	4292.5	(37/2$^+$)	
		674.71 *23*	100 *9*	4175.9	(37/2$^+$)	
4856.4	(47/2$^-$)	697.07 *20*	100	4159.3	(43/2$^-$)	
4864.0	(45/2$^-$)	707.17 *21*	100	4156.9	(41/2$^-$)	
5017.1	(45/2$^+$)	681.11 *21*	100	4336.0	(41/2$^+$)	
5037.9	(45/2$^-$)	354.18 *23*	35 *3*	4683.5	(43/2$^-$)	
		691.38 *21*	100 *5*	4346.5	(41/2$^-$)	
5089.0	(45/2$^+$)	650.4 *6*	24 *10*	4438.6	(41/2$^+$)	
		939.1 *3*	100 *14*	4149.9	(41/2$^+$)	
5123.9	(43/2$^+$)	273.37 *21*	100 *5*	4850.6	(41/2$^+$)	
		302.08 *24*	32 *17*	4821.4	(41/2$^+$)	
		559.72 *24*	50 *3*	4564.3	(39/2$^+$)	
		627.6 *3*	25 *17*	4496.0	(39/2$^+$)	
5182.8	(43/2$^+$)	361.0 *3*	46 *4*	4821.4	(41/2$^+$)	
		686.9 *3*	100 *8*	4496.0	(39/2$^+$)	

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

Adopted Levels, Gammas (continued)

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

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]
5205.2	(49/2$^+$)	810.01 *20*	100	4395.1	(45/2$^+$)	&
5218.9	(49/2$^-$)	713.63 *20*	100	4505.3	(45/2$^-$)	&
5228.3	(47/2$^-$)	698.77 *21*	100	4529.5	(43/2$^-$)	
5305.0	(47/2$^+$)	810.57 *22*	100	4494.4	(43/2$^+$)	
5312.6	(49/2$^+$)	724.03 *21*	100 *5*	4588.5	(45/2$^+$)	
		918.0 *3*	40 *3*	4395.1	(45/2$^+$)	
5372.2	(47/2$^+$)	672.1 *3*	37 *3*	4700.1	(43/2$^+$)	
		729.15 *22*	100 *5*	4643.1	(43/2$^+$)	
		877.7 *3*	45 *5*	4494.4	(43/2$^+$)	
5387.2	(47/2$^-$)	701.14 *22*	100 *7*	4686.1	(43/2$^-$)	
		703.6 *3*	39 *2*	4683.5	(43/2$^-$)	&
5403.5	(47/2$^-$)	365.4 *4*	42 *2*	5037.9	(45/2$^-$)	
		720.15 *23*	100 *5*	4683.5	(43/2$^-$)	
5407.3	(47/2$^+$)	707.2 *3*	100 *12*	4700.1	(43/2$^+$)	
		764.3 *3*	100 *12*	4643.1	(43/2$^+$)	
5427.7	(45/2$^+$)	303.68 *21*	100 *4*	5123.9	(43/2$^+$)	
		577.2 *5*	37 *4*	4850.6	(41/2$^+$)	
		606.53 *25*	65 *4*	4821.4	(41/2$^+$)	
5537.2	(45/2$^+$)	354.21 *25*	39 *6*	5182.8	(43/2$^+$)	
		686.4 *4*	100 *11*	4850.6	(41/2$^+$)	
		716.9 *5*	83 *17*	4821.4	(41/2$^+$)	
5553.3	(49/2$^+$)	728.11 *21*	100	4825.1	(45/2$^+$)	
5622.3	(51/2$^-$)	765.91 *20*	100	4856.4	(47/2$^-$)	
5633.4	(49/2$^-$)	769.40 *22*	100	4864.0	(45/2$^-$)	
5738.0	(49/2$^+$)	720.99 *21*	100	5017.1	(45/2$^+$)	
5744.9	(47/2$^+$)	317.08 *21*	96 *4*	5427.7	(45/2$^+$)	
		621.03 *22*	100 *5*	5123.9	(43/2$^+$)	
5783.6	(49/2$^-$)	380.10 *25*	30 *2*	5403.5	(47/2$^-$)	
		745.65 *22*	100 *4*	5037.9	(45/2$^-$)	
5802.7	(49/2$^+$)	713.7 *3*	100 *11*	5089.0	(45/2$^+$)	
		977.7 *5*	33 *6*	4825.1	(45/2$^+$)	
5905.6	(47/2$^+$)	368.40 *25*	45 *5*	5537.2	(45/2$^+$)	
		722.8 *3*	100 *10*	5182.8	(43/2$^+$)	
5988.2	(51/2$^-$)	759.84 *21*	100	5228.3	(47/2$^-$)	
5999.8	(53/2$^-$)	780.90 *20*	100	5218.9	(49/2$^-$)	
6034.7	(53/2$^+$)	829.51 *21*	100	5205.2	(49/2$^+$)	
6077.0	(49/2$^+$)	331.86 *21*	100 *4*	5744.9	(47/2$^+$)	
		649.41 *23*	87 *4*	5427.7	(45/2$^+$)	
6108.5	(51/2$^+$)	736.34 *24*	100 *6*	5372.2	(47/2$^+$)	
		803.6 *3*	61 *4*	5305.0	(47/2$^+$)	
6144.7	(51/2$^-$)	757.56 *24*	100	5387.2	(47/2$^-$)	
6146.4	(51/2$^+$)	774.21 *21*	100 *6*	5372.2	(47/2$^+$)	
		841.4 *3*	38 *3*	5305.0	(47/2$^+$)	
6158.2	(53/2$^+$)	846.0 *4*	100 *7*	5312.6	(49/2$^+$)	&
		952.7 *3*	48 *5*	5205.2	(49/2$^+$)	
6174.1	(51/2$^-$)	390.3 *3*	41 *4*	5783.6	(49/2$^-$)	
		770.8 *3*	100 *7*	5403.5	(47/2$^-$)	
6188.9	(51/2$^+$)	781.6 *3*	100	5407.3	(47/2$^+$)	
6287.8	(49/2$^+$)	382.4 *4*	56 *6*	5905.6	(47/2$^+$)	
		750.4 *4*	100 *13*	5537.2	(45/2$^+$)	
6336.6	(53/2$^+$)	783.31 *22*	100	5553.3	(49/2$^+$)	
6426.6	(51/2$^+$)	349.52 *21*	100 *5*	6077.0	(49/2$^+$)	
		681.79 *23*	97 *5*	5744.9	(47/2$^+$)	
6455.9	(55/2$^-$)	833.63 *21*	100	5622.3	(51/2$^-$)	&
6463.2	(53/2$^-$)	829.73 *23*	100	5633.4	(49/2$^-$)	
6520.8	(53/2$^+$)	782.78 *22*	100	5738.0	(49/2$^+$)	
6562.4	(53/2$^+$)	759.7 *4*	100 *17*	5802.7	(49/2$^+$)	
		1009.1 *4*	83 *11*	5553.3	(49/2$^+$)	
6572.6	(53/2$^-$)	398.4 *3*	32 *3*	6174.1	(51/2$^-$)	
		789.01 *25*	100 *7*	5783.6	(49/2$^-$)	
6682.4	(51/2$^+$)	394.5 *4*	86 *7*	6287.8	(49/2$^+$)	
		776.9 *4*	100 *14*	5905.6	(47/2$^+$)	
6792.0	(53/2$^+$)	365.36 *22*	67 *5*	6426.6	(51/2$^+$)	
		715.13 *25*	100 *7*	6077.0	(49/2$^+$)	
6807.3	(55/2$^-$)	819.05 *22*	100	5988.2	(51/2$^-$)	
6848.0	(57/2$^-$)	848.23 *21*	100	5999.8	(53/2$^-$)	&
6914.3	(57/2$^+$)	879.59 *21*	100	6034.7	(53/2$^+$)	
6935.7	(55/2$^-$)	791.03 *24*	100	6144.7	(51/2$^-$)	
6947.0	(55/2$^+$)	838.5 *4*	100	6108.5	(51/2$^+$)	
6977.5	(55/2$^+$)	831.13 *22*	100	6146.4	(51/2$^+$)	
6988.6	(55/2$^-$)	415.9 *4*	38 *6*	6572.6	(53/2$^-$)	
		814.6 *4*	100 *13*	6174.1	(51/2$^-$)	
7020.8	(55/2$^+$)	831.8 *3*	100	6188.9	(51/2$^+$)	
7088.2	(57/2$^+$)	930.02 *24*	100	6158.2	(53/2$^+$)	
7090.4	(53/2$^+$)	802.6 *5*	100	6287.8	(49/2$^+$)	
7173.5	(55/2$^+$)	381.42 *22*	87 *3*	6792.0	(53/2$^+$)	
		746.92 *25*	100 *7*	6426.6	(51/2$^+$)	
7176.0	(57/2$^+$)	839.26 *23*	100	6336.6	(53/2$^+$)	
7322.9	(57/2$^+$)	760.5 *3*	100 *11*	6562.4	(53/2$^+$)	
		802.5 *6*	22 *4*	6520.8	(53/2$^+$)	
7348.8	(57/2$^+$)	828.0 *3*	100	6520.8	(53/2$^+$)	
7351.8	(57/2$^-$)	888.6 *3*	100	6463.2	(53/2$^-$)	

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

Adopted Levels, Gammas (continued)

γ(^{163}Er) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]
7356.5	(59/2$^-$)	900.59 *21*	100	6455.9	(55/2$^-$)	&
7413.5	(57/2$^-$)	840.9 *5*	100	6572.6	(53/2$^-$)	
7518.0	(55/2$^+$)	835.6 *5*	100	6682.4	(51/2$^+$)	
7573.9	(57/2$^+$)	400.0 *3*	31 *3*	7173.5	(55/2$^+$)	
		781.90 *25*	100 *5*	6792.0	(53/2$^+$)	
7681.2	(59/2$^-$)	873.8 *3*	100	6807.3	(55/2$^-$)	
7733.7	(59/2$^-$)	798.1 *3*	100	6935.7	(55/2$^-$)	
7763.4	(61/2$^-$)	915.38 *22*	100	6848.0	(57/2$^-$)	&
7831.9	(59/2$^-$)	843.3 *4*	100	6988.6	(55/2$^-$)	
7845.5	(59/2$^+$)	898.5 *6*	100	6947.0	(55/2$^+$)	
7856.7	(61/2$^+$)	942.7 *5*	100	6914.3	(57/2$^+$)	
7954.6	(57/2$^+$)	864.2 *5*	100	7090.4	(53/2$^+$)	
7988.3	(59/2$^+$)	414.13 *22*	100 *4*	7573.9	(57/2$^+$)	
		815.0 *3*	78 *7*	7173.5	(55/2$^+$)	
8067.7	(61/2$^+$)	891.6 *3*	100	7176.0	(57/2$^+$)	
8080.2	(61/2$^+$)	992.0 *3*	100	7088.2	(57/2$^+$)	
8127.9	(61/2$^+$)	805.0 *3*	100	7322.9	(57/2$^+$)	
8195.9	(61/2$^+$)	847.1 *3*	100	7348.8	(57/2$^+$)	
8277.9	(61/2$^-$)	926.1 *5*	100	7351.8	(57/2$^-$)	
8306.3	(61/2$^-$)	892.8 *5*	100	7413.5	(57/2$^-$)	
8322.9	(63/2$^-$)	966.42 *22*	100	7356.5	(59/2$^-$)	
8420.1	(61/2$^+$)	431.61 *22*	100 *6*	7988.3	(59/2$^+$)	
		846.6 *3*	81 *6*	7573.9	(57/2$^+$)	
8551.7	(63/2$^-$)	817.9 *3*	78 *11*	7733.7	(59/2$^-$)	
		870.5 *3*	100 *11*	7681.2	(59/2$^-$)	
8636.8	(63/2$^-$)	903.5 *5*	67 *10*	7733.7	(59/2$^-$)	
		955.4 *4*	100 *10*	7681.2	(59/2$^-$)	
8697.8	(63/2$^-$)	865.9 *5*	100	7831.9	(59/2$^-$)	
8745.1	(65/2$^-$)	981.63 *24*	100	7763.4	(61/2$^-$)	
8794.5	(63/2$^+$)	949.0 *7*	100	7845.5	(59/2$^+$)	
8847.7	(65/2$^+$)	991.1 *4*	100	7856.7	(61/2$^+$)	
8866.8	(63/2$^+$)	446.6 *3*	50 *4*	8420.1	(61/2$^+$)	
		878.6 *5*	100 *7*	7988.3	(59/2$^+$)	
8986.9	(65/2$^+$)	858.8 *4*	100	8127.9	(61/2$^+$)	
9002.2	(65/2$^+$)	874.5 *4*	100 *20*	8127.9	(61/2$^+$)	
		934.2 *4*	100 *13*	8067.7	(61/2$^+$)	
9106.0	(65/2$^+$)	910.1 *3*	100	8195.9	(61/2$^+$)	
9128.2	(65/2$^+$)	1048.0 *5*	100	8080.2	(61/2$^+$)	
9212.9	(65/2$^-$)	935.0 *4*	100	8277.9	(61/2$^-$)	
9330.3	(65/2$^+$)	910.2 *5*	100	8420.1	(61/2$^+$)	
9352.3	(67/2$^-$)	1029.4 *3*	100	8322.9	(63/2$^-$)	
9440.6	(67/2$^-$)	888.9 *3*	100	8551.7	(63/2$^-$)	
9607.8	(67/2$^-$)	910.0 *5*	100	8697.8	(63/2$^-$)	
9630.0	(67/2$^-$)	993.1 *4*	100	8636.8	(63/2$^-$)	
9779.6	(69/2$^-$)	1034.5 *3*	100	8745.1	(65/2$^-$)	
9806.5	(67/2$^+$)	939.7 *5*	100	8866.8	(63/2$^+$)	
9816.1	(69/2$^-$)	1071.0 *3*	100	8745.1	(65/2$^-$)	
9845.9	(69/2$^+$)	998.2 *8*	100	8847.7	(65/2$^+$)	
9909.4	(69/2$^+$)	922.4 *4*	93 *13*	8986.9	(65/2$^+$)	
		1061.8 *3*	100 *7*	8847.7	(65/2$^+$)	
10076.3	(69/2$^+$)	970.3 *4*	100	9106.0	(65/2$^+$)	
10183.2	(69/2$^-$)	970.3 *6*	100	9212.9	(65/2$^-$)	
10229.2	(69/2$^+$)	1101.0 *5*	100	9128.2	(65/2$^+$)	
10299.9	(69/2$^+$)	969.6 *6*	100	9330.3	(65/2$^+$)	
10380.0	(71/2$^-$)	939.4 *4*	100 *17*	9440.6	(67/2$^-$)	
		1027.6 *5*	75 *8*	9352.3	(67/2$^-$)	
10440.1	(71/2$^-$)	1087.8 *3*	100	9352.3	(67/2$^-$)	
10569.8	(71/2$^-$)	962.0 *5*	100	9607.8	(67/2$^-$)	
10732.0	(73/2$^-$)	915.9 *5*	100 *7*	9816.1	(69/2$^-$)	
		952.4 *5*	33 *7*	9779.6	(69/2$^-$)	
10808.7	(71/2$^+$)	1002.2 *8*	100	9806.5	(67/2$^+$)	
10824.9	(73/2$^+$)	979.0 *8*	100	9845.9	(69/2$^+$)	
10903.6	(73/2$^-$)	1087.5 *5*	100 *33*	9816.1	(69/2$^-$)	
		1124.0 *5*	100 *33*	9779.6	(69/2$^-$)	
10909.0	(73/2$^+$)	999.6 *3*	100	9909.4	(69/2$^+$)	
11325.0	(73/2$^+$)	1025.1 *6*	100	10299.9	(69/2$^+$)	
11377.5	(75/2$^-$)	997.5 *5*	100	10380.0	(71/2$^-$)	
11548.4	(75/2$^-$)	1108.4 *3*	100 *10*	10440.1	(71/2$^-$)	
		1168.3 *6*	90 *20*	10380.0	(71/2$^-$)	
11713.7	(77/2$^-$)	981.7 *8*	100	10732.0	(73/2$^-$)	
11830.9	(77/2$^+$)	1006.0 *10*	100	10824.9	(73/2$^+$)	
11870.0	(75/2$^+$)	1061.3 *6*	100	10808.7	(71/2$^+$)	
12049.6	(77/2$^-$)	1146.0 *5*	100	10903.6	(73/2$^-$)	
12699.4	(79/2$^-$)	1151.0 *4*	100	11548.4	(75/2$^-$)	
12758.7	(81/2$^-$)	1045.0 *5*	100	11713.7	(77/2$^-$)	
12881.5	(81/2$^+$)	1050.6 *10*	100	11830.9	(77/2$^+$)	
13864.7	(85/2$^-$)	1106.0 *6*	100	12758.7	(81/2$^-$)	
612.0+x	(29/2)	612.0 *8*	100	x	(25/2)	
1076.5+x	(33/2)	464.5 *5*	100	612.0+x	(29/2)	
1624.0+x	(37/2)	547.5 *3*	100	1076.5+x	(33/2)	
2236.0+x	(41/2)	612.0 *8*	100	1624.0+x	(37/2)	
2565.4+x	(43/2)	329.5 *3*	20 *4*	2236.0+x	(41/2)	

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

Adopted Levels, Gammas (continued)

γ(^{163}Er) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π
2565.4+x	(43/2)	637.4 *5*	100 *36*	1927.9+x	(39/2)	4075.6+x	(51/2)	791.8 *4*	100	3283.8+x	(47/2)
		679.8 *3*	100 *18*	2236.0+x	(41/2)	4495.4+x	(53/2)	824.0 *5*	100	3671.4+x	(49/2)
		718.3 *4*	100 *22*	2565.4+x	(43/2)	4930.7+x	(55/2)	855.1 *5*	100	4075.6+x	(51/2)
3671.4+x	(49/2)	755.5 *3*	100	2915.9+x	(45/2)	5393.7+x	(57/2)	898.3 *6*	100	4495.4+x	(53/2)
						5866.5+x	(59/2)	935.8 *5*	100	4930.7+x	(55/2)
						6357.7+x	(61/2)	964.0 *6*	100	5393.7+x	(57/2)

[†] From (^{18}O,5nγ) for high-spin (J>7/2) levels and from ε decay for low-spin (J<9/2) levels, except as noted. The uncertainties of Eγ′s quoted here (taken from 1982Vy07) are too low to give an acceptable least-squares fit to Eγ′s. In the opinion of evaluators, these should be at least doubled.

[‡] From α(exp)′s and subshell ratios in ε decay, except as noted.

[#] Poor fit. Eγ deviates from results of least-squares adjustment by >2 σ′s.

[@] From level-energy difference. γ ray near this energy is reported in (α,2nγ).

[&] γγ(θ)(DCO) (1997Ha23) and/or γ(θ) in (α,2nγ) consistent with ΔJ=2, stretched quadrupole (most likely E2 from RUL).

[a] γγ(θ)(DCO) (1997Ha23) and/or γ(θ) in (α,2nγ) consistent with ΔJ=1, stretched dipole or D+Q (most likely M1+E2 from RUL).

[b] From γγ(θ)(DCO), (1997Ha23) interpret this transition as ΔJ=0 (most likely dipole).

[c] Large value of α(K)exp in ε decay suggests possibility of some E0 admixture.

[d] 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.

[e] Multiply placed with intensity suitably divided.

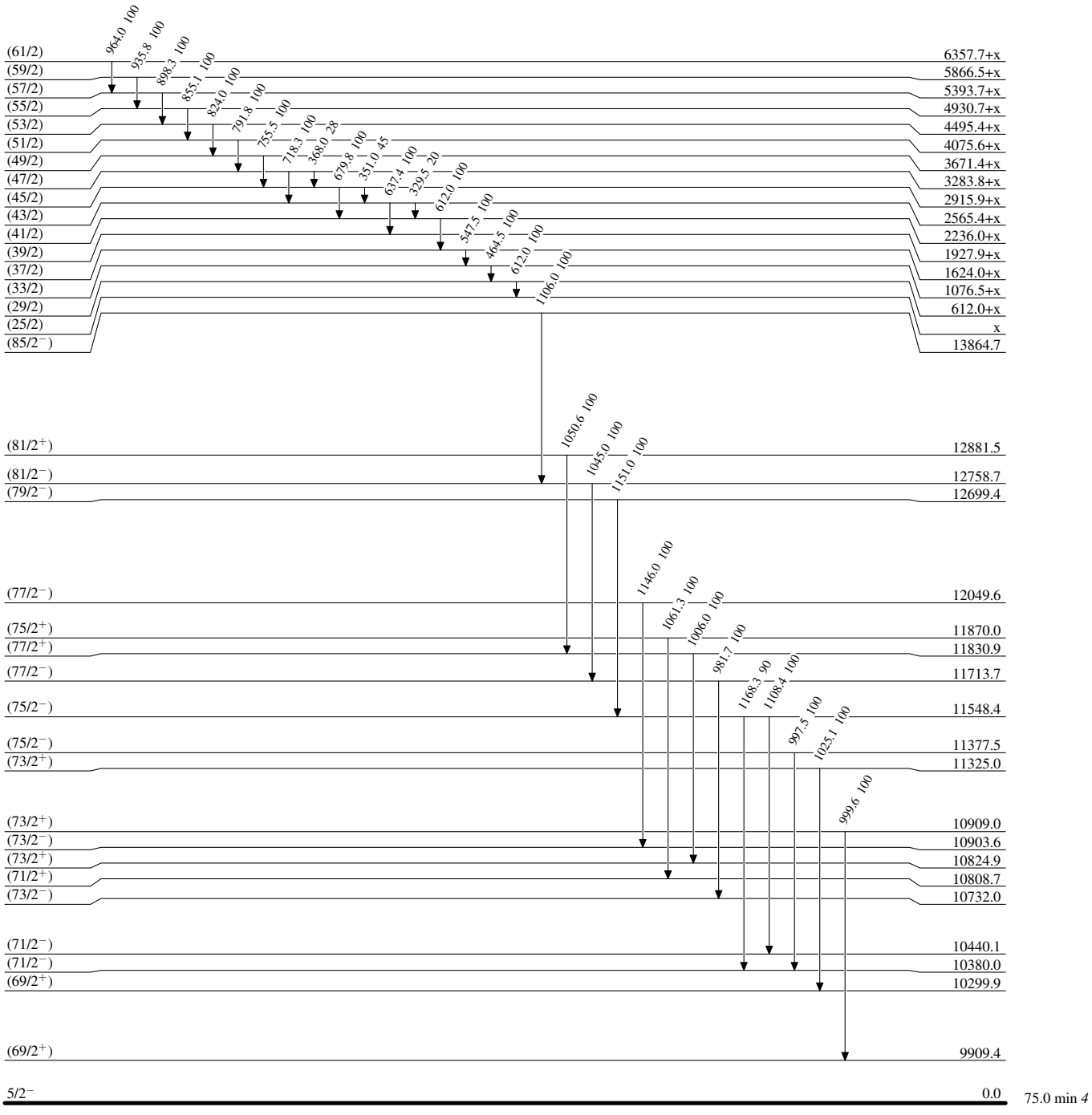
[f] Placement of transition in the level scheme is uncertain.

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

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

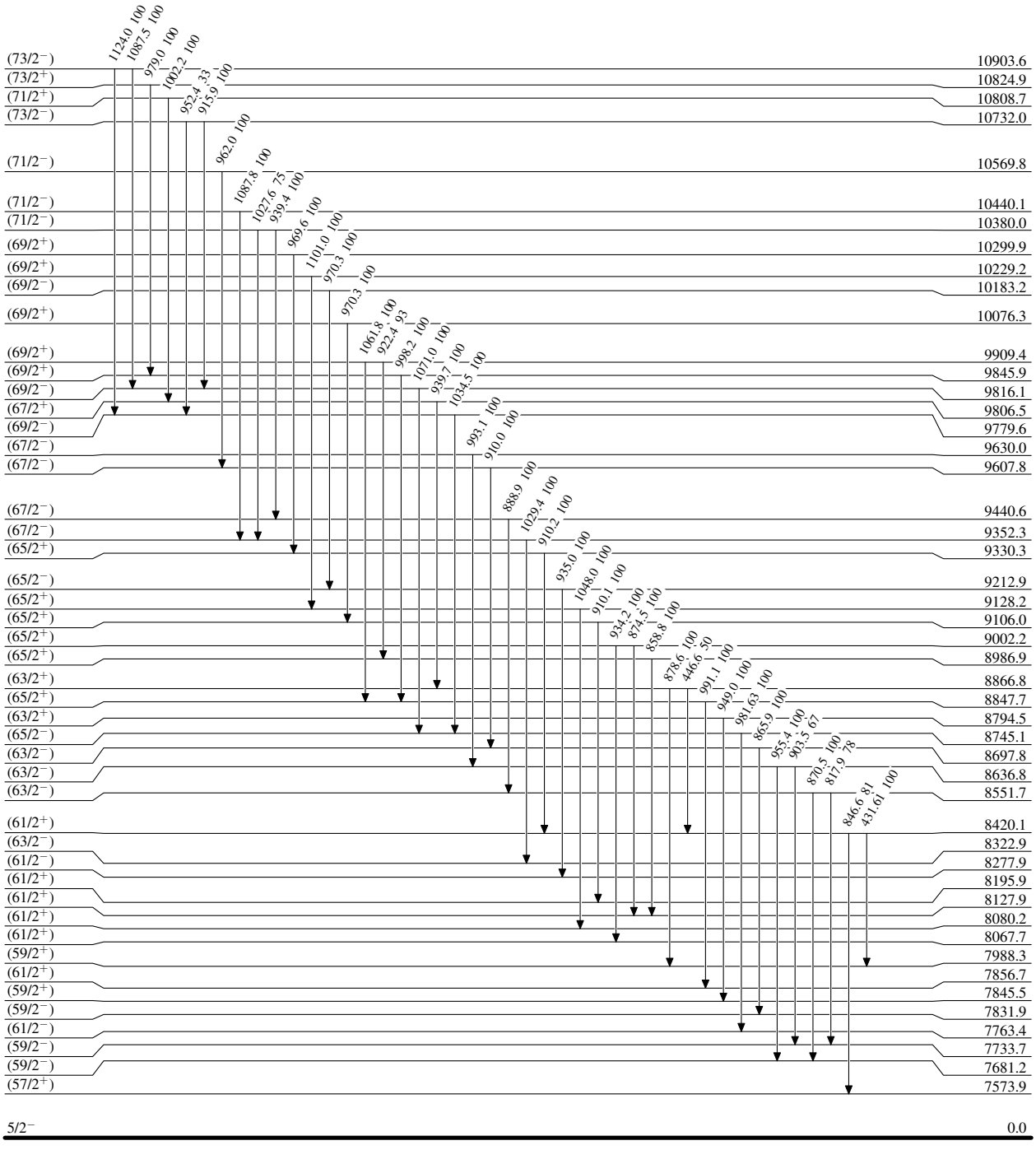


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

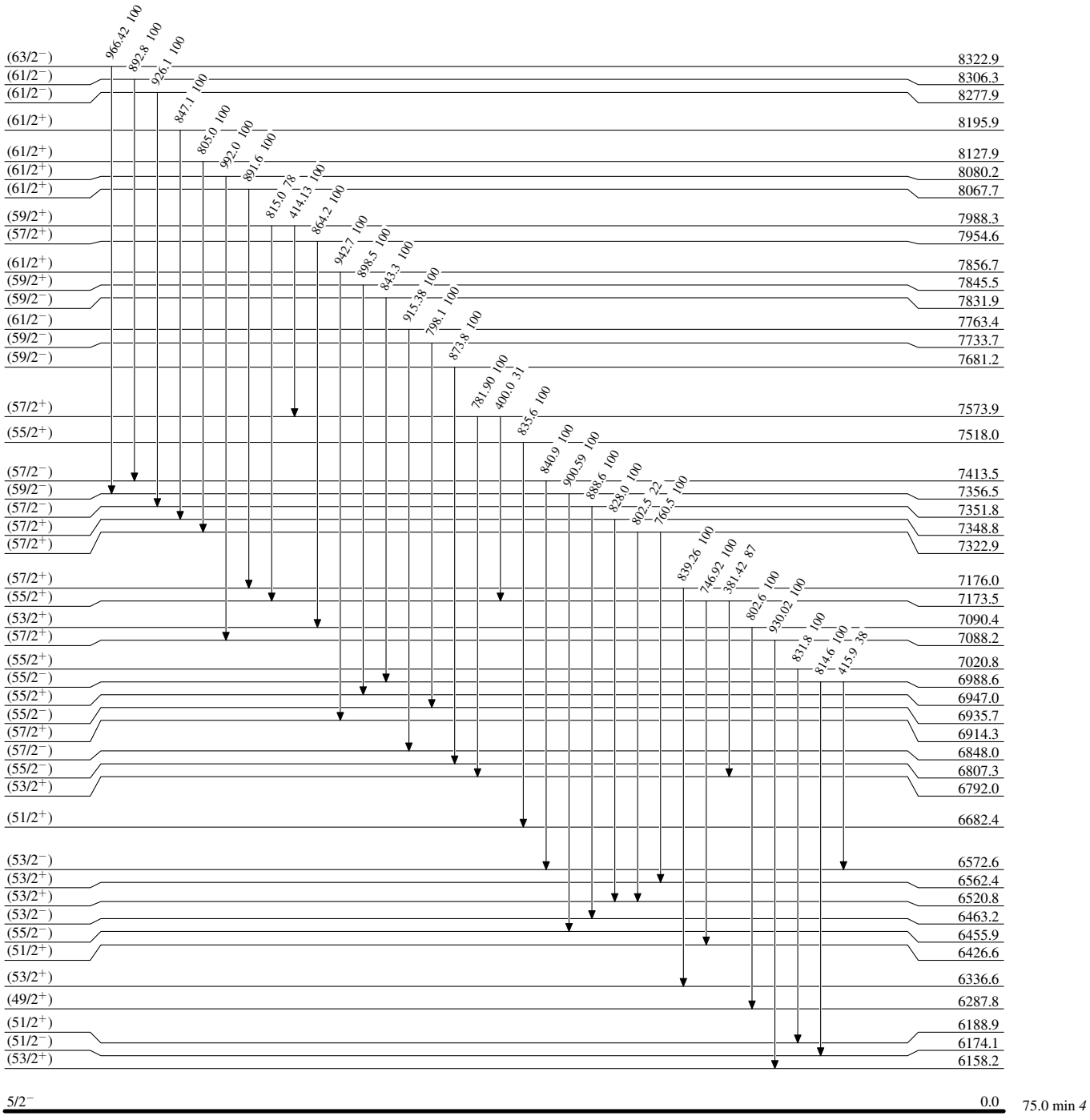


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

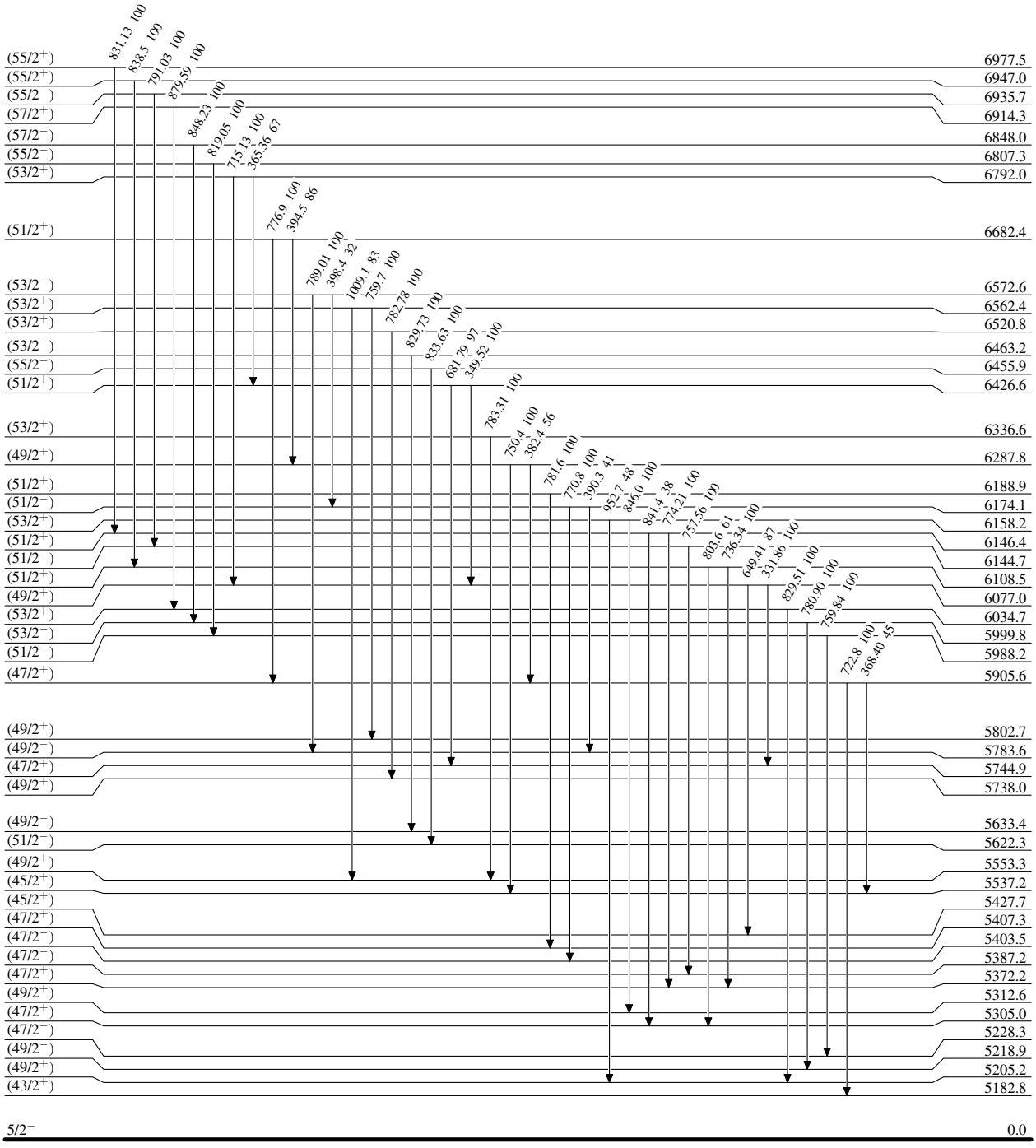


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

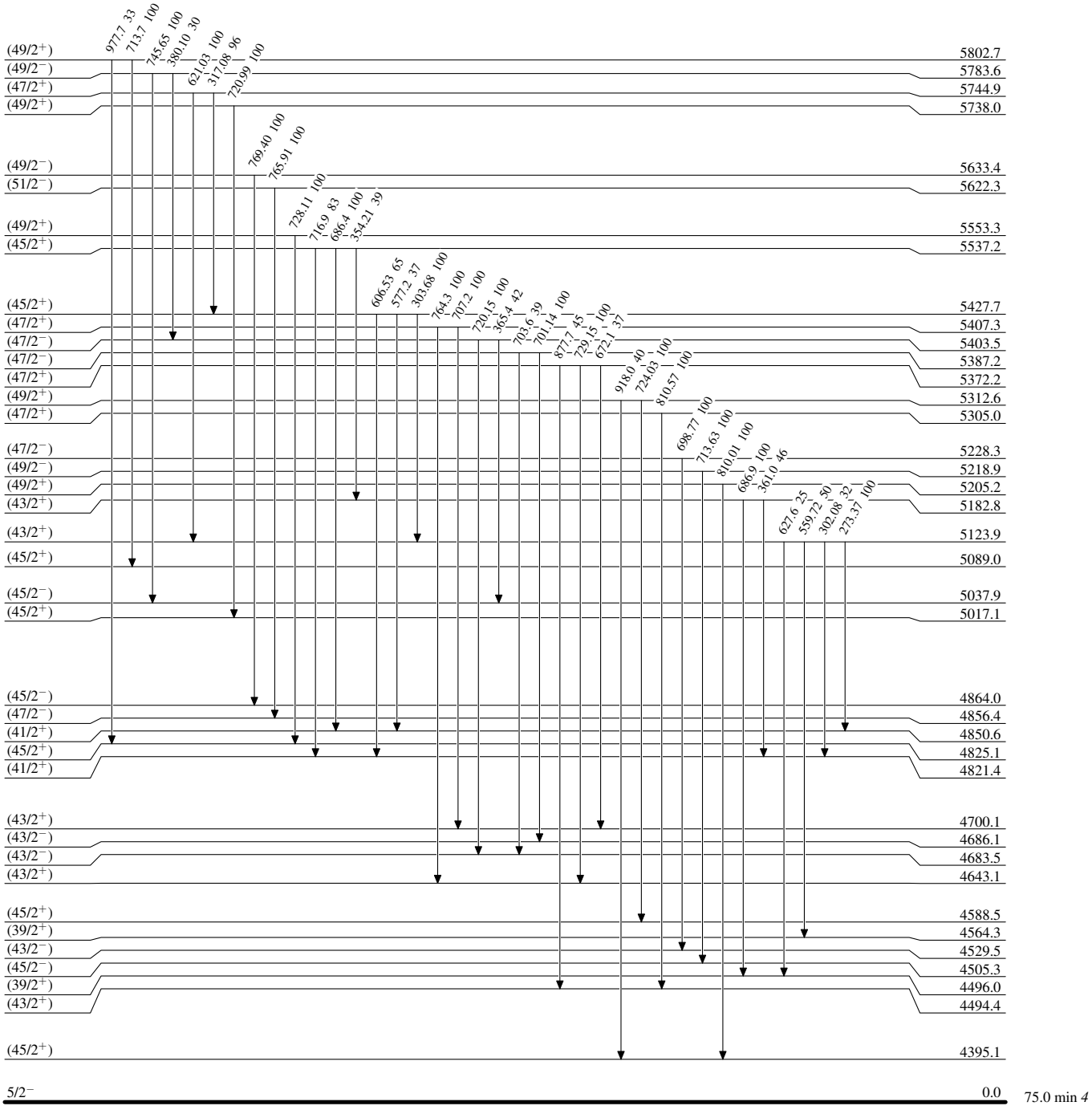


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

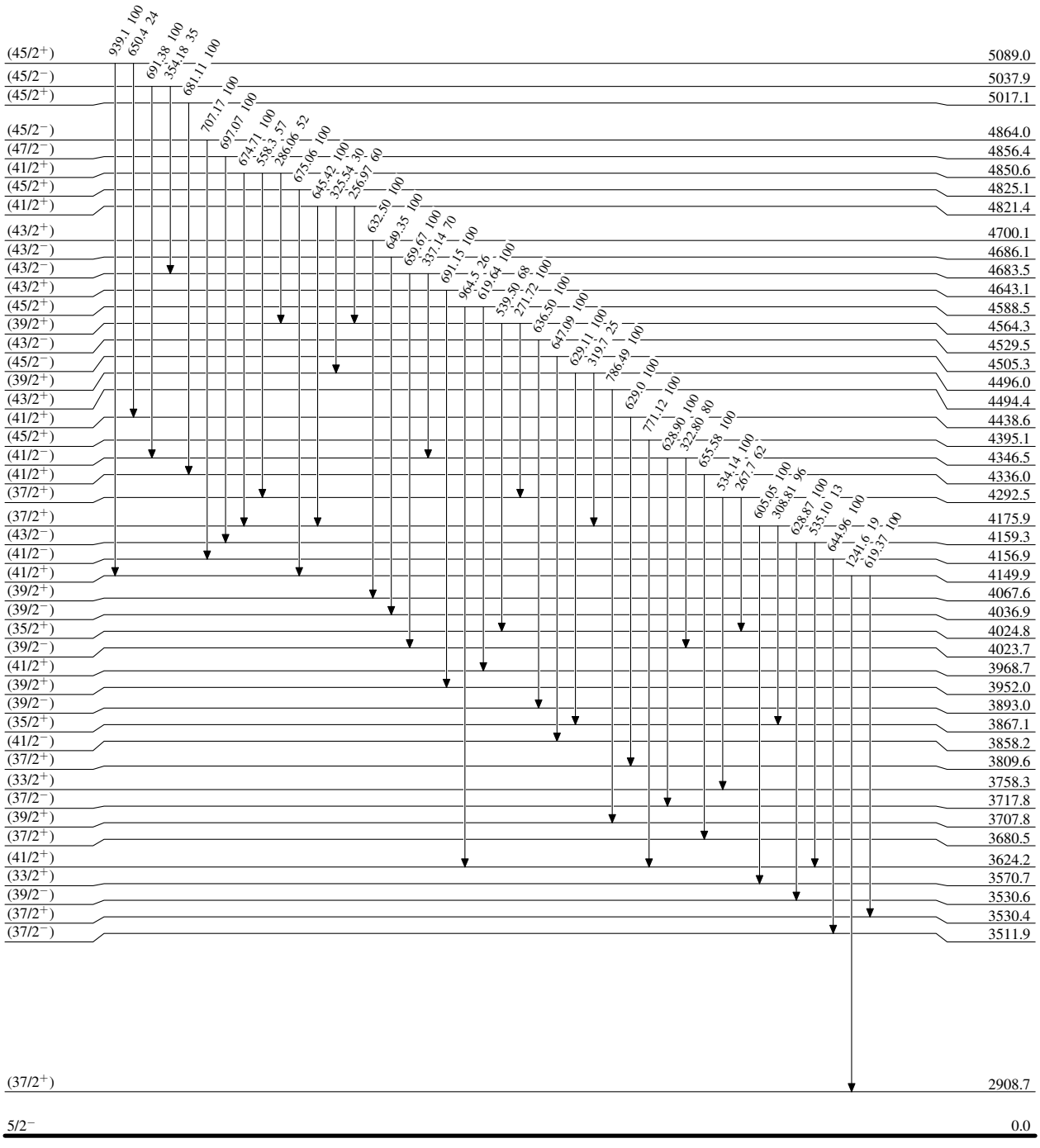


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



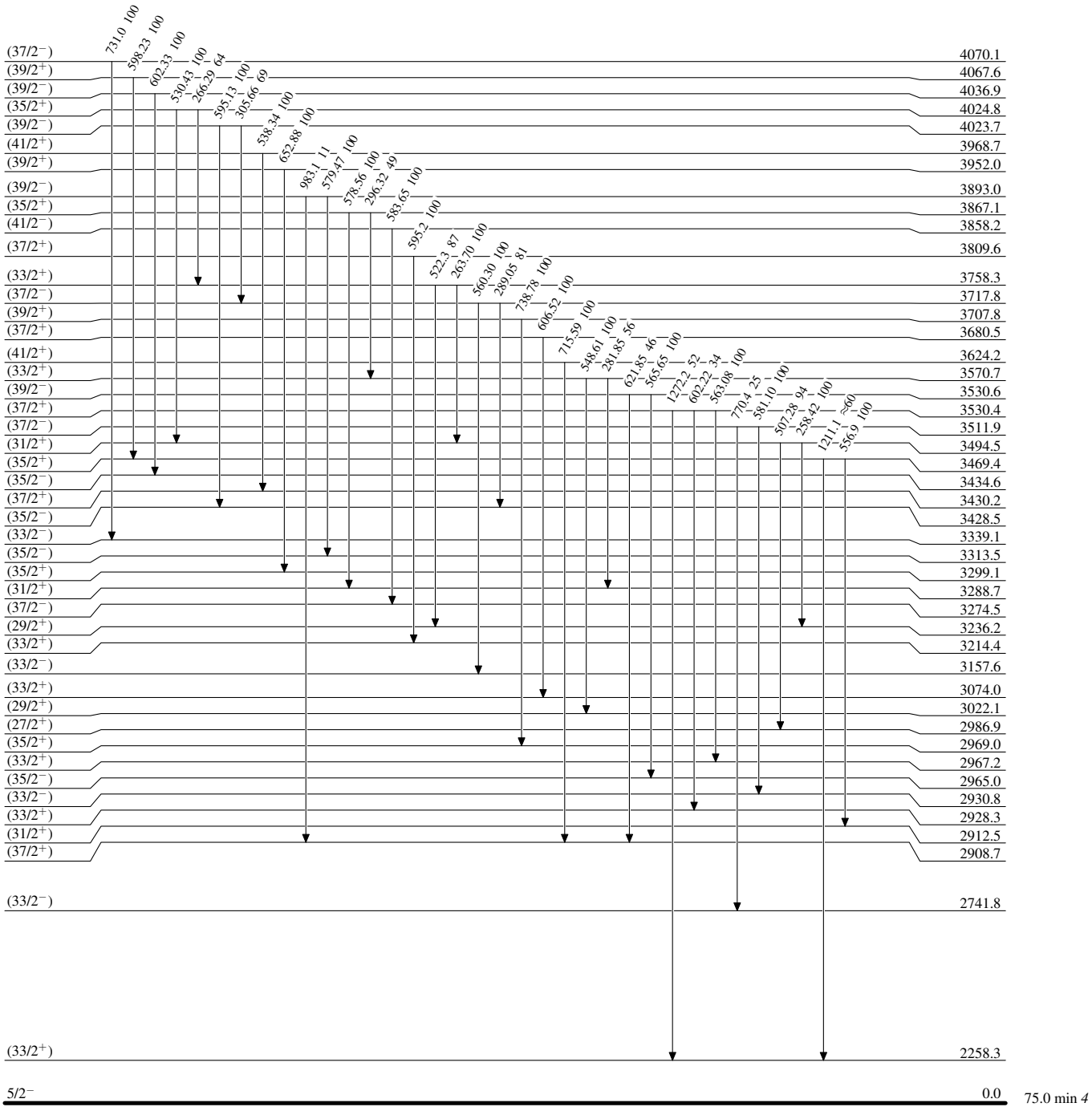
75.0 min *4*

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

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



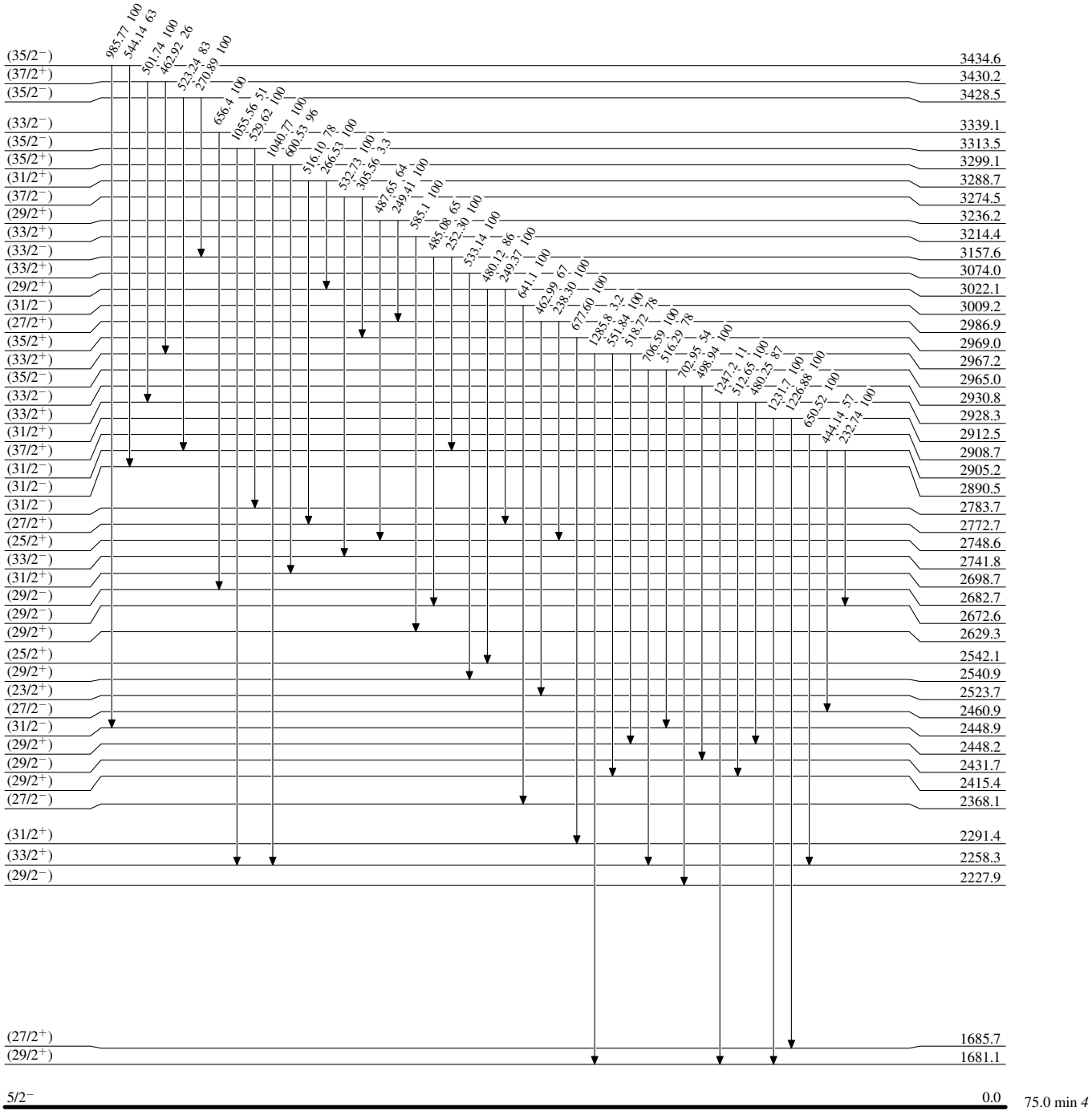
75.0 min *4*

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

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

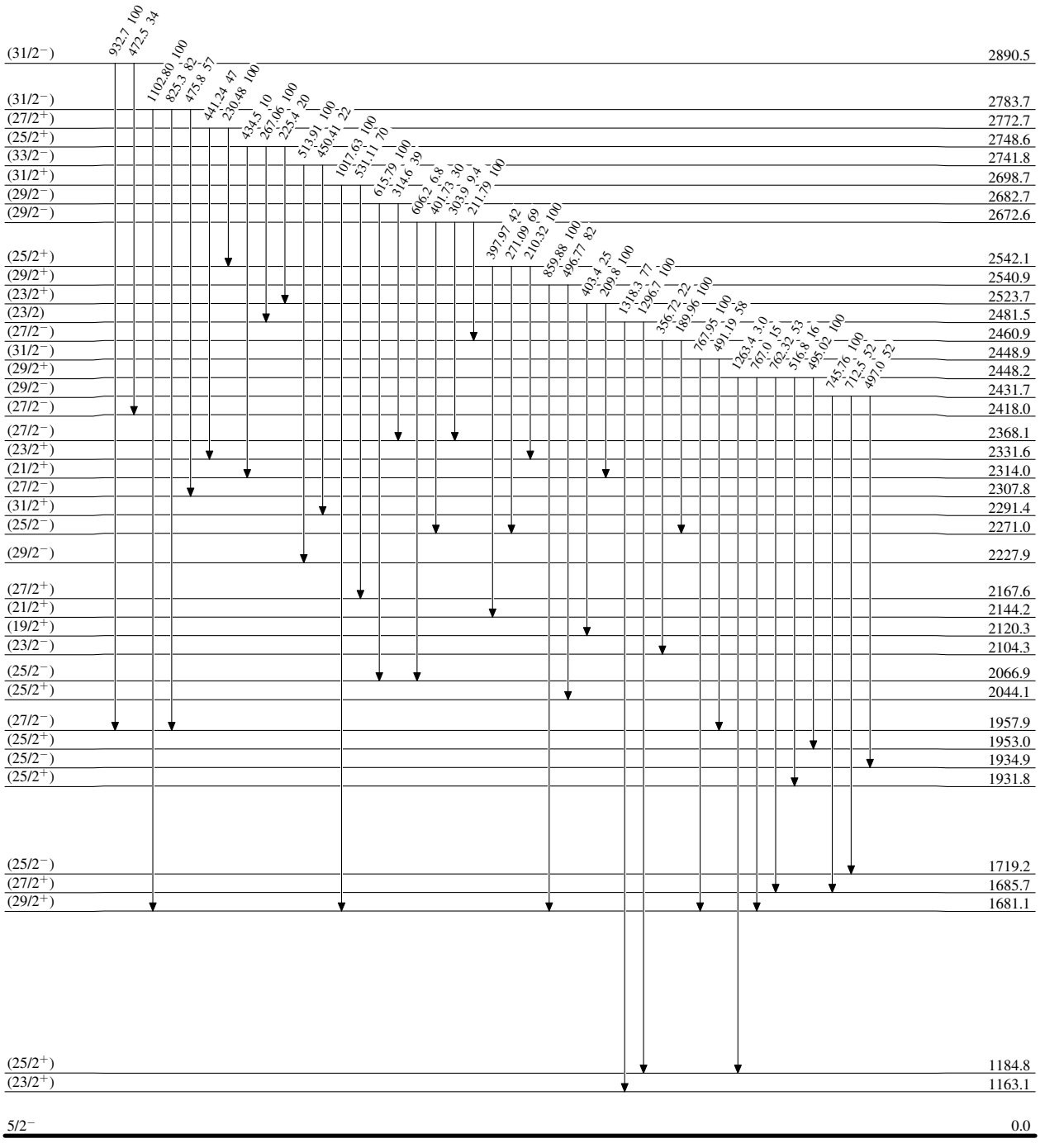


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

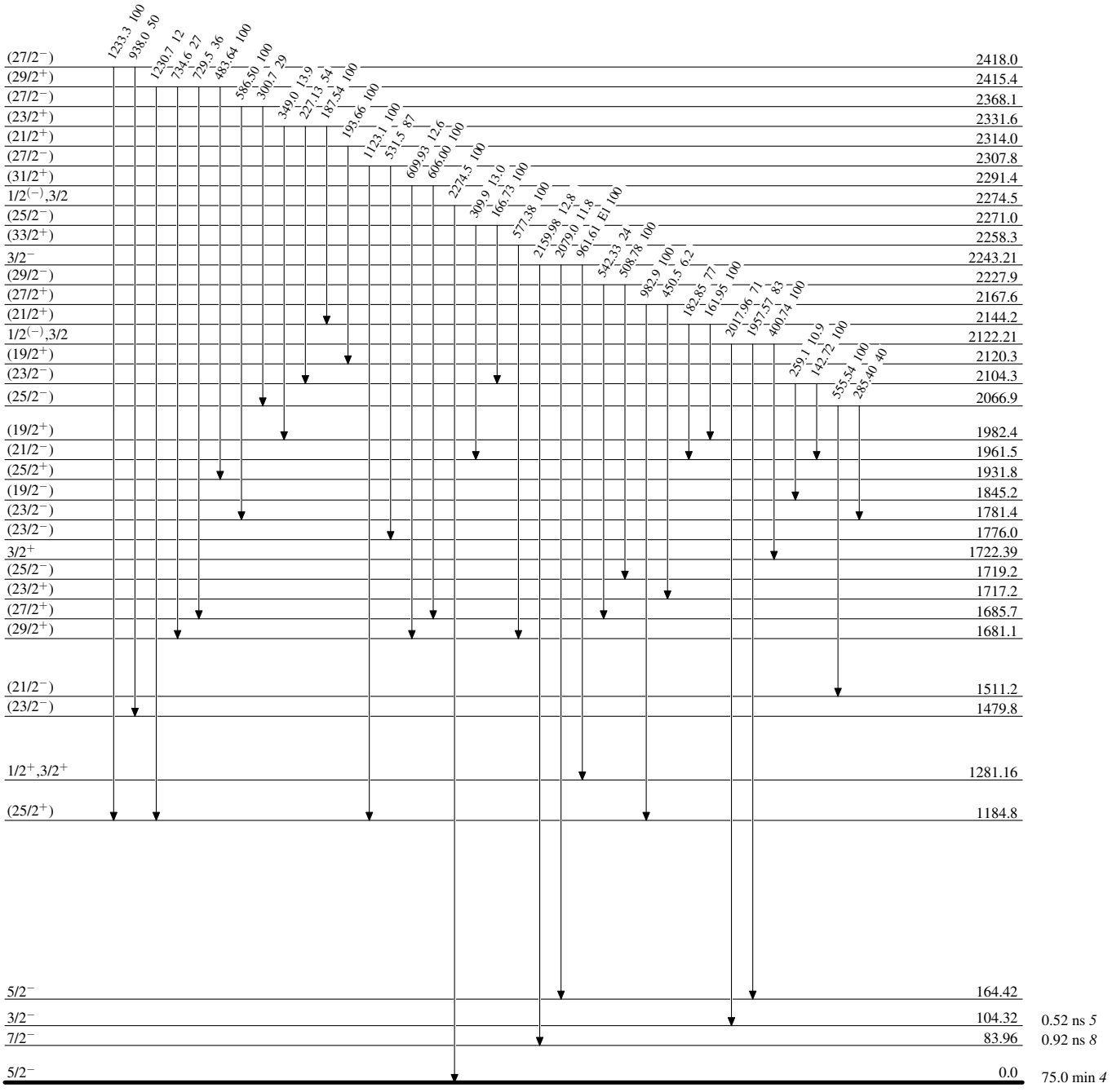


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

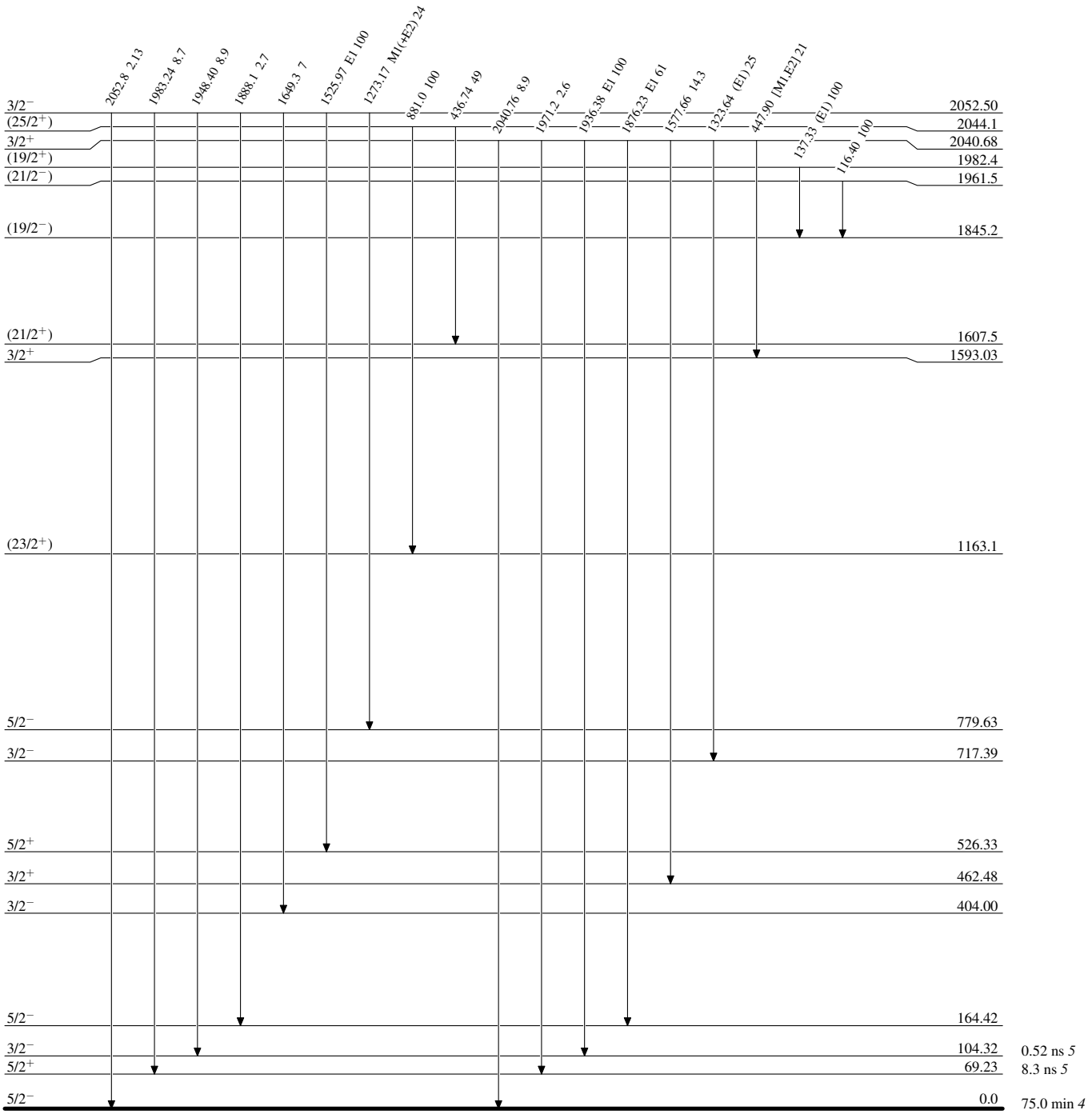


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

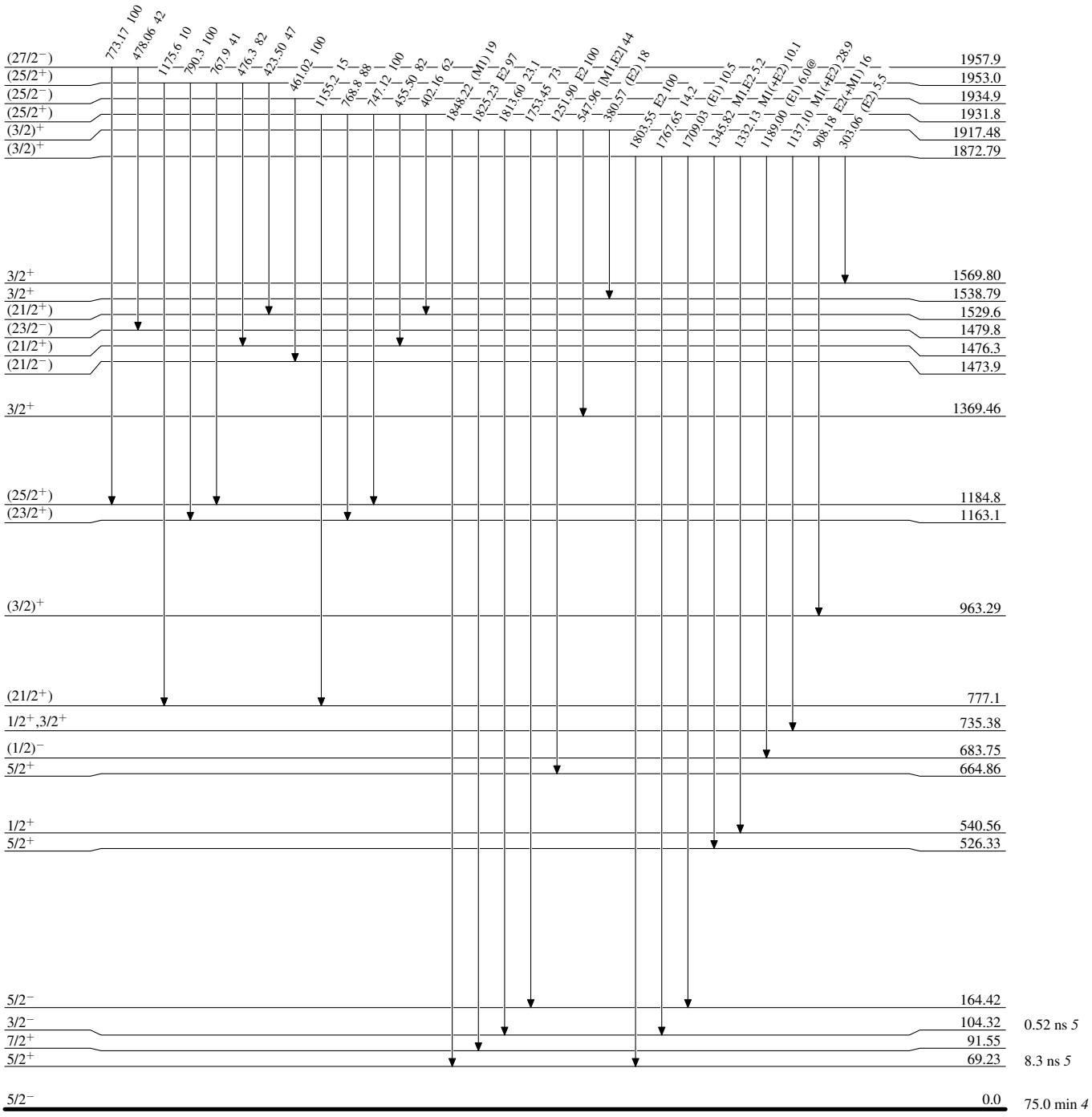


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas

Level Scheme (continued)

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

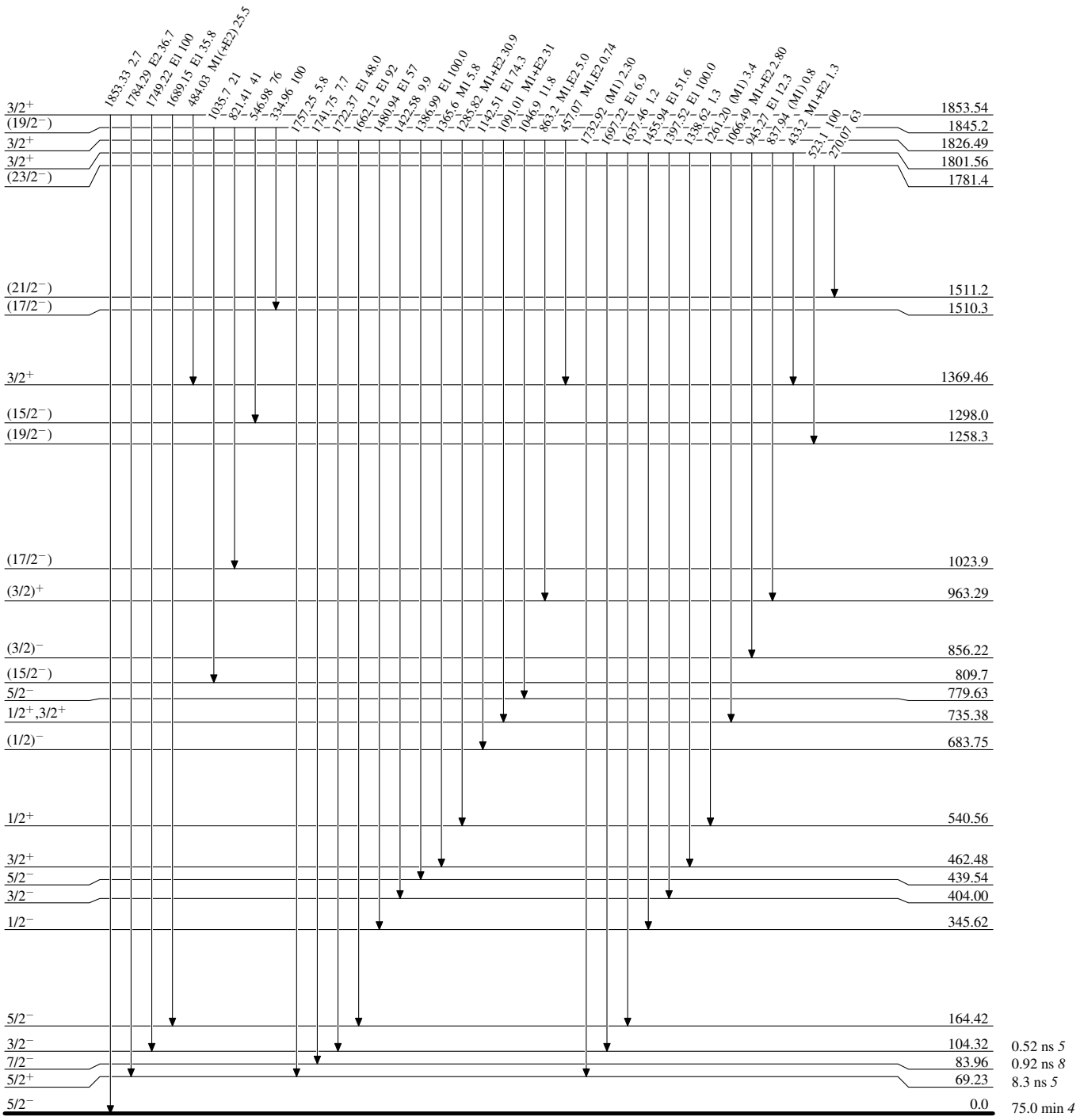


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas

Level Scheme (continued)

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

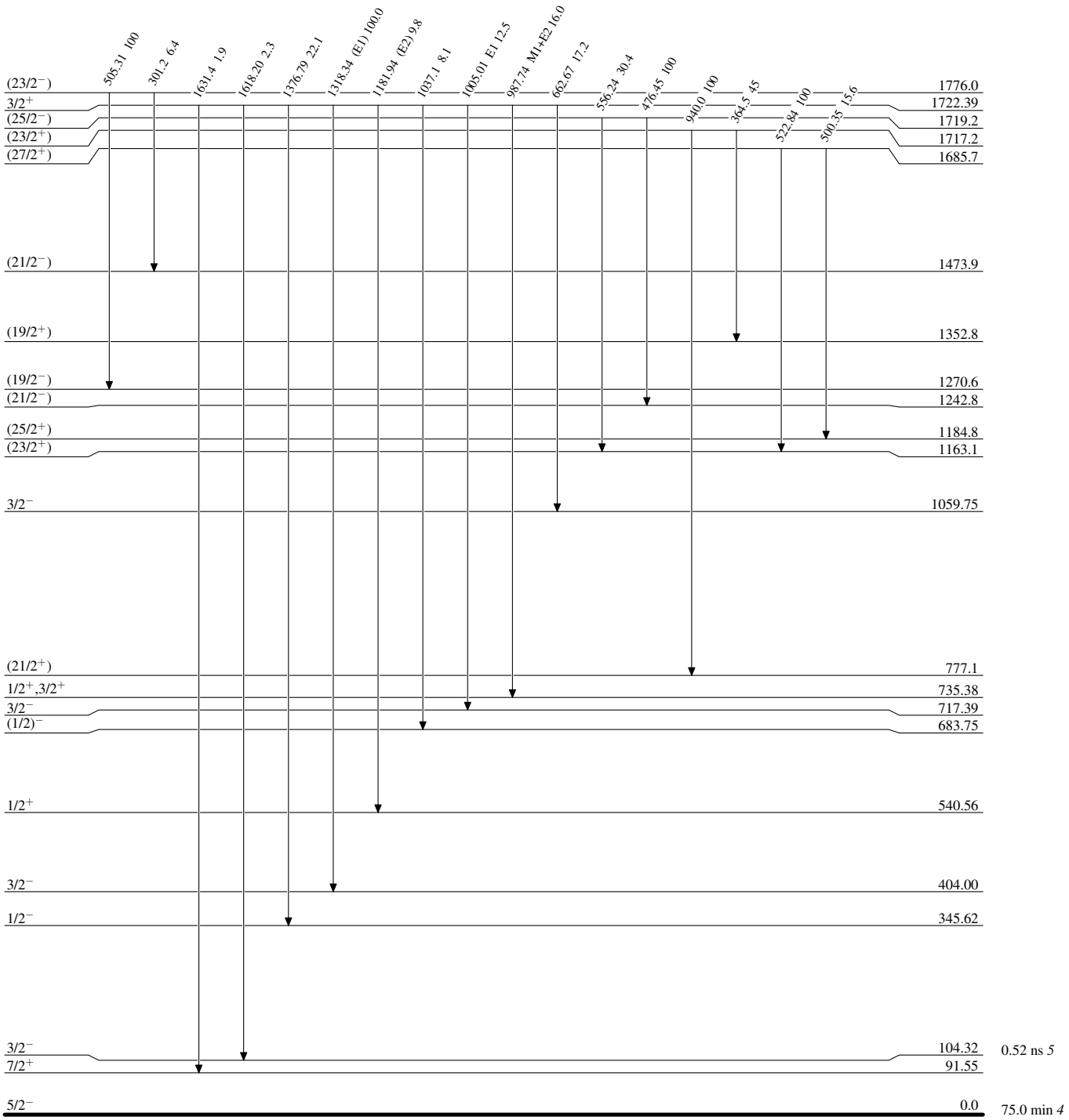


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas

Level Scheme (continued)

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

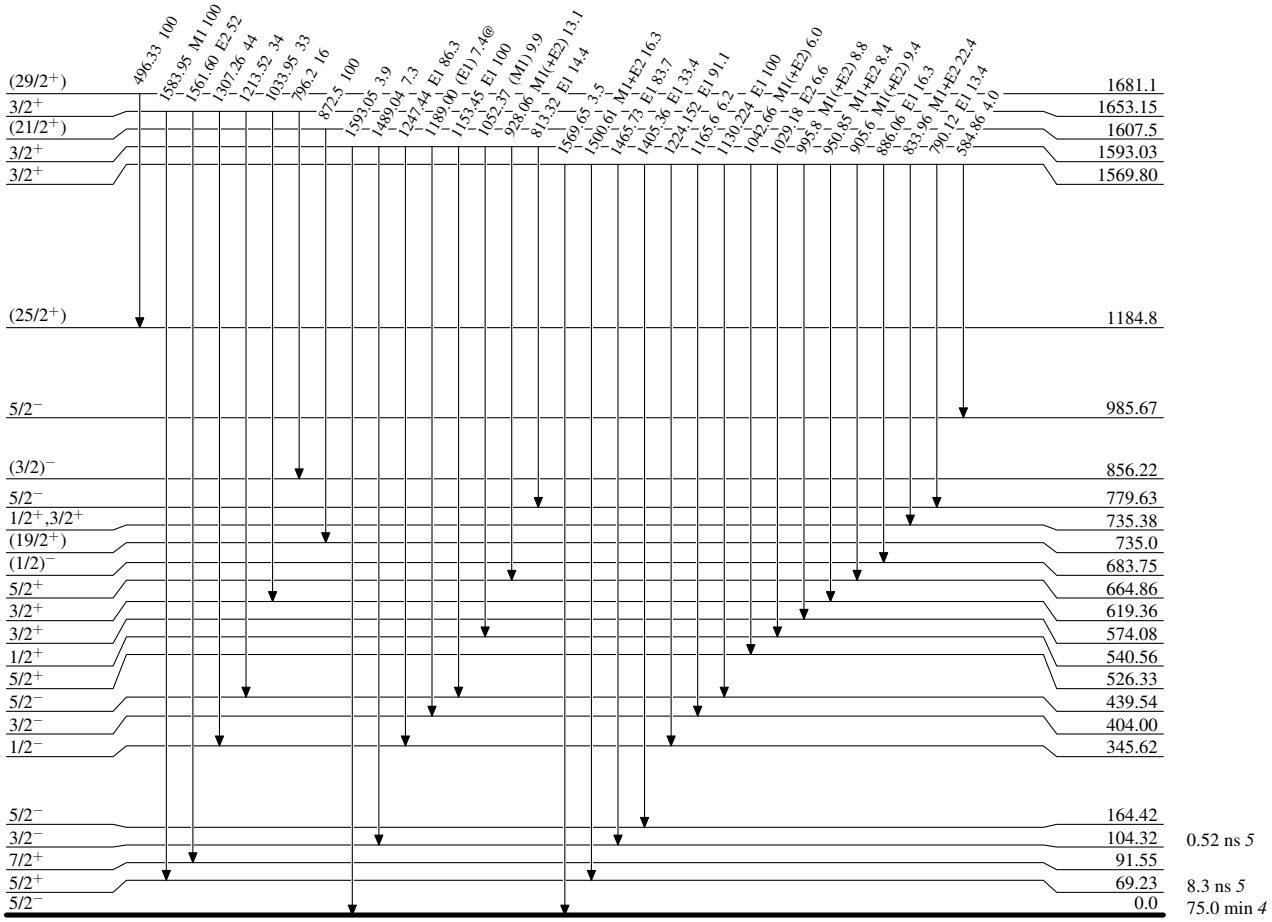


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas

Level Scheme (continued)

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

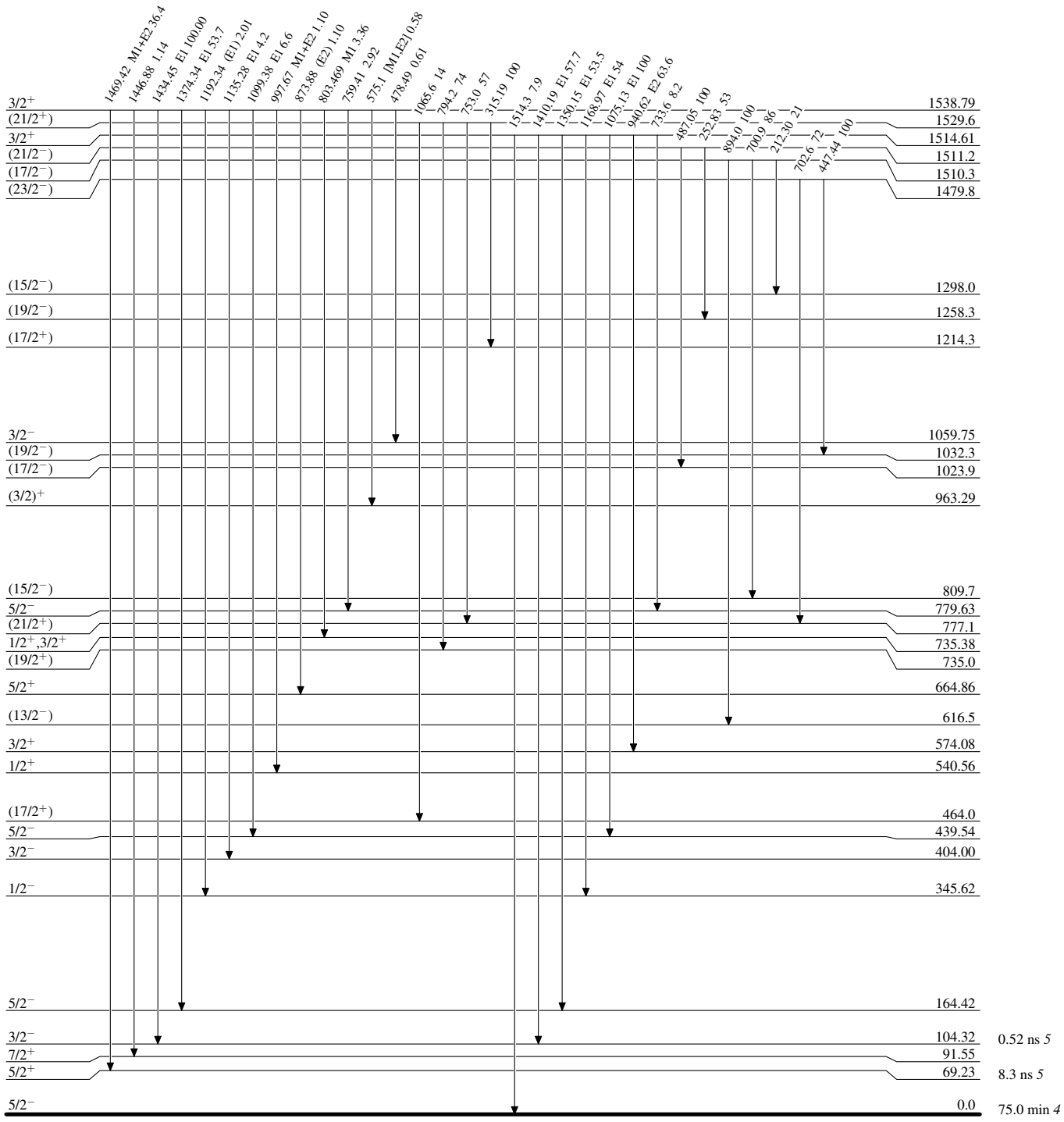


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas

Level Scheme (continued)

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

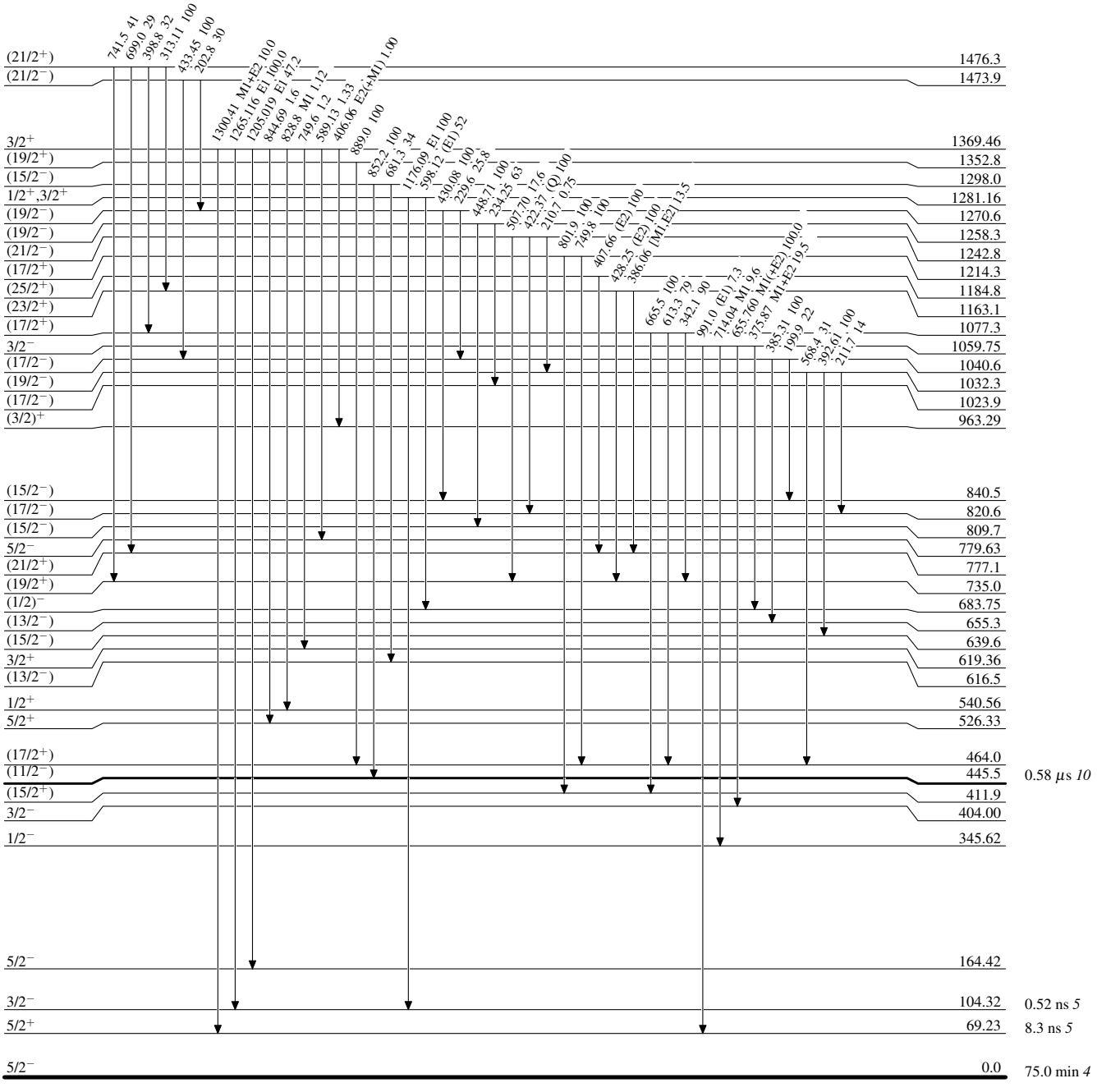


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas

Level Scheme (continued)

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

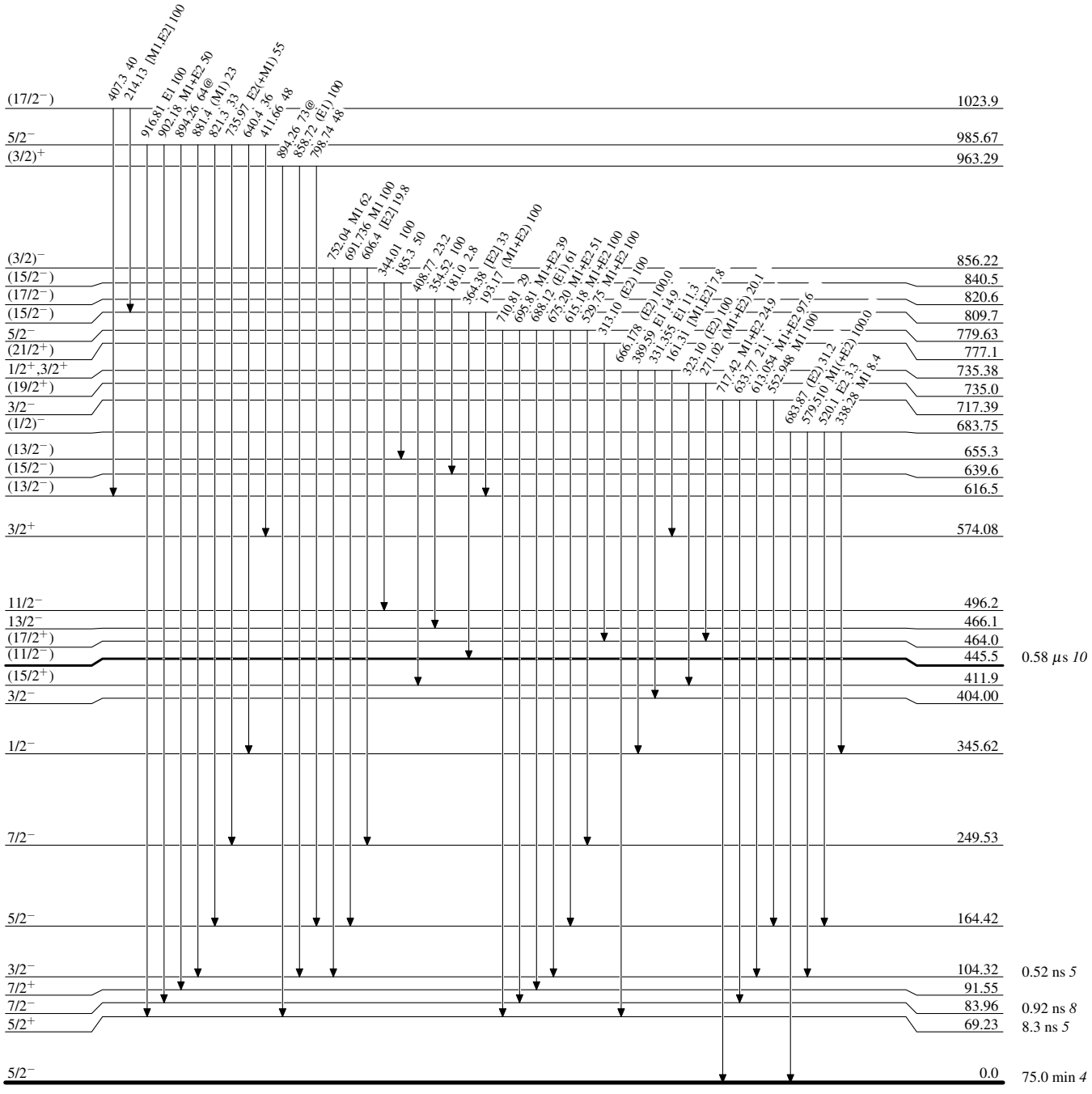


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas

Level Scheme (continued)

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



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

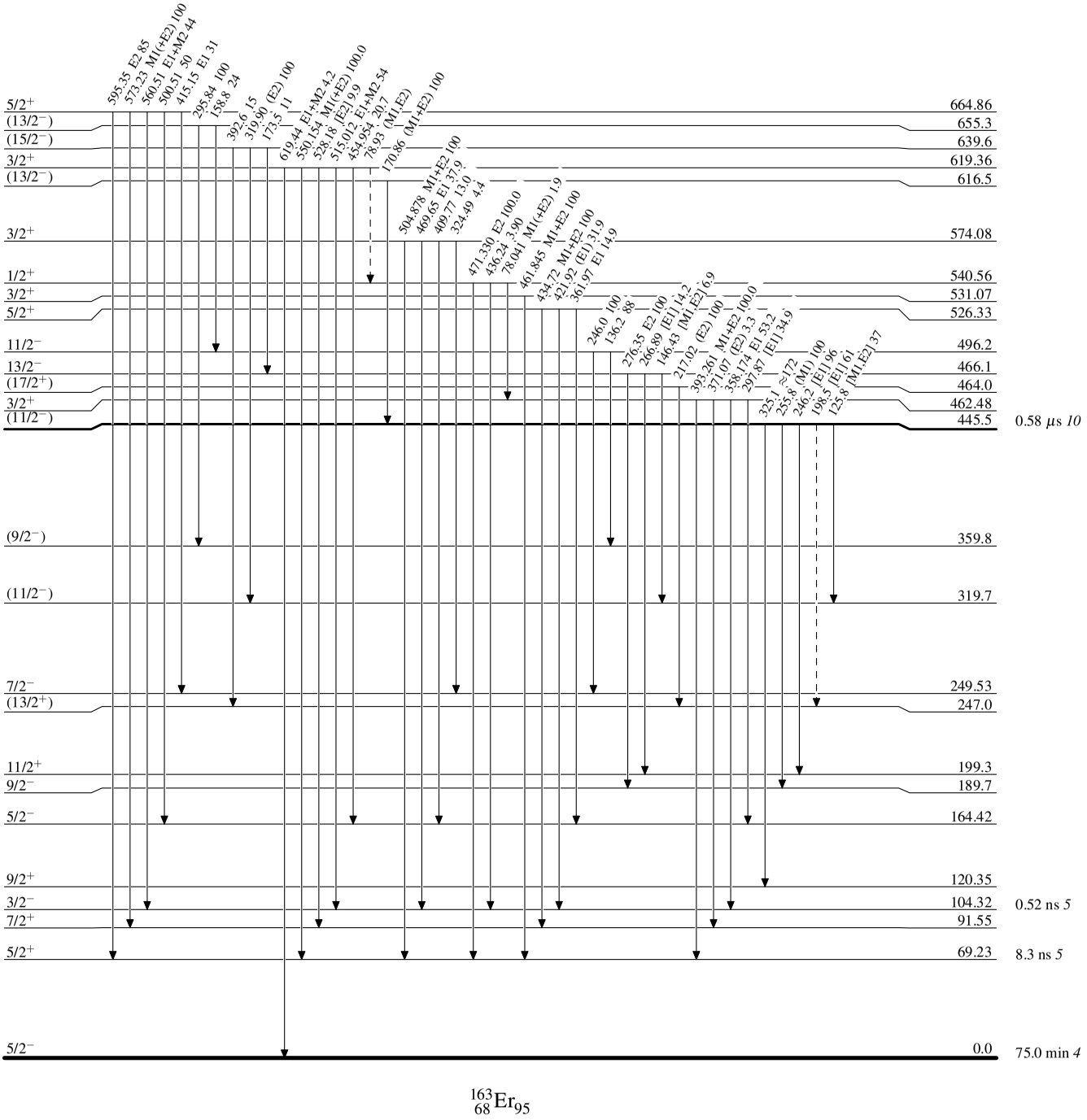
Adopted Levels, Gammas

Legend

Level Scheme (continued)

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

- - - - - - ► γ Decay (Uncertain)



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

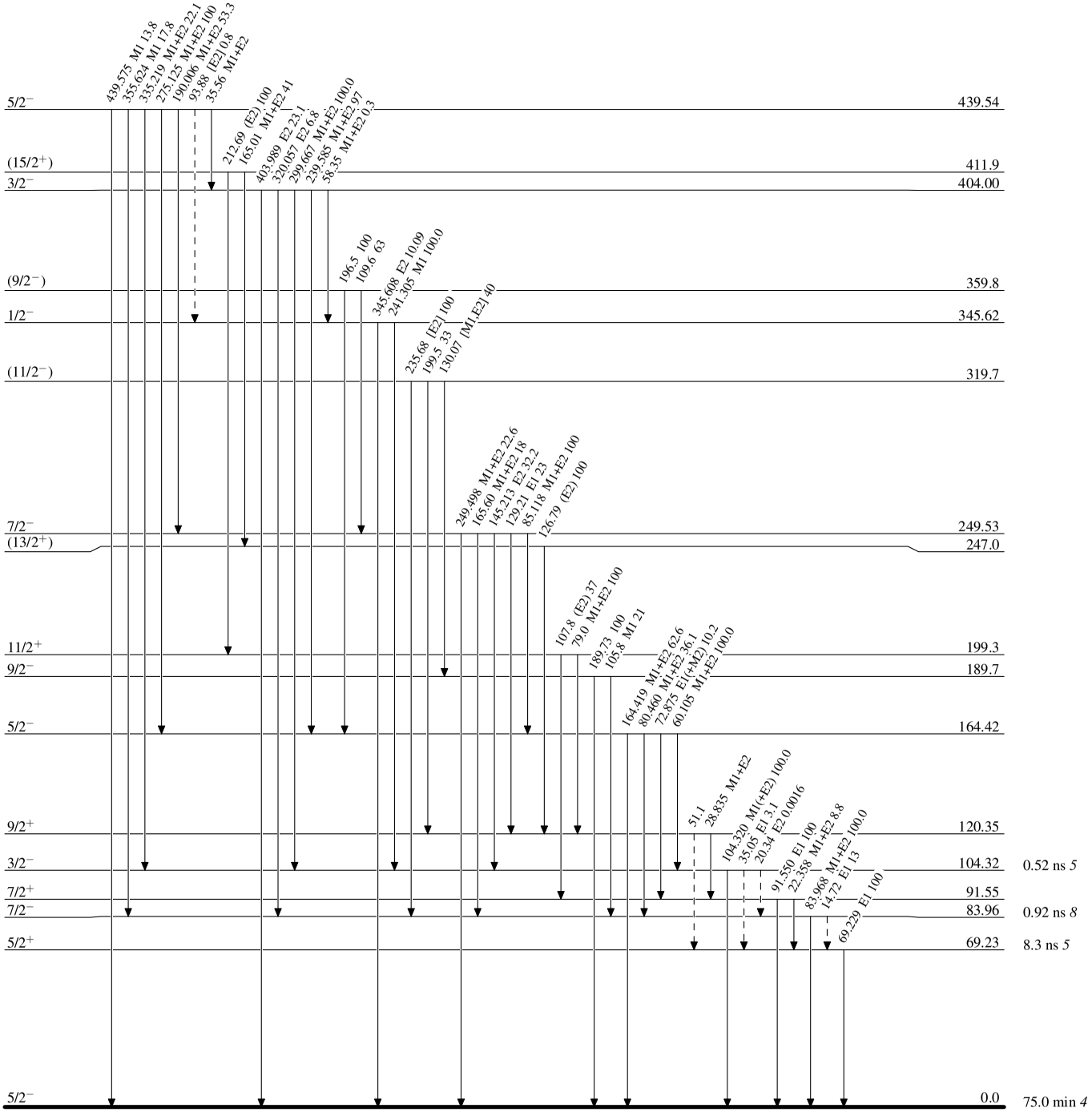
Adopted Levels, Gammas

Legend

Level Scheme (continued)

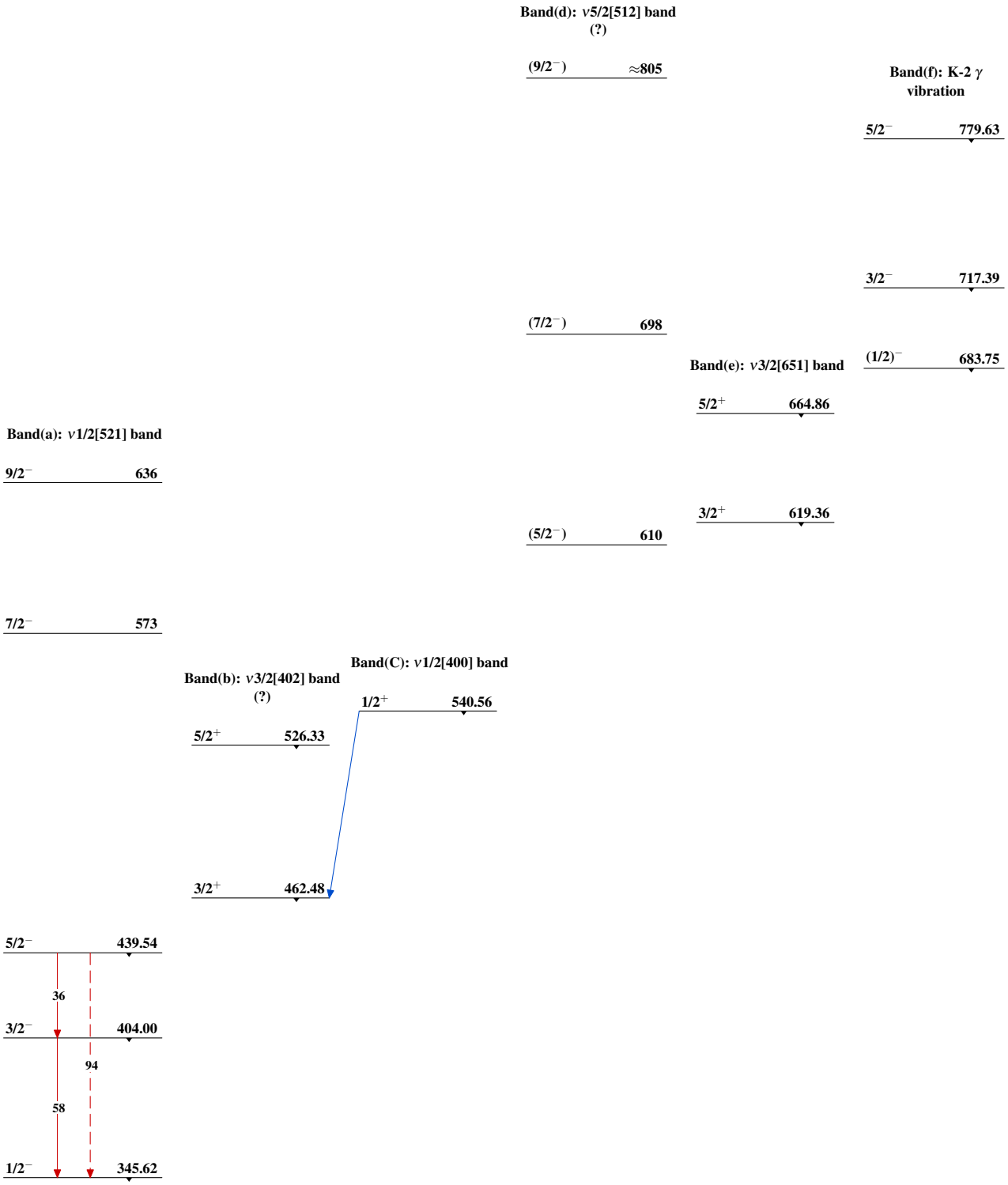
Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

γ Decay (Uncertain)



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

Adopted Levels, Gammas



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

Adopted Levels, Gammas (continued)

Band(h): ν1/2[510] band (?)

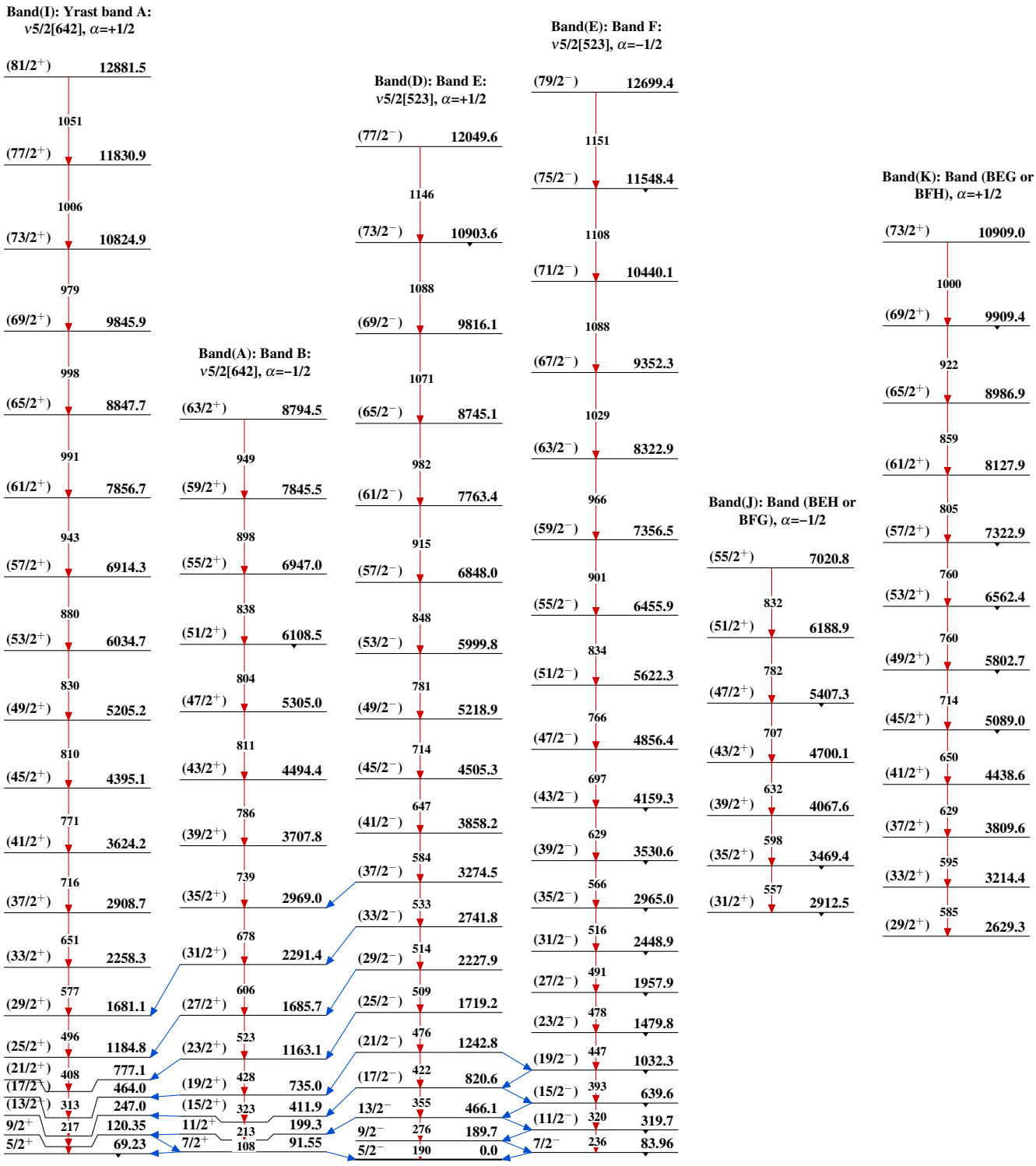
9/2$^-$	1395
7/2$^-$	1245
5/2$^-$	1183
3/2$^-$	1098
(1/2$^-$)	1075

Band(g): ν1/2[530] band

(7/2$^-$)	973
(5/2$^-$)	877
(3/2)$^-$	856.22

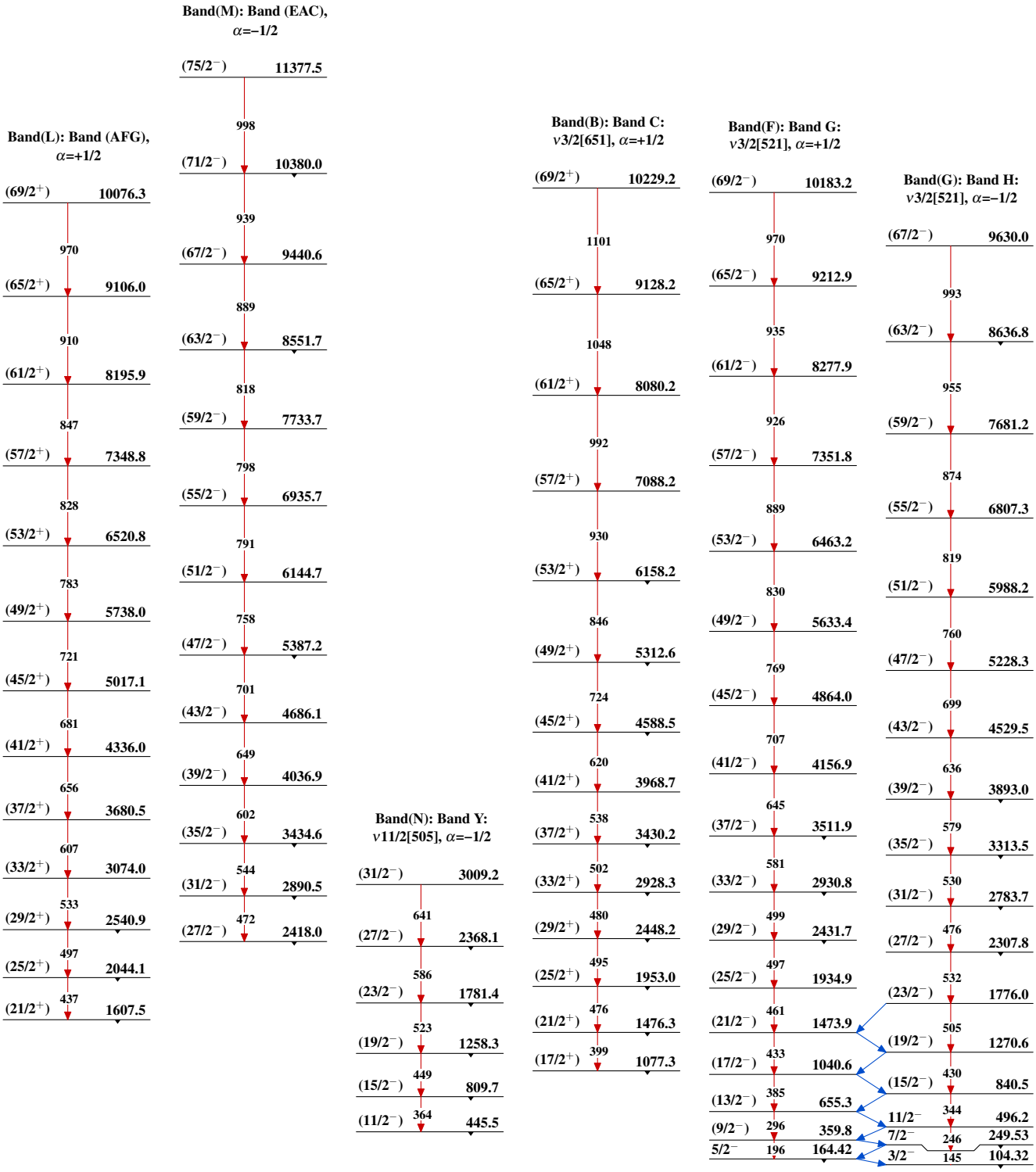
$^{163}_{68}Er_{95}$

Adopted Levels, Gammas (continued)

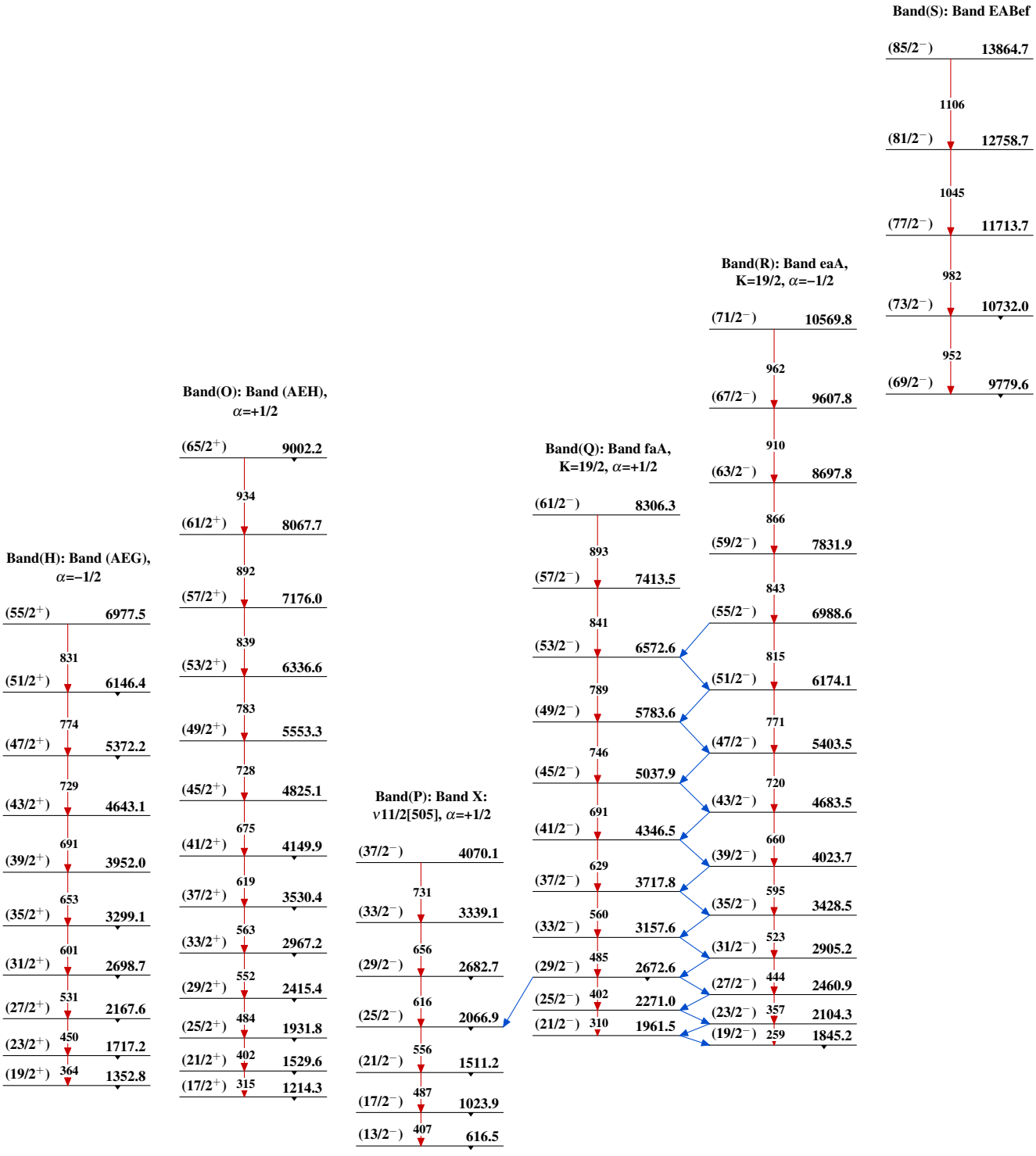


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas (continued)

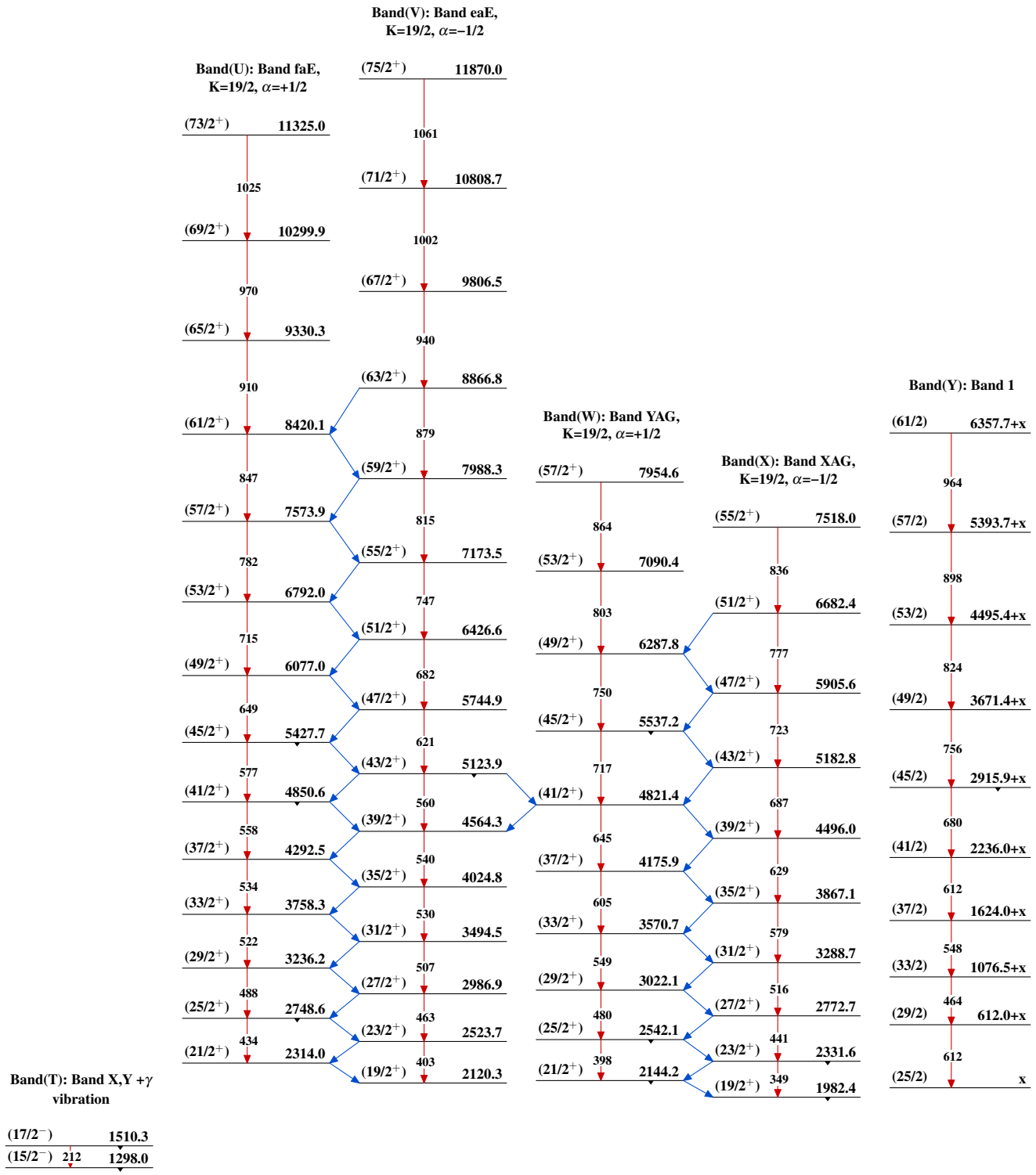


Adopted Levels, Gammas (continued)

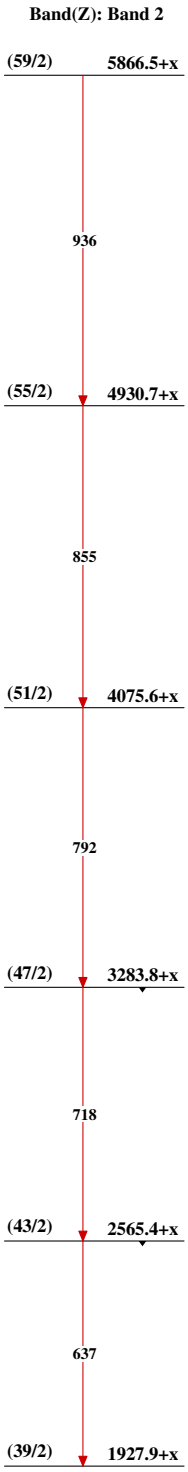


$^{163}_{68}Er_{95}$

Adopted Levels, Gammas (continued)



Adopted Levels, Gammas (continued)



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