Adopted Levels, Gammas

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

Q(β^-)=−3.99×10^3 *3*; S(n)=7.33×10^3 *3*; S(p)=5.66×10^3 *3*; Q(α)=2170 *10* 2017Wa10
Q(ε)=2768.5 *20*; S(2n)=1.729×10^4 *3*; S(2p)=9714 *3*
Additional information 1.
Additional information 2.
Data are from ^{159}Tm ε decay and (HI,xnγ) reactions.
Model calculations that may be of interest: structure of lowest 9/2$^+$ (1979Ka16), signature splitting from triaxial-rotor-plus-one-quasiparticle model (1994Ma01), configuration-dependent cranked Nilsson-Strutinsky calculations and potential-energy-surface diagrams (2008Ma43,2009Ol09) relevant to a tsd band structure.

^{159}Er Levels

Cross Reference (XREF) Flags

- A (HI,xnγ)
- B ^{159}Tm ε decay
- C ^{116}Cd(^{48}Ca,5nγ):tsd

E(level)[†]	J$^\pi$[‡#]	T$_{1/2}$	XREF	Comments
0[@]	3/2$^-$	36 min *1*	AB	%ε+%β^+=100 μ=−0.304 *2*; Q=+1.17 *1* J$^\pi$: J from atomic-beam magnetic-resonance (1969Ek01); π from μ value for ν3/2[521] Nilsson orbital (1989Be04). T$_{1/2}$: From 1966La11. Others:≈1 h (1961Ab06); 1.0 h *3* (1965St08); 50 min *15* (quoted in 1968Ab16). μ: From the evaluation of 1989Ra17 and the compilation of 2005St24. Q: From the evaluation of 1989Ra17 and the compilation of 2005St24.
59.249[&] *14*	5/2$^-$	≤0.3 ns	AB	J$^\pi$: From M1 γ to 3/2$^-$ level and expected band structure. T$_{1/2}$: From ^{159}Tm ε decay (1983Be17). Other:≤0.20 ns (1975VaYW).
144.232[@] *14*	7/2$^-$	<0.17 ns	AB	J$^\pi$: From M1 γ to 5/2$^-$ level and expected band structure. T$_{1/2}$: From ^{159}Tm ε decay (1983Be17).
182.602[b] *24*	9/2$^+$	0.337 μs *14*	AB	J$^\pi$: From E1 γ to 7/2$^-$ level and similar low-energy 9/2$^+$ isomers in ^{161}Er, ^{159}Dy, and ^{151}Sm. configuration: Model calculations of 1979Ka16 suggest contributions from ν3/2[651] (51%), ν1/2[660] (33%), and ν5/2[642] (13%). T$_{1/2}$: From ^{159}Tm ε decay (1975Bu10). Others: 0.31 μs *3* (1975St07), from ^{159}Tm ε decay, and 0.32 μs *3*, from (HI,xnγ) (1971LeYU).
220.330[a] *14*	5/2$^-$	0.210 ns *20*	B	J$^\pi$: From M1 γ to 3/2$^-$ level, (M1) γ to 7/2$^-$ level, and expected band structure. T$_{1/2}$: From ^{159}Tm ε decay (1983Be17).
225[e]	13/2$^+$		A	J$^\pi$: From γ to 9/2$^+$ level and proposed band structure.
258.270[&] *22*	9/2$^-$		AB	J$^\pi$: From E2 γ to 5/2$^-$ level, M1 γ to 7/2$^-$, and expected band structure.
271.481[b] *16*	5/2$^+$		B	J$^\pi$: From E1 γ's to 3/2$^-$ and 7/2$^-$ levels.
302.49[b] *3*	7/2$^+$	220 ps *10*	B	J$^\pi$: From (E1) γ to 5/2$^-$ level, M1 γ to 9/2$^+$, and expected band structure. T$_{1/2}$: From ^{159}Tm ε decay (1983Be17).
307.211[a] *22*	7/2$^-$		B	J$^\pi$: From M1 γ's to 5/2$^-$ and 7/2$^-$ levels and γ to 9/2$^+$.
348.336[c] *14*	3/2$^+$		B	J$^\pi$: From E1 γ's to 3/2$^-$ and 5/2$^-$ levels and expected presence of a K$^\pi$=3/2$^+$ bandhead.
362.5[f]	(11/2$^+$)		A	J$^\pi$: From (M1) γ to 13/2$^+$ level and proposed band structure.
429.05[o] *3*	11/2$^-$	0.59 μs *6*	AB	J$^\pi$: From M1 γ to 9/2$^-$ level and (E2) γ to 7/2$^-$. The small B(E2)(W.u.)

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Adopted Levels, Gammas (continued)

^{159}Er Levels (continued)

E(level)[†]	Jπ[‡#]	$T_{1/2}$	XREF	Comments
				to the 7/2⁻ member of the 3/2⁻ g.s. band indicates that this state is not a member of that band. Assigned as the ν11/2[505] bandhead (1971LeYU in HI,xnγ).
				$T_{1/2}$: Weighted average of 0.55 μs *15* from ^{159}Tm ε decay (1975St07) and 0.60 μs *6* from (HI,xnγ) (1971LeYU).
435[e]	(17/2⁺)	100 ps *4*	A	Jπ: From E2 γ to 13/2⁺ level and expected band structure. $T_{1/2}$: Weighted average of 95 ps *5* (1974Na08) and 103 ps *+3–4* from (HI,xnγ) (1986Os02).
449.44 *4*	(5/2⁻,7/2,9/2⁻)		B	Jπ: From γ's to 5/2⁻ and 9/2⁻ levels.
468.11 *3*	(3/2,5/2)⁺		B	Jπ: From M1 γ to 5/2⁺ level and (M1) γ to 3/2⁺.
555.11 *3*	(5/2)⁻		B	Jπ: From E1 γ to 7/2⁺ level and γ to 3/2⁺.
565.81[d] *7*	(7/2)⁻		B	Jπ: From E2 γ to 11/2⁻ level, γ to 7/2⁺, and expected band structure.
574[&]	13/2⁻		A	Jπ: From E2 γ to 9/2⁻ level and (M1) γ to 11/2⁻.
591[f]	(15/2⁺)		A	Jπ: From M1 γ's to 13/2⁺ and 17/2⁺ levels.
616.01 *6*	(3/2⁺,5/2,7/2⁺)		B	Jπ: From γ's to 3/2⁺ and 7/2⁺ levels.
617.18 *3*	(5/2⁻,7/2⁻)		B	Jπ: From γ's to 3/2⁻, 9/2⁻, and, possibly, 9/2⁺ levels.
717.18 *10*	(5/2⁺,7/2)		B	Jπ: From γ's to 9/2⁺, 5/2⁻, and 5/2⁺ levels.
785[e]	21/2⁺	9.1 ps *8*	A	μ≤0.74 Jπ: From E2 γ to 17/2⁺ level and expected band structure. $T_{1/2}$: Weighted average of 8.2 ps *9* (1974Na08) and 9.8 ps *+7–8* (1986Os02) from (HI,xnγ). μ: From the evaluation by 1989Ra17, based on data of 1980Sp03. See also the compilation by 2005St24.
790.78 *6*			B	
833[@]	15/2⁻		A	Jπ: From (E2) γ to 11/2⁻ level and expected band structure.
890.65 *6*			B	
962[f]	(19/2⁺)		A	Jπ: From M1 γ's to (17/2⁺) and (21/2⁺) levels.
963.70 *5*	(3/2,5/2,7/2)⁺		B	Jπ: From E1 γ to (5/2)⁻ level.
990[&]	17/2⁻		A	Jπ: From E2 γ to 13/2⁻ level, (M1) γ to 15/2⁻, and expected band structure.
990.80 *15*			B	
1050.09 *12*			B	
1190.95 *18*			B	
1251[e]	(25/2⁺)	2.1 ps *+4–6*	A	Jπ: From E2 γ to (21/2⁺) level and expected band structure. $T_{1/2}$: From (HI,xnγ) (1986Os02).
1317.96 *16*	(7/2)		B	
1449[f]	(23/2⁺)		A	
1479[&]	21/2⁻		A	
1715	(23/2⁺)		A	
1807[e]	(29/2⁺)	1.5 ps *+3–6*	A	$T_{1/2}$: From (HI,xnγ) (1986Os02).
2012[&]	25/2⁻		A	
2027[f]	(27/2⁺)		A	
2089[g]	25/2⁻		A	
2231[j]	19/2⁻		A	
2261[@]	27/2⁻		A	
2293[i]	21/2⁻		A	
2394[j]	23/2⁻		A	
2434[e]	(33/2⁺)		A	
2475[&]	29/2⁻		A	
2523[i]	25/2⁻		A	
2551[h]	29/2⁻		A	

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Adopted Levels, Gammas (continued)

^{159}Er Levels (continued)

E(level)†	Jπ‡#	XREF	E(level)†	Jπ‡#	XREF
2582[g]	29/2−	A	6670[h]	53/2−	A
2663[@]	31/2−	A	6729[i]	53/2−	A
2677[f]	(31/2+)	A	6883[@]	55/2−	A
2689[j]	27/2−	A	7052[e]	(57/2+)	A
2883[i]	29/2−	A	7117[j]	55/2−	A
2912[&]	33/2−	A	7295[&]	57/2−	A
3099[h]	33/2−	A	7519[i]	57/2−	A
3106[j]	31/2−	A	7536[h]	(57/2−)	A
3111[e]	37/2+	A	7753[@]	59/2−	A
3147[@]	35/2−	A	7934[j]	59/2−	A
3200[g]	33/2−	A	7958[e]	61/2+	A
3356[i]	33/2−	A	8161[&]	61/2−	A
3382[f]	(35/2+)	A	8365[i]	61/2−	A
3439[&]	37/2−	A	8441[h]	(61/2−)	A
3629[j]	35/2−	A	8664[@]	63/2−	A
3695[h]	37/2−	A	8812[j]	63/2−	A
3734[@]	39/2−	A	8884[e]	65/2+	A
3821[e]	41/2+	A	9073[&]	65/2−	A
3864[g]	37/2−	A	9276[i]	(65/2−)	A
3923[i]	37/2−	A	9359[h]	(65/2−)	A
4065[&]	41/2−	A	9632[@]	67/2−	A
4130[f]	(39/2+)	A	9757[j]	(67/2−)	A
4236[j]	39/2−	A	9840[e]	69/2+	A
4353[h]	41/2−	A	10047[&]	69/2−	A
4421[@]	43/2−	A	10255[i]	(69/2−)	A
4561[e]	45/2+	A	10308[h]	(69/2−)	A
4564[i]	41/2−	A	10659[@]	71/2−	A
4585[g]	41/2−	A	10768[j]	(71/2−)	A
4786[&]	45/2−	A	10837[e]	73/2+	A
4905[f]	(43/2+)	A	11091[&]	(73/2−)	A
4906[j]	43/2−	A	11300[i]	(73/2−)	A
5075[h]	45/2−	A	11302[h]	(73/2−)	A
5193[@]	47/2−	A	11745[@]	(75/2−)	A
5256[i]	45/2−	A	11843[j]	(75/2−)	A
5343[e]	49/2+	A	11883[e]	(77/2+)	A
5587[&]	49/2−	A	12199[&]	(77/2−)	A
5615[j]	47/2−	A	12348[h]	(77/2−)	
5851[h]	49/2−	A	12411[i]	(77/2−)	A
5980[i]	49/2−	A	12891[@]	(79/2−)	A
6026[@]	51/2−	A	12969[j]	(79/2−)	A
6175[e]	53/2+	A	12981[e]	(81/2+)	
6350[j]	51/2−	A	13325[&]	(81/2−)	A
6438[&]	53/2−	A	13553[i]	(81/2−)	A

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Adopted Levels, Gammas (continued)

^{159}Er Levels (continued)

E(level)[†]	Jπ[‡#]	XREF	Comments
14099[@]	(83/2−)	A	
14114	(85/2+)		
14134[j]	(83/2−)	A	
14135[e]	(85/2+)	A	
14433[&]	(85/2−)	A	
14747[i]	(85/2−)	A	
15266	(89/2+)	A	
15342[j]	(87/2−)	A	
15372[e]	(89/2+)	A	
15536?[&]	(89/2−)	A	
16607	(93/2+)	A	
16649[e]	(93/2+)	A	
16680?[&]	(93/2−)	A	
17888?[&]	(97/2−)	A	
x[k]	(11/2−)	A	E(level): from 1998Si03, x > 225 keV from expected decay to Kπ=13/2+ band.
x+204[l]	(13/2−)	A	
x+430[k]	(15/2−)	A	
x+673[l]	(17/2−)	A	
x+935[k]	(19/2−)	A	
x+1209[l]	(21/2−)	A	
x+1499[k]	(23/2−)	A	
x+1795[l]	(25/2−)	A	
x+2104[k]	(27/2−)	A	
x+2415[l]	(29/2−)	A	
x+2729[k]	(31/2−)	A	
x+3026[l]	(33/2−)	A	
x+3309[k]	(35/2−)	A	
x+3584[l]	(37/2−)	A	
x+3882[k]	(39/2−)	A	
x+4196[l]	(41/2−)	A	
x+4541[k]	(43/2−)	A	
x+4896[l]	(45/2−)	A	
x+5674[l]	(49/2−)	A	
x+6525[l]	(53/2−)	A	
x+7431[l]	(57/2−)	A	
y[m]	(35/2+)	A	E(level): from 1998Si03, y > 3105.
y+216[n]	(37/2+)	A	
y+442[m]	(39/2+)	A	

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Adopted Levels, Gammas (continued)

^{159}Er Levels (continued)

E(level)[†]	Jπ[‡#]	XREF	Comments
y+689[n]	(41/2+)	A	
y+953[m]	(43/2+)	A	
y+1248[n]	(45/2+)	A	
y+1565[m]	(47/2+)	A	
y+1910[n]	(49/2+)	A	
y+2276[m]	(51/2+)	A	
y+2670[n]	(53/2+)	A	
y+3082[m]	(55/2+)	A	
y+3520[n]	(57/2+)	A	
y+3976[m]	(59/2+)	A	
y+4449[n]	(61/2+)	A	
y+4942[m]	(63/2+)	A	
y+5435[n]	(65/2+)	A	
z[p]	J	C	Jπ: J≈57/2.
z+911[p]	J+2	C	
z+1859[p]	J+4	C	
z+2849[p]	J+6	C	
z+3883[p]	J+8	C	
z+4957[p]	J+10	C	
z+6071[p]	J+12	C	
z+7222[p]	J+14	C	
z+8436[p]	J+16	C	
z+9706[p]	J+18	C	
z+11047[p]	J+20	C	

[†] Energies are from the separate least-squares fits to the decay data and the (HI,xnγ) data.
[‡] Configurations are discussed in 1975Ag03, 1975St07, 1983Be17, 1987De18, 1998Si03, 2008Ma43, and 2009Ol09.
[#] For levels below 1350 keV, level specific arguments are given. Above this energy, assignments are based on stretched E2 character of γ transitions deduced from γ(θ) measurements in (HI,xnγ) studies, the proposed band structure and interpretation of the results of cranked shell-model calculations.
[@] Band(A): $K^\pi=3/2^-$, ν3/2[521] band, α=−1/2.
[&] Band(a): $K^\pi=3/2^-$, ν3/2[521] band, α=+1/2.
[a] Band(B): $K^\pi=5/2^-$, ν5/2[523] band.
[b] Band(C): $K^\pi=5/2^+$, ν5/2[642] band. Strongly Coriolis-mixed with other $\nu i_{13/2}$-based Nilsson orbitals.
[c] Band(D): $K^\pi=3/2^+$, mixed ν(3/2[402]+3/2[651]) bandhead.
[d] Band(E): $K^\pi=7/2^-$, ν7/2[514] bandhead.
[e] Band(F): $\nu i_{13/2}$, yrast band; α=+1/2 branch.
[f] Band(f): $\nu i_{13/2}$, yrast band; α=−1/2 branch.
[g] Band(G): -π band, α=+1/2 branch.
[h] Band(H): -π band, α=+1/2 branch.
[i] Band(I): $K^\pi=17/2^-$ band, α=+1/2 branch.
[j] Band(i): $K^\pi=17/2^-$ band, α=−1/2 branch.
[k] Band(J): -π band, α=−1/2 branch.
[l] Band(j): -π band, α=+1/2 branch.
[m] Band(K): +π band, α=−1/2 branch.
[n] Band(k): +π band, α=+1/2 branch.
[o] Band(L): $K^\pi=11/2^-$, ν11/2[505], bandhead.
[p] Band(M): Triaxial SD band. Suggested conf is (relative to the ^{146}Gd core) $\pi[(h_{11/2})^6(h_{9/2}f_{7/2})^1(i_{13/2})^1]\otimes \nu[(N=4)^{-2}(h_{11/2})^{-2}(i_{13/2})^5]$, with the estimated deformation parameters $\varepsilon_2\approx0.37$ and $\gamma\approx+20°$.

Adopted Levels, Gammas (continued)

$\gamma(^{159}Er)$

Unplaced γ's are not given here; see ^{159}Tm ε decay.

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	δ[‡]	α[#]	Comments
59.249	5/2$^-$	59.29 *3*	100	0	3/2$^-$	M1+E2	<0.33	13.3 *6*	B(M1)(W.u.)>0.021
144.232	7/2$^-$	84.98 *2*	100 *10*	59.249	5/2$^-$	M1+E2	<0.37	4.60 *9*	B(M1)(W.u.)>0.029
		144.24 *2*	34 *3*	0	3/2$^-$	E2		0.773	B(E2)(W.u.)>57 I_γ: From ^{159}Er ε decay. Other: 82 *18*, from (HI,xnγ).
182.602	9/2$^+$	38.32 *3*	100	144.232	7/2$^-$	E1		0.801	B(E1)(W.u.)=6.7×10^{-6} *3*
220.330	5/2$^-$	76.13 *7*	5.2 *16*	144.232	7/2$^-$	(M1)		6.24	B(M1)(W.u.)=0.0047 *16*
		161.09 *2*	59 *3*	59.249	5/2$^-$	M1+E2		0.63 *11*	
		220.30 *2*	100	0	3/2$^-$	M1		0.308	B(M1)(W.u.)=0.0037 *4*
225	13/2$^+$	43	100	182.602	9/2$^+$				
258.270	9/2$^-$	114.03 *3*	54 *4*	144.232	7/2$^-$	M1		1.95	I_γ: From (HI,xnγ). Other: 82 *9*, from ^{159}Tm ε decay.
		199.06 *3*	100 *5*	59.249	5/2$^-$	E2		0.256	
271.481	5/2$^+$	88.93 *4*	14.9 *11*	182.602	9/2$^+$	E2		4.61	
		127.12 *6*	10.3 *11*	144.232	7/2$^-$	E1		0.1719	
		212.23 *5*	23 *3*	59.249	5/2$^-$	E1		0.0446	
		271.42 *2*	100 *3*	0	3/2$^-$	E1		0.0238	
302.49	7/2$^+$	119.82[&] *6*	100[&] *13*	182.602	9/2$^+$	M1		1.697	B(M1)(W.u.)=0.019 *4* I_γ: Value chosen to give I(ε+β^+)=0.0 for 2nd-forbidden branch from ^{159}Tm to the 9/2$^+$ level at 182 keV. Mult.: Reported as M1, but γ is a doublet.
		243.27 *3*	41 *2*	59.249	5/2$^-$	(E1)		0.0314	B(E1)(W.u.)=9.6×10^{-6} *13*
307.211	7/2$^-$	87.09 *6*	25 *7*	220.330	5/2$^-$	M1		4.23	
		124.40 *10*	8.5 *17*	182.602	9/2$^+$	[E1]		0.182	
		163.04 *3*	100 *7*	144.232	7/2$^-$	M1		0.710	
		247.87[&] *20*	76[&] *3*	59.249	5/2$^-$	M1		0.223	I_γ: Division of Iγ in ^{159}Tm ε decay assumes possible 247 γ from 428 level has negligible intensity.
348.336	3/2$^+$	76.13 *7*	5.0 *15*	271.481	5/2$^+$	M1		6.24	
		127.98 *2*	73 *5*	220.330	5/2$^-$	E1		0.1688	
		289.11 *2*	100 *5*	59.249	5/2$^-$	E1		0.0203	
		348.40 *2*	76 *5*	0	3/2$^-$	E1		0.01287	
362.5	(11/2$^+$)	137.0	100			(M1)		1.160	
429.05	11/2$^-$	170.75 *9*	88 *6*	258.270	9/2$^-$	M1		0.624	B(M1)(W.u.)=2.6×10^{-6} *4* B(M1)(W.u.): Calculation assumes 247 γ has negligible intensity. I_γ: from (HI,xnγ); other: 37 *5* from ^{159}Tm ε decay.
		247		182.602	9/2$^+$				
		284.84 *3*	100 *5*	144.232	7/2$^-$	(E2)		0.0809	B(E2)(W.u.)=0.0040 *5* B(E2)(W.u.): Calculation assumes 247 γ has negligible intensity.
435	(17/2$^+$)	210	100	225	13/2$^+$	E2		0.214	B(E2)(W.u.)=223 *11*

$^{159}_{68}Er_{91}$-6

Adopted Levels, Gammas (continued)

γ(^{159}Er) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	α[#]	Comments
449.44	(5/2⁻,7/2,9/2⁻)	142.23 *6*	89 *11*	307.211	7/2⁻			
		191.21 *6*	89 *14*	258.270	9/2⁻			
		229.06 *7*	100 *19*	220.330	5/2⁻			
468.11	(3/2,5/2)⁺	119.82[&] *6*	41[&] *27*	348.336	3/2⁺	(M1)	1.697	I_γ: Value for the other 119 γ chosen to give I(ε+β⁺)=0.0 for 2nd-forbidden branch from ^{159}Tm ε decay to the 9/2⁺ level at 182 keV. Mult.: Reported as M1, but γ is doublet.
		196.62 *3*	100 *5*	271.481	5/2⁺	M1(+E2)	0.34 *8*	
		247.70[&] *20*	≤16[&]	220.330	5/2⁻	[E1]	0.0300	I_γ: Division of Iγ assumes intensity of the possible 247 from 428 level is negligible.
555.11	(5/2)⁻	105.8 *3*	2.0 *10*	449.44	(5/2⁻,7/2,9/2⁻)			
		206.8 *3*	60 *20*	348.336	3/2⁺			
		252.70 *5*	100 *30*	302.49	7/2⁺	E1	0.0285	
		296.70 *20*	40 *10*	258.270	9/2⁻			
		334.75 *3*	81 *8*	220.330	5/2⁻			
565.81	(7/2)⁻	136.80 *6*	100 *10*			E2	0.932	
		262.90 *20*	9.3 *19*	302.49	7/2⁺			
		307.50 *20*	79 *19*	258.270	9/2⁻	(M1)	0.1248	
574	13/2⁻	144.7	5.8 *16*	429.05	11/2⁻	(M1)	0.994	
		316	100.0 *16*	258.270	9/2⁻	E2	0.0590	
591	(15/2⁺)	155.9	30.3 *15*	435	(17/2⁺)	M1	0.806	
		228	48 *3*	362.5	(11/2⁺)	E2	0.1636	
		364.7	100 *5*			M1	0.0793	
616.01	(3/2⁺,5/2,7/2⁺)	267.62 *9*	36 *7*	348.336	3/2⁺			
		313.50 *15*	100 *21*	302.49	7/2⁺			
		344.65 *15*	12 *4*	271.481	5/2⁺			
		395.70 *10*	50 *8*	220.330	5/2⁻			Mult.: Measurements indicate (E2), which is consistent only with J^π=5/2⁻.
617.18	(5/2⁻,7/2⁻)	358.94 *3*	59 *5*	258.270	9/2⁻	(M1)	0.0827	
		434.40[@] *6*	100[@] *6*	182.602	9/2⁺			
		473.00 *6*	68 *5*	144.232	7/2⁻	(M1)	0.0403	
		617.1 *4*	25 *9*	0	3/2⁻	(E2)	0.00976	
717.18	(5/2⁺,7/2)	445.70 *7*	100 *7*	271.481	5/2⁺	(M1,E2)		
		496.88 *12*	41 *7*	220.330	5/2⁻			
		534.60 *20*	93 *21*	182.602	9/2⁺			
		572.50[a] *25*	26 *7*	144.232	7/2⁻	(M1,E2)		
785	21/2⁺	351	100	435	(17/2⁺)	E2	0.0433	B(E2)(W.u.)=219 *20*
790.78		361.75 *5*	50 *4*	429.05	11/2⁻	(M1)	0.0811	
		532.20 *20*	100 *21*	258.270	9/2⁻	(M1)	0.0297	
833	15/2⁻	404	100			(E2)	0.0291	
890.65		422.53 *5*	100 *6*	468.11	(3/2,5/2)⁺	(M1)	0.0539	

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Adopted Levels, Gammas (continued)

γ(^{159}Er) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	α[#]	Comments
890.65		583.5 *3*	34 *13*	307.211	7/2$^-$			
		619.3 *3*	50 *17*	271.481	5/2$^+$	(M1,E2)	0.015 *6*	
962	(19/2$^+$)	176.3	15 *2*	785	21/2$^+$	M1	0.571	
		371	100 *3*	591	(15/2$^+$)	E2	0.0369	
		526.8	48 *2*	435	(17/2$^+$)	M1	0.0305	
963.70	(3/2,5/2,7/2)$^+$	246.7 *3*	7 *3*	717.18	(5/2$^+$,7/2)			
		408.59 *3*	100 *6*	555.11	(5/2)$^-$	E1	0.00883	
990	17/2$^-$	156.4	3.5 *12*	833	15/2$^-$	(M1)	0.798	
		416	100.0 *17*	574	13/2$^-$	E2	0.0268	
990.80		770.60 *20*	100 *20*	220.330	5/2$^-$			
		990.80 *20*	100 *20*	0	3/2$^-$			
1050.09		434.25[@] *15*	100[@] *20*	616.01	(3/2$^+$,5/2,7/2$^+$)			
		778.70 *20*	40 *8*	271.481	5/2$^+$			
		792.3 *3*	40 *12*	258.270	9/2$^-$			
		906.1 *4*	40 *12*	144.232	7/2$^-$			
1190.95		762.1 *15*	100 *17*					
		888.3 *3*	33 *9*	302.49	7/2$^+$			
		933.10 *25*	33 *9*	258.270	9/2$^-$			
		1131.9 *4*	22 *7*	59.249	5/2$^-$			
1251	(25/2$^+$)	466	100	785	21/2$^+$	E2	0.0198	B(E2)(W.u.)=2.4×10^2 *+7−5*
1317.96	(7/2)	1059.80 *20*	25 *8*	258.270	9/2$^-$			
		1135.60 *25*	100 *21*	182.602	9/2$^+$			
		1174.5[a] *4*	25 *8*	144.232	7/2$^-$			
1449	(23/2$^+$)	197.5	9.2 *26*	1251	(25/2$^+$)	M1	0.417	
		486	100 *5*	962	(19/2$^+$)	E2	0.01770	
		662.9	26.3 *26*	785	21/2$^+$	M1	0.01704	
1479	21/2$^-$	489	100	990	17/2$^-$	E2	0.01742	
1715	(23/2$^+$)	930	100	785	21/2$^+$			
1807	(29/2$^+$)	558	100	1251	(25/2$^+$)	E2	0.01247	B(E2)(W.u.)=1.3×10^2 *+6−3*
2012	25/2$^-$	533	100	1479	21/2$^-$	E2	0.01398	
2027	(27/2$^+$)	219.5	7.8 *20*	1807	(29/2$^+$)	M1	0.311	
		578	100 *4*	1449	(23/2$^+$)	E2	0.01143	
		776.4	25 *4*	1251	(25/2$^+$)	M1	0.01149	
2089	25/2$^-$	640	100	1449	(23/2$^+$)	E1	0.00329	
2231	19/2$^-$	1445	100	785	21/2$^+$			
		1796	100	435	(17/2$^+$)			
2261	27/2$^-$	1010	100	1251	(25/2$^+$)	(E1)	0.00134	
2394	23/2$^-$	102	100	2293	21/2$^-$			
2434	(33/2$^+$)	628	100	1807	(29/2$^+$)	E2	0.00936	
2475	29/2$^-$	386	79 *7*	2089	25/2$^-$	E2	0.0330	
		448	100 *7*	2027	(27/2$^+$)	E1	0.00715	

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Adopted Levels, Gammas (continued)

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

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	α[#]
2475	29/2$^-$	463	82 *7*	2012	25/2$^-$	E2	0.0201
2523	25/2$^-$	131		2394	23/2$^-$		
		228		2293	21/2$^-$		
		809		1715	(23/2$^+$)		
		1072		1449	(23/2$^+$)		
		1272		1251	(25/2$^+$)		
2551	29/2$^-$	462		2089	25/2$^-$		
		540		2012	25/2$^-$		
		744		1807	(29/2$^+$)		
2582	29/2$^-$	570	100	2012	25/2$^-$		
2663	31/2$^-$	402	23 *3*	2261	27/2$^-$	(E2)	0.0295
		856	100 *7*	1807	(29/2$^+$)	E1	0.00184
2677	(31/2$^+$)	650	100	2027	(27/2$^+$)	E2	0.00863
2689	27/2$^-$	166		2523	25/2$^-$		
		294		2394	23/2$^-$		
2883	29/2$^-$	194		2689	27/2$^-$		
		359		2523	25/2$^-$		
2912	33/2$^-$	437	100	2475	29/2$^-$	E2	0.0235
3099	33/2$^-$	547		2551	29/2$^-$		
		665		2434	(33/2$^+$)		
3106	31/2$^-$	223		2883	29/2$^-$		
		417		2689	27/2$^-$		
3111	37/2$^+$	677	100	2434	(33/2$^+$)	E2	0.00785
3147	35/2$^-$	485	100 *3*	2663	31/2$^-$	E2	0.01779
		714	28 *5*	2434	(33/2$^+$)	E1	0.00263
3200	33/2$^-$	618	100	2582	29/2$^-$		
3356	33/2$^-$	250		3106	31/2$^-$		
		473		2883	29/2$^-$		
3382	(35/2$^+$)	705	100	2677	(31/2$^+$)	E2	0.00715
3439	37/2$^-$	527	100	2912	33/2$^-$	E2	0.01438
3629	35/2$^-$	274		3356	33/2$^-$		
		523		3106	31/2$^-$		
3695	37/2$^-$	596	100	3099	33/2$^-$		
3734	39/2$^-$	588		3147	35/2$^-$	E2	0.01096
		626		3111	37/2$^+$		
3821	41/2$^+$	710	100	3111	37/2$^+$	E2	0.00704
3864	37/2$^-$	664	100	3200	33/2$^-$		
3923	37/2$^-$	294		3629	35/2$^-$		
		567		3356	33/2$^-$		
4065	41/2$^-$	626	100	3439	37/2$^-$	E2	0.00943
4130	(39/2$^+$)	748	100	3382	(35/2$^+$)	E2	0.00626
4236	39/2$^-$	313		3923	37/2$^-$		
4236	39/2$^-$	607		3629	35/2$^-$		
4353	41/2$^-$	658	100	3695	37/2$^-$		
4421	43/2$^-$	687	100	3734	39/2$^-$	E2	0.00759
4561	45/2$^+$	740	100	3821	41/2$^+$	E2	0.00641
4564	41/2$^-$	328		4236	39/2$^-$		
		641		3923	37/2$^-$		
4585	41/2$^-$	721	100	3864	37/2$^-$		
4786	45/2$^-$	721	100	4065	41/2$^-$	E2	0.00680
4905	(43/2$^+$)	775	100	4130	(39/2$^+$)	E2	0.00578
4906	43/2$^-$	342		4564	41/2$^-$		
		669		4236	39/2$^-$		
5075	45/2$^-$	722	100	4353	41/2$^-$		
5193	47/2$^-$	772	100	4421	43/2$^-$	E2	0.00583
5256	45/2$^-$	351		4906	43/2$^-$		
		692		4564	41/2$^-$		
5343	49/2$^+$	782	100	4561	45/2$^+$	E2	0.00567
5587	49/2$^-$	801	100	4786	45/2$^-$	E2	0.00538
5615	47/2$^-$	359		5256	45/2$^-$		
		710		4906	43/2$^-$		
5851	49/2$^-$	776	100	5075	45/2$^-$		
5980	49/2$^-$	364		5615	47/2$^-$		
		723		5256	45/2$^-$		
6026	51/2$^-$	833	100	5193	47/2$^-$	E2	0.00494
6175	53/2$^+$	832	100	5343	49/2$^+$	E2	0.00495
6350	51/2$^-$	371		5980	49/2$^-$		
		735		5615	47/2$^-$		
6438	53/2$^-$	851	100	5587	49/2$^-$	E2	0.00472
6670	53/2$^-$	819	100	5851	49/2$^-$		
6729	53/2$^-$	379		6350	51/2$^-$		
		749		5980	49/2$^-$		
6883	55/2$^-$	857	100	6026	51/2$^-$		
7052	(57/2$^+$)	877	100	6175	53/2$^+$	E2	0.00442
7117	55/2$^-$	388		6729	53/2$^-$		
		767		6350	51/2$^-$		
7295	57/2$^-$	857	100	6438	53/2$^-$	E2	0.00465
7519	57/2$^-$	402		7117	55/2$^-$		
		790		6729	53/2$^-$		
7536	(57/2$^-$)	866	100	6670	53/2$^-$		
7753	59/2$^-$	870	100	6883	55/2$^-$		
7934	59/2$^-$	415		7519	57/2$^-$		
		816		7117	55/2$^-$		
7958	61/2$^+$	906	100	7052	(57/2$^+$)	E2	0.00413

Adopted Levels, Gammas (continued)

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

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	α[#]
8161	$61/2^-$	866	100	7295	$57/2^-$	E2	0.00454
8365	$61/2^-$	432		7934	$59/2^-$		
		846		7519	$57/2^-$		
8441	$(61/2^-)$	905	100	7536	$(57/2^-)$		
8664	$63/2^-$	911	100	7753	$59/2^-$		
8812	$63/2^-$	447		8365	$61/2^-$		
		878		7934	$59/2^-$		
8884	$65/2^+$	926	100	7958	$61/2^+$	E2	0.00394
9073	$65/2^-$	912	100	8161	$61/2^-$	E2	0.00407
9276	$(65/2^-)$	464		8812	$63/2^-$		
		911		8365	$61/2^-$		
9359	$(65/2^-)$	918	100	8441	$(61/2^-)$		
9632	$67/2^-$	968	100	8664	$63/2^-$		
9757	$(67/2^-)$	481		9276	$(65/2^-)$		
		945		8812	$63/2^-$		
9840	$69/2^+$	956	100	8884	$65/2^+$	E2	0.00369
10047	$69/2^-$	974	100	9073	$65/2^-$	(E2)	0.00355
10255	$(69/2^-)$	499		9757	$(67/2^-)$		
		979		9276	$(65/2^-)$		
10308	$(69/2^-)$	949	100	9359	$(65/2^-)$		
10659	$71/2^-$	1027	100	9632	$67/2^-$		
10768	$(71/2^-)$	513		10255	$(69/2^-)$		
		1012		9757	$(67/2^-)$		
10837	$73/2^+$	997	100	9840	$69/2^+$	E2	0.00338
11091	$(73/2^-)$	1044	100	10047	$69/2^-$	(E2)	0.00308
11300	$(73/2^-)$	532		10768	$(71/2^-)$		
		1044	100	10255	$(69/2^-)$		
11302	$(73/2^-)$	994	100	10308	$(69/2^-)$		
11745	$(75/2^-)$	1086	100	10659	$71/2^-$		
11843	$(75/2^-)$	543		11300	$(73/2^-)$		
		1074		10768	$(71/2^-)$		
11883	$(77/2^+)$	1046	100	10837	$73/2^+$	E2	0.00307
12199	$(77/2^-)$	1108	100	11091	$(73/2^-)$	(E2)	0.00273
12348	$(77/2^-)$	1046	100	11302	$(73/2^-)$		
12411	$(77/2^-)$	568		11843	$(75/2^-)$		
		1112	100	11300	$(73/2^-)$		
12891	$(79/2^-)$	1146	100	11745	$(75/2^-)$		
12969	$(79/2^-)$	558		12411	$(77/2^-)$		
		1126	100	11843	$(75/2^-)$		
12981	$(81/2^+)$	1098	100	11883	$(77/2^+)$	E2	0.00278
13325	$(81/2^-)$	1126	100	12199	$(77/2^-)$		
13553	$(81/2^-)$	1142	100	12411	$(77/2^-)$		
14099	$(83/2^-)$	1208	100	12891	$(79/2^-)$		
14134	$(83/2^-)$	1165	100	12969	$(79/2^-)$		
14135	$(85/2^+)$	1154	100	12981	$(81/2^+)$	E2	0.00252
14433	$(85/2^-)$	1108		13325	$(81/2^-)$		
14747	$(85/2^-)$	1194	100	13553	$(81/2^-)$		
15266	$(89/2^+)$	1152	100	14114	$(85/2^+)$		
15342	$(87/2^-)$	1209	100	14134	$(83/2^-)$		
15372	$(89/2^+)$	1233	100	14135	$(85/2^+)$	E2	0.00222
15536?	$(89/2^-)$	1102[a]	100	14433	$(85/2^-)$		
16607	$(93/2^+)$	1341	100	15266	$(89/2^+)$		
16649	$(93/2^+)$	1277	100	15372	$(89/2^+)$		
16680?	$(93/2^-)$	1144[a]	100	15536?	$(89/2^-)$		
17888?	$(97/2^-)$	1208[a]	100	16680?	$(93/2^-)$		
x+204	$(13/2^-)$	204		225	$13/2^+$		
x+430	$(15/2^-)$	226		x+204	$(13/2^-)$		
		430		225	$13/2^+$		
x+673	$(17/2^-)$	242		x+430	$(15/2^-)$		
		469		x+204	$(13/2^-)$		
x+935	$(19/2^-)$	262		x+673	$(17/2^-)$		
		505		x+430	$(15/2^-)$		
x+1209	$(21/2^-)$	274		x+935	$(19/2^-)$		
		536		x+673	$(17/2^-)$		
x+1499	$(23/2^-)$	290		x+1209	$(21/2^-)$		
		564		x+935	$(19/2^-)$		
x+1795	$(25/2^-)$	297		x+1499	$(23/2^-)$		
		587		x+1209	$(21/2^-)$		
x+2104	$(27/2^-)$	309		x+1795	$(25/2^-)$		
		605		x+1499	$(23/2^-)$		
x+2415	$(29/2^-)$	311		x+2104	$(27/2^-)$		
		620		x+1795	$(25/2^-)$		
x+2729	$(31/2^-)$	625		x+2104	$(27/2^-)$		
x+3026	$(33/2^-)$	611		x+2415	$(29/2^-)$		
x+3309	$(35/2^-)$	580		x+2729	$(31/2^-)$		
x+3584	$(37/2^-)$	558		x+3026	$(33/2^-)$		
x+3882	$(39/2^-)$	573		x+3309	$(35/2^-)$		
x+4196	$(41/2^-)$	612		x+3584	$(37/2^-)$		
x+4541	$(43/2^-)$	659		x+3882	$(39/2^-)$		
x+4896	$(45/2^-)$	700		4421	$43/2^-$		
x+5674	$(49/2^-)$	778		x+4896	$(45/2^-)$		
x+6525	$(53/2^-)$	851		x+5674	$(49/2^-)$		

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Adopted Levels, Gammas (continued)

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

E_i(level)	J_i^π	E_γ	E_f	J_f^π
x+7431	$(57/2^-)$	906	x+6525	$(53/2^-)$
y+216	$(37/2^+)$	216	y	$(35/2^+)$
y+442	$(39/2^+)$	225	y+216	$(37/2^+)$
		442	y	$(35/2^+)$
y+689	$(41/2^+)$	246	y+442	$(39/2^+)$

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π
y+689	$(41/2^+)$	474		y+216	$(37/2^+)$
		512		y+442	$(39/2^+)$
		558		y+689	$(41/2^+)$
		612		y+953	$(43/2^+)$
		663		4353	$41/2^-$
		712		y+1565	$(47/2^+)$
		760		y+1910	$(49/2^+)$
		807		y+2276	$(51/2^+)$
y+3520	$(57/2^+)$	438		y+3082	$(55/2^+)$
		851		y+2670	$(53/2^+)$
y+3976	$(59/2^+)$	455		y+3520	$(57/2^+)$
		893		y+3082	$(55/2^+)$
y+4449	$(61/2^+)$	473		y+3976	$(59/2^+)$
		931		y+3520	$(57/2^+)$
y+4942	$(63/2^+)$	493		y+4449	$(61/2^+)$
		966		y+3976	$(59/2^+)$
y+5435	$(65/2^+)$	985		y+4449	$(61/2^+)$
z+911	J+2	911	100	z	J
z+1859	J+4	948	100	z+911	J+2
z+2849	J+6	990	100	z+1859	J+4
z+3883	J+8	1034	100	z+2849	J+6
z+4957	J+10	1074	100	z+3883	J+8
z+6071	J+12	1114	100	z+4957	J+10
z+7222	J+14	1151	100	z+6071	J+12
z+8436	J+16	1214	100	z+7222	J+14
z+9706	J+18	1270	100	z+8436	J+16
z+11047	J+20	1341	100	z+9706	J+18

† Based on measurements of α(K)exp and L-subshell ratios from ^{159}Tm ε decay (1975St07,1975Ag03) and of $\gamma(\theta)$ from (HI,xnγ) (1987Si07).

‡ From ^{159}Tm ε decay (1975St07).

Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with "Frozen Orbitals" approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

@ Multiply placed with undivided intensity.

& Multiply placed with intensity suitably divided.

a Placement of transition in the level scheme is uncertain.

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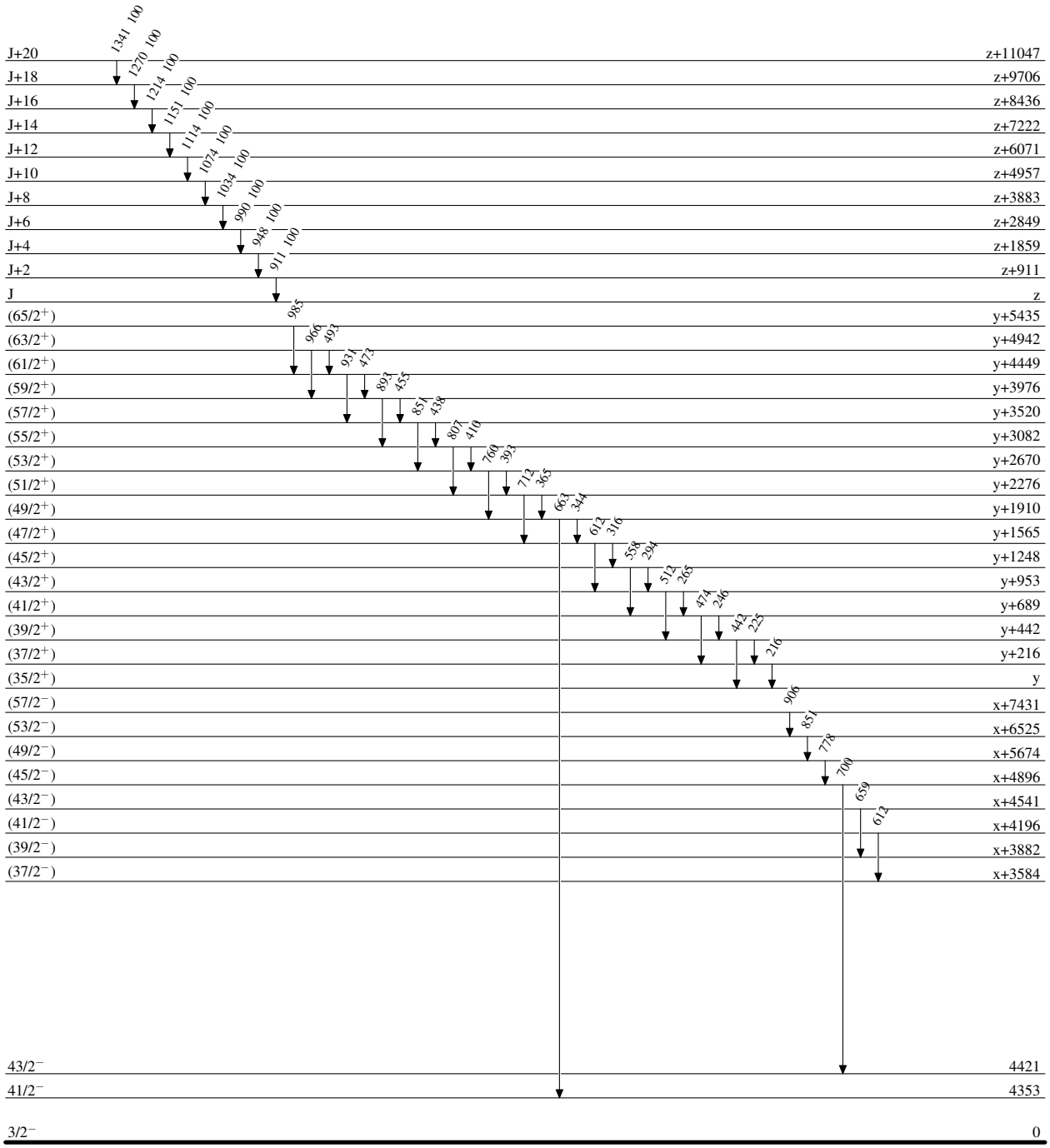
Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



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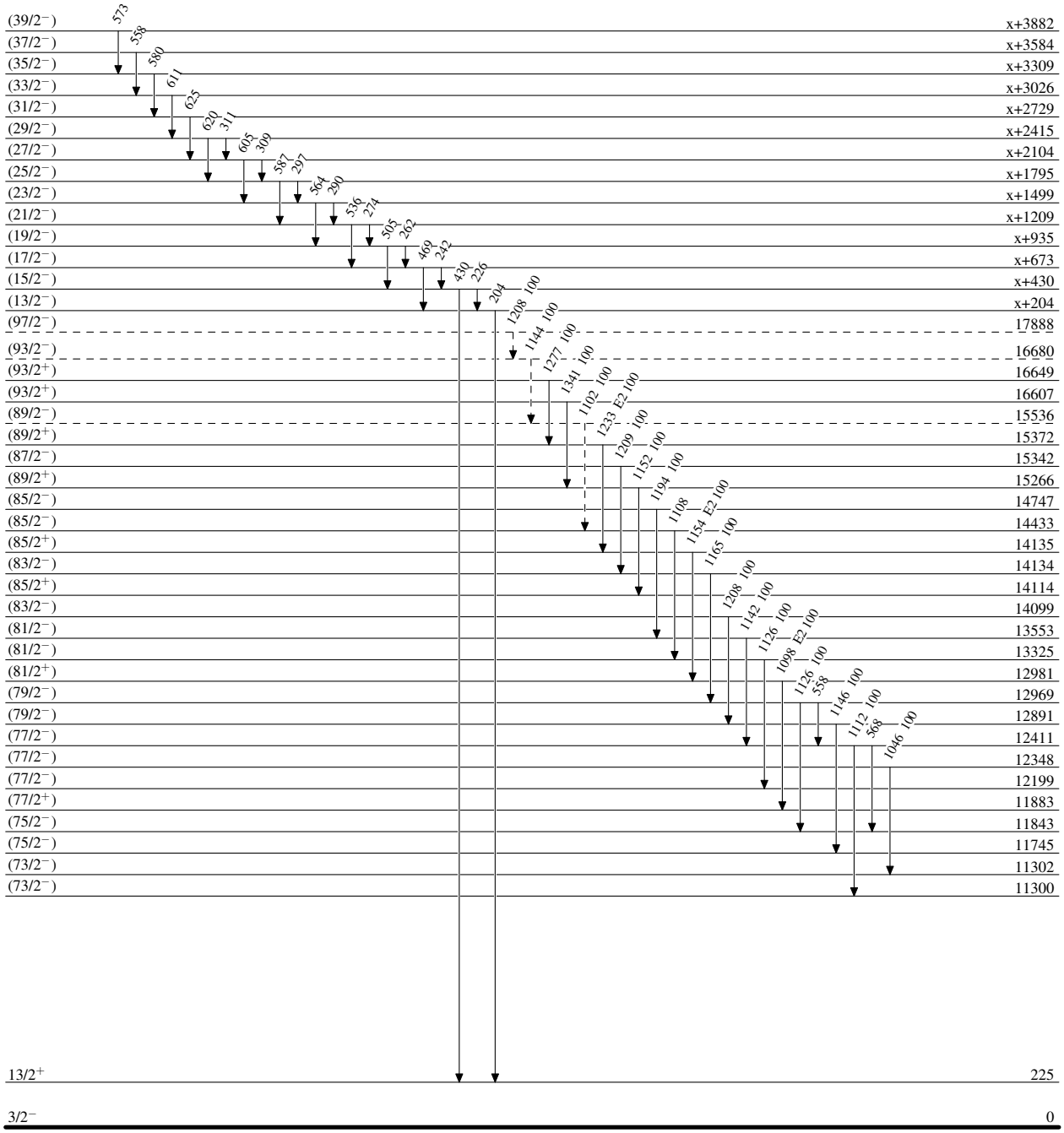
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



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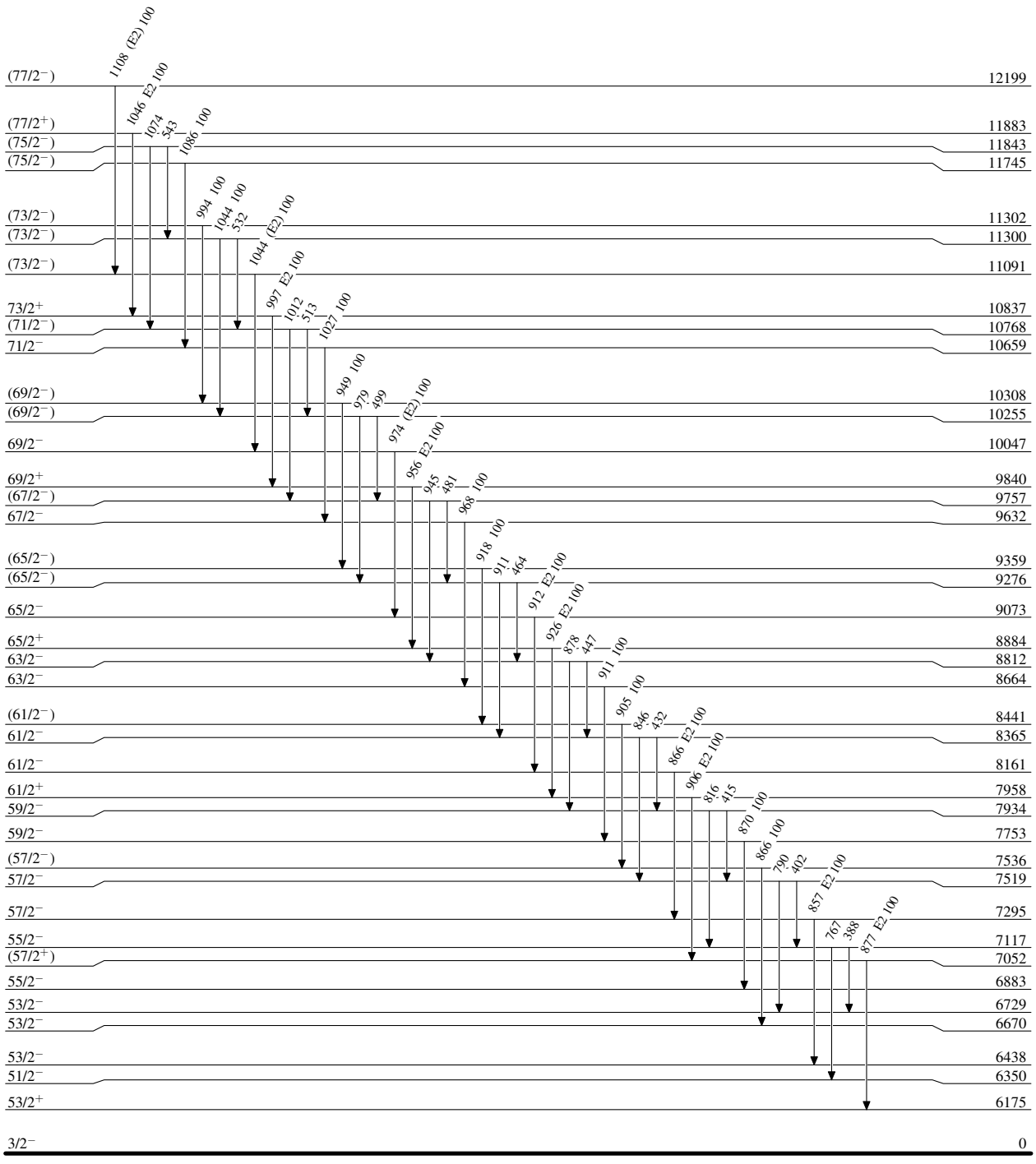
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



36 min *1*

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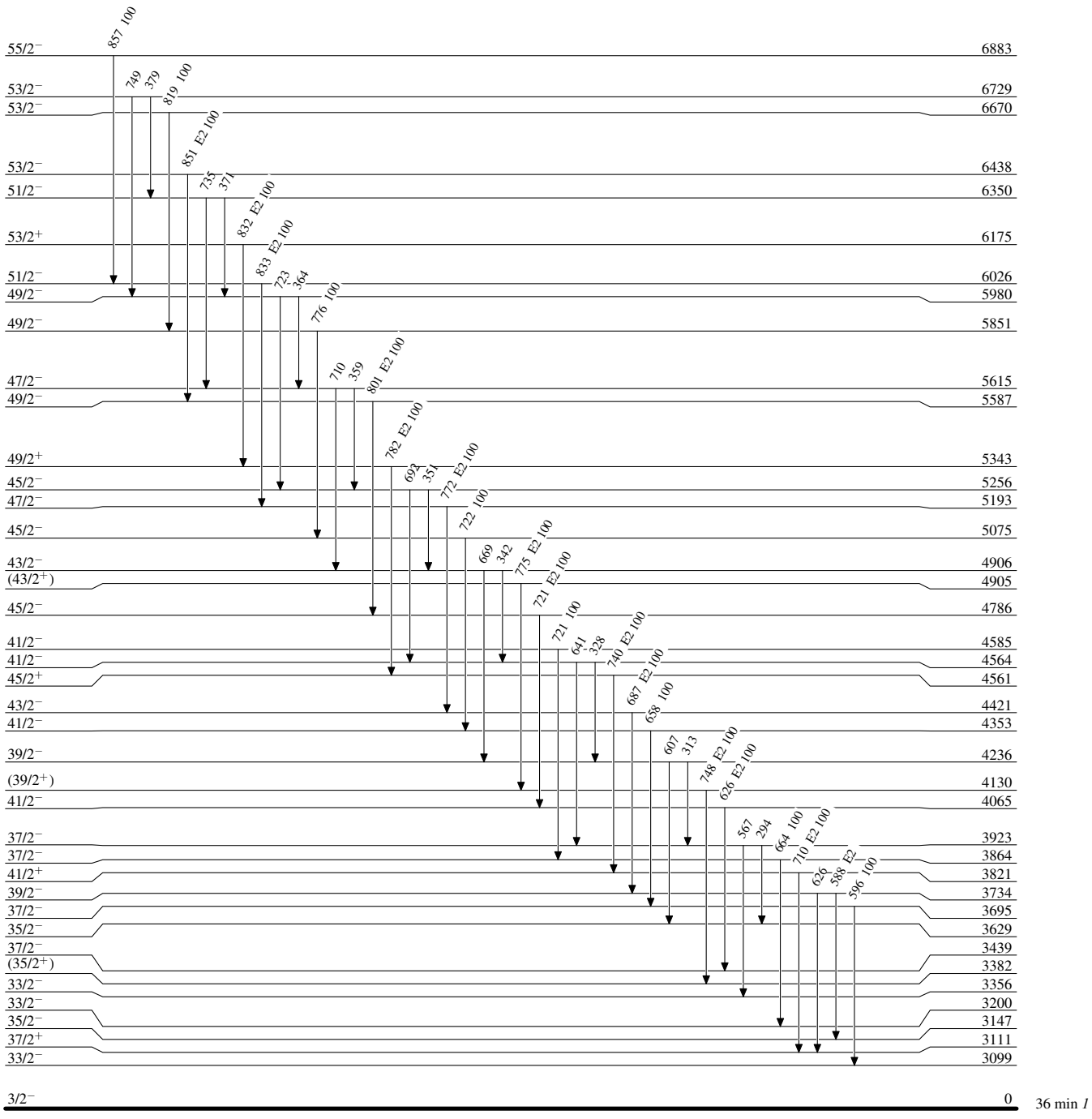
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

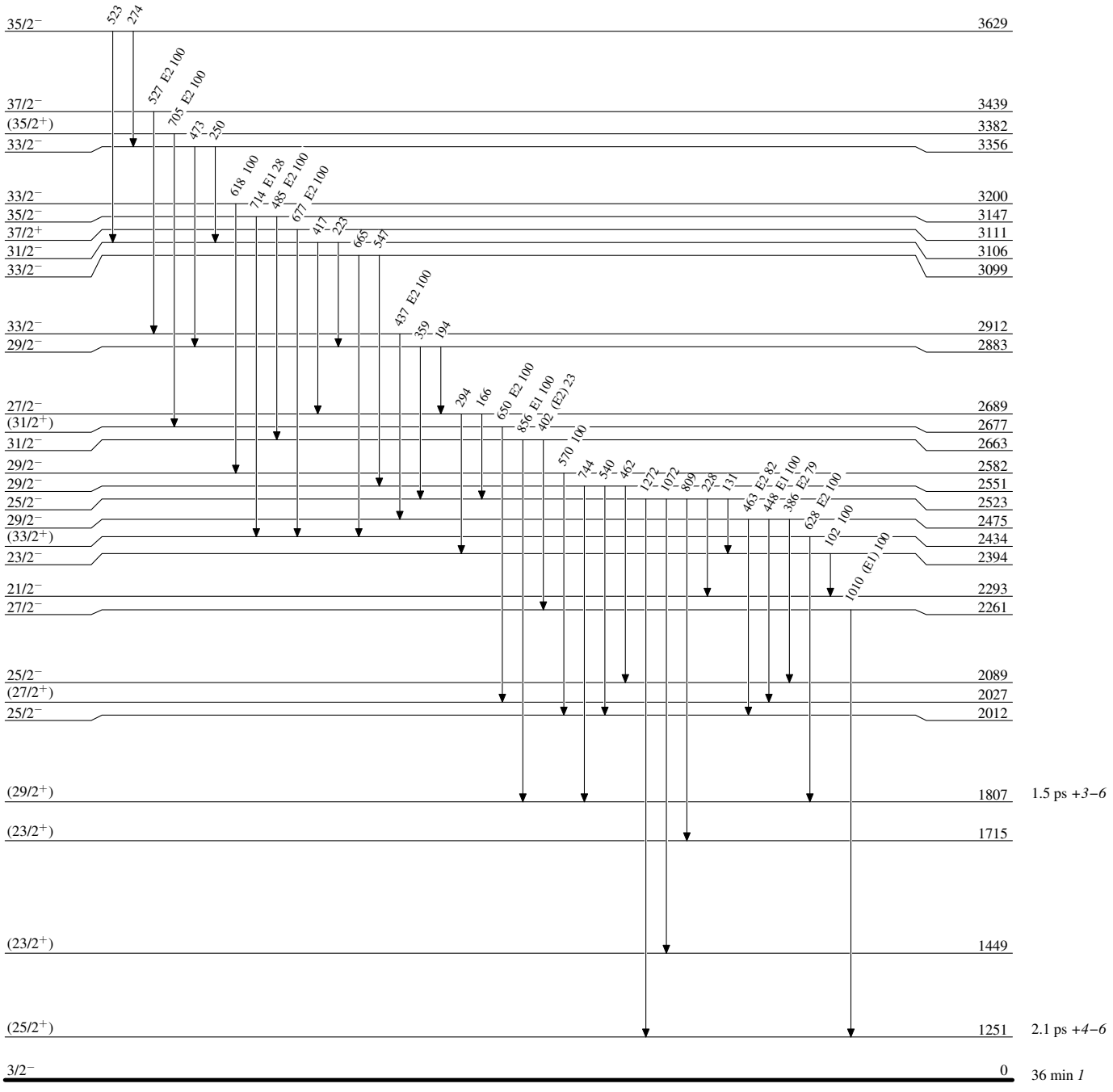


$^{159}_{68}Er_{91}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{159}_{68}Er_{91}$

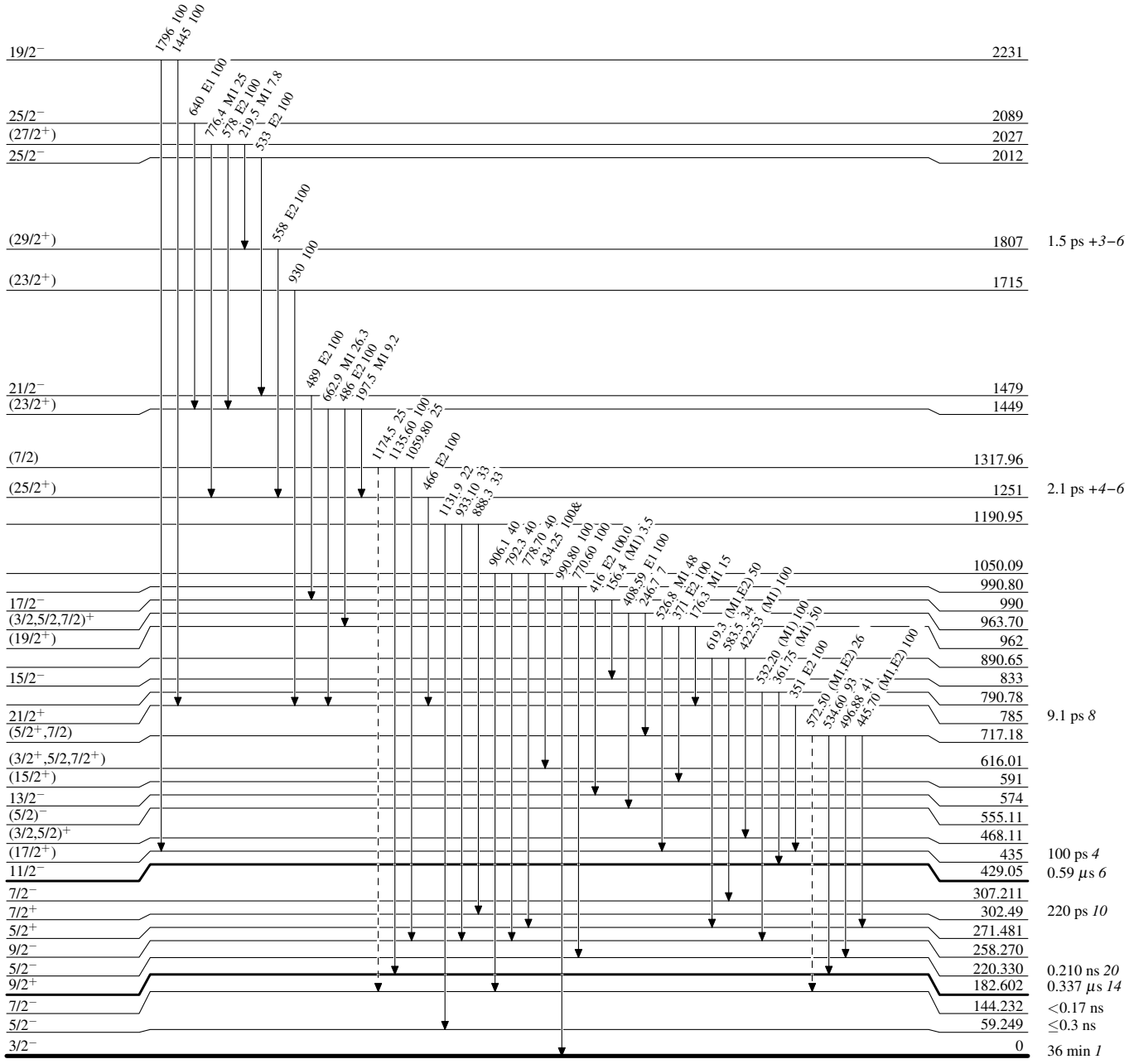
Adopted Levels, Gammas

Legend

Level Scheme (continued)

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

- - - - - - ► γ Decay (Uncertain)

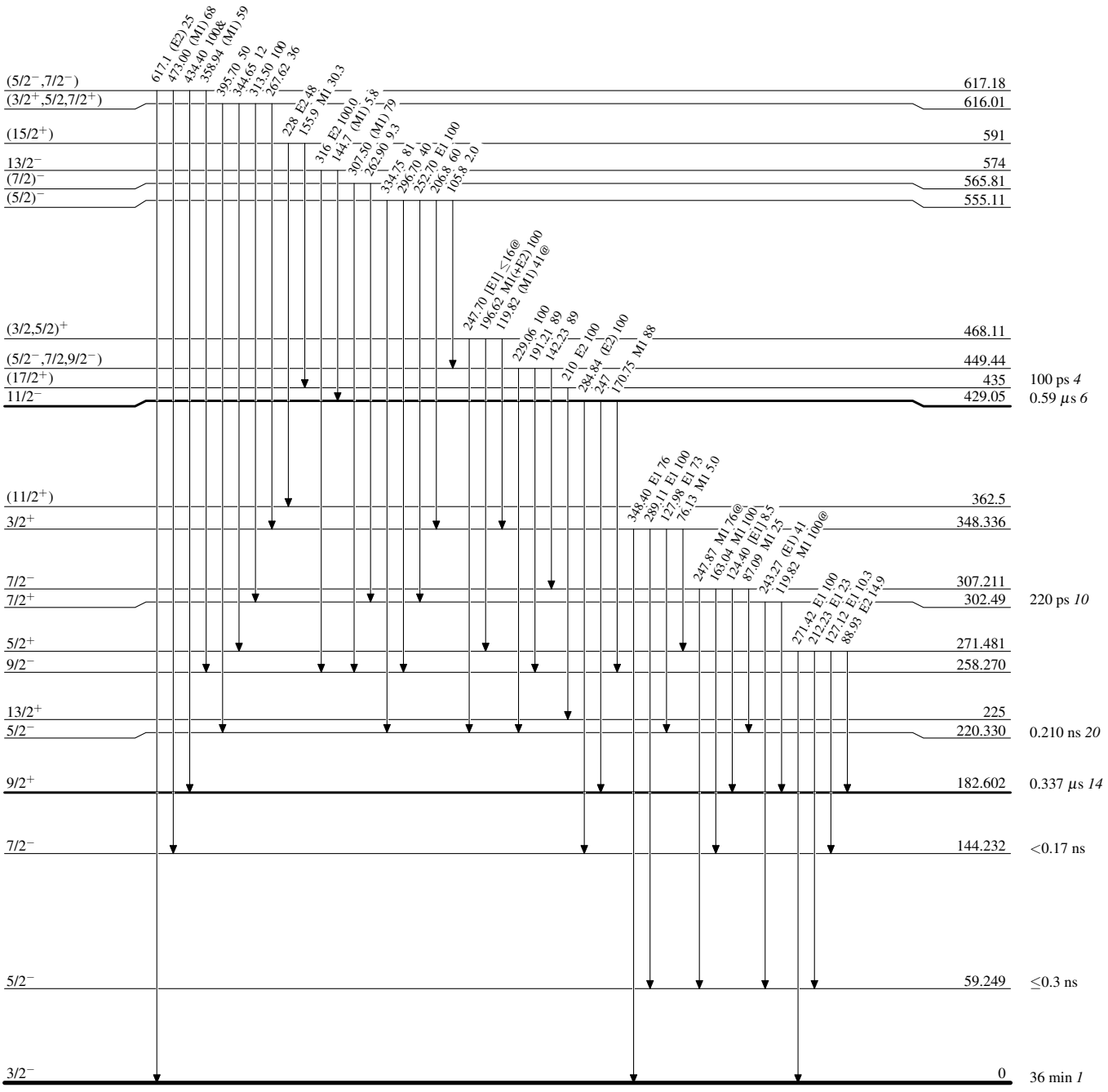


$^{159}_{68}Er_{91}$

Adopted Levels, Gammas

Level Scheme (continued)

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

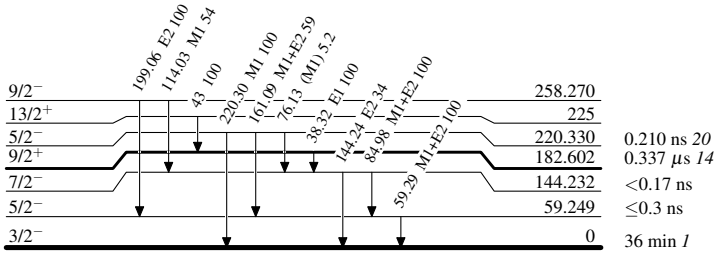


$^{159}_{68}Er_{91}$

Adopted Levels, Gammas

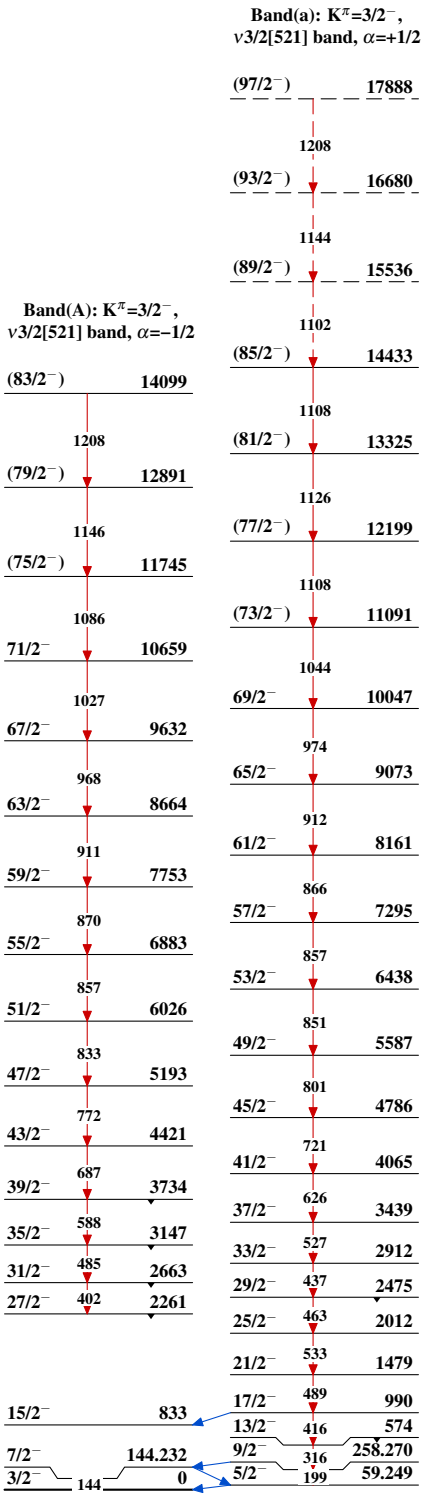
Level Scheme (continued)

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



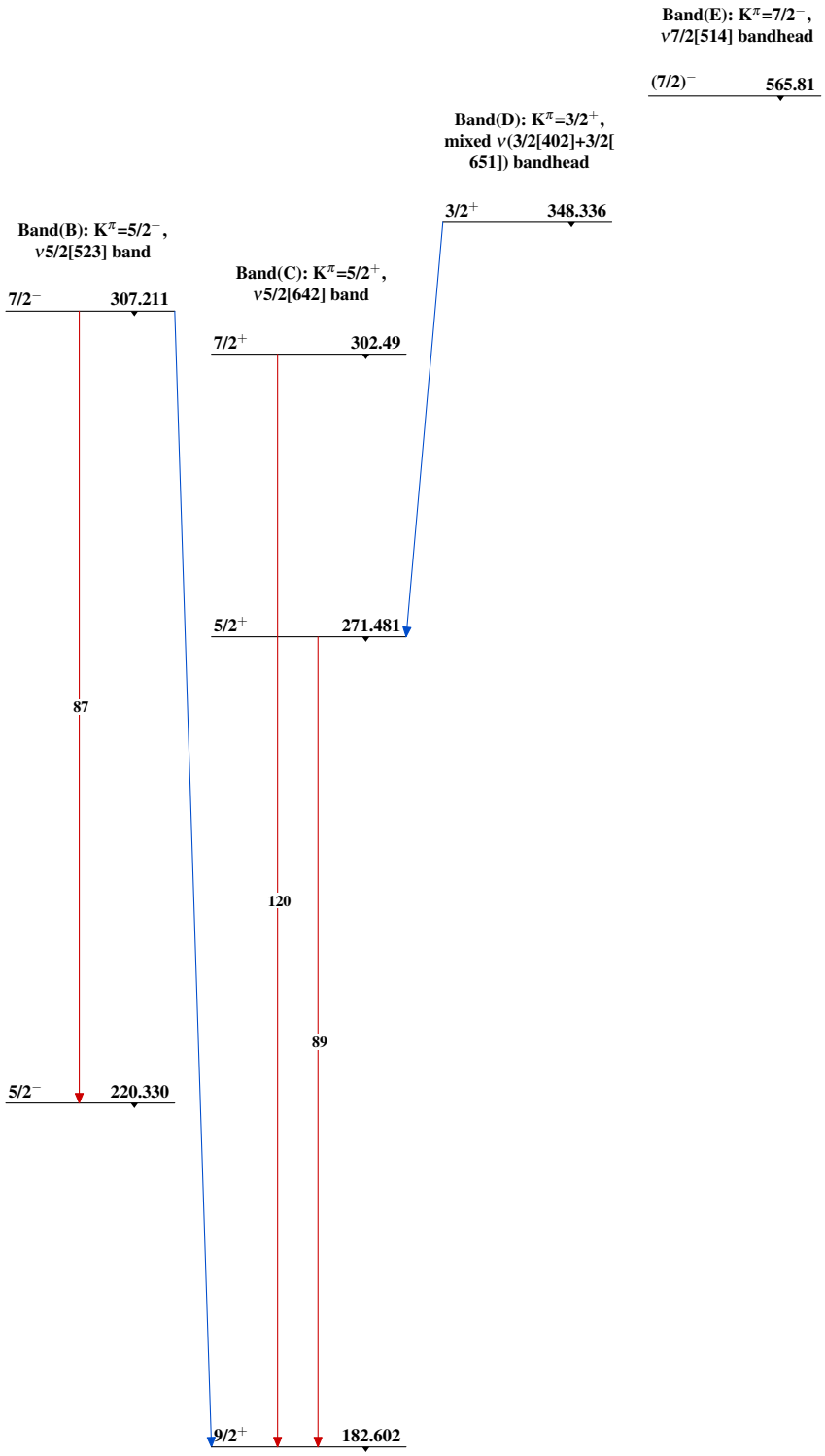
$^{159}_{68}Er_{91}$

Adopted Levels, Gammas



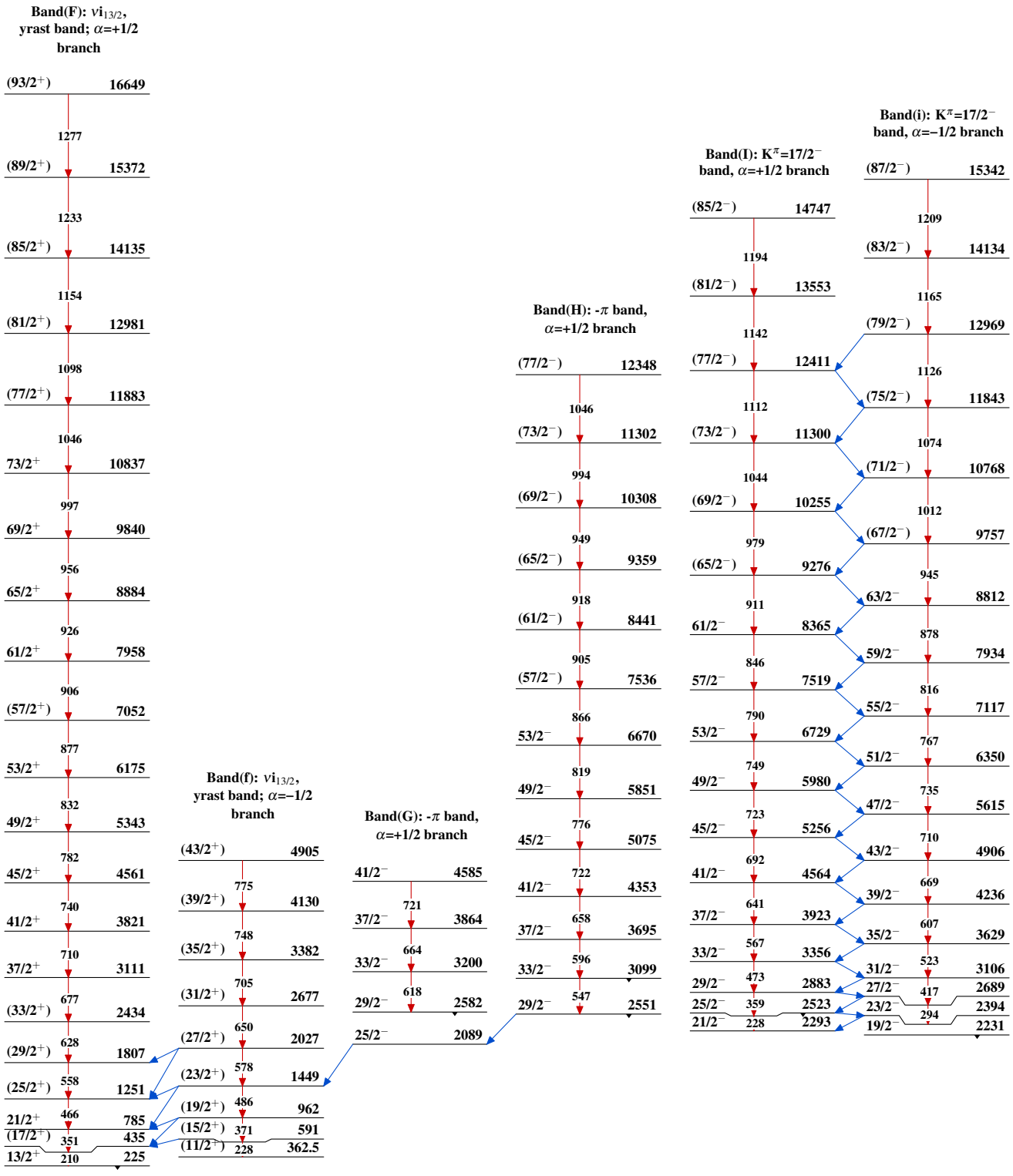
$^{159}_{68}Er_{91}$

Adopted Levels, Gammas (continued)



$^{159}_{68}Er_{91}$

Adopted Levels, Gammas (continued)



Adopted Levels, Gammas (continued)