

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen [#]		NDS 147, 1 (2018)	30-Nov-2017

$Q(\beta^-)=961.4$ 14; $S(n)=6674.5$ 14; $S(p)=5889.3$ 14; $Q(\alpha)=429.8$ 18 [2017Wa10](#)

$S(2n)=15083$ 3, $S(2p)=13880$ 40 ([2017Wa10](#)).

Identification and production of ^{164}Ho by M.L. Pool and L.L. Quill, Phys. Rev. 53, 437 (1938) from bombardment of Ho and Y by fast neutrons.

Hyperfine structure, and isotope-shift measurements for g.s.: [1987AIZU](#), [1987ArZT](#).

For theoretical nuclear structure calculations, consult NSR database, for about 10 references. These are listed in the ENSDF dataset as document records.

[Additional information 1](#).

 ^{164}Ho LevelsCross Reference (XREF) Flags

A	^{164}Ho IT decay (36.6 min)	D	$^{165}\text{Ho}(\gamma, n)$
B	$^{160}\text{Gd}(^{11}\text{B}, \alpha 3n\gamma)$	E	$^{165}\text{Ho}(\gamma, n\gamma)$
C	$^{164}\text{Dy}(p, n\gamma), (d, 2n\gamma)$	F	$^{165}\text{Ho}(d, t)$

E(level) [†]	J^π [‡]	$T_{1/2}$	XREF	Comments
0.0 [@]	1 ⁺	28.8 min 5	ABCDEF	$\% \varepsilon + \% \beta^+ = 60$ 5; $\% \beta^- = 40$ 5 (1974Bu30) J^π : spin from atomic beam (1969Ek01 , 1970LiZY); parity from $\log ft = 4.6$ to 0^+ ; 1^+ also supported in (d,t). $T_{1/2}$: from weighted average of 28.1 min 10 (1972Dr04), 29.0 min 5 (1972Ka19), and 29 min 2 (1966Jo07). Others: 23.9 min 5 (1966Se07), 46 min (1964Bo41), 33.6 min 10 (1961We02), 38.5 min (1961Kh06), 36.7 min 5 (1954Br96), 41 min (1954Ha19), 41.5 min (1950Wa12 , earlier value of 38.6 min in 1948Wa13), 34.0 5 (1950Wi13), 47 min (1938Po05). In the studies prior to 1966, the g.s. and isomeric activities were not isolated.
37.341 [@] 20	2 ⁺	≤ 2.8 ns	ABCDEF	J^π : (45.79 γ)E3 – (56.64 γ)M1+E2 – (37.34 γ)M1+E2 γ cascade from J=6 level at 139.78 to J=1 ⁺ g.s. establishes negative parity for 139.78 level, 3 ⁺ for 93.99 level, and 2 ⁺ for 27.34 level. 2 ⁺ also supported in (d,t). $T_{1/2}$: $\gamma\gamma(t)$ (1965Hu02).
93.99 [@] 4	3 ⁺		ABCDEF	J^π : E2 γ to 1 ⁺ . See J^π comment for 37.34 level. 3 ⁺ also supported in (d,t).
139.78 ^a 7	6 ⁻	36.6 min 3	ABCDEF	$\%IT=100$ J^π : spin from atomic beam (1969Ek01 , 1970LiZY), parity from E3 γ to 3 ⁺ . See J^π comment for 37.34 level. 6 ⁻ also supported in (d,t). $T_{1/2}$: weighted average of 36.4 min 3 (2008Ha21), 36.7 min 10 (1972Dr04), and 37.3 min 5 (1972Ka19). Others: 41 min 1 (1971Pa02), 42.4 min 3 (1968Bo25), 37.5 min +15–5 (1966Jo07), 39.0 min 5 (1966Se07). Possibility of an isomeric activity was first proposed by 1954Br96 , but separate half-lives of the ground state and the isomer were first measured by 1966Jo07 and 1966Se07 .
167.4 [@] 4	4 ⁺ [#]		BCD F	XREF: C(164.3).
188.6 ⁱ 5	(3 ⁺)	≤ 0.5 ns	C	$T_{1/2}$: $\gamma(t)$ (1978Sc10).
191.0 ^{&} 5	6 ⁺ [#]		B F	
193.3 ^b 4	(1 ⁻)		BC	
203.7 ^a 5	7 ⁻ [#]		BCD F	
207.8 ^b 3	(2 ⁻)		B	
236.1 ^b 4	(3 ⁻) [#]		BCD F	
261.7 [@] 4	5 ⁺ [#]		BCd F	
273.8 ^b 4	(4 ⁻)		B d F	J^π : (8 ⁻) from assignment to the $K^\pi=6^-$ band in $^{165}\text{Ho}(d, t)$.

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Adopted Levels, Gammas (continued) ^{164}Ho Levels (continued)

E(level) [†]	J ^π [‡]	T _{1/2}	XREF	Comments
293.7 ^a 7	(8 ⁻)		B F	J ^π : (4 ⁻) from assignment to the K ^π =1 ⁻ band in $^{165}\text{Ho}(\text{d,t})$.
297.4 ⁱ 7	(4 ⁺)		C	
317.3 ^{&} 8	7 ⁺ #		B F	
330.9 ^b 7	(5 ⁻)		B	
342.6 ^c 5	5 ⁺ #	2.6 ns 2	BCD F	XREF: D(338.3). T _{1/2} : γ(t) (1978Sc10).
370.2 [@] 6	(6 ⁺)		B F	XREF: F(367). E(level),J ^π : note that in (d,t), a 367 keV 4 level was tentatively assigned as (9 ⁻) member of K ^π =6 ⁻ band. Based simply on the energy agreement, the 367 level in (d,t) is considered the same as 370 level in ($^{11}\text{B},\alpha 3\text{n}\gamma$).
394 4			D F	XREF: D(390.5).
398.2 ^b 9	(6 ⁻)		B	
406.5 ^a 7	(9 ⁻)		B	
421 1			D F	1970Jo11 suggest possible J=3 from K ^π =3 ⁺ , π7/2[523]↑-ν1/2[521]↓, but the authors note that a state with a similar configuration is proposed at 188.6 in (p,nγ).
429.9 ⁱ 7	(5 ⁺)		C	
452.4 ^c 8	6 ⁺ #		BC F	
460.9 ^{&} 9	(8 ⁺)		B	
486 ^d 2	(2 ⁺)#		F	
488.0 ^b 10	(7 ⁻)		B	
499 2			F	Possible (K=6,π7/2[523]↑+ν5/2[642]↑)+Q ₂₂ (1970Jo11).
502.7 [@] 6	(7 ⁺)		B	
540.3 ^a 7	(10 ⁻)		B	
558 ^d 1	(3 ⁺)#		F	
579.6 ^c 9	7 ⁺ #		BC F	XREF: F(583).
586.9 ^b 11	(8 ⁻)		B	
620 ^e 1	2 ⁻ #		F	
621.7 ^{&} 9	(9 ⁺)		B	
644.2 [@] 7	(8 ⁺)		B	
650 ^d 3	(4 ⁺)#		F	
670 ^e 2	3 ⁻ #		F	
691 4			F	Possible (K=1,π7/2[523]↑-ν5/2[642]↑)+Q ₂₂ (1970Jo11).
694.2 ^a 8	(11 ⁻)		B	
711.9 ^b 11	(9 ⁻)		B	
723.1 ^c 9	(8 ⁺)		BC	XREF: C(720.6).
733 ^f 1	(5 ⁻)#		F	
777 ^d 2	(5 ⁺)#		F	
799.1 ^{&} 9	(10 ⁺)		B	
814.0 [@] 7	(9 ⁺)		B	
833 ^g 1	(4 ⁻)#		F	
843.1 ^b 11	(10 ⁻)		B	
863 4			F	
867.0 ^a 8	(12 ⁻)		B	
881.5 ^c 9	(9 ⁺)		B	
925 ^h 1	(3 ⁻)#		F	
967 5			F	
985.1 [@] 7	(10 ⁺)		B	
992.8 ^{&} 9	(11 ⁺)		B	

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Adopted Levels, Gammas (continued) ^{164}Ho Levels (continued)

E(level) [†]	J ^π [‡]	XREF	E(level) [†]	J ^π [‡]	XREF	E(level) [†]	J ^π [‡]	XREF
994 ^h 4	(4 ⁻) [#]	F	1492.0 ^a 9	(15 ⁻)	B	2350.1 ^b 13	(17 ⁻)	B
1006.7 ^b 11	(11 ⁻)	B	1577.2 ^b 12	(14 ⁻)	B	2462.5 ^{&} 12	(17 ⁺)	B
1049.9 ^c 9	(10 ⁺)	B	1631.0 [@] 9	(13 ⁺)	B	2548.1 ^a 10	(19 ⁻)	B
1058.2 ^a 8	(13 ⁻)	B	1666.0 ^{&} 10	(14 ⁺)	B	2623.9 ^b 13	(18 ⁻)	B
1171.3 ^b 12	(12 ⁻)	B	1728.2 ^a 9	(16 ⁻)	B	2825.8 ^a 10	(20 ⁻)	B
1192.0 [@] 8	(11 ⁺)	B	1825.7 ^b 12	(15 ⁻)	B	2941.0 ^b 13	(19 ⁻)	B
1202.1 ^{&} 9	(12 ⁺)	B	1865.3 [@] 7	(14 ⁺)	B	3162.0 ^a 11	(21 ⁻)	B
1234.8 ^c 10	(11 ⁺)	B	1919.0 ^{&} 10	(15 ⁺)	B	3250.4 ^b 14	(20 ⁻)	B
1265.3 ^a 9	(14 ⁻)	B	1990.1 ^a 9	(17 ⁻)	B	3452.0 ^a 11	(22 ⁻)	B
1377.2 ^b 12	(13 ⁻)	B	2062.4 ^b 12	(16 ⁻)	B	3826.7 ^a 12	(23 ⁻)	B
1387.2 [@] 8	(12 ⁺)	B	2113.5 [@] 8	(15 ⁺)	B	4125.5 ^a 13	(24 ⁻)	B
1420.2 ^c 11	(12 ⁺)	B	2183.8 ^{&} 11	(16 ⁺)	B	4541.8 ^a 9	(25 ⁻)	B
1426.8 ^{&} 10	(13 ⁺)	B	2249.6 ^a 10	(18 ⁻)	B			

[†] From least-squares fit to E_γ data. ΔE_γ=0.5 keV assigned by the evaluators when not stated. See $^{164}\text{Dy}(p,n\gamma),(d,2n\gamma)$ for tentative high-spin levels proposed by 1972WaYR at 281.4; 300.3; 376.4, 377.2 and 495.5 keV, and a floating 90.0-112.8-133.8-151.2 γ cascade with level sequence of J=3 to 7.

[‡] From probable band assignments in $^{160}\text{Gd}(^{11}\text{B},\alpha 3n\gamma)$ and $^{165}\text{Ho}(d,t)$, unless otherwise stated.

[#] From 1970Jo11, based on the ‘fingerprint’ method, by requiring relative energies to fit the rotational-model formula and comparison of the relative intensity pattern within a band to the calculated theoretical cross sections.

[@] Band(A): $K^\pi=1^+, \pi 7/2[523]\uparrow-\nu 5/2[523]\downarrow$.

[&] Band(B): $K^\pi=6^+, \pi 7/2[523]\uparrow+\nu 5/2[523]\downarrow$.

^a Band(C): $K^\pi=6^-, \pi 7/2[523]\uparrow+\nu 5/2[642]\uparrow$.

^b Band(D): $K^\pi=1^-, \pi 7/2[523]\uparrow-\nu 5/2[642]\uparrow$.

^c Band(E): $K^\pi=5^+, \pi 7/2[523]\uparrow+\nu 3/2[521]\uparrow$.

^d Band(F): $K^\pi=2^+, \pi 7/2[523]\uparrow-\nu 3/2[521]\uparrow$.

^e Band(G): $K^\pi=2^-, \pi 7/2[523]\uparrow-\nu 3/2[402]\downarrow$.

^f Band(H): $K^\pi=5^-, \pi 7/2[523]\uparrow+\nu 3/2[402]\downarrow$.

^g Band(I): $K^\pi=4^-, \pi 7/2[523]\uparrow+\nu 1/2[400]\uparrow$.

^h Band(J): $K^\pi=3^-, \pi 7/2[523]\uparrow-\nu 1/2[400]\uparrow$.

ⁱ Band(K): $K^\pi=3^+, \pi 7/2[523]\uparrow-\nu 1/2[521]\downarrow$.

Adopted Levels, Gammas (continued)

$\gamma(^{164}\text{Ho})$

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	I_γ	E_f	J_f^π	Mult. [‡]	$\delta^\ddagger$	$\alpha^\#$	Comments
37.341	2 ⁺	37.34 2	100	0.0	1 ⁺	M1+E2	0.045 +12-8	7.8 3	$\alpha(\text{L})=6.10$ 20; $\alpha(\text{M})=1.35$ 5 $\alpha(\text{N})=0.314$ 11; $\alpha(\text{O})=0.0450$ 13; $\alpha(\text{P})=0.00241$ 4 B(M1)(W.u.)>0.017; B(E2)(W.u.)>5.4
93.99	3 ⁺	56.64 5	100 5	37.341	2 ⁺	M1+E2	0.052 11	14.2 7	$\alpha(\text{K})_{\text{exp}}=12.0$ 7; $\alpha(\text{L})=1.75$ 4; $\alpha(\text{M})=0.388$ 8; $\alpha(\text{N})=0.090$ 18 $\alpha(\text{O})=0.01299$ 24; $\alpha(\text{P})=0.000707$ 10 Additional information 2.
		94.00 5	2.10 23	0.0	1 ⁺	E2		3.56	$\alpha(\text{K})=1.272$ 18; $\alpha(\text{L})=1.76$ 3; $\alpha(\text{M})=0.425$ 6 $\alpha(\text{N})=0.0957$ 14; $\alpha(\text{O})=0.01133$ 17; $\alpha(\text{P})=5.27\times 10^{-5}$ 8
139.78	6 ⁻	45.79 6	100	93.99	3 ⁺	E3		4.53×10 ³	$\alpha(\text{L})=3.38\times 10^3$ 6; $\alpha(\text{M})=914$ 15 $\alpha(\text{N})=208$ 4; $\alpha(\text{O})=23.3$ 4; $\alpha(\text{P})=0.01321$ 21 B(E3)(W.u.)=0.000181 4 Additional information 3.
167.4	4 ⁺	73.7		93.99	3 ⁺				$\alpha(\text{K})=2.57$ 4; $\alpha(\text{L})=0.383$ 6; $\alpha(\text{M})=0.0845$ 12
188.6	(3 ⁺)	94.6		93.99	3 ⁺	[M1]		3.06	$\alpha(\text{N})=0.0196$ 3; $\alpha(\text{O})=0.00285$ 4; $\alpha(\text{P})=0.0001596$ 23 B(M1)(W.u.)>0.012 Additional information 4.
191.0	6 ⁺	51.2		139.78	6 ⁻				
193.3	(1 ⁻)	156.0		37.341	2 ⁺				
		193.3		0.0	1 ⁺				
203.7	7 ⁻	63.9		139.78	6 ⁻				
207.8	(2 ⁻)	113.6		93.99	3 ⁺				
		170.6		37.341	2 ⁺				
		208.0		0.0	1 ⁺				
236.1	(3 ⁻)	198.8		37.341	2 ⁺				Additional information 5.
261.7	5 ⁺	94.5		167.4	4 ⁺				Additional information 6.
		167.4		93.99	3 ⁺				
273.8	(4 ⁻)	37.7		236.1	(3 ⁻)				
		179.8		93.99	3 ⁺				
293.7	(8 ⁻)	90.1		203.7	7 ⁻				
297.4	(4 ⁺)	108.7		188.6	(3 ⁺)				
317.3	7 ⁺	126.3		191.0	6 ⁺				Additional information 7.
330.9	(5 ⁻)	163.5		167.4	4 ⁺				
342.6	5 ⁺	202.8		139.78	6 ⁻	[E1]		0.0485	$\alpha(\text{K})=0.0409$ 6; $\alpha(\text{L})=0.00598$ 9; $\alpha(\text{M})=0.001315$ 19 $\alpha(\text{N})=0.000302$ 5; $\alpha(\text{O})=4.22\times 10^{-5}$ 6; $\alpha(\text{P})=2.05\times 10^{-6}$ 3 B(E1)(W.u.)=9.9×10 ⁻⁶ 8
370.2	(6 ⁺)	108.5		261.7	5 ⁺				
398.2	(6 ⁻)	67.3		330.9	(5 ⁻)				
406.5	(9 ⁻)	112.7		293.7	(8 ⁻)				
		202.8		203.7	7 ⁻				
429.9	(5 ⁺)	132.4		297.4	(4 ⁺)				
		241.4		188.6	(3 ⁺)				
452.4	6 ⁺	109.8		342.6	5 ⁺				
460.9	(8 ⁺)	143.5		317.3	7 ⁺				

Adopted Levels, Gammas (continued)

$\gamma(^{164}\text{Ho})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	E_f	J_f^π	Comments
488.0	(7 ⁻)	89.8	398.2	(6 ⁻)	Additional information 8.
502.7	(7 ⁺)	132.5	370.2	(6 ⁺)	
		241.0	261.7	5 ⁺	
540.3	(10 ⁻)	133.7	406.5	(9 ⁻)	
		246.7	293.7	(8 ⁻)	
579.6	7 ⁺	127.3	452.4	6 ⁺	
586.9	(8 ⁻)	99.0	488.0	(7 ⁻)	
621.7	(9 ⁺)	160.7	460.9	(8 ⁺)	
		304.5	317.3	7 ⁺	
644.2	(8 ⁺)	141.3	502.7	(7 ⁺)	
		274.0	370.2	(6 ⁺)	
694.2	(11 ⁻)	153.9	540.3	(10 ⁻)	
		287.6	406.5	(9 ⁻)	
711.9	(9 ⁻)	125.1	586.9	(8 ⁻)	
		223.8	488.0	(7 ⁻)	
723.1	(8 ⁺)	143.6	579.6	7 ⁺	
		270.6	452.4	6 ⁺	
799.1	(10 ⁺)	177.5	621.7	(9 ⁺)	
		338.1	460.9	(8 ⁺)	
814.0	(9 ⁺)	169.8	644.2	(8 ⁺)	
		311.5	502.7	(7 ⁺)	
843.1	(10 ⁻)	131.1	711.9	(9 ⁻)	
		256.2	586.9	(8 ⁻)	
867.0	(12 ⁻)	172.9	694.2	(11 ⁻)	
		326.7	540.3	(10 ⁻)	
881.5	(9 ⁺)	158.2	723.1	(8 ⁺)	
		302.0	579.6	7 ⁺	
985.1	(10 ⁺)	171.2	814.0	(9 ⁺)	
		340.8	644.2	(8 ⁺)	
992.8	(11 ⁺)	193.6	799.1	(10 ⁺)	
		371.2	621.7	(9 ⁺)	
1006.7	(11 ⁻)	163.6	843.1	(10 ⁻)	
		294.8	711.9	(9 ⁻)	
1049.9	(10 ⁺)	168.4	881.5	(9 ⁺)	
		326.9	723.1	(8 ⁺)	
1058.2	(13 ⁻)	191.2	867.0	(12 ⁻)	
		363.9	694.2	(11 ⁻)	
1171.3	(12 ⁻)	164.5	1006.7	(11 ⁻)	
		328.1	843.1	(10 ⁻)	
1192.0	(11 ⁺)	206.7	985.1	(10 ⁺)	
		378.2	814.0	(9 ⁺)	
1202.1	(12 ⁺)	209.4	992.8	(11 ⁺)	
		403.1	799.1	(10 ⁺)	

Adopted Levels, Gammas (continued)

$\gamma(^{164}\text{Ho})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	E_f	J_f^π	$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	E_f	J_f^π	$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	E_f	J_f^π
1234.8	(11 ⁺)	185.0	1049.9 (10 ⁺)		1666.0	(14 ⁺)	464.0	1202.1 (12 ⁺)		2462.5	(17 ⁺)	543.5	1919.0 (15 ⁺)	
		353.3	881.5 (9 ⁺)		1728.2	(16 ⁻)	236.3	1492.0 (15 ⁻)		2548.1	(19 ⁻)	298.5	2249.6 (18 ⁻)	
1265.3	(14 ⁻)	207.1	1058.2 (13 ⁻)				462.9	1265.3 (14 ⁻)				558.4	1990.1 (17 ⁻)	
		398.5	867.0 (12 ⁻)		1825.7	(15 ⁻)	248.5	1577.2 (14 ⁻)		2623.9	(18 ⁻)	273.9	2350.1 (17 ⁻)	
1377.2	(13 ⁻)	205.8	1171.3 (12 ⁻)				448.6	1377.2 (13 ⁻)				561.4	2062.4 (16 ⁻)	
		370.6	1006.7 (11 ⁻)		1865.3	(14 ⁺)	477.4 [@]	1387.2 (12 ⁺)		2825.8	(20 ⁻)	277.7	2548.1 (19 ⁻)	
1387.2	(12 ⁺)	195.1	1192.0 (11 ⁺)		1919.0	(15 ⁺)	253.1	1666.0 (14 ⁺)				575.9	2249.6 (18 ⁻)	
		402.0	985.1 (10 ⁺)				492.2	1426.8 (13 ⁺)		2941.0	(19 ⁻)	317.0	2623.9 (18 ⁻)	
1420.2	(12 ⁺)	370.3	1049.9 (10 ⁺)		1990.1	(17 ⁻)	261.9	1728.2 (16 ⁻)				590.9	2350.1 (17 ⁻)	
1426.8	(13 ⁺)	224.8	1202.1 (12 ⁺)				498.1	1492.0 (15 ⁻)		3162.0	(21 ⁻)	336.1	2825.8 (20 ⁻)	
		433.7	992.8 (11 ⁺)		2062.4	(16 ⁻)	236.7	1825.7 (15 ⁻)				614.1	2548.1 (19 ⁻)	
1492.0	(15 ⁻)	226.8	1265.3 (14 ⁻)				485.2	1577.2 (14 ⁻)		3250.4	(20 ⁻)	626.5	2623.9 (18 ⁻)	
		433.6	1058.2 (13 ⁻)		2113.5	(15 ⁺)	481.8 [@]	1631.0 (13 ⁺)		3452.0	(22 ⁻)	626.2	2825.8 (20 ⁻)	
1577.2	(14 ⁻)	200.0	1377.2 (13 ⁻)		2183.8	(16 ⁺)	517.8	1666.0 (14 ⁺)		3826.7	(23 ⁻)	664.7	3162.0 (21 ⁻)	
		405.9	1171.3 (12 ⁻)		2249.6	(18 ⁻)	259.2	1990.1 (17 ⁻)		4125.5	(24 ⁻)	673.5	3452.0 (22 ⁻)	
1631.0	(13 ⁺)	243.8	1387.2 (12 ⁺)				521.3	1728.2 (16 ⁻)		4541.8	(25 ⁻)	714.8 [@]	3826.7 (23 ⁻)	
		439.1	1192.0 (11 ⁺)		2350.1	(17 ⁻)	287.6	2062.4 (16 ⁻)						
1666.0	(14 ⁺)	239.2	1426.8 (13 ⁺)				524.5	1825.7 (15 ⁻)						

[†] Values with uncertainties are from ¹⁶⁴Ho IT decay (37.5 min). Others are from ¹⁶⁰Gd(¹¹B, α 3n γ).

[‡] From ce data in IT decay, unless otherwise stated.

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.

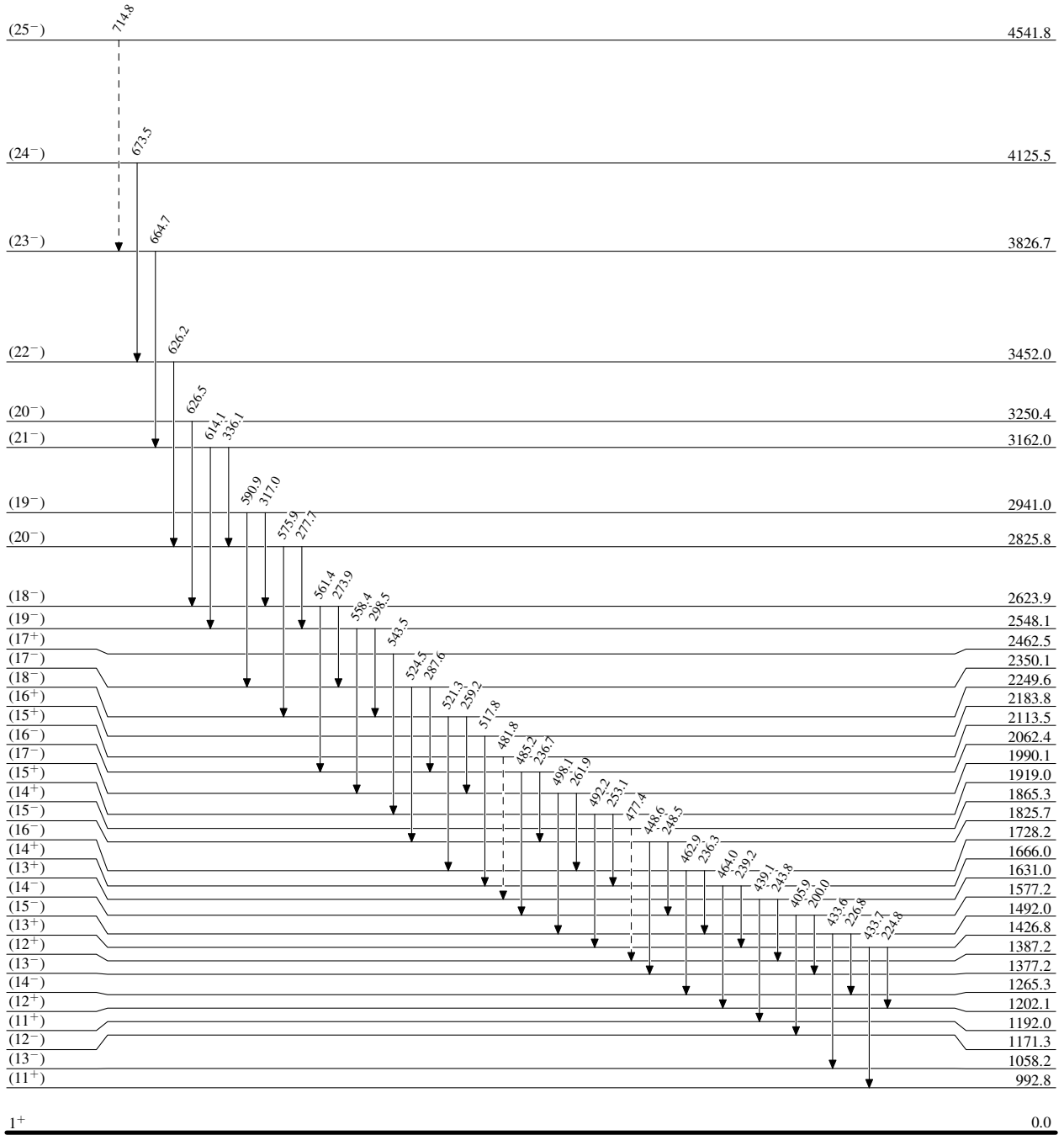
@ Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

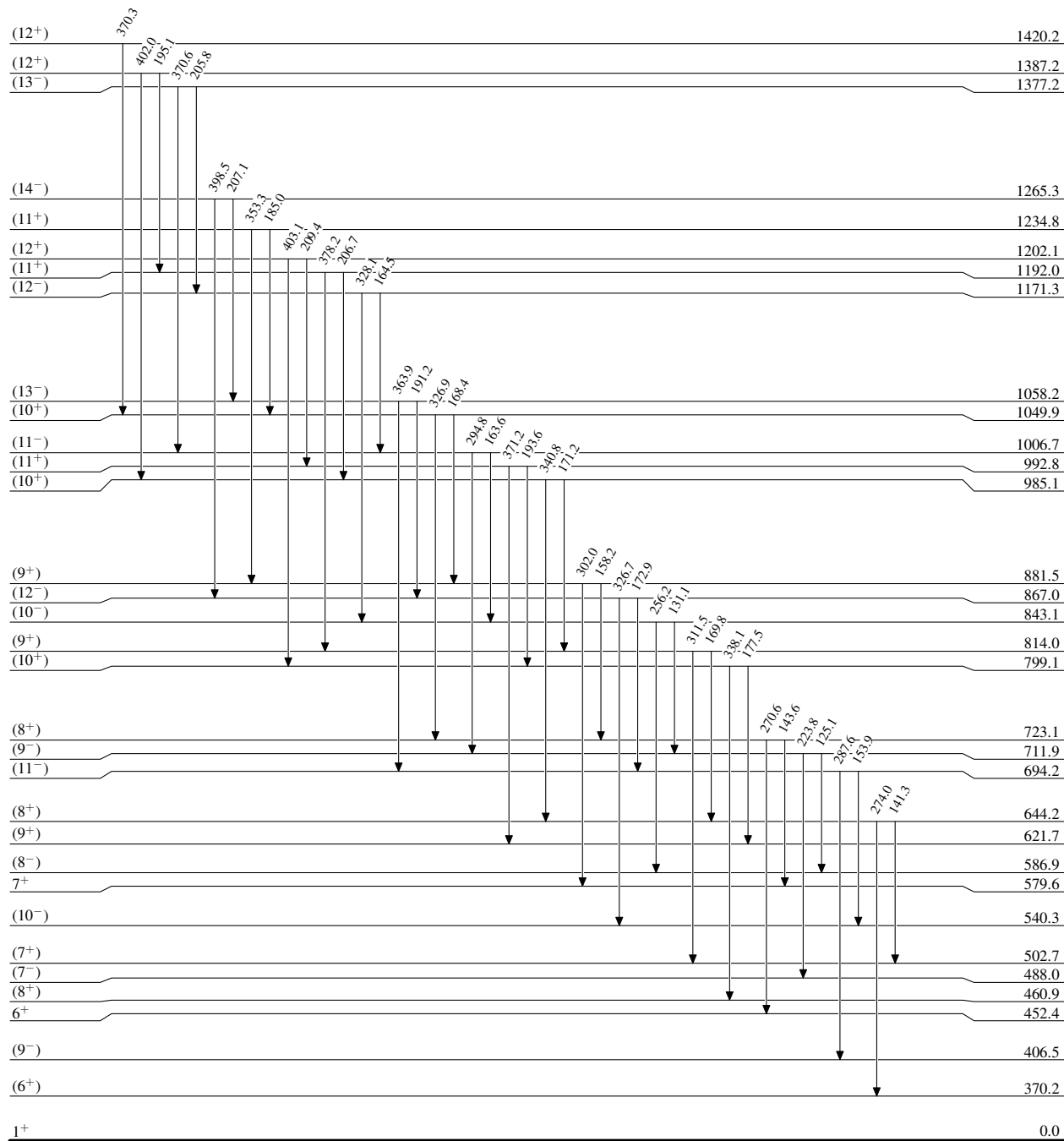
Level Scheme

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)

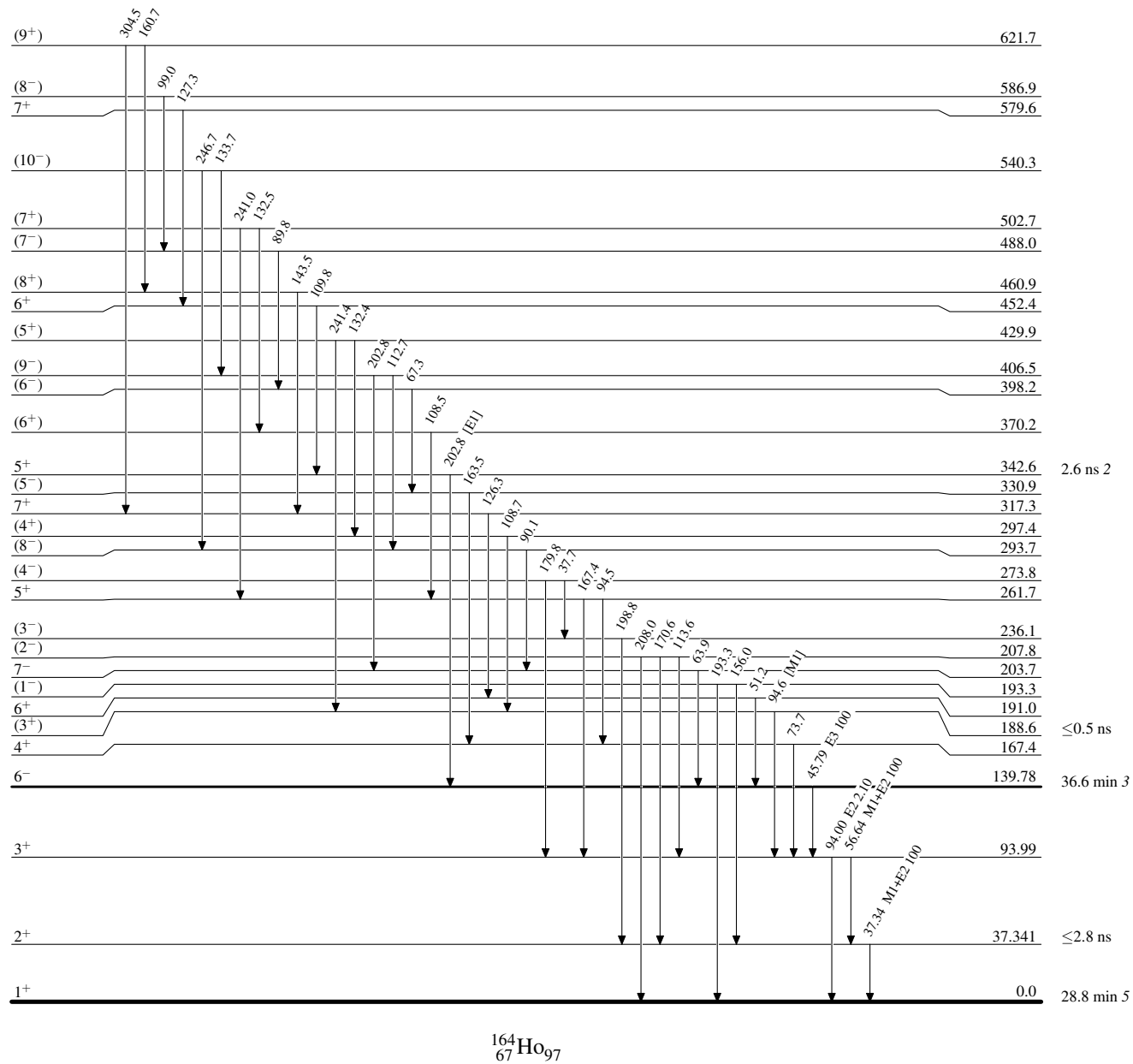
Adopted Levels, GammasLevel Scheme (continued)

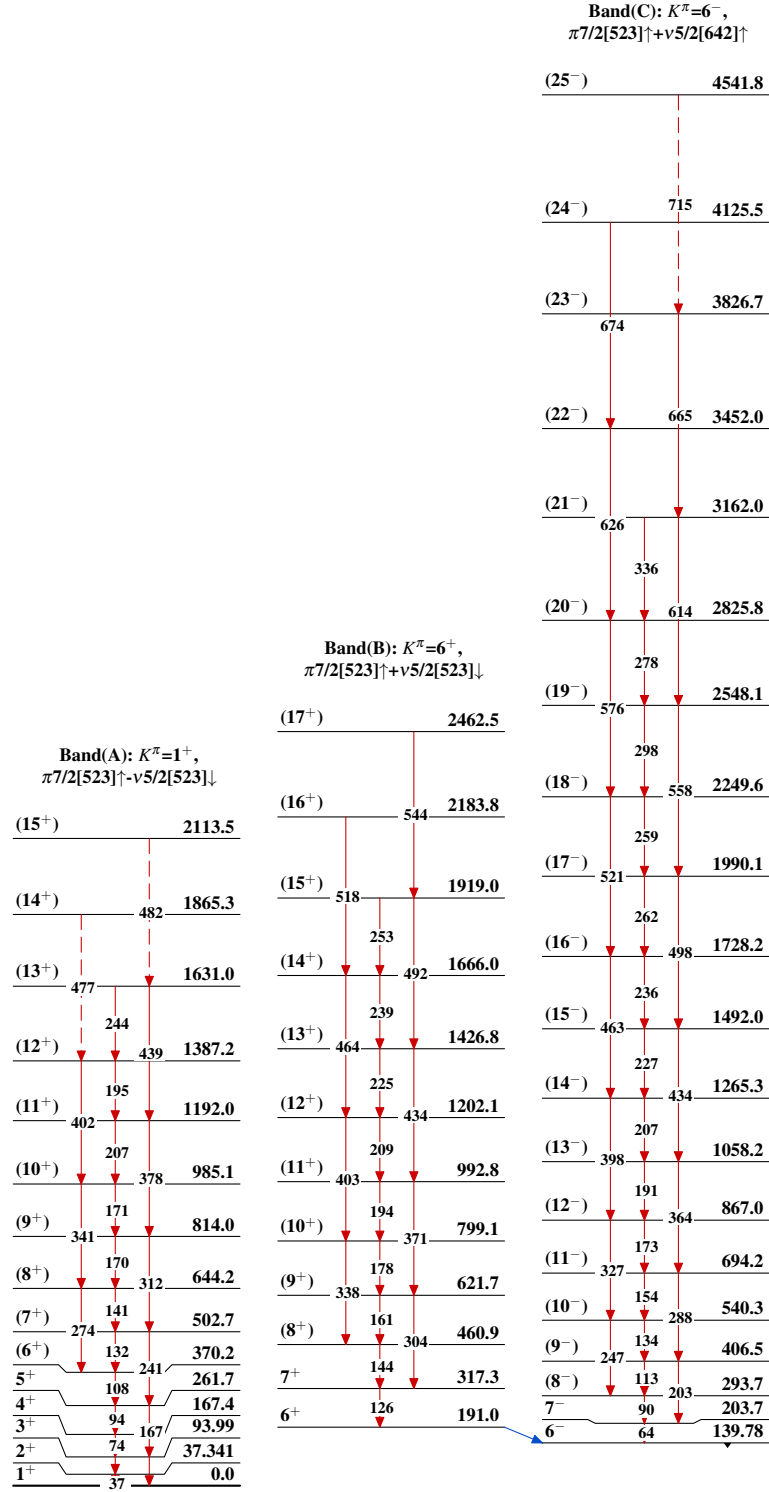
Intensities: Relative photon branching from each level

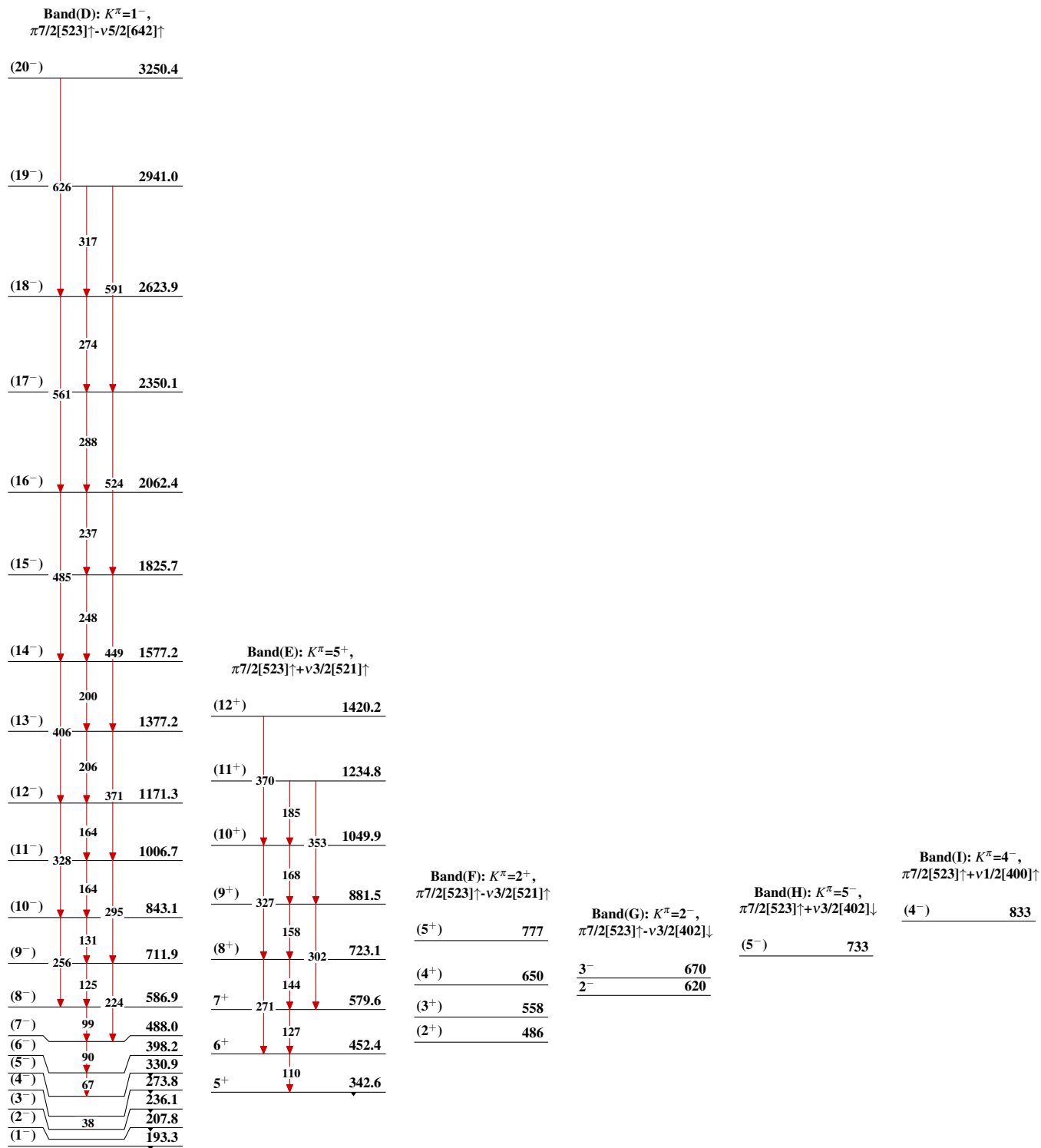


Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Relative photon branching from each level



Adopted Levels, Gammas $^{164}_{67}\text{Ho}_{97}$

Adopted Levels, Gammas (continued)

Adopted Levels, Gammas (continued)

Band(J): $K^\pi=3^-$,
 $\pi 7/2[523]\uparrow-\nu 1/2[400]\uparrow$

(4⁻) 994

(3⁻) 925

Band(K): $K^\pi=3^+$,
 $\pi 7/2[523]\uparrow-\nu 1/2[521]\downarrow$

(5⁺) 429.9

132

241

(4⁺) 297.4

109

(3⁺) 188.6

$^{164}_{67}\text{Ho}_{97}$