Adopted Levels, Gammas

History

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

Q(β^-)=−6380 *30*; S(n)=9790 *21*; S(p)=5578 *16*; Q(α)=2622 *29* 2017Wa10
S(2n)=17334 *21*, S(2p)=9261 *15* (2017Wa10).
Identification and production of ^{164}Yb by 1960Bu27 from spallation reactions by bombardment of Tm_2O_3 by protons.
For theoretical nuclear structure calculations, consult NSR database, for about 130 references. About 40 of these back to 1999 are listed in the ENSDF dataset as document records.
Additional information 1.
Mass measurements: 2005Li24, 2001Bo59, 2000Ra23.

^{164}Yb Levels

Nomenclature of the quasi-neutron orbitals:
A: ν5/2[642],α=+1/2, $i_{13/2}$ orbital.
B: ν5/2[642],α=−1/2; $i_{13/2}$ orbital.
C: ν3/2[651],α=+1/2; $i_{13/2}$ orbital.
D: ν3/2[651],α=−1/2; $i_{13/2}$ orbital.
E: ν3/2[521],α=+1/2; $h_{9/2}$ orbital.
F: ν3/2[521],α=−1/2; $h_{9/2}$ orbital.
G: ν5/2[523],α=+1/2; $f_{7/2}$ orbital.
H: ν5/2[523],α=+1/2; $f_{7/2}$ orbital.

Cross Reference (XREF) Flags

A ^{164}Lu ε decay (3.14 min)
B ^{124}Sn(^{44}Ca,4nγ)
C ^{152}Sm(^{16}O,4nγ)
D ^{186}W(N,Xγ)

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[#]	XREF	Comments
0.0[@]	0$^+$	75.8 min *17*	ABCD	%ε=100 The rms charge radius ($<r^2>^{1/2}$: 5.2307 fm *60* (2013An02 evaluation). See also 2009An12 for trends in nuclear radii. $\Delta<r^2>(^{164}Yb-^{176}Yb)$=0.761 fm^2 *21* (1994Ma57, saturated absorption laser spectroscopy). Others: 1992Al25, 1985Ne09, 1982Bu21. $T_{1/2}$: from γ-decay curve (1972Ch23). Others: 78 min *2* (1964Pa07), 75 min *2* (1960Ab04, decay curve for β^+ radiation), 85 min (1960Bu27), 74 min (1955Ne03).
123.310[@] *23*	2$^+$	932 ps *30*	ABCD	μ=+0.64 *10* (2004Be13,2014StZZ) J$^\pi$: E2 γ to 0$^+$. $T_{1/2}$: from 2016Pr01 evaluation, based on half-life measurements using RDDS method in heavy-ion γ-ray studies. Measured $T_{1/2}$= 0.96 ns *7* (1979Ri06), 0.971 ns *31* (1978Ba16), 882 ps *35* (1976Bo27). 1979Ri06 and 1978Ba16 used ce(t) and recoil-shadow method in ^{152}Sm(^{16}O,4nγ) reaction, and 1976Bo27 used RDDS method in ^{128}Te(^{40}Ar,4nγ) reaction (see ^{124}Sn(^{44}Ca,4nγ) dataset). μ: measured using Integral Perturbed Angular Correlation (IPAC) in 2004Be13.
385.56[@] *4*	4$^+$	29.7 ps *10*	ABCD	J$^\pi$: ΔJ=2, E2 γ to 2$^+$.
760.05[@] *7*	6$^+$	5.02 ps *17*	ABCD	J$^\pi$: ΔJ=2, E2 γ to 4$^+$.
863.886[&] *24*	(2$^+$)		A	J$^\pi$: gammas to 0$^+$ and 2$^+$, possible member of γ band.
975.55 *5*	(0$^+$)		A	J$^\pi$: γ to 2$^+$, systematics of 0$^+$ states in neighboring nuclides.

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Adopted Levels, Gammas (continued)

^{164}Yb Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
1003.78[&] *4*	(3+)		A C	Jπ: gammas to 2+ and 4+.
1073.48 *4*	2+		A	Jπ: strong gammas to 0+, 2+ and 4+.
1144.31[&] *10*	(4+)		A	Jπ: γ to 4+, possible member of γ band.
1223.09[@] *9*	8+	1.5 ps *5*	BCD	Jπ: ΔJ=2, E2 γ to 6+.
1323.15 *6*	(2+,3,4+)		A	Jπ: gammas to 2+ and 4+.
1335.90 *6*	(1,2+)		A	Jπ: γ to 0+.
1347.58[&] *11*	(5)+		C	Jπ: ΔJ=1, M1+E2 γ to 4+; band assignment.
1365.15 *8*	(4+,5,6+)		A	Jπ: gammas to 4+ and 6+.
1415.90 *4*	(1+,2,3,4+)		A	Jπ: gammas to 2+ and (3+).
1442.10[e] *9*	(5−)		BC	Jπ: ΔJ=1 γ to 4+.
1500.27 *9*	(2+,3,4+)		A	Jπ: gammas to 2+ and 4+.
1512.99 *10*	(1,2+)		A	Jπ: γ to 0+.
1550.99[c] *7*	(4−)		ABC	Jπ: γ to 4+.
1565.34[g] *15*	(6+)		C	Jπ: gammas to 4+ and 6+.
1611.76 *4*	(1+,2,3,4+)		A	Jπ: gammas to (2+) and (3+).
1674.22[e] *10*	(7)−		BC	Jπ: ΔJ=1, E1 γ to 6+.
1753.35[@] *11*	10+	0.82 ps *30*	BCD	Jπ: ΔJ=2, E2 γ to 8+.
1779.55[&] *12*	(7+)		C	Jπ: ΔJ=1 γ to 6+, γ to (5+).
1784.9 *3*	≤4		A	Jπ: γ to 2+.
1798.44[c] *8*	(6−)		BC	Jπ: gammas to 6+ and (4−).
1873.54[g] *11*	(8+)		C	Jπ: gammas to 6+ and 8+.
1951.23 *13*			A	
1999.69[e] *11*	(9)−		BC	Jπ: ΔJ=1, E1 γ to 8+, γ to (7)−.
2123.16[c] *9*	(8)−		BC	Jπ: E1 γ to 8+, ΔJ=2 γ to (6)−.
2272.19[&] *13*	(9+)		C	
2283.95[g] *12*	(10+)		C	
2310.35[a] *12*	(8−)		C	
2329.89[@] *12*	12+	0.55 ps *20*	BCD	Jπ: ΔJ=2, E2 γ to 10+.
2400.80[e] *12*	(11)−		BC	Jπ: ΔJ=1, E1 γ to 10+.
2482.81[c] *11*	(10)−		BC	Jπ: ΔJ=2, E2 γ to (8)−.
2597.37[a] *11*	(10−)		C	
2683.48[i] *12*	12+		C	Jπ: ΔJ=2, E2 γ to 10+; γ to 12+.
2794.98[&] *15*	(11+)		C	
2824.55[f] *13*	(12+)		C	
2863.28[e] *12*	(13−)		BC	
2863.81[c] *12*	(12−)		BC	
2899.20[@] *13*	14+	0.73 ps *20*	BCD	Jπ: ΔJ=2, E2 γ to 12+.
3012.46[a] *12*	(12−)		C	
3086.72[i] *12*	14+		BC	Jπ: ΔJ=2, E2 γ to 12+, γ to 14+.
3293.68[&] *18*	(13+)		C	
3305.33[f] *12*	(14+)		C	
3317.13[c] *13*	(14−)		BC	
3377.83[e] *13*	(15−)		BC	
3388.98[i] *13*	(16+)	1.75 ps *35*	BC	
3504.30[a] *14*	(14−)		C	
3695.62[@] *13*	16+		BC	Jπ: ΔJ=2, E2 γ to 14+.
3753.44[l] *16*	(15+)		C	
3849.32[c] *13*	(16−)		BC	
3863.11[f] *14*	(16+)		C	
3932.46[i] *15*	(18+)	0.74 ps *35*	BC	

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Adopted Levels, Gammas (continued)

^{164}Yb Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	XREF	Comments
3941.58[e] *15*	(17$^-$)		BC	
4065.91[a] *15*	(16$^-$)		C	
4295.44[l] *18*	(17$^+$)		C	
4391.02[@] *15*	(18)$^+$		BC	
4393.50[j] *21*	(17$^+$)		C	
4445.05[c] *16*	(18$^-$)		BC	
4467.76[k] *21*	(17$^+$)		C	
4479.82[f] *15*	(18$^+$)		C	
4552.02[e] *16*	(19$^-$)		BC	J$^{\pi}$: (E2) γ to (17$^-$).
4565.12[i] *16*	(20$^+$)	0.29 ps *13*	BC	
4657.41[b] *16*	(18$^-$)		C	
4703.81[a] *18*	(18$^-$)		C	
4915.49[l] *21*	(19$^+$)		C	
4965.41[j] *19*	(19$^+$)		C	
5039.75[k] *20*	(19$^+$)		C	
5067.83[c] *21*	(20$^-$)		BC	J$^{\pi}$: (E2) γ to (18$^-$).
5097.26[h] *16*	(20$^+$)		BC	
5182.87[f] *16*	(20$^+$)		C	
5197.30[b] *16*	(20$^-$)		C	
5205.96[e] *18*	(21$^-$)		BC	
5277.89[i] *18*	(22$^+$)	0.173 ps *21*	BC	
5380.31[a] *21*	(20$^-$)		C	
5596.70[l] *23*	(21$^+$)		C	
5611.06[j] *20*	(21$^+$)		C	
5688.4[c] *3*	(22$^-$)		BC	J$^{\pi}$: (E2) γ to (20$^-$).
5695.01[k] *20*	(21$^+$)		C	
5804.26[h] *17*	(22$^+$)		BC	
5864.92[b] *19*	(22$^-$)		C	
5907.13[e] *20*	(23$^-$)	0.159 ps *21*	BC	J$^{\pi}$: (E2) γ to (21$^-$).
5961.2[f] *3*	(22$^+$)		C	
6058.41[i] *20*	(24$^+$)	0.132 ps *+42−21*	BC	J$^{\pi}$: ΔJ=(2), (E2) γ to (22$^+$).
6083.7[a] *3*	(22$^-$)		C	
6273.22[d] *25*	(23$^-$)		C	
6308.4[j] *3*	(23$^+$)		C	
6339.30[l] *25*	(23$^+$)		C	
6372.3[c] *3*	(24$^-$)		BC	
6428.75[k] *21*	(23$^+$)		C	
6525.25[h] *19*	(24$^+$)		C	
6606.42[b] *21*	(24$^-$)		C	
6666.83[e] *23*	(25$^-$)	0.159 ps *35*	BC	
6785.5[f] *4*	(24$^+$)		C	
6847.9[a] *4*	(24$^-$)		C	
6896.78[i] *22*	(26$^+$)	0.104 ps *+28−21*	BC	
7011.2[d] *3*	(25$^-$)		C	
7066.6[j] *4*	(25$^+$)		C	
7133.5[l] *4*	(25$^+$)		C	
7148.7[c] *4*	(26$^-$)		BC	
7201.0[m] *3*	(25$^-$)		C	

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Adopted Levels, Gammas (continued)

^{164}Yb Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	E(level)†	Jπ‡	$T_{1/2}$#	XREF
7217.7[k] *3*	(25+)		C	8724.6[i] *4*	(30+)	0.083 ps *+35−28*	BC
7299.58[h] *24*	(26+)		C	8771.0[j] *5*	(29+)		C
7405.2[b] *3*	(26−)		C	8871.0[l] *5*	(29+)		C
7495.43[e] *25*	(27−)		BC	8971.2[c] *5*	(30−)		BC
7645.6[f] *4*	(26+)		C	8999.1[h] *4*	(30+)		C
7785.98[i] *24*	(28+)	0.049 ps *+21−14*	BC	9185.0[b] *5*	(30−)		C
7829.3[d] *4*	(27−)		C	9367.6[e] *4*	(31−)		BC
7887.5[j] *4*	(27+)		C	9644.7[d] *6*	(31−)		C
7970.3[m] *3*	(27−)		C	9714.2[i] *4*	(32+)	0.083 ps *42*	BC
7977.4[l] *4*	(27+)		C	9716.5[j] *6*	(31+)		C
8018.5[c] *5*	(28−)		BC	9985.8[c] *5*	(32−)		BC
8059.5[k] *4*	(27+)		C	10371.8[e] *5*	(33−)		BC
8135.1[h] *4*	(28+)		C	10744.1[i] *7*	(34+)		BC
8264.7[b] *4*	(28−)		C	11817[i] *1*	(36+)		B
8397.8[e] *4*	(29−)		BC	12931[i] *2*	(38+)		B
8715.0[d] *5*	(29−)		C				

† From least-squares fit to Eγ data.

‡ For high-spin (J>6), the assignments are based on γ(θ) and ce data in (16,4nγ), and band associations from γγ coin data in (^{16}O,4nγ) and (^{44}Ca,4nγ).

For excited states, the values are from Doppler-shift method (1976Bo27) up to 18^+ level in the g.s. band. Above 18^+, the values are from Doppler-broadened line shapes (1996Xi01).

@ Band(A): g.s. band.

& Band(B): γ band.

[a] Band(C): π=−,α=0, BE → BEAD.

[b] Band(D): π=−, α=0, AHBC → AHBCEF.

[c] Band(E): π=−, α=0, AF → AFBC.

[d] Band(F): π=−, α=1, AGBC → AGBCEF.

[e] Band(G): π=−,α=1, AE → AEBC.

[f] Band(H): π=+,α=0, BC and/or AD.

[g] Band(I): π=+,α=0, EF.

[h] Band(J): π=+,α=0, BCAD.

[i] Band(K): π=+,α=0, AB → ABEFCD.

[j] Band(L): π=+,α=1, Q1 (ABEG and/or ABFH). weakly populated band.

[k] Band(M): π=+,α=1, Q2 (ABEG and/or ABFH). weakly populated band.

[l] Band(N): π=+,α=1, Q3 (AC). weakly populated band.

[m] Band(O): π=+,α=1, Q4 (BFAD(?)). weakly populated band.

Adopted Levels, Gammas (continued)

γ(^{164}Yb)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[@]	Comments
123.310	2^+	123.27 *3*	100	0.0	0^+	E2	1.462	α(K)=0.620 *9*; α(L)=0.644 *9*; α(M)=0.1580 *23* α(N)=0.0361 *5*; α(O)=0.00419 *6*; α(P)=2.63×10^{-5} *4* B(E2)(W.u.)=162.4 *53*
385.56	4^+	262.22 *4*	100	123.310	2^+	E2	0.1118	α(K)=0.0767 *11*; α(L)=0.0270 *4*; α(M)=0.00646 *9* α(N)=0.001487 *21*; α(O)=0.000184 *3*; α(P)=3.81×10^{-6} *6* B(E2)(W.u.)=259 *9*
760.05	6^+	374.6 *1*	100	385.56	4^+	E2	0.0387	B(E2)(W.u.)=276 *10* E_γ: weighted average of values from α decay and (^{16}O,4nγ).
863.886	(2^+)	740.52 *4*	100 *5*	123.310	2^+			
		863.89 *3*	75 *3*	0.0	0^+			
975.55	(0^+)	852.24 *4*	100	123.310	2^+			
1003.78	(3^+)	618.23 *5*	14 *2*	385.56	4^+			
		880.51 *4*	100 *5*	123.310	2^+			
1073.48	2^+	687.83 *5*	56 *7*	385.56	4^+			
		950.19 *5*	66 *7*	123.310	2^+			
		1073.56 *5*	100 *8*	0.0	0^+			
1144.31	(4^+)	758.75 *9*	100	385.56	4^+			
1223.09	8^+	463.2 *1*	100	760.05	6^+	E2	0.0217	B(E2)(W.u.)=3.2×10^2 *11*
1323.15	$(2^+,3,4^+)$	937.56 *7*	37 *6*	385.56	4^+			
		1199.87 *7*	100 *10*	123.310	2^+			
1335.90	$(1,2^+)$	1212.60 *7*	100 *8*	123.310	2^+			
		1335.86 *10*	84 *8*	0.0	0^+			
1347.58	$(5)^+$	344.1 *2*	31 *12*	1003.78	(3^+)			
		961.7 *2*	100 *19*	385.56	4^+	M1+E2		δ: +0.18 *5* or +11 *+12−4*.
1365.15	$(4^+,5,6^+)$	605.25 *10*	≈15	760.05	6^+			
		979.46 *9*	100 *25*	385.56	4^+			
1415.90	$(1^+,2,3,4^+)$	342.48 *15*	7 *2*	1073.48	2^+			
		412.10 *6*	15 *2*	1003.78	(3^+)			
		552.01 *3*	100 *8*	863.886	(2^+)			
		1292.54 *17*	52 *9*	123.310	2^+			
1442.10	(5^-)	1056.5 *1*	100	385.56	4^+	D		
1500.27	$(2^+,3,4^+)$	1115.07[#] *11*	54 *10*	385.56	4^+			
		1376.60[#] *11*	100 *10*	123.310	2^+			
1512.99	$(1,2^+)$	1389.56 *11*	100 *10*	123.310	2^+			
		1513.32 *19*	98 *11*	0.0	0^+			
1550.99	(4^-)	547.0 *2*	50 *20*	1003.78	(3^+)			
		1165.5 *1*	100 *30*	385.56	4^+			
		1427.7[&] *1*	5 *4*	123.310	2^+			
1565.34	(6^+)	805.1 *2*	100 *33*	760.05	6^+			
		1180.2 *3*	100 *33*	385.56	4^+			
1611.76	$(1^+,2,3,4^+)$	608.02 *4*	38 *4*	1003.78	(3^+)			
		747.82 *4*	100 *6*	863.886	(2^+)			

$^{164}_{70}Yb_{94}$-5

Adopted Levels, Gammas (continued)

γ(^{164}Yb) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.‡	δ‡	α@	Comments
1674.22	$(7)^-$	914.1 *1*	100	760.05	6^+	E1			
1753.35	10^+	530.4 *1*	100	1223.09	8^+	E2		0.01537	B(E2)(W.u.)=3.0×10^2 *12*
1779.55	(7^+)	431.9 *1*	60 *23*	1347.58	$(5)^+$				
		1019.6 *2*	100 *20*	760.05	6^+				δ(Q/D)=+0.03 *3* or≤−17.
1784.9	≤4	1661.6 *3*	100	123.310	2^+				
1798.44	(6^-)	247.5 *1*	58 *12*	1550.99	(4^-)				
		356.3 *1*	50 *12*	1442.10	(5^-)				
		451.1 *2*	25 *8*	1347.58	$(5)^+$				
		1038.3 *1*	100 *12*	760.05	6^+				
		1413.0& *10*	12 *4*	385.56	4^+				This γ to 4^+ implies mult=M2, reported in ^{152}Sm(^{16}O,4nγ) (1995No04), not in ^{124}Sn(^{44}Ca,4nγ) (1996Xi01); treated as questionable by evaluators.
1873.54	(8^+)	308.2 *2*	14 *5*	1565.34	(6^+)				
		650.4 *1*	100 *14*	1223.09	8^+				
		1113.3 *2*	52 *14*	760.05	6^+				
1951.23		535.33 *12*	100	1415.90	$(1^+,2,3,4^+)$				
1999.69	$(9)^-$	325.7 *2*	6 *2*	1674.22	$(7)^-$				
		776.6 *1*	100.0 *16*	1223.09	8^+	E1(+M2)	+0.082 *15*		
2123.16	$(8)^-$	324.8 *1*	100 *7*	1798.44	(6^-)	Q			
		448.9 *1*	47 *7*	1674.22	$(7)^-$	D+Q			
		900.1 *1*	47 *7*	1223.09	8^+	E1			
2272.19	(9^+)	492.6 *1*	100 *19*	1779.55	(7^+)				
		1049.3 *2*	88 *19*	1223.09	8^+				δ(Q/D)=−0.11 *4* or +8 *+3−5*.
2283.95	(10^+)	410.3 *1*	86 *21*	1873.54	(8^+)				
		1060.8 *2*	100 *21*	1223.09	8^+				
2310.35	(8^-)	187.6 *3*	17 *9*	2123.16	$(8)^-$				
		511.5 *2*	100 *25*	1798.44	(6^-)				
		635.4 *3*	25 *8*	1674.22	$(7)^-$				
		1087.5 *3*	50 *17*	1223.09	8^+				
2329.89	12^+	576.7 *1*	100	1753.35	10^+	E2		0.01252	B(E2)(W.u.)=3.0×10^2 *11*
2400.80	$(11)^-$	401.1 *1*	30.9 *15*	1999.69	$(9)^-$				
		647.4 *1*	100.0 *22*	1753.35	10^+	E1(+M2)	+0.016 *26*		
2482.81	$(10)^-$	359.7 *1*	100 *5*	2123.16	$(8)^-$	E2		0.0434	
		483.2 *1*	49 *5*	1999.69	$(9)^-$	D+Q	+0.74 *6*		
		729.4 *1*	30 *5*	1753.35	10^+				
2597.37	(10^-)	286.9 *1*	24 *8*	2310.35	(8^-)				
		474.2 *1*	100 *12*	2123.16	$(8)^-$				
2683.48	12^+	353.5 *1*	75 *12*	2329.89	12^+				
		399.4 *1*	29 *8*	2283.95	(10^+)				
		930.2 *1*	100 *12*	1753.35	10^+	E2			
2794.98	(11^+)	522.8 *1*	100 *14*	2272.19	(9^+)				
		1041.6 *2*	42 *14*	1753.35	10^+				δ(Q/D)=−0.06 *6* or≤−7.
2824.55	(12^+)	141.1 *2*	25 *13*	2683.48	12^+				

$^{164}_{70}Yb_{94}$-6

Adopted Levels, Gammas (continued)

γ(^{164}Yb) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[@]	Comments
2824.55	(12$^+$)	540.6 *1*	100 *19*	2283.95	(10$^+$)			
2863.28	(13$^-$)	180.0 *2*	2.4 *8*	2683.48	12$^+$			
		462.4 *1*	100.0 *24*	2400.80	(11)$^-$			
		533.5 *1*	56.4 *24*	2329.89	12$^+$			
2863.81	(12$^-$)	266.3 *2*	4.3 *14*	2597.37	(10$^-$)			
		381.0 *1*	100 *4*	2482.81	(10)$^-$			
		463.2 *3*	26 *4*	2400.80	(11)$^-$	(Q)		
2899.20	14$^+$	569.4 *1*	100	2329.89	12$^+$	E2	0.01291	B(E2)(W.u.)=2.4×10^2 *7*
3012.46	(12$^-$)	415.0 *1*	86 *11*	2597.37	(10$^-$)			
		529.7 *1*	100 *11*	2482.81	(10)$^-$			
3086.72	14$^+$	187.6 *1*	10 *3*	2899.20	14$^+$			
		403.1 *1*	15 *3*	2683.48	12$^+$			
		756.8 *1*	100 *4*	2329.89	12$^+$	E2		
3293.68	(13$^+$)	498.7 *1*	100	2794.98	(11$^+$)			
3305.33	(14$^+$)	218.6 *1*	30 *9*	3086.72	14$^+$			
		480.8 *1*	78 *13*	2824.55	(12$^+$)			
		621.8 *1*	100 *13*	2683.48	12$^+$			
		975.7 *2*	26 *9*	2329.89	12$^+$			
3317.13	(14$^-$)	453.2 *1*	100 *4*	2863.81	(12$^-$)	(Q)		
		454.4 *2*	12 *4*	2863.28	(13$^-$)			
3377.83	(15$^-$)	291.1 *1*	13 *3*	3086.72	14$^+$	D+Q		
		514.5 *1*	100.0 *20*	2863.28	(13$^-$)	Q		
3388.98	(16$^+$)	302.3 *1*	2.9 *7*	3086.72	14$^+$			
		489.8 *1*	100.0 *22*	2899.20	14$^+$	E2	0.0188	B(E2)(W.u.)=2.1×10^2 *5*
3504.30	(14$^-$)	491.8 *1*	100 *7*	3012.46	(12$^-$)			
		641.0 *2*	15 *5*	2863.81	(12$^-$)			
3695.62	16$^+$	306.6 *1*	12 *4*	3388.98	(16$^+$)			
		608.8 *1*	98 *6*	3086.72	14$^+$	(E2)	0.01100	
		796.6 *1*	100 *6*	2899.20	14$^+$	E2		
3753.44	(15$^+$)	854.1 *1*	100	2899.20	14$^+$			
3849.32	(16$^-$)	471.4 *1*	8 *2*	3377.83	(15$^-$)			
		532.2 *1*	100 *4*	3317.13	(14$^-$)			
3863.11	(16$^+$)	167.2 *2*	6 *3*	3695.62	16$^+$			
		474.6 *2*	12 *6*	3388.98	(16$^+$)			
		557.8 *1*	100 *9*	3305.33	(14$^+$)			
		776.2 *2*	34 *9*	3086.72	14$^+$			
		963.8 *2*	12 *6*	2899.20	14$^+$			
3932.46	(18$^+$)	543.3 *1*	100	3388.98	(16$^+$)	E2	0.01448	B(E2)(W.u.)=3.0×10^2 *15*
3941.58	(17$^-$)	552.2 *2*	6 *2*	3388.98	(16$^+$)			
		563.8 *1*	100 *3*	3377.83	(15$^-$)			
4065.91	(16$^-$)	561.7 *1*	100	3504.30	(14$^-$)			
4295.44	(17$^+$)	541.4 *2*	89 *22*	3753.44	(15$^+$)			
		906.8 *2*	100 *33*	3388.98	(16$^+$)			

$^{164}_{70}Yb_{94}$-7

Adopted Levels, Gammas (continued)

γ(^{164}Yb) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[@]	Comments
4391.02	$(18)^+$	695.4 *1*	100	3695.62	16^+	E2			
4393.50	(17^+)	1004.9 *2*	100	3388.98	(16^+)				
4445.05	(18^-)	595.6 *1*	100	3849.32	(16^-)				
4467.76	(17^+)	1079.2 *2*	100	3388.98	(16^+)				
4479.82	(18^+)	616.7 *2*	100 *12*	3863.11	(16^+)				
		784.3 *1*	76 *12*	3695.62	16^+				
4552.02	(19^-)	610.4 *1*	100 *4*	3941.58	(17^-)	(E2)		0.01093	
		619.6 *2*	20 *7*	3932.46	(18^+)	D(+Q)	+0.2 *2*		
4565.12	(20^+)	632.4 *1*	100	3932.46	(18^+)	E2		0.01006	B(E2)(W.u.)=3.6×10^2 *16*
4657.41	(18^-)	591.6 *1*	100 *23*	4065.91	(16^-)				δ: ≈0.5 for ΔJ=1.
		808.2 *2*	38 *15*	3849.32	(16^-)				
4703.81	(18^-)	637.9 *1*	100	4065.91	(16^-)				
4915.49	(19^+)	619.8 *2*	100 *30*	4295.44	(17^+)				
		983.3 *2*	40 *20*	3932.46	(18^+)				
4965.41	(19^+)	572.3 *2*	100 *33*	4393.50	(17^+)				
		1032.8 *2*	78 *22*	3932.46	(18^+)				
5039.75	(19^+)	572.4 *2*	67 *33*	4467.76	(17^+)				
		1107.4 *2*	100 *33*	3932.46	(18^+)				
5067.83	(20^-)	622.5 *2*	100	4445.05	(18^-)	(E2)		0.01043	
5097.26	(20^+)	618.8 *2*	32 *8*	4479.82	(18^+)				E_γ: poor fit in the level scheme. Level-energy difference=617.4.
		706.0 *1*	100 *12*	4391.02	$(18)^+$	(E2)			
5182.87	(20^+)	702.8 *1*	100 *17*	4479.82	(18^+)				
		792.1 *1*	94 *17*	4391.02	$(18)^+$				
5197.30	(20^-)	540.0 *1*	73 *20*	4657.41	(18^-)				
		752.2 *1*	100 *20*	4445.05	(18^-)				δ: ≈0.5 for ΔJ=1.
5205.96	(21^-)	641.0 *2*	18 *5*	4565.12	(20^+)	D(+Q)	−0.04 *4*		
		653.9 *1*	100 *5*	4552.02	(19^-)	Q			
5277.89	(22^+)	712.8 *1*	100	4565.12	(20^+)	[E2]			B(E2)(W.u.)=3.3×10^2 *4*
5380.31	(20^-)	676.5 *1*	100	4703.81	(18^-)				
5596.70	(21^+)	681.2 *1*	100	4915.49	(19^+)				
5611.06	(21^+)	645.7 *1*	100 *25*	4965.41	(19^+)				
		1045.7 *2*	25 *8*	4565.12	(20^+)				
5688.4	(22^-)	620.6 *2*	100	5067.83	(20^-)	(E2)		0.01051	
5695.01	(21^+)	655.8 *2*	80 *40*	5039.75	(19^+)				
		1129.6 *2*	100 *40*	4565.12	(20^+)				
5804.26	(22^+)	707.1 *1*	100 *17*	5097.26	(20^+)	(E2)			
		1238.4[#] *2*	39 *11*	4565.12	(20^+)				
5864.92	(22^-)	667.7 *1*	100 *20*	5197.30	(20^-)				
		796.8 *2*	30 *12*	5067.83	(20^-)				
5907.13	(23^-)	701.1 *1*	100	5205.96	(21^-)	(E2)			B(E2)(W.u.)=3.9×10^2 *6*
5961.2	(22^+)	778.3 *2*	100	5182.87	(20^+)				
6058.41	(24^+)	780.6 *1*	100	5277.89	(22^+)	(E2)			B(E2)(W.u.)=2.8×10^2 *+5−9*
6083.7	(22^-)	703.4 *2*	100	5380.31	(20^-)	(E2)			

$^{164}_{70}Yb_{94}$-8

Adopted Levels, Gammas (continued)

γ(^{164}Yb) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult. ‡	Comments
6273.22	(23$^-$)	1067.5 *2*	100	5205.96	(21$^-$)		
6308.4	(23$^+$)	697.3 *2*	100	5611.06	(21$^+$)		
6339.30	(23$^+$)	742.6 *1*	100	5596.70	(21$^+$)		
6372.3	(24$^-$)	683.9 *1*	100	5688.4	(22$^-$)		
6428.75	(23$^+$)	733.8 *1*	100 *38*	5695.01	(21$^+$)		
		1150.6 *2*	38 *13*	5277.89	(22$^+$)		
6525.25	(24$^+$)	720.9 *1*	100 *21*	5804.26	(22$^+$)		
		1247.4 *3*	29 *14*	5277.89	(22$^+$)		
6606.42	(24$^-$)	741.5 *1*	100	5864.92	(22$^-$)		
6666.83	(25$^-$)	759.7 *1*	100	5907.13	(23$^-$)	[E2]	B(E2)(W.u.)=2.6×10^2 *6*
6785.5	(24$^+$)	824.3 *2*	100	5961.2	(22$^+$)		
6847.9	(24$^-$)	764.2 *2*	100	6083.7	(22$^-$)		
6896.78	(26$^+$)	838.4 *1*	100	6058.41	(24$^+$)	[E2]	B(E2)(W.u.)=2.5×10^2 *+5−7*
7011.2	(25$^-$)	738.2 *2*	100 *33*	6273.22	(23$^-$)		
		1103.5 *3*	22 *11*	5907.13	(23$^-$)		
7066.6	(25$^+$)	758.2 *2*	100	6308.4	(23$^+$)		
7133.5	(25$^+$)	794.2 *2*	100	6339.30	(23$^+$)		
7148.7	(26$^-$)	776.4 *2*	100	6372.3	(24$^-$)		
7201.0	(25$^-$)	1142.5 *2*	100	6058.41	(24$^+$)		
7217.7	(25$^+$)	788.9 *2*	100	6428.75	(23$^+$)		
7299.58	(26$^+$)	774.0 *2*	100 *25*	6525.25	(24$^+$)		
		1241.9 *3*	38 *13*	6058.41	(24$^+$)		
7405.2	(26$^-$)	798.8 *2*	100	6606.42	(24$^-$)		
7495.43	(27$^-$)	828.6 *1*	100	6666.83	(25$^-$)		
7645.6	(26$^+$)	860.1 *2*	100	6785.5	(24$^+$)		
7785.98	(28$^+$)	889.2 *1*	100	6896.78	(26$^+$)	[E2]	B(E2)(W.u.)=3.9×10^2 *+12−17*
7829.3	(27$^-$)	818.1 *2*	100	7011.2	(25$^-$)		
7887.5	(27$^+$)	820.9 *2*	100	7066.6	(25$^+$)		
7970.3	(27$^-$)	769.2 *2*	100 *9*	7201.0	(25$^-$)		
		1073.8 *3*	97 *9*	6896.78	(26$^+$)		
7977.4	(27$^+$)	843.9 *2*	100	7133.5	(25$^+$)		
8018.5	(28$^-$)	869.8 *2*	100	7148.7	(26$^-$)		
8059.5	(27$^+$)	841.8 *2*	100	7217.7	(25$^+$)		
8135.1	(28$^+$)	835.5 *2*	100	7299.58	(26$^+$)		
8264.7	(28$^-$)	859.5 *2*	100	7405.2	(26$^-$)		
8397.8	(29$^-$)	902.4 *2*	100	7495.43	(27$^-$)		
8715.0	(29$^-$)	885.7 *3*	100	7829.3	(27$^-$)		
8724.6	(30$^+$)	938.6 *2*	100	7785.98	(28$^+$)	[E2]	B(E2)(W.u.)=1.8×10^2 *+6−8*
8771.0	(29$^+$)	883.5 *2*	100	7887.5	(27$^+$)		
8871.0	(29$^+$)	893.6 *2*	100	7977.4	(27$^+$)		
8971.2	(30$^-$)	952.7 *2*	100	8018.5	(28$^-$)		
8999.1	(30$^+$)	864.0 *2*	100	8135.1	(28$^+$)		
9185.0	(30$^-$)	920.3 *3*	100	8264.7	(28$^-$)		

$^{164}_{70}Yb_{94}$-9

Adopted Levels, Gammas (continued)

$\gamma(^{164}Yb)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
9367.6	(31^-)	969.8 *2*	100	8397.8	(29^-)		
9644.7	(31^-)	929.7 *3*	100	8715.0	(29^-)		
9714.2	(32^+)	989.6 *2*	100	8724.6	(30^+)	[E2]	B(E2)(W.u.)=1.3×10^2 *7*
9716.5	(31^+)	945.5 *3*	100	8771.0	(29^+)		
9985.8	(32^-)	1014.6 *2*	100	8971.2	(30^-)		
10371.8	(33^-)	1004.2 *3*	100	9367.6	(31^-)		
10744.1	(34^+)	1029.9 *4*	100	9714.2	(32^+)		
11817	(36^+)	1073[&]		10744.1	(34^+)		
12931	(38^+)	1114[&]		11817	(36^+)		

[†] When a level is populated in more than one dataset, values are from ε decay for γ rays from low-spin (J≤6), and from (^{16}O,4nγ) (1995No04) for γ rays from high-spin (J≥6) levels, as no uncertainties for Eγ are provided in (^{44}Ca,4nγ) and (n,Xγ) reactions. Exceptions are noted.

[‡] From $\gamma(\theta)$ and ce data in (^{16}O,4nγ). When level lifetimes are available, RUL is used to assign mult=E2 for ΔJ=2 and M1+E2 for mixed ΔJ=1 transitions.

[#] Uncertainty should be increased by a factor of≈2 to get an acceptable fit in the level scheme.

[@] Additional information 2.

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

$^{164}_{70}Yb_{94}$-10

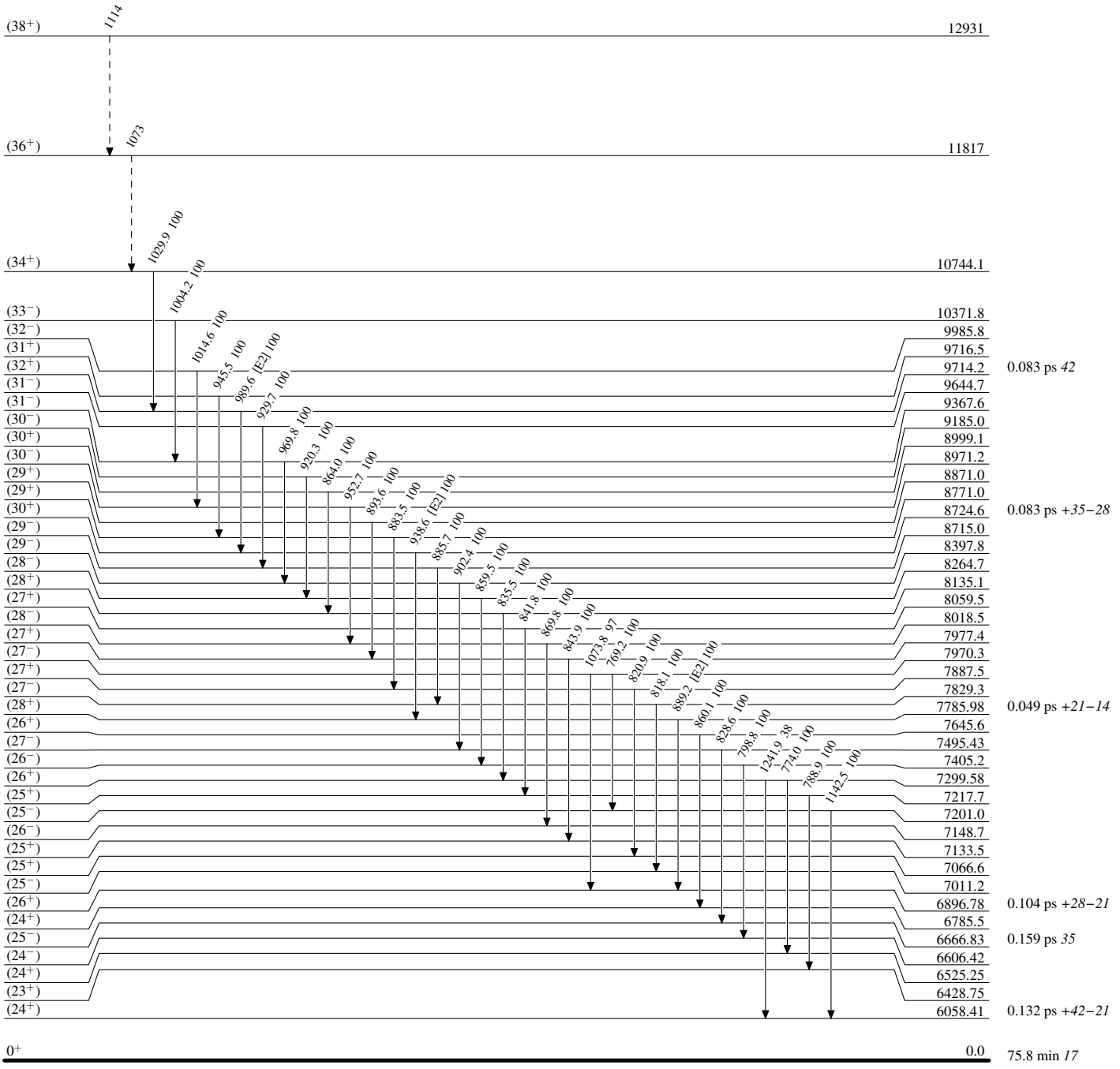
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)

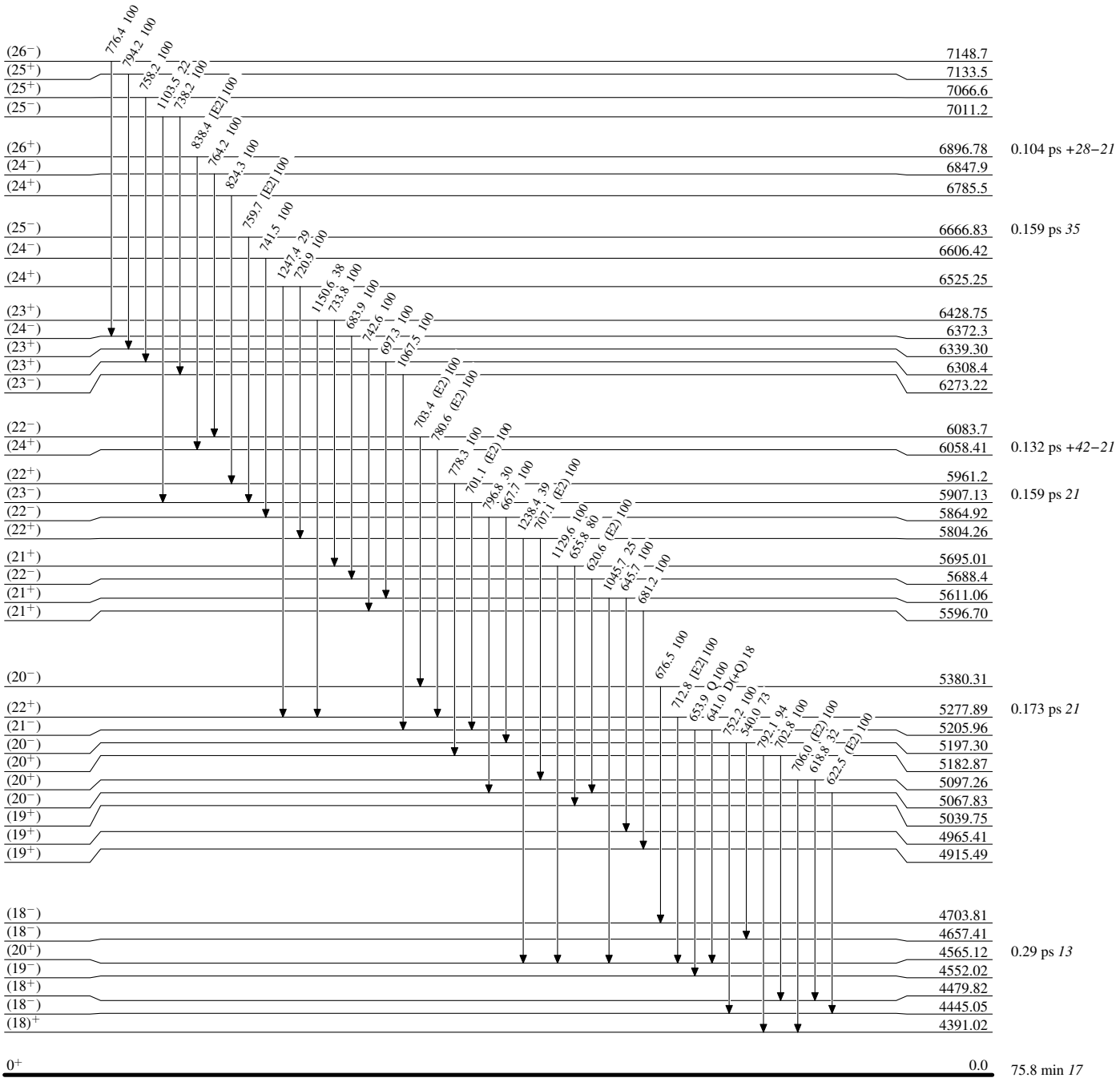


$^{164}_{70}Yb_{94}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

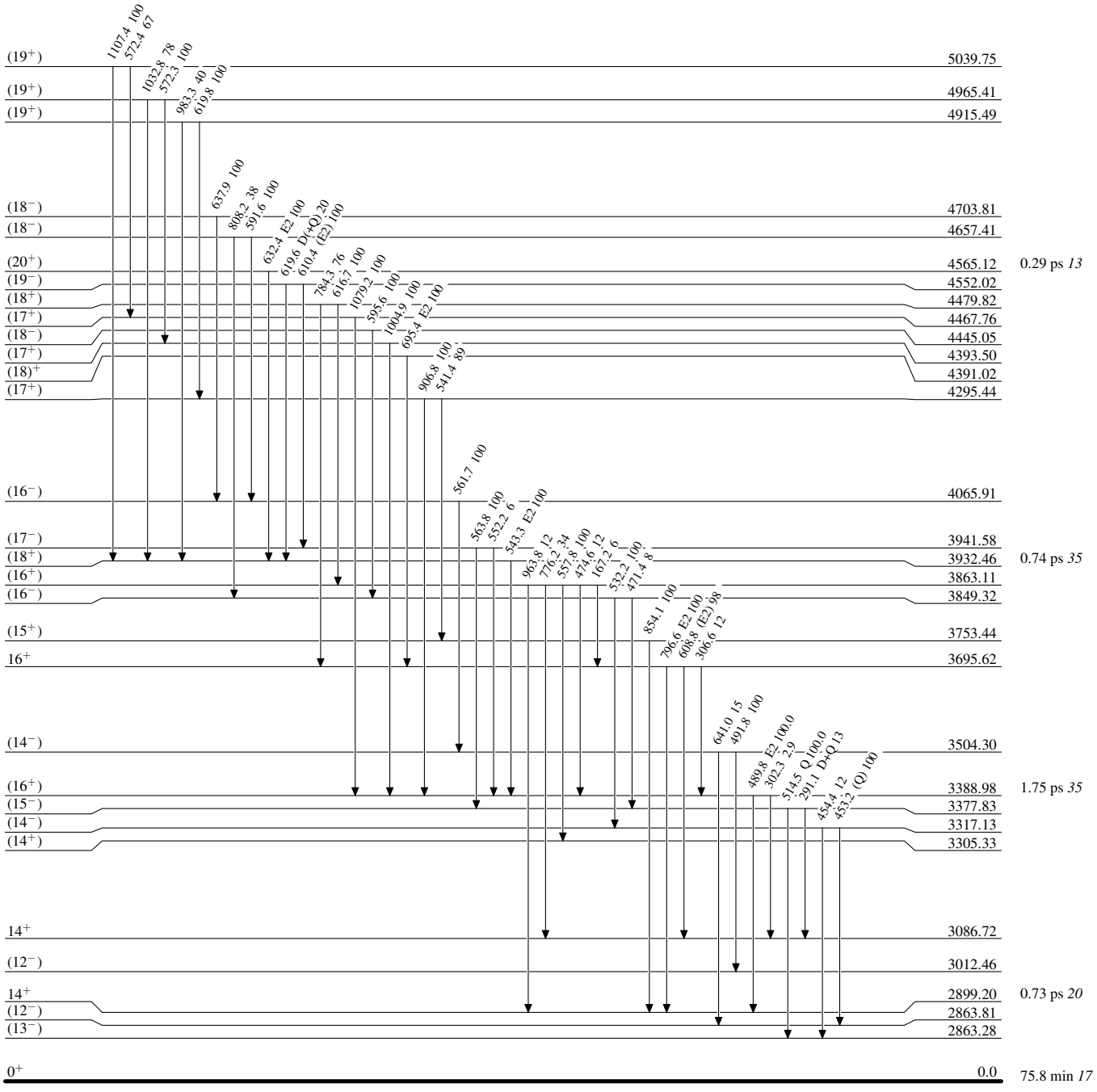


$^{164}_{70}Yb_{94}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

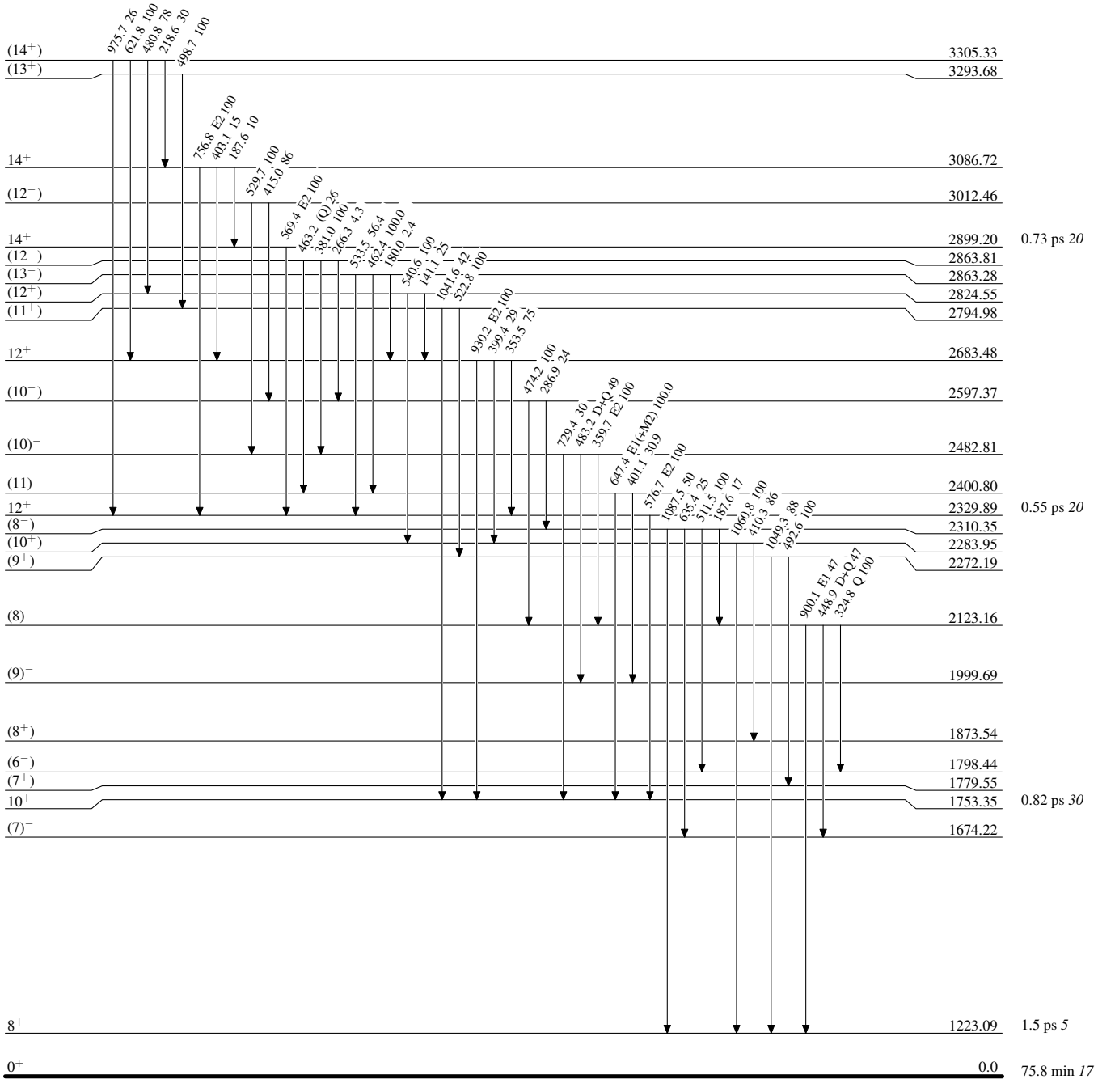


$^{164}_{70}Yb_{94}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{164}_{70}Yb_{94}$

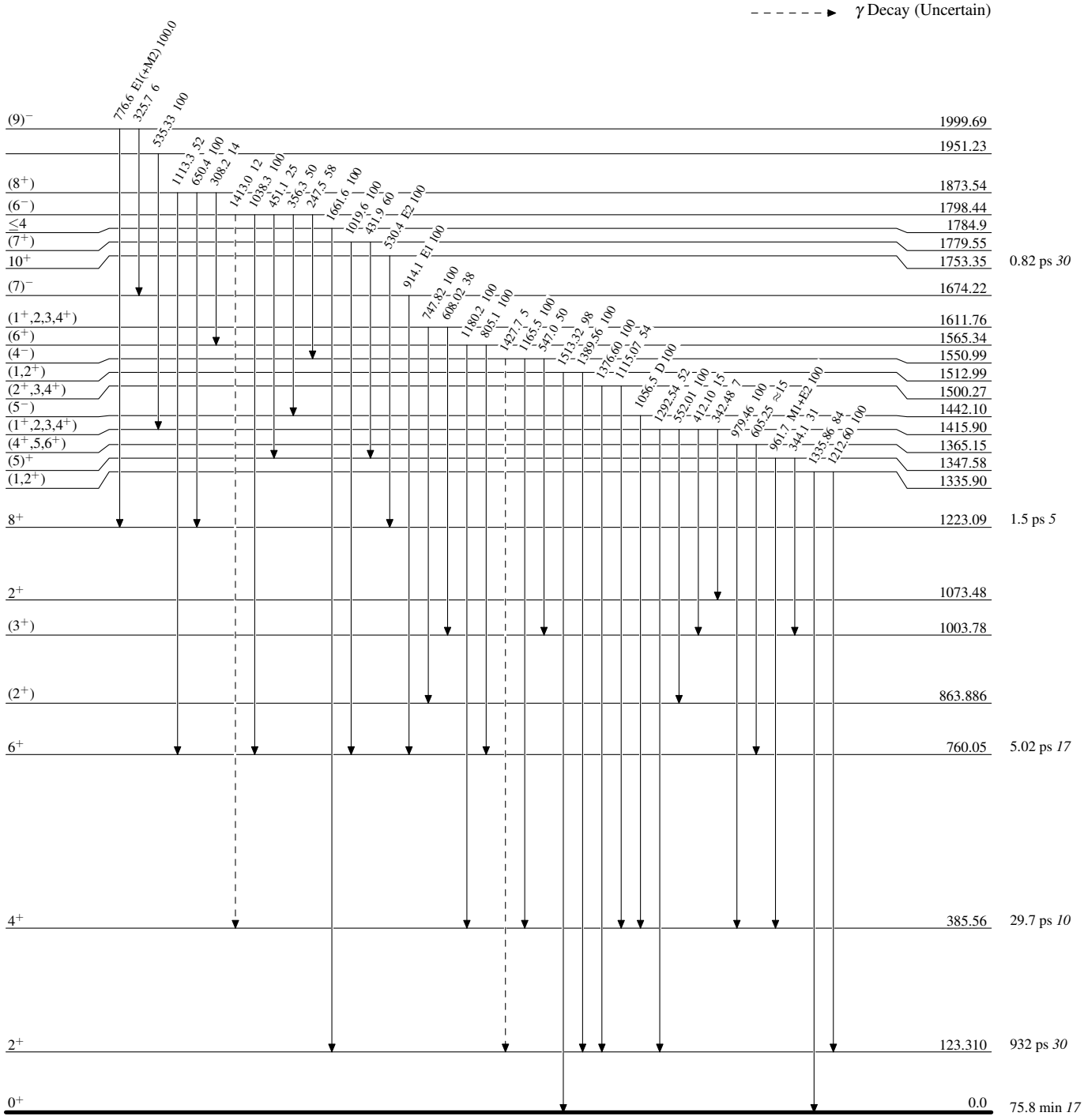
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

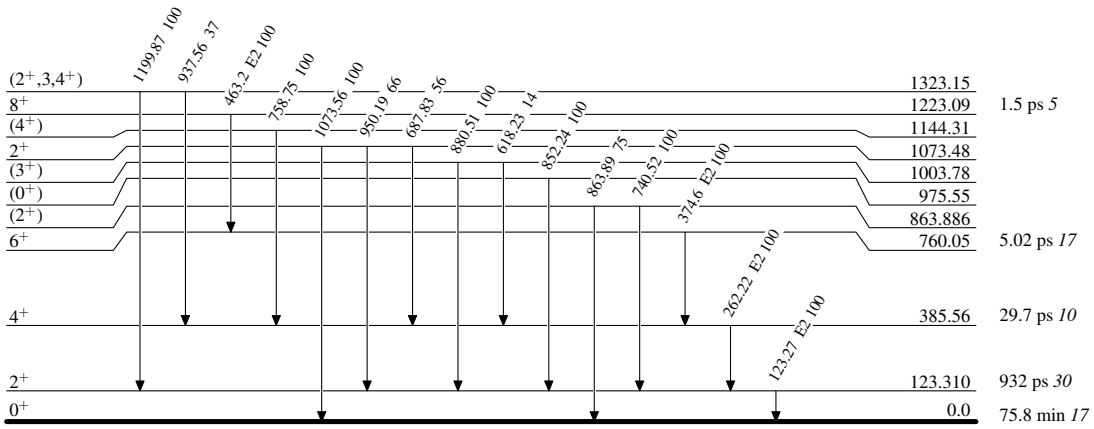


$^{164}_{70}Yb_{94}$

Adopted Levels, Gammas

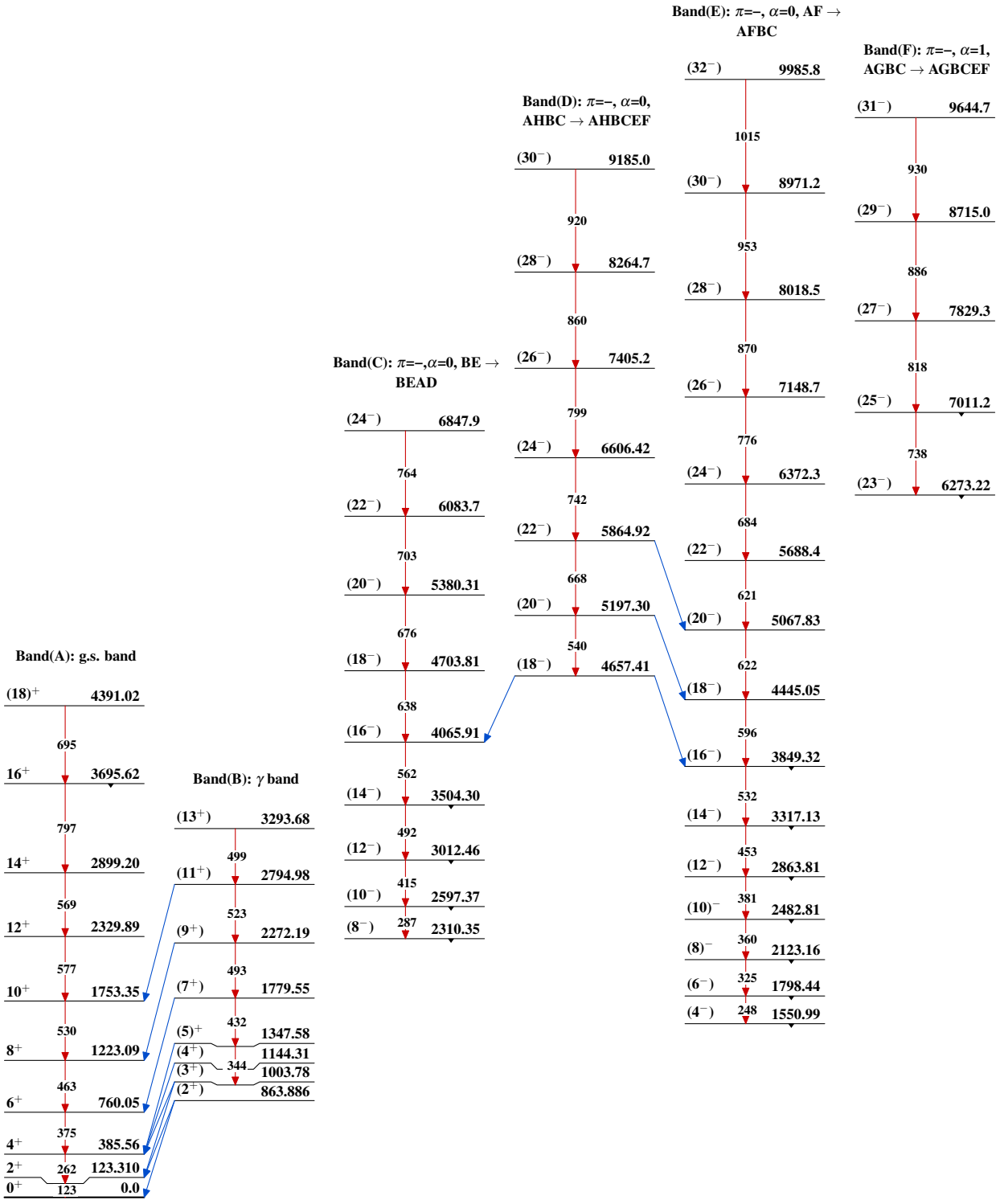
Level Scheme (continued)

Intensities: Relative photon branching from each level

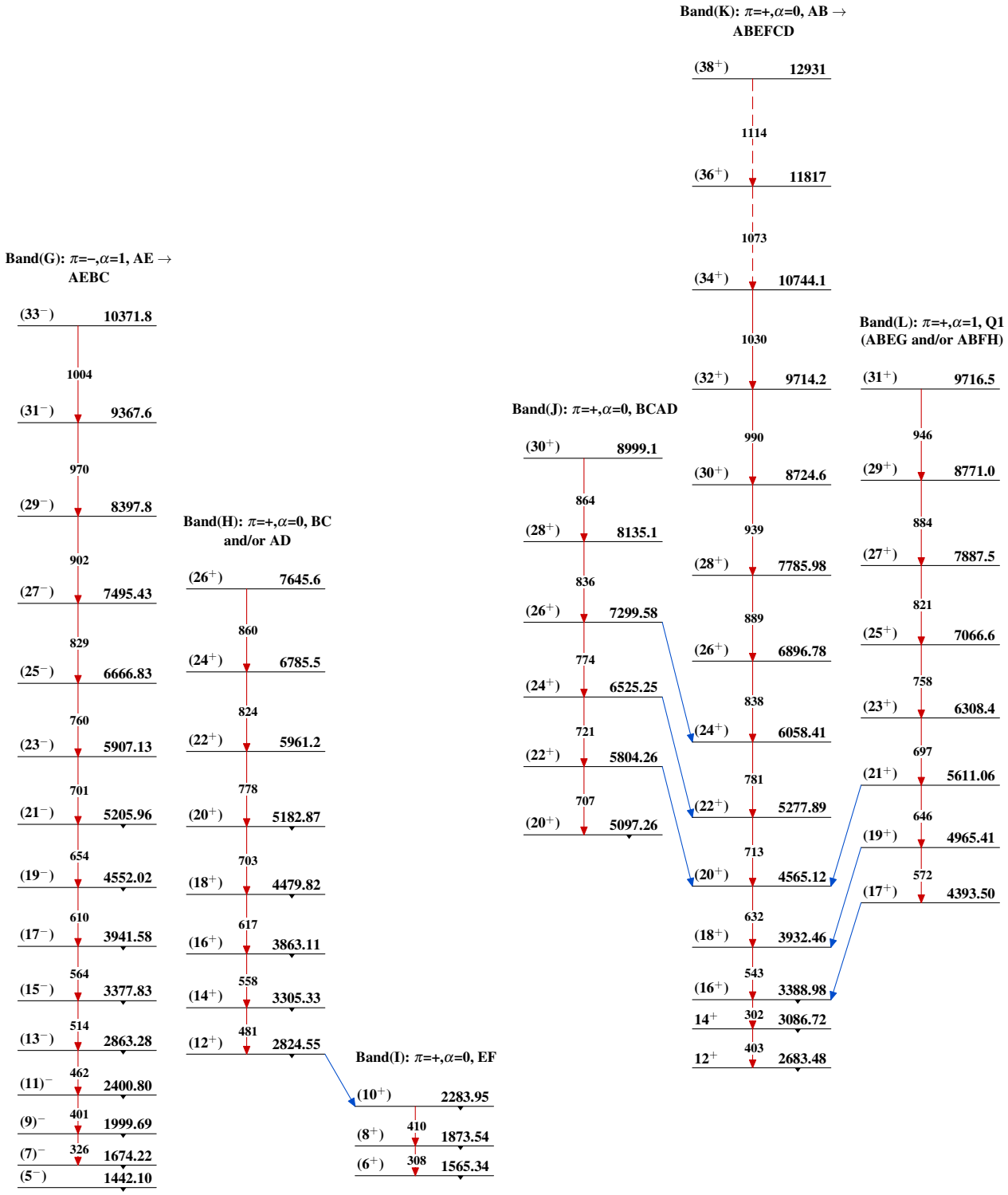


$^{164}_{70}Yb_{94}$

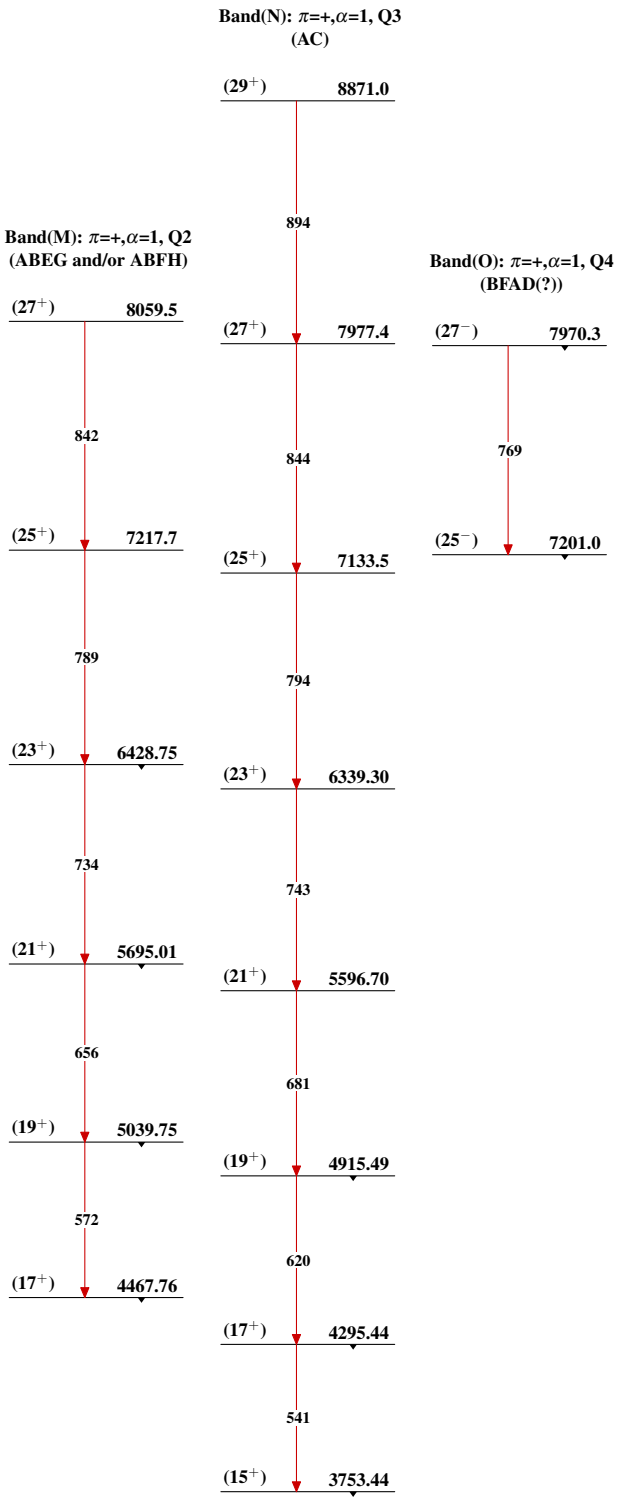
Adopted Levels, Gammas



Adopted Levels, Gammas (continued)



Adopted Levels, Gammas (continued)



$^{164}_{70}Yb_{94}$