Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 176, 1 (2021)	1-May-2021

Q(β^-)=−7890 *60*; S(n)=10401 *18*; S(p)=4882 *28*; Q(α)=3624 *25* 2021Wa16
S(2n)=18296 *10*, S(2p)=7437 *26* (2021Wa16).
Additional information 1.
In the (HI,xnγ) dataset there are important differences between the works of 2019Sa61 and of 2010Ba02 and 2005Ba88 respectively. 2019Sa61 used triple-coincidence data for level scheme analysis (double-coincidence data could not be used). When compared with 2010Ba02 or 2005Ba88 level schemes (obtained from double-coincidence data) many of the weak low-lying inter-band transitions from bands 2, 4, 5, 7, 8, 9 were not retrieved by 2019Sa61, as well as in-band transitions of band 9 and all transitions of bands 11 and 12. The comparison is even more difficult becasue of 2010Ba02 and 2005Ba88 that did not list any γ-ray relative intensity information. Although questioned, all missing transitions and their corresponding levels were maintained by 2019Sa61 in their level scheme (Figs. 9 and 10). Indeed while triple-coincidence techinque is more selective it can lose weak transitions due to the lack of statistics. As only an inter-comparison of double-coincidence data of 2019Sa61 with 2010Ba02 and 2005Ba88 together with a thorough analysis of possible contaminants could reject such transitions, they are kept and listed as questionable by the evaluator as well. As most of these questioned transitions are in between existing levels they could possibly be revealed by more productive experiments. Finally 2019Ma70 bring new data and confirm the existence and placements of the low-lying inter-band transitions of bands 7, 8 and 9 of 2005Ba88, which indicates that those of 2010Ba02 should not be discarded before new measurements.

^{160}Yb Levels

Cross Reference (XREF) Flags

- A ^{160}Lu ε decay (36.1 s+40 s)
- B ^{186}W(n,4p23nγ)
- C ^{120}Sn(^{44}Ca,4nγ):tsd
- D (HI,xnγ)

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	XREF	Comments
0.0[&]	0$^+$	4.8 min *2*	AB D	%ε+%β^+=100 T$_{1/2}$: from 1969NeZW. 1970DeZF have measured an activity with T$_{1/2}$=4.1 min *2* and assigned it to ^{160}Yb. 1974AdZX have measured T$_{1/2}$=4.2 min *2* for a source prepared by chemical separation and mass separation following Ta(p) spallation and assigned the activity to ^{161}Yb. The activity measured by 1970DeZF was likely due to ^{161}Yb. From a compilation of optical isotope-shift data, 1987Au06 give λ(^{168}Yb-^{160}Yb)=0.719 fm^2 *40*, where the nuclear parameter, λ, is approximately equal to Δ<r^2>. In an evaluation of nuclear rms charge radii, 2013An02 report <r^2>$^{1/2}$=5.1781 fm *76*.
243.00[&] *7*	2$^+$	121 ps *7*	AB D	J$^\pi$: E2 transition to g.s.
638.39[&] *9*	4$^+$	8.5 ps *6*	AB D	J$^\pi$: E2 transition to 2$^+$ state only. Member of g.s. band. g: using a technique involving $\gamma\gamma$ coincidences in a 4π geometry as well as transient magnetic fields and the recoil-distance technique, 1990Lu02 measured an average g-factor of +0.48 *26* for the low-spin members (centering around the 4$^+$ state, and also including primarily the 2$^+$ and the 6$^+$ states) of the g.s. band.
820.51[f] *8*	2$^+$		A D	J$^\pi$: E2 transition to 0$^+$.
1086.01[h] *12*	(0)$^+$		A D	J$^\pi$: sole decay mode is E2 transition to 2$^+$ state. J^π=0$^+$ is thus preferred, although 1984Au13 state that 2$^+$,3$^+$,and 4$^+$ are possible.
1112.68[g] *10*	3$^+$		A D	J$^\pi$: M1+E2 γ to 2$^+$, D+Q γ to 4$^+$.
1147.16[&] *10*	6$^+$	1.9 ps *2*	B D	XREF: B(?). J$^\pi$: E2 transition to 4$^+$ state only. Member of g.s. band.

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Adopted Levels, Gammas (continued)

^{160}Yb Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	XREF	Comments
1221.6?			A	
1255.79[f] *11*	(4$^+$)		A D	J$^{\pi}$: 4$^+$ based on E2, 435γ to 2$^+$ (2019Ma70), contradicted by 3$^-$ based on E1, 617γ to 4$^+$ (2019Sa61). Moreover according to 1984Au13 both 435γ and 617γ are E1 based on α(K)exp (in the ε decay dataset) which makes 3$^-$ the best adopted value based on strong arguments. However if 3$^-$ this would be an odd-spin negative parity band with M2, 318γ and 366γ from band 8 and E3, 566γ from band 10, which is unlikely, which rather qualifies this level as the 4$^+$ and member of γ-vibrational band as placed in this dataset by 2005Ba88 and maintained by 2019Ma70.
1292.72[h] *10*	(2$^+$)		A D	J$^{\pi}$: γ transitions to 0$^+$ and 4$^+$ states.
1358.30[@] *10*	2$^+$		A D	J$^{\pi}$: 2$^+$ from γ to 0$^+$ and E2 transition to 4$^+$ in ε decay; (3$^-$) from DCO ratio of 1115γ to 2$^+$ in (HI,xnγ) (2010Ba02). 2$^+$ is preferred (determined by strong arguments), which makes (3$^-$) not only tentative but rather questionable.
1496.36 *15*	(1,2$^+$)		A	J$^{\pi}$: transitions to 0$^+$ and 2$^+$.
1525.37[c] *12*	3$^-$		A D	J$^{\pi}$: E1 705γ to 2$^+$; it qualifies this level as member of AE, π=−, α=1 band suggested by 2005Ba88 in (HI,xnγ).
1529.15 *12*	(2$^+$,3,4$^+$)		A	J$^{\pi}$: transitions to 2$^+$ and 4$^+$.
1567.45[b] *22*	(4)$^-$		A D	J$^{\pi}$: E1 transition to 4$^+$ state indicates that J^{π}=3$^-$, 4$^-$, or 5$^-$. Proposed assignment of this level as a member of the negative-parity, signature-0, side band suggests J^{π}=4$^-$.
1567.60?[d] *16*	5$^{(-)}$		D	A same energy, (4)$^-$ level decayed by a same energy transition (929.6γ, compare with 929γ here) was placed by 1987By04, 1983Ri10, and 1980Ri08 in another band, which makes questionable the existence of this level. J$^{\pi}$: D γ to 4$^+$, π from band assignment.
1573.95[g] *10*	5$^+$		D	J$^{\pi}$: E2 γ to 3$^+$.
1591.70[h] *11*	4$^+$		D	J$^{\pi}$: E2 γ from 6$^+$.
1629.0?[@ j] *6*			D	
1676.37 *13*	(2$^+$,3,4$^+$)		A	J$^{\pi}$: transitions to 2$^+$ and 4$^+$.
1694.46[e] *18*	(4$^-$)		D	
1736.79[&] *12*	8$^+$	1.0 ps *2*	D	J$^{\pi}$: E2 γ to 6$^+$.
1743.15[f] *11*	(6$^+$)		D	J$^{\pi}$: E2 γ to (4$^+$).
1811.26 *25*	(1,2$^+$)		A	J$^{\pi}$: transitions to 0$^+$ and 2$^+$.
1871?[c]	(5$^-$)		D	Level drawn in continuation of band AE, π=−, α=1 with no J^{π} assignment in 2005Ba88 (Fig. 2, Level Scheme of ^{160}Yb), but not reproduced by 2010Ba02 and 2010Ba25. J$^{\pi}$: if really a member of AE, π=−, α=1 band, its upper level is (7$^-$) and its lower one is most likely 3$^-$.
1926.99[d] *13*	7$^-$		D	J$^{\pi}$: E1 multipolarity of 780γ to 6$^+$ state.
1952.0?[@ j] *6*			D	
1957.22[h] *11*	6$^+$		D	J$^{\pi}$: E2 γ to 4$^+$.
2050.23[e] *16*	(6$^-$)		D	This 2051, (6$^-$) level with its decaying 482.7γ and 902.9γ placed in this band by 2010Ba02 and 2010Ba25 is the same as 2051, 6$^-$ level with its decaying 484 and 903.6 placed in a different band by 1987By04, 1983Ri10, and 1980Ri08. J$^{\pi}$: D multipolarity of 903γ to 6$^+$ state and band assignment.
2050.56[b] *24*	6$^-$		D	See comment at the nearby level. J$^{\pi}$: E2 312γ from 8$^-$.
2108.47[g] *11*	7$^+$		D	J$^{\pi}$: E2 γ to 5$^+$.
2272.0[@ c] *6*	7$^-$		D	J$^{\pi}$: E2 554γ from 9$^-$.
2274.20[f] *12*	(8$^+$)		D	J$^{\pi}$: E2 γ to (6$^+$).
2362.32[b] *14*	8$^-$		D	J$^{\pi}$: M1+E2 435γ to 7$^-$ state.
2364.14[h] *12*	8$^+$		D	J$^{\pi}$: E2 γ to 6$^+$.

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Adopted Levels, Gammas (continued)

^{160}Yb Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
2372.63[d] *14*	9^-		D	Jπ: E2 446γ to 7^- state.
2374.32[&] *14*	10^+	1.1 ps *3*	D	Jπ: E2 638γ to 8^+. $T_{1/2}$: weighted average of 1.0 ps *6* (1988Fe01), 1.3 ps *3* (1990Lu02), and 0.60 ps *35* (1976Bo27).
2415.0?[@ j]			D	
2480.55[c] *13*	9^-		D	Jπ: E1 744γ to 8^+.
2527.41[e] *19*	(8^-)		D	
2578.58[b] *14*	10^-	90 ps *28*	D	Jπ: E2 216γ to 8^-.
2649.3?[@ a] *9*	(8^-)		D	
2700.81[g] *14*	9^+		D	
2703.8[l] *13*	$(8^-,9^+)$		D	
2718.4?[@ k] *6*	(9^-)		D	Jπ: $(7^-,8,9^-)$ from γ's to 7^-, 8^+ and 9^- respectively. (9^-) band-head assigned by 2010Ba02 (HI dataset) based on DCO and polarization measurements (with no listed evidence).
2763.99[c] *14*	11^-	46 ps *4*	D	Jπ: E2 283γ to 9^-.
2789.83[f] *12*	(10^+)		D	Jπ: E2 γ to (8^+).
2840.39[h] *13*	(10^+)		D	
2878.03[d] *16*	11^-		D	Jπ: E2 505γ to 9^-.
2898.27[a] *17*	(10^-)		D	
2943?[@ j]			D	
2960.80[&] *17*	12^+	1.0 ps *4*	D	$T_{1/2}$: 1990Lu02 report $T_{1/2}\leq 0.8$ ps.
2977.65[b] *16*	12^-		D	
3008.8[e] *3*	(10^-)		D	
3024.6[l] *9*	$(10^-,11^+)$		D	
3127.5?[@ k] *8*	(11^-)		D	
3137.55[i] *17*	12^+	<6 ps	D	Jπ: E2 763γ to 10^+.
3195.70[c] *17*	13^-	<6 ps	D	
3318.72[f] *14*	(12^+)		D	Jπ: E2 γ to (10^+).
3329.65[a] *17*	(12^-)		D	
3330.52[g] *17*	11^+		D	Jπ: E2 γ to 9^+.
3365.00[&] *19*	14^+	7.7 ps *8*	D	μ=−3.2 *43* μ: From g=−0.23 *31* (1990Lu02, by intergal perturbed angular correlatin method). Jπ: E2 404γ to 12^+.
3422.9[d] *3*	13^-	<3 ps	D	Jπ: E2 545γ to 11^-.
3457.3[l] *9*	$(12^-,13^+)$		D	
3518.44[b] *17*	14^-	3.8 ps *12*	D	Jπ: E2 541γ to 12^-.
3544.8?[@ e] *11*	(12^-)		D	
3682.7?[@ k] *8*	(13^-)		D	
3745.78[i] *17*	14^+		D	
3757.31[c] *19*	15^-	<3 ps	D	Jπ: E2 562γ to 13^-.
3849.10[&] *22*	16^+	1.6 ps *3*	D	
3869.51[f] *17*	(14^+)		D	
3896.7[a] *3*	(14^-)		D	
4015.65[g] *21*	(13^+)		D	
4024.9[l] *13*	$(14^-,15^+)$		D	
4028.8[d] *4*	$15^{(-)}$		D	Jπ: (E2) in-band 606γ to 13^-.
4172.52[b] *21*	16^-	1.4 ps *7*	D	Jπ: E2 654γ to 14^-.
4310.7?[@ k] *10*	(15^-)		D	

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Adopted Levels, Gammas (continued)

^{160}Yb Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
4375.78[i] *20*	16^+		D	Jπ: E2 630γ to 14^+.
4427.50[&] *24*	18^+	2.1 ps *3*	D	
4428.71[c] *25*	17^-	1.5 ps *6*	D	Jπ: E2 671γ to 15^-.
4475.5[f] *3*	(16^+)		D	
4555.7[a] *4*	(16^-)		D	
4683.9[l] *17*	$(16^-,17^+)$		D	
4702.2[d] *4*	$17^{(-)}$	<7 ps	D	Jπ: (E2) in-band 673γ to $15^{(-)}$.
4714.2 *3*	$(17,18^+)$		D	Jπ: 865γ to 16^+ but no band assignment.
4911.7[b] *3*	18^-	<5 ps	D	
4984.6 *3*	(17)		D	Jπ: 1136γ to 16^+ but no band assignment.
4990.3?[@k] *16*	(17^-)		D	
5035.8[i] *3*	(18^+)		D	
5091.2[&] *3*	20^+	1.1 ps *3*	D	Jπ: E2 664γ to 18^+.
5176.7[c] *4*	19^-	1.3 ps *8*	D	Jπ: (E2) in-band 748γ to 17^-.
5203.7[a] *4*	(18^-)		D	
5331.8[l] *20*	$(18^-,19^+)$		D	
5368.2 *11*			D	
5406.3[d] *5*	(19^-)		D	
5692.7[b] *4*	20^-		D	
5827.6[&] *3*	22^+	0.53 ps *9*	D	Jπ: (E2) 736γ to 20^+.
5947.8[c] *4*	21^-	1.7 ps *6*	D	Jπ: (E2) in-band 771γ to 19^-.
6123.9[d] *5*	(21^-)		D	
6380.7[b] *4*	22^-		D	Jπ: E2 664γ to 20^-.
6623.2[&] *4*	24^+	0.15 ps *2*	D	Jπ: E2 796γ to 22^+.
6694.1[c] *5*	23^-	<2 ps	D	Jπ: E2 746γ to 21^-.
7092.4[b] *5*	24^-		D	
7458.9[&] *4*	26^+	0.18 ps *+3–4*	D	Jπ: E2 836γ to 24^+.
7459.1[c] *5*	25^-		D	Jπ: E2 836γ to 23^-.
7870.4[b] *5*	26^-		D	Jπ: E2 778γ to 24^-.
8272.1[c] *11*	(27^-)		D	
8289.6[&] *5*	(28^+)	0.19 ps *3*	D	
8708.4[b] *6*	28^-		D	Jπ: E2 838γ to 24^-.
9126.6[&] *5*	(30^+)	0.19 ps *+3–5*	D	
9132.1[c] *15*	(29^-)		D	
9555.4[b] *6*	(30^-)		D	
10003.6[&] *12*	(32^+)	0.19 ps *+6–3*	D	
10010.1[c] *18*	(31^-)		D	
10408.4[b] *12*	(32^-)		D	
10887.1[c] *21*	(33^-)		D	
10957.6[&] *15*	(34^+)	0.18 ps *3*	D	
11293.4[b] *16*	(34^-)		D	
11790.1[c] *23*	(35^-)		D	
11964.6[&] *18*	(36^+)	0.26 ps *3*	D	
12228.4[b] *19*	(36^-)		D	
12740.1[c] *25*	(37^-)		D	
13042.6[&] *21*	(38^+)		D	
13228.4[b] *21*	(38^-)		D	

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Adopted Levels, Gammas (continued)

^{160}Yb Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	XREF	Comments
13740[c] *3*	(39$^-$)	D	
14200.6[&] *23*	(40$^+$)	D	
14290?[b]	(40$^-$)	D	
15403?[b]	(42$^-$)	D	
0.0+x[m]	J≈(20)	C	Additional information 2.
654.0+x[m] *10*	J+2	C	
1350.0+x[m] *15*	J+4	C	
2085.0+x[m] *18*	J+6	C	
2856.0+x[m] *20*	J+8	C	
3641.0+x[m] *23*	J+10	C	
4449.0+x[m] *25*	J+12	C	
5304+x[m] *3*	J+14	C	
6215+x[m] *3*	J+16	C	
7177+x[m] *3*	J+18	C	
8185+x[m] *4*	J+20	C	
9237+x[m] *4*	J+22	C	
10339+x[m] *4*	J+24	C	
11501+x[m] *4*	J+26	C	
12734+x[m] *4*	J+28	C	
14045+x[m] *4*	J+30	C	

[†] The level energies have been computed from a least-squares fit to the listed Eγ values. Where no uncertainties are given for the Eγ values, these uncertainties have been assumed to be 1 keV.

[‡] Most values are from the levels populated in the heavy-ion-induced reactions based on measured γ-ray multipolarities (if polarization information is missing stretched quadrupole transitions are assumed to be E2) together with considerations of expected rotational-band structure and theoretical calculations. If available specific arguments are given in comments.

[#] Except where otherwise noted, the $T_{1/2}$ values are obtained from the level lifetimes determined from the (HI,xnγ) reaction studies.

[@] Level not confirmed by 2019Sa61 ((HI,xnγ) dataset).

[&] Band(A): Band 1 g.s. band.

[a] Band(b): Band 2 AG, π=−, α=0. From HI dataset established by 2010Ba02 and confirmed by 2019Sa61.

[b] Band(c): Band 3 AF, π=−, α=0. Negative-parity, signature-0, side band. Probable configuration=(ν 3/2[651])(ν 3/2[532] and ν 3/2[521]).

[c] Band(C): Band 4 AE, π=−, α=1. Negative-parity, signature-1, side band. Probable configuration=(ν 3/2[651])(ν 3/2[532] and ν 3/2[521]).

[d] Band(D): Band 5 octupole band, α=1. According to 2019Sa61 Band 5 is compatible with a Y30-octupole pear-shape one-phonon vibration band (2019Sa61). Probable configuration=(ν 3/2[651])(ν 3/2[532] and ν 3/2[521]).

[e] Band(d): Band 6 octupole band, α=0. Tetrahedral nature of this band proposed earlier in the literature is not supported in 2010Ba02 based on nonzero values of absolute and relative quadrupole moments. According to 2019Sa61 this band is compatible with a K^{π}=2$^-$, Y32-triplanar-octupole or tetrahedral-vibration band.

[f] Band(e): Band 7. Even-spin γ-vibrational band based on 2$^+$.

[g] Band(f): Band 8. Odd-spin γ-vibrational band based on 3$^+$.

[h] Band(E): Band 9. Tentative β-vibrational band.

[i] Band(G): Band 10. Aligned positive-parity (or S) band.

[j] Band(F): Band 11. Side band: unassigned J^{π} values from HI dataset established by 2005Ba88 and not confirmed by 2019Sa61.

[k] Band(B): Band 12 AH, π=−, α=1. From HI dataset established by 2010Ba02 and not confirmed by 2019Sa61.

[l] Band(H): Band 13. Side band: parity and signature uncertain. Except for the first transitions, this band (with even J values and

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Adopted Levels, Gammas (continued)

^{160}Yb Levels (continued)

π=−) is identical with the AG, π=−, α=0 band 2 (each band with different excitation energies).

[m] Band(I): Band 14 triaxial strongly-deformed band. Population intensity ≈ 0.3% of the 4n-reaction channel. The decay pattern and dynamic moment of inertia are found to be similar to triaxial strongly-bands in ^{157}Er and ^{158}Er. From model calculations, a minimum associated with this structure is suggested to correspond to deformation parameters: ε_2≈0.37, γ≈20°. A discontinuity in the dynamic moment of inertia for this band at $\hbar\omega$=0.40-0.45 MeV is interpreted as crossing between $\nu i_{13/2}$ levels. Possible configuration relative to ^{146}Gd core=$\pi[(h^8_{11/2},(h_{9/2},f_{7/2})^1]\otimes \nu[i^4_{13/2},h^{-2}_{11/2},N_{osc}=4^{-2}]$.

Adopted Levels, Gammas (continued)

γ(^{160}Yb)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[b]	Comments
243.00	2+	243.2 *1*	100	0.0	0+	E2[#]	0.1419	B(E2)(W.u.)=93 *+6−5* α(K)=0.0947 *14*; α(L)=0.0362 *6*; α(M)=0.00868 *13* α(N)=0.00200 *3*; α(O)=0.000245 *4*; α(P)=4.63×10^{-6} *7*
638.39	4+	395.6 *1*	100	243.00	2+	E2[#]	0.0332	B(E2)(W.u.)=129 *9* α(K)=0.0252 *4*; α(L)=0.00619 *9*; α(M)=0.001448 *21* α(N)=0.000335 *5*; α(O)=4.34×10^{-5} *6*; α(P)=1.346×10^{-6} *19*
820.51	2+	577.2[@] *1*	100[@] *8*	243.00	2+	M1+E2	0.0204 *80*	α(K)=0.0169 *70*; α(L)=0.00272 *79*; α(M)=6.1×10^{-4} *17* α(N)=1.43×10^{-4} *40*; α(O)=2.01×10^{-5} *62*; α(P)=9.9×10^{-7} *44* Mult.: from (HI,xnγ) dataset by R(DCO) (2019Ma70).
		820.4[@] *1*	57[@] *5*	0.0	0+	E2[#]	0.00561	α(K)=0.00462 *7*; α(L)=0.000772 *11*; α(M)=0.0001748 *25* α(N)=4.08×10^{-5} *6*; α(O)=5.64×10^{-6} *8*; α(P)=2.59×10^{-7} *4*
1086.01	(0)+	843.0[@] *1*	100[@]	243.00	2+	E2[#]	0.00529	α(K)=0.00436 *7*; α(L)=0.000723 *11*; α(M)=0.0001635 *23* α(N)=3.82×10^{-5} *6*; α(O)=5.29×10^{-6} *8*; α(P)=2.45×10^{-7} *4*
1112.68	3+	292.5[@] *3*	16[@] *2*	820.51	2+	M1+E2	0.124 *45*	α(K)=0.099 *43*; α(L)=0.0195 *17*; α(M)=0.0045 *3* α(N)=0.00105 *7*; α(O)=0.000141 *19*; α(P)=5.7×10^{-6} *29* Mult.: based on R(DCO) and polarization in (HI,xnγ) dataset (2019Ma70).
		474.4[@] *1*	18[@] *2*	638.39	4+	D+Q		Mult.: based on R(DCO) in (HI,xnγ) dataset (2019Ma70).
		869.6[@] *1*	100[@] *8*	243.00	2+	(M1+E2)	0.0075 *26*	α(K)=0.0063 *23*; α(L)=9.5×10^{-4} *29*; α(M)=2.13×10^{-4} *62* α(N)=5.0×10^{-5} *15*; α(O)=7.1×10^{-6} *22*; α(P)=3.7×10^{-7} *14* Mult.: based on R(DCO) and polarization in (HI,xnγ) dataset (2019Ma70).
1147.16	6+	509.2 *1*	100	638.39	4+	E2	0.01703	B(E2)(W.u.)=166 *+19−16* α(K)=0.01342 *19*; α(L)=0.00279 *4*; α(M)=0.000645 *9* α(N)=0.0001498 *21*; α(O)=1.99×10^{-5} *3*; α(P)=7.37×10^{-7} *11*
1221.6?		978.5[@c]	[@]	243.00	2+			
1255.79	(4+)	435.15 *10*	59 *12*	820.51	2+	(E2)	0.0258	α(K)=0.0199 *3*; α(L)=0.00457 *7*; α(M)=0.001065 *15* α(N)=0.000247 *4*; α(O)=3.23×10^{-5} *5*; α(P)=1.075×10^{-6} *15* I_γ: from ^{160}Lu ε decay. Mult.: E2 based on DCO (2019Ma70) contradicts E1 based on α(K)exp (1984Au13).
		616.71 *10*	100 *18*	638.39	4+	(M1+E2)	0.0173 *67*	α(K)=0.0144 *58*; α(L)=0.00229 *68*; α(M)=5.1×10^{-4} *15* α(N)=1.20×10^{-4} *35*; α(O)=1.69×10^{-5} *53*; α(P)=8.4×10^{-7} *37* I_γ: from ^{160}Lu ε decay. Mult.: contradictory assignments: M1+E2 (2019Ma70) versus E1 (2019Sa61 and 1984Au13).
		1012		243.00	2+			Transition observed only in (HI,xnγ) (2005Ba88).
1292.72	(2+)	653.8[@]	16[@]	638.39	4+			
		1049.8[@] *1*	100[@] *16*	243.00	2+			
		1292.7[@] *2*	61[@] *11*	0.0	0+			

$^{160}_{70}Yb_{90}$-7

Adopted Levels, Gammas (continued)

γ(^{160}Yb) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[b]	Comments
1358.30	2+	719.9[@] *1*	12[@] *1*	638.39	4+	E2[#]	0.00747	α(K)=0.00610 *9*; α(L)=0.001070 *15*; α(M)=0.000243 *4* α(N)=5.67×10^{-5} *8*; α(O)=7.77×10^{-6} *11*; α(P)=3.41×10^{-7} *5*
		1115.3[@] *1*	100[@] *7*	243.00	2+			
		1358.3[@] *2*	7[@] *6*	0.0	0+			
1496.36	(1,2+)	1253.4[@] *2*	67[@] *20*	243.00	2+			
		1496.3[@] *2*	100[@] *13*	0.0	0+			
1525.37	3−	704.7[@] *1*	100[@] *7*	820.51	2+	E1[#]	0.00294	α(K)=0.00250 *4*; α(L)=0.000349 *5*; α(M)=7.72×10^{-5} *11* α(N)=1.80×10^{-5} *3*; α(O)=2.56×10^{-6} *4*; α(P)=1.333×10^{-7} *19*
		886[c]		638.39	4+			Transition tentatively observed only in (HI,xnγ).
		1283.0[@] *2*	18[@] *7*	243.00	2+			Transition observed only in ε decay.
1529.15	(2+,3,4+)	890.7[@] *1*	100[@] *14*	638.39	4+			
		1286.4[@] *2*	57[@] *14*	243.00	2+			
1567.45	(4)−	929.1[@] *2*	100[@]	638.39	4+	E1[#]	1.72×10^{-3}	α(K)=0.001460 *21*; α(L)=0.000201 *3*; α(M)=4.44×10^{-5} *7* α(N)=1.039×10^{-5} *15*; α(O)=1.480×10^{-6} *21*; α(P)=7.86×10^{-8} *11*
1567.60?	5(−)	210[&] [c]		1358.30	2+			
		929.4 *2*	100	638.39	4+	D		
1573.95	5+	318.05 *11*		1255.79	(4+)			
		427.08 *11*		1147.16	6+			Mult.: M1+E2 adopted by 2019Ma70 in (HI,xnγ) dataset based on R(DCO) which however better fits Q,E2.
		461.33 *10*	89 *44*	1112.68	3+	E2	0.0220	α(K)=0.01708 *24*; α(L)=0.00377 *6*; α(M)=0.000876 *13* α(N)=0.000203 *3*; α(O)=2.67×10^{-5} *4*; α(P)=9.30×10^{-7} *13* Mult.: based on R(DCO) and polarization in (HI,xnγ) dataset (2019Ma70).
		935.43 *10*	100 *56*	638.39	4+			Mult.: M1+E2 adopted by 2019Ma70 in (HI,xnγ) dataset based on DCO which however based on polarization better fits E1(+M2).
1591.70	4+	299.33 *21*		1292.72	(2+)			
		953.34 *15*		638.39	4+			Mult.: M1+E2 adopted by 2019Ma70 in (HI,xnγ) dataset based on DCO which however better fits Q,E2.
		1348.65 *15*		243.00	2+			
1629.0?		371[&] [c]		1255.79	(4+)			
		514[&] [c]		1112.68	3+			
		806[&] [c]		820.51	2+			
1676.37	(2+,3,4+)	1038.0[@] *1*	100[@] *25*	638.39	4+			
		1433.2[@] *3*	63[@] *38*	243.00	2+			
1694.46	(4−)	337[&] [c]		1358.30	2+			
		1056.2 *2*	100	638.39	4+			
1736.79	8+	589.5 *1*	100	1147.16	6+	E2	0.01188	B(E2)(W.u.)=152 *+38−26* α(K)=0.00952 *14*; α(L)=0.00183 *3*; α(M)=0.000419 *6* α(N)=9.75×10^{-5} *14*; α(O)=1.315×10^{-5} *19*; α(P)=5.28×10^{-7} *8*
1743.15	(6+)	488.04 *10*	100	1255.79	(4+)	E2	0.0191	α(K)=0.01495 *21*; α(L)=0.00319 *5*; α(M)=0.000739 *11*

$^{160}_{70}Yb_{90}$-8

Adopted Levels, Gammas (continued)

γ(^{160}Yb) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[b]	Comments
								α(N)=0.0001716 *24*; α(O)=2.27×10^{-5} *4*; α(P)=8.18×10^{-7} *12* Mult.: based on R(DCO) in (HI,xnγ) dataset (2019Ma70).
1743.15	(6$^+$)	596.37 *10*		1147.16	6$^+$	D(+Q)		Mult.: M1+E2 adopted by 2019Ma70 in (HI,xnγ) dataset based on DCO which however better fits D(+Q).
		1104.52 *33*		638.39	4$^+$			A_p=0.17 *40* (2019Ma70). Mult.: electric character based on polarization adopted by 2019Ma70 in (HI,xnγ) dataset as E2 which however does not exclude E1.
1811.26	(1,2$^+$)	1568.9[@] *3*	100[@] *31*	243.00	2$^+$			
		1810.1[@] *4*	38[@] *15*	0.0	0$^+$			
1871?	(5$^-$)	346[c]	100	1525.37	3$^-$			
1926.99	7$^-$	359.5 *2*	4.5 *23*	1567.60?	5$^{(-)}$			
		779.7 *1*	100 *20*	1147.16	6$^+$	E1	0.00241	α(K)exp=0.0020 *9* α(K)=0.00204 *3*; α(L)=0.000284 *4*; α(M)=6.28×10^{-5} *9* α(N)=1.469×10^{-5} *21*; α(O)=2.08×10^{-6} *3*; α(P)=1.094×10^{-7} *16*
1952.0?		325[&c]		1629.0?				
		696[&c]		1255.79	(4$^+$)			
		839[&c]		1112.68	3$^+$			
1957.22	6$^+$	365.60 *11*		1591.70	4$^+$	E2	0.0414	α(K)=0.0310 *5*; α(L)=0.00807 *12*; α(M)=0.00190 *3* α(N)=0.000439 *7*; α(O)=5.63×10^{-5} *8*; α(P)=1.636×10^{-6} *23* Mult.: based on R(DCO) in (HI,xnγ) dataset (2019Ma70).
		809.89 *12*		1147.16	6$^+$	D(+Q)		Mult.: M1+E2 adopted by 2019Ma70 in (HI,xnγ) dataset based on DCO which however better fits D(+Q).
		1318.74 *11*		638.39	4$^+$	E2	0.00217	α(K)=0.00180 *3*; α(L)=0.000268 *4*; α(M)=5.97×10^{-5} *9* α(N)=1.398×10^{-5} *20*; α(O)=1.98×10^{-6} *3*; α(P)=1.013×10^{-7} *15*; α(IPF)=2.19×10^{-5} *3* Mult.: based on R(DCO) in (HI,xnγ) dataset (2019Ma70).
2050.23	(6$^-$)	355.9 *2*	34 *17*	1694.46	(4$^-$)			
		482.7 *2*	39 *22*	1567.60?	5$^{(-)}$			482.7γ and 902.9γ decaying from 2051, (6)$^-$ level are the same as 484γ and 903.6γ and decaying from 2051, (6)$^-$ level but placed in different bands by different autors (see comments on respective levels).
		902.9 *2*	100 *28*	1147.16	6$^+$	D		See comment at 483γ.
2050.56	6$^-$	484	50	1567.45	(4)$^-$			See comment at 483γ.
		903.6	100	1147.16	6$^+$			See comment at 483γ.
2108.47	7$^+$	365.55 *12*		1743.15	(6$^+$)			
		534.62 *10*	100 *50*	1573.95	5$^+$	E2	0.01507	α(K)=0.01195 *17*; α(L)=0.00242 *4*; α(M)=0.000557 *8* α(N)=0.0001294 *19*; α(O)=1.729×10^{-5} *25*; α(P)=6.59×10^{-7} *10* Mult.: based on R(DCO) in (HI,xnγ) dataset (2019Ma70).
		961.51 *11*		1147.16	6$^+$			Mult.: M1+E2 adopted by 2019Ma70 in (HI,xnγ) dataset based on polarization which however does not exclude E1 or E2.
2272.0	7$^-$	344[&c]		1926.99	7$^-$			
		704[&c]		1567.60?	5$^{(-)}$			
		1124[&c]		1147.16	6$^+$			

$^{160}_{70}Yb_{90}$-9

Adopted Levels, Gammas (continued)

γ(^{160}Yb) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.‡	δ[a]	α[b]	Comments
2274.20	(8$^+$)	530.9 *1*	100 *60*	1743.15	(6$^+$)	E2		0.01534	α(K)=0.01215 *17*; α(L)=0.00247 *4*; α(M)=0.000569 *8* α(N)=0.0001322 *19*; α(O)=1.764×10^{-5} *25*; α(P)=6.70×10^{-7} *10* Mult.: from R(DCO) in (HI,xnγ) dataset (2019Ma70).
		537.45 *15*		1736.79	8$^+$				
		1127.35 *16*		1147.16	6$^+$				
2362.32	8$^-$	255.0 *2*	17 *9*	2108.47	7$^+$	D			
		311.8 *2*	57 *17*	2050.56	6$^-$	E2		0.0658	α(K)=0.0475 *7*; α(L)=0.01416 *20*; α(M)=0.00335 *5* α(N)=0.000774 *11*; α(O)=9.77×10^{-5} *14*; α(P)=2.44×10^{-6} *4*
		435.0 *2*	64 *19*	1926.99	7$^-$	E2+M1	≈5	≈0.0269	α(K)≈0.0209; α(L)≈0.00465; α(M)≈0.001080 α(N)≈0.000250; α(O)≈3.30×10^{-5}; α(P)≈1.142×10^{-6} δ: from measured quadrupole content of ≈96% (1980Ri02, HI dataset).
		625.2 *2*	100 *30*	1736.79	8$^+$	(E1)		0.00376	α(K)=0.00319 *5*; α(L)=0.000448 *7*; α(M)=9.93×10^{-5} *14* α(N)=2.32×10^{-5} *4*; α(O)=3.28×10^{-6} *5*; α(P)=1.693×10^{-7} *24*
2364.14	8$^+$	406.81 *10*		1957.22	6$^+$	(E2)		0.0308	α(K)=0.0234 *4*; α(L)=0.00564 *8*; α(M)=0.001319 *19* α(N)=0.000305 *5*; α(O)=3.97×10^{-5} *6*; α(P)=1.258×10^{-6} *18* Mult.: based on R(DCO) in (HI,xnγ) dataset (2019Ma70).
		1216.91 *11*	100 *50*	1147.16	6$^+$	E2		0.00251	α(K)=0.00210 *3*; α(L)=0.000317 *5*; α(M)=7.08×10^{-5} *10* α(N)=1.657×10^{-5} *24*; α(O)=2.34×10^{-6} *4*; α(P)=1.182×10^{-7} *17*; α(IPF)=6.73×10^{-6} *10* Mult.: based on R(DCO) in (HI,xnγ) dataset (2019Ma70).
2372.63	9$^-$	445.6 *2*	49 *10*	1926.99	7$^-$	E2		0.0241	α(K)=0.0186 *3*; α(L)=0.00421 *6*; α(M)=0.000978 *14* α(N)=0.000227 *4*; α(O)=2.98×10^{-5} *5*; α(P)=1.010×10^{-6} *15*
		635.8 *1*	100 *20*	1736.79	8$^+$	D			
2374.32	10$^+$	637.5 *1*	100	1736.79	8$^+$	E2		0.00987	α(K)=0.00797 *12*; α(L)=0.001473 *21*; α(M)=0.000337 *5* α(N)=7.84×10^{-5} *11*; α(O)=1.064×10^{-5} *15*; α(P)=4.44×10^{-7} *7* B(E2)(W.u.)=94 *+35−20*
2415.0?		463[&c]		1952.0?					
		672[&c]		1743.15	(6$^+$)				
		1267[&c]		1147.16	6$^+$				
2480.55	9$^-$	106.2 *2*	1.6 *8*	2374.32	10$^+$				
		209[&c]		2272.0	7$^-$				
		553.5 *2*	22 *6*	1926.99	7$^-$	E2		0.01384	α(K)=0.01102 *16*; α(L)=0.00219 *3*; α(M)=0.000503 *7* α(N)=0.0001169 *17*; α(O)=1.567×10^{-5} *22*; α(P)=6.09×10^{-7} *9*
		743.7 *1*	100 *10*	1736.79	8$^+$	E1		0.00264	α(K)=0.00224 *4*; α(L)=0.000312 *5*; α(M)=6.91×10^{-5} *10* α(N)=1.616×10^{-5} *23*; α(O)=2.29×10^{-6} *4*; α(P)=1.199×10^{-7} *17*
2527.41	(8$^-$)	477.2 *2*	68 *23*	2050.23	(6$^-$)				
		600[&c]		1926.99	7$^-$				
		790.6 *2*	100 *32*	1736.79	8$^+$				
2578.58	10$^-$	97.9 *2*	4.3 *22*	2480.55	9$^-$				
		205.8 *2*	13 *4*	2372.63	9$^-$	[M1,E2]		0.342 *98*	α(K)=0.26 *11*; α(L)=0.063 *8*; α(M)=0.0148 *23* α(N)=0.0034 *5*; α(O)=0.00045 *3*; α(P)=1.48×10^{-5} *77*
		216.4 *1*	100 *10*	2362.32	8$^-$	E2		0.207	α(K)=0.1319 *19*; α(L)=0.0576 *9*; α(M)=0.01389 *20*

$^{160}_{70}Yb_{90}$-10

Adopted Levels, Gammas (continued)

γ(^{160}Yb) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[b]	Comments
								α(N)=0.00319 *5*; α(O)=0.000387 *6*; α(P)=6.28×10^{-6} *9* B(E2)(W.u.)=1.8×10^{2} *+8−4*
2649.3?	(8$^-$)	286[&c]		2362.32	8$^-$			
		377[&c]		2272.0	7$^-$			
		598[&c]		2050.23	(6$^-$)			
2700.81	9$^+$	592.47 *10*	100 *50*	2108.47	7$^+$			
		963.71 *15*		1736.79	8$^+$			Mult.: M1+E2 adopted by 2019Ma70 in (HI,xnγ) dataset based on polarization which however does not exclude E1 or E2.
2703.8	(8$^-$,9$^+$)	775.9[c]	100	1926.99	7$^-$			
		966.4[c]	21	1736.79	8$^+$			
2718.4?	(9$^-$)	346[&c]		2372.63	9$^-$			
		792[&c]		1926.99	7$^-$			
		982[&c]		1736.79	8$^+$			
2763.99	11$^-$	185.5 *2*	1.7 *9*	2578.58	10$^-$	[M1,E2]	0.47 *12*	α(K)=0.35 *15*; α(L)=0.092 *18*; α(M)=0.022 *5* α(N)=0.0050 *11*; α(O)=0.00064 *9*; α(P)=2.0×10^{-5} *11*
		283.4 *1*	100 *10*	2480.55	9$^-$	E2	0.0879	α(K)=0.0617 *9*; α(L)=0.0201 *3*; α(M)=0.00479 *7* α(N)=0.001105 *16*; α(O)=0.0001379 *20*; α(P)=3.12×10^{-6} *5* B(E2)(W.u.)=77 *+10−9*
		389.6 *2*	19 *6*	2374.32	10$^+$	[E1]	0.01066	α(K)=0.00899 *13*; α(L)=0.001303 *19*; α(M)=0.000290 *4* α(N)=6.75×10^{-5} *10*; α(O)=9.43×10^{-6} *14*; α(P)=4.66×10^{-7} *7* B(E1)(W.u.)=9.5×10^{-6} *+31−30*
		391.3 *2*	37 *11*	2372.63	9$^-$	[E2]	0.0342	α(K)=0.0259 *4*; α(L)=0.00642 *9*; α(M)=0.001503 *22* α(N)=0.000348 *5*; α(O)=4.50×10^{-5} *7*; α(P)=1.383×10^{-6} *20* B(E2)(W.u.)=5.7 *15*
2789.83	(10$^+$)	425.55 *10*		2364.14	8$^+$			Mult.: Q,E2 adopted in (HI,xnγ) dataset (2019Ma70) based on DCO which does not exclude D(+Q).
		515.63 *10*		2274.20	(8$^+$)	E2	0.01650	α(K)=0.01303 *19*; α(L)=0.00269 *4*; α(M)=0.000621 *9* α(N)=0.0001442 *21*; α(O)=1.92×10^{-5} *3*; α(P)=7.16×10^{-7} *10* Mult.: adopted in (HI,xnγ) dataset (2019Ma70) based on R(DCO).
		1053.14 *11*	100 *67*	1736.79	8$^+$			
2840.39	(10$^+$)	476.22 *11*		2364.14	8$^+$			
		566.18 *10*		2274.20	(8$^+$)			
		1104.52 *33*		1736.79	8$^+$			
2878.03	11$^-$	300[&c]		2578.58	10$^-$			
		398[&c]		2480.55	9$^-$			
		503.7 *2*	26 *8*	2374.32	10$^+$			
		505.4 *1*	100 *19*	2372.63	9$^-$	E2	0.01736	α(K)=0.01367 *20*; α(L)=0.00285 *4*; α(M)=0.000660 *10* α(N)=0.0001532 *22*; α(O)=2.04×10^{-5} *3*; α(P)=7.50×10^{-7} *11*
2898.27	(10$^-$)	179[&c]		2718.4?	(9$^-$)			
		250[&c]		2649.3?	(8$^-$)			
		319.7 *1*	100	2578.58	10$^-$			
		371[&c]		2527.41	(8$^-$)			

$^{160}_{70}Yb_{90}$-11

Adopted Levels, Gammas (continued)

γ(^{160}Yb) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.‡	α b	Comments
2898.27	(10⁻)	418 &c		2480.55	9⁻			
		526 &c		2372.63	9⁻			
		536 &c		2362.32	8⁻			
2943?		528 &c		2415.0?				
2960.80	12⁺	586.6 *1*	100	2374.32	10⁺	E2	0.01202	α(K)=0.00963 *14*; α(L)=0.00185 *3*; α(M)=0.000425 *6* α(N)=9.89×10⁻⁵ *14*; α(O)=1.333×10⁻⁵ *19*; α(P)=5.34×10⁻⁷ *8* B(E2)(W.u.)=1.6×10² *+10−5*
2977.65	12⁻	213.6 *2*	4.7 *24*	2763.99	11⁻			
		399.1 *1*	100 *10*	2578.58	10⁻	E2	0.0324	α(K)=0.0246 *4*; α(L)=0.00601 *9*; α(M)=0.001406 *20* α(N)=0.000325 *5*; α(O)=4.22×10⁻⁵ *6*; α(P)=1.318×10⁻⁶ *19*
3008.8	(10⁻)	481.4 *2*	100	2527.41	(8⁻)			
		646		2362.32	8⁻			
3024.6	(10⁻,11⁺)	320.8	67	2703.8	(8⁻,9⁺)			
		650.5	100	2374.32	10⁺			
3127.5?	(11⁻)	249 &c		2878.03	11⁻			
		408 &c		2718.4?	(9⁻)			
		646 &c		2480.55	9⁻			
		752 &c		2374.32	10⁺			
		754 &c		2372.63	9⁻			
3137.55	12⁺	763.1 *1*	100	2374.32	10⁺	E2	0.00657	α(K)=0.00538 *8*; α(L)=0.000923 *13*; α(M)=0.000209 *3* α(N)=4.89×10⁻⁵ *7*; α(O)=6.72×10⁻⁶ *10*; α(P)=3.02×10⁻⁷ *5*
3195.70	13⁻	318 &c		2878.03	11⁻			
		431.7 *1*	100	2763.99	11⁻	E2	0.0262	α(K)=0.0202 *3*; α(L)=0.00465 *7*; α(M)=0.001084 *16* α(N)=0.000251 *4*; α(O)=3.28×10⁻⁵ *5*; α(P)=1.089×10⁻⁶ *16*
3318.72	(12⁺)	478.37 *10*		2840.39	(10⁺)			
		528.84 *10*	100 *60*	2789.83	(10⁺)	E2	0.01549	α(K)=0.01226 *18*; α(L)=0.00249 *4*; α(M)=0.000575 *8* α(N)=0.0001337 *19*; α(O)=1.784×10⁻⁵ *25*; α(P)=6.76×10⁻⁷ *10* Mult.: adopted in (HI,xnγ) dataset (2019Ma70) based on R(DCO).
3329.65	(12⁻)	352.0 *2*	23 *15*	2977.65	12⁻			
		431.4 *1*	15 *8*	2898.27	(10⁻)			
		451 &c		2878.03	11⁻			
		565.6 *2*	100 *31*	2763.99	11⁻			
		751 &c		2578.58	10⁻			
3330.52	11⁺	629.71 *10*	100	2700.81	9⁺	E2	0.01016	α(K)=0.00819 *12*; α(L)=0.001523 *22*; α(M)=0.000348 *5* α(N)=8.11×10⁻⁵ *12*; α(O)=1.100×10⁻⁵ *16*; α(P)=4.56×10⁻⁷ *7* Mult.: based on R(DCO) in (HI,xnγ) dataset (2019Ma70).
3365.00	14⁺	404.2 *1*	100	2960.80	12⁺	E2	0.0313	B(E2)(W.u.)=128 *+15−12* α(K)=0.0238 *4*; α(L)=0.00576 *8*; α(M)=0.001347 *19* α(N)=0.000312 *5*; α(O)=4.05×10⁻⁵ *6*; α(P)=1.278×10⁻⁶ *18*
3422.9	13⁻	462 &c		2960.80	12⁺			
		544.9 *2*	100	2878.03	11⁻	E2	0.01438	α(K)=0.01143 *16*; α(L)=0.00229 *4*; α(M)=0.000526 *8* α(N)=0.0001224 *18*; α(O)=1.638×10⁻⁵ *23*; α(P)=6.31×10⁻⁷ *9*

$^{160}_{70}Yb_{90}$-12

Adopted Levels, Gammas (continued)

γ(^{160}Yb) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.‡	α b	Comments
3422.9	13⁻	659 &c		2763.99	11⁻			
3457.3	(12⁻,13⁺)	433	100	3024.6	(10⁻,11⁺)			
		496.3	47	2960.80	12⁺			
3518.44	14⁻	322.7 *2*	6 *4*	3195.70	13⁻			
		540.8 *1*	100 *10*	2977.65	12⁻	E2	0.01465	α(K)=0.01163 *17*; α(L)=0.00234 *4*; α(M)=0.000538 *8* α(N)=0.0001251 *18*; α(O)=1.673×10^{-5} *24*; α(P)=6.42×10^{-7} *9* B(E2)(W.u.)=58 *+27−14*
3544.8?	(12⁻)	536 &		3008.8	(10⁻)			
3682.7?	(13⁻)	259 &c		3422.9	13⁻			
		555 &c		3127.5?	(11⁻)			
		804 &c		2878.03	11⁻			
3745.78	14⁺	608.1 *1*	100 *10*	3137.55	12⁺			
		785.1 *1*	48 *10*	2960.80	12⁺			
3757.31	15⁻	334 &c		3422.9	13⁻			
		561.6 *1*	100	3195.70	13⁻	E2	0.01335	α(K)=0.01065 *15*; α(L)=0.00210 *3*; α(M)=0.000482 *7* α(N)=0.0001121 *16*; α(O)=1.504×10^{-5} *21*; α(P)=5.89×10^{-7} *9*
3849.10	16⁺	484.1 *1*	100	3365.00	14⁺	E2	0.0194	α(K)=0.01517 *22*; α(L)=0.00325 *5*; α(M)=0.000753 *11* α(N)=0.0001748 *25*; α(O)=2.31×10^{-5} *4*; α(P)=8.30×10^{-7} *12* B(E2)(W.u.)=2.5×10^{2} *+6−4*
3869.51	(14⁺)	550.79 *10*	100	3318.72	(12⁺)			
3896.7	(14⁻)	378 &c		3518.44	14⁻			
		567.0 *2*	100	3329.65	(12⁻)			
4015.65	(13⁺)	686.00 *12*	100	3330.52	11⁺			
4024.9	(14⁻,15⁺)	567.6	100	3457.3	(12⁻,13⁺)			
4028.8	15(⁻)	605.9 *2*	100	3422.9	13⁻	(E2)	0.01112	α(K)=0.00894 *13*; α(L)=0.001693 *24*; α(M)=0.000388 *6* α(N)=9.03×10^{-5} *13*; α(O)=1.220×10^{-5} *18*; α(P)=4.97×10^{-7} *7*
		833 &c		3195.70	13⁻			
4172.52	16⁻	415.2 *2*	2.0 *10*	3757.31	15⁻	[M1,E2]	0.048 *19*	α(K)=0.039 *17*; α(L)=0.0068 *15*; α(M)=0.0015 *3* α(N)=0.00036 *8*; α(O)=5.0×10^{-5} *13*; α(P)=2.3×10^{-6} *11*
		654.1 *2*	100 *31*	3518.44	14⁻	E2	0.00930	α(K)=0.00752 *11*; α(L)=0.001375 *20*; α(M)=0.000314 *5* α(N)=7.31×10^{-5} *11*; α(O)=9.95×10^{-6} *14*; α(P)=4.20×10^{-7} *6* B(E2)(W.u.)=64 *+56−21*
4310.7?	(15⁻)	628 &c	100	3682.7?	(13⁻)			
4375.78	16⁺	630.0 *1*	100	3745.78	14⁺	E2	0.01015	α(K)=0.00818 *12*; α(L)=0.001521 *22*; α(M)=0.000348 *5* α(N)=8.10×10^{-5} *12*; α(O)=1.099×10^{-5} *16*; α(P)=4.56×10^{-7} *7*
		1011 &c		3365.00	14⁺			
4427.50	18⁺	578.4 *1*	100	3849.10	16⁺	E2	0.01243	α(K)=0.00994 *14*; α(L)=0.00193 *3*; α(M)=0.000443 *7* α(N)=0.0001030 *15*; α(O)=1.386×10^{-5} *20*; α(P)=5.51×10^{-7} *8* B(E2)(W.u.)=80 *+13−10*
4428.71	17⁻	671.4 *2*	100	3757.31	15⁻	E2	0.00875	α(K)=0.00710 *10*; α(L)=0.001283 *18*; α(M)=0.000293 *5* α(N)=6.82×10^{-5} *10*; α(O)=9.29×10^{-6} *13*; α(P)=3.97×10^{-7} *6* B(E2)(W.u.)=53 *+34−16*

$^{160}_{70}Yb_{90}$-13

Adopted Levels, Gammas (continued)

γ(^{160}Yb) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[b]	Comments
4475.5	(16$^+$)	606.0 *2*	100	3869.51	(14$^+$)			
4555.7	(16$^-$)	659.0 *2*	100	3896.7	(14$^-$)			
4683.9	(16$^-$,17$^+$)	659.0	100	4024.9	(14$^-$,15$^+$)			
4702.2	17$^{(-)}$	673.4 *2*	100	4028.8	15$^{(-)}$	(E2)	0.00870	α(K)=0.00705 *10*; α(L)=0.001273 *18*; α(M)=0.000290 *4* α(N)=6.76×10^{-5} *10*; α(O)=9.22×10^{-6} *13*; α(P)=3.94×10^{-7} *6*
4714.2	(17,18$^+$)	865.1 *2*	100	3849.10	16$^+$			
4911.7	18$^-$	483.0 *2*	<3.4	4428.71	17$^-$	[M1,E2]	0.032 *13*	α(K)=0.026 *12*; α(L)=0.0044 *12*; α(M)=0.00100 *25* α(N)=0.00023 *6*; α(O)=3.25×10^{-5} *93*; α(P)=1.54×10^{-6} *71*
		739.2 *2*	100 *31*	4172.52	16$^-$	E2	0.00705	α(K)=0.00576 *8*; α(L)=0.001000 *14*; α(M)=0.000227 *4* α(N)=5.30×10^{-5} *8*; α(O)=7.28×10^{-6} *11*; α(P)=3.23×10^{-7} *5*
4984.6	(17)	1135.5 *2*	100	3849.10	16$^+$			
4990.3?	(17$^-$)	681[&c]	100	4310.7?	(15$^-$)			
5035.8	(18$^+$)	660.0 *2*	100	4375.78	16$^+$			
5091.2	20$^+$	663.7 *1*	100	4427.50	18$^+$	E2	0.00899	α(K)=0.00728 *11*; α(L)=0.001323 *19*; α(M)=0.000302 *5* α(N)=7.03×10^{-5} *10*; α(O)=9.57×10^{-6} *14*; α(P)=4.07×10^{-7} *6* B(E2)(W.u.)=77 *+30−17*
5176.7	19$^-$	748.0 *2*	100	4428.71	17$^-$	(E2)	0.00686	α(K)=0.00561 *8*; α(L)=0.000971 *14*; α(M)=0.000220 *3* α(N)=5.14×10^{-5} *8*; α(O)=7.06×10^{-6} *10*; α(P)=3.15×10^{-7} *5* B(E2)(W.u.)=36 *+36−14*
5203.7	(18$^-$)	648.0 *2*	100	4555.7	(16$^-$)			
5331.8	(18$^-$,19$^+$)	647.9	100	4683.9	(16$^-$,17$^+$)			
5368.2		654	100	4714.2	(17,18$^+$)			
5406.3	(19$^-$)	704.1 *2*	100	4702.2	17$^{(-)}$			
5692.7	20$^-$	781.0 *2*	100	4911.7	18$^-$			
5827.6	22$^+$	736.4 *1*	100	5091.2	20$^+$	E2	0.00711	α(K)=0.00581 *9*; α(L)=0.001010 *15*; α(M)=0.000229 *4* α(N)=5.35×10^{-5} *8*; α(O)=7.34×10^{-6} *11*; α(P)=3.25×10^{-7} *5* B(E2)(W.u.)=95 *+19−14*
5947.8	21$^-$	771.1 *2*	100	5176.7	19$^-$	(E2)	0.00642	α(K)=0.00526 *8*; α(L)=0.000899 *13*; α(M)=0.000204 *3* α(N)=4.76×10^{-5} *7*; α(O)=6.55×10^{-6} *10*; α(P)=2.95×10^{-7} *5* B(E2)(W.u.)=24 *+12−6*
6123.9	(21$^-$)	717.6 *2*	100	5406.3	(19$^-$)			
6380.7	22$^-$	688.0 *2*	100	5692.7	20$^-$	E2	0.00828	α(K)=0.00673 *10*; α(L)=0.001203 *17*; α(M)=0.000274 *4* α(N)=6.39×10^{-5} *9*; α(O)=8.72×10^{-6} *13*; α(P)=3.76×10^{-7} *6*
6623.2	24$^+$	795.6 *2*	100	5827.6	22$^+$	E2	0.00600	α(K)=0.00492 *7*; α(L)=0.000832 *12*; α(M)=0.000189 *3* α(N)=4.40×10^{-5} *7*; α(O)=6.07×10^{-6} *9*; α(P)=2.76×10^{-7} *4* B(E2)(W.u.)=228 *+34−28*
6694.1	23$^-$	746.3 *2*	100	5947.8	21$^-$	E2	0.00690	α(K)=0.00564 *8*; α(L)=0.000976 *14*; α(M)=0.000222 *4* α(N)=5.17×10^{-5} *8*; α(O)=7.10×10^{-6} *10*; α(P)=3.16×10^{-7} *5*
7092.4	24$^-$	711.7 *2*	100	6380.7	22$^-$			
7458.9	26$^+$	835.7 *2*	100	6623.2	24$^+$	E2	0.00539	α(K)=0.00444 *7*; α(L)=0.000739 *11*; α(M)=0.0001670 *24* α(N)=3.90×10^{-5} *6*; α(O)=5.40×10^{-6} *8*; α(P)=2.50×10^{-7} *4* B(E2)(W.u.)=149 *+41−22*

$^{160}_{70}Yb_{90}$-14

Adopted Levels, Gammas (continued)

γ(^{160}Yb) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[b]	Comments
7459.1	25⁻	765.0 *2*	100	6694.1	23⁻	E2	0.00653	α(K)=0.00535 *8*; α(L)=0.000917 *13*; α(M)=0.000208 *3* α(N)=4.86×10^{-5} *7*; α(O)=6.68×10^{-6} *10*; α(P)=3.00×10^{-7} *5*
7870.4	26⁻	778.0 *2*	100	7092.4	24⁻	E2	0.00630	α(K)=0.00516 *8*; α(L)=0.000880 *13*; α(M)=0.000199 *3* α(N)=4.65×10^{-5} *7*; α(O)=6.41×10^{-6} *9*; α(P)=2.90×10^{-7} *4*
8272.1	(27⁻)	813		7459.1	25⁻			
8289.6	(28⁺)	830.7 *2*	100	7458.9	26⁺			
8708.4	28⁻	838.0 *2*	100	7870.4	26⁻	E2	0.00536	α(K)=0.00442 *7*; α(L)=0.000734 *11*; α(M)=0.0001659 *24* α(N)=3.87×10^{-5} *6*; α(O)=5.36×10^{-6} *8*; α(P)=2.48×10^{-7} *4*
9126.6	(30⁺)	837.0 *2*	100	8289.6	(28⁺)			
9132.1	(29⁻)	860	100	8272.1	(27⁻)			
9555.4	(30⁻)	847.0 *2*	100	8708.4	28⁻			
10003.6	(32⁺)	877	100	9126.6	(30⁺)	[E2]	0.00487	α(K)=0.00402 *6*; α(L)=0.000658 *10*; α(M)=0.0001486 *21* α(N)=3.47×10^{-5} *5*; α(O)=4.82×10^{-6} *7*; α(P)=2.26×10^{-7} *4* B(E2)(W.u.)=111 *+21−26*
10010.1	(31⁻)	878	100	9132.1	(29⁻)			
10408.4	(32⁻)	853	100	9555.4	(30⁻)			
10887.1	(33⁻)	877	100	10010.1	(31⁻)			
10957.6	(34⁺)	954	100	10003.6	(32⁺)	[E2]	0.00408	B(E2)(W.u.)=77 *+15−11* α(K)=0.00339 *5*; α(L)=0.000541 *8*; α(M)=0.0001218 *17* α(N)=2.85×10^{-5} *4*; α(O)=3.97×10^{-6} *6*; α(P)=1.91×10^{-7} *3*
11293.4	(34⁻)	885	100	10408.4	(32⁻)			
11790.1	(35⁻)	903	100	10887.1	(33⁻)			
11964.6	(36⁺)	1007	100	10957.6	(34⁺)	[E2]	0.00366	B(E2)(W.u.)=41 *+5−4* α(K)=0.00304 *5*; α(L)=0.000479 *7*; α(M)=0.0001076 *15* α(N)=2.51×10^{-5} *4*; α(O)=3.52×10^{-6} *5*; α(P)=1.711×10^{-7} *24*
12228.4	(36⁻)	935	100	11293.4	(34⁻)			
12740.1	(37⁻)	950	100	11790.1	(35⁻)			
13042.6	(38⁺)	1078	100	11964.6	(36⁺)			
13228.4	(38⁻)	1000	100	12228.4	(36⁻)			
13740	(39⁻)	1000	100	12740.1	(37⁻)			
14200.6	(40⁺)	1158	100	13042.6	(38⁺)			
14290?	(40⁻)	1061[c]	100	13228.4	(38⁻)			
15403?	(42⁻)	1113[c]	100	14290?	(40⁻)			
654.0+x	J+2	654	100	0.0+x	J≈(20)			
1350.0+x	J+4	696	100	654.0+x	J+2			
2085.0+x	J+6	735	100	1350.0+x	J+4			
2856.0+x	J+8	771	100	2085.0+x	J+6			
3641.0+x	J+10	785	100	2856.0+x	J+8			
4449.0+x	J+12	808	100	3641.0+x	J+10			
5304+x	J+14	855	100	4449.0+x	J+12			
6215+x	J+16	911	100	5304+x	J+14			
7177+x	J+18	962	100	6215+x	J+16			
8185+x	J+20	1008	100	7177+x	J+18			

$^{160}_{70}Yb_{90}$-15

Adopted Levels, Gammas (continued)

$\gamma(^{160}Yb)$ (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π
9237+x	J+22	1052	100	8185+x	J+20
10339+x	J+24	1102	100	9237+x	J+22
11501+x	J+26	1162	100	10339+x	J+24
12734+x	J+28	1233	100	11501+x	J+26
14045+x	J+30	1311	100	12734+x	J+28

† From (HI,xnγ), except as noted.
‡ Except as noted from (HI,xnγ) based on angular-distribution, angular-correlation and polarization measurements (2019Sa61).
# Determined from α(K)exp data from the ^{160}Lu(ε+β^+) decay.
@ From ^{160}Lu ε decay.
& γ transition not confirmed by 2019Sa61 ((HI,xnγ) dataset).
a Additional information 3.
b Additional information 4.
c Placement of transition in the level scheme is uncertain.

$^{160}_{70}Yb_{90}$-16

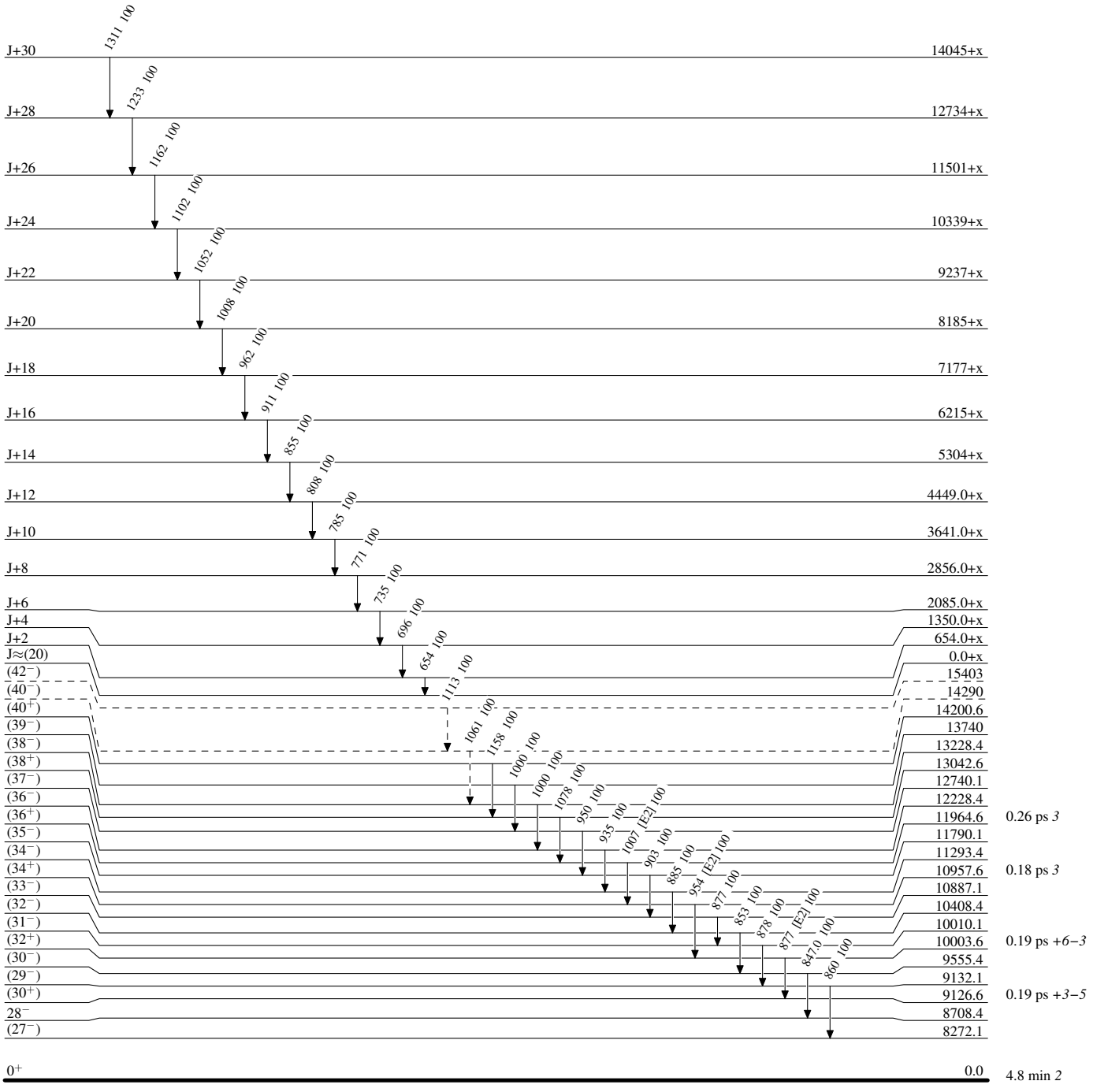
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{160}_{70}Yb_{90}$

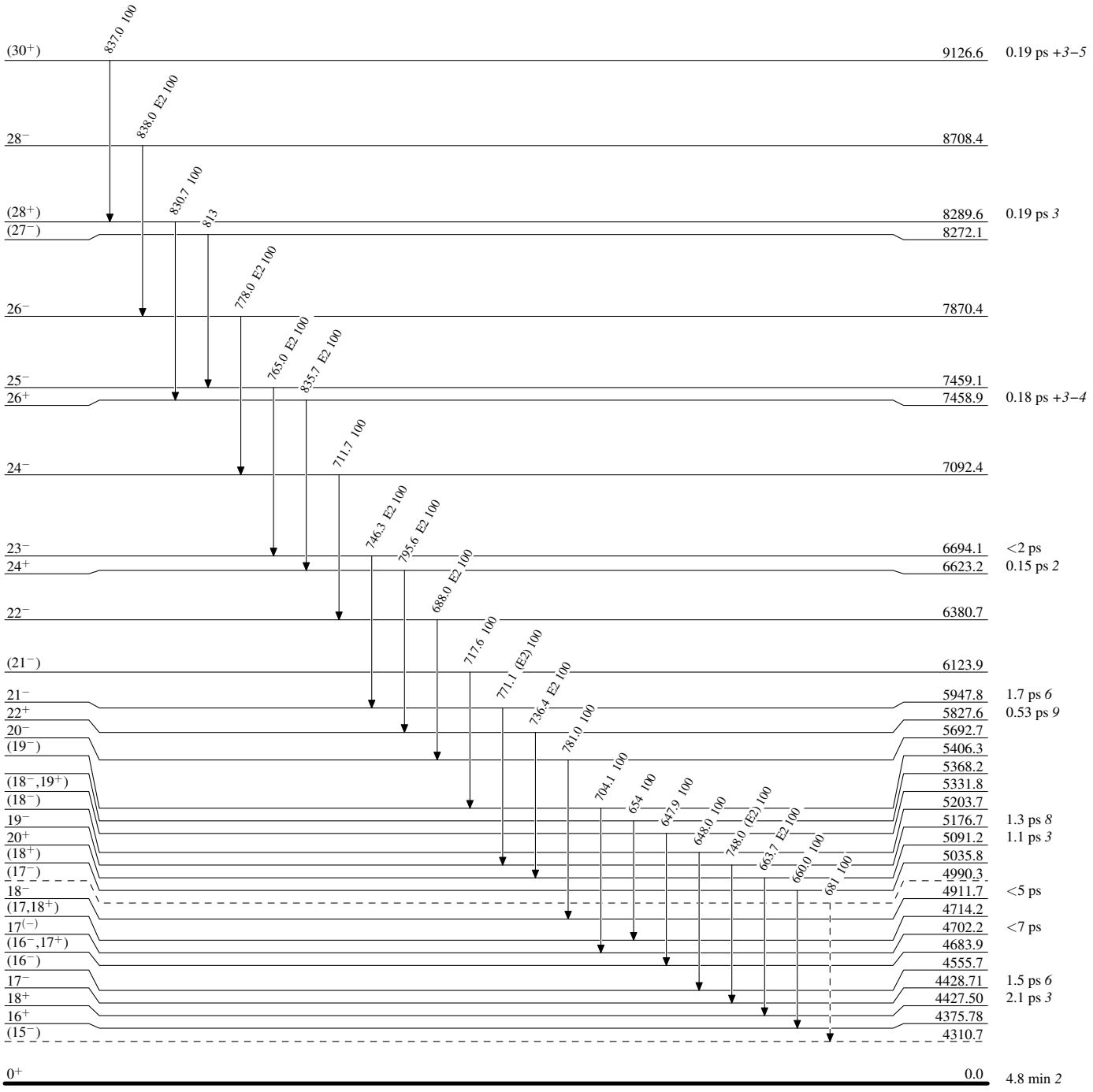
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{160}_{70}Yb_{90}$

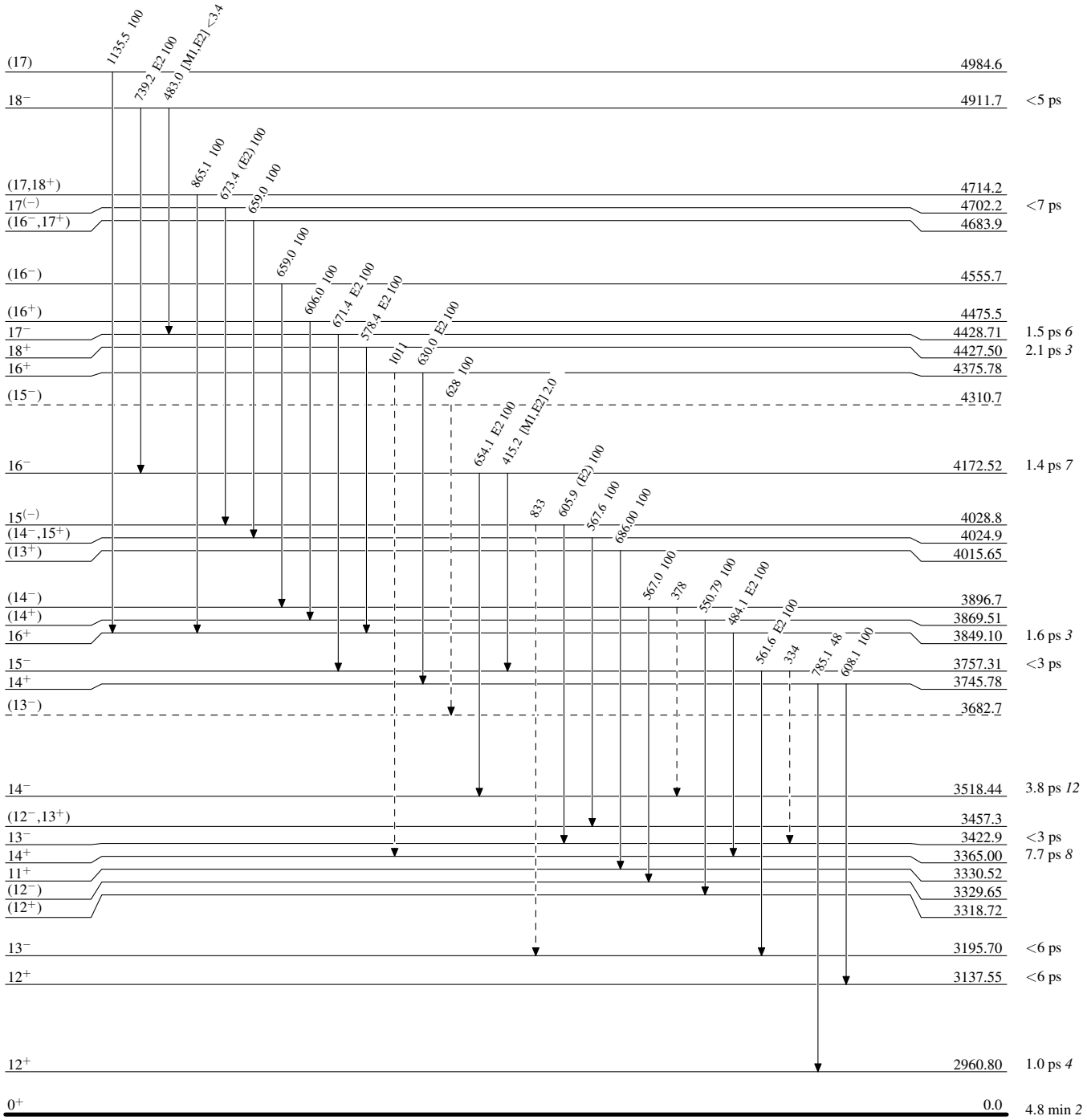
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{160}_{70}Yb_{90}$

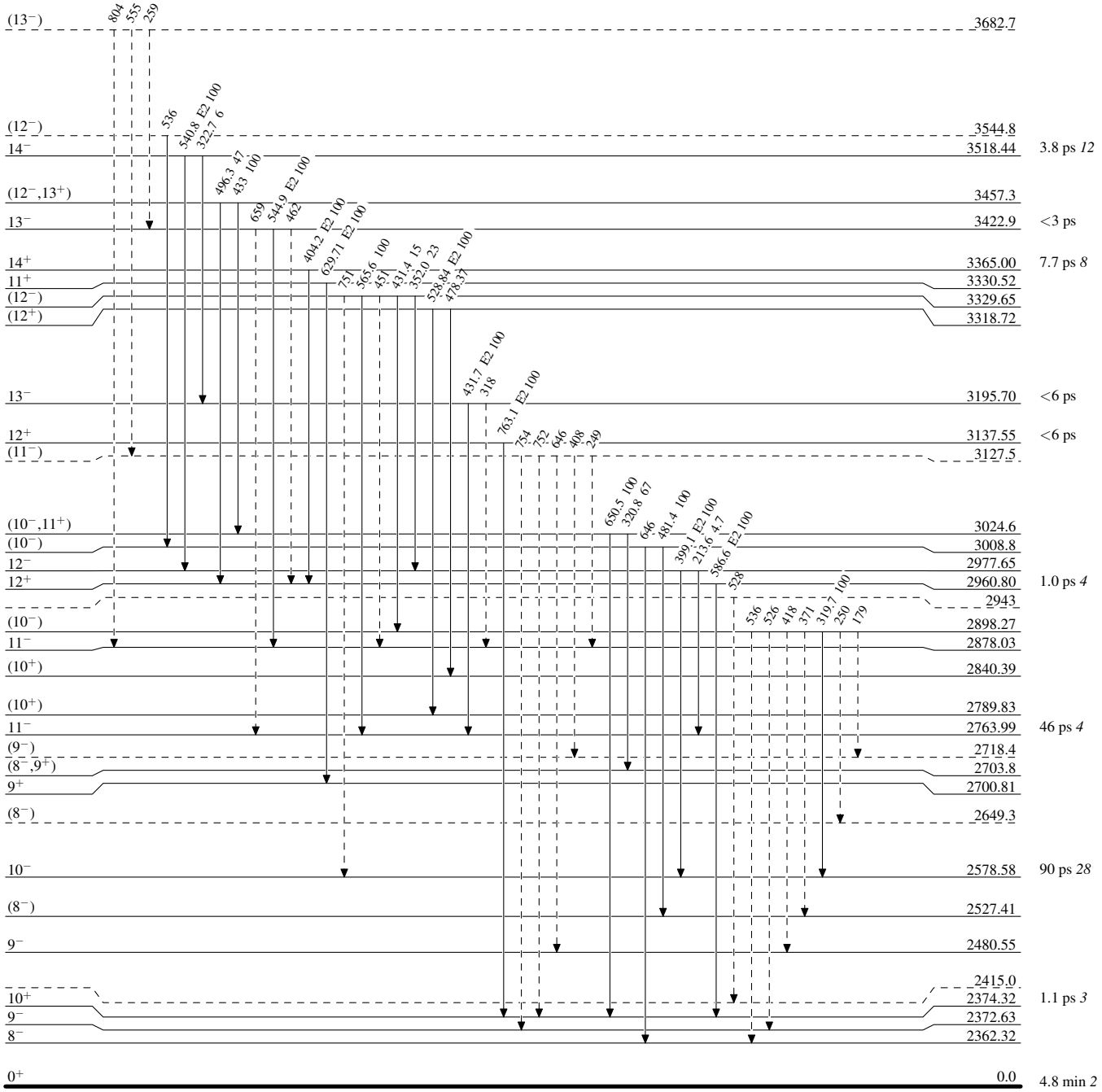
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{160}_{70}Yb_{90}$

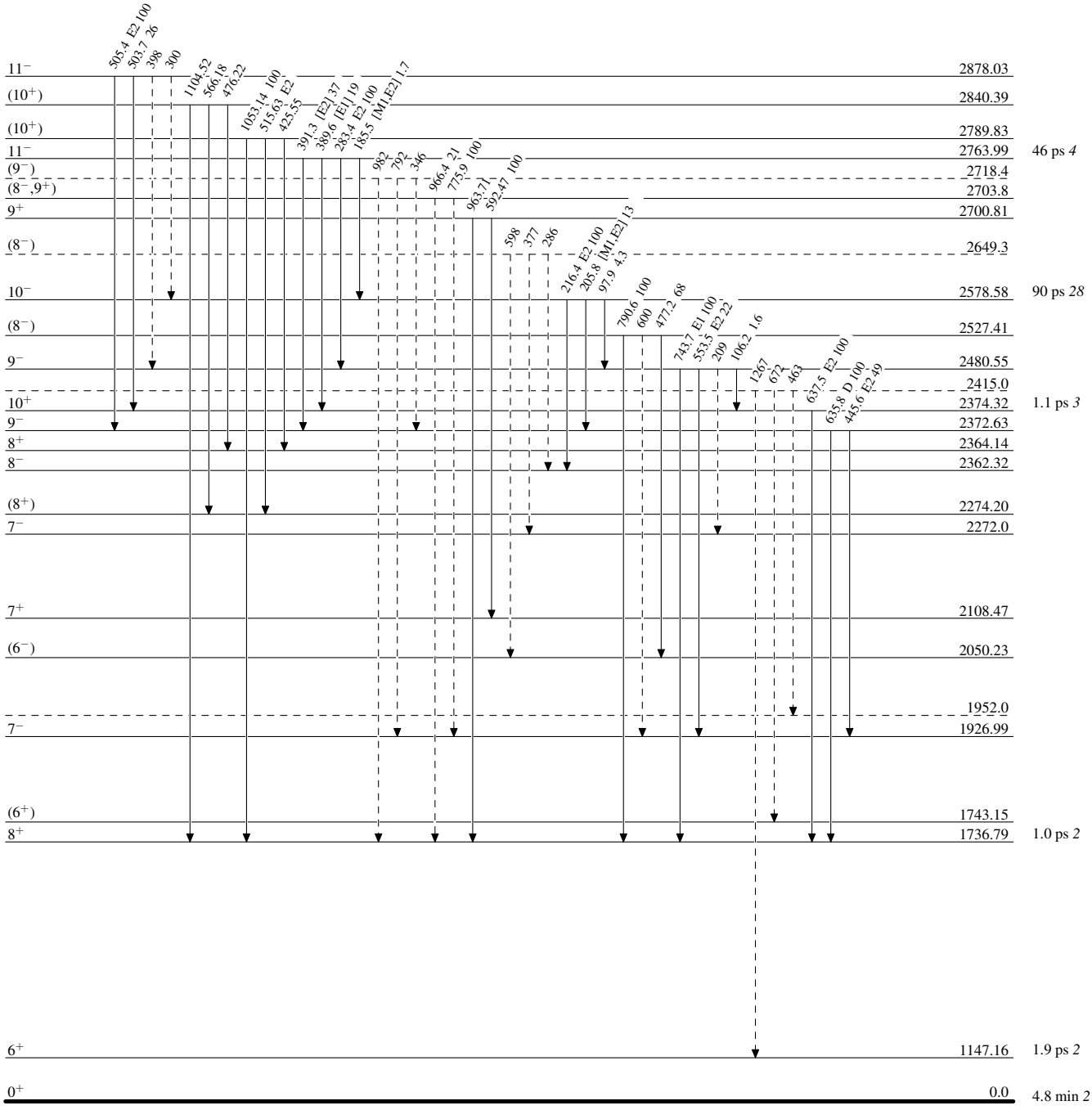
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



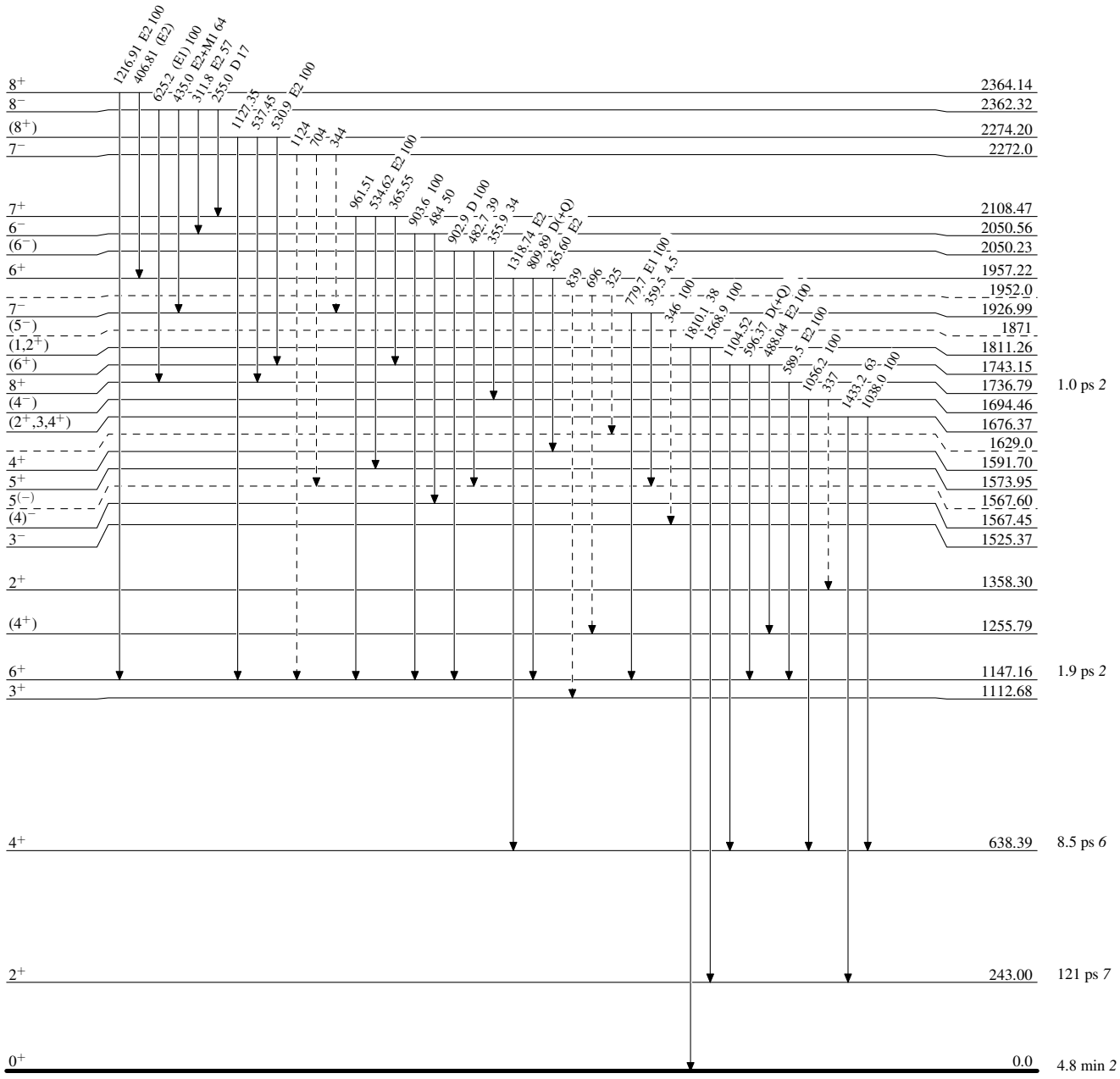
$^{160}_{70}Yb_{90}$

Adopted Levels, Gammas Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{160}_{70}Yb_{90}$

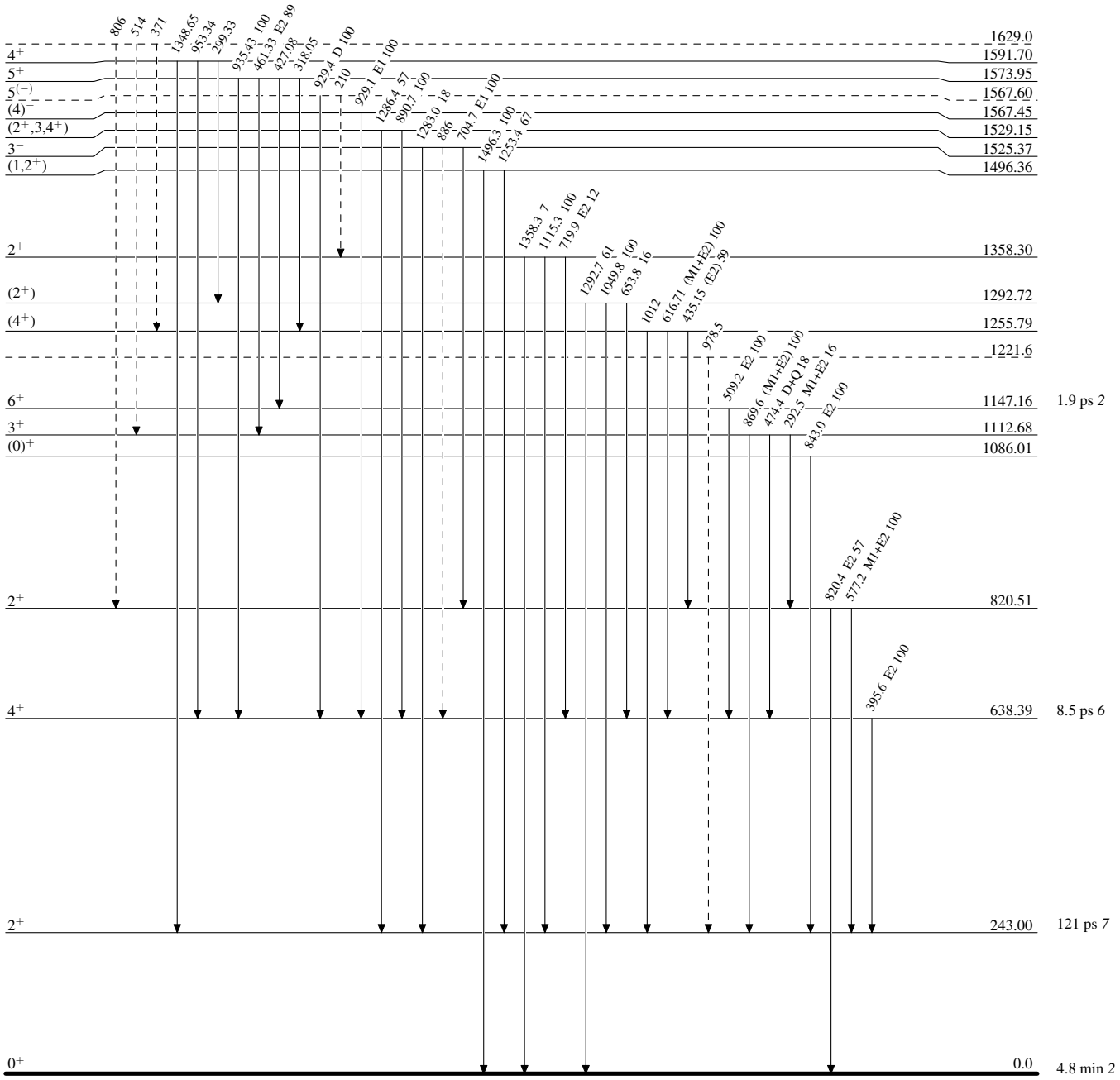
Adopted Levels, Gammas

Legend

Level Scheme (continued)

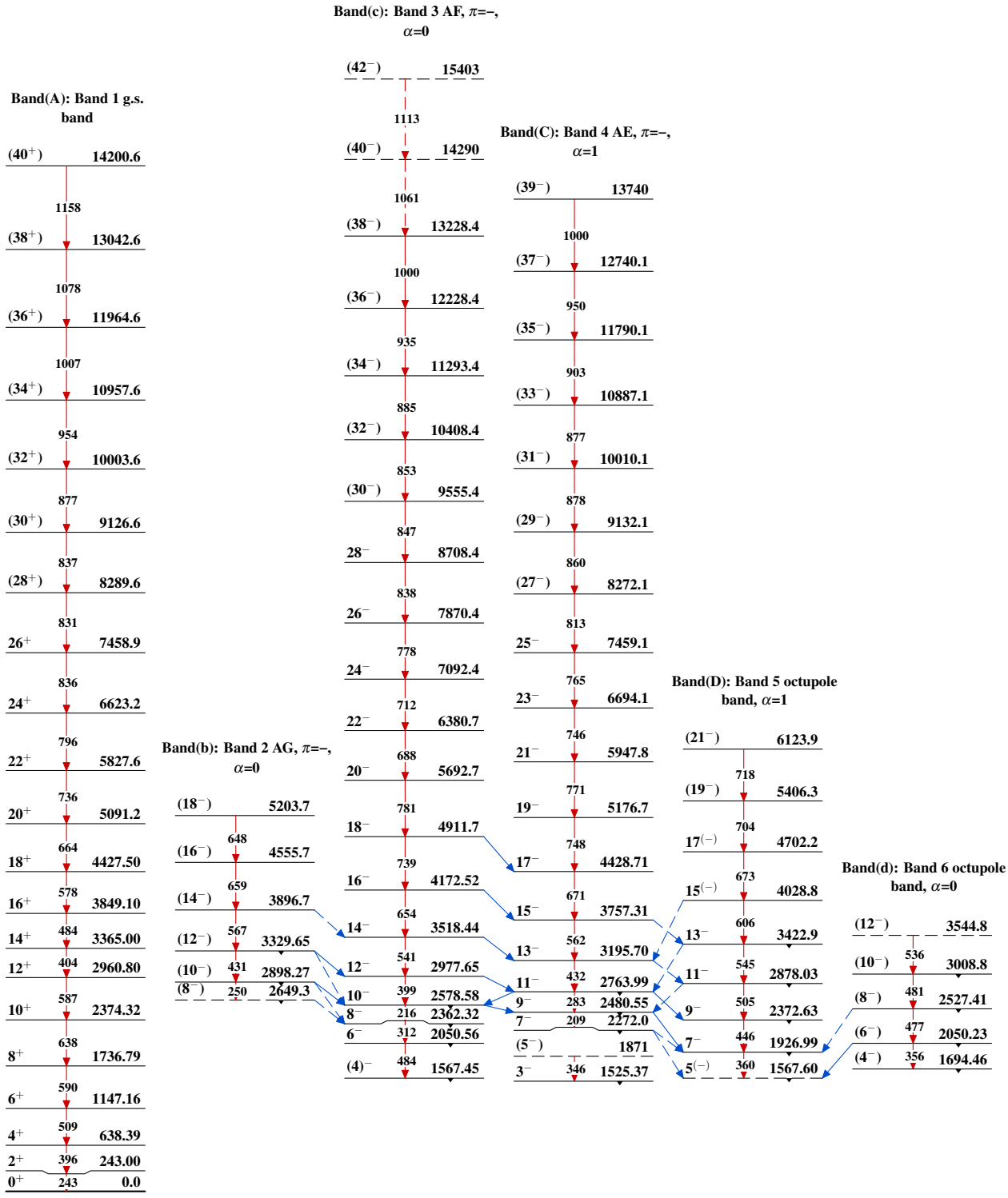
Intensities: Relative photon branching from each level

γ Decay (Uncertain)

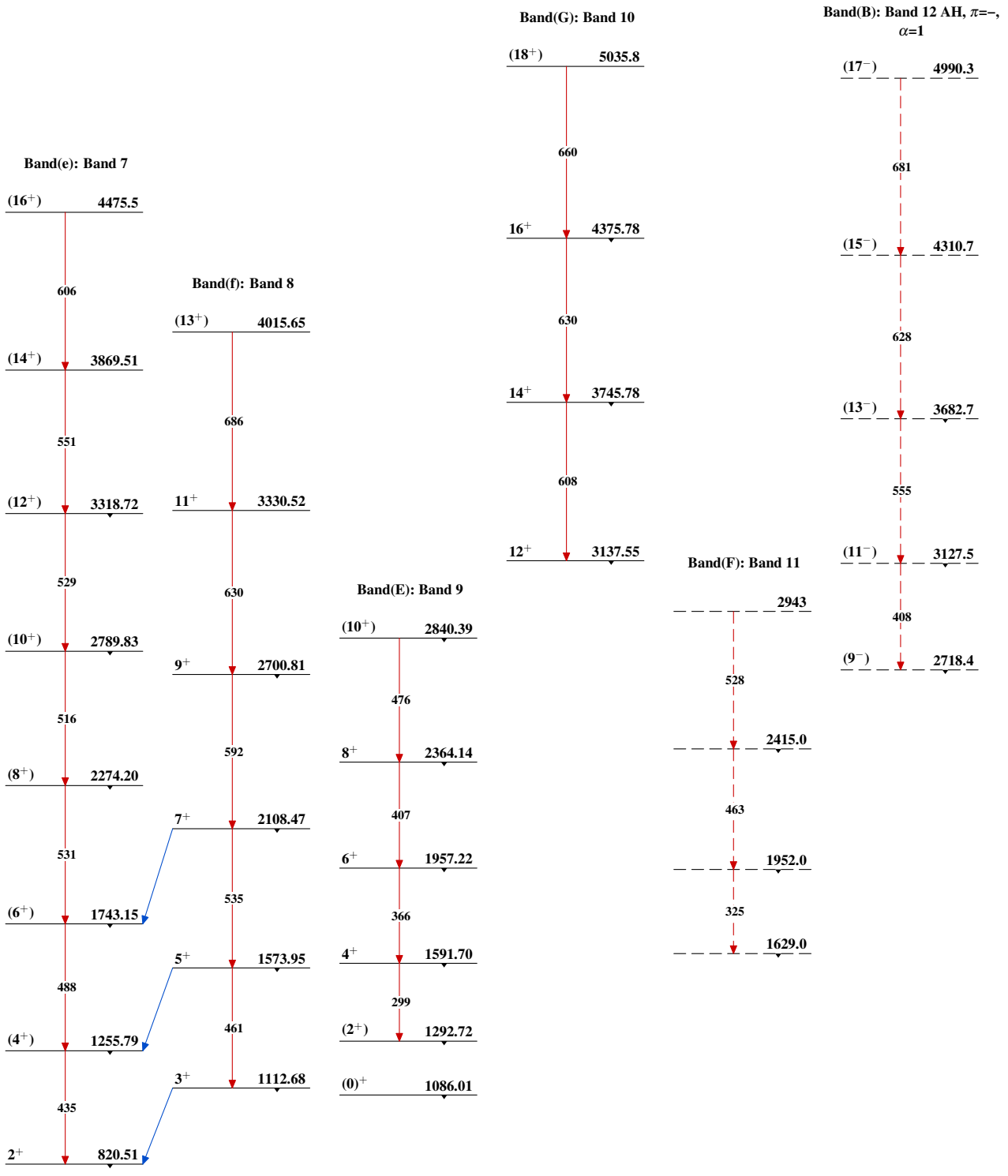


$^{160}_{70}Yb_{90}$

Adopted Levels, Gammas

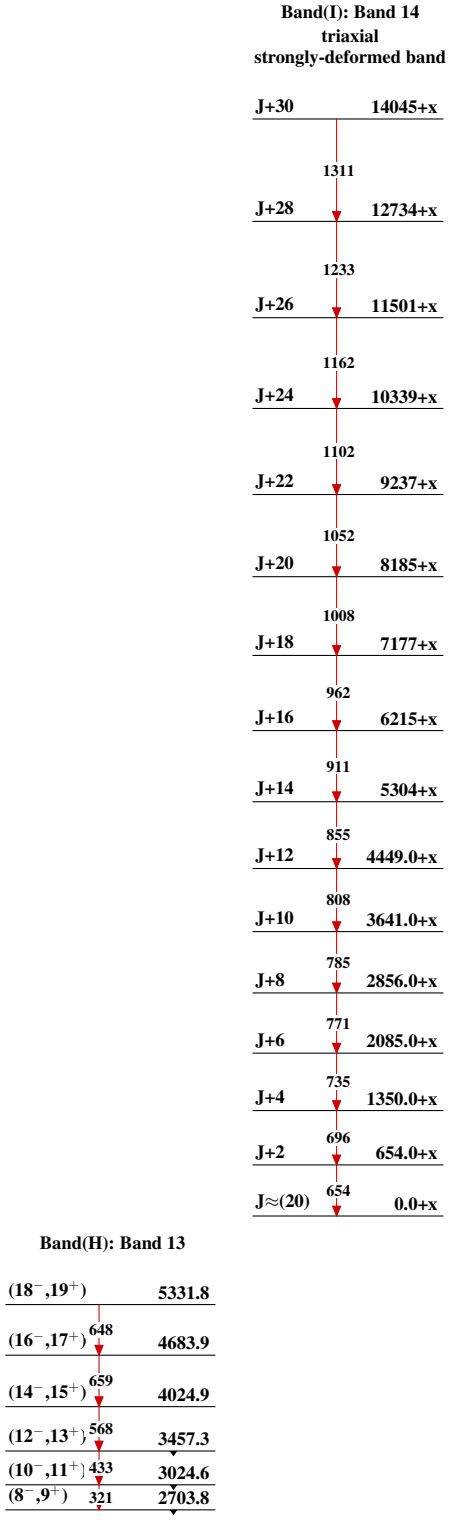


Adopted Levels, Gammas (continued)



$^{160}_{70}Yb_{90}$

Adopted Levels, Gammas (continued)



$^{160}_{70}Yb_{90}$