Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 160, 1 (2019)	21-Oct-2019

Q(β^-)=−7.96×10^3 *3*; S(n)=8642 *24*; S(p)=3364 *22*; Q(α)=5338.8 *21* 2017Wa10
Q(ε)=6123 *19*; S(2n)=19437 *24*; S(2p)=4612 *22*; Q(εp)=4813 *17* 2017Wa10
Additional information 1.
All data on excited states are from ^{144}Sm(^{16}O,5nγ) dataset (2016Li41) that includes with few adjustments those from ^{102}Pd(^{58}Ni,4pn) dataset (2001Di17).

^{155}Yb Levels

Cross Reference (XREF) Flags

A ^{159}Hf α decay
B ^{102}Pd(^{58}Ni,4pnγ)
C ^{144}Sm(^{16}O,5nγ)

E(level)†	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0‡	(7/2$^-$)	1.793 s *20*	ABC	%α=89 *5*; %ε+%β^+=11 *5* μ=−0.913 *22*; Q=−0.5 *3* 1998Ba08 (also 1999BaZW, 2000Ba16, 2000Se22) report Δ<r^2>(^{155}Yb,^{168}Yb)=1.316 fm^2 *8*. 2002BaZX report Δ<r^2>(^{174}Yb,^{155}Yb)=−1.630 fm^2 *8*. Some of these papers also indicate that there is essentially no change in deformation for isotopes of Yb with A=154, 155, and 156. In an evaluation of the nuclear rms charge radii, 2013An02 report <r^2>$^{1/2}$=5.1040 fm *110*. T$_{1/2}$: weighted average of 1.75 s *5* (1991To08) and 1.800 s *20* (1996Pa01). Others: 1.7 s *2* (1982Bo04); 1.8 s *3* (1980Da09); 1.59 s *22* (1979Ho10); 1.9 s *2* (1977Ha48); and 1.65 s *15* (1964Ma45). %α: Weighted average of 84% *10* (1979Ho10) and 90% *5* (1991To08). μ: From resonance-ionization spectroscopy in a LASER ion source (1998Ba08). These same values are listed in a number of subsequent publications (1999BaZW, 2000Ba16, 2000Se22, 2002BaZX) from this same group and thus probably do not represent additional measurements. 1992Al18 (also 1992AlZM, 1992AlZY) report μ=−0.84 *8*, from optical hyperfine splitting measurements using LASER-induced resonance photoionization. See also 2014StZZ compilation. Q: From resonance-ionization spectroscopy in a LASER ion source (1998Ba08). These same values are listed in a number of subsequent publications (1999BaZW, 2000Ba16, 2000Se22, 2002BaZX) from this same group and thus probably do not represent additional measurements. 1992Al18 (also 1992AlZM, 1992AlZY) report Q=−1.2 *10*, from optical hyperfine splitting measurements using LASER-induced resonance photoionization. See also 2016St14 compilation. J$^\pi$: α transition, most probably favored, to ^{151}Er (J^π=(7/2$^-$)). The ^{155}Yb g.s. is expected to have configuration=(ν f$_{7/2}$), since ν f$_{7/2}$, the first neutron orbital above the N=82 closed shell, accounts for the g.s. configurations of the even-Z, odd-N nuclides in this mass region. Bandhead. configuration: (νf$_{7/2}$)$_{7/2^-}$, oblate, β=0.15, $\gamma\approx$60° (2016Li41).
168.7# *3*	(9/2$^-$)		BC	configuration: (νh$_{9/2}$)$_{9/2^-}$, prolate, β=0.14, $\gamma\approx$0°. J$^\pi$: (M1+E2) to (7/2$^-$) g.s.; bandhead.
666.00‡ *19*	(11/2$^-$)		C	J$^\pi$: E2 in band to (7/2$^-$).
839.4@ *3*	(13/2$^+$)		C	J$^\pi$: D(+Q) to (11/2$^-$); π=(+) from assigned structure (2016Li41); bandhead. configuration: (νi$_{13/2}$)$_{13/2^+}$, oblate, β=0.16, $\gamma\approx$60° (2016Li41).
983.8# *4*	(13/2$^-$)		BC	J$^\pi$: E2 in band to (9/2$^-$).

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Adopted Levels, Gammas (continued)

^{155}Yb Levels (continued)

E(level)[†]	Jπ	XREF	Comments
1178.5[‡] *3*	(15/2⁻)	C	Jπ: in band γ to (11/2⁻).
1527.5[@] *3*	(17/2⁺)	C	Jπ: E2 in band to (13/2⁺).
1592.8[#] *4*	(17/2⁻)	BC	Jπ: E2 in band to (13/2⁻).
1912.8[#] *5*	(21/2⁻)	BC	Jπ: E2 in band to (17/2⁻).
2033.7[@] *5*	(21/2⁺)	C	Jπ: in band γ to (17/2⁺).
2494.4[@] *6*	(25/2⁺)	C	Jπ: E2 in band to (21/2⁺).
2526.6 *6*	(23/2⁻)	C	Jπ: (M1+E2) to (21/2⁻).
2768.8[#] *6*	(25/2⁻)	C	Jπ: (M1+E2) to (23/2⁻); in band γ to (21/2⁻).
3520.3[#] *8*	(29/2⁻)	C	Jπ: E2 in band to (25/2⁻).
3740.8[#] *9*	(33/2⁻)	C	Jπ: E2 in band to (29/2⁻).
4183.4 *11*	(35/2⁻)	C	Jπ: (M1+E2) to (33/2⁻).
4549.6 *12*	(37/2)	C	Jπ: D to (35/2⁻).

[†] From least-squares fit to Eγ′s.

[‡] Band(A): Based on $(\nu f_{7/2})_{7/2^-}$. Levels (7/2⁻), (11/2⁻), (15/2⁻) proposed to arise from the coupling of the $\nu f_{7/2}$ orbital to the 0⁺, 2⁺, 4⁺ couplings of the two $\nu f_{7/2}$ orbitals (2016Li41).

[#] Band(B): Based on $(\nu h_{9/2})_{9/2^-}$. Levels (9/2⁻), (13/2⁻), (17/2⁻), (21/2⁻) proposed to arise from the coupling of the $\nu h_{9/2}$ orbital to the 0⁺, 2⁺, 4⁺, 6⁺ couplings of the two $\nu f_{7/2}$ orbitals (2001Di17, 2016Li41).

[@] Band(C): Based on $(\nu i_{13/2})_{13/2^+}$. Levels (13/2⁺), (17/2⁺), (21/2⁺), (25/2⁺) proposed to arise from the coupling of the $\nu i_{13/2}$ orbital to the 0⁺, 2⁺, 4⁺, 6⁺ couplings of the two $\nu f_{7/2}$ orbitals (2016Li41).

γ(^{155}Yb)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	α[‡]	Comments
168.7	(9/2⁻)	168.7 *4*	100	0.0	(7/2⁻)	(M1+E2)	0.62 *15*	α(K)=0.45 *19*; α(L)=0.130 *33*; α(M)=0.0306 *89* α(N)=0.0071 *20*; α(O)=0.00090 *18*; α(P)=2.5×10⁻⁵ *14*
666.00	(11/2⁻)	666.0 *2*	100	0.0	(7/2⁻)	E2	0.00892	α(K)=0.00723 *11*; α(L)=0.001311 *19*; α(M)=0.000299 *5* α(N)=6.97×10⁻⁵ *10*; α(O)=9.49×10⁻⁶ *14*; α(P)=4.04×10⁻⁷ *6*
839.4	(13/2⁺)	173.4 *2*	100	666.00	(11/2⁻)	D(+Q)		
983.8	(13/2⁻)	317.8 *5*		666.00	(11/2⁻)			
		815.1 *2*	100	168.7	(9/2⁻)	E2	0.00569	α(K)=0.00468 *7*; α(L)=0.000785 *11*; α(M)=0.0001776 *25* α(N)=4.14×10⁻⁵ *6*; α(O)=5.73×10⁻⁶ *8*; α(P)=2.63×10⁻⁷ *4*
1178.5	(15/2⁻)	512.5 *3*	100	666.00	(11/2⁻)			
1527.5	(17/2⁺)	349.0 *3*	71.5 *25*	1178.5	(15/2⁻)	D(+Q)		
		688.1 *2*	100	839.4	(13/2⁺)	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*
1592.8	(17/2⁻)	414.3 *5*		1178.5	(15/2⁻)			
		609.0 *2*	100	983.8	(13/2⁻)	E2	0.01099	α(K)=0.00884 *13*; α(L)=0.001669 *24*; α(M)=0.000382 *6* α(N)=8.90×10⁻⁵ *13*; α(O)=1.203×10⁻⁵ *17*; α(P)=4.91×10⁻⁷ *7*

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Adopted Levels, Gammas (continued)

γ(^{155}Yb) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	α[‡]	Comments
1912.8	(21/2$^-$)	320.0 *3*	100	1592.8	(17/2$^-$)	E2	0.0610	α(K)=0.0442 *7*; α(L)=0.01289 *19*; α(M)=0.00305 *5* α(N)=0.000704 *11*; α(O)=8.91×10^{-5} *13*; α(P)=2.29×10^{-6} *4*
2033.7	(21/2$^+$)	506.2 *3*	100	1527.5	(17/2$^+$)			Mult.: based on ADO ratio this should be D+Q; 2016Li41 adopt Q as in band transition.
2494.4	(25/2$^+$)	460.7 *3*	100	2033.7	(21/2$^+$)	E2	0.0220	α(K)=0.01714 *25*; α(L)=0.00379 *6*; α(M)=0.000880 *13* α(N)=0.000204 *3*; α(O)=2.69×10^{-5} *4*; α(P)=9.33×10^{-7} *14*
2526.6	(23/2$^-$)	613.8 *5*	100	1912.8	(21/2$^-$)	(M1+E2)	0.0175 *68*	α(K)=0.0145 *59*; α(L)=0.00231 *68*; α(M)=5.2×10^{-4} *15* α(N)=1.22×10^{-4} *35*; α(O)=1.71×10^{-5} *54*; α(P)=8.5×10^{-7} *37*
2768.8	(25/2$^-$)	242.2 *5*	35.9 *7*	2526.6	(23/2$^-$)	(M1+E2)	0.212 *69*	α(K)=0.166 *70*; α(L)=0.0361 *9*; α(M)=0.0084 *5* α(N)=0.00195 *9*; α(O)=0.000258 *10*; α(P)=9.5×10^{-6} *48*
		856.0 *4*	100 *1*	1912.8	(21/2$^-$)			Mult.: based on ADO ratio this should be D+Q; 2016Li41 adopt Q as in band transition.
3520.3	(29/2$^-$)	751.5 *5*	100	2768.8	(25/2$^-$)	E2	0.00679	α(K)=0.00556 *8*; α(L)=0.000959 *14*; α(M)=0.000218 *3* α(N)=5.08×10^{-5} *8*; α(O)=6.98×10^{-6} *10*; α(P)=3.12×10^{-7} *5*
3740.8	(33/2$^-$)	220.5 *5*	100	3520.3	(29/2$^-$)	E2	0.195	α(K)=0.1251 *20*; α(L)=0.0534 *9*; α(M)=0.01286 *22* α(N)=0.00296 *5*; α(O)=0.000359 *6*; α(P)=5.98×10^{-6} *9*
4183.4	(35/2$^-$)	442.6 *5*	100	3740.8	(33/2$^-$)	(M1+E2)	0.040 *16*	α(K)=0.033 *15*; α(L)=0.0056 *14*; α(M)=0.0013 *3* α(N)=0.00030 *7*; α(O)=4.1×10^{-5} *12*; α(P)=1.93×10^{-6} *91*
4549.6	(37/2)	366.2 *5*	100	4183.4	(35/2$^-$)	D		

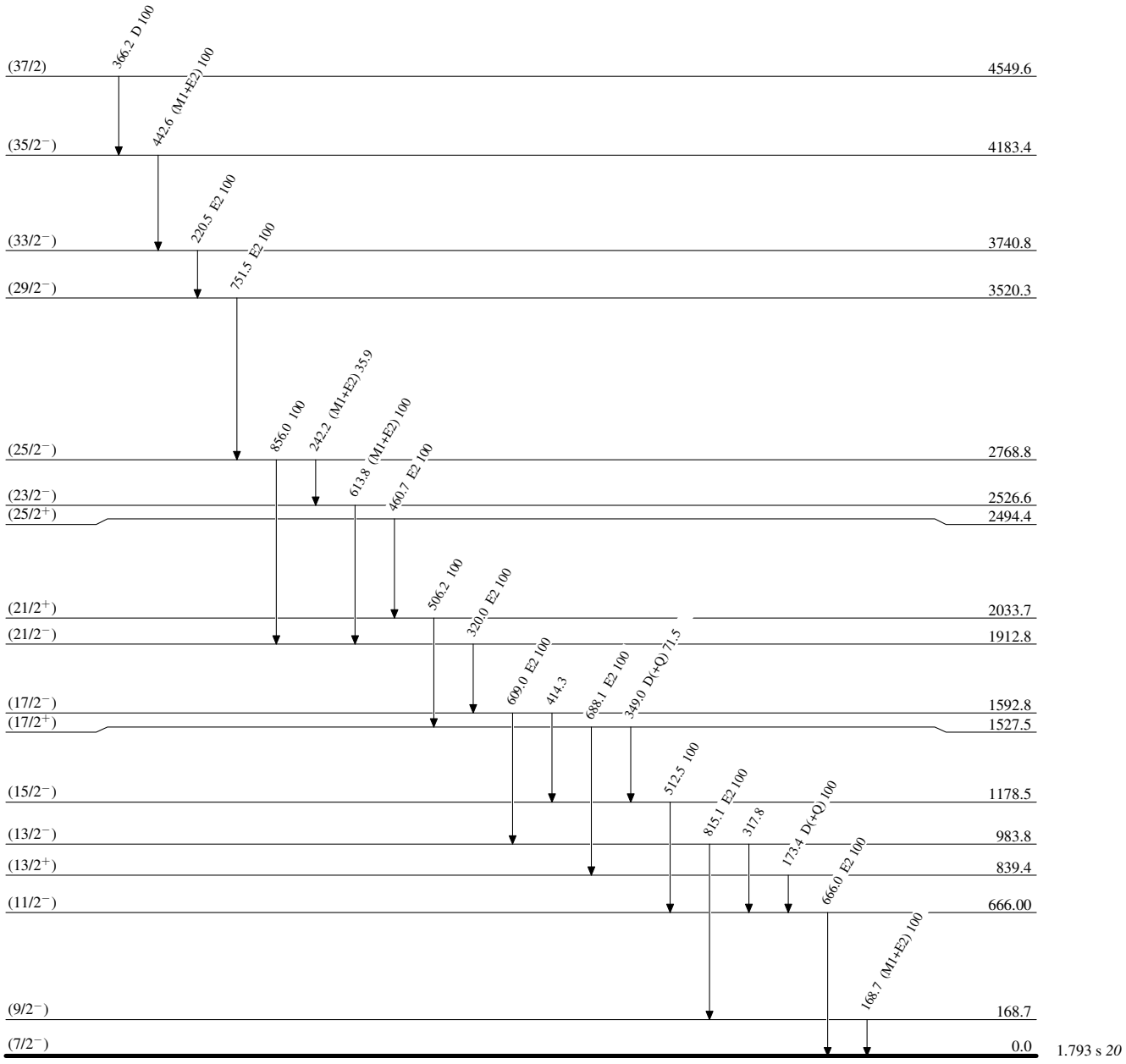
[†] From mesured experimental ratio $R_{ADO}=I_\gamma(135°)\backslash I_\gamma(90°)$ in ^{144}Sm(^{16}O,5nγ) dataset (2016Li41) with Q adopted as E2 (M2 is unlikely), D+Q adopted as (M1+E2) (E1+M2 is less likely) and relatively pure D adopted as D(+Q). According to 2016Li41 all transitions are stretched.

[‡] Additional information 2.

Adopted Levels, Gammas

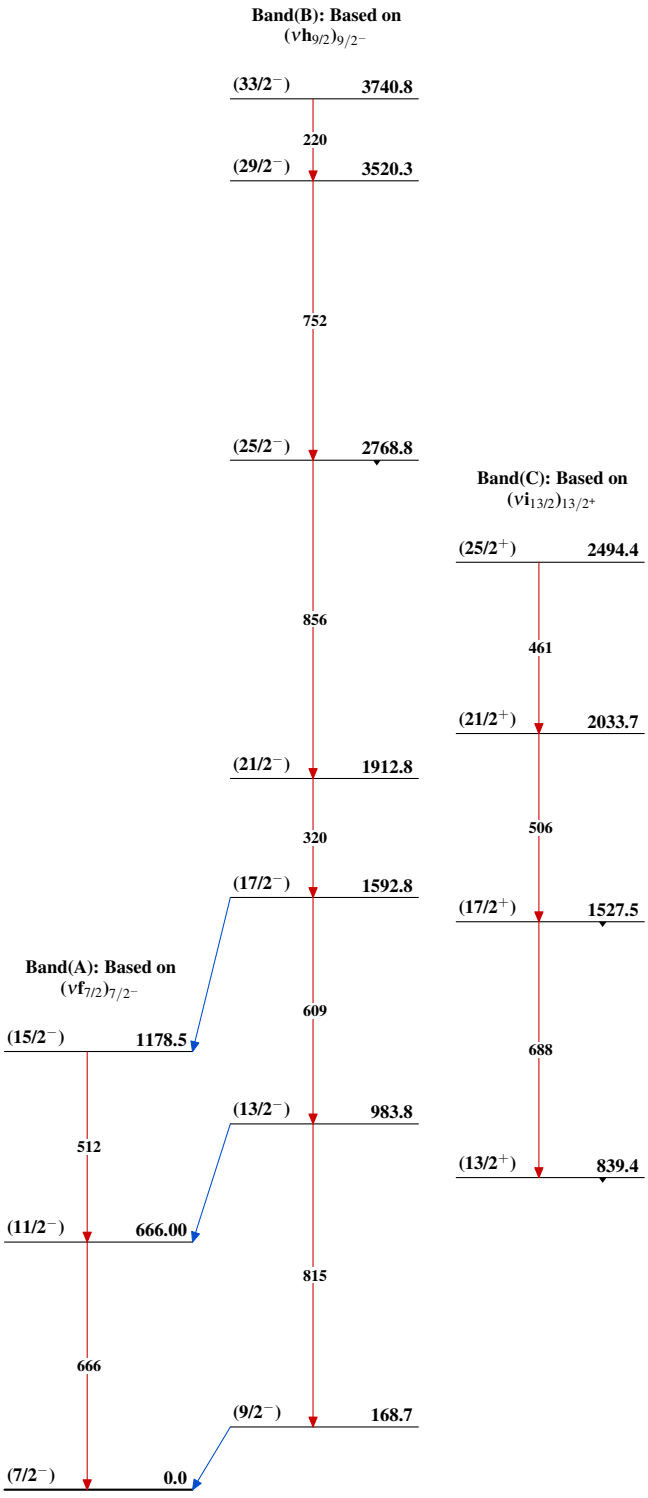
Level Scheme

Intensities: Relative photon branching from each level



$^{155}_{70}Yb_{85}$

Adopted Levels, Gammas



$^{155}_{70}Yb_{85}$