

Adopted Levels, Gammas

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

Q(β^-) = -6.13×10^3 4; S(n) = 7900 19; S(p) = 4.42×10^3 3; Q(α) = 3946 19 2017Wa10
Q(ϵ) = 4.73×10^3 3; S(2n) = 18559 19; S(2p) = 7.00×10^3 3; Q(ϵ p) = 2.18×10^3 3 2017Wa10

[Additional information 1.](#)

[Additional information 2.](#)

All data and assignments concerning the excited levels and the γ 's are from the (HI,xn γ) studies. Thus, no level-specific J^π arguments are given here. See the high-spin data set for comments. The ¹⁵⁹Lu ϵ decay has been reported (1980Al14), but the γ 's have not been placed in the ¹⁵⁹Yb level scheme.

¹⁵⁹Yb Levels

Cross Reference (XREF) Flags

A ¹⁵⁹Lu ϵ decay
B (HI,xn γ)

E(level)	J^π	T _{1/2}	XREF	Comments
0	5/2 ⁽⁻⁾	1.67 min 9	A	$\% \epsilon + \% \beta^+ = 100$ $\mu = -0.366$ 8; Q = -0.22 2 J^π : From 1991Sc33, resonance-ionization laser spectroscopy. π , from the expected filling of the $\nu f_{7/2}$ shell for the N=83,85,87 nuclides (1983Ne13). However, in this interpretation, the calculated μ value poses a problem (1983Ne13). T _{1/2} : From weighted average of 1.75 min 20 (1977Gr12), 1.40 min 20 (1980Al14), and 1.72 min 10 (1993Al03). Others are 1.8 min 4 (1975GoYW) and 1.75 min 20 (1976PoZV), both by same authors as 1977Gr12. The article 1980Al14 has the same first author as 1993Al03, but the other authors are all different and the 13-year difference suggests that these are independent measurements. μ : From the evaluation of 1989Ra17 and based on data of 1983Ne13. A later value is -0.368 8 (1991Sc33) (see also the compilation of 2005St24). Q: From the evaluation of 1989Ra17, based on data of 1983Ne13. The same value is also listed in the compilation by 2005St24. $\Delta \langle r^2 \rangle(^{159}\text{Yb} - ^{168}\text{Yb}) = 0.846$ fm ² 23 is given by by 1991Sc33. The evaluator has deduced $\Delta \langle r^2 \rangle(^{159}\text{Yb} - ^{160}\text{Yb}) = 0.114$ fm ² 23 and $\Delta \langle r^2 \rangle(^{157}\text{Yb} - ^{159}\text{Yb}) = 0.245$ fm ² 43 from other differences.
0+x [‡]	(13/2 ⁺)		B	
299.6+x [‡]	(17/2 ⁺)	31 ps 4	B	
747.1+x [‡]	(21/2 ⁺)	3.7 ps 6	B	
1063.6+x ^{&}	(19/2 ⁺)		B	
1296.2+x [‡]	(25/2 ⁺)	1.5 ps 4	B	
1556.1+x [@]	(21/2 ⁻)		B	
1612.1+x ^{&}	(23/2 ⁺)		B	
1929.3+x [‡]	(29/2 ⁺)	2.4 ps 8	B	
1976.6+x [@]	(25/2 ⁻)		B	
2185.1+x ^{&}	(27/2 ⁺)		B	
2457.3+x [@]	(29/2 ⁻)		B	
2626.8+x [‡]	(33/2 ⁺)	<1.2 ps	B	
2700.4+x [#]	(31/2 ⁻)		B	
2960.4+x [@]	(33/2 ⁻)		B	
3233.8+x [#]	(35/2 ⁻)		B	

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Adopted Levels, Gammas (continued) ^{159}Yb Levels (continued)

E(level)	$J^\pi^\dagger$	$T_{1/2}$	XREF	E(level)	$J^\pi^\dagger$	XREF
3375.9+x [‡]	(37/2 ⁺)	<9 ps	B	7264.1+x [@]	(57/2 ⁻)	B
3532.0+x [@]	(37/2 ⁻)		B	7353.1+x [‡]	(57/2 ⁺)	B
3857.8+x [#]	(39/2 ⁻)		B	7707.4+x [#]	(59/2 ⁻)	B
4166.0+x [‡]	(41/2 ⁺)		B	8066.0+x [@]	(61/2 ⁻)	B
4180.9+x [@]	(41/2 ⁻)		B	8280.8+x [‡]	(61/2 ⁺)	B
4552.4+x [#]	(43/2 ⁻)		B	8567.7+x [#]	(63/2 ⁻)	B
4894.6+x [@]	(45/2 ⁻)		B	8961.1+x [@]	(65/2 ⁻)	B
4940.5+x [‡]	(45/2 ⁺)		B	9282.3+x [‡]	(65/2 ⁺)	B
5340.1+x [#]	(47/2 ⁻)		B	9455.6+x [#]	(67/2 ⁻)	B
5680.3+x [@]	(49/2 ⁻)		B	9890.3+x [@]	(69/2 ⁻)	B
5704.8+x [‡]	(49/2 ⁺)		B	10380.3+x ^{?‡}	(69/2 ⁺)	B
6107.3+x [#]	(51/2 ⁻)		B	10386.8+x [#]	71/2 ⁻	B
6466.0+x [@]	(53/2 ⁻)		B	10906.7+x [@]	(73/2 ⁻)	B
6489.9+x [‡]	(53/2 ⁺)		B	11337+x [#]	(75/2 ⁻)	B
6895.0+x [#]	(55/2 ⁻)		B	11970.7+x ^{?@}	(77/2 ⁻)	B

[†] Values for the excited states are those from the high-spin data set. See that data set for comments.

[‡] Band(A): $\pi=+$, $\alpha=+1/2$ band. Yrast band to 41/2. Assumed to be $\nu_{i13/2}$.

[#] Band(B): $\pi=-$, $\alpha=-1/2$ band.

[@] Band(C): $\pi=-$, $\alpha=+1/2$ band.

[&] Band(D): $\pi=+$, $\alpha=-1/2$ band.

 $\gamma(^{159}\text{Yb})$

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	Comments
299.6+x	(17/2 ⁺)	299.6	100	0+x	(13/2 ⁺)	E2	B(E2)(W.u.)=148 20
747.1+x	(21/2 ⁺)	447.5	100	299.6+x	(17/2 ⁺)	E2	B(E2)(W.u.)= 1.7×10^2 3
1063.6+x	(19/2 ⁺)	764.0	100	299.6+x	(17/2 ⁺)		
1296.2+x	(25/2 ⁺)	549.1	100	747.1+x	(21/2 ⁺)	E2	B(E2)(W.u.)= 1.5×10^2 4
1556.1+x	(21/2 ⁻)	492.5	100	1063.6+x	(19/2 ⁺)		
		808.5	25	747.1+x	(21/2 ⁺)		
1612.1+x	(23/2 ⁺)	865.0	100	747.1+x	(21/2 ⁺)		
1929.3+x	(29/2 ⁺)	633.1	100	1296.2+x	(25/2 ⁺)	E2	B(E2)(W.u.)=45 16
1976.6+x	(25/2 ⁻)	364.6	55	1612.1+x	(23/2 ⁺)	D	
		420.5	70	1556.1+x	(21/2 ⁻)		
		680.1	100	1296.2+x	(25/2 ⁺)		
2185.1+x	(27/2 ⁺)	888.9	100	1296.2+x	(25/2 ⁺)		
2457.3+x	(29/2 ⁻)	272.1	14	2185.1+x	(27/2 ⁺)		
		480.7	100	1976.6+x	(25/2 ⁻)		
		527.3 [†]	38	1929.3+x	(29/2 ⁺)		
2626.8+x	(33/2 ⁺)	697.5	100	1929.3+x	(29/2 ⁺)	E2	B(E2)(W.u.)>55
2700.4+x	(31/2 ⁻)	771.1	100	1929.3+x	(29/2 ⁺)	D	
2960.4+x	(33/2 ⁻)	259.4	10	2700.4+x	(31/2 ⁻)		
		503.1	100	2457.3+x	(29/2 ⁻)		
3233.8+x	(35/2 ⁻)	533.4	100	2700.4+x	(31/2 ⁻)		
		607.1	74	2626.8+x	(33/2 ⁺)	D	
3375.9+x	(37/2 ⁺)	749.1	100	2626.8+x	(33/2 ⁺)	E2	B(E2)(W.u.)>5.2

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Adopted Levels, Gammas (continued) $\gamma(^{159}\text{Yb})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π
3532.0+x	(37/2 ⁻)	571.6	100	2960.4+x	(33/2 ⁻)
3857.8+x	(39/2 ⁻)	624.0	100	3233.8+x	(35/2 ⁻)
4166.0+x	(41/2 ⁺)	790.1	100	3375.9+x	(37/2 ⁺)
4180.9+x	(41/2 ⁻)	648.9	100	3532.0+x	(37/2 ⁻)
4552.4+x	(43/2 ⁻)	694.6	100	3857.8+x	(39/2 ⁻)
4894.6+x	(45/2 ⁻)	713.7	100	4180.9+x	(41/2 ⁻)
4940.5+x	(45/2 ⁺)	774.5	100	4166.0+x	(41/2 ⁺)
5340.1+x	(47/2 ⁻)	787.7	100	4552.4+x	(43/2 ⁻)
5680.3+x	(49/2 ⁻)	785.7	100	4894.6+x	(45/2 ⁻)
5704.8+x	(49/2 ⁺)	764.3	100	4940.5+x	(45/2 ⁺)
6107.3+x	(51/2 ⁻)	767.2	100	5340.1+x	(47/2 ⁻)
6466.0+x	(53/2 ⁻)	785.7	100	5680.3+x	(49/2 ⁻)
6489.9+x	(53/2 ⁺)	785.1	100	5704.8+x	(49/2 ⁺)
6895.0+x	(55/2 ⁻)	787.7	100	6107.3+x	(51/2 ⁻)
7264.1+x	(57/2 ⁻)	798.1	100	6466.0+x	(53/2 ⁻)
7353.1+x	(57/2 ⁺)	863.2	100	6489.9+x	(53/2 ⁺)
7707.4+x	(59/2 ⁻)	812.4	100	6895.0+x	(55/2 ⁻)
8066.0+x	(61/2 ⁻)	801.9	100	7264.1+x	(57/2 ⁻)
8280.8+x	(61/2 ⁺)	927.7	100	7353.1+x	(57/2 ⁺)
8567.7+x	(63/2 ⁻)	860.3	100	7707.4+x	(59/2 ⁻)
8961.1+x	(65/2 ⁻)	895.1	100	8066.0+x	(61/2 ⁻)
9282.3+x	(65/2 ⁺)	1001.5	100	8280.8+x	(61/2 ⁺)
9455.6+x	(67/2 ⁻)	887.9	100	8567.7+x	(63/2 ⁻)
9890.3+x	(69/2 ⁻)	929.2	100	8961.1+x	(65/2 ⁻)
10380.3+x?	(69/2 ⁺)	1098 [†]	100	9282.3+x	(65/2 ⁺)
10386.8+x	71/2 ⁻	931.2	100	9455.6+x	(67/2 ⁻)
10906.7+x	(73/2 ⁻)	1016.4	100	9890.3+x	(69/2 ⁻)
11337+x?	(75/2 ⁻)	950 [†]		10386.8+x	71/2 ⁻
11970.7+x?	(77/2 ⁻)	1064 [†]	100	10906.7+x	(73/2 ⁻)

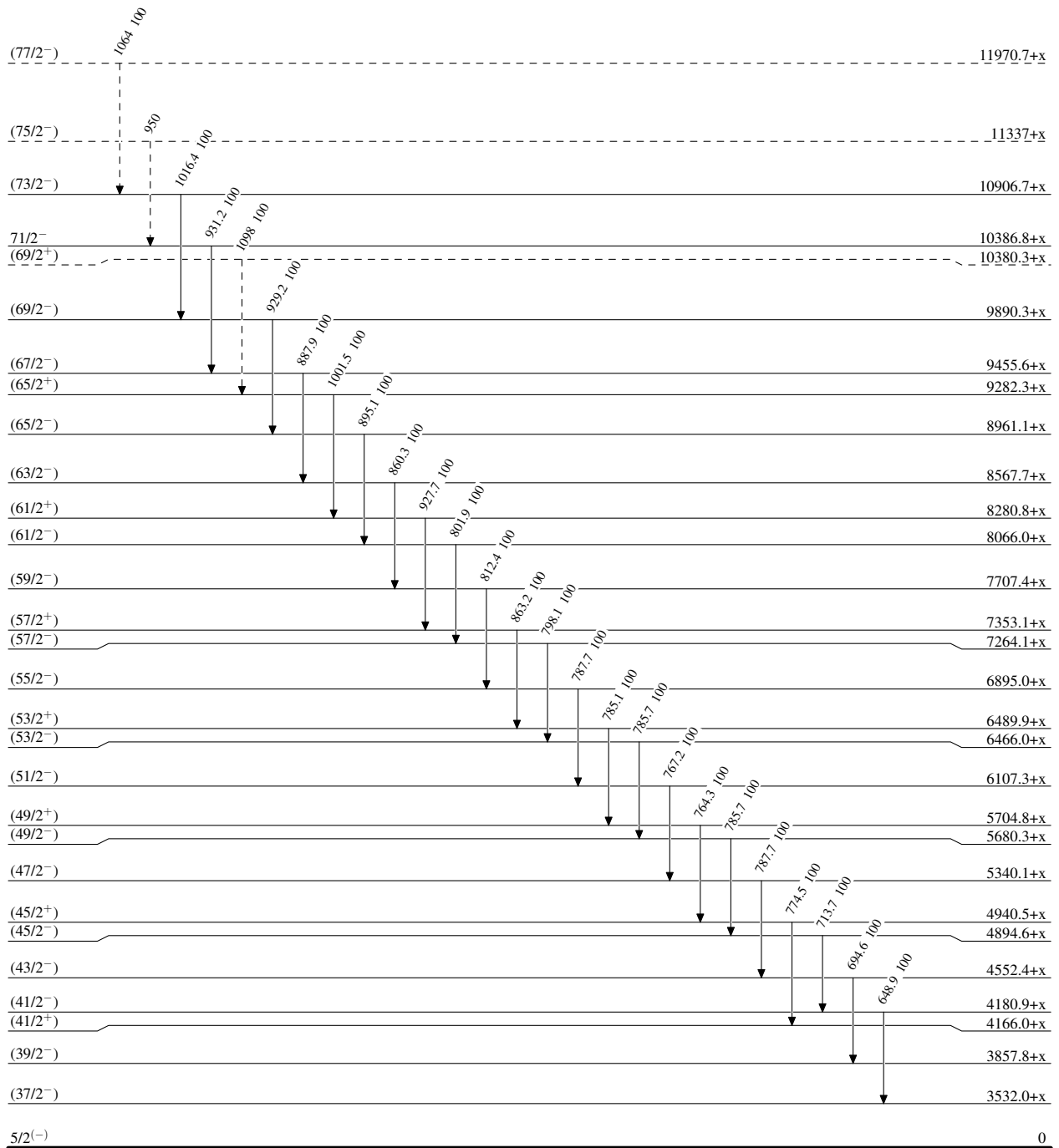
[†] Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

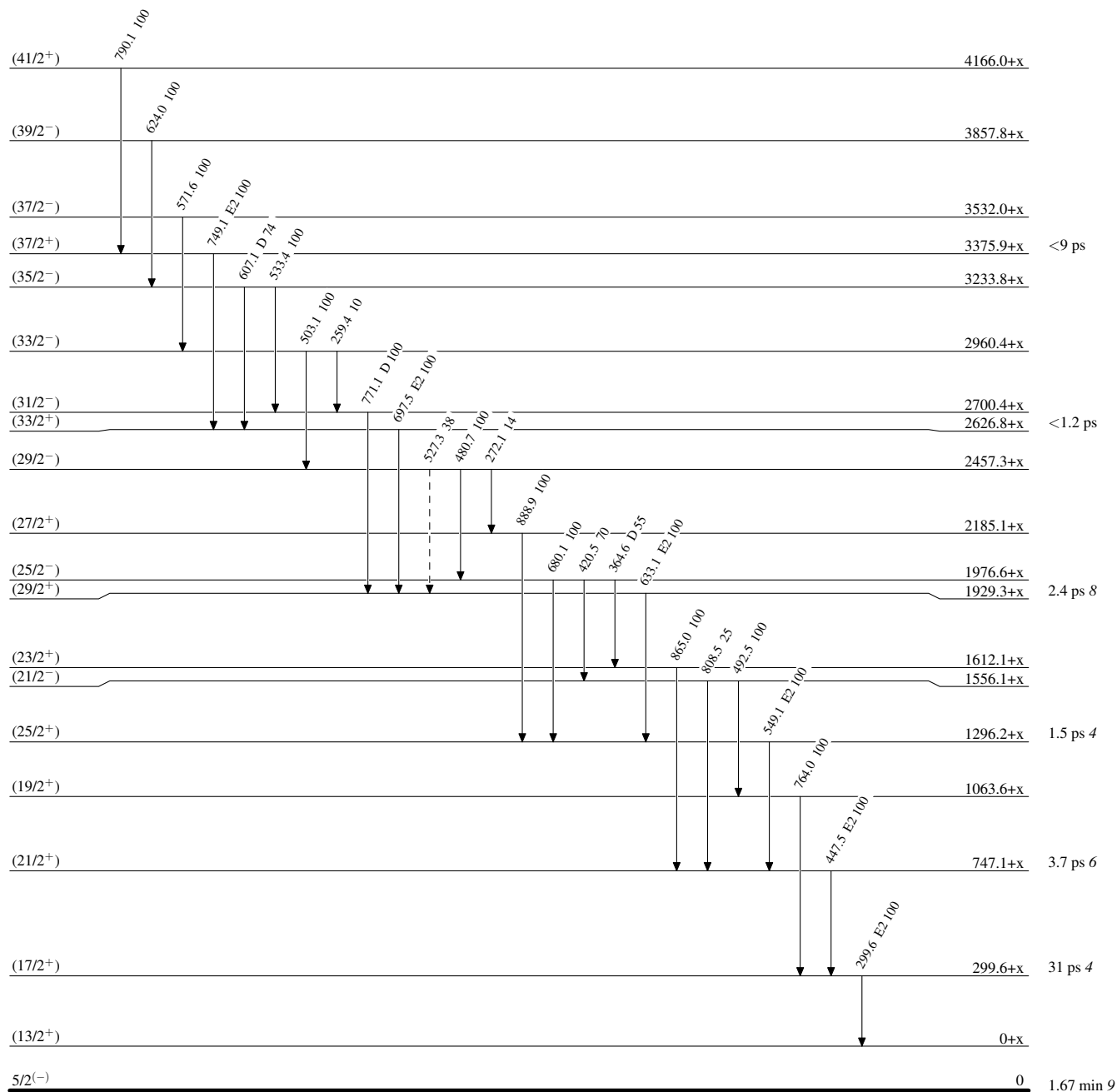
-----► γ Decay (Uncertain)

 $5/2^{-}$ 0 1.67 min 9

 $^{159}_{70}\text{Yb}_{89}$

Legend

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)

 $^{159}_{70}\text{Yb}_{89}$

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