Adopted Levels, Gammas

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	28-Feb-2018

Q(β^-)=5553 *4*; S(n)=5725 *3*; S(p)=9660 *4*; Q(α)=−7.91×10^3 *15* 2017Wa10
S(2n)=13492 *14*, S(2p)=24330 *40* (2017Wa10).
Mass measurement: 2013Va12, 2012Ha25, 2008Su19.
Additional information 1.
Theoretical nuclear structure calculations for ^{132}Sb: consult Nuclear Science References (NSR) database at www.nndc.bnl.gov/nsr/ for about 20 articles.

^{132}Sb Levels

Cross Reference (XREF) Flags

- A ^{132}Sn β^- decay (39.7 s)
- B ^{133}Sn β^-n decay (1.46 s)
- C ^{248}Cm SF decay

E(level)†	J$^\pi$@	T$_{1/2}$[a]	XREF	Comments
0.0[f]	(4)$^+$	2.79 min *7*	A	%β^-=100 J$^\pi$: M1+E2 γ from (3)$^+$. Configuration=$\pi g_{7/2}\otimes\nu d^{-1}_{3/2}$. J^π=3$^+$ is not completely ruled out. T$_{1/2}$: weighted average of 2.70 min *15* (1972Na10), 2.80 min *10* (1974Ke08), 2.80 min *7* (1975Ba36), 2.79 min *10* (1975NuZX). Other: 2.1 min *3* (1973Er18). Others: 1974Fo06, 1974Gr29, 1973Mc09, 1973Ke25, 1972Ke20, 1966St25, 1956Pa20.
0+x[b]	(8$^-$)	4.10 min *5*	A C	%β^-=100 XREF: A(?). E(level): x=150-250 keV (1989St06). Other: 200 *30* (2017Au03). T$_{1/2}$: from 1975Ba36. Others: 4.2 min *1* (1974Ke08) and 4.1 min *4* (1973Er18,1970ErZZ). Others: 1974Fo06, 1974Gr29, 1972Na10, 1966St25, 1956Pa20. J$^\pi$: configuration=$\pi g_{7/2}\otimes\nu h^{-1}_{11/2}$.
85.55[f] *6*	(3)$^+$	15.62 ns *13*	A	J$^\pi$: M1+E2 γ from (2)$^+$. J=2 if J(^{132}Sb g.s.)=3 Configuration=$\pi g_{7/2}\otimes\nu d^{-1}_{3/2}$.
162.8[f] *2*	(5$^+$)&		A	
254.5[b] *3*	(6$^-$)&	102 ns *4*	A	J$^\pi$: 4$^-$ is possible but less likely. T$_{1/2}$: from $\gamma\gamma$(t) (1974ClZX) in the study of isomers in fission products, value is listed in ^{132}Sn β^- decay dataset. Other: 150 ns *70* (1989St06, $\gamma\gamma$(t) in ^{132}Sn β^- decay).
389.2?#[b] *4*	(4$^-$)&		A	J$^\pi$: 3$^-$ is possible but less likely.
426.07[f] *6*	(2)$^+$	15.8 ps *17*	A	J$^\pi$: M1+E2 γ from 1$^+$. J=3 if J(^{132}Sb g.s.)=3. Configuration=$\pi g_{7/2}\otimes\nu d^{-1}_{3/2}$.
483.1[b] *4*	(3$^-$)&		A	J$^\pi$: 2$^-$ is possible but less likely.
529.10 *5*	(3$^+$)	≤13 ps	A	J$^\pi$: γ from 1$^+$; γ to (4$^+$). J=2 if J(^{132}Sb g.s.)=3. Configuration=$\pi g_{7/2}\otimes\nu s^{-1}_{1/2}$.
1025.0+x[b] *8*	(9$^-$)		C	
1078.31 *6*	(2)$^+$	2.6 ps *14*	A	J$^\pi$: M1+E2 γ from 1$^+$; γ to (4$^+$). J=1 if J(^{132}Sb g.s.)=3. Possible member of configuration=$\pi d_{5/2}\otimes\nu d^{-1}_{3/2}$.
1325.15 *6*	1$^+$	≤37 ps	A	J$^\pi$: log *ft*=4.05 from 0$^+$. Possible member of configuration=$\pi d_{5/2}\otimes\nu d^{-1}_{3/2}$.
2268.26 *19*	1$^+$	≤60 ps	A	J$^\pi$: log *ft*=4.88 from 0$^+$. Possible configuration=$\pi d_{5/2}\otimes\nu d^{-1}_{3/2}$.
2799.0+x[c] *8*	(10$^+$)		C	
3199.7+x[c] *11*	(11$^+$)		C	

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Adopted Levels, Gammas (continued)

^{132}Sb Levels (continued)

E(level)†	Jπ@	XREF	E(level)†	Jπ@	XREF	E(level)†	Jπ@	XREF
3489.1+x‡ *11*	(10⁻)	C	4446.2+x[e] *12*	(12⁻)	C	4892.2+x[e] *19*	(14⁻)	C
4126.3+x[d] *11*	(11⁺)	C	4544.7+x[d] *13*	(13⁺)	C	5109.2+x[e] *21*	(15⁻)	C
4266.2+x[d] *12*	(12⁺)	C	4601.2+x[e] *16*	(13⁻)	C			

† From least-squares fit to Eγ data.
‡ Reverse ordering of 957-2464 is possible from intensity considerations (2001Bh06) with an intermediate level at 1982+x instead of that at 3489+x, however, based on model considerations and decay characteristics discussed by 2001Bh06, the latter is preferred.
# The intermediate level would be at 348.4 if the ordering of the 93.9-134.7 cascade is reversed.
@ For low spins (J<8), the assignments are essentially suggested by 1989St06 on the basis of 1⁺ for 1325 and 2268 levels (from log *ft* values); (4)⁺ for ^{132}Sb g.s.; multipolarity of transitions; and γγ(θ) data from 1995Ma02. Other J^π choices are possible if $J^\pi(^{132}\text{Sb g.s.})=3^+$. Comparison with shell-model calculations is also used in assigning J^π values.
& Preferred choice (1989St06). Less likely choice is given under comments.
[a] From βγ(t) (1995Ma02) in ^{132}Sn β^- decay, unless otherwise indicated.
[b] Band(A): $\pi g_{7/2}\otimes\nu(h^{-1}_{11/2})$.
[c] Band(B): $\pi h_{11/2}\otimes\nu(h^{-1}_{11/2})$.
[d] Band(C): $\pi g_{7/2}\otimes\nu(f_{7/2}h^{-1}_{11/2}d^{-1}_{3/2})$.
[e] Band(D): $\pi g_{7/2}\otimes\nu(f_{7/2}h^{-2}_{11/2})$.
[f] Band(E): Possible $\pi g_{7/2}\otimes\nu d^{-1}_{3/2}$.

γ(^{132}Sb)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	δ‡	α&	Comments
85.55	(3)⁺	85.58 *8*	100	0.0	(4)⁺	M1+E2	−0.095 *14*	0.981 *15*	B(M1)(W.u.)=0.00112 *2*; B(E2)(W.u.)=0.9 *3* α(K)=0.841 *13*; α(L)=0.1130 *25*; α(M)=0.0225 *5* α(N)=0.00431 *10*; α(O)=0.000418 *8*
162.8	(5⁺)	162.8 *2*	100	0.0	(4)⁺	(M1)		0.1591	α(K)=0.1374 *20*; α(L)=0.0175 *3*; α(M)=0.00346 *5* α(N)=0.000668 *10*; α(O)=6.60×10⁻⁵ *10*
254.5	(6⁻)	91.7 *2*	100	162.8	(5⁺)	(E1)		0.241	B(E1)(W.u.)=2.67×10⁻⁶ *11* α(K)=0.208 *4*; α(L)=0.0268 *5*; α(M)=0.00526 *8* α(N)=0.000995 *16*; α(O)=9.19×10⁻⁵ *14*
389.2?	(4⁻)	134.7@ *2*	100	254.5	(6⁻)	(E2)		0.574	α(K)=0.440 *7*; α(L)=0.1075 *17*; α(M)=0.0220 *4* α(N)=0.00405 *7*; α(O)=0.000319 *5*
426.07	(2)⁺	340.53 *5*	100	85.55	(3)⁺	M1(+E2)	≤0.2	0.0226	B(M1)(W.u.)=0.029 *3*; B(E2)(W.u.)<8.1
		426.1[a]	≤1	0.0	(4)⁺				
483.1	(3⁻)	93.9@ *2*	100	389.2?	(4⁻)	(M1)		0.740	α(K)=0.638 *10*; α(L)=0.0822 *13*; α(M)=0.01628 *25* α(N)=0.00314 *5*; α(O)=0.000309 *5*
529.10	(3⁺)	443.5 *2*	10.6 *9*	85.55	(3)⁺				
		529.09 *6*	100 *9*	0.0	(4)⁺	D(+Q)	−0.23 *23*		

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Adopted Levels, Gammas (continued)

$\gamma(^{132}Sb)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[&]	Comments
1025.0+x	(9^-)	1025	100	0+x	(8^-)				
1078.31	$(2)^+$	549.23 *7*	6.3 *5*	529.10	(3^+)	D(+Q)	−0.07 *21*		
		652.31 *6*	7.3 *5*	426.07	$(2)^+$	(M1+E2)	−0.7 *6*		B(M1)(W.u.)=0.0012 *10*; B(E2)(W.u.)=0.9 *8*
		992.66 *8*	100 *5*	85.55	$(3)^+$	M1+E2	−0.49 *8*		B(M1)(W.u.)=0.006 *4*; B(E2)(W.u.)=0.9 *6*
		1078.3 *1*	6.8 *4*	0.0	$(4)^+$				
1325.15	1^+	246.87 *5*	95 *5*	1078.31	$(2)^+$	M1+E2	−0.14 *6*	0.0523 *9*	B(M1)(W.u.)>0.016; B(E2)(W.u.)>0.55
		795.7 *2*	0.70 *5*	529.10	(3^+)				
		899.04 *5*	100 *6*	426.07	$(2)^+$	M1+E2	−0.22 *10*		B(M1)(W.u.)>0.00034; B(E2)(W.u.)>0.0018
		1239.63 *5*	21.9 *11*	85.55	$(3)^+$				
2268.26	1^+	1739.10 *25*	19 *4*	529.10	(3^+)				
		1842.22 *25*	100 *7*	426.07	$(2)^+$				
2799.0+x	(10^+)	1774	100	1025.0+x	(9^-)				
		2799	49	0+x	(8^-)				
3199.7+x	(11^+)	401	100	2799.0+x	(10^+)				
3489.1+x	(10^-)	2464[#]	100	1025.0+x	(9^-)				
4126.3+x	(11^+)	927	100	3199.7+x	(11^+)				
		1327	25	2799.0+x	(10^+)				
4266.2+x	(12^+)	140	100	4126.3+x	(11^+)				
		1066	50	3199.7+x	(11^+)				
4446.2+x	(12^-)	957[#]	70	3489.1+x	(10^-)				
		1247	100	3199.7+x	(11^+)				
4544.7+x	(13^+)	99	100	4446.2+x	(12^-)				
		278	50	4266.2+x	(12^+)				
4601.2+x	(13^-)	155	100	4446.2+x	(12^-)				
4892.2+x	(14^-)	291	100	4601.2+x	(13^-)				
5109.2+x	(15^-)	217	100	4892.2+x	(14^-)				

[†] From ^{122}Sn β^- decay or ^{248}Cm SF decay. Intensities are relative photon branching from each level.

[‡] From ce and $\gamma\gamma(\theta)$ data in ^{132}Sn β^-; RUL for E2 and M2 used when level lifetimes are available. Multipolarities of γ rays in 93.9-134.7-91.7-162.8 cascade are from intensity balance.

[#] Reverse ordering of 957-2464 is possible, however, the ordering shown here is preferred. See also comment for 3489+x level.

[@] Reverse ordering of 93.9-134.7 is possible.

[&] Additional information 2.

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

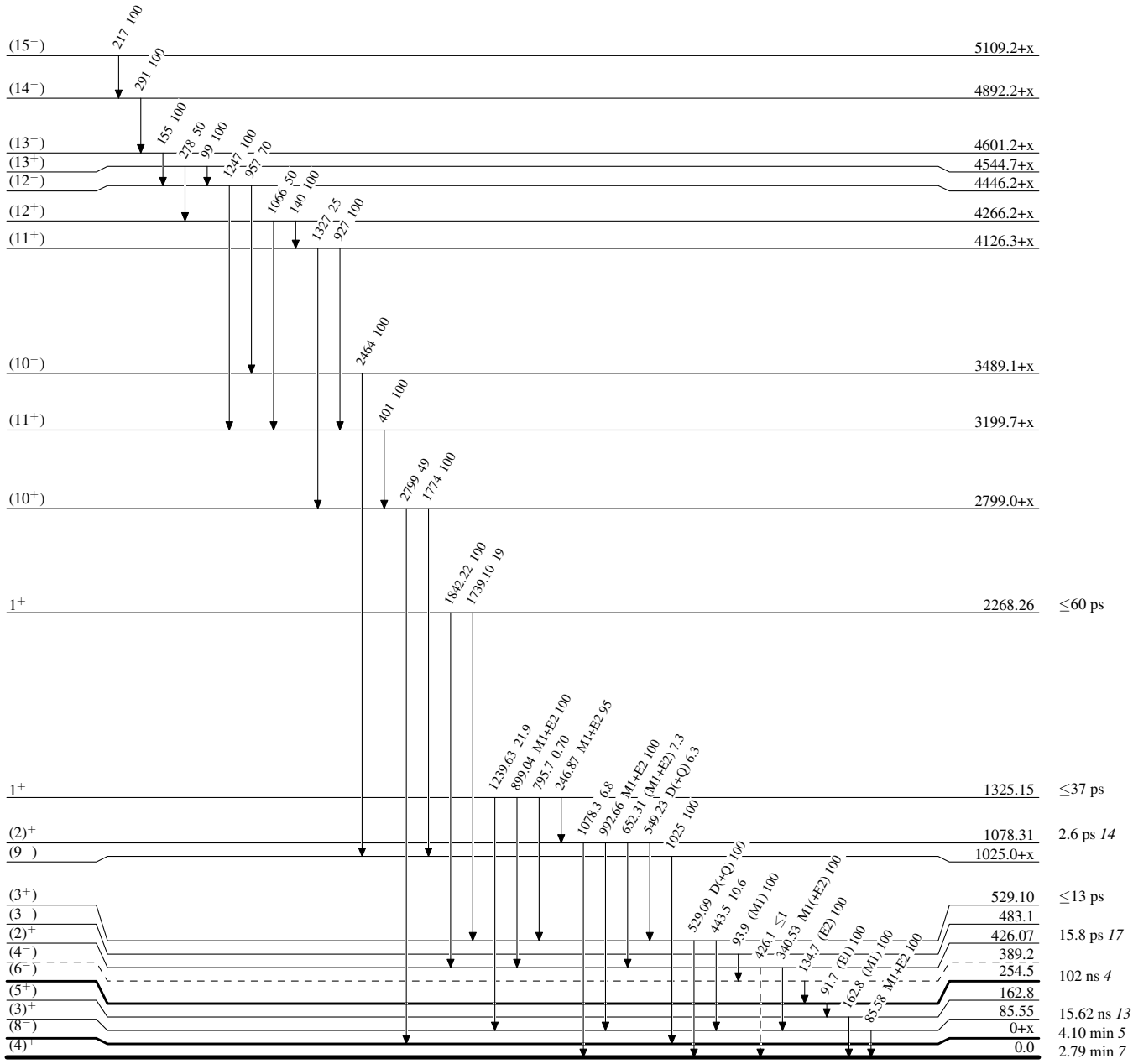
Adopted Levels, Gammas

Legend

Level Scheme

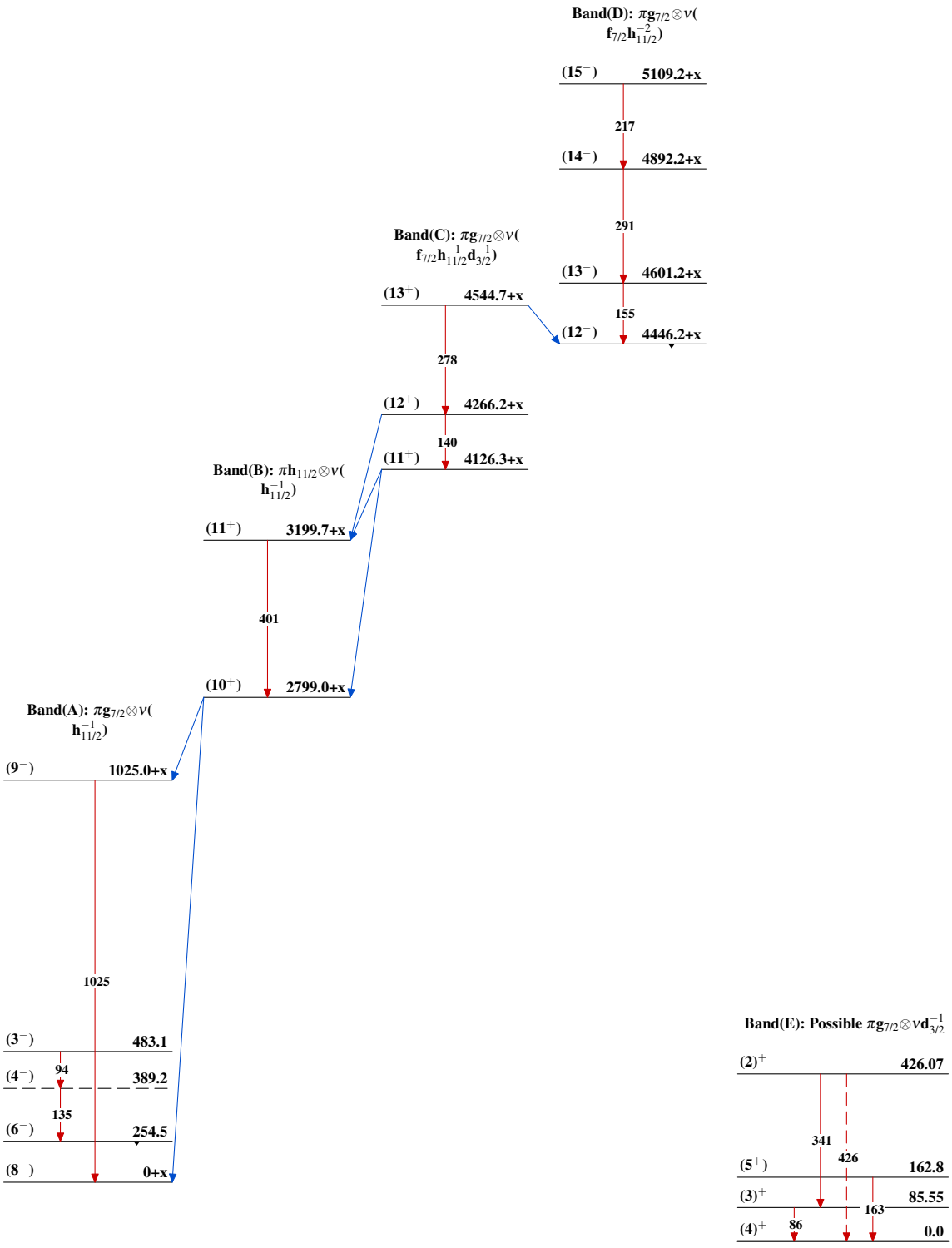
Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)



$^{132}_{51}Sb_{81}$

Adopted Levels, Gammas



$^{132}_{51}Sb_{81}$