Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	K. Kitao, Y. Tendow and A. Hashizume	NDS 96, 241 (2002)	1-Dec-2001

Q(β^-)=950 *8*; S(n)=7015 *11*; S(p)=5642 *8*; Q(α)=−2593 *8*   2012Wa38
Note: Current evaluation has used the following Q record.
Q(β^-)=982 *13*; S(n)=7021 *11*; S(p)=5644 *7*; Q(α)=−2598 *8*   1995Au04

^{120}Sb Levels

Cross Reference (XREF) Flags

A	^{116}Cd(^{7}Li,3nγ)	E	^{120}Sn(p,np) IAR
B	^{119}Sn(p,n) IAR	F	^{120}Sn(^{3}He,t) IAR
C	^{120}Sn(p,nγ)	G	^{121}Sb(p,d),(d,t)
D	^{120}Sn(p,n):bound states		

E(level)†	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0	1$^+$	15.89 min *4*	C E G	%ε+%β^+=100 μ=2.34 *22* μ: atomic beam magnetic resonance, value relative to that of ^{121}Sb(g.s. 5/2$^+$) (1989Ra17). The assignment of the 1$^+$ isomer to g.s. is tentative. J$^\pi$: atomic beam (1976Fu06); π=+ from log *ft*=4.5 to 0$^+$. T$_{1/2}$: value from 1965Eb01. For values in agreement with adopted value, see 1961Ra06, 1968Bo25, 1973ArZI; for values in disagreement, see 1950Jo59, 1967Ha27, 1968Ra14, 1970Pa17.
0.0+x	8$^-$	5.76 d *2*	A	%ε+%β^+=100 μ=2.34 *1* Additional information 1. μ: radiative detection of NMR, value recalculated and relative to μ=−1.905 *20* for ^{122}Sb (2$^-$ g.s.) (1989Ra17). E(level): 0 *100* is suggested in 1997Au04 as a value from systematics. J$^\pi$: atomic beam (1974Ek01), NMR (1974Ca06); parity from log *ft*=5.17 to (7)$^-$. T$_{1/2}$: value from 1967Ha27. See also 1958Mc59, 1968Bo25, 1968Ki06, 1972Pa13.
8.37 *6*	(2)$^-$		C	J$^\pi$: E1 γ from 3$^+$, syst of low-lying 2$^-$ in even-mass Sb isotopes.
78.16 *5*	3$^+$	246 ns *2*	C G	μ=+2.584 *6*; Q=0.41 *4* μ,Q: differential perturbed angular correlation of γ's following nuclear reaction. μ does not include a Knight-shift correction; Q relative to that for g.s. of ^{121}Sb and includes the Sternheimer correction (1989Ra17). J$^\pi$: excit in (p,nγ) suggests 3$^+$,0$^-$; L(p,d),(d,p)=0 rules out 0$^-$. T$_{1/2}$: weighted average of 241 ns *3* (1979Ad02) and 247 ns *1* (1976Io03) in (p,nγ).
149.32 *5*	3$^+$		C G	J$^\pi$: excit in (p,nγ) suggests 3$^+$,0$^-$; L(p,d),(d,p)=0 rules out 0$^-$.
165.20+x *24*			A	
166.09 *7*	3$^-$		C	J$^\pi$: excit and $\gamma(\theta)$ in (p,nγ).
192.62 *4*	2$^+$		C G	XREF: G(191). J$^\pi$: M1+E2 γ to 1$^+$; L(p,d),(d,t)=0+2.
230.40+x *21*			A	
233.09 *4*	2$^+$		C G	XREF: G(236). J$^\pi$: L(p,d),(d,t)=0; excit in (p,nγ) rules out 3$^+$.
243.89 *6*	4		C	J$^\pi$: excit and $\gamma(\theta)$ in (p,nγ).
260.20 *7*	3$^-$		C	J$^\pi$: excit in (p,nγ).
261.71 *9*	4		C	J$^\pi$: excit in (p,nγ).
280?			G	
334.08 *7*	4		C G	XREF: G(332).

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Adopted Levels, Gammas (continued)

^{120}Sb Levels (continued)

E(level)[†]	J^π	XREF	Comments
			J^π: excit and $\gamma(\theta)$ in (p,nγ).
341.35 *7*	5	C	J^π: excit in (p,nγ).
343.24 *8*	4	C	J^π: excit in (p,nγ).
387.11 *14*		C G	XREF: G(384).
390.34 *5*	2,3	C	J^π: excit in (p,nγ).
437.68 *6*	2^+	C G	XREF: G(435). J^π: excit and $\gamma(\theta)$ in (p,nγ) allows 1,2 and π=+ from L(p,d),(d,t)=0+2.
447.69 *4*	1^+	C	J^π: excit and γ(lin pol) in (p,nγ), γ to 3^+.
518.0+x *3*		A	
551.86 *17*		C	
616.69 *21*		C	
628.46 *11*	$2^+,3^+$	C G	XREF: G(623). J^π: L(p,d),(d,t)=0+2.
636.59 *15*	$2,3,4^+$	C	J^π: γ's to 2^+ and 4.
668 *5*	$2^+,3^+$[&]	G	
699 *5*	+	G	J^π: L(p,d),(d,t)=2+4.
724.24 *13*	$2^+,3^+$	C G	XREF: G(718). J^π: L(p,d),(d,t)=0+2.
729.82 *21*		C	
758.69 *21*		C	
760.92 *13*		C	
772 *4*	+	G	J^π: L(p,d),(d,t)=4.
820.39 *21*		C	
821.69 *21*		C	
841.64 *14*	$2^+,3^+$	C G	J^π: L(p,d),(d,t)=0+2.
858.0+x[‡] *3*	(8^-)[@]	A	J^π: syst for ΔJ=1 band and its band head in Sb isotopes.
901.69 *21*		C	
908.29 *21*	$2^+,3^+$[&]	C G	
934 *4*	+	G	J^π: L(p,d),(d,t)=2.
974 *4*	$2^+,3^+$[&]	G	
1022.35 *17*	+	C E G	J^π: L(p,d),(d,t)=2.
1032.31 *15*		C	
1037.06+x[‡] *25*	(9^-)[@]	A	
1059 *5*	$2^+,3^+$[&]	G	
1104 *4*	+	G	J^π: L(p,d),(d,t)=2.
1164 *4*	$2^+,3^+$[a]	G	
1208 *4*	+	G	J^π: L(p,d),(d,t)=2.
1239 *4*	$2^+,3^+$[&]	G	
1242.6+x *3*		A	
1285 *4*		G	E(level): possible doublet with L(p,d),(d,t)=0,5.
1331 *4*	$2^+,3^+$[&]	G	
1369.9+x[‡] *4*	(10^-)[@]	A	
1383 *4*	$2^+,3^+$[&]	G	
1449.8+x *4*		A	
1457 *5*	$2^+,3^+$[&]	G	
1499 *4*	+	G	J^π: L(p,d),(d,t)=2.
1550 *5*	+	G	J^π: L(p,d),(d,t)=2.
1564.9+x *4*		A	
1586 *5*	$2^+,3^+$[a]	G	
1639 *6*	$2^+,3^+$[&]	G	
1697 *6*	$2^+,3^+$[&]	G	
1742.8+x[‡] *5*	(11^-)[@]	A	
2123.9+x *5*		A	

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Adopted Levels, Gammas (continued)

^{120}Sb Levels (continued)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
2134.1+x[‡] *5*	(12^-)[@]		A	
2266.3+x *4*			A	
2328.3+x *6*		400 ns *8*	A	$T_{1/2}$: from (^{7}Li,3nγ).
2552.7+x[‡] *6*	(13^-)[@]		A	
2736.4+x *5*			A	
2884.7+x *6*		14 ns *3*	A	$T_{1/2}$: from (^{7}Li,3nγ).
10204[#] *30*			B	E(level): IAS of g.s. in ^{120}Sn. $\Gamma(p)/\Gamma\approx0.1$.
11354[#] *30*			B	E(level): IAS of 2^+ 1171 level in ^{120}Sn.
11994[#] *30*			B	E(level): IAS of 0^+ 1875 level in ^{120}Sn.
12314[#] *30*			B	E(level): IAS of 2^+ 2097 level in ^{120}Sn.
12504[#] *30*			B	E(level): IAS of 0^+,1^+ 2297 level in ^{120}Sn.
12604[#] *30*			B	E(level): IAS of 2^+ 2421 level in ^{120}Sn.
12784[#] *30*			B	E(level): IAS of 0^+ 2587 level in ^{120}Sn.
12914[#] *30*			B	E(level): IAS of 2^+ 2728 level in ^{120}Sn.
13034[#] *30*			B	E(level): IAS of 1^+ 2835 level in ^{120}Sn.
13124[#] *30*			B	E(level): IAS of 2^+ 2930 level in ^{120}Sn.

[†] For levels connecting with γ-transitions, from a least-squares fit to adopted E(γ's) by the evaluators. Others from ^{121}Sb(p,d),(d,t), unless otherwise noted.
[‡] Band(A): $\Delta J=1$ $\pi=-$ band.
[#] From ^{119}Sn(p,n) IAR.
[@] $\Delta J=1$ γ cascades and from an expected band structure.
[&] L(p,d),(d,t)=0+2, L=0 component gives 2^+,3^+.
[a] L(p,d),(d,t)=0+2+4, L=0 component gives 2^+,3^+.

γ(^{120}Sb)

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π	Mult.[@]	δ[@]	α[&]	Comments
78.16	3^+	69.78 *4*	100	8.37	$(2)^-$	E1		0.521	α(K)exp=0.43 *4* (1976Io03); B(E1)(W.u.)=2.19×10^{-6} *2* Mult.: from α(K)exp.
149.32	3^+	71.14 *5*	100	78.16	3^+	(M1+E2)		3.6 *20*	Mult.: D+Q from $\gamma(\theta)$. Decay scheme requires $\Delta\pi$=no.
165.20+x		165.0[‡] *3*	100	0.0+x	8^-	D			
166.09	3^-	157.66 *5*	100	8.37	$(2)^-$	D+Q			
192.62	2^+	114.47 *5*	100.0 *13*	78.16	3^+	(M1+E2)	0.00 *4*	0.73 *30*	Mult.: D+Q from $\gamma(\theta)$. Decay scheme requires $\Delta\pi$=no.
		192.63[#] *5*	35 *6*	0.0	1^+	M1+E2			Mult.: from $\gamma(\theta)$ and γ-ray linear pol in (p,nγ).
230.40+x		65.0[‡] *3*	19.0 *4*	165.20+x		D			
		230.4[‡] *3*	100.0 *4*	0.0+x	8^-	Q			
233.09	2^+	83.75[#] *7*	1.7 *2*	149.32	3^+				
		154.91[#] *7*	30 *3*	78.16	3^+				
		233.09 *5*	100.0 *13*	0.0	1^+				
243.89	4	94.51[#] *6*	73 *8*	149.32	3^+	D+Q			
		165.61 *7*	100 *4*	78.16	3^+	D+Q			

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Adopted Levels, Gammas (continued)

$\gamma(^{120}Sb)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ	E_f	J^π_f	Mult.[@]	δ[@]	Comments
260.20	3^-	251.92 *5*	100	8.37	$(2)^-$	M1+E2	+0.07 *5*	Mult.: from $\gamma(\theta)$ and γ-ray linear pol in (p,nγ).
261.71	4	95.62 *6*	100	166.09	3^-	D+Q		
334.08	4	90.2 *1*	10 *1*	243.89	4			
		184.76 *5*	100 *4*	149.32	3^+	D+Q		
341.35	5	81.5 *1*	100 *5*	260.20	3^-			
		97.33[#] *6*	80 *4*	243.89	4	D+Q		
343.24	4	177.15 *5*	100	166.09	3^-			
387.11		125.4 *1*	100	261.71	4			
390.34	2,3	146.44[#] *5*	20.9 *10*	243.89	4	D+Q		
		157.21[#] *7*	7.1 *10*	233.09	2^+			
		197.77 *6*	100 *5*	192.62	2^+			
437.68	2^+	245.10[#] *6*	12.6 *13*	192.62	2^+			
		271.43[#] *8*	25.5 *12*	166.09	3^-			
		288.40 *5*	100 *5*	149.32	3^+	D+Q		
447.69	1^+	214.60[#] *5*	29.8 *14*	233.09	2^+			
		255.02[#] *5*	85 *6*	192.62	2^+	D+Q		
		369.60[#] *6*	63 *10*	78.16	3^+			
		439.30[#] *9*	76 *11*	8.37	$(2)^-$			
		447.64 *9*	100 *5*	0.0	1^+	D+Q		
518.0+x		287.4[‡] *3*	100	230.40+x				
551.86		543.4 *2*	100	8.37	$(2)^-$			
616.69		372.8 *2*	100	243.89	4			
628.46	$2^+,3^+$	395.3 *2*	22 *1*	233.09	2^+			
		436.0 *2*	63 *3*	192.62	2^+			
		628.5 *2*	100 *5*	0.0	1^+			
636.59	$2,3,4^+$	392.7 *2*	100 *5*	243.89	4			
		403.5 *2*	25 *1*	233.09	2^+			
724.24	$2^+,3^+$	390.2 *2*	33 *2*	334.08	4			
		531.6 *2*	100 *5*	192.62	2^+			
729.82		580.5 *2*	100	149.32	3^+			
758.69		592.6 *2*	100	166.09	3^-			
760.92		132.5 *1*	100	628.46	$2^+,3^+$			
		313.1 *2*	82 *4*	447.69	1^+			
820.39		587.3 *2*	100	233.09	2^+			
821.69		577.8 *2*	100	243.89	4			
841.64	$2^+,3^+$	117.4 *1*	87 *4*	724.24	$2^+,3^+$			
		649.0 *2*	100 *5*	192.62	2^+			
858.0+x	(8^-)	339.9[‡] *3*	21 *2*	518.0+x		D		
		627.6[‡] *3*	100 *1*	230.40+x		Q		
901.69		668.6 *2*	100	233.09	2^+			
908.29	$2^+,3^+$	675.2 *2*	100	233.09	2^+			
1022.35	+	470.4 *2*	40 *2*	551.86				
		632.1 *2*	100 *5*	390.34	2,3			
1032.31		584.7 *2*	100 *5*	447.69	1^+			
		641.9 *2*	64 *3*	390.34	2,3			
1037.06+x	(9^-)	178.9[‡] *3*	100 *1*	858.0+x	(8^-)	D+Q		
		1037.2[‡] *3*		0.0+x	8^-			
1242.6+x		1242.6[‡] *3*	100	0.0+x	8^-	(Q)		
1369.9+x	(10^-)	332.8[‡] *3*	100	1037.06+x	(9^-)	D+Q		
		511.7[‡a] *4*		858.0+x	(8^-)			
1449.8+x		931.8[‡] *3*	100	518.0+x		D		

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Adopted Levels, Gammas (continued)

γ(^{120}Sb) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ	E_f	J^π_f	Mult.[@]
1564.9+x		115.0[‡] *3*	48 *1*	1449.8+x		D
		322.4 *3*	100 *1*	1242.6+x		D
1742.8+x	(11^-)	372.9[‡] *3*	100	1369.9+x	(10^-)	D+Q
		705.7[‡a] *4*		1037.06+x	(9^-)	
2123.9+x		559.0[‡] *3*	100	1564.9+x		D
2134.1+x	(12^-)	391.3[‡] *3*	100	1742.8+x	(11^-)	D+Q
		764.2[‡] *4*		1369.9+x	(10^-)	
2266.3+x		1023.7[‡] *3*	100	1242.6+x		
2328.3+x		204.4[‡] *3*	100	2123.9+x		(Q)
2552.7+x	(13^-)	418.6[‡] *3*		2134.1+x	(12^-)	
2736.4+x		470.1[‡] *3*	100	2266.3+x		(Q)
2884.7+x		148.3[‡] *3*	100	2736.4+x		(Q)

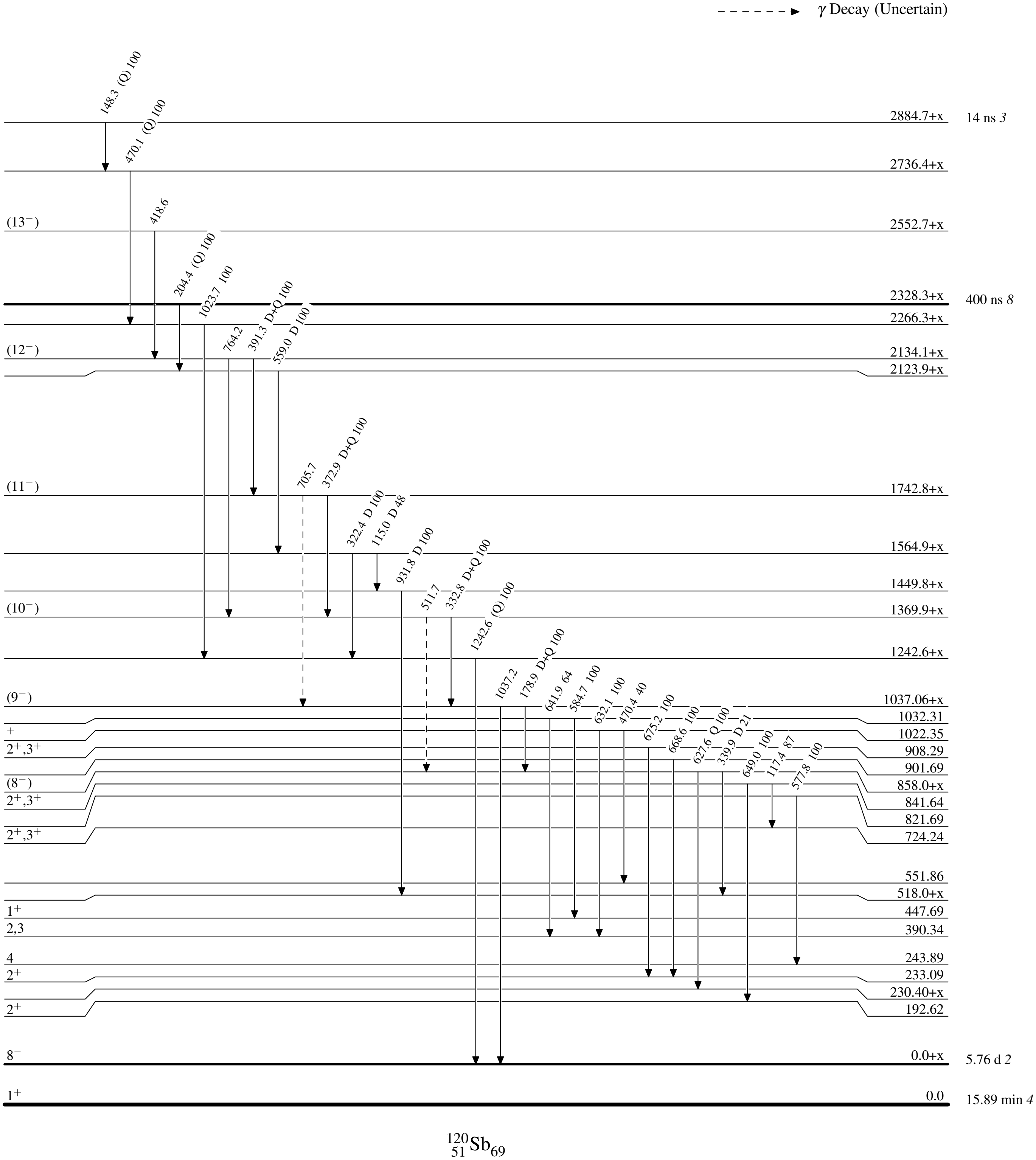
† From ^{120}Sn(p,nγ), unless otherwise noted.
‡ From (^{7}Li,3nγ).
\# Weighted av from 1979Ad02 and 1982Em02 in (p,nγ).
@ From $\gamma(\theta)$ in (p,nγ), unless otherwise noted.
& Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
a Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

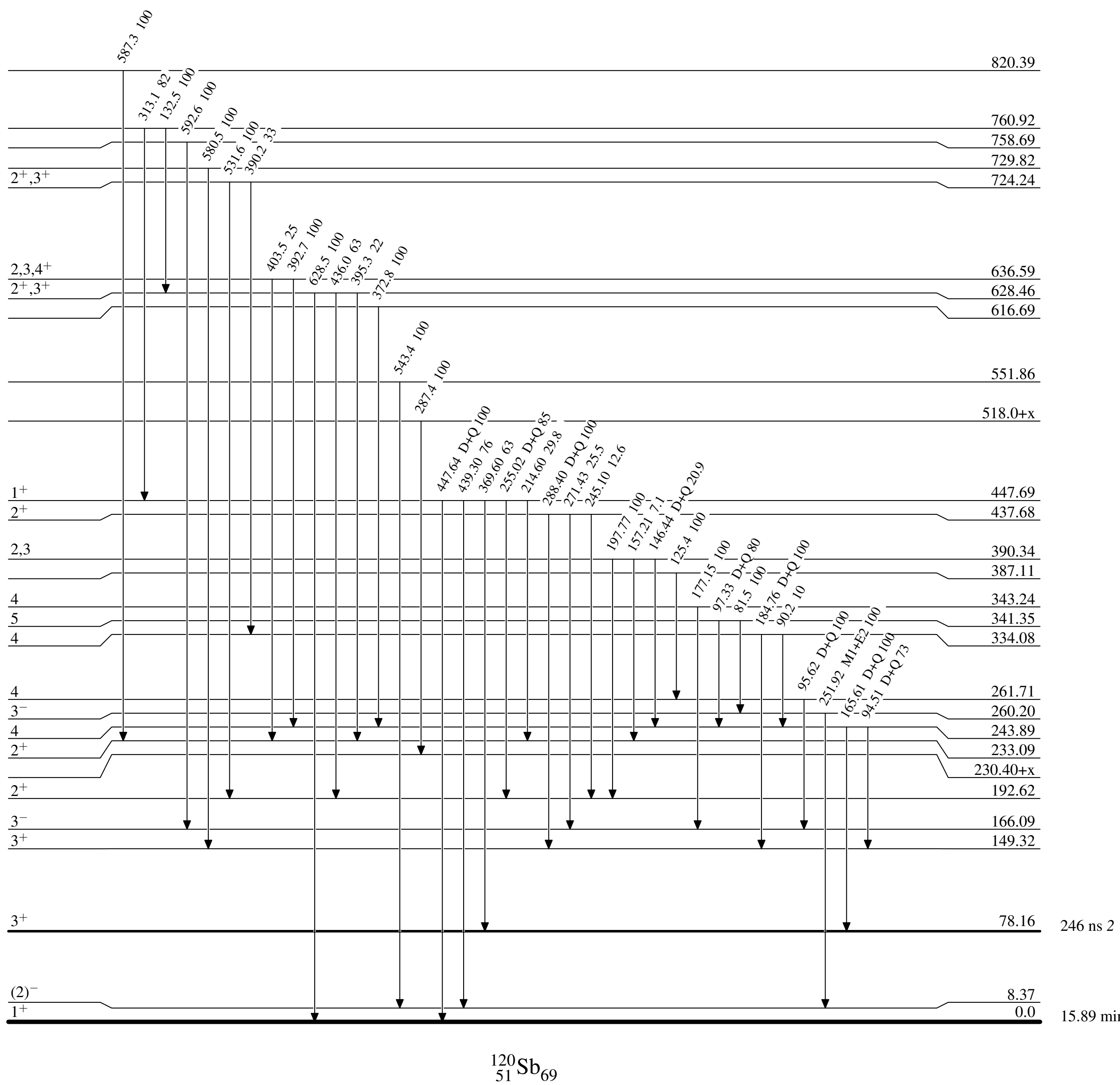
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

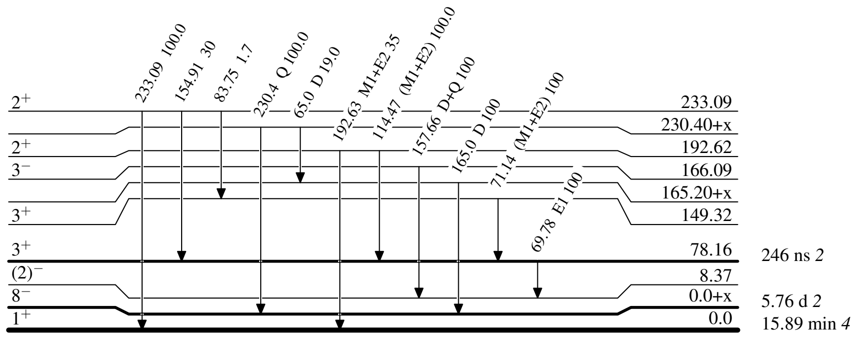
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

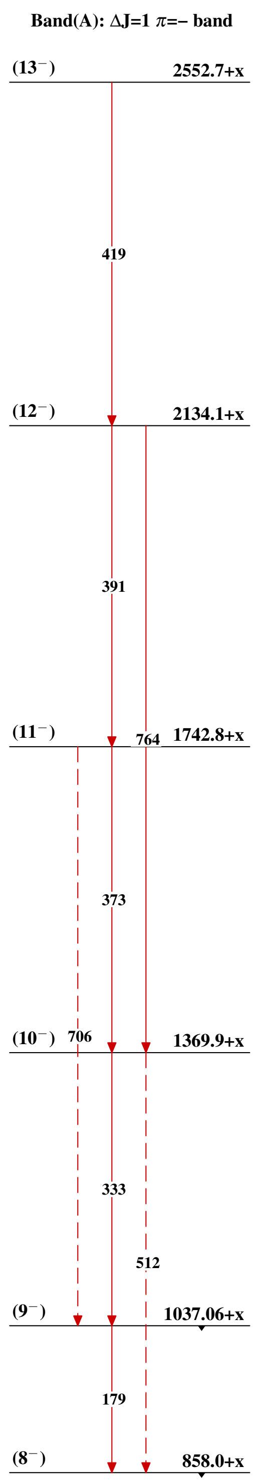
Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{120}_{51}Sb_{69}$

Adopted Levels, Gammas



$^{120}_{51}Sb_{69}$