

**Adopted Levels, Gammas**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 135, 193 (2016)	31-May-2016

Q( $\beta^-$ )=-5326 9; S(n)=11939 4; S(p)=3912.4 23; Q( $\alpha$ )=-4121 5 2012Wa38  
 S(2n)=22115.1 25, S(2p)=12146 4 (2012Wa38).

Additional information 1.

Mass measurement: 1994Ot01, 1982Au01, 1979Ep01.

Moments and charge radii measured: 1981Th04, 1978Ek05, 1978Ek04.

<sup>79</sup>Rb Levels

Band assignments are from 1996Sm07, 1995Su27, 1993Ho15, 1990Sk02 and 1982Pa20.

Cross Reference (XREF) Flags

<b>A</b>	<sup>79</sup> Sr $\epsilon$ decay (2.25 min)	<b>E</b>	<sup>63</sup> Cu( <sup>19</sup> F,2np $\gamma$ ), <sup>65</sup> Cu( <sup>18</sup> O,4n $\gamma$ )
<b>B</b>	<sup>24</sup> Mg( <sup>58</sup> Ni,3p $\gamma$ )	<b>F</b>	<sup>70</sup> Ge( <sup>12</sup> C,2np $\gamma$ ), <sup>63</sup> Cu( <sup>19</sup> F,2np $\gamma$ )
<b>C</b>	<sup>58</sup> Ni( <sup>28</sup> Si,3p $\alpha\gamma$ )	<b>G</b>	<sup>78</sup> Kr( <sup>3</sup> He,d)
<b>D</b>	<sup>58</sup> Ni( <sup>30</sup> Si,2 $\alpha\gamma$ )		

E(level) <sup>‡</sup>	J $\pi$ <sup>#</sup>	T <sub>1/2</sub> <sup>†</sup>	XREF	Comments
0.0 <sup>b</sup>	5/2 <sup>+</sup>	22.9 min 5	ABCDEFG	% $\epsilon$ +% $\beta^+$ =100 $\mu$ =+3.3579 12 (1981Th04,2014StZZ) Q=-0.12 4 (1981Th04,2014StZZ,2013StZZ) Evaluated rms charge radius=4.2284 fm 65 (2013An02). Evaluated $\delta\langle r^2 \rangle$ ( <sup>79</sup> Rb, <sup>87</sup> Rb)=0.2291 fm <sup>2</sup> 23 (2013An02). $\mu, Q$ : from hyperfine structure in LASER-spectroscopy (1981Th04). Other: $\mu$ =3.37 7 (1978Ek05,1978Ek04). Q=-0.098 22 in 1981Th04 re-evaluated in 2013StZZ. J $\pi$ : spin from atomic-beam method (1978Ek04,1981Th04); parity from L( <sup>3</sup> He,d)=2. T <sub>1/2</sub> : average of 22.8 min 5 (1972Br31) and 23.0 min 5 (1971Li02). Others: 23.0 min 5 (1973BoXS), 24 min 2 (1968To05), 20.9 min 8 (1961Ch16), 24 min 1 (1957Ch31).
39.37 <sup>e</sup> 5	(3/2 <sup>-</sup> )	20.5 <sup>@</sup> ns 25	ABCDEF	T <sub>1/2</sub> : average of 18 ns 1 (1982De36) and 23 ns 1 (1981Li12). J $\pi$ : dipole $\gamma$ to 5/2 <sup>+</sup> and evidence of $\epsilon$ feeding from 3/2 <sup>(-)</sup> . Linkages of transitions from the negative parity band to positive band and measured lifetimes favor 3/2 <sup>-</sup> over 5/2 <sup>-</sup> .
96.76 <sup>b</sup> 7	9/2 <sup>+</sup>	18.6 ns 5	BCDEFG	$\mu$ =+5.03 7 (1994Io02,2014StZZ) J $\pi$ : L( <sup>3</sup> He,d)=4; $\Delta J$ =2 $\gamma$ to 5/2 <sup>+</sup> . T <sub>1/2</sub> : from $\gamma$ (t) (1994Io02). Other: 18 ns 4 (1982Pa20). $\mu$ : TDPAD in <sup>79</sup> Br( <sup>3</sup> He,3n $\gamma$ ) (1994Io02).
119.60 <sup>j</sup> 19	(5/2 <sup>+</sup> )		DE	J $\pi$ : $\Delta J$ =(0), dipole $\gamma$ to 5/2 <sup>+</sup> .
144.38 <sup>g</sup> 5	3/2 <sup>-</sup>	<3 <sup>@</sup> ns	ABC E G	XREF: G(137). J $\pi$ : L( <sup>3</sup> He,d)=1; DCO ratio in in-beam $\gamma$ ray rules out 1/2.
147.01 <sup>c</sup> 8	(7/2 <sup>+</sup> )		BCDEF	
174.20 <sup>d</sup> 7	(5/2 <sup>-</sup> )	<3 <sup>@</sup> ns	ABCDEF	J $\pi$ : M1+E2 $\gamma$ to (3/2 <sup>-</sup> ); $\Delta J$ =(0), dipole $\gamma$ to 5/2 <sup>+</sup> .
285.34 7	1/2 <sup>-</sup> , 3/2 <sup>-</sup>	<3 <sup>@</sup> ns	A G	J $\pi$ : L( <sup>3</sup> He,d)=1.
357.13 8	(1/2, 3/2, 5/2)	<3 <sup>@</sup> ns	A g	J $\pi$ : $\gamma$ to (3/2 <sup>-</sup> ); possible $\epsilon$ feeding from 3/2 <sup>(-)</sup> . See also comment for 363 level.
363.37 <sup>h</sup> 6	(5/2 <sup>-</sup> )	<3 <sup>@</sup> ns	ABC E g	J $\pi$ : $\Delta J$ =1 $\gamma$ to 3/2 <sup>-</sup> (1/2 not allowed by $\gamma$ ( $\theta$ )); probable band

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**Adopted Levels, Gammas (continued)**

<sup>79</sup>Rb Levels (continued)

E(level) <sup>‡</sup>	J <sup>π</sup> #	T <sub>1/2</sub> <sup>†</sup>	XREF	Comments
				assignment. L( <sup>3</sup> He,d)=3 for a 366 group gives 5/2 <sup>-</sup> or 7/2 <sup>-</sup> for 363 or 357 level.
452.89 8	1/2 <sup>-</sup> ,3/2 <sup>-</sup>	<3 <sup>@</sup> ns	A G	J <sup>π</sup> : L( <sup>3</sup> He,d)=1.
453.46 <sup>e</sup> 7	(7/2 <sup>-</sup> )		BCDE	
597.56 <sup>b</sup> 12	13/2 <sup>+</sup>	8.2 <sup>&amp;</sup> ps 4	BCDEF	J <sup>π</sup> : ΔJ=2, E2 γ to 9/2 <sup>+</sup> .
643.93 <sup>c</sup> 10	(11/2 <sup>+</sup> )	5.7 <sup>&amp;</sup> ps 3	BCDEF	J <sup>π</sup> : M1+E2 γ to 9/2 <sup>+</sup> , ΔJ=2 γ to (7/2 <sup>+</sup> ).
645 10	5/2 <sup>-</sup> ,7/2 <sup>-</sup>		G	J <sup>π</sup> : L( <sup>3</sup> He,d)=1+3 for a doublet at 645.
651.75 13	1/2 <sup>-</sup> ,3/2 <sup>-</sup>	<3 <sup>@</sup> ns	A G	XREF: G(645). J <sup>π</sup> : see comment for 645 level.
670.34 <sup>g</sup> 8	(7/2 <sup>-</sup> )		BC E	
679.89 <sup>d</sup> 9	(9/2 <sup>-</sup> )	6.4 <sup>&amp;</sup> ps 17	BCDEF	
774.4 <sup>j</sup> 4	(9/2 <sup>+</sup> )		DE	
849 10	1/2 <sup>+</sup>		G	J <sup>π</sup> : L( <sup>3</sup> He,d)=0.
997 10	+		G	J <sup>π</sup> : L( <sup>3</sup> He,d)=0+2 suggests a doublet with J <sup>π</sup> =1/2 <sup>+</sup> and 3/2 <sup>+</sup> ,5/2 <sup>+</sup> .
1024.65 <sup>h</sup> 10	(9/2 <sup>-</sup> )		BC E	
1049.89 <sup>e</sup> 10	(11/2 <sup>-</sup> )		BCDE	
1161.36? 21	(11/2,13/2)		E	J <sup>π</sup> : ΔJ=0,1 γ to 13/2 <sup>+</sup> and γ to 9/2 <sup>+</sup> .
1182 10	1/2 <sup>+</sup>		G	J <sup>π</sup> : L( <sup>3</sup> He,d)=0.
1294 10			G	J <sup>π</sup> : L( <sup>3</sup> He,d)=1+4 suggests a doublet with J <sup>π</sup> =1/2 <sup>-</sup> ,3/2 <sup>-</sup> and 7/2 <sup>+</sup> ,9/2 <sup>+</sup> .
1349.27 <sup>d</sup> 11	(13/2 <sup>-</sup> )	1.21 <sup>a</sup> ps 30	BCDEF	T <sub>1/2</sub> : weighted average of 1.04 ps 41 (2006Si26) and 1.3 ps 3 (1982Pa20).
1353.26 <sup>b</sup> 16	(17/2 <sup>+</sup> )	0.770 <sup>a</sup> ps 30	BCDEF	T <sub>1/2</sub> : weighted average of 0.83 ps 14 (1982Pa20), 0.69 ps 21 (1993Ho15), 0.769 ps 30 (2006Si26).
1400 10			G	J <sup>π</sup> : L( <sup>3</sup> He,d)=1+2 suggests a doublet with J <sup>π</sup> =1/2 <sup>-</sup> ,3/2 <sup>-</sup> and 3/2 <sup>+</sup> ,5/2 <sup>+</sup> .
1410.85 <sup>g</sup> 12	(11/2 <sup>-</sup> )		BC E	
1454.44 <sup>c</sup> 13	(15/2 <sup>+</sup> )	0.91 <sup>a</sup> ps 14	BCDEF	T <sub>1/2</sub> : weighted average of 0.90 ps 14 (1982Pa20) and 0.96 ps 39 (2006Si26).
1490 10	+		G	J <sup>π</sup> : L( <sup>3</sup> He,d)=0+2 suggests a doublet with J <sup>π</sup> =1/2 <sup>+</sup> and 3/2 <sup>+</sup> ,5/2 <sup>+</sup> .
1517.3 <sup>j</sup> 6	(13/2 <sup>+</sup> )		DE	
1817.31 <sup>h</sup> 17	(13/2 <sup>-</sup> )		BC E	
1821.92 <sup>e</sup> 13	(15/2 <sup>-</sup> )	0.70 <sup>a</sup> ps 26	BCDE	T <sub>1/2</sub> : from 2006Si26.
1852.37 16			DE	J <sup>π</sup> : (17/2 <sup>+</sup> ) suggested by 1996Sm07 from ΔJ=2 γ to 13/2 <sup>+</sup> ; 1993Ho15 suggest (15/2 <sup>+</sup> ) from ΔJ=1 γ to 13/2 <sup>+</sup> .
2093 10	1/2 <sup>+</sup>		G	J <sup>π</sup> : L( <sup>3</sup> He,d)=0.
2164.97 <sup>d</sup> 14	(17/2 <sup>-</sup> )	0.41 <sup>a</sup> ps 10	BCDEF	T <sub>1/2</sub> : weighted average of 0.52 ps 15 (1982Pa20), 0.37 ps 10 (1993Ho15), 0.36 ps 19 (2006Si26).
2297.3 <sup>g</sup> 3	(15/2 <sup>-</sup> )		C E	
2315.77 <sup>b</sup> 19	(21/2 <sup>+</sup> )	0.20 <sup>a</sup> ps 3	BCDEF	T <sub>1/2</sub> : weighted average of 0.34 ps 7 (1982Pa20), 0.180 ps 21 (1993Ho15), 0.26 ps 10 (2006Si26).
2358.0 <sup>j</sup> 7	(17/2 <sup>+</sup> )		D	
2510.25 <sup>c</sup> 17	(19/2 <sup>+</sup> )	0.18 <sup>a</sup> ps 5	BCDEF	T <sub>1/2</sub> : weighted average of 0.16 ps 4 (1993Ho15), 0.30 ps 11 (2006Si26).
2711.1 <sup>h</sup> 5	(17/2 <sup>-</sup> )		BC E	
2767.62 <sup>e</sup> 24	(19/2 <sup>-</sup> )	0.21 <sup>a</sup> ps 5	BCDE	T <sub>1/2</sub> : weighted average of 0.19 ps 5 (1993Ho15), 0.33 ps 12 (2006Si26).
3029.7 <sup>g</sup> 8	(19/2 <sup>-</sup> )		C	
3111.47 <sup>d</sup> 17	(21/2 <sup>-</sup> )	0.18 <sup>a</sup> ps 3	BCDEF	T <sub>1/2</sub> : weighted average of 0.24 ps 7 (1982Pa20), 0.16 ps 3 (1993Ho15), 0.27 ps 10 (2006Si26).
3239.3? 15			E	
3276.2 <sup>j</sup> 8	(21/2 <sup>+</sup> )		D	
3308.9 <sup>i</sup> 4	(19/2 <sup>-</sup> )		DE	

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**Adopted Levels, Gammas (continued)** $^{79}\text{Rb}$  Levels (continued)

E(level) <sup>‡</sup>	J <sup>π</sup> #	T <sub>1/2</sub> <sup>†</sup>	XREF	Comments
3457.58 <sup>b</sup> 21	(25/2 <sup>+</sup> )	0.117 <sup>a</sup> ps 25	BCDEF	T <sub>1/2</sub> : weighted average of 0.17 ps 4 (1982Pa20), 0.097 ps 21 (1993Ho15), 0.20 ps 8 (2006Si26).
3581.7 <sup>h</sup> 11	(21/2 <sup>-</sup> )		C E	
3687.0 <sup>i</sup> 4	(21/2 <sup>-</sup> )		DE	
3699.8 <sup>c</sup> 4	(23/2 <sup>+</sup> )	0.104 <sup>a</sup> ps 23	BCDE	T <sub>1/2</sub> : weighted average of 0.097 ps 21 (1993Ho15), 0.18 ps 7 (2006Si26).
3879.2 <sup>e</sup> 4	(23/2 <sup>-</sup> )	0.111 <sup>a</sup> ps 28	BCDE	T <sub>1/2</sub> : weighted average of 0.104 ps 21 (1993Ho15), 0.22 ps 8 (2006Si26).
3935.7 <sup>g</sup> 12	(23/2 <sup>-</sup> )		C	
4151.7 <sup>i</sup> 5	(23/2 <sup>-</sup> )		DE	
4201.78 <sup>d</sup> 20	(25/2 <sup>-</sup> )	0.10 <sup>a</sup> ps 3	BCDEF	T <sub>1/2</sub> : weighted average of 0.14 ps 7 (1982Pa20), 0.08 ps 3 (1993Ho15), 0.14 ps 6 (2006Si26).
4213.1? 20			E	
4352.2 <sup>j</sup> 10	(25/2 <sup>+</sup> )		D	
4600.7 <sup>h</sup> 15	(25/2 <sup>-</sup> )		C	
4685.9 <sup>i</sup> 5	(25/2 <sup>-</sup> )		DE	
4774.49 <sup>b</sup> 24	(29/2 <sup>+</sup> )	0.047 <sup>a</sup> ps 14	BCDEF	T <sub>1/2</sub> : weighted average of 0.042 ps 14 (1993Ho15), 0.069 ps 28 (2006Si26). Other: <0.21 ps (1982Pa20).
4954.5 <sup>c</sup> 5	(27/2 <sup>+</sup> )	0.090 <sup>a</sup> ps 34	BCDE	T <sub>1/2</sub> : from 2006Si26. Other: <0.16 ps (1993Ho15).
5144.4 <sup>e</sup> 5	(27/2 <sup>-</sup> )	0.21 <sup>a</sup> ps 8	BCDE	T <sub>1/2</sub> : from 2006Si26. Other: <0.12 ps (1993Ho15).
5286.9 <sup>i</sup> 11	(27/2 <sup>-</sup> )		D	
5463.49 <sup>d</sup> 22	(29/2 <sup>-</sup> )	0.069 <sup>a</sup> ps 28	BCDE	T <sub>1/2</sub> : from 2006Si26. Other: <0.15 ps (1993Ho15).
5607.7 <sup>j</sup> 11	(29/2 <sup>+</sup> )		D	
6275.7 <sup>b</sup> 3	(33/2 <sup>+</sup> )	0.11 <sup>a</sup> ps 5	BCDEF	T <sub>1/2</sub> : from 2006Si26. Other: <0.07 ps (1993Ho15).
6346.3 <sup>c</sup> 7	(31/2 <sup>+</sup> )	<0.15 <sup>a</sup> ps	BCDE	T <sub>1/2</sub> : from 2006Si26.
6573.0 <sup>e</sup> 6	(31/2 <sup>-</sup> )	<0.125 <sup>a</sup> ps	BCDE	T <sub>1/2</sub> : from 2006Si26.
6899.30 <sup>d</sup> 25	(33/2 <sup>-</sup> )	<0.09 <sup>a</sup> ps	BCDE	T <sub>1/2</sub> : from 2006Si26.
6944.9 <sup>j</sup> 12	(33/2 <sup>+</sup> )		D	
7910.3 <sup>c</sup> 9	(35/2 <sup>+</sup> )		BCDE	
7964.3 <sup>b</sup> 3	(37/2 <sup>+</sup> )	0.021 <sup>a</sup> ps 7	BCDE	T <sub>1/2</sub> : from 2006Si26.
8135.0 <sup>e</sup> 8	(35/2 <sup>-</sup> )		BCD	
8340.6 <sup>j</sup> 13	(37/2 <sup>+</sup> )		D	
8370.4 <sup>d</sup> 4	(37/2 <sup>-</sup> )		BCD	
8489.7 <sup>f</sup> 4	(37/2 <sup>-</sup> )		BCD	
9642.3 <sup>c</sup> 13	(39/2 <sup>+</sup> )		CD	
9828 <sup>b</sup> 3	(41/2 <sup>+</sup> )	<0.028 <sup>a</sup> ps	BC E	T <sub>1/2</sub> : from 2006Si26.
9850.7 <sup>d</sup> 5	(41/2 <sup>-</sup> )		CD	
9881.0 <sup>e</sup> 13	(39/2 <sup>-</sup> )		CD	
9891.4 <sup>j</sup> 14	(41/2 <sup>+</sup> )		D	
10028.3 <sup>f</sup> 5	(41/2 <sup>-</sup> )		CD	
11510.0 <sup>e</sup> 16	(43/2 <sup>-</sup> )		D	
11519.1 <sup>d</sup> 6	(45/2 <sup>-</sup> )		CD	
11606.3 <sup>c</sup> 17	(43/2 <sup>+</sup> )		D	
11665.8 <sup>j</sup> 17	(45/2 <sup>+</sup> )		D	
11720.7 <sup>f</sup> 6	(45/2 <sup>-</sup> )		CD	
11834 <sup>b</sup> 4	(45/2 <sup>+</sup> )		CD	
13211 <sup>e</sup> 5	(47/2 <sup>-</sup> )		D	
13525.1 <sup>d</sup> 12	(49/2 <sup>-</sup> )		CD	
13597.7 <sup>f</sup> 12	(49/2 <sup>-</sup> )		D	
13689.8 <sup>j</sup> 20	(49/2 <sup>+</sup> )		D	
13791 4			CD	J <sup>π</sup> : γ to (45/2 <sup>+</sup> ).

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Adopted Levels, Gammas (continued) $^{79}\text{Rb}$  Levels (continued)

<u>E(level)<sup>‡</sup></u>	<u>J<sup>π</sup>#</u>	<u>XREF</u>
13996 <sup>b</sup> 4	(49/2 <sup>+</sup> )	D
15556 <sup>f</sup> 5	(53/2 <sup>-</sup> )	D
15984 <sup>j</sup> 5	(53/2 <sup>+</sup> )	D

<sup>†</sup> From DSA method in  $^{63}\text{Cu}(^{19}\text{F},2\text{npy})$  (1993Ho15) unless otherwise stated.

<sup>‡</sup> From least-squares fit to  $E\gamma$  values.

# For levels with  $J \geq 7/2$ , assignments are based on  $\gamma(\theta)$ , DCO data and band associations in various in-beam  $\gamma$ -ray studies. For other levels J<sup>π</sup> values are estimated from approximate  $\log ft$  values from  $3/2^{(-)}$ .

@ From  $X\gamma(t)$  in  $^{79}\text{Sr}$   $\varepsilon$  decay (1982De36,1981Li12).

& From RDDS in  $^{63}\text{Cu}(^{19}\text{F},2\text{npy})$  (1982Pa20).

<sup>a</sup> From DSAM (2006Si26,1993Ho15,1982Pa20), weighted averages taken when values from different studies are available.

<sup>b</sup> Band(A):  $\pi 3/2[431], \alpha = +1/2$ .

<sup>c</sup> Band(a):  $\pi 3/2[431], \alpha = -1/2$ .

<sup>d</sup> Band(B):  $\pi 3/2[312], \alpha = +1/2$ .

<sup>e</sup> Band(b):  $\pi 3/2[312], \alpha = -1/2$ .

<sup>f</sup> Band(C): Forking structure related to  $\pi 3/2[312]$  band,  $\alpha = +1/2$ .

<sup>g</sup> Band(D):  $3/2^-$  band,  $\alpha = -1/2$ .

<sup>h</sup> Band(d):  $3/2^-$  band,  $\alpha = +1/2$ .

<sup>i</sup> Band(E):  $\Delta J=1$ , 3-quasiparticle band. Tentative assignment (1993Ho15) based on configuration= $((\pi g_{9/2})(\nu g_{9/2})(\nu pf))$ .

<sup>j</sup> Band(F):  $\pi 1/2[440]$  band.

**Adopted Levels, Gammas (continued)**

E <sub>i</sub> (level)	J <sup>π</sup> <sub>i</sub>	γ( <sup>79</sup> Rb)		γ( <sup>79</sup> Rb)			δ <sup>‡</sup>	α&	Comments
		E <sub>γ</sub> <sup>†</sup>	I <sub>γ</sub> <sup>†</sup>	E <sub>f</sub>	J <sup>π</sup> <sub>f</sub>	Mult. <sup>‡</sup>			
39.37	(3/2 <sup>-</sup> )	39.41 7	100	0.0	5/2 <sup>+</sup>	(E1)		1.443	B(E1)(W.u.)=0.000120 15 α(K)=1.270 19; α(L)=0.1471 22; α(M)=0.0239 4 α(N)=0.00256 4; α(O)=9.08×10 <sup>-5</sup> 14 Mult.: E1 or M1 from α(K)exp in <sup>79</sup> Sr ε decay. E1 is supported by probable band assignments.
96.76	9/2 <sup>+</sup>	96.7 1	100	0.0	5/2 <sup>+</sup>	[E2] <sup>#</sup>		1.099	α(K)=0.926 14; α(L)=0.1463 22; α(M)=0.0242 4 α(N)=0.00249 4; α(O)=6.92×10 <sup>-5</sup> 10 B(E2)(W.u.)=85.1 25
119.60	(5/2 <sup>+</sup> )	119.5 2	100	0.0	5/2 <sup>+</sup>	D			B(M1)(W.u.)>0.0050
144.38	3/2 <sup>-</sup>	105.00 4	100 3	39.37	(3/2 <sup>-</sup> )	(M1)		0.1266	α(K)=0.1116 16; α(L)=0.01261 18; α(M)=0.00209 3 α(N)=0.000235 4; α(O)=9.97×10 <sup>-6</sup> 14 Mult.: dipole from α(K)exp<0.12 in <sup>79</sup> Sr ε decay but ΔJ <sup>π</sup> supports M1. Branching ratio for 105γ and 144γ is from <sup>79</sup> Sr ε decay. I <sub>γ</sub> (105γ)/I <sub>γ</sub> (144γ)=15 1/18 4 from in-beam γ ray is in severe disagreement.
		144.41 6	14 7	0.0	5/2 <sup>+</sup>				
147.01	(7/2 <sup>+</sup> )	49.8 5		96.76	9/2 <sup>+</sup>	D+Q	+0.19 10		
		147.0 1	100 6	0.0	5/2 <sup>+</sup>				
174.20	(5/2 <sup>-</sup> )	54.0 5		119.60	(5/2 <sup>+</sup> )	M1+E2	-0.18 12	0.072 14	α(K)=0.063 12; α(L)=0.0074 17; α(M)=0.0012 3 α(N)=0.00014 3; α(O)=5.6×10 <sup>-6</sup> 9 B(M1)(W.u.)>0.0023
		134.87 6	100 5	39.37	(3/2 <sup>-</sup> )				
285.34	1/2 <sup>-</sup> ,3/2 <sup>-</sup>	174.2 2	10 4	0.0	5/2 <sup>+</sup>	D			
		140.92 8	100 13	144.38	3/2 <sup>-</sup>				
		245.80 8	69 31	39.37	(3/2 <sup>-</sup> )				
357.13	(1/2,3/2,5/2)	317.76 6	100	39.37	(3/2 <sup>-</sup> )				
363.37	(5/2 <sup>-</sup> )	218.98 8	100 14	144.38	3/2 <sup>-</sup>	@			Branching ratio of 324γ and 219γ is from <sup>79</sup> Sr ε decay. I <sub>γ</sub> (219γ)/I <sub>γ</sub> (324γ)=100 6/18 3 from in-beam γ-ray is in severe disagreement.
		324.03 6	90 14	39.37	(3/2 <sup>-</sup> )				
452.89	1/2 <sup>-</sup> ,3/2 <sup>-</sup>	167.43 6	7 4	285.34	1/2 <sup>-</sup> ,3/2 <sup>-</sup>				
		308.9 3	17 4	144.38	3/2 <sup>-</sup>				
		413.8 2	100 8	39.37	(3/2 <sup>-</sup> )				
453.46	(7/2 <sup>-</sup> )	279.2 1	92 15	174.20	(5/2 <sup>-</sup> )	@			I <sub>γ</sub> (414γ)/I <sub>γ</sub> (279γ)=100 2/20 2 (1990Sk02) is in disagreement with value from 1993Ho15 adopted here.
		356.6 1	61 8	96.76	9/2 <sup>+</sup>	D			
		414.3 1	100 8	39.37	(3/2 <sup>-</sup> )	#			
		453.3 4	100 31	0.0	5/2 <sup>+</sup>				
597.56	13/2 <sup>+</sup>	500.8 1	100	96.76	9/2 <sup>+</sup>	E2		0.00341	α(K)=0.00301 5; α(L)=0.000338 5; α(M)=5.56×10 <sup>-5</sup> 8 α(N)=6.23×10 <sup>-6</sup> 9; α(O)=2.57×10 <sup>-7</sup> 4 B(E2)(W.u.)=108 6

Adopted Levels, Gammas (continued)

$\gamma(^{79}\text{Rb})$  (continued)

$E_i(\text{level})$	$J_i^\pi$	$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_f$	$J_f^\pi$	Mult. <sup>‡</sup>	$\delta^\ddagger$	$\alpha^\&$	Comments
643.93	(11/2) <sup>+</sup>	496.9 1	100 9	147.01	(7/2) <sup>+</sup>	[E2] <sup>#</sup>		0.00349	$\alpha(\text{K})=0.00308$ 5; $\alpha(\text{L})=0.000346$ 5; $\alpha(\text{M})=5.70 \times 10^{-5}$ 8 $\alpha(\text{N})=6.38 \times 10^{-6}$ 9; $\alpha(\text{O})=2.63 \times 10^{-7}$ 4 B(E2)(W.u.)=98 12
		547.2 1	65 5	96.76	9/2 <sup>+</sup>	M1+E2	+0.38 14	0.00201 7	B(M1)(W.u.)=0.0081 12; B(E2)(W.u.)=5 4 $\alpha(\text{K})=0.00178$ 6; $\alpha(\text{L})=0.000194$ 7; $\alpha(\text{M})=3.19 \times 10^{-5}$ 12 $\alpha(\text{N})=3.62 \times 10^{-6}$ 13; $\alpha(\text{O})=1.56 \times 10^{-7}$ 5
651.75	1/2 <sup>-</sup> ,3/2 <sup>-</sup>	366.34 14	47 6	285.34	1/2 <sup>-</sup> ,3/2 <sup>-</sup>				
		612.5 2	100 12	39.37	(3/2) <sup>-</sup>				
670.34	(7/2) <sup>-</sup>	307.0 1	100 11	363.37	(5/2) <sup>-</sup>	@			
		526.0 1	54 8	144.38	3/2 <sup>-</sup>	#			
		630.7 3	19 4	39.37	(3/2) <sup>-</sup>				
		669.7 3	31 4	0.0	5/2 <sup>+</sup>				
679.89	(9/2) <sup>-</sup>	226.6 2	10 2	453.46	(7/2) <sup>-</sup>	@			
		505.8 1	100 2	174.20	(5/2) <sup>-</sup>	[E2] <sup>#</sup>		0.00331	B(E2)(W.u.)=1.1 × 10 <sup>2</sup> 3 $\alpha(\text{K})=0.00292$ 4; $\alpha(\text{L})=0.000327$ 5; $\alpha(\text{M})=5.40 \times 10^{-5}$ 8 $\alpha(\text{N})=6.04 \times 10^{-6}$ 9; $\alpha(\text{O})=2.49 \times 10^{-7}$ 4 B(E1)(W.u.)=4.5 × 10 <sup>-5</sup> 16
		532.9 2	15 3	147.01	(7/2) <sup>+</sup>	(E1)			
774.4	(9/2) <sup>+</sup>	654.8 3	100	119.60	(5/2) <sup>+</sup>				
1024.65	(9/2) <sup>-</sup>	354.3 1	86 14	670.34	(7/2) <sup>-</sup>	@			
		661.3 1	100 14	363.37	(5/2) <sup>-</sup>	#			
1049.89	(11/2) <sup>-</sup>	370.2 2	10 3	679.89	(9/2) <sup>-</sup>	@			
		453.9 <sup>a</sup> 4	10 3	597.56	13/2 <sup>+</sup>				$E_\gamma$ : seen by 1993Ho15 only.
		596.8 1	100 6	453.46	(7/2) <sup>-</sup>	#			
		953.4 3	13 3	96.76	9/2 <sup>+</sup>				
1161.36?	(11/2,13/2)	563.8 2	<40	597.56	13/2 <sup>+</sup>				
		1064.6 4	100 20	96.76	9/2 <sup>+</sup>				
1349.27	(13/2) <sup>-</sup>	299.3 1	11 2	1049.89	(11/2) <sup>-</sup>	@			
		669.5 1	100 2	679.89	(9/2) <sup>-</sup>	E2		1.48 × 10 <sup>-3</sup>	$\alpha(\text{K})=0.001306$ 19; $\alpha(\text{L})=0.0001437$ 21; $\alpha(\text{M})=2.37 \times 10^{-5}$ 4 $\alpha(\text{N})=2.67 \times 10^{-6}$ 4; $\alpha(\text{O})=1.124 \times 10^{-7}$ 16 B(E2)(W.u.)=1.5 × 10 <sup>2</sup> 4 Mult.: $\gamma(\theta)$ ( $\Delta J=2$ ) and $T_{1/2}(\text{level})$ . B(E1)(W.u.)=4.7 × 10 <sup>-5</sup> 17 $E_\gamma$ : $\gamma$ not confirmed by 1996Sm07.
		705.1 <sup>a</sup> 3	6.4 15	643.93	(11/2) <sup>+</sup>	[E1]			
1353.26	(17/2) <sup>+</sup>	755.7 1	100	597.56	13/2 <sup>+</sup>	[E2] <sup>#</sup>		1.07 × 10 <sup>-3</sup>	$\alpha(\text{K})=0.000946$ 14; $\alpha(\text{L})=0.0001034$ 15; $\alpha(\text{M})=1.705 \times 10^{-5}$ 24

## Adopted Levels, Gammas (continued)

							$\gamma(^{79}\text{Rb})$ (continued)			
$E_i(\text{level})$	$J_i^\pi$	$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_f$	$J_f^\pi$	Mult.‡	Comments			
							$\alpha(\text{N})=1.92\times 10^{-6}$ 3; $\alpha(\text{O})=8.17\times 10^{-8}$ 12			
							B(E2)(W.u.)=148 6			
1410.85	(11/2 <sup>-</sup> )	386.2 2	36 9	1024.65	(9/2 <sup>-</sup> )	@				
		740.5 1	100 18	670.34	(7/2 <sup>-</sup> )	#				
1454.44	(15/2 <sup>+</sup> )	810.5 1	100 4	643.93	(11/2 <sup>+</sup> )	[E2]#	B(E2)(W.u.)=61 12			
		856.9 3	45 14	597.56	13/2 <sup>+</sup>					
1517.3	(13/2 <sup>+</sup> )	742.9 4	100	774.4	(9/2 <sup>+</sup> )					
1817.31	(13/2 <sup>-</sup> )	406.5 2	33 16	1410.85	(11/2 <sup>-</sup> )	@				
		792.7 2	100 17	1024.65	(9/2 <sup>-</sup> )	#				
1821.92	(15/2 <sup>-</sup> )	472.7 2	13 4	1349.27	(13/2 <sup>-</sup> )					
		772.0 1	100 4	1049.89	(11/2 <sup>-</sup> )	#				
1852.37		1254.8 1	100	597.56	13/2 <sup>+</sup>	@				
2164.97	(17/2 <sup>-</sup> )	343.0 2	<2	1821.92	(15/2 <sup>-</sup> )					
		815.7 1	100 6	1349.27	(13/2 <sup>-</sup> )	E2	B(E2)(W.u.)=1.9×10 <sup>2</sup> 5			
							Mult.: $\gamma(\theta)$ ( $\Delta J=2$ ) and RUL.			
2297.3	(15/2 <sup>-</sup> )	481		1817.31	(13/2 <sup>-</sup> )					
		886.3 3	100	1410.85	(11/2 <sup>-</sup> )					
2315.77	(21/2 <sup>+</sup> )	962.5 1	100	1353.26	(17/2 <sup>+</sup> )	E2#	B(E2)(W.u.)=1.7×10 <sup>2</sup> 3			
2358.0	(17/2 <sup>+</sup> )	840.7 3	100	1517.3	(13/2 <sup>+</sup> )					
2510.25	(19/2 <sup>+</sup> )	1055.8 1	100	1454.44	(15/2 <sup>+</sup> )	[E2]#	B(E2)(W.u.)=1.2×10 <sup>2</sup> 4			
2711.1	(17/2 <sup>-</sup> )	413		2297.3	(15/2 <sup>-</sup> )					
		894.1 5	100	1817.31	(13/2 <sup>-</sup> )	#				
2767.62	(19/2 <sup>-</sup> )	945.7 2	100	1821.92	(15/2 <sup>-</sup> )	[E2]#	B(E2)(W.u.)=1.8×10 <sup>2</sup> 5			
3029.7	(19/2 <sup>-</sup> )	319		2711.1	(17/2 <sup>-</sup> )					
		732		2297.3	(15/2 <sup>-</sup> )					
3111.47	(21/2 <sup>-</sup> )	946.5 1	100	2164.97	(17/2 <sup>-</sup> )	[E2]#	B(E2)(W.u.)=2.1×10 <sup>2</sup> 4			
3239.3?		1886.0 15	100	1353.26	(17/2 <sup>+</sup> )					
3276.2	(21/2 <sup>+</sup> )	918.2 5	100	2358.0	(17/2 <sup>+</sup> )					
3308.9	(19/2 <sup>-</sup> )	1143.9 3	100	2164.97	(17/2 <sup>-</sup> )					
		1956.2 <sup>a</sup> 5		1353.26	(17/2 <sup>+</sup> )		E <sub>γ</sub> : $\gamma$ not seen by 1996Sm07.			
3457.58	(25/2 <sup>+</sup> )	1141.8 1	100	2315.77	(21/2 <sup>+</sup> )	[E2]#	B(E2)(W.u.)=1.2×10 <sup>2</sup> 3			
3581.7	(21/2 <sup>-</sup> )	552		3029.7	(19/2 <sup>-</sup> )					
		870 5	100	2711.1	(17/2 <sup>-</sup> )					
3687.0	(21/2 <sup>-</sup> )	378.1 2	100	3308.9	(19/2 <sup>-</sup> )					
3699.8	(23/2 <sup>+</sup> )	1189.5 3	100	2510.25	(19/2 <sup>+</sup> )	[E2]#	B(E2)(W.u.)=1.1×10 <sup>2</sup> 3			
3879.2	(23/2 <sup>-</sup> )	1111.6 3	100	2767.62	(19/2 <sup>-</sup> )	E2	B(E2)(W.u.)=1.5×10 <sup>2</sup> 4			
3935.7	(23/2 <sup>-</sup> )	354		3581.7	(21/2 <sup>-</sup> )					
		906		3029.7	(19/2 <sup>-</sup> )					
4151.7	(23/2 <sup>-</sup> )	464.7 2		3687.0	(21/2 <sup>-</sup> )					
		842.8 <sup>a</sup> 3		3308.9	(19/2 <sup>-</sup> )					

## Adopted Levels, Gammas (continued)

 $\gamma(^{79}\text{Rb})$  (continued)

$E_i$ (level)	$J_i^\pi$	$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_f$	$J_f^\pi$	Mult. <sup>‡</sup>	Comments
4201.78	(25/2 <sup>-</sup> )	1090.3 1	100	3111.47	(21/2 <sup>-</sup> )	[E2] <sup>#</sup>	B(E2)(W.u.)=1.8×10 <sup>2</sup> 6
4213.1?		1897.3 20	100	2315.77	(21/2 <sup>+</sup> )		
4352.2	(25/2 <sup>+</sup> )	1076.0 5	100	3276.2	(21/2 <sup>+</sup> )		
4600.7	(25/2 <sup>-</sup> )	1019		3581.7	(21/2 <sup>-</sup> )		
4685.9	(25/2 <sup>-</sup> )	534.2 2	100	4151.7	(23/2 <sup>-</sup> )		
4774.49	(29/2 <sup>+</sup> )	1316.9 1	100	3457.58	(25/2 <sup>+</sup> )	[E2] <sup>#</sup>	B(E2)(W.u.)=1.5×10 <sup>2</sup> 5
4954.5	(27/2 <sup>+</sup> )	1254.7 3	100	3699.8	(23/2 <sup>+</sup> )	E2 <sup>#</sup>	B(E2)(W.u.)=1.0×10 <sup>2</sup> 4
5144.4	(27/2 <sup>-</sup> )	1265.2 3	100	3879.2	(23/2 <sup>-</sup> )	E2	B(E2)(W.u.)=41 16 E <sub>γ</sub> : from 1996Sm07. Others: 1263.5 5 (1993Ho15), 1259.4 14 (1990Sk02), 1260 (1995Su27).
5286.9	(27/2 <sup>-</sup> )	601 1		4685.9	(25/2 <sup>-</sup> )		
5463.49	(29/2 <sup>-</sup> )	1261.7 1	100	4201.78	(25/2 <sup>-</sup> )	E2 <sup>#</sup>	B(E2)(W.u.)=1.3×10 <sup>2</sup> 6
5607.7	(29/2 <sup>+</sup> )	1255.5 5	100	4352.2	(25/2 <sup>+</sup> )		
6275.7	(33/2 <sup>+</sup> )	1501.2 1	100	4774.49	(29/2 <sup>+</sup> )	E2 <sup>#</sup>	B(E2)(W.u.)=34 16
6346.3	(31/2 <sup>+</sup> )	1391.8 5	100	4954.5	(27/2 <sup>+</sup> )	E2	
6573.0	(31/2 <sup>-</sup> )	1428.5 3	100	5144.4	(27/2 <sup>-</sup> )	E2	B(E2)(W.u.)>38 E <sub>γ</sub> : from 1996Sm07. Others: 1423.6 10 (1993Ho15), 1423 (1990Sk02, 1995Su27).
6899.30	(33/2 <sup>-</sup> )	1435.8 1	100	5463.49	(29/2 <sup>-</sup> )	E2	B(E2)(W.u.)>51
6944.9	(33/2 <sup>+</sup> )	1337.2 5	100	5607.7	(29/2 <sup>+</sup> )		
7910.3	(35/2 <sup>+</sup> )	1564.0 5	100	6346.3	(31/2 <sup>+</sup> )		
7964.3	(37/2 <sup>+</sup> )	1688.6 1	100	6275.7	(33/2 <sup>+</sup> )	E2	B(E2)(W.u.)=1.0×10 <sup>2</sup> 4
8135.0	(35/2 <sup>-</sup> )	1562.0 5	100	6573.0	(31/2 <sup>-</sup> )	Q	
8340.6	(37/2 <sup>+</sup> )	1395.7 5	100	6944.9	(33/2 <sup>+</sup> )		
8370.4	(37/2 <sup>-</sup> )	1471.1 3	100	6899.30	(33/2 <sup>-</sup> )		
8489.7	(37/2 <sup>-</sup> )	1590.4 3	100	6899.30	(33/2 <sup>-</sup> )	Q	
9642.3	(39/2 <sup>+</sup> )	1732 1	100	7910.3	(35/2 <sup>+</sup> )		
9828	(41/2 <sup>+</sup> )	1863.3 30	100	7964.3	(37/2 <sup>+</sup> )	E2	B(E2)(W.u.)>44
9850.7	(41/2 <sup>-</sup> )	1480.3 3	100	8370.4	(37/2 <sup>-</sup> )		
9881.0	(39/2 <sup>-</sup> )	1746 <sup>a</sup> 1	100	8135.0	(35/2 <sup>-</sup> )		
9891.4	(41/2 <sup>+</sup> )	1550.7 5	100	8340.6	(37/2 <sup>+</sup> )		
10028.3	(41/2 <sup>-</sup> )	1538.6 3	100	8489.7	(37/2 <sup>-</sup> )	Q	
		1659 <sup>a</sup>		8370.4	(37/2 <sup>-</sup> )		
11510.0	(43/2 <sup>-</sup> )	1629 <sup>a</sup> 1	100	9881.0	(39/2 <sup>-</sup> )		
11519.1	(45/2 <sup>-</sup> )	1668.3 3	100	9850.7	(41/2 <sup>-</sup> )		
11606.3	(43/2 <sup>+</sup> )	1964 1	100	9642.3	(39/2 <sup>+</sup> )		E <sub>γ</sub> : in ( <sup>28</sup> Si,3pαγ) (1995Su27), (43/2 <sup>+</sup> ) level is shown to decay by a 1767γ.
11665.8	(45/2 <sup>+</sup> )	1774.4 10	100	9891.4	(41/2 <sup>+</sup> )		
11720.7	(45/2 <sup>-</sup> )	1692.3 3	100	10028.3	(41/2 <sup>-</sup> )		
11834	(45/2 <sup>+</sup> )	2006 1	100	9828	(41/2 <sup>+</sup> )		
13211	(47/2 <sup>-</sup> )	1701 <sup>a</sup> 4	100	11510.0	(43/2 <sup>-</sup> )		
13525.1	(49/2 <sup>-</sup> )	2006 1	100	11519.1	(45/2 <sup>-</sup> )		
13597.7	(49/2 <sup>-</sup> )	1877 <sup>a</sup> 1	100	11720.7	(45/2 <sup>-</sup> )		
13689.8	(49/2 <sup>+</sup> )	2024 1	100	11665.8	(45/2 <sup>+</sup> )		
13791		1957.1 <sup>a</sup> 3	100	11834	(45/2 <sup>+</sup> )		



Adopted Levels, Gammas (continued)

$\gamma(^{79}\text{Rb})$  (continued)

$E_i(\text{level})$	$J_i^\pi$	$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_f$	$J_f^\pi$	Comments
13996	(49/2 <sup>+</sup> )	2162 <sup>l</sup>	100	11834	(45/2 <sup>+</sup> )	$E_\gamma$ : in ( <sup>28</sup> Si,3p $\alpha\gamma$ ) ( <a href="#">1995Su27</a> ), a cascade 2189 $\gamma$ -1956 $\gamma$ feeds the 45/2 <sup>+</sup> level at 11834, but from $\gamma\gamma$ coin, 2189 $\gamma$ and 1956 $\gamma$ are parallel above the 11834 level.
15556	(53/2 <sup>-</sup> )	1958 <sup>a</sup> <sup>4</sup>	100	13597.7	(49/2 <sup>-</sup> )	$E_\gamma$ : in ( <sup>28</sup> Si,3p $\alpha\gamma$ ) ( <a href="#">1995Su27</a> ), a 1964 $\gamma$ is shown to feed 13525 level.
15984	(53/2 <sup>+</sup> )	2294 <sup>a</sup> <sup>4</sup>	100	13689.8	(49/2 <sup>+</sup> )	

<sup>†</sup> From <sup>79</sup>Sr  $\epsilon$  decay or in-beam  $\gamma$ -ray studies. When common levels are seen, values are from <sup>79</sup>Sr  $\epsilon$  decay. In in-beam  $\gamma$ -ray studies data are taken mainly from (<sup>30</sup>Si,2 $\alpha\gamma$ ) ([1996Sm07](#)) and from <sup>63</sup>Cu(<sup>19</sup>F,2n $\rho\gamma$ ) ([1993Ho15](#)).

<sup>‡</sup> From  $\gamma(\theta)$ , DCO ratios in in-beam  $\gamma$ -ray studies and RUL (for E2 and M2).

# DCO ratio in in-beam  $\gamma$ -ray studies consistent with  $\Delta J=2$  (E2) transition.

@ DCO ratio in in-beam  $\gamma$ -ray studies consistent with  $\Delta J=1$  transition.

& From BrIcc v2.3b (16-Dec-2014) [2008Ki07](#), “Frozen Orbitals” appr.

<sup>a</sup> Placement of transition in the level scheme is uncertain.

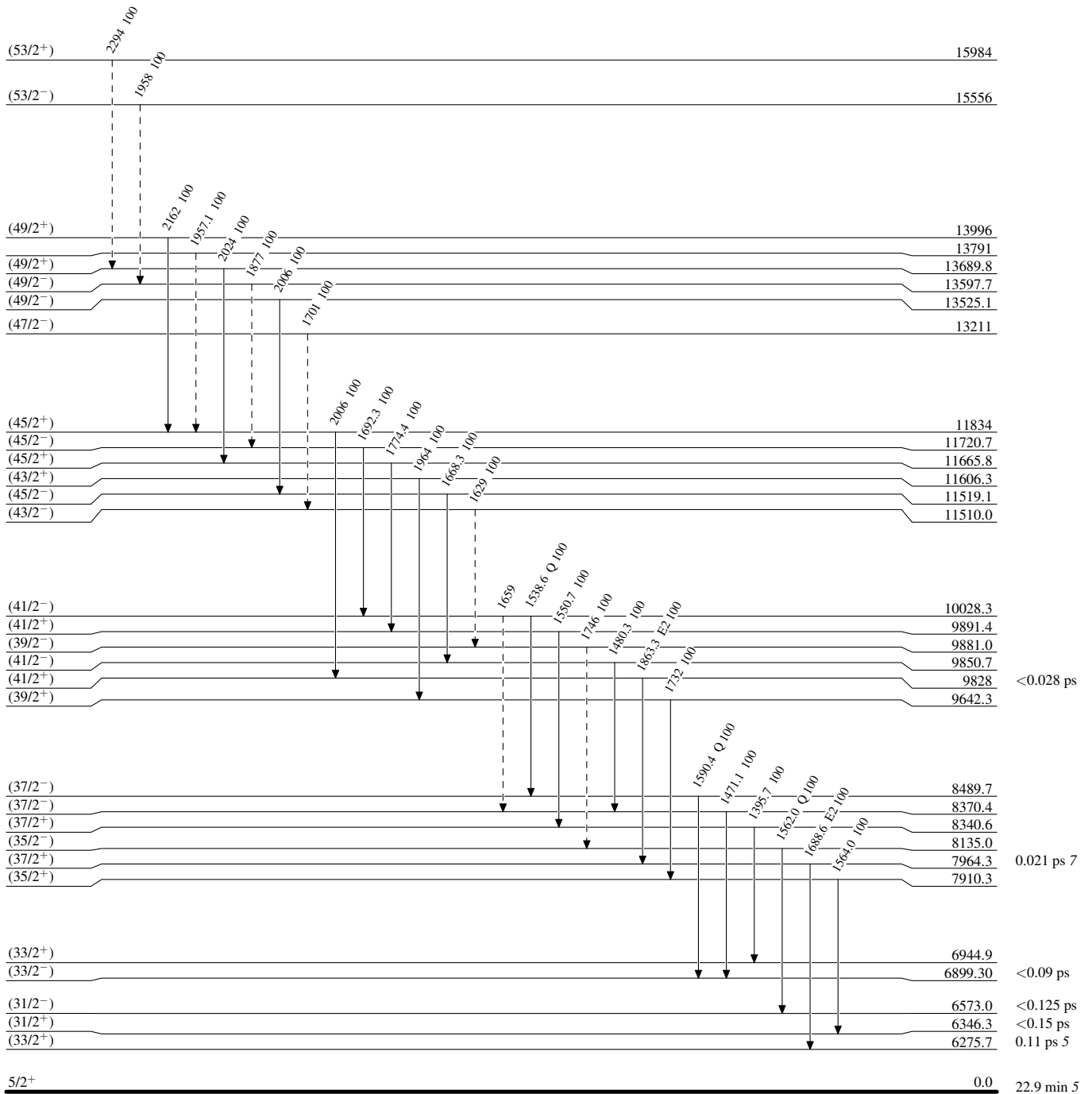
**Adopted Levels, Gammas**

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----▶  $\gamma$  Decay (Uncertain)



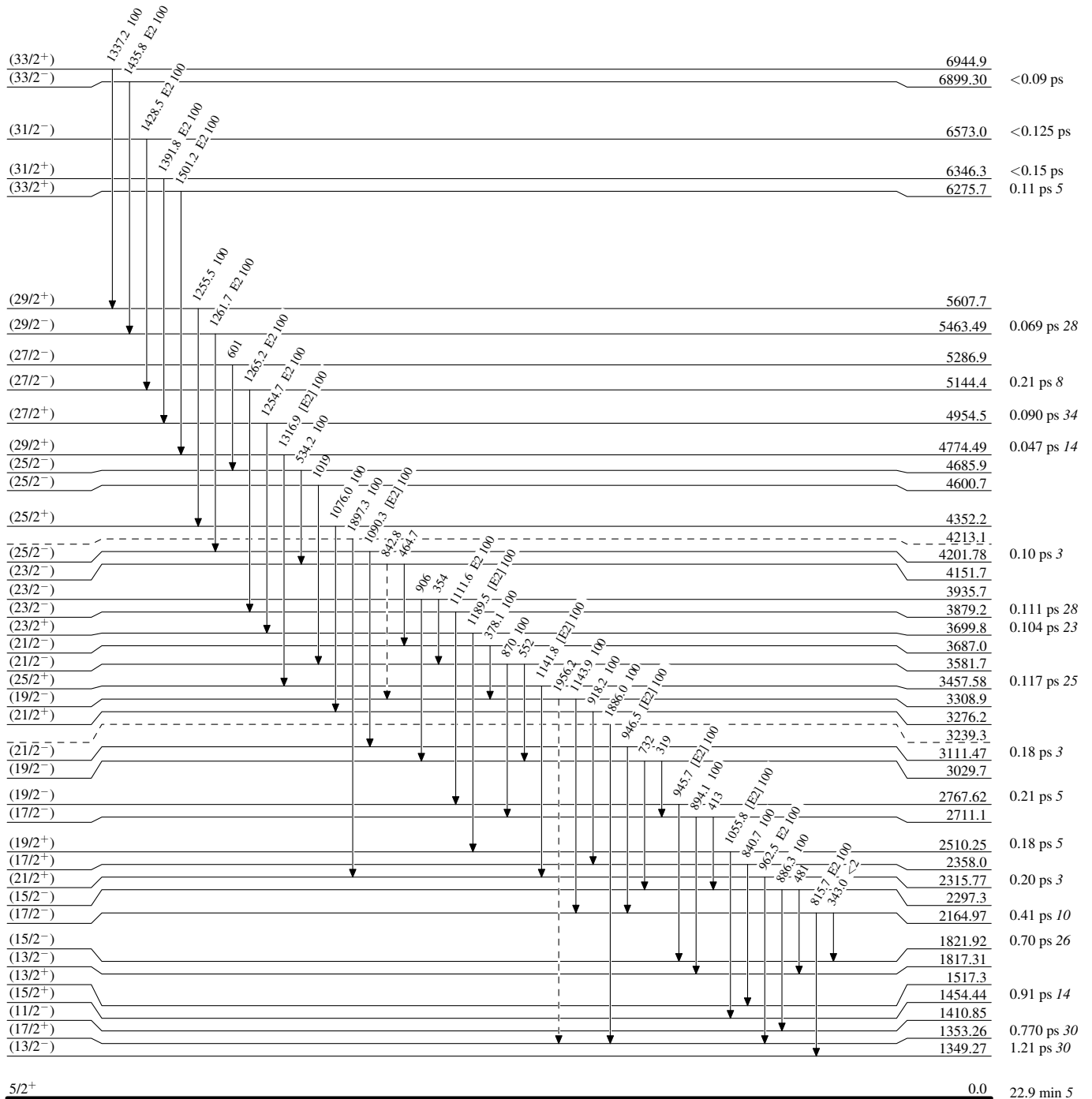
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

-----▶  $\gamma$  Decay (Uncertain)



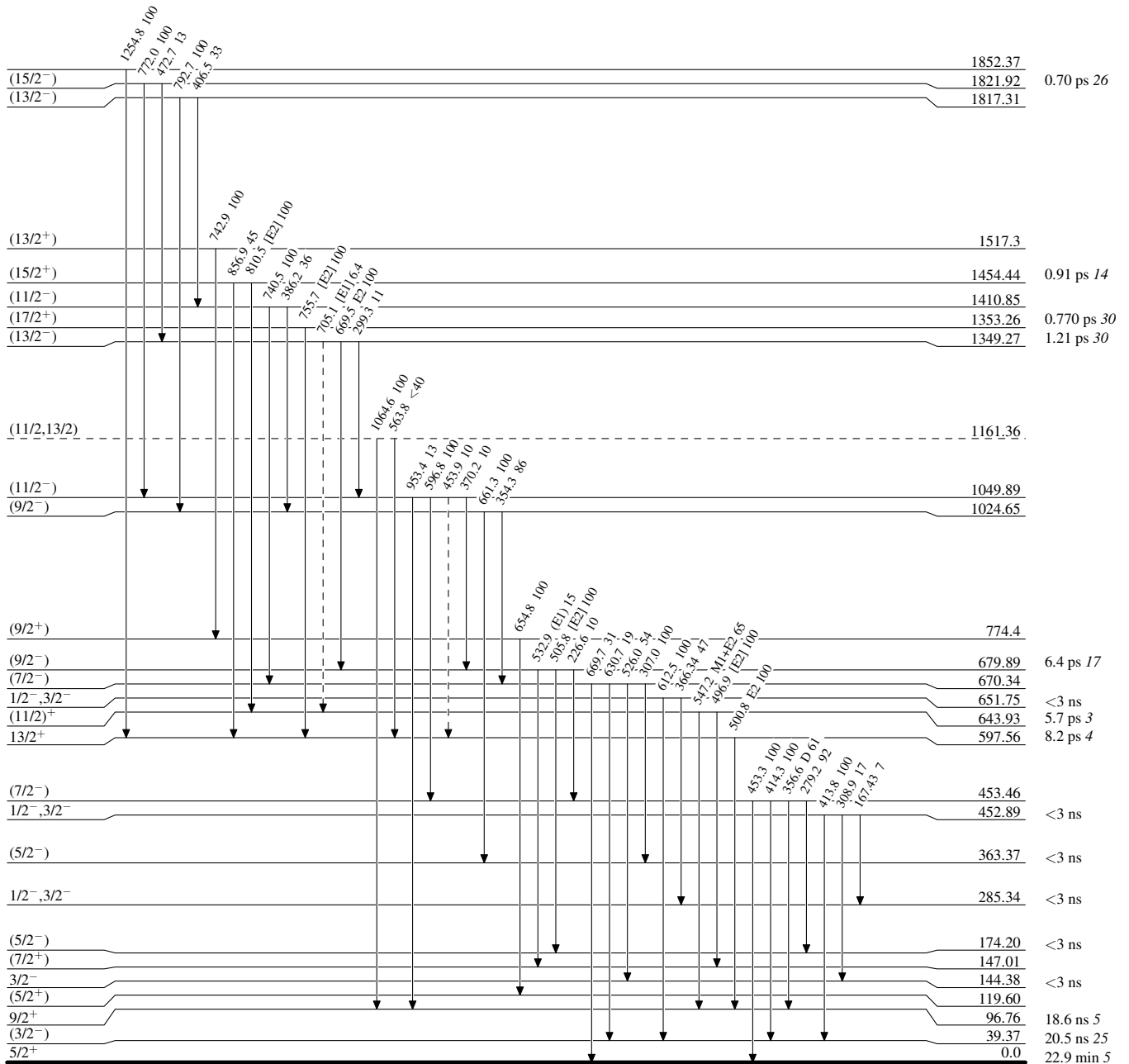
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

-----▶  $\gamma$  Decay (Uncertain)

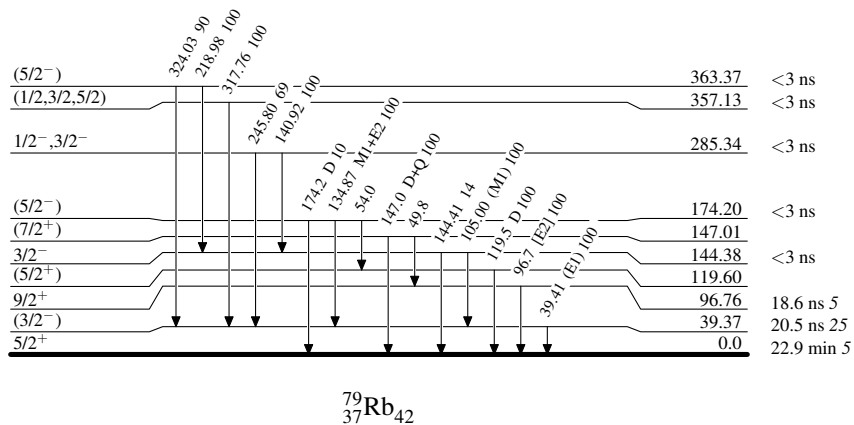


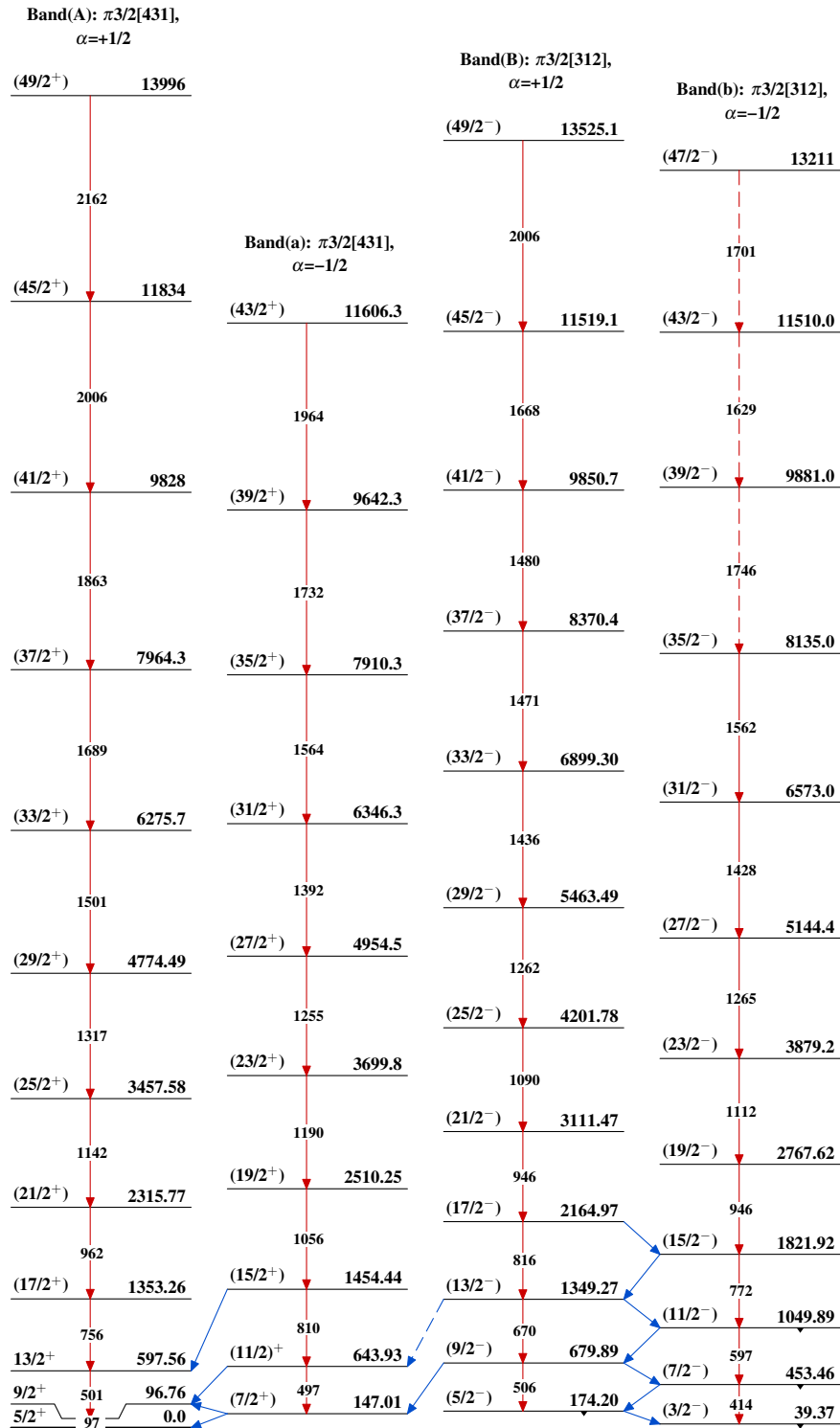
<sup>79</sup>Rb<sub>42</sub>

### Adopted Levels, Gammas

#### Level Scheme (continued)

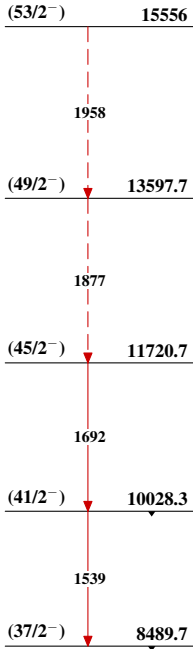
Intensities: Relative photon branching from each level



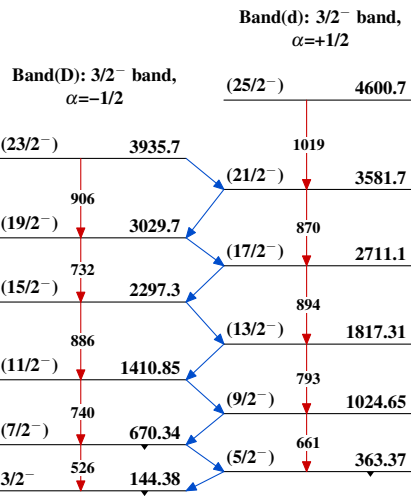
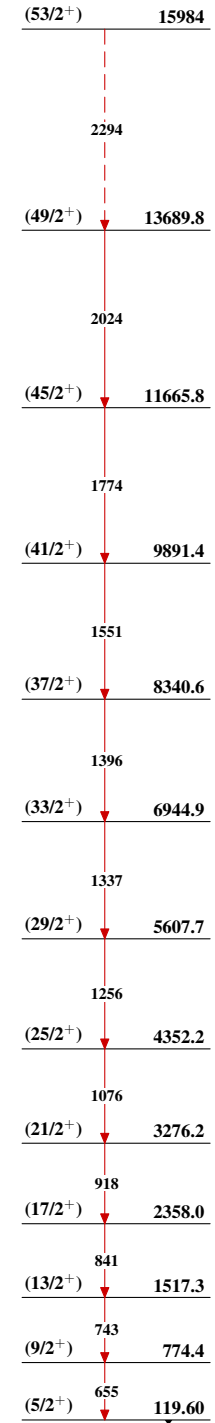
Adopted Levels, Gammas $^{79}\text{Rb}_{42}$

**Adopted Levels, Gammas (continued)**

**Band(C): Forking structure related to  $\pi 3/2[312]$  band,  $\alpha=+1/2$**



**Band(F):  $\pi 1/2[440]$  band**



**Band(E):  $\Delta J=1$ , 3-quasiparticle band**

