Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	T. D. Johnson and W. D. Kulp(a)	NDS 129, 1 (2015)	27-Jul-2015

Q(β^-)=282.2 *11*; S(n)=9922.10 *20*; S(p)=8621.10 *1*; Q(α)=−8009 *4* 2012Wa38
Q(β^-n)=−8145.9 *11* Q(εp)=−16255 *3*.
Some recent nuclear structure theory, calculations: 2010Ro31, 2010Sh23 2006Fl02.

^{87}Rb Levels

Since ^{87}Rb has a closed neutron shell with N=50, the low-lying levels will have configurations based on the odd protons; these states include $p_{3/2}$, $f_{5/2}$, and $g_{9/2}$.

Cross Reference (XREF) Flags

A	Coulomb excitation	E	^{87}Rb(n,n′γ)	I	^{192}Os(^{82}Se,Xγ)
B	^{86}Kr(p,p′) IAR	F	^{87}Rb(p,p′)	J	^{176}Yb(^{23}Na,Xγ)
C	^{86}Kr(^{3}He,d)	G	^{88}Sr(d,^{3}He)	K	^{87}Rb(γ,γ')
D	^{87}Kr β^- decay	H	^{87}Sr ε decay (2.815 h)	L	^{12}C(^{86}Kr,Xγ)

E(level)[†‡]	J$^\pi$	$T_{1/2}$	XREF	Comments
0.0[b]	3/2$^-$	4.97×10^{10} y *3*	A CDE GHIJKL	%β^-=100 Q=+0.132 *1*; μ=+2.75131 *12* J$^\pi$: from atomic beam magnetic resonance (1962Pe14), optical spectroscopy (1976Fu06), confirmed by hyperfine-structure measurement (1981Th04). π from L=1 in (^{3}He,d). $T_{1/2}$: Taken from most recent measurement using 4$\pi\beta$ liquid scintillation counting in a photomultiplier-tube spectrometer (2003Ko66). Full precision is 4.967×10^{10} y *32*. Others: 4.72 *4* (1966Mc12), 4.88 *8* (1974Ne14,1972Ne19), and 4.89 *4* (1977De22), 5.560 *25* [E. Akatsu, Radioisotopes 30 (1981) 647], 5.21 *15* (1965Br25), 4.60 *6* (1965ThZY, as cited in 1990Ho28), 4.77 *10* (1964Ko11), 5.80 *12* (1962Le08), 5.25 *10* (1961Mc07), 5.82 *10* (1961Eg01), 5.53 *10* (1961Be41), 4.72 *8* (1960Ra01), 5.02 *20* [G. V. Ovchinnikova, Geochemica 5 (1959) 393, as cited in 1990Ho28], 4.7 *1* (1959Fl40), 5.07 *20* (1957Li42), 4.6 *5* (1956Fr12), 5.0 *2* (1956Al31), 6.2 *3* (1954Ma31), 4.3 *3* (1954Ge60), 6.2 *2* (1954Fl18), 5.9 *3* (1952Le24), and 6.15 *30* (1951Cu30) where all numbers are in units of 1x10^{10} y. There are several other measurements reported before 1950. Many of these values have been taken from citations in 1961Be41 or 1990Ho28. In the previous evaluation, the evaluator averaged only the three recent measurements of 1966Mc12 and 1977De22, who determined the amount of ^{87}Sr produced in the ^{87}Rb β^- decay, and of 1974Ne14 (absolute counting in proportional counter), where systematic errors which were shown to be inherent in the older measurements (see 1976Ne10) were avoided to a large extent. This weighted average has an internal uncertainty of 0.027, a reduced-χ^2 of 4.9, and an external uncertainty of 0.06. This uncertainty was increased to 0.09 to include the two most precise values. It is clear that the adopted half-life depends greatly on which values are included in the average. For example, note that the four values from 1961 and 1962 range from 5.25 *10* to 5.82 *10*. Others: in the process of analyzing some meteorite data, 1982Mi14 state that, if their ^{87}Rb-^{87}Sr data are to agree with their

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Adopted Levels, Gammas (continued)

^{87}Rb Levels (continued)

E(level)[†‡]	Jπ	$T_{1/2}$	XREF	Comments
				U-Th-Pb data, the ^{87}Rb decay constant would need to be 1.402 *8* x10^{-11} y^{-1}, which corresponds to a half-life of 4.94 *3* x10^{10} years. Determination of the half-life is, for some techniques, dependent on the β spectrum shape factor function, discussion of which may be found in 2007Gr05 and 2007Gr06. μ: from 2011StZZ evaluation and based on data of 1993Du08; others: +2.751818 *2*, and +2.751235 *3* cited in 1989Ra17 evaluation. Q: from 2011StZZ evaluation, where the measured values are given as +0.132 *1* (1973Fe05), +0.127 *1* (1971St12) +0.134 *1*, +0.128 *1* (1999Ke12). Other: +0.13 *2* (1981Th04). δ<r^2>(^{85,87}Rb)=0.03 *6* fm^2 and δ<r^2>(^{87,89}Rb)=0.28 *6* fm^2 (1999GaZU). Plot in 1981Jo01 gives similar values. Octupole mom(mag): −0.58 b υ_n *39* from combining measured hyperfine intervals with atomic structure calculations, 2009Ge02.
402.588[b] *12*	5/2⁻	0.08 ns *+9−5*	A CDEFG IJKL	Jπ: L=3 in (^{3}He,d), M1+E2 γ to 3/2⁻. $T_{1/2}$: from Coulomb excitation.
845.44 *4*	1/2⁻	101 fs *+9−11*	CDEFG KL	Jπ: a comparison of $T_{1/2}$ measured by DSAM in ^{12}C(86Kr,xγ) with g$\Gamma^2_{\gamma 0}$/Γ measured in (n,n′γ) gives J=1/2. $T_{1/2}$: DSAM (2013St05). Other: 95 fs *+14−11* from Γ in (γ,γ′).
1349.36 *10*			DE L	
1389.78 *8*	3/2⁻	0.19 ps *+5−3*	DEF K	Jπ: L=2 in (p,p′) from 3/2⁻, comparison of γ excitation functions in (n,n′γ) with Hauser-Feshbach calculations gives 3/2⁻. $T_{1/2}$: Calculated from (γ,γ′) level width.
1463.00 *15*	1/2⁻	0.21 ps *+12−6*	C EF K	Jπ: γ excitation in (n,n′γ). $T_{1/2}$: Calculated from (γ,γ′) level width.
1577.9[b] *3*	9/2⁺	6 ns *1*	C EFG IJ L	XREF: G(1578). Jπ: L=4 in (^{3}He,d), comparison with model calculation supports an assignment of $g_{9/2}$ (1975Me02). $T_{1/2}$: from (α,α′) using a pulsed beam technique (1995Ka18).
1578.05 *5*	1/2⁻,3/2⁻		D G IJK	XREF: G(1578). Jπ: L=1 in (d,^{3}He).
1740.57 *5*	3/2⁻		DEF K	Jπ: L=2 in (p,p′) from 3/2⁻, comparison of γ excitation functions in (n,n′γ) with Hauser-Feshbach calculations gives 3/2⁻.
1893 *10*	(1/2,3/2)⁻		C	Jπ: L=1 in (^{3}He,d).
1950.0 *3*	(1/2)		E	Jπ: Comparison of γ excitation functions with Hauser-Feshback calculations in (n,n′γ).
2014 *1*	(1/2,3/2,5/2)⁻		F K	Jπ: L=2 in (p,p′) from 3/2⁻ and direct excitation in (γγ′).
2284 *1*	(1/2,3/2,5/2)⁻		F K	Jπ: L=2 in (p,p′) from 3/2⁻ and direct excitation in (γγ′).
2378.36 *17*	(1/2⁻,3/2,5/2)		D K	Jπ: From (γγ′). The 1/2⁺ can be ruled out since the the 1975 γ transtion to the 403 keV 5/2⁻ level would then have mult=M2 with the g$\Gamma^2_{\gamma 0}$/Γ value leading to B(M2)(W.u.)=830 exceeding RUL.
2379 *8*	(⁺)		F	Jπ: L=(5) in (p,p′) from 3/2⁻, this level is probably not identical with the 2379 level observed in β⁻ decay because of γ to 3/2⁻ from the latter level.
2398[@] *1*	1/2⁻,3/2⁻		C F K	Jπ: L=1 in (^{3}He,d).
2414.43 *6*	(3/2⁻)		D G	XREF: G(2420).

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Adopted Levels, Gammas (continued)

^{87}Rb Levels (continued)

E(level)[†‡]	Jπ	T1/2	XREF	Comments
				Jπ: logft=6.8, $\log f^{1u}t$=7.6 from 5/2+ L=(1) in (d,^{3}He).
2415[#] 8	(7/2,9/2)+		F	Jπ: L=3 in (p,p′) from 3/2−.
2530	1/2−,3/2−		G	Jπ: L=1 in (d,^{3}He).
2554.82 7	3/2+,5/2+		CD F K	XREF: C(2548). Jπ: L=2 in (^{3}He,d) leads to 3/2+,5/2+.
2731[@] 4	7/2+,9/2+		C F	Jπ: L=4 in (^{3}He,d).
2811.2 2	3/2+,5/2+		CD F K	Jπ: L=2 in (^{3}He,d).
2960.62 7	(3/2,5/2)+		D F	Jπ: L=3 in (p,p′) from 3/2−, γ to 3/2−.
2974[@] 4	7/2+,9/2+		C F	Jπ: L=4 in (^{3}He,d).
3001.2[b] 4	(11/2)+		F IJ	XREF: F(3002). Jπ: based on systematics of surrounding levels in ^{87}Rb. J and L=5 in (p,p′) from 3/2−.
3005 1	(1/2,3/2,5/2)+		K	Jπ: from (γγ′).
3043 1	(1/2,3/2,5/2)		K	J from (γγ′).
3055.15 24	3/2,5/2,7/2−		D F	XREF: F(3058). Jπ: logft=7.6, $\log f^{1u}t$=8.0 from 5/2+, γ to 3/2−.
3060 1	1/2+	24.4 fs +24−21	C F K	XREF: F(3058). E(level): only from (^{3}He,d) and (g,g′). Jπ: L=0 in (^{3}He,d). $T_{1/2}$: Calculated by evaluator from (γ,γ′) level width.
3098.5 11	(13/2)+		F J	XREF: F(3099). Jπ: L=5 in (p,p′) from 3/2− and γ from (17/2+).
3308.49 12	3/2+,5/2+		CD F K	Jπ: L=2 in (^{3}He,d).
3338.1[@] 7	1/2−,3/2−		C F K	XREF: C(3335). Jπ: L=1 in (^{3}He,d).
3356 8			F	
3409.1[b] 3	(13/2+)		F IJ	XREF: F(3411). Jπ: Based on one γ(θ) data in (82Se,xγ) and band placement.
3411 8			F	
3436 8			F	
3480 8	(7/2,9/2)+		F	Jπ: L=3+(5) in (p,p′) from 3/2−.
3534 8			F	
3586 8	−		F	Jπ: L=4 in (p,p′) from 3/2−.
3618 8	+		F	Jπ: L=5 in (p,p′) from 3/2−.
3644.1[b] 3	(15/2+)		F IJ	XREF: F(3647). Jπ: Based on one γ(θ) data in (82Se,xγ) and band placement.
3685[#] 8	(7/2,9/2)+		C F	Jπ: L=3+(5) in (p,p′) from 3/2−.
3692 7	1/2−,3/2−&(5/2)−		C	Jπ: L=1+(4) in (^{3}He,d) and possible doublet with 3702 in (p,p′) with L=4.
3702 1	(1/2,3/2,5/2)−		F K	XREF: F(3707). Jπ: L=4 in (p,p′) from 3/2− and (γ,γ′) and possible doublet with L=1+(4) in (^{3}He,d).
3744 8			F	
3767[@] 1	1/2−,3/2−		C F K	XREF: C(3764). Jπ: L=1 in (^{3}He,d).
3824 8	−		F	Jπ: L=2 in (p,p′) from 3/2−.
3837 1	1/2+	3.9 fs +4−3	C K	Jπ: L=0 in (^{3}He,d) and (γ,γ′). $T_{1/2}$: Calculated by evaluator from (γ,γ′) level width.
3910 8	+		F	Jπ: L=5 in (p,p′) from 3/2−.
3958 8	−		F	Jπ: L=4 in (p,p′) from 3/2−.
3974[@] 4	3/2+,5/2+		C F	Jπ: L=2 in (^{3}He,d).

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Adopted Levels, Gammas (continued)

^{87}Rb Levels (continued)

E(level)[†‡]	J^π	XREF	Comments
4014[#] *8*		F	
4029 *8*	$-$	F	J^π: L=4 in (p,p′) from $3/2^-$.
4057 *8*		F	
4068 *8*		F	
4090.0 *11*		f J	XREF: f(4094).
4106 *8*	$-$	F	J^π: L=4 in (p,p′) from $3/2^-$.
4146 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
4150.6[b] *3*	$(17/2^+)$	IJ	J^π: Based on one $\gamma(\theta)$ data in (82Se,xγ) and band placement.
4153 *8*	$-$	F	J^π: L=2 in (p,p′) from $3/2^-$.
4209 *8*	$-$	F	J^π: L=4 in (p,p′) from $3/2^-$.
4266 *5*	[a]	C	
4314.1 *15*		J	
4379 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
4492 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
4681 *5*	$1/2^-,3/2^-$	C	J^π: L=1 in (^{3}He,d).
4854.7[b] *4*	$(19/2^+)$	IJ	J^π: Based on one $\gamma(\theta)$ data in (82Se,gθ) and band placement.
4862 *5*	$(1/2^+)\&(3/2^+,5/2^+)$	C	J^π: L=(0+2) in (^{3}He,d).
4941 *5*	$1/2^+$	C	J^π: L=0 in (^{3}He,d).
5026.4[b] *4*	$(21/2^+)$	IJ	J^π: Based on one $\gamma(\theta)$ data in (82Se,gθ) and band placement.
5118 *9*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
5196 *5*	$1/2^+$	C	J^π: L=0 in (^{3}He,d).
5233 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
5316 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
5347 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
5480.8[b] *5*	$(23/2^+)$	IJ	J^π: Based on one $\gamma(\theta)$ data in (82Se,Xγ) and band placement.
5491 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
5542 *5*	$(1/2^+)\&(3/2^+,5/2^+)$	C	J^π: L=(0+2) in (^{3}He,d).
5634 *7*	$1/2^+$	C	J^π: L=0 in (^{3}He,d).
5750 *5*	$1/2^+$	C	J^π: L=0 in (^{3}He,d).
5790.0 *11*		J	
5802 *5*	$(1/2^+)\&(3/2^+,5/2^+)$	C	J^π: L=(0+2) in (^{3}He,d).
5845 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
5884 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
5978 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
6018 *5*	$1/2^+$	C	J^π: L=0 in (^{3}He,d).
6089 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
6176 *5*	$1/2^+$	C	J^π: L=0 in (^{3}He,d).
6206 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
6307 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
6345.9 *11*		J	
6375 *5*	$(1/2^+)\&(3/2^+,5/2^+)$	C	J^π: L=(0+2) in (^{3}He,d).
6468 *5*	$1/2^+$	C	J^π: L=0 in (^{3}He,d).
6512 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
6548 *5*	$1/2^+$	C	J^π: L=0 in (^{3}He,d).
6565.5[b] *6*		IJ	
6618 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
6652 *5*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
6744 *10*	$3/2^+,5/2^+$	C	J^π: L=2 in (^{3}He,d).
6791 *9*	$(1/2^+)\&(3/2^+,5/2^+)$	C	J^π: L=(0+2) in (^{3}He,d).
6821.3[b] *6*		IJ	
6838 *5*	$1/2^+$	C	J^π: L=0 in (^{3}He,d).
6989 *5*	$1/2^+$	C	J^π: L=0 in (^{3}He,d).
7242.1 *9*		J	

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Adopted Levels, Gammas (continued)

^{87}Rb Levels (continued)

E(level)[†‡]	J^π	$T_{1/2}$	XREF	Comments
13969	5/2+[&]	36.0 keV	B	J^π: isobaric analog to the 5/2+ ground state in ^{87}Kr.
14491	1/2+[&]	77.0 keV	B	J^π: L=0 in (p,p′) IAR.
15447	3/2+,5/2+[&]	49.6 keV	B	J^π: L=2 in (p,p′) IAR.
15855	3/2+,5/2+[&]	30.0 keV	B	J^π: L=2 in (p,p′) IAR.
15969	3/2+,5/2+[&]	36.0 keV	B	J^π: L=2 in (p,p′) IAR.
16041	1/2+[&]	60.0 keV	B	J^π: L=0 in (p,p′) IAR.
16084	3/2+,5/2+[&]	62.0 keV	B	J^π: L=2 in (p,p′) IAR.
16241	9/2−,11/2−[&]	45.0 keV	B	J^π: L=5 in (p,p′) IAR.
16513	7/2+[&]	30.0 keV	B	J^π: isobaric analog to the 2519 level in ^{87}Kr (J^π=7/2+).
16763	3/2+,5/2+[&]	65.0 keV	B	J^π: L=2 in (p,p′) IAR.
16884	3/2+,5/2+[&]	65.0 keV	B	J^π: L=2 in (p,p′) IAR.
16995	5/2−,7/2−[&]	35.0 keV	B	J^π: L=3 in (p,p′) IAR.
17194	1/2+[&]	70.0 keV	B	J^π: L=0 in (p,p′) IAR.
17514	3/2+,5/2+[&]	38.0 keV	B	J^π: L=2 in (p,p′) IAR.

[†] From least-squares fit to γ energies.
[‡] Questionable level at 1999 keV from (n,n′γ) has been omitted.
[#] From ^{87}Rb(p,p′).
[@] Weighted average from (^{3}He,d) and ^{87}Rb(p,p′).
[&] The assignment of isobaric analogs in ^{87}Kr is confirmed by the agreement of spectroscopic factors in ^{86}Kr(p,p′) and ^{86}Kr(d,p).
[a] J^π=(1/2−,3/2−) and 3/2+,5/2+ from L=(1)+2 in (^{3}He,d).
[b] Band(A): Yrast sequence.

$\gamma(^{87}Rb)$

E_i(level)	J_i^{π}	E_{γ}[†‡]	I_{γ}[#]	E_f	J_f^{π}	Mult.	δ	α[e]	Comments
402.588	5/2$^-$	402.588 *12*	100	0.0	3/2$^-$	M1+E2	−0.24 *+9−12*	0.00411 *6*	B(M1)(W.u.)=0.0042 *+61−23*; B(E2)(W.u.)=1.63 *15* α(K)=0.00364 *16*; α(L)=0.000398 *19*; α(M)=6.6×10^{-5} *3* α(N)=7.4×10^{-6} *4*; α(O)=3.20×10^{-7} *13* Mult.,δ: from Coulomb excitation.
845.44	1/2$^-$	845.43 *4*	100	0.0	3/2$^-$	M1		7.30×10^{-4}	α(K)=0.000648 *9*; α(L)=6.93×10^{-5} *10*; α(M)=1.143×10^{-5} *16* α(N)=1.300×10^{-6} *19*; α(O)=5.68×10^{-8} *8* B(M1)(W.u.)=0.36 *4*; B(E2)(W.u.)>300 Mult.: Dominant M1 character interpreted as proton spin flip from $2p_{1/2}$ to $2p_{3/2}$. B(E2)(W.u.): Limit from RUL, which leads to δ<1.1.
1349.36		946.69 *13*	100	402.588	5/2$^-$				
1389.78	3/2$^-$	987.2[@] *2*	24[@]	402.588	5/2$^-$				
		1389.77 *8*	100	0.0	3/2$^-$				
1463.00	1/2$^-$	1060.4[@] *2*	15[@]	402.588	5/2$^-$	[E2]		4.68×10^{-4} *7*	B(E2)(W.u.)=11 *+4−3*
		1463.0[@] *2*	100[@]	0.0	3/2$^-$				
1577.9	9/2$^+$	1175.3[@] *3*	100[@d]	402.588	5/2$^-$	M2		8.04×10^{-4}	B(M2)(W.u.)=0.103 *18* α(K)=0.000712 *10*; α(L)=7.71×10^{-5} *11*; α(M)=1.272×10^{-5} *18* α(N)=1.447×10^{-6} *21*; α(O)=6.31×10^{-8} *9*; α(IPF)=6.66×10^{-7} *11* Mult.: Deduced from half-life (1995Ka18).
		1578.0 *5*	14[d] *1*	0.0	3/2$^-$	[E3]		4.08×10^{-4}	B(E3)(W.u.)=2.3 *5* α(K)=0.000319 *5*; α(L)=3.45×10^{-5} *5*; α(M)=5.69×10^{-6} *8* α(N)=6.45×10^{-7} *9*; α(O)=2.78×10^{-8} *4*; α(IPF)=4.89×10^{-5} *7*
1578.05	1/2$^-$,3/2$^-$	1175.40[&] *8*	100 *3*	402.588	5/2$^-$				
		1578.03[&] *14*	11.7 *9*	0.0	3/2$^-$				
1740.57	3/2$^-$	894.2[@] *8*	2[@b]	845.44	1/2$^-$				
		1337.99 *7*	31.1 *17*	402.588	5/2$^-$				
		1740.54 *7*	100 *2*	0.0	3/2$^-$				
1950.0	(1/2)	1547.4[@] *3*	100[@]	402.588	5/2$^-$				
2014	(1/2,3/2,5/2)$^-$	2014	100	0.0	3/2$^-$				
2284	(1/2,3/2,5/2)$^-$	1881	49 *9*	402.588	5/2$^-$				
		2284	100 *9*	0.0	3/2$^-$				
2378.36	(1/2$^-$,3/2,5/2)	1975 *1*	43 *9*	402.588	5/2$^-$				Only observed in ($\gamma\gamma'$) from 2002Ka25.

From ENSDF

$^{87}_{37}Rb_{50}$-6

$\gamma(^{87}Rb)$ (continued)

E_i(level)	J_i^π	E_γ[†‡]	I_γ[#]	E_f	J_f^π	Mult.	α[e]	Comments
2378.36	(1/2⁻,3/2,5/2)	2378.5[&] 3	100 9	0.0	3/2⁻			
2398	1/2⁻,3/2⁻	1553 1	8 2	845.44	1/2⁻			Only observed in ($\gamma\gamma'$) from 2002Ka25.
		1995 1	11 1	402.588	5/2⁻			Only observed in ($\gamma\gamma'$) from 2002Ka25.
		2398 1	100 2	0.0	3/2⁻			Only observed in ($\gamma\gamma'$) from 2002Ka25.
2414.43	(3/2⁻)	673.83[&] 8	65.6 17	1740.57	3/2⁻			
		836.37[&] 6	26.7 7	1578.05	1/2⁻,3/2⁻			
		2011.88[&] 10	100 4	402.588	5/2⁻			
2554.82	3/2⁺,5/2⁺	814.25[&] 6	1.77 6	1740.57	3/2⁻			
		976.5[&] 3	0.61 4	1578.05	1/2⁻,3/2⁻			
		2554.8[&] 2	100 5	0.0	3/2⁻			
2811.2	3/2⁺,5/2⁺	1461.3[&] 6	15.4 16	1349.36				
		2408.5[&] 2	71 6	402.588	5/2⁻			
		2811.4[&] 2	100 5	0.0	3/2⁻			
2960.62	(3/2,5/2)⁺	582.3[&] 2	0.9 3	2378.36	(1/2⁻,3/2,5/2)			
		1382.55[&] 6	7.3 3	1578.05	1/2⁻,3/2⁻			
		1611.18[&] 14	2.7 4	1349.36				
		2558.1[&] 2	100 5	402.588	5/2⁻			
		2961.2[&] 8	1.8 5	0.0	3/2⁻			
3001.2	(11/2)⁺	1423.3[a] 4	100[c] 20	1577.9	9/2⁺			
3005	(1/2,3/2,5/2)⁺	3005 1	100	0.0	3/2⁻			
3043	(1/2,3/2,5/2)	3043	100	0.0	3/2⁻			
3055.15	3/2,5/2,7/2⁻	2652.5[&] 4	28 5	402.588	5/2⁻			
		3055.1[&] 3	100 6	0.0	3/2⁻			
3060	1/2⁺	3060	100	0.0	3/2⁻	[E1]	1.29×10^{-3} 2	B(E2)(W.u.)=0.00049 5
3098.5	(13/2)⁺	1520.0 5	100	1577.9	9/2⁺			
3308.49	3/2⁺,5/2⁺	894.02[&] 13	10.1 7	2414.43	(3/2⁻)			
		3308.5[&] 2	100 6	0.0	3/2⁻			
3338.1	1/2⁻,3/2⁻	1760 1	100 21	1578.05	1/2⁻,3/2⁻			I_γ: From ($\gamma\gamma'$).
		3338 1	52 21	0.0	3/2⁻			I_γ: From ($\gamma\gamma'$).
3409.1	(13/2⁺)	408.0 5	11.1[c] 22	3001.2	(11/2)⁺			
		1831.1 1	100[c] 21	1577.9	9/2⁺			
3644.1	(15/2⁺)	235.0 1	100[c] 20	3409.1	(13/2⁺)	D+Q		
3702	(1/2,3/2,5/2)⁻	2312 1	8 3	1389.78	3/2⁻			E_γ: Only in ($\gamma\gamma'$).
		3702 1	100 3	0.0	3/2⁻			E_γ: Only in ($\gamma\gamma'$).
3767	1/2⁻,3/2⁻	3767 1	100	0.0	3/2⁻			E_γ: Only in ($\gamma\gamma'$).
3837	1/2⁺	3837	100	0.0	3/2⁻	[E1]	1.64×10^{-3} 3	B(E1)(W.u.)=0.00156 +12−6 E_γ: Only in ($\gamma\gamma'$).
4090.0		1088.8 10	100 32	3001.2	(11/2)⁺			E_γ: Only in $^{176}Yb(^{23}Na,x\gamma)$ deep inelastic.

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$\gamma(^{87}Rb)$ (continued)

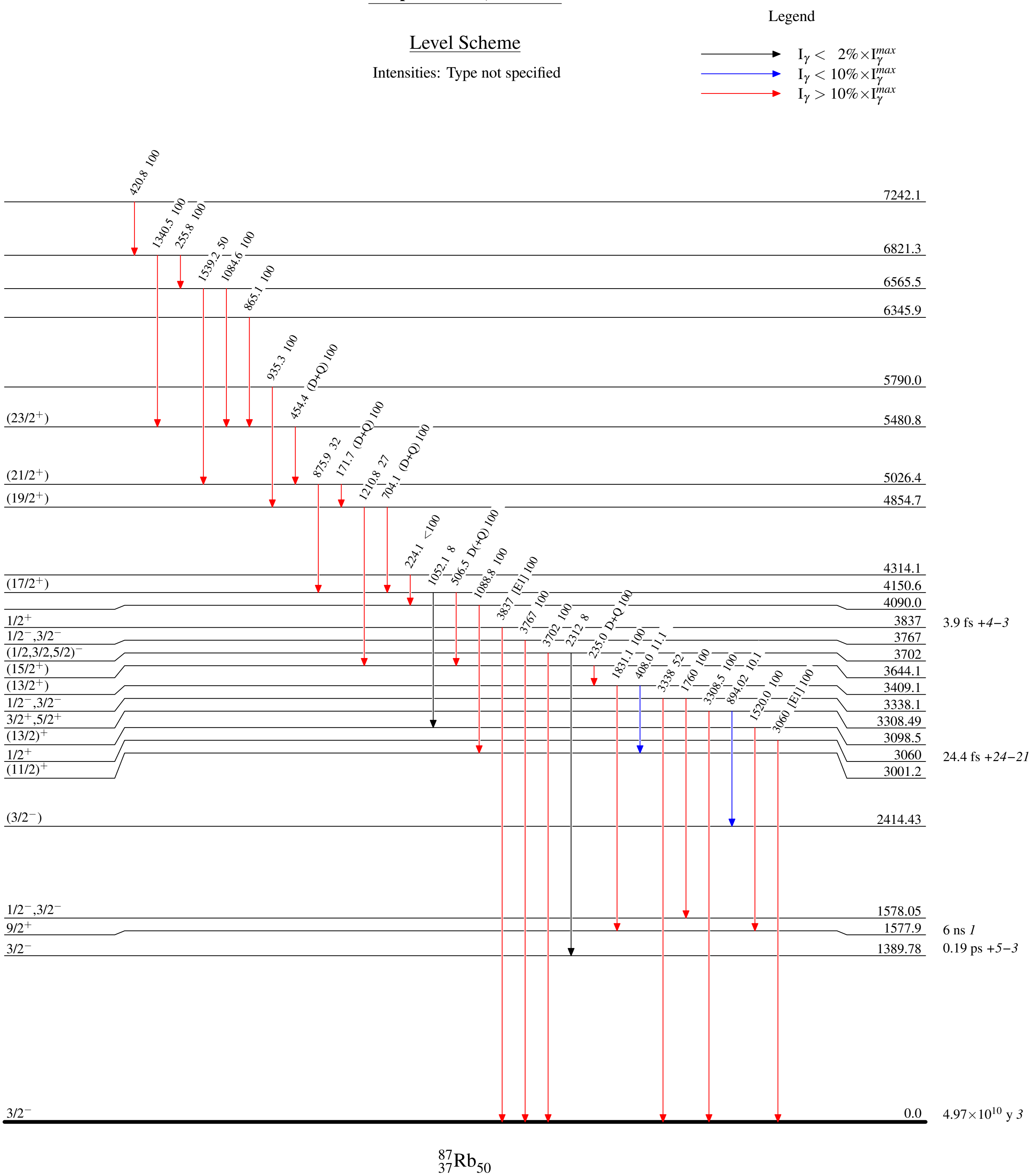
E_i(level)	J^π_i	E_γ[†‡]	I_γ[#]	E_f	J^π_f	Mult.	Comments
4150.6	(17/2$^+$)	506.5[a] *1*	100[d] *10*	3644.1	(15/2$^+$)	D(+Q)	
		1052.1 *10*	8[d] *2*	3098.5	(13/2)$^+$		E only in ^{176}Yb(^{23}Na,Xγ) deep inelastic.
4314.1		224.1 *10*	<100	4090.0			
4854.7	(19/2$^+$)	704.1[a] *2*	100[c] *19*	4150.6	(17/2$^+$)	(D+Q)	
		1210.8[a] *4*	27[c] *4*	3644.1	(15/2$^+$)		
5026.4	(21/2$^+$)	171.7[a] *1*	100[d] *27*	4854.7	(19/2$^+$)	(D+Q)	
		875.9[a] *4*	32[d] *9*	4150.6	(17/2$^+$)		
5480.8	(23/2$^+$)	454.4[a] *3*	100[d] *15*	5026.4	(21/2$^+$)	(D+Q)	
5790.0		935.3 *10*	100 *32*	4854.7	(19/2$^+$)		
6345.9		865.1 *10*	100 *20*	5480.8	(23/2$^+$)		
6565.5		1084.6[a] *4*	100[d] *34*	5480.8	(23/2$^+$)		
		1539.2 *10*	50 *33*	5026.4	(21/2$^+$)		E Seen only in ^{176}Yb(^{23}Na,Xγ).
6821.3		255.8 *5*	100[c] *20*	6565.5			
		1340.5 *5*	100[c] *20*	5480.8	(23/2$^+$)		
7242.1		420.8 *6*	100 *40*	6821.3			

[†] Weighted average from β^- decay and (n,n′γ), unless indicated otherwise.
[‡] γ rays which are reported in only one decay mode, such as (n,n′γ) or β- decay, and are reported as questionable are omitted.
[#] From β^- decay, unless indicated otherwise.
[@] From only (n,n′γ).
[&] From β^- decay.
[a] Weighted average from 2005Fo05 and 2004Zh27.
[b] Note that a transition with E_γ=894.02 *13* and I_γ(894)/I_γ(1740)=0.0221 *15* is seen in β^- decay, but is placed from the 3308 level. Note that energy of the β^- does not fit the 1740 level. Also the 3308 level is not populated in (n,n′γ), so the transition can not be placed from that level.
[c] From ^{192}Os(^{82}Se,xG) deep inelastic.
[d] From ^{176}Yb(^{23}Na,xG) deep inelastic.
[e] Additional information 1.

Adopted Levels, Gammas

Level Scheme

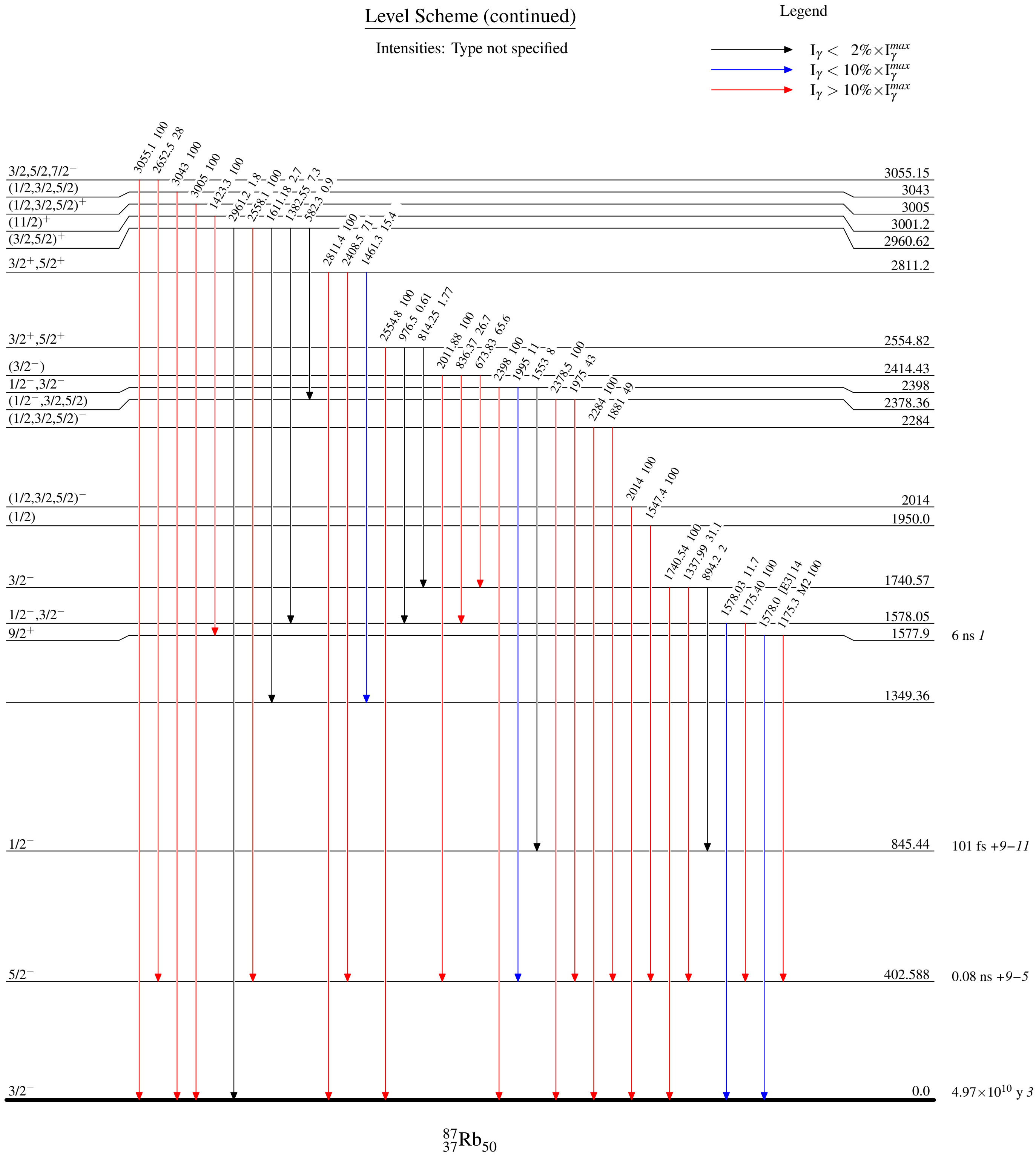
Intensities: Type not specified



Adopted Levels, Gammas

Level Scheme (continued)

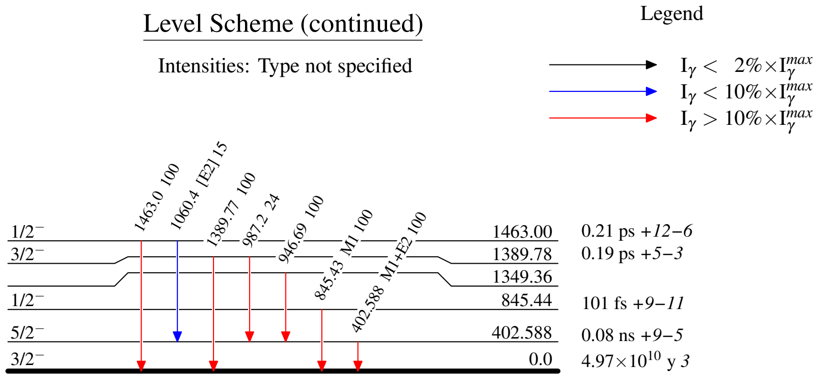
Intensities: Type not specified



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



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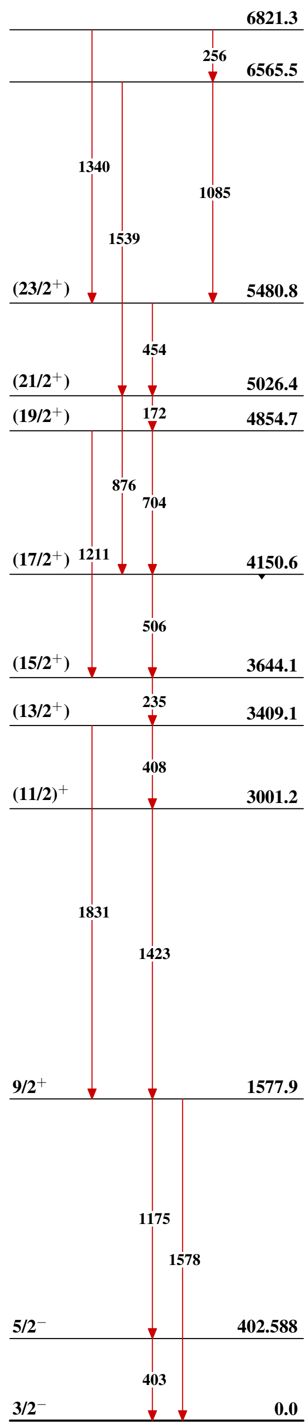
Adopted Levels, Gammas

Band(A): Yrast sequence



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