Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 116, 1 (2014)	31-Dec-2013

Q(β^-)=−1064.1 *28*; S(n)=10479.7 *22*; S(p)=7016.966 *6*; Q(α)=−6616.6 *13* 2012Wa38
S(2n)=19239.3 *23*, S(2p)=17732 *4* (2012Wa38).

Typographical error in previous Eγ=151.159 ground-state transition corrected to 151.195 by B. Singh; May 27, 2015. GTOL rerun to deduce level energies, some of which got adjusted upward by 0.01-0.03 keV. Evaluator thanks Prof. K. Krane (Oregon State University) for pointing out this typographical mistake, May 14, 2015.

Isotopic assignment by Aston: Nature 127, 233 (1931), using mass spectrographic technique.

Hyperfine structure measurements: 2007Pe27, 2006Da03, 2005Kr15, 2004Ba25, 2003Ra19, 2001Ba98, 1996Mi15, 1995Ke04, 1994Se20, 1993Du08, 1992Ho16, 1991Ma21, 1987An02.

Mass measurements: 2010Mo30, 2001Ra42, 1999Br47, 1994Ot01.

Structure calculations: 2001Am08, 2000Sc34, 1996Ma57, 1995Ta21.

^{85}Rb Levels

Cross Reference (XREF) Flags

A	^{85}Kr β^- decay (10.739 y)	F	^{82}Se(^{7}Li,4nγ)	K	Coulomb excitation
B	^{85}Kr β^- decay (4.480 h)	G	^{84}Kr(p,γ)	L	^{86}Sr(d,^{3}He)
C	^{85}Sr ε decay (64.849 d)	H	^{84}Kr(p,p′) IAR	M	^{86}Sr(t,α)
D	^{85}Sr ε decay (67.63 min)	I	^{84}Kr(^{3}He,d)	N	^{88}Sr(pol p,α)
E	^{76}Ge(^{12}C,p2nγ)	J	^{85}Rb(n,n′γ),(n,n′)		

E(level)	J$^\pi$	T$_{1/2}$‡	XREF	Comments
0.0	5/2$^-$	stable	ABCDEFG IJKLMN	μ=+1.35298 *10* (1993Du08,2011StZZ) Q=+0.277 *1* (1973Fe05,1999Ke12,2011StZZ) RMS charge radius (<r^2>)$^{1/2}$=4.2036 fm *24* (2013An02 evaluation). J$^\pi$: spin from optical spectroscopy (1933Ko01) and atomic beam (1936Mi01); parity from L(^{3}He,d)=L(d,^{3}He)=3. Additional information 1. μ: atomic-beam laser spectroscopy (1993Du08). Others: +1.353028 *3* (1968Eh01,atomic beam magnetic resonance); +1.35302 *2* (1968Wh01,optical pumping with radiative detection); +1.357 *1* (1981Th04,atomic beam laser spectroscopy); +1.3533515 *8* (NMR, weighted average in 1976Fu06 evaluation recalculated in 1989Ra17 evaluation); 1969DeZY; 1967Gr08; 1967Ba47; 1954Wa37 and 1952Wa08; 1951Ya03; 1939Ku07. Q: optical-double resonance (1973Fe05), recalculated by 1999Ke12. Others: +0.23 *4* (1981Th04,atomic-beam laser spectroscopy), +0.273 *2* (molecular beam,recalculated by 1971St12), 1972Gu08 and 1971Ch61, 1970Fi17, 1968Zu01, 1968Bu06, 1967Bo40, 1966Bu17, 1965Sc08, 1962Pe14, 1961Bu02, 1956Se59, 1955Me07, 1954Tr35. 2011StZZ compilation quoted an alternative recalculated value of +0.286 *1* from 1999Ke12. It does not appear that 1999Ke12 support this higher value.
151.192 *6*	3/2$^-$	0.71 ns *5*	ABCD FG IJKLMN	J$^\pi$: L(^{3}He,d)=L(d,^{3}He)=1; M1+E2 γ to 5/2$^-$. T$_{1/2}$: weighted average of 0.65 ns *14* from (p,γ), 0.67 ns *7* from Coulomb excitation, 0.79 ns *8* from β^- decay (4,480 h), 0.6 ns *1* in (α,α′) (1988Ko08).
281.005 *10*	1/2$^-$	40 ps *3*	ABCD FG IJKLMN	J$^\pi$: L(^{3}He,d)=L(d,^{3}He)=1; 451$\gamma(\theta)$ from 732 level allows only 1/2. T$_{1/2}$: weighted average of 40 ps *4* from Coulomb excitation, 39 ps *7* from (p,γ), and 39 ps *6* calculated from B(E2)↑ from Coulomb excitation if J=1/2 and Iγ=0.58 *6* from (p,γ).
514.0065 *22*	9/2$^+$	1.015 μs *1*	A C EF IJ LMN	%IT=100

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Adopted Levels, Gammas (continued)

^{85}Rb Levels (continued)

E(level)	J^π	$T_{1/2}$[‡]	XREF	Comments
				μ=+6.043 *5* (1991Ma21,2011StZZ) Q=−0.7 *2* (1991Ma21,2011StZZ) J^π: L(^{3}He,d)=L(d,^{3}He)=4; comparison of μ with Schmidt values. $T_{1/2}$: γ(t), from ε decay (64.84 d). Other measurement: 985 ns *20* from (n,n′γ). μ,Q: optical pumping with radiative detection. Others: μ=+6.046 *10* (1984Sh24), +6.16 *5* (1974He22, time-differential PAD and stroboscopic observation of PAD).
731.829 *11*	3/2⁻	4.4[#] ps *4*	B D G IJKLMN	J^π: L(^{3}He,d)=1; M1+E2 γ to 5/2⁻.
868.94 *4*	7/2⁻	2.5[#] ps *3*	C FG JK N	J^π: Coulomb excitation from 5/2⁻, gammas to 9/2⁺ and 3/2⁻; RUL.
885.84 *14*	1/2⁻	0.78 ps *+17−10*	G IJ LMN	XREF: L(868). J^π: L(t,α)=1; σ in (n,n′γ) excludes 3/2⁻.
919.73 *3*	(3/2,5/2)⁻	0.46 ps *4*	D FG J LMn	J^π,E(level): 5/2⁻,7/2⁻ from L(d,^{3}He)=3; 1/2⁻,3/2⁻ from L(t,α)=1 and log *ft*=8.1 *4* for weak population from 1/2⁻ parent in ^{85}Sr ε decay (67.63 min); Hauser-Feshbach analysis of σ in (n,n′γ) suggests 5/2⁻. 7/2⁻ is ruled out by γ to 1/2⁻, but 1/2⁻ is not completely ruled out. Other possibility is that there are two closely spaced levels near this energy, one with J^π=5/2⁻ and the other with 1/2⁻,3/2⁻. $T_{1/2}$: may be overestimated by about 0.15 ps due to sizeable feeding from levels with comparable half-lives.
950.95 *3*	5/2⁺	2.8 ps *6*	C FG IJ L N	J^π: L(^{3}He,d)=2; γ to 9/2⁺ and RUL. L(d,^{3}He)=1 is inconsistent.
1175.56 *4*	(5/2⁻)[†]	0.66 ps *13*	G IJ LMN	J^π: L(d,^{3}He)=L(t,α)=(3); gammas to 1/2⁻ and 5/2⁻. L(^{3}He,d)=4 is inconsistent with γ transition to 1/2⁻.
1293.34 *8*	(13/2)⁺[†]	8.4[@] ps *10*	EF J	J^π: also from $\gamma\gamma$(DCO) in (n,n′γ).
1295.96 *5*	1/2⁻,3/2⁻	0.17 ps *9*	G IJ LMN	J^π: L(^{3}He,d)=L(t,α)=1; gammas to 1/2⁻ and 5/2⁻. L(d,^{3}He)=3 is inconsistent with L=1 in (^{3}He,d) and (t,α).
1384.24 *8*	5/2⁻,7/2⁻	1.0 ps *5*	FG J LMN	J^π: L(t,α)=3. $T_{1/2}$: questionable due to a possible double origin of 1233γ.
1445.05 *7*	(9/2⁻)		FG J n	J^π: (7/2⁻) from shell model calculations in (n,n′γ), (9/2⁻) from DCO in (^{7}Li,4nγ); gammas to 5/2⁻, 7/2⁻ and 9/2⁺; γ from (13/2⁻).
1449.20 *11*	(5/2⁺,7/2⁺)[†]		J n	
1496.31 *9*	(1/2)⁻	0.35 ps *+28−21*	G J LMN	J^π: L(t,α)=1; $\gamma(\theta)$ in (n,n′γ) excludes 3/2⁻.
1631.42 *7*	(5/2)⁻	0.35 ps *+21−14*	G J LMN	J^π: L(t,α)=3; $\gamma(\theta)$ in (n,n′γ) favors 5/2.
1668.65 *6*	1/2,3/2,5/2⁻	0.18 ps *11*	G N	J^π: γ to 1/2⁻ (RUL).
1747.88 *13*	(11/2⁺,13/2⁺)		F J	J^π: gammas to 9/2⁺ and (13/2⁺); $\gamma(\theta)$ in (n,n′γ).
1786.93 *16*	(5/2⁺)		J	J^π: gammas to 3/2⁻ and 9/2⁺. Hauser-Feshbach analysis of σ in (n,n′γ) strongly suggests 5/2⁺.
1792.31 *9*	1/2⁻	≤0.12 ps	G IJ MN	J^π: L(^{3}He,d)=1; $\gamma(\theta)$ in (n,n′γ) excludes 3/2⁻.
1802.2 *3*	(9/2⁺,11/2⁺,13/2⁺)[†]		J N	
1852.62 *24*	(3/2,5/2⁺)[†]		J N	
1891 *15*			M	
1929.7 *3*	1/2,3/2,5/2⁻	≤0.10 ps	G m	XREF: m(1940).

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Adopted Levels, Gammas (continued)

^{85}Rb Levels (continued)

E(level)	J^{π}	$T_{1/2}$ ‡	XREF	Comments
1950.06 *14*	$(1/2)^-$	0.3 ps *3*	G IJ mN	J^{π}: γ to $1/2^-$ (RUL). XREF: m(1940). J^{π}: L(^{3}He,d)=1; $\gamma(\theta)$ in (n,n′γ) favors $1/2^-$.
1999.9 *7*	$(1/2^-)$†		J M	E(level): if the assignment of 2000γ in (n,n′γ) is not correct E=2006 *10* from (t,α).
2028.14 *12*	$(1/2^-$ to $7/2^-)$	0.9 ps *4*	G	J^{π}: gammas to $3/2^-$ and $(5/2)^-$.
2039.5 *3*	$(1/2,3/2,5/2^-)$		G	J^{π}: γ to $1/2^-$.
2053 *5*	$7/2^+,9/2^+$		I M	E(level): weighted average of 2050 *5* from (^{3}He,d) and 2056 *6* from (t,α). J^{π}: L(^{3}He,d)=4.
2083.34 *8*	$(11/2^-)$		F	J^{π}: ΔJ=1 γ to $9/2^+$; γ to $(13/2)^+$.
2087.6 *6*	$1/2,3/2,5/2^-$	≤0.3 ps	G	J^{π}: γ to $1/2^-$ (RUL).
2120.97 *14*	$(11/2^+)$		F	J^{π}: gammas to $9/2^+$ and $(13/2)^+$.
2202.4 *5*	$1/2^-,3/2^-$	0.3 ps *+3−2*	G LM	J^{π}: L(t,α)=1.
2239.10 *15*	$(5/2^-$ to $11/2^-)$		F	J^{π}: γ to $7/2^-$; γ to $(9/2^-)$.
2304 *12*			M	
2364.44 *8*	$(13/2^+)$		F	J^{π}: ΔJ=2, Q γ to $9/2^+$, ΔJ=1, dipole γ to $(13/2)^+$.
2373.5 *4*	$1/2^-,3/2^-$	0.07 ps *+28−7*	G I	J^{π}: L(^{3}He,d)=1.
2476.75 *12*	$(17/2)^+$	0.76@ ps *+21−14*	EF	J^{π}: ΔJ=2, E2 γ to $(13/2)^+$.
2511.42 *11*	$(13/2^-)$		F	J^{π}: ΔJ=1 γ to $(11/2^-)$; γ to $(13/2)^+$.
2514 *5*	$7/2^+,9/2^+$		I	J^{π}: L(^{3}He,d)=4.
2602 *5*	$1/2^-,3/2^-$		I	J^{π}: L(^{3}He,d)=1.
2622.65 *19*	$(11/2^+)$		F	J^{π}: ΔJ=1, (M1+E2) γ to $(13/2^+)$.
2659.25 *12*	$(11/2^+)$		F	J^{π}: ΔJ=1, (M1+E2) γ to $(13/2)^+$.
2685.69 *10*	$(15/2^+)$		F	J^{π}: ΔJ=1, (M1+E2) γ to $(13/2)^+$.
2730 *5*	$3/2^+,5/2^+$		I	J^{π}: L(^{3}He,d)=2.
2801 *10*	$1/2^+$		I	J^{π}: L(^{3}He,d)=0.
2826.55 *14*	$(19/2)^-$	12.5@ ns *6*	EF	μ=+1.3 *4* (1990Ka26,2011StZZ) μ: time differential PAD method (1990Ka26). Other: ≤1.6 (1989Wi01) from g factor ≤0.17. J^{π}: ΔJ=1, E1 γ to $(17/2)^+$.
2843.65 *11*	$(15/2^-)$		F	J^{π}: ΔJ=2 γ to $(11/2^-)$, ΔJ=1 γ to $(13/2^-)$.
2948 *10*	$1/2^+$		I	J^{π}: L(^{3}He,d)=0.
2981.13 *13*	$(15/2^-)$		F	J^{π}: ΔJ=1 γ to $(13/2^-)$; γ to $(11/2^-)$.
3016.95 *20*	$(17/2^-)$		F	J^{π}: ΔJ=2 γ to $(13/2^-)$, ΔJ=1, D+Q γ to $(15/2^-)$.
3024 *10*	$3/2^+,5/2^+$		I	J^{π}: L(^{3}He,d)=2.
3042.13 *16*	$(15/2^-)$		F	J^{π}: ΔJ=1 γ to $(13/2^-)$.
3054.56 *15*	$(21/2^-)$	>69@ ps	EF	J^{π}: ΔJ=1, M1 γ to $(19/2^-)$. $T_{1/2}$: not corrected for side feeding.
3073.2 *8*	$(17/2$ to $21/2^+)$		F	J^{π}: γ to $(17/2)^+$.
3148 *10*	$3/2^+,5/2^+$		I	J^{π}: L(^{3}He,d)=2.
3198.29 *12*	$(17/2^-)$		F	J^{π}: ΔJ=1 γ to $(15/2^+)$; γ to $(17/2^-)$; D+Q γ to $(15/2^-)$.
3200 *10*	$3/2^+,5/2^+$		I	J^{π}: L(^{3}He,d)=2.
3203.27 *18*	$(17/2^+)$		F	J^{π}: ΔJ=(2) γ to $(13/2^+)$; γ to $(15/2^+)$.
3310 *10*	$(1/2^-,3/2^-)$		I	J^{π}: L(^{3}He,d)=(1).
3398 *10*	$1/2^-,3/2^-$		I	J^{π}: L(^{3}He,d)=1.
3491.15 *15*	$(21/2^+)$	5.5@ ps *14*	EF	J^{π}: ΔJ=2, (E2) γ to $(17/2^+)$; ΔJ=0, (E1) γ to $(21/2^-)$.
3541 *10*	$3/2^+,5/2^+$		I	J^{π}: L(^{3}He,d)=2.
3562.56 *21*	(19/2)		F	J^{π}: ΔJ=1, dipole γ to $(21/2^-)$.
3598 *10*	$3/2^+,5/2^+$		I	J^{π}: L(^{3}He,d)=2.
3656 *10*	$1/2^+$&$3/2^+,5/2^+$		I	E(level),J^{π}: doublet with L(^{3}He,d)=0+2.
3698 *10*	$1/2^+$		I	J^{π}: L(^{3}He,d)=0.
3717.2 *5*	(23/2,25/2)		F	J^{π}: γ to $(21/2^-)$.
3813.19 *15*	$(19/2^-)$		F	J^{π}: ΔJ=1, (M1+E2) γ to $(17/2^-)$.

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Adopted Levels, Gammas (continued)

^{85}Rb Levels (continued)

E(level)	J^π	$T_{1/2}$ ‡	XREF	Comments
3886 *10*	3/2+,5/2+		I	J^π: L(^{3}He,d)=2.
3981 *10*	1/2+		I	J^π: L(^{3}He,d)=0.
4039 *10*	3/2+,5/2+		I	J^π: L(^{3}He,d)=2.
4117 *10*	3/2+,5/2+		I	J^π: L(^{3}He,d)=2.
4135.42 *18*	(23/2+)	0.069@ ps *28*	EF	J^π: ΔJ=1, dipole γ to (21/2+).
4154 *10*	(3/2+,5/2+)		I	J^π: L(^{3}He,d)=(2).
4195 *10*	(5/2−,7/2−)		M	J^π: L(t,α)=(3).
4220 *10*	(1/2+)		I	J^π: L(^{3}He,d)=(0).
4311.08 *18*	(21/2−)		F	J^π: ΔJ=1 γ to (19/2−).
4343 *10*	3/2+,5/2+		I	J^π: L(^{3}He,d)=2.
4356.53 *21*	(21/2−)	0.28 ps *7*	F	J^π: ΔJ=1, dipole γ to (19/2−).
4379.8 *6*	(25/2 to 29/2)		F	J^π: γ to (23/2,25/2).
4484 *10*	3/2+,5/2+		I	J^π: L(^{3}He,d)=2.
4575 *10*	3/2+,5/2+		I	J^π: L(^{3}He,d)=2.
4631 *10*	1/2+		I	J^π: L(^{3}He,d)=0.
4729 *10*	1/2−,3/2−		I	J^π: L(^{3}He,d)=1.
4756 *10*	3/2+,5/2+		I	J^π: L(^{3}He,d)=2.
4757.21 *23*	(25/2+)	0.21@ ps *7*	EF	J^π: ΔJ=1, dipole γ to (23/2)+.
4847.0 *3*			F	J^π: γ to (21/2−) suggests (21/2:25/2−).
4861 *10*	3/2+,5/2+		I	J^π: L(^{3}He,d)=2.
4913 *10*	1/2+		I	J^π: L(^{3}He,d)=0.
4940.4 *5*		≤0.49 ps	F	J^π: γ to (21/2−) give (17/2−:25/2−). $T_{1/2}$: 0.49 ps *14*, not corrected for side feeding.
5013 *10*	3/2+,5/2+		I	J^π: L(^{3}He,d)=2.
5074 *10*	3/2+,5/2+		I	J^π: L(^{3}He,d)=2.
5127 *10*	3/2+,5/2+		I	J^π: L(^{3}He,d)=2.
5186 *10*	1/2+		I	J^π: L(^{3}He,d)=0.
5245 *10*	3/2+,5/2+		I	J^π: L(^{3}He,d)=2.
5312.25 *20*	(25/2+)	0.28@ ps *+28−14*	F	J^π: ΔJ=2, (E2) γ to (21/2+); ΔJ=1, D+Q γ to (23/2)+.
5367 *10*	(3/2+,5/2+)		I	J^π: L(^{3}He,d)=(2).
5419.30 *19*	(27/2+)	>7@ ps	EF	J^π: ΔJ=1, dipole γ to (25/2+); ΔJ=(2) γ to (23/2+).
5444 *10*	3/2+,5/2+		I	J^π: L(^{3}He,d)=2.
5516 *10*	1/2+		I	J^π: L(^{3}He,d)=0.
5563 *10*	(3/2+,5/2+)		I	J^π: L(^{3}He,d)=(2).
5611.80 *22*	(29/2+)	3.5@ ps *+14−7*	F	J^π: ΔJ=1, (M1) γ to (27/2+).
5643 *10*	(3/2+,5/2+)		I	J^π: L(^{3}He,d)=(2).
5668 *10*	3/2+,5/2+		I	J^π: L(^{3}He,d)=2.
5719 *10*	(1/2−,3/2−)		I	J^π: L(^{3}He,d)=(1).
5815 *10*	(3/2+,5/2+)		I	J^π: L(^{3}He,d)=(2).
5996 *10*	(3/2+,5/2+)		I	J^π: L(^{3}He,d)=(2).
6065 *10*	1/2+		I	J^π: L(^{3}He,d)=0.
6185 *10*	3/2+,5/2+		I	J^π: L(^{3}He,d)=2.
6335.9 *3*	(31/2+)	0.14@ ps *7*	F	J^π: ΔJ=1 γ to (29/2+).
7107.1 *5*	(33/2+)	0.042@ ps *+35−21*	F	J^π: ΔJ=1 γ to (31/2+).
11948 *17*	(5/2)+	14.2 keV	H	J^π: L(p,p′)=2; IAR of 1141, 5/2+ level in ^{85}Kr.
12232 *17*	1/2+	23.7 keV	H	J^π: L(p,p′)=0; IAR of 1431, 1/2+ level in ^{85}Kr.

† From Hauser-Feshbach calculations and observed γ branchings in (n,n′γ).
‡ From DSA in (p,γ), (^{7}Li,4nγ) and (^{12}C,p2nγ) unless indicated otherwise.
# Weighted average from (p,γ) and Coulomb excitation.
@ From DSAM in heavy-ion reactions, unless otherwise stated.

Adopted Levels, Gammas (continued)

$\gamma(^{85}\mathrm{Rb})$

E_i(level)	J^π_i	E_γ[†]	I_γ[c]	E_f	J^π_f	Mult.[f]	δ[f]	α[h]	Comments
151.192	3/2⁻	151.195[‡] *6*	100	0.0	5/2⁻	M1+E2	0.072 *4*	0.0481 *7*	B(M1)(W.u.)=0.0085 *6*; B(E2)(W.u.)=2.2 *3* E_γ: previous value of 151.159 corrected to 151.195 by B. Singh; May 15, 2015. GTOL rerun to deduce level energies. Thanks to Prof. K. Krane (Oregon State University) for pointing out this typographical mistake, May 14, 2015. Mult.: from β^- decay (4.480 h). δ: deduced from B(E2)↑ in Coulomb excitation and $T_{1/2}$.
281.005	1/2⁻	129.820[‡] *12*	100.00 *7*	151.192	3/2⁻	(M1)		0.0710	B(M1)(W.u.)=0.234 *18*
		281.01 *2*	0.58 *5*	0.0	5/2⁻	(E2)		0.0227	B(E2)(W.u.)=1.96 *23* E_γ: weighted average from (p,γ), β^- decay (4.480 h), and ε decay (67.63 min). I_γ: weighted average of 0.58 *6* from (p,γ) and 0.59 *9* calculated from $T_{1/2}$=40 ps *3* (weighted average of 40 ps *4* from Coulomb excitation and 39 ps *7* from (p,γ)) and B(E2)↑ from Coulomb excitation if J(281)=1/2. Other: 0.27 *15* from ε decay (67.63 min). B(E2)(W.u.): weighted average of 2.16 *27* from Coulomb excitation if J(281)=1/2 and 2.11 *27* calculated from $T_{1/2}$=40 ps *3* (weighted average of 40 ps *4* from Coulomb excitation and 39 ps *7* from (p,γ)), Eγ, and Iγ=0.58 *6* from (p,γ).
514.0065	9/2⁺	233[i]	≤0.00004	281.005	1/2⁻	[M4]		1.99	
		362.81 *4*	0.00084 *30*	151.192	3/2⁻	(E3)		0.0338	B(E3)(W.u.)=0.028 *10* E_γ: from β^- decay (10.756 y). I_γ: unweighted average of 0.00143 *24* (1990Je03), 0.0005 *1* (1980Me06) and 0.0006 *3* (1962Al11). Weighted average is 0.0063 *22*.
		514.0048 *22*	100	0.0	5/2⁻	M2		0.00712	B(M2)(W.u.)=0.04374 *5* E_γ,Mult.: from ε decay (64.850 d).
731.829	3/2⁻	450.85[#] *2*	68.4[d] *21*	281.005	1/2⁻	M1+E2	−0.6 *3*		B(M1)(W.u.)=0.016 *5*; B(E2)(W.u.)=32 *24* Mult.,δ: from $\gamma(\theta)$ in Coulomb excitation and RUL.
		580.65[#] *5*	5.1[d] *5*	151.192	3/2⁻				E_γ: weighted average from (p,γ), (n,n′γ), and ε decay (67.63 min). I_γ: weighted average from (n,n′γ) and ε decay (67.63 min). If M1, B(M1)(W.u.)=0.00076 *10*. If E2, B(E2)(W.u.)=2.6 *4*.
		731.812[#] *13*	100[d] *3*	0.0	5/2⁻	M1+E2	0.62 *6*		B(M1)(W.u.)=0.0053 *6*; B(E2)(W.u.)=4.4 *8* Mult.,δ: deduced from B(E2)↑ in Coulomb excitation, $T_{1/2}$, and Iγ.
868.94	7/2⁻	354.9[a] *3*	2.1[e] *3*	514.0065	9/2⁺	(E1)			B(E1)(W.u.)=6.4×10⁻⁵ *12*
		717.87[a] *5*	1.0 *2*	151.192	3/2⁻	(E2)			B(E2)(W.u.)=0.52 *13* I_γ: other: 2.6 *3* from ε decay (64.84 d).
		868.6 *1*	100 *3*	0.0	5/2⁻	M1+E2	+1.1 +*3*−*2*		B(M1)(W.u.)=0.0059 *20*; B(E2)(W.u.)=11 *3*

From ENSDF

$^{85}_{37}\mathrm{Rb}_{48}$-5

γ(^{85}Rb) (continued)

E_i(level)	J^{π}_i	E_γ†	I_γ c	E_f	J^{π}_f	Mult. f	δ f	Comments
								E_γ: somewhat poor fit, level-energy difference=868.9. E_γ: weighted average from ε decay (64.84 d), (p,γ), and (n,n$'\gamma$). Mult.,δ: deduced from B(E2)↑ in Coulomb excitation, $T_{1/2}$, and Iγ.
885.84	1/2⁻	734.6@ *2*	100 *3*	151.192	3/2⁻			If M1, B(M1)(W.u.)=0.068 *+10−16*. If E2, B(E2)(W.u.)=148 *+20−34*.
		885.8@ *3*	3.7 *4*	0.0	5/2⁻	(E2)		B(E2)(W.u.)=2.1 *+4−6*
919.73	(3/2,5/2)⁻	638.5@ *5*	0.5 *2*	281.005	1/2⁻			If E2, B(E2)(W.u.)=1.8 *8*.
		768.54 *3*	100 *3*	151.192	3/2⁻			E_γ: weighted average, from (^{7}Li,4nγ), (p,γ), and (n,n$'\gamma$). If M1, B(M1)(W.u.)=0.074 *8*. If E2, B(E2)(W.u.)=146 *14*.
		919.70 *5*	41.7 *12*	0.0	5/2⁻			If M1, B(M1)(W.u.)=0.0180 *18*. If E2, B(E2)(W.u.)=24.6 *24*.
950.95	5/2⁺	436.9@ *3*	3.8 *4*	514.0065	9/2⁺	(E2)		B(E2)(W.u.)=19 *5*
		799.66 *7*	10.6 *4*	151.192	3/2⁻	(E1)		B(E1)(W.u.)=2.3×10^{-5} *5*
		950.96 *3*	100 *3*	0.0	5/2⁻	(E1)		B(E1)(W.u.)=0.00013 *3*
1175.56	(5/2⁻)	443.8@ *3*	3.4 *5*	731.829	3/2⁻			If M1, B(M1)(W.u.)=0.0092 *24*. If E2, B(E2)(W.u.)=54 *14*.
		894.5@ *3*	9.4 *5*	281.005	1/2⁻	[E2]		If E2, B(E2)(W.u.)=4.6 *10*.
		1024.36 *4*	100 *4*	151.192	3/2⁻			If M1, B(M1)(W.u.)=0.0222 *46*. If E2, B(E2)(W.u.)=24.4 *50*.
		1175.53 *18*	27.5 *12*	0.0	5/2⁻			E_γ: from (p,γ). For (n,n$'\gamma$) 1980Ba29 report that contributions due to ^{87}Rb are possible. I_γ: for (n,n$'\gamma$) 1980Ba29 report that contributions due to ^{87}Rb are possible, but Iγ is confirmed by Iγ=23 from (p,γ). If M1, B(M1)(W.u.)=0.0040 *10*. If E2, B(E2)(W.u.)=3.4 *8*.
1293.34	(13/2)⁺	779.36 *10*	100	514.0065	9/2⁺	E2		B(E2)(W.u.)=10.6 *13* E_γ: weighted average of 779.4 keV *1* from ^{82}Se(^{7}Li,4nγ) and 779.2 *2* from (n,n$'\gamma$).
1295.96	1/2⁻,3/2⁻	376.2@ *4*	3	919.73	(3/2,5/2)⁻			If M1, B(M1)(W.u.)=0.042 *23*.
		1014.88 *14*	20.0 *15*	281.005	1/2⁻			If E2, B(E2)(W.u.)=16 *9*.
		1144.76 *7*	100 *4*	151.192	3/2⁻			If M1, B(M1)(W.u.)=0.050 *28*. If E2, B(E2)(W.u.)=44 *24*.
		1295.96 *8*	49.4 *19*	0.0	5/2⁻			If M1, B(M1)(W.u.)=0.018 *10*. If E2, B(E2)(W.u.)=12 *8*.
1384.24	5/2⁻,7/2⁻	464.32 *18*	100 *5*	919.73	(3/2,5/2)⁻	(M1+E2)	<1.7	B(M1)(W.u.)>0.015; B(E2)(W.u.)<690 δ: from RUL. E_γ: weighted average from ^{82}Se(^{7}Li,4nγ), (p,γ), and (n,n$'\gamma$).
		1233.00 *9*	87 *5*	151.192	3/2⁻			If M1, B(M1)(W.u.)=0.0054 *28*. If E2, B(E2)(W.u.)=4.0 *22*.
		1385.1@ *3*	4.9 *5*	0.0	5/2⁻			If M1, B(M1)(W.u.)=0.00022 *12*. If E2, B(E2)(W.u.)=0.12 *8*.
1445.05	(9/2⁻)	576.15 *14*	47.0 *25*	868.94	7/2⁻			
		931.1@ *2*	12.2 *6*	514.0065	9/2⁺			
		1445.0 *1*	100 *4*	0.0	5/2⁻			
1449.20	(5/2⁺,7/2⁺)	498.1@ *3*	23 *3*	950.95	5/2⁺			
		580.6@ *2*	3.3 *6*	868.94	7/2⁻			
		934.9@ *2*	100 *3*	514.0065	9/2⁺			
		1449.2@ *2*	18.2 *15*	0.0	5/2⁻			

$\gamma(^{85}Rb)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[c]	E_f	J^π_f	Mult.[f]	δ[f]	Comments
1496.31	(1/2)⁻	576.30[&] *20*		919.73	(3/2,5/2)⁻			
		610.4 *2*	22 *4*	885.84	1/2⁻	[M1]		B(M1)(W.u.)=0.04 *+3−4*
		1215.1[@] *3*	13.1 *20*	281.005	1/2⁻	[M1]		B(M1)(W.u.)=0.0030 *+19−25*
		1345.25 *12*	100 *5*	151.192	3/2⁻			If M1, B(M1)(W.u.)=0.018 *13*. If E2, B(E2)(W.u.)=10 *9*.
		1496.4 *3*	16.8 *16*	0.0	5/2⁻	(E2)		B(E2)(W.u.)=1.1 *+7−9*
1631.42	(5/2)⁻	680.0[@] *8*	5.3 *14*	950.95	5/2⁺	(E1)		B(E1)(W.u.)=0.00011 *+6−8*
		762.49 *5*	100 *5*	868.94	7/2⁻			If M1, B(M1)(W.u.)=0.09 *+4−6*. If E2, B(E2)(W.u.)=180 *+80−120*.
		1480.5[@] *4*	8.1 *11*	151.192	3/2⁻			If M1, B(M1)(W.u.)=0.0010 *+4−6*. If E2, B(E2)(W.u.)=0.54 *+24−34*.
		1631.2 *2*	38.1 *18*	0.0	5/2⁻			If M1, B(M1)(W.u.)=0.0036 *+16−22*. If E2, B(E2)(W.u.)=1.6 *+8−10*.
1668.65	1/2,3/2,5/2⁻	1387.63[&] *6*	100	281.005	1/2⁻			If M1, B(M1)(W.u.)=0.05 *+7−2*. If E2, B(E2)(W.u.)=28 *+44−11*. If E1, B(E1)(W.u.)=7×10⁻⁴ *+12−3*.
1747.88	(11/2⁺,13/2⁺)	454.6 *2*	100 *10*	1293.34	(13/2)⁺			
		1233.6 *4*	29 *6*	514.0065	9/2⁺			
1786.93	(5/2⁺)	1054.7[@] *4*	11.3 *12*	731.829	3/2⁻			
		1272.7[@] *3*	24.6 *19*	514.0065	9/2⁺			
		1787.1[@] *2*	100 *6*	0.0	5/2⁻			
1792.31	1/2⁻	1060.4[@] *2*	13.0 *13*	731.829	3/2⁻			If M1, B(M1)(W.u.)>0.018. If E2, B(E2)(W.u.)>18.
		1641.12 *10*	100 *8*	151.192	3/2⁻			If M1, B(M1)(W.u.)>0.036. If E2, B(E2)(W.u.)>16.
1802.2	(9/2⁺,11/2⁺,13/2⁺)	508.7[@] *6*	6	1293.34	(13/2)⁺			
		1288.2[@] *3*	100	514.0065	9/2⁺			
1852.62	(3/2,5/2⁺)	1120.5[@] *3*	72 *6*	731.829	3/2⁻			
		1853.1[@] *4*	100 *8*	0.0	5/2⁻			
1929.7	1/2,3/2,5/2⁻	1778.53 *25*	100	151.192	3/2⁻			If M1, B(M1)(W.u.)>0.04. If E2, B(E2)(W.u.)>14.
1950.06	(1/2)⁻	1798.84 *14*	100 *60*	151.192	3/2⁻			If M1, B(M1)(W.u.)=0.008 *+10−8*. If E2, B(E2)(W.u.)=2.6 *+34−26*.
		1950.1 *4*	70 *70*	0.0	5/2⁻	(E2)		B(E2)(W.u.)=1.2 *+19−12*
1999.9	(1/2⁻)	1999.9[@i] *7*	100	0.0	5/2⁻			E_γ: this γ observed in (n,n′γ) may result from ^{87}Rb impurities.
2028.14	(1/2⁻ to 7/2⁻)	1108.44[&] *19*	61[&]	919.73	(3/2,5/2)⁻			If M1, B(M1)(W.u.)=0.0068 *32*. If E2, B(E2)(W.u.)=6.4 *30*.
		1876.90[&] *14*	100[&]	151.192	3/2⁻			B(M1)(W.u.)=0.0011 *6*; B(E2)(W.u.)=0.38 *17* If M1, B(M1)(W.u.)=0.0022 *12*. If E2, B(E2)(W.u.)=0.76 *34*.
2039.5	(1/2,3/2,5/2⁻)	1758.5[&] *3*	100	281.005	1/2⁻			
2083.34	(11/2⁻)	638.4 *4*	5.4 *11*	1445.05	(9/2⁻)			
		789.9 *2*	20 *4*	1293.34	(13/2)⁺			
		1214.5 *4*	16 *3*	868.94	7/2⁻			
		1569.3 *1*	100 *11*	514.0065	9/2⁺	D(+Q)	−0.09 *9*	

$^{85}_{37}Rb_{48}$-7

Adopted Levels, Gammas (continued)

$\gamma(^{85}Rb)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[c]	E_f	J_f^π	Mult.[f]	δ[f]	α[h]	Comments
2087.6	1/2,3/2,5/2⁻	1806.6[&] *6*	100	281.005	1/2⁻				If M1, B(M1)(W.u.)>0.012. If E2, B(E2)(W.u.)=4.4.
2120.97	(11/2⁺)	827.5 *4*	100 *13*	1293.34	(13/2)⁺				
		1606.9 *2*	88 *13*	514.0065	9/2⁺				
2202.4	1/2⁻,3/2⁻	2051.2[&] *5*	100	151.192	3/2⁻				If M1, B(M1)(W.u.)=0.008 *+6−8*. If E2, B(E2)(W.u.)=2.4 *+16−24*.
2239.10	(5/2⁻ to 11/2⁻)	794.0 *2*	100 *19*	1445.05	(9/2⁻)				
		1370.2 *2*	72 *14*	868.94	7/2⁻				
2364.44	(13/2⁺)	243.4 *2*	14 *3*	2120.97	(11/2⁺)	D			
		616.6 *2*	14 *3*	1747.88	(11/2⁺,13/2⁺)				
		1071.1 *2*	14 *3*	1293.34	(13/2)⁺	D			
		1850.4 *1*	100 *11*	514.0065	9/2⁺	Q			
2373.5	1/2⁻,3/2⁻	2222.3[&] *4*	100	151.192	3/2⁻				If M1, B(M1)(W.u.)=0.028 *+30−28*. If E2, B(E2)(W.u.)=3 *+4−3*.
2476.75	(17/2)⁺	1183.4 *1*	100	1293.34	(13/2)⁺	E2			B(E2)(W.u.)=14 *+3−4*
2511.42	(13/2⁻)	428.0 *2*	100 *8*	2083.34	(11/2⁻)	D(+Q)	−0.10 *10*		
		1066.4 *2*	42 *9*	1445.05	(9/2⁻)				
		1218.1 *2*	77 *8*	1293.34	(13/2)⁺				
2622.65	(11/2⁺)	258.2 *4*	54 *10*	2364.44	(13/2⁺)	(M1+E2)	−1.5 *15*		
		1329.3 *2*	100 *21*	1293.34	(13/2)⁺				
2659.25	(11/2⁺)	294.8 *4*	15 *3*	2364.44	(13/2⁺)	(M1+E2)	≥+0.3	0.014 *5*	
		911.2 *4*	13 *3*	1747.88	(11/2⁺,13/2⁺)				
		1365.9 *1*	100 *10*	1293.34	(13/2)⁺	(M1+E2)	+1.4 *10*		
2685.69	(15/2⁺)	321.3 *2*	42 *6*	2364.44	(13/2⁺)	(M1+E2)	−0.34 *16*		
		937.8 *2*	21 *4*	1747.88	(11/2⁺,13/2⁺)				
		1392.3 *1*	100 *11*	1293.34	(13/2)⁺	(M1+E2)	−0.4 *2*		
2826.55	(19/2)⁻	349.8 *1*	100	2476.75	(17/2)⁺	E1		0.00262	B(E1)(W.u.)=6.5×10⁻⁷ *4*
2843.65	(15/2⁻)	332.2 *4*	18 *4*	2511.42	(13/2⁻)	D(+Q)	0.00 *12*		
		479.2 *1*	100 *12*	2364.44	(13/2⁺)	D(+Q)	−0.07 *7*		
		760.2 *4*	19 *4*	2083.34	(11/2⁻)	Q			
2981.13	(15/2⁻)	137.3 *4*	26 *5*	2843.65	(15/2⁻)				
		469.7 *2*	100 *21*	2511.42	(13/2⁻)	D(+Q)	−0.06 *8*		
		616.7 *2*	89 *18*	2364.44	(13/2⁺)	D+Q	−0.4 *3*		
		897.9 *4*	25 *4*	2083.34	(11/2⁻)				
		1688.0 *4*	48 *10*	1293.34	(13/2)⁺				
3016.95	(17/2⁻)	173.3 *4*	12.5 *25*	2843.65	(15/2⁻)	D+Q	−0.32 *21*		
		505.6 *4*	35 *7*	2511.42	(13/2⁻)	Q			
		540.3 *3*	100 *8*	2476.75	(17/2)⁺				
3042.13	(15/2⁻)	198.6 *4*	31 *6*	2843.65	(15/2⁻)				
		530.7 *2*	100 *10*	2511.42	(13/2⁻)	D(+Q)	−0.07 *14*		
		1748.9 *4*	30 *6*	1293.34	(13/2)⁺				
3054.56	(21/2⁻)	228.0 *1*	100	2826.55	(19/2)⁻	M1		0.0162	B(M1)(W.u.)<0.027
3073.2	(17/2 to 21/2⁺)	596.5 *8*	100	2476.75	(17/2)⁺				

Adopted Levels, Gammas (continued)

γ(^{85}Rb) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[c]	E_f	J^π_f	Mult.[f]	δ[f]	α[h]	Comments
3198.29	(17/2$^-$)	156.2 *2*	48 *9*	3042.13	(15/2$^-$)	(M1+E2)	−0.19 *16*	0.048 *11*	
		181.6 *4*	11.5 *23*	3016.95	(17/2$^-$)				
		217.2 *2*	72 *15*	2981.13	(15/2$^-$)	(M1+E2)	−0.32 *20*	0.022 *5*	
		354.6 *2*	77 *8*	2843.65	(15/2$^-$)	(M1+E2)	−0.38 *26*		
		512.5 *2*	100 *8*	2685.69	(15/2$^+$)	D			
3203.27	(17/2$^+$)	517.6 *4*	35 *7*	2685.69	(15/2$^+$)				
		838.4 *4*	47 *9*	2364.44	(13/2$^+$)	(Q)			
		1910.0 *2*	100 *10*	1293.34	(13/2)$^+$				
3491.15	(21/2$^+$)	436.6 *2*	12.9 *14*	3054.56	(21/2$^-$)	(E1)			B(E1)(W.u.)=9.E−5 *3* Mult.: ΔJ=0 transition.
		1014.4 *1*	100 *14*	2476.75	(17/2)$^+$	(E2)			B(E2)(W.u.)=3.8 *12*
3562.56	(19/2)	507.9 *2*	100	3054.56	(21/2$^-$)	D(+Q)	+0.02 *6*		
3717.2	(23/2,25/2)	662.6 *4*	100	3054.56	(21/2$^-$)	(D)			
3813.19	(19/2$^-$)	614.9 *1*	100 *9*	3198.29	(17/2$^-$)	(M1+E2)	−0.5 *3*		
		758.9 *4*	5.2 *9*	3054.56	(21/2$^-$)				
4135.42	(23/2$^+$)	644.3 *1*	100	3491.15	(21/2$^+$)	(M1)			B(M1)(W.u.)=1.2 *5*
4311.08	(21/2$^-$)	497.8 *2*	100 *8*	3813.19	(19/2$^-$)	D(+Q)	−0.2 *6*		
		748.6 *4*	16 *3*	3562.56	(19/2)				
		1112.8 *2*	48 *10*	3198.29	(17/2$^-$)				
		1256.7 *4*	33 *7*	3054.56	(21/2$^-$)				
4356.53	(21/2$^-$)	543.5 *2*	100 *20*	3813.19	(19/2$^-$)	(M1(+E2))	≤−0.1		B(M1)(W.u.)>0.24; B(E2)(W.u.)<20
		793.5 *4*	16 *3*	3562.56	(19/2)				If M1, B(M1)(W.u.)=0.020 *8*. If E2, B(E2)(W.u.)=36 *14*.
		1301.8 *4*	16 *3*	3054.56	(21/2$^-$)				If M1, B(M1)(W.u.)=0.0044 *16*. If E2, B(E2)(W.u.)=3.0 *12*.
4379.8	(25/2 to 29/2)	662.6 *4*	100	3717.2	(23/2,25/2)				
4757.21	(25/2$^+$)	621.9 *2*	100	4135.42	(23/2$^+$)	(M1)			B(M1)(W.u.)=0.44 *15*
4847.0		535.9 *2*	100	4311.08	(21/2$^-$)				
4940.4		583.9 *4*	100	4356.53	(21/2$^-$)				If M1, B(M1)(W.u.)>0.44. From RUL=300 for E2, δ(E2/M1)<0.8.
5312.25	(25/2$^+$)	1176.8 *2*	100 *15*	4135.42	(23/2$^+$)	(M1+E2)			If M1, B(M1)(W.u.)=0.034 *+20−34*. If E2, B(E2)(W.u.)=28 *+16−28*.
		1820.7 *3*	41 *8*	3491.15	(21/2$^+$)	(E2)			B(E2)(W.u.)=1.3 *+8−13*
5419.30	(27/2$^+$)	107.0 *1*	100 *11*	5312.25	(25/2$^+$)	(M1)		0.120	B(M1)(W.u.)<0.85
		662.2 *2*	96 *11*	4757.21	(25/2$^+$)	(M1)			B(M1)(W.u.)<0.0034
		1283.9 *1*	96 *11*	4135.42	(23/2$^+$)	(E2)			B(E2)(W.u.)<0.33
5611.80	(29/2$^+$)	192.5[b] *1*	100[b]	5419.30	(27/2$^+$)	(M1)[g]		0.0252	B(M1)(W.u.)=0.86 *+18−35*
6335.9	(31/2$^+$)	724.1[b] *2*	100[b]	5611.80	(29/2$^+$)	(M1)[g]			B(M1)(W.u.)=0.41 *21* Mult.: E1 is not excluded.
7107.1	(33/2$^+$)	771.2[b] *3*	100[b]	6335.9	(31/2$^+$)	(M1)[g]			B(M1)(W.u.)=1.1 *+6−10*

From ENSDF

γ(^{85}Rb) (continued)

† Weighted average from (p,γ) and (n,n′γ) or values from ^{82}Se(^{7}Li,4nγ) if not indicated otherwise. The values from (n,n′γ) except those for 130γ and 151γ are systematically 0.03% smaller than the values from other reactions and decays; therefore, they are corrected here by a linear regression using the values from the other datasets.

‡ Weighted average from (p,γ), ^{85}Kr β^- decay (10.739 y and 4.480 h), (n,n′γ), and ^{85}Sr ε decay (64.849 d and 67.63 min).

Weighted average from (p,γ), ^{85}Kr β^- decay (4.480 h), (n,n′γ), and ^{85}Sr ε decay (67.63 min).

@ From (n,n′γ).

& From (p,γ).

a From ^{85}Sr ε decay (64.849 d).

b From ^{85}Sr ε decay (67.63 min).

c Branching ratios from each level are from (n,n′γ) or ^{82}Se(^{7}Li,4nγ), unless indicated otherwise.

d Weighted average from ^{85}Kr β^- decay (4.480 h), (n,n′γ), and ^{85}Sr ε decay (67.63 min).

e Weighted average from (n,n′γ), and ^{85}Sr ε decay (64.849 d).

f From ^{82}Se(^{7}Li,4nγ) unless indicated otherwise.

g From RUL.

h 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.

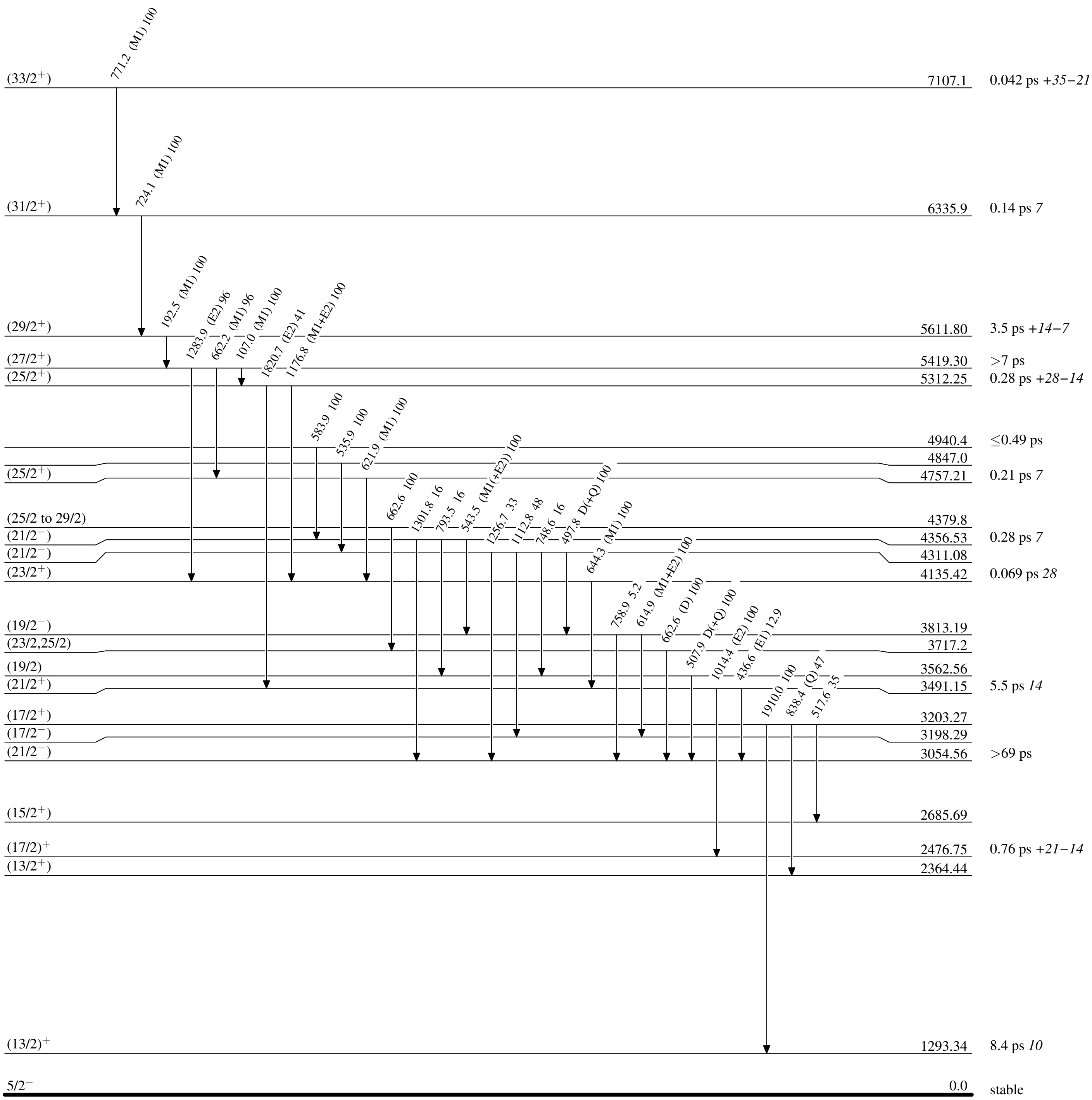
i Placement of transition in the level scheme is uncertain.

$^{85}_{37}$Rb$_{48}$-10

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

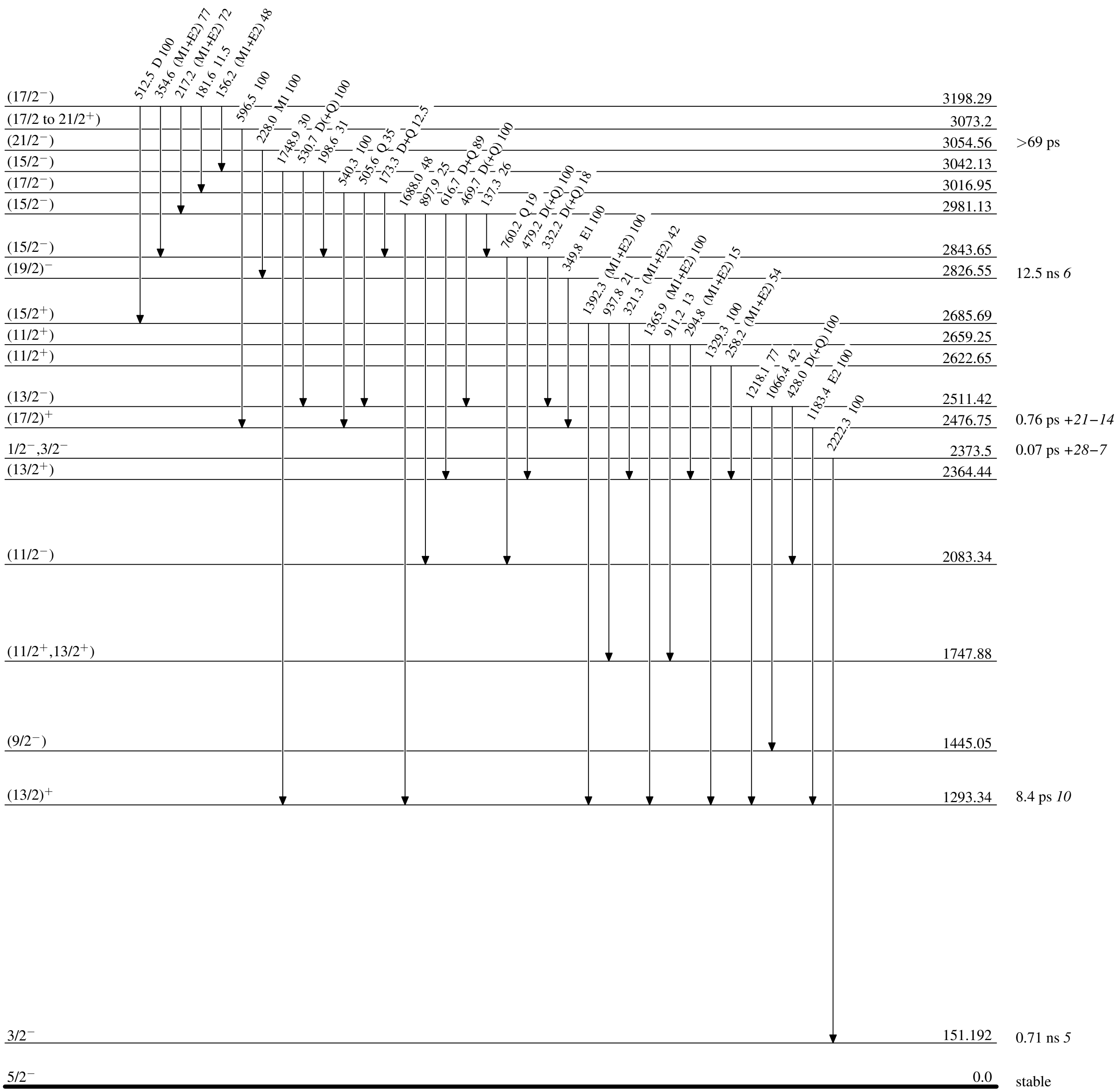


$^{85}_{37}Rb_{48}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

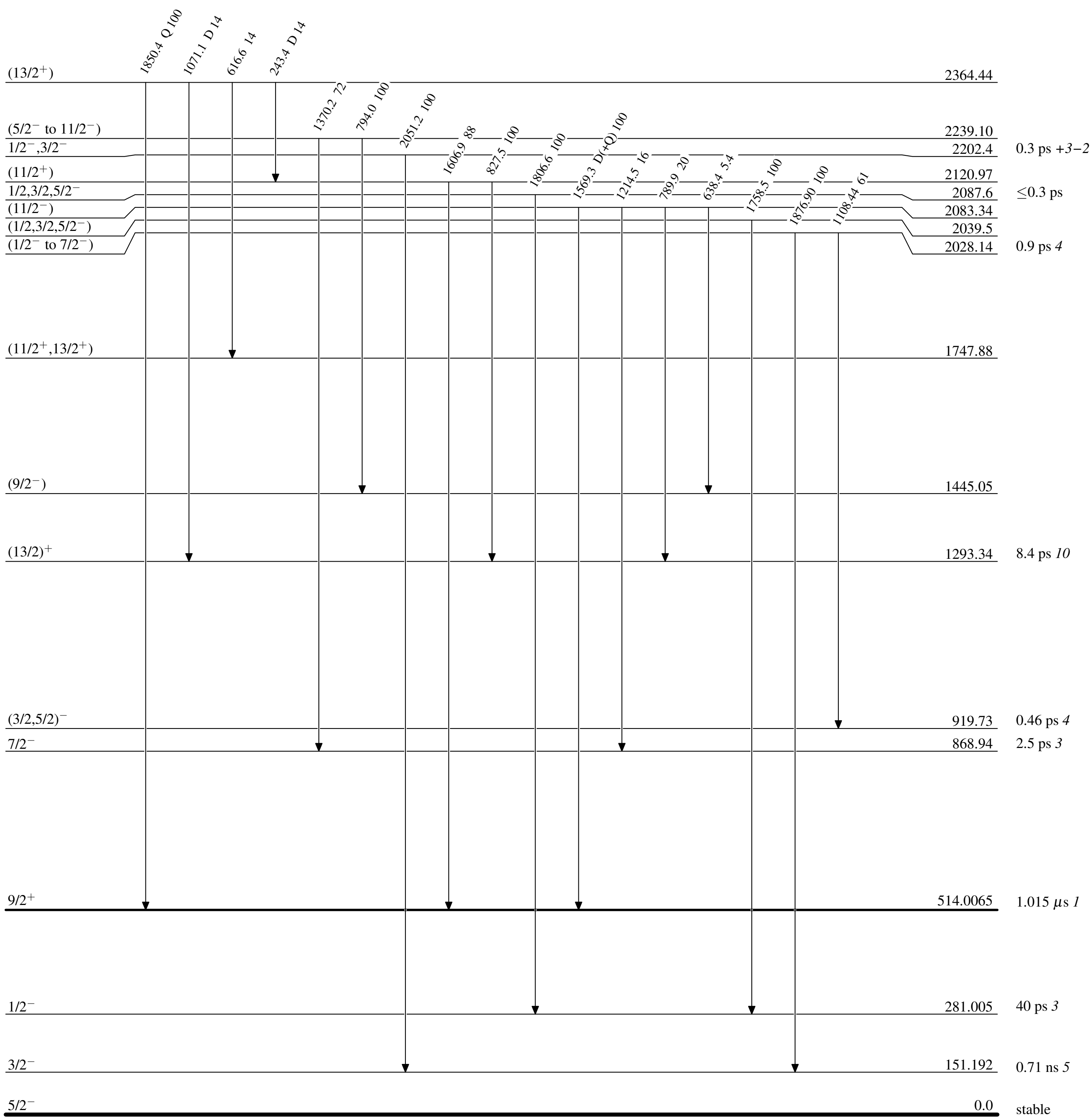


$^{85}_{37}Rb_{48}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{85}_{37}Rb_{48}$

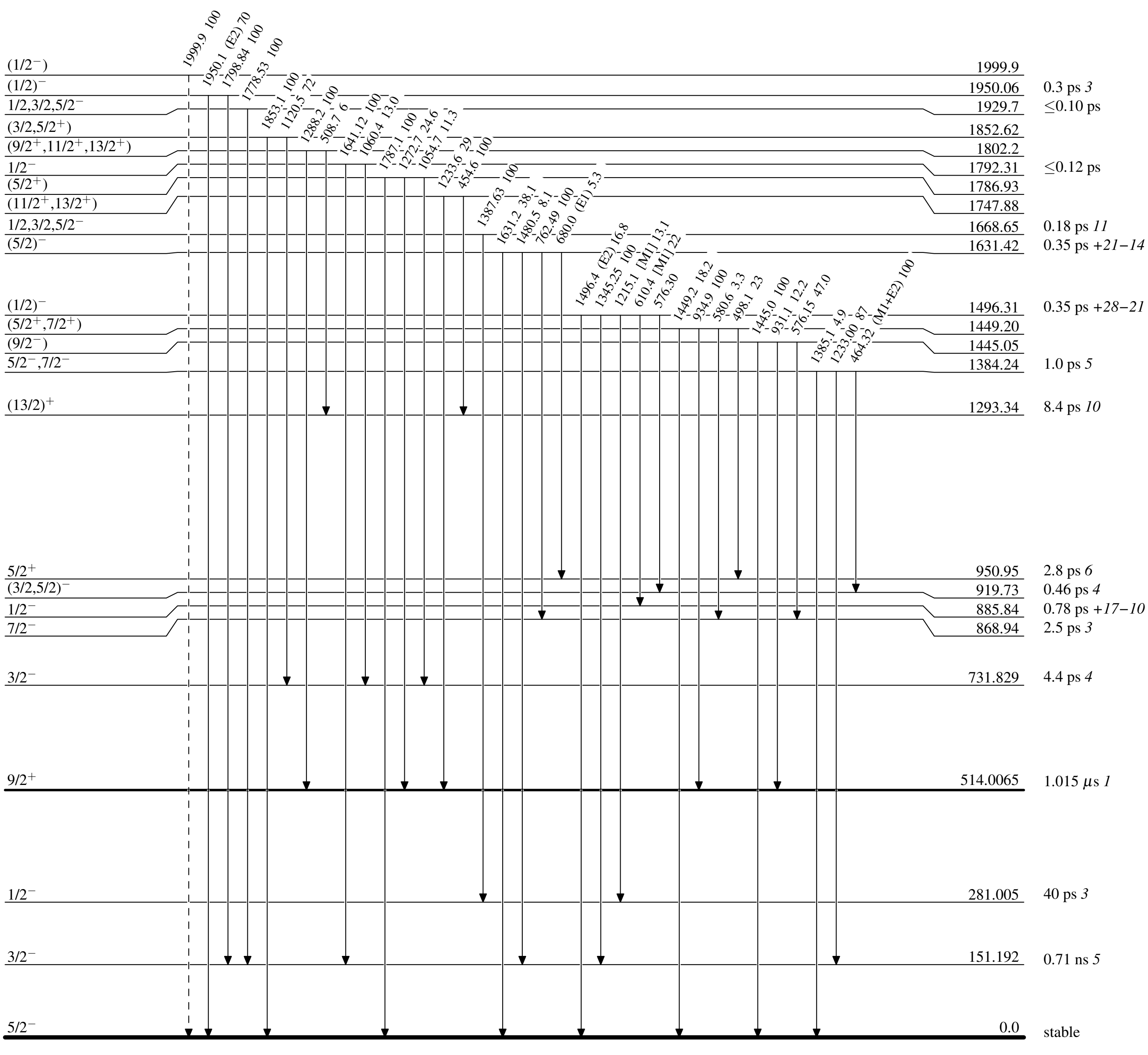
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



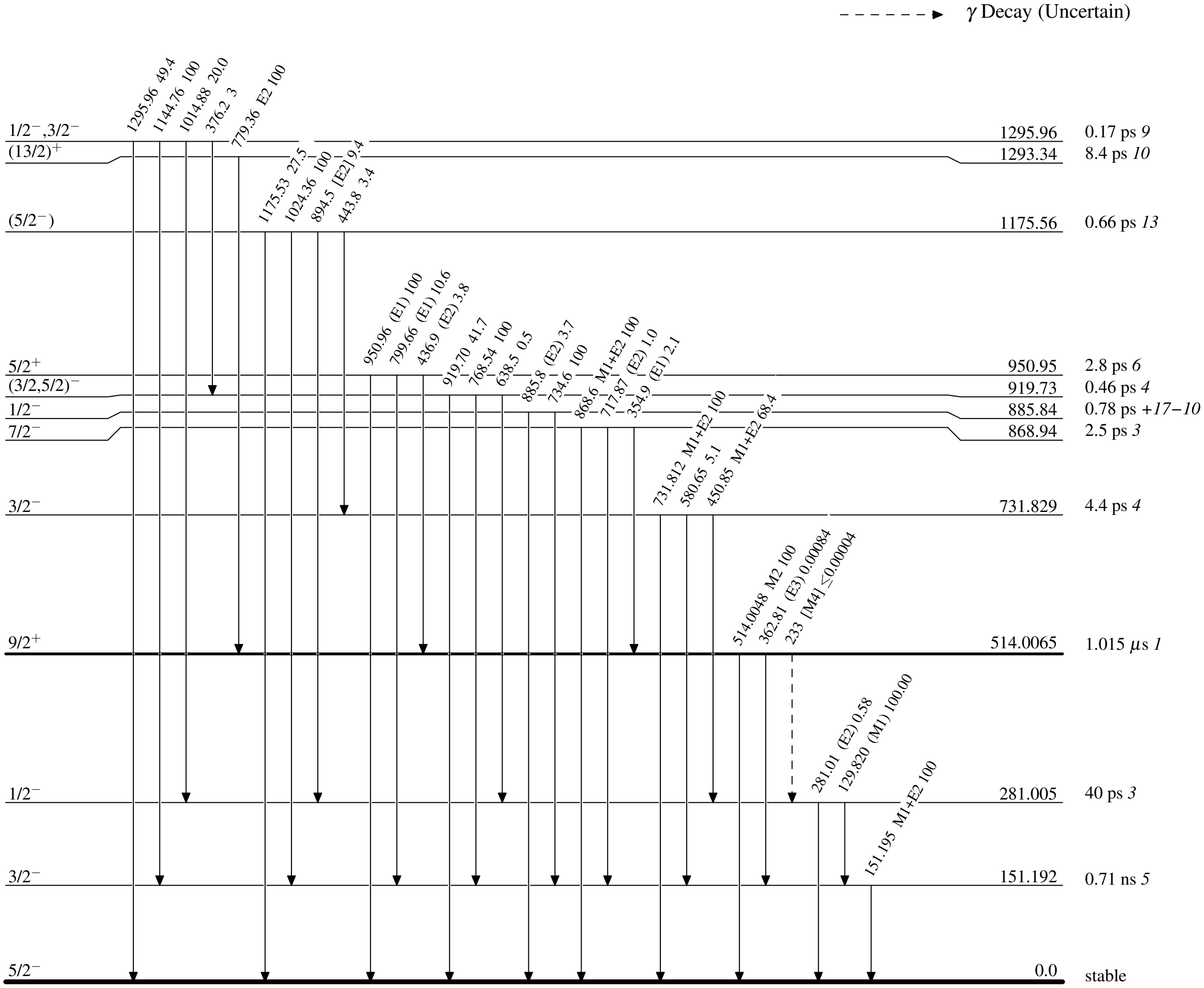
$^{85}_{37}Rb_{48}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{85}_{37}Rb_{48}$