^{92}Rb β^- decay 2006Lh01,1980Al08,1972Ol03

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 113, 2187 (2012)	15-Sep-2012

Parent: ^{92}Rb: E=0.0; $J^\pi=0^-$; $T_{1/2}$=4.48 s *3*; Q(β^-)=8095 *6*; %β^- decay=100.0

Others: 2001Ko07, 1992GrZX, 1992Gr06, 1992Pr03, 1991Ma05, 1990Ru05, 1988GrZX, 1983Ia02, 1982Al01, 1980De02, 1979Bo26, 1978St02, 1978Wo15, 1970MaZC.

1972Ol03: Eγ, Iγ, $\gamma\gamma$ coin.

1980Al08: $\gamma\gamma$ coin, $\gamma\gamma(\theta)$.

2006Lh01: %I(815γ).

2011Ta26: segmented total absorption spectrometer measurements to determine γ cascade multiplicities; No details given.

^{92}Sr Levels

The decay scheme is that proposed by 1972Ol03, and modified by 1980Al08. 1980Al08 place one new γ ray (1071.4γ) and relocate 1465γ, 1239γ on the basis of coincidence information, implying new levels at 2054 and 2850 keV. 1980Al08 find no evidence for the 2624? keV level proposed by 1972Ol03, and thus leave the 97γ unplaced; they also confirm the 2088-level proposed tentatively by 1972Ol03.

E(level)	J^π †	$T_{1/2}$ ‡	Comments
0.0	0^+	2.611 h *17*	$T_{1/2}$: adopted value.
814.98 *4*	2^+	8 ps *3*	
1384.79 *9*	2^+	5.1 ps *24*	
1778.33 *12*	$2^{(+)}$	≤5.0 ps	
2053.9 *6*	(2^+)		
2088.39 *18*	$0^{(+)}$		
2140.82 *14*	1^+	7.1 ps *25*	
2527.18 *18*	0^+	6 ps *4*	
2783.6 *4*			
2820.90 *18*	$2^{(+)}$,(1)		
2849.6 *6*			
4637.8 *5*	1		
5053.8 *4*	1		
5738.4 *9*	1		
5893.5 *7*	$1^{(-)}$		
5901.1 *10*	$1^{(-)}$		
6003.5 *7*	1^-		
6030.0 *8*	1^-		
6116.1 *10*	1^-		
6949.1? *7*	$0^-,1^-$		
7363.0 *8*	1^-		

† From Adopted Levels.
‡ From $\beta\gamma\gamma$(t) (1991Ma05), except as noted.

β^- radiations

E(decay)†	E(level)	Iβ^- ‡@	Log *ft*	Comments
(732 *6*)	7363.0	0.26 *6*	3.97 *11*	av Eβ=246.0 *24*
(1979 *6*)	6116.1	0.16 *5*	5.85 *14*	av Eβ=790.2 *28*
(2065 *6*)	6030.0	0.22 *6*	5.78 *12*	av Eβ=829.9 *28*
(2092 *6*)	6003.5	0.30 *6*	5.67 *9*	av Eβ=842.1 *28*

Continued on next page (footnotes at end of table)

^{92}Rb β^- decay 2006Lh01,1980Al08,1972Ol03 (continued)

β^- radiations (continued)

E(decay)†	E(level)	Iβ⁻‡@	Log *ft*	Comments
(2194 *6*)	5901.1	0.17 *5*	6.00 *13*	av Eβ=889.6 *29*
(2202 *6*)	5893.5	0.16 *4*	6.04 *11*	av Eβ=893.1 *28*
(2357 *6*)	5738.4	0.17 *4*	6.13 *11*	av Eβ=965.4 *29*
(3041 *6*)	5053.8	0.22 *5*	6.49 *10*	av Eβ=1288.0 *29*
(3457 *6*)	4637.8	0.33 *7*	6.55 *10*	av Eβ=1486.0 *29*
(5245 *6*)	2849.6	0.051 *15*	8.17 *13*	av Eβ=2344.8 *29*
(5274 *6*)	2820.90	0.54 *9*	7.15 *8*	av Eβ=2358.6 *29*
(5568 *6*)	2527.18	0.31 *6*	9.39[1u] *9*	av Eβ=2494.1 *29*
(5954 *6*)	2140.82	0.15 *4*	7.95 *12*	av Eβ=2686.7 *29*
(6007 *6*)	2088.39	0.141 *24*	7.99 *8*	av Eβ=2712.0 *29*
(6041[&] *6*)	2053.9	0.035 *14*	10.57[1u] *18*	av Eβ=2722.2 *29*
(6317 *6*)	1778.33	0.11 *5*	10.19[1u] *20*	av Eβ=2855.1 *29*
(6710 *6*)	1384.79	0.43 *10*	9.77[1u] *11*	av Eβ=3045.2 *29*
(7280 *6*)	814.98	1.0 *3*	9.63[1u] *13*	av Eβ=3320.7 *29*
8104[#] *8*	0.0	95.2 *7*	5.751 *5*	av Eβ=3719.4 *29* Log *ft*: unreasonably low for a first-forbidden transition.

† Measured average Eβ=3460 *230* (1982Al01), 3770 *150* (1990Ru05) cf. 3638 *28* calculated for the adopted decay scheme using the code RADLST.

‡ From intensity imbalance At each level.

Weighted average of 8111 *15* (1980De02), 8095 *25* (1988GrZX), 8107 *15* (1992Pr03) and 8096 *16* (1992GrZX). Other Q(β^-) measurements: 8100 *50* (2001Ko07), 8091 *15* (Blonnigen, unpublished datum quoted in 1992Pr03), 8080 *30* (1983Ia02), 7980 *100* (1978St02), 8080 *160* (1978Wo15), 8050 *50* (1978Wu04), 8180 *130* (1970MaZC).

@ Absolute intensity per 100 decays.

& Existence of this branch is questionable.

γ(^{92}Sr)

Iγ normalization: from %Iγ(815γ)=3.2 *4* (2006Lh01). This implies %Iβ(g.s.)=100−Σ(I(γ+ce) to g.s.)=95.2 *7* (%β^-n is negligible), consistent with Iβ(g.s.)=94 *+6−20* deduced indirectly by 1972Ol03 from integrated γ intensity ratio for ^{92}Rb:^{92}Sr, from I(1384γ)=90% 10 in ^{92}Sr β^- decay and from the ^{92}Rb decay scheme. note that the above 95% Iβ(g.s.) results in log *ft*=5.75, lower than expected for this 0$^-$ to 0$^+$ β^-decay. (log *ft*≥5.9 implies Iβ(g.s.)≤70%). As noted by 2006Lh01, any unreported Iγ to g.s. would reduce Iβ(g.s.) and hence raise log *ft*. Q(β^-) is large, so decay scheme could be incomplete; however, the RADLST code indicates a total energy release of 8136 *45* for this decay scheme, In satisfactory agreement with Q=8095 *6* and %β^-=100.

Average Eγ=393 *32* (1990Ru05) cf. 208 *10* calculated for the adopted decay scheme using the code RADLST.

E$_\gamma$[‡]	I$_\gamma$[‡j]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.[#]	δ[#]	α[†]	Comments
[x]96.7 *6*	0.49 *23*								
386.1 *3*	0.76 *13*	2527.18	0$^+$	2140.82	1$^+$	(M1)	[a]	0.00485 *7*	α=0.00485 *7*; α(K)=0.00429 *6*; α(L)=0.000472 *7*; α(M)=7.93×10^{-5} *12*; α(N+..)=1.060×10^{-5} *15* α(N)=9.95×10^{-6} *14*; α(O)=6.48×10^{-7} *10* Mult.,δ: pure D from $\gamma\gamma(\theta)$; $\Delta\pi$=No from level scheme.
393.5 *1*	3.8 *2*	1778.33	2$^{(+)}$	1384.79	2$^+$	(M1)[b]	[b]	0.00463 *7*	α=0.00463 *7*; α(K)=0.00410 *6*; α(L)=0.000450 *7*; α(M)=7.57×10^{-5} *11*; α(N+..)=1.012×10^{-5} *15* α(N)=9.50×10^{-6} *14*; α(O)=6.19×10^{-7} *9* Mult.,δ: pure D from $\gamma\gamma(\theta)$: $\Delta\pi$=(No) from level scheme.
569.8 *1*	17.0 *10*	1384.79	2$^+$	814.98	2$^+$	(M1+E2)	+0.21 *2*	0.00196 *3*	α=0.00196 *3*; α(K)=0.001737 *25*; α(L)=0.000189 *3*; α(M)=3.18×10^{-5} *5*; α(N+..)=4.26×10^{-6} *6* α(N)=4.00×10^{-6} *6*; α(O)=2.61×10^{-7} *4*
703.6 *3*	1.4 *3*	2088.39	0$^{(+)}$	1384.79	2$^+$	(E2)[d]	[d]	0.001389 *20*	α=0.001389 *20*; α(K)=0.001227 *18*; α(L)=0.0001361 *20*; α(M)=2.28×10^{-5} *4*; α(N+..)=3.03×10^{-6} α(N)=2.85×10^{-6} *4*; α(O)=1.81×10^{-7} *3*
756.0 *2*	3.4 *3*	2140.82	1$^+$	1384.79	2$^+$	M1(+E2)[f]	−0.09[f] *3*	0.001026 *15*	α=0.001026 *15*; α(K)=0.000909 *13*; α(L)=9.84×10^{-5} *14*; α(M)=1.652×10^{-5} *24*; α(N+..)=2.22×10^{-6} α(N)=2.08×10^{-6} *3*; α(O)=1.366×10^{-7} *20*
814.98[@] *3*	100 *6*	814.98	2$^+$	0.0	0$^+$	E2		0.000949 *14*	α=0.000949 *14*; α(K)=0.000839 *12*; α(L)=9.23×10^{-5} *13*; α(M)=1.550×10^{-5} *22*; α(N+..)=2.06×10^{-6} α(N)=1.94×10^{-6} *3*; α(O)=1.239×10^{-7} *18*
963.5 *2*	4.6 *4*	1778.33	2$^{(+)}$	814.98	2$^+$	(E2+M1)	+1.7 *+13−15*	0.000625 *20*	α=0.000625 *20*; α(K)=0.000553 *17*; α(L)=6.02×10^{-5} *24*; α(M)=1.01×10^{-5} *4*; α(N+..)=1.35×10^{-6} *5* α(N)=1.27×10^{-6} *5*; α(O)=8.22×10^{-8} *19*
1071.4[&]	0.4[&]	2849.6		1778.33	2$^{(+)}$				
1238.9 *6*	1.1 *4*	2053.9	(2$^+$)	814.98	2$^+$	(E2+M1)[i]	[i]	0.000372 *6*	α=0.000372 *6*; α(K)=0.000318 *5*; α(L)=3.43×10^{-5} *5*; α(M)=5.75×10^{-6} *9*; α(N+..)=1.36×10^{-5} *17* α(N)=7.23×10^{-7} *11*; α(O)=4.74×10^{-8} *7*; α(IPF)=1.29×10^{-5} *17*

$^{92}_{38}$Sr$_{54}$-3

γ(^{92}Sr) (continued)

E_γ[‡]	I_γ[‡j]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	δ[#]	α[†]	Comments
1273.4 *2*	3.0 *4*	2088.39	$0^{(+)}$	814.98	2^+	(E2)[c]	[c]	0.000360 *5*	α=0.000360 *5*; α(K)=0.000300 *5*; α(L)=3.24×10^{-5} *5*; α(M)=5.44×10^{-6} *8*; α(N+..)=2.22×10^{-5} *4* α(N)=6.83×10^{-7} *10*; α(O)=4.45×10^{-8} *7*; α(IPF)=2.14×10^{-5} *3*
1325.8 *2*	4.2 *5*	2140.82	1^+	814.98	2^+	E2+M1[e]	−0.27[e] *5*	0.000339 *5*	α=0.000339 *5*; α(K)=0.000277 *4*; α(L)=2.97×10^{-5} *5*; α(M)=4.99×10^{-6} *7*; α(N+..)=2.75×10^{-5} *5* α(N)=6.28×10^{-7} *9*; α(O)=4.15×10^{-8} *6*; α(IPF)=2.68×10^{-5} *5*
1384.6 *3*	11.0 *20*	1384.79	2^+	0.0	0^+	E2		0.000332 *5*	α=0.000332 *5*; α(K)=0.000252 *4*; α(L)=2.72×10^{-5} *4*; α(M)=4.55×10^{-6} *7*; α(N+..)=4.84×10^{-5} *7* α(N)=5.72×10^{-7} *8*; α(O)=3.74×10^{-8} *6*; α(IPF)=4.78×10^{-5} *7*
1399.0 *6*	1.6 *5*	2783.6		1384.79	2^+				
1464.7 *6*	1.2 *4*	2849.6		1384.79	2^+				
1712.3 *2*	13.1 *10*	2527.18	0^+	814.98	2^+	E2[g]	[g]	0.000360 *5*	α=0.000360 *5*; α(K)=0.0001655 *24*; α(L)=1.772×10^{-5} *25*; α(M)=2.97×10^{-6} *5*; α(N+..)=0.0001740 α(N)=3.74×10^{-7} *6*; α(O)=2.46×10^{-8} *4*; α(IPF)=0.0001736 *25*
1778.3 *10*	1.1 *6*	1778.33	$2^{(+)}$	0.0	0^+				
[x]1789.2 *9*	1.2 *6*								
1816.7 *5*	1.8 *4*	4637.8	1	2820.90	$2^{(+)}$,(1)				
1895.1 *6*	1.7 *5*	6949.1?	$0^-,1^-$	5053.8	1				
1968.6 *6*	2.1 *6*	2783.6		814.98	2^+				
2006.5 *5*	2.2 *6*	2820.90	$2^{(+)}$,(1)	814.98	2^+	[h]	[h]		
2232.0 *5*	2.4 *6*	5053.8	1	2820.90	$2^{(+)}$,(1)				
2820.6 *2*	18.8 *14*	2820.90	$2^{(+)}$,(1)	0.0	0^+				
2860.3 *21*	0.8 *8*	4637.8	1	1778.33	$2^{(+)}$				
2913.2 *6*	2.2 *6*	5053.8	1	2140.82	1^+				
3110.0 *7*	3.0 *9*	5893.5	$1^{(-)}$	2783.6					
3502.0 *16*	1.1 *7*	6030.0	1^-	2527.18	0^+				
3670.8 *12*	1.3 *6*	5053.8	1	1384.79	2^+				
3823.6 *16*	1.1 *7*	4637.8	1	814.98	2^+				
4240.4 *16*	1.0 *6*	5053.8	1	814.98	2^+				
[x]4427.9 *9*	3.9 *8*								
4508.2 *12*	1.9 *5*	5893.5	$1^{(-)}$	1384.79	2^+				
4637.7 *9*	6.7 *9*	4637.8	1	0.0	0^+				
4809.3[k] *15*	3.2 *16*	6949.1?	$0^-,1^-$	2140.82	1^+				
4835.9 *11*	3.1 *8*	7363.0	1^-	2527.18	0^+				
4922.6 *11*	3.3 *6*	5738.4	1	814.98	2^+				
5086.2 *12*	2.6 *12*	5901.1	$1^{(-)}$	814.98	2^+				
5188.1 *8*	7.5 *13*	6003.5	1^-	814.98	2^+				

^{92}Rb β^- decay 2006Lh01,1980Al08,1972Ol03 (continued)

$\gamma(^{92}$Sr) (continued)

E_γ[‡]	I_γ[‡j]	E_i(level)	J_i^π	E_f	J_f^π
5215.1 *10*	3.3 *12*	6030.0	1^-	814.98	2^+
[x]5248.7 *12*	3.3 *8*				
5301.7 *13*	2.5 *8*	6116.1	1^-	814.98	2^+
[x]5376.6 *15*	1.8 *8*				
[x]5497.7 *13*	2.5 *7*				
[x]5573.7 *17*	2.5 *15*				
5584.2 *11*	5.0 *10*	7363.0	1^-	1778.33	$2^{(+)}$
[x]5632.2 *10*	6.0 *10*				
5739.4 *14*	2.1 *8*	5738.4	1	0.0	0^+
[x]5879.4 *15*	2.1 *8*				
5900.6 *14*	2.8 *8*	5901.1	$1^{(-)}$	0.0	0^+
6004.1 *15*	1.8 *6*	6003.5	1^-	0.0	0^+
6030.0 *15*	2.4 *7*	6030.0	1^-	0.0	0^+
6114.8 *15*	2.5 *8*	6116.1	1^-	0.0	0^+

[†] Additional information 1.
[‡] From 1972Ol03, unless indicated otherwise.
[#] From $\gamma\gamma(\theta)$, assuming no γ ray seen in coin spectrum has L>2, that ≥10% Q admixture indicates mult=M1+E2, and that J=2 states with significant branching to 0^+ g.s. have π=+ (1980Al08).
[@] From 1979Bo26.
[&] From 1980Al08.
[a] $\delta(386\gamma)$ in table 1 (summary of $\gamma\gamma(\theta)$ results) of 1980Al08 is a misprint; quoted δ is for 2007γ.
[b] 394γ-(570γ)−815$\gamma(\theta)$ gives δ=−1.1 *11* for 2(D,Q)2(Q,D)2(Q)0^+, 394γ-1385$\gamma(\theta)$ gives δ=+0.07 *5* for 2(D,Q)2(Q)0^+ and 394γ-570$\gamma(\theta)$ gives δ=−0.04 *+4−5* for 2(D,Q)2(D,Q)0 cascade. Evaluator assumes mult=pure D for 394γ.
[c] 1273γ-815$\gamma(\theta)$ gives A_2=+0.30 *11*, A_4=+1.25 *20* implying 0(Q)2(Q)0^+ cascade.
[d] 704γ-(570γ)−815$\gamma(\theta)$, 704γ-1385$\gamma(\theta)$ (A_2=+0.40 *14*, A_4=+1.60 *26*) and 704γ-570$\gamma(\theta)$ imply 0(Q)2(Q,D)2(Q)0^+, 0(Q)2(Q)0^+ and 0(Q)2(D,Q)2 cascades.
[e] 1326γ-815$\gamma(\theta)$ gives δ=−0.27 *5* for 1(D,Q)2(Q)0^+ cascade.
[f] 756γ-(570γ)−815$\gamma(\theta)$, 756γ-1385$\gamma(\theta)$ and 756γ-570$\gamma(\theta)$ give δ=−0.10 *12*, −0.04 *4* and −0.12 *3* for 1(Q,D)2(Q,D)2(Q)0^+, 1(Q,D)2(Q)0^+ and 1(Q,D)2(Q)0^+ cascades, respectively. Evaluator adopts weighted average value, δ=−0.09 *3*.
[g] 1712γ-815$\gamma(\theta)$ has A_2=+0.33 *3*, A_4=+1.18 *6* indicating a 0(Q)2(Q)0^+ cascade.
[h] 2007γ-815$\gamma(\theta)$ gives δ(D,Q)<−0.53 for a 2(D,Q)2(Q)0 cascade; however, J(2821 level)=1 also possible. Note that table 1 of 1980Al08 (summary of $\gamma\gamma(\theta)$ results) incorrectly ascribes this δ to 386γ (a J=0 to J=1 transition).
[i] 1239γ-815$\gamma(\theta)$ gives δ<−3.3 or >+11.8 for 2(Q,D)2(Q)0^+ cascade.
[j] For absolute intensity per 100 decays, multiply by 0.032 *4*.
[k] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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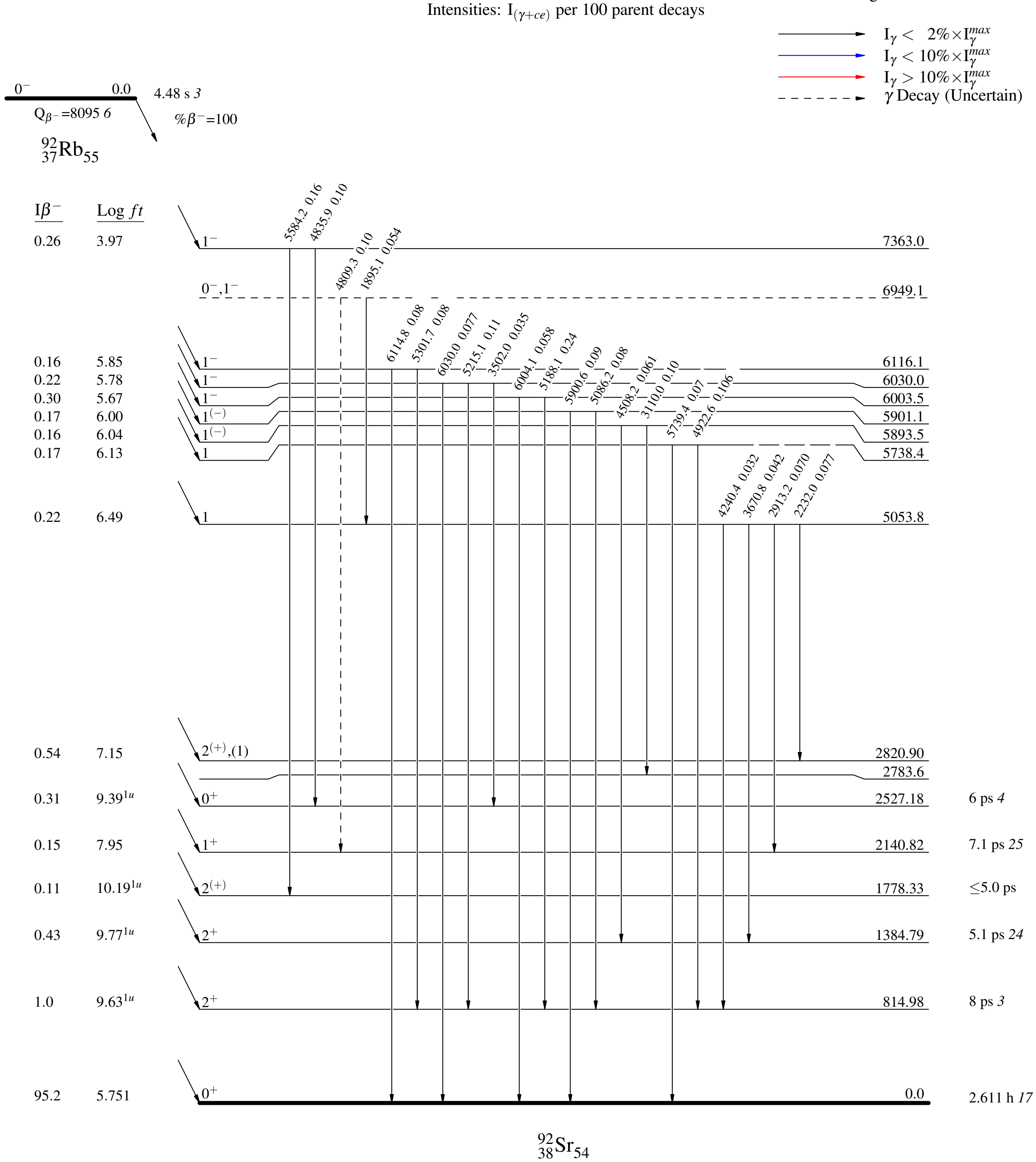
Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

Legend



^{92}Rb β^- decay 2006Lh01,1980Al08,1972Ol03

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

Legend