^{93}Kr β^- decay 1977Bi01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 112, 1163 (2011)	15-Dec-2010

Parent: ^{93}Kr: E=0; J$^\pi$=1/2$^+$; $T_{1/2}$=1.286 s *10*; Q(β^-)=8485 *8*; %β^- decay=100.0

Others: 1972Am01, 1972Mc04, 1973Cl02, 1974Ac04, 1975Br03, 1979Bo26, 1986Si20, 1988GrZX.

1979Bo26: curved crystal spectrometer; measured Eγ for three lines.

1977Bi01: Ge(Li), low energy photon spectrometer for Eγ=0-350 keV; measured Eγ, Iγ (217 lines), $\gamma\gamma$ coin.

1975Br03: Ge(Li); measured Eγ, Iγ (47 lines), Eβ, Iβ, $\gamma\gamma$ coin, $\beta\gamma$ coin.

1974Ac04: Ge(Li) and Si(Li); measured Eγ, Iγ (84 lines), $\gamma\gamma$ coin, α(K)exp (relative to ^{85}Kr(304γ) and ^{85}Rb(151γ)).

The adopted decay scheme is that of 1977Bi01; for E(level)<3050, it is supported by extensive coin information. The schemes proposed by 1977Bi01 and 1975Br03 are in excellent agreement; however, of the 25 levels proposed in 1974Ac04, only 13 are common to the scheme of 1977Bi01. Placed γ rays whose Eγ deviates significantly from the least-squares adjusted value are noted. Approximately 5.6% of Iγ remains unplaced, and Iβ=−0.36 *18* is indicated for 1642 level, so decay scheme must be regarded as incomplete.

^{93}Rb Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0	5/2$^-$	5.84 s *2*	$T_{1/2}$: from Adopted Levels.
253.39 *3*	3/2$^-$,5/2$^-$	57 μs *15*	$T_{1/2}$: from Adopted Levels. Other: <0.5 ns (1986Si20).
266.86 *3*	1/2$^-$,3/2$^-$,5/2$^-$	2.0 ns *2*	$T_{1/2}$: from $\beta\gamma$ coin (1986Si20).
323.95 *3*	3/2$^-$,5/2$^-$	<0.7 ns	$T_{1/2}$: from 1986Si20.
506.02 *4*	1/2$^-$,3/2$^-$	<0.7 ns	$T_{1/2}$: from 1986Si20.
820.53 *3*			
1350.18 *3*			
1557.40 *9*			
1563.03 *4*			
1641.07 *4*			
1642.08 *8*			Iβ=−0.36 *18* from intensity balance.
1688.72 *4*			
1850.20 *7*			
1880.39 *6*			
1964.64 *5*			
2009.33 *7*			
2083.88 *6*			
2169.14 *8*			
2210.60 *6*			
2264.84 *12*			
2285.76 *4*			
2609.47 *6*			
2664.84 *6*			
2745.28 *12*			
2814.99 *8*	1/2,3/2		
2855.94 *4*	(3/2)$^+$		
3002.12 *6*	1/2$^+$,3/2$^+$		
3063.35 *5*	1/2,3/2		
3245.15 *9*			
3265.18 *13*			
3280.04 *15*	1/2,3/2		
3308.32 *14*	1/2,3/2		
3358.76 *14*			
3464.7 *4*	1/2$^{(-)}$,3/2		
3493.73 *12*	1/2,3/2		
3551.55 *7*	1/2,3/2		
3631.4 *3*	1/2,3/2		
3733.98 *15*			

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^{93}Kr β^- decay 1977Bi01 (continued)

^{93}Rb Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
3777.16 *8*		5048.98 *12*	1/2,3/2	5759.7 *3*	1/2+,3/2+	6260.1 *5*	1/2+,3/2+
3800.90 *9*		5237.65 *13*	1/2+,3/2+	5859.84 *12*	1/2+,3/2+	6572.20 *20*	1/2+,3/2+
4050.69 *14*	1/2,3/2	5491.78 *14*	1/2+,3/2+	5920.34 *11*	1/2+,3/2+	6725.56 *19*	1/2+,3/2+
4080.58 *9*	1/2,3/2	5496.27 *17*	1/2+,3/2+	5965.48 *18*	1/2+,3/2+		
4861.52 *11*	1/2,3/2	5665.51 *11*	1/2+,3/2+	6070.51 *19*	1/2+,3/2+		

† From least-squares fit to Eγ, omitting 1596γ (4σ from expected value), and 1097γ, 1238γ (3σ from expected Eγ).
‡ From Adopted Levels.

β^- radiations

<E$_\beta$>=2700 210 (1982Al01) cf. 2768 145 calculated using the RADLST code for the decay scheme adopted here.

E(decay)	E(level)	Iβ⁻†#	Log *ft*	Comments
(1759 *8*)	6725.56	1.39 *14*	4.14 *5*	av Eβ=691.0 *37*
(1913 *8*)	6572.20	0.51 *4*	4.72 *4*	av Eβ=761.1 *37*
(2225 *8*)	6260.1	0.31 *9*	5.21 *13*	av Eβ=905.4 *38*
(2414 *8*)	6070.51	0.30 *3*	5.37 *5*	av Eβ=993.9 *38*
(2520 *8*)	5965.48	1.38 *12*	4.79 *4*	av Eβ=1043.2 *38*
(2565 *8*)	5920.34	1.47 *12*	4.79 *4*	av Eβ=1064.4 *38*
(2625 *8*)	5859.84	1.11 *9*	4.96 *4*	av Eβ=1092.9 *38*
(2725 *8*)	5759.7	0.53 *11*	5.35 *9*	av Eβ=1140.1 *38*
(2819 *8*)	5665.51	0.42 *18*	5.51 *19*	av Eβ=1184.6 *38*
(2989 *8*)	5496.27	0.75 *7*	5.37 *4*	av Eβ=1264.8 *38*
(2993 *8*)	5491.78	0.72 *6*	5.39 *4*	av Eβ=1266.9 *38*
(3247 *8*)	5237.65	0.52 *5*	5.68 *5*	av Eβ=1387.8 *39*
(3436 *8*)	5048.98	0.30 *4*	6.03 *6*	av Eβ=1477.8 *39*
(3623 *8*)	4861.52	0.56 *8*	5.86 *7*	av Eβ=1567.4 *39*
(4404 *8*)	4080.58	0.91 *11*	6.02 *6*	av Eβ=1942.2 *39*
(4434 *8*)	4050.69	0.46 *11*	6.33 *11*	av Eβ=1956.6 *39*
(4684 *8*)	3800.90	0.23 *7*	6.74 *14*	av Eβ=2076.9 *39*
(4708 *8*)	3777.16	0.40 *8*	6.50 *9*	av Eβ=2088.3 *39*
(4751 *8*)	3733.98	0.23 *13*	6.76 *25*	av Eβ=2109.1 *39*
(4854 *8*)	3631.4	0.38 *5*	6.59 *6*	av Eβ=2158.5 *39*
(4933 *8*)	3551.55	1.73 *12*	5.96 *3*	av Eβ=2197.0 *39*
(4991 *8*)	3493.73	1.08 *10*	6.19 *4*	av Eβ=2224.9 *39*
(5020 *8*)	3464.7	0.73 *23*	6.37 *14*	av Eβ=2238.9 *39*
(5126@ *8*)	3358.76	≤0.22	≥6.9	av Eβ=2290.0 *39*
(5177 *8*)	3308.32	0.69 *6*	6.45 *4*	av Eβ=2314.3 *39*
(5205 *8*)	3280.04	0.86 *8*	6.37 *4*	av Eβ=2328.0 *39*
(5220 *8*)	3265.18	0.27 *19*	6.9 *3*	av Eβ=2335.1 *39*
(5240 *8*)	3245.15	0.20 *8*	7.01 *18*	av Eβ=2344.8 *39*
(5422 *8*)	3063.35	2.60 *14*	5.967 *24*	av Eβ=2432.5 *39*
(5483 *8*)	3002.12	4.26 *23*	5.774 *24*	av Eβ=2462.1 *39*
(5629 *8*)	2855.94	21.3 *9*	5.127 *19*	av Eβ=2532.7 *39*
(5670 *8*)	2814.99	2.17 *15*	6.13 *3*	av Eβ=2552.4 *39*
(5820 *8*)	2664.84	0.41 *16*	6.91 *17*	av Eβ=2624.9 *39*
(6199 *8*)	2285.76	1.50 *17*	6.47 *5*	av Eβ=2808.0 *39*
(6274 *8*)	2210.60	0.45 *12*	7.02 *12*	av Eβ=2844.3 *39*
(6401 *8*)	2083.88	0.13 *7*	7.59 *24*	av Eβ=2905.5 *39*
(6476 *8*)	2009.33	1.89 *12*	6.45 *3*	av Eβ=2941.5 *39*

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^{93}Kr β^- decay 1977Bi01 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^{-} † #	Log *ft*	Comments
(6520 *8*)	1964.64	1.05 *12*	6.72 *5*	av Eβ=2963.1 *39*
(6605 *8*)	1880.39	2.48 *15*	6.38 *3*	av Eβ=3003.8 *39*
(6796[@] *8*)	1688.72	0.20 *13*	7.5 *3*	av Eβ=3096.4 *39*
(6844[@] *8*)	1641.07	0.25 *22*	7.4 *4*	av Eβ=3119.4 *39*
(6922 *8*)	1563.03	2.5 *6*	6.46 *11*	av Eβ=3157.1 *39*
(7664[@] *8*)	820.53	0.6 *3*	7.29 *22*	av Eβ=3515.7 *39*
(7979 *8*)	506.02	12.3 *12*	6.06 *5*	av Eβ=3667.5 *39*
(8161 *8*)	323.95	10.0 *15*	6.19 *7*	av Eβ=3755.3 *39*
(8218 *8*)	266.86	8.3 *11*	6.29 *6*	av Eβ=3782.8 *39*
(8232 *8*)	253.39	6 *3*	6.43 *22*	av Eβ=3789.3 *39*
(8485 *8*)	0	1.5[‡] *15*	7.1 *5*	av Eβ=3911.6 *39*

† From intensity balance, except As noted. an intensity of of 0.5Iγ±0.5Iγ is assigned for the three transitions (1596γ, 1298γ, 1097γ) which fit their placements poorly.

‡ 5.0% 5 (1975Br03), 0% 5 (1974Ac04). The 1975Br03 datum is based on I(324γ, ^{93}Rb)/I(590γ, ^{93}Y) in source at saturation and %I(590γ) (value unstated), and does not allow for adopted %β^-n(^{93}Kr)=2.01 *16* (Iβ(g.s.) becomes 3.0% 5 after that correction). The 1974Ac04 datum is based on saturation values for Σ(Iγ to ^{93}Rb g.s.), Σ(Iγ to ^{93}Y g.s.) and authors′ decay schemes, assuming Iβ(g.s., ^{93}Y)=0 and %β^-n(^{93}Kr)=2.6. Compared with decay schemes adopted from 1977Bi01, the schemes in 1974Ac04 include 93% and 95%, respectively, of total Iγ to g.s. for ^{93}Y and ^{93}Rb; consequently, Σ(Iβ to excited states of ^{93}Sr)=97% 5 implied in 1974Ac04 should probably be reduced to 95% 5, resulting in Iβ(g.s.)=3% 5. Since the precision of the 1975Br03 datum (Iβ(g.s.)=3.0% 5, after above revision) appears to be unrealistically high, the evaluator adopts Iβ(g.s.)=1.5% 15. (log $f^{1u}t$>8.5 implies Iβ(g.s.)<11%).

\# Absolute intensity per 100 decays.

@ Existence of this branch is questionable.

γ(^{93}Rb)

Iγ normalization: From Σ(I(γ+ce) to g.s.)=96.5% 15, based on Iβ(g.s.)=1.5% 15 and %β^-n(^{93}Kr)=1.95 *11*.

1977Bi01 report many more γ rays than 1975Br03 or 1974Ac04 and resolve ten multiplets reported as single lines in prior studies. The evaluator, therefore, omits γ rays reported in 1974Ac04 alone (Eγ=427.63, 658.50, 763.9, 802.3, 1077.4, 1209.1, 1750.1, 2626.3, 3171.0), but retains those γ's which lie outside the energy range of 1977Bi01 (Eγ=4128.1, 4369.1, 4672.2). The 507γ in 1974Ac04 and 1975Br03 is due to summing (1977Bi01).

α(K)exp data are from 1974Ac04.

E_γ[†]	I_γ[†f]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[&]	δ[&]	α[g]	Comments
57.11[‡] *5*	10.70[‡] *5*	323.95	3/2⁻,5/2⁻	266.86	1/2⁻,3/2⁻,5/2⁻	(M1)		0.700	α(K)=0.616 *9*; α(L)=0.0706 *10*; α(M)=0.01168 *17*; α(N+..)=0.001369 *20* α(N)=0.001314 *19*; α(O)=5.52×10^{-5} *8*
70.57[‡] *5*	64[‡] *3*	323.95	3/2⁻,5/2⁻	253.39	3/2⁻,5/2⁻	(M1)		0.383	α(K)=0.338 *5*; α(L)=0.0385 *6*; α(M)=0.00637 *9*; α(N+..)=0.000748 *11* α(N)=0.000718 *11*; α(O)=3.02×10^{-5} *5*
182.02[‡] *5*	223[‡] *12*	506.02	1/2⁻,3/2⁻	323.95	3/2⁻,5/2⁻	M1+E2	0.75 *15*	0.057 *8*	α(K)exp=0.050 *6* α(K)=0.050 *7*; α(L)=0.0061 *9*; α(M)=0.00101 *15*; α(N+..)=0.000114 *16* α(N)=0.000110 *16*; α(O)=4.1×10^{-6} *5* E$_\gamma$: other: 181.99 *2* (1974Ac04).
191.06 *8*	3.2 *3*	2855.94	(3/2)⁺	2664.84					
239.26 *22*	6.6 *12*	1880.39		1641.07					
252.51[‡] *6*	811[‡] *40*	506.02	1/2⁻,3/2⁻	253.39	3/2⁻,5/2⁻	M1(+E2)[c]	≤0.46	0.0143 *19*	α(K)=0.0126 *16*; α(L)=0.00141 *20*; α(M)=0.00023 *4*; α(N+..)=2.7×10^{-5} *4* α(N)=2.6×10^{-5} *4*; α(O)=1.10×10^{-6} *13*
253.42[‡] *5*	1708[‡] *90*	253.39	3/2⁻,5/2⁻	0	5/2⁻	M1(+E2)[c]	≤0.44	0.0140 *17*	α(K)=0.0124 *15*; α(L)=0.00139 *19*; α(M)=0.00023 *3*; α(N+..)=2.7×10^{-5} *4* α(N)=2.6×10^{-5} *4*; α(O)=1.08×10^{-6} *12* E$_\gamma$: others: 253.357 *22* and 253.13 *3* (1979Bo26), 253.58 *25* (1974Ac04). Iγ=41.1% 16 based on recommended decay scheme normalization.
254.83 *5*	29 *3*	5920.34	1/2⁺,3/2⁺	5665.51	1/2⁺,3/2⁺				
266.83[‡] *5*	854[‡] *40*	266.86	1/2⁻,3/2⁻,5/2⁻	0	5/2⁻	E2(+M1)	≥2.0	0.0256 *17*	α(K)exp=0.0233 *23* α(K)=0.0225 *15*; α(L)=0.00267 *19*; α(M)=0.00044 *3*; α(N+..)=5.0×10^{-5} *4* α(N)=4.8×10^{-5} *4*; α(O)=1.86×10^{-6} *12* E$_\gamma$: others: 266.87 *3* (1979Bo26), 266.78 *2* (1974Ac04). Iγ=20.6% 10 based on recommended decay scheme normalization.

From ENSDF

γ(^{93}Rb) (continued)

E_γ†	I_γ†f	E_i(level)	J^π_i	E_f	J^π_f	Mult.&	αg	Comments
292.88‡ 8	3.75‡ 25	1850.20		1557.40				
316.72‡ 9	10.0‡ 8	4050.69	1/2,3/2	3733.98				
323.89‡ 5	1000‡ 50	323.95	$3/2^-,5/2^-$	0	$5/2^-$	M1	0.00671 10	α(K)exp=0.0051 9 α=0.00671 10; α(K)=0.00594 9; α(L)=0.000650 9; α(M)=0.0001073 15; α(N+..)=1.269×10^{-5} 1 α(N)=1.216×10^{-5} 17; α(O)=5.25×10^{-7} 8 E_γ: others: 323.92 2 (1974Ac04), 323.28 3 (1979Bo26; presumed misprint). Iγ=24.1% 11 based on recommended decay scheme normalization.
399.01 12	4.9 4	2609.47		2210.60				
401.5 3	1.9 3	1964.64		1563.03				
480.44 20	3.6 5	2169.14		1688.72				
491.93 22	3.3 5	3493.73	1/2,3/2	3002.12	$1/2^+,3/2^+$			
496.56‡ 5	75‡ 4	820.53		323.95	$3/2^-,5/2^-$			
519.78 19	4.0 5	3265.18		2745.28				
529.59‡ 5	20.4‡ 11	1350.18		820.53				
553.53 20	3.2 5	820.53		266.86	$1/2^-,3/2^-,5/2^-$			
555.41 15	4.3 5	3800.90		3245.15				
567.05‡ 11	6.9‡ 5	820.53		253.39	$3/2^-,5/2^-$			
570.16‡ 5	49.4‡ 25	2855.94	$(3/2)^+$	2285.76				
578.73 17	3.5 4	6070.51	$1/2^+,3/2^+$	5491.78	$1/2^+,3/2^+$			
616.51 11	4.2 3	5665.51	$1/2^+,3/2^+$	5048.98	1/2,3/2			
623.64 16	2.14 23	2264.84		1641.07				
643.18 23	3.8 9	2285.76		1642.08				
644.78‡ 9	11.2‡ 12	2609.47		1964.64				
686.51 11	5.6 4	2855.94	$(3/2)^+$	2169.14				
x713.3 4	2.3 4							
x716.9 5	2.1 5							
722.68‡ 8	11.3‡ 7	2285.76		1563.03				
733.72‡ 5	36.4‡ 19	2083.88		1350.18				
737.24 23	2.2 3	1557.40		820.53				
770.7 4	5.7 10	4050.69	1/2,3/2	3280.04	1/2,3/2			
777.57‡ 10	8.3‡ 6	3063.35	1/2,3/2	2285.76				
820.45‡@ 5	154‡ 8	820.53		0	$5/2^-$			
844.12 6	23.3 12	1350.18		506.02	$1/2^-,3/2^-$			
852.66 12	3.9 3	3063.35	1/2,3/2	2210.60				
891.5 6	1.3 4	2855.94	$(3/2)^+$	1964.64				
895.05 13	7.2 6	2745.28		1850.20				
898.0 5	1.8 4	5759.7	$1/2^+,3/2^+$	4861.52	1/2,3/2			

γ(^{93}Rb) (continued)

E_γ†	I_γ†f	E_i(level)	J_i^π	E_f	J_f^π
921.19‡ *10*	9.4‡ *7*	3777.16		2855.94	$(3/2)^+$
965.01‡ *11*	9.0‡ *7*	2814.99	1/2,3/2	1850.20	
976.08‡ *6*	29.4‡ *16*	2664.84		1688.72	
1000.5 *3*	1.9 *4*	3265.18		2264.84	
1005.65 *9*	6.8 *5*	2855.94	$(3/2)^+$	1850.20	
1026.19‡ *5*	90‡ *5*	1350.18		323.95	$3/2^-,5/2^-$
1046.57 *14*	5.0 *5*	2609.47		1563.03	
1051.7 *3*	3.1 *5*	1557.40		506.02	$1/2^-,3/2^-$
1054.55 *23*	4.4 *5*	3265.18		2210.60	
1058.71 *17*	12.8 *17*	5920.34	$1/2^+,3/2^+$	4861.52	1/2,3/2
1060.53‡ *13*	15.9‡ *18*	4861.52	1/2,3/2	3800.90	
1080.6 *7*	1.7 *6*	6572.20	$1/2^+,3/2^+$	5491.78	$1/2^+,3/2^+$
1083.42‡ *6*	33.8‡ *18*	1350.18		266.86	$1/2^-,3/2^-,5/2^-$
1097.14[d] *9*	5.3 *10*	1350.18		253.39	$3/2^-,5/2^-$
1126.3 *3*	2.8 *5*	2814.99	1/2,3/2	1688.72	
1136.1 *3*	3.2 *6*	1642.08		506.02	$1/2^-,3/2^-$
1139.17‡ *18*	8.0‡ *7*	3308.32	1/2,3/2	2169.14	
1157.09 *11*	13.1 *10*	5237.65	$1/2^+,3/2^+$	4080.58	1/2,3/2
1191.49‡ *9*	9.6‡ *6*	3800.90		2609.47	
1214.98‡ *5*	73‡ *4*	2855.94	$(3/2)^+$	1641.07	
1235.5 *3*	5.5 *9*	3245.15		2009.33	
1238.76‡[d] *6*	46.0‡ *25*	1563.03		323.95	$3/2^-,5/2^-$
1290.54 *23*	9.9 *14*	1557.40		266.86	$1/2^-,3/2^-,5/2^-$
1296.08‡ *6*	78‡ *4*	1563.03		266.86	$1/2^-,3/2^-,5/2^-$
1309.51 *21*	4.3 *5*	1563.03		253.39	$3/2^-,5/2^-$
1313.44 *14*	12.2 *10*	3002.12	$1/2^+,3/2^+$	1688.72	
1318.38‡ *14*	38‡ *3*	1642.08		323.95	$3/2^-,5/2^-$
1350.24‡ *6*	31.0‡ *17*	1350.18		0	$5/2^-$
1360.26‡ *11*	9.4‡ *7*	3002.12	$1/2^+,3/2^+$	1642.08	
1364.77‡ *9*	28.3‡ *20*	1688.72		323.95	$3/2^-,5/2^-$
1374.78‡ *9*	17.6‡ *12*	3063.35	1/2,3/2	1688.72	
1382.7 *3*	7.8 *16*	3551.55	1/2,3/2	2169.14	
1387.92 *9*	56 *4*	1641.07		253.39	$3/2^-,5/2^-$
1421.79‡ *6*	40.0‡ *21*	1688.72		266.86	$1/2^-,3/2^-,5/2^-$
1435.35‡ *13*	42‡ *3*	1688.72		253.39	$3/2^-,5/2^-$
1445.64 *18*	8.4 *9*	5496.27	$1/2^+,3/2^+$	4050.69	1/2,3/2
1458.50‡ *9*	16.4‡ *11*	1964.64		506.02	$1/2^-,3/2^-$
1471.3 *3*	15.7 *17*	4080.58	1/2,3/2	2609.47	
1505.76‡ *6*	93‡ *5*	2855.94	$(3/2)^+$	1350.18	
1508.41 *23*	9.0 *13*	3358.76		1850.20	
1525.89 *20*	8.9 *10*	1850.20		323.95	$3/2^-,5/2^-$
1528.9 *3*	6.0 *9*	3493.73	1/2,3/2	1964.64	
[x]1543.15‡ *11*	14.2‡ *10*				
1556.32 *12*	10.3 *8*	3245.15		1688.72	
1563.09 *6*	39.2 *21*	1563.03		0	$5/2^-$
1576.6 *6*	3.7 *10*	3265.18		1688.72	
1586.89‡ *7*	35.1‡ *20*	3551.55	1/2,3/2	1964.64	
1596.20[d] *6*	57 *3*	1850.20		253.39	$3/2^-,5/2^-$
1613.33[b] *8*	14.3 *25*	1880.39		266.86	$1/2^-,3/2^-,5/2^-$
1616.9 *8*	2.8 *10*	4861.52	1/2,3/2	3245.15	
1627.10‡ *6*	82‡ *4*	1880.39		253.39	$3/2^-,5/2^-$
1638.04 *19*	20.9 *19*	3280.04	1/2,3/2	1642.08	
1641.08‡ *6*	60‡ *3*	1641.07		0	$5/2^-$
1651.87‡ *8*	28.7‡ *17*	3002.12	$1/2^+,3/2^+$	1350.18	
1662.74 *13*	17.0 *13*	2169.14		506.02	$1/2^-,3/2^-$
1666.3 *6*	3.4 *9*	3308.32	1/2,3/2	1642.08	
1681.9 *7*	4.0 *10*	3245.15		1563.03	
1685.07 *20*	22.7 *20*	2009.33		323.95	$3/2^-,5/2^-$
1687.4 *5*	6.0 *20*	3245.15		1557.40	
1697.84 *6*	58 *3*	1964.64		266.86	$1/2^-,3/2^-,5/2^-$
1704.45 *18*	10.5 *10*	2210.60		506.02	$1/2^-,3/2^-$
1710.78‡ *18*	20.8‡ *22*	1964.64		253.39	$3/2^-,5/2^-$
1713.4 *3*	12.8 *20*	3063.35	1/2,3/2	1350.18	
1742.49‡ *8*	53‡ *3*	2009.33		266.86	$1/2^-,3/2^-,5/2^-$
1745.28 *20*	17.2 *18*	3308.32	1/2,3/2	1563.03	
1755.88‡ *19*	13.1‡ *13*	2009.33		253.39	$3/2^-,5/2^-$
1779.68 *8*	23.8 *14*	2285.76		506.02	$1/2^-,3/2^-$
1785.8 *4*	5.1 *10*	4050.69	1/2,3/2	2264.84	
1788.96 *17*	13.0 *12*	2609.47		820.53	
1794.80‡ *8*	36.0‡ *20*	4080.58	1/2,3/2	2285.76	
1798.3 *3*	7.4 *10*	4861.52	1/2,3/2	3063.35	1/2,3/2
1803.71 *17*	9.2 *8*	5048.98	1/2,3/2	3245.15	
1822.3 *12*	7 *6*	3464.7	$1/2^{(-)},3/2$	1642.08	
1823.8 *8*	14 *6*	3464.7	$1/2^{(-)},3/2$	1641.07	
1840.1 *3*	11 *3*	4050.69	1/2,3/2	2210.60	
1850.1 *3*	4.0 *6*	1850.20		0	$5/2^-$

γ(^{93}Rb) (continued)

E_γ †	I_γ † f	E_i(level)	J^π_i	E_f	J^π_f
1862.68 *12*	11.0 *8*	3551.55	1/2,3/2	1688.72	
1886.79‡ *8*	29.0‡ *17*	2210.60		323.95	3/2⁻,5/2⁻
1929.7 *3*	13.2 *20*	3280.04	1/2,3/2	1350.18	
1943.54 *11*	19.7 *13*	2210.60		266.86	1/2⁻,3/2⁻,5/2⁻
1957.10 *18*	14.5 *14*	2210.60		253.39	3/2⁻,5/2⁻
1961.83‡ *6*	74‡ *4*	2285.76		323.95	3/2⁻,5/2⁻
1989.3 *3*	11.7 *14*	3631.4	1/2,3/2	1642.08	
1994.41 *21*	10.8 *11*	2814.99	1/2,3/2	820.53	
2011.68‡ *19*	9.5‡ *9*	2264.84		253.39	3/2⁻,5/2⁻
2018.87‡ *7*	58‡ *3*	2285.76		266.86	1/2⁻,3/2⁻,5/2⁻
2035.26‡ *7*	75‡ *4*	2855.94	(3/2)⁺	820.53	
2082.62 *14*	12.3 *9*	5859.84	1/2⁺,3/2⁺	3777.16	
2088.24 *19*	11.3 *10*	3777.16		1688.72	
2160.0 *5*	2.8 *6*	3800.90		1641.07	
2179.3 *12*	4 *3*	6260.1	1/2⁺,3/2⁺	4080.58	1/2,3/2
2181.54‡ *12*	48‡ *4*	3002.12	1/2⁺,3/2⁺	820.53	
2235.4 *8*	3.0 *9*	5237.65	1/2⁺,3/2⁺	3002.12	1/2⁺,3/2⁺
2239.2 *3*	7.4 *10*	2745.28		506.02	1/2⁻,3/2⁻
2308.3 *5*	3.1 *7*	5859.84	1/2⁺,3/2⁺	3551.55	1/2,3/2
2342.4 *8*	7.3 *25*	2609.47		266.86	1/2⁻,3/2⁻,5/2⁻
2349.96 *10*	306 *16*	2855.94	(3/2)⁺	506.02	1/2⁻,3/2⁻
2366.0 *6*	5.3 *20*	5859.84	1/2⁺,3/2⁺	3493.73	1/2,3/2
2368.5 *6*	5.7 *20*	5920.34	1/2⁺,3/2⁺	3551.55	1/2,3/2
2411.44‡ *15*	12.8‡ *9*	2664.84		253.39	3/2⁻,5/2⁻
2424.26 *25*	7.2 *8*	3245.15		820.53	
2491.2 *3*	19 *3*	2814.99	1/2,3/2	323.95	3/2⁻,5/2⁻
2496.05‡ *10*	95‡ *5*	3002.12	1/2⁺,3/2⁺	506.02	1/2⁻,3/2⁻
2517.4 *6*	3.2 *7*	4080.58	1/2,3/2	1563.03	
2521.47 *16*	19.6 *12*	6572.20	1/2⁺,3/2⁺	4050.69	1/2,3/2
2531.9‡ *3*	5.4‡ *6*	2855.94	(3/2)⁺	323.95	3/2⁻,5/2⁻
2548.02‡ *17*	25.8‡ *20*	2814.99	1/2,3/2	266.86	1/2⁻,3/2⁻,5/2⁻
ˣ2549.9#e *6*	13# *4*				
2557.26 *16*	24.3 *17*	3063.35	1/2,3/2	506.02	1/2⁻,3/2⁻
2561.33 *12*	41.4 *24*	2814.99	1/2,3/2	253.39	3/2⁻,5/2⁻
2589.18‡ *15*	21.2‡ *14*	2855.94	(3/2)⁺	266.86	1/2⁻,3/2⁻,5/2⁻
2602.61‡ *11*	174‡ *9*	2855.94	(3/2)⁺	253.39	3/2⁻,5/2⁻
2606.65 *19*	29.5 *24*	5965.48	1/2⁺,3/2⁺	3358.76	
2663.49 *20*	21.2 *22*	5665.51	1/2⁺,3/2⁺	3002.12	1/2⁺,3/2⁺
2678.0 *4*	10.9 *19*	3002.12	1/2⁺,3/2⁺	323.95	3/2⁻,5/2⁻
2700.5 *3*	9.1 *11*	4050.69	1/2,3/2	1350.18	

^{93}Kr β^- decay 1977Bi01 (continued)

$\gamma(^{93}Rb)$ (continued)

E_γ[†]	I_γ[†f]	E_i(level)	J^π_i	E_f	J^π_f
2720.2 *4*	8.3 *10*	5965.48	$1/2^+,3/2^+$	3245.15	
2739.14 *12*	21.1 *12*	3063.35	1/2,3/2	323.95	$3/2^-,5/2^-$
[x]2755.62 *25*	8.9 *9*				
[x]2772.9 *3*	8.5 *9*				
[x]2782.26 *20*	22.9 *18*				
2796.56 *16*	15.0 *10*	3063.35	1/2,3/2	266.86	$1/2^-,3/2^-,5/2^-$
2809.92[‡] *12*	18.3[‡] *10*	3063.35	1/2,3/2	253.39	$3/2^-,5/2^-$
2826.62 *24*	8.1 *8*	5491.78	$1/2^+,3/2^+$	2664.84	
2838.5 *3*	7.5 *9*	5048.98	1/2,3/2	2210.60	
[x]2846.0 *5*	27 *12*				
2852.6 *5*	7.9 *18*	3358.76		506.02	$1/2^-,3/2^-$
2855.95 *11*	90 *5*	2855.94	$(3/2)^+$	0	$5/2^-$
2913.5 *3*	8.6 *10*	3733.98		820.53	
2944.6 *4*	7.3 *12*	5759.7	$1/2^+,3/2^+$	2814.99	1/2,3/2
2948.32 *19*	25.1 *17*	6725.56	$1/2^+,3/2^+$	3777.16	
2956.68[‡] *16*	24.8[‡] *17*	3777.16		820.53	
[x]2972.22[‡] *20*	18.1[‡] *18*				
2998.5 *3*	26 *6*	3265.18		266.86	$1/2^-,3/2^-,5/2^-$
3000.5 *5*	14 *6*	5665.51	$1/2^+,3/2^+$	2664.84	
3014.7 *5*	13 *4*	5759.7	$1/2^+,3/2^+$	2745.28	
3026.5 *3*	7.2 *10*	3280.04	1/2,3/2	253.39	$3/2^-,5/2^-$
[x]3097.7 *5*	3.2 *8*				
3105.40 *20*	12.2 *10*	3358.76		253.39	$3/2^-,5/2^-$
3150.8[‡] *5*	8.7[‡] *21*	5965.48	$1/2^+,3/2^+$	2814.99	1/2,3/2
3196.8 *7*	6.0 *19*	6260.1	$1/2^+,3/2^+$	3063.35	1/2,3/2
3214.5 *3*	8.9 *9*	6070.51	$1/2^+,3/2^+$	2855.94	$(3/2)^+$
3220.3[‡] *3*	7.2[‡] *8*	4861.52	1/2,3/2	1641.07	
3226.70[‡] *15*	41[‡] *3*	3493.73	1/2,3/2	266.86	$1/2^-,3/2^-,5/2^-$
3229.9 *7*	6.1 *20*	4050.69	1/2,3/2	820.53	
3250.3 *3*	6.5 *7*	5859.84	$1/2^+,3/2^+$	2609.47	
3260.7 *5*	3.6 *6*	6725.56	$1/2^+,3/2^+$	3464.7	$1/2^{(-)},3/2$
3281.1 *7*	3.3 *8*	5491.78	$1/2^+,3/2^+$	2210.60	
3285.3 *3*	7.3 *8*	5496.27	$1/2^+,3/2^+$	2210.60	
3294.8 *8*	8.6 *15*	3800.90		506.02	$1/2^-,3/2^-$
3298.31[‡] *19*	26.6[‡] *21*	3551.55	1/2,3/2	253.39	$3/2^-,5/2^-$
3303.9 *8*	4.4 *13*	4861.52	1/2,3/2	1557.40	
3307.2 *7*	4.2 *14*	3631.4	1/2,3/2	323.95	$3/2^-,5/2^-$
3356.0[‡] *5*	9[‡] *3*	5965.48	$1/2^+,3/2^+$	2609.47	
3358.8 *10*	5.0 *25*	3358.76		0	$5/2^-$
3379.7 *4*	7.0 *10*	5665.51	$1/2^+,3/2^+$	2285.76	
3408.09[‡] *22*	18.9[‡] *14*	5491.78	$1/2^+,3/2^+$	2083.88	
3412.7 *5*	5.8 *10*	5496.27	$1/2^+,3/2^+$	2083.88	
3445.1 *6*	2.7 *5*	6260.1	$1/2^+,3/2^+$	2814.99	1/2,3/2
3453.3 *3*	8.4 *10*	3777.16		323.95	$3/2^-,5/2^-$
3460.7 *6*	29 *5*	6725.56	$1/2^+,3/2^+$	3265.18	
3464.4 *12*	13 *4*	3464.7	$1/2^{(-)},3/2$	0	$5/2^-$
3467.2 *10*	11 *5*	3733.98		266.86	$1/2^-,3/2^-,5/2^-$
[x]3471.3 *5*	6.3 *14*				
3482.4 *5*	4.9 *8*	5491.78	$1/2^+,3/2^+$	2009.33	
[x]3582.7 *3*	6.3 *6*				
3634.7 *3*	7.9 *9*	5920.34	$1/2^+,3/2^+$	2285.76	
3645.9 *5*	9.7 *22*	5496.27	$1/2^+,3/2^+$	1850.20	
3649.2 *4*	12.7 *22*	5859.84	$1/2^+,3/2^+$	2210.60	
3655.5 *5*	5.7 *9*	5920.34	$1/2^+,3/2^+$	2264.84	
[x]3705.87 *16*	12.3 *8*				
3776.0 *3*	6.1 *7*	5859.84	$1/2^+,3/2^+$	2083.88	
3795.8 *11*	1.6 *5*	5965.48	$1/2^+,3/2^+$	2169.14	
3887.1 *4*	5.3 *8*	5237.65	$1/2^+,3/2^+$	1350.18	
[x]4014.1 *11*	2.5 *10*				
[x]4032.88 *20*	8.8 *7*				
[x]4128.1[#a] *10*	9[#] *7*				
[x]4369.1[#a] *7*	5[#] *3*				
[x]4672.2[#] *6*	8[#] *4*				

[†] From 1977Bi01. The highest precision Eγ data are from 1977Bi01 and 1974Ac04; agreement is excellent for low Eγ but, for Eγ above≈1700, data from 1974Ac04 tend to be higher than those from 1977Bi01. Iγ data from 1977Bi01 and 1975Br03 are, with a few exceptions, in good agreement; except for Eγ<1000, those from 1974Ac04 are, typically, low relative to those of 1977Bi01 (some by a factor of≈2). The distribution of Iγ between members of the 253-keV doublet varies greatly among authors.

[‡] Observed in 1977Bi01 and at least one other decay study.

$^{93}_{37}Rb_{56}$-8

γ(^{93}Rb) (continued)

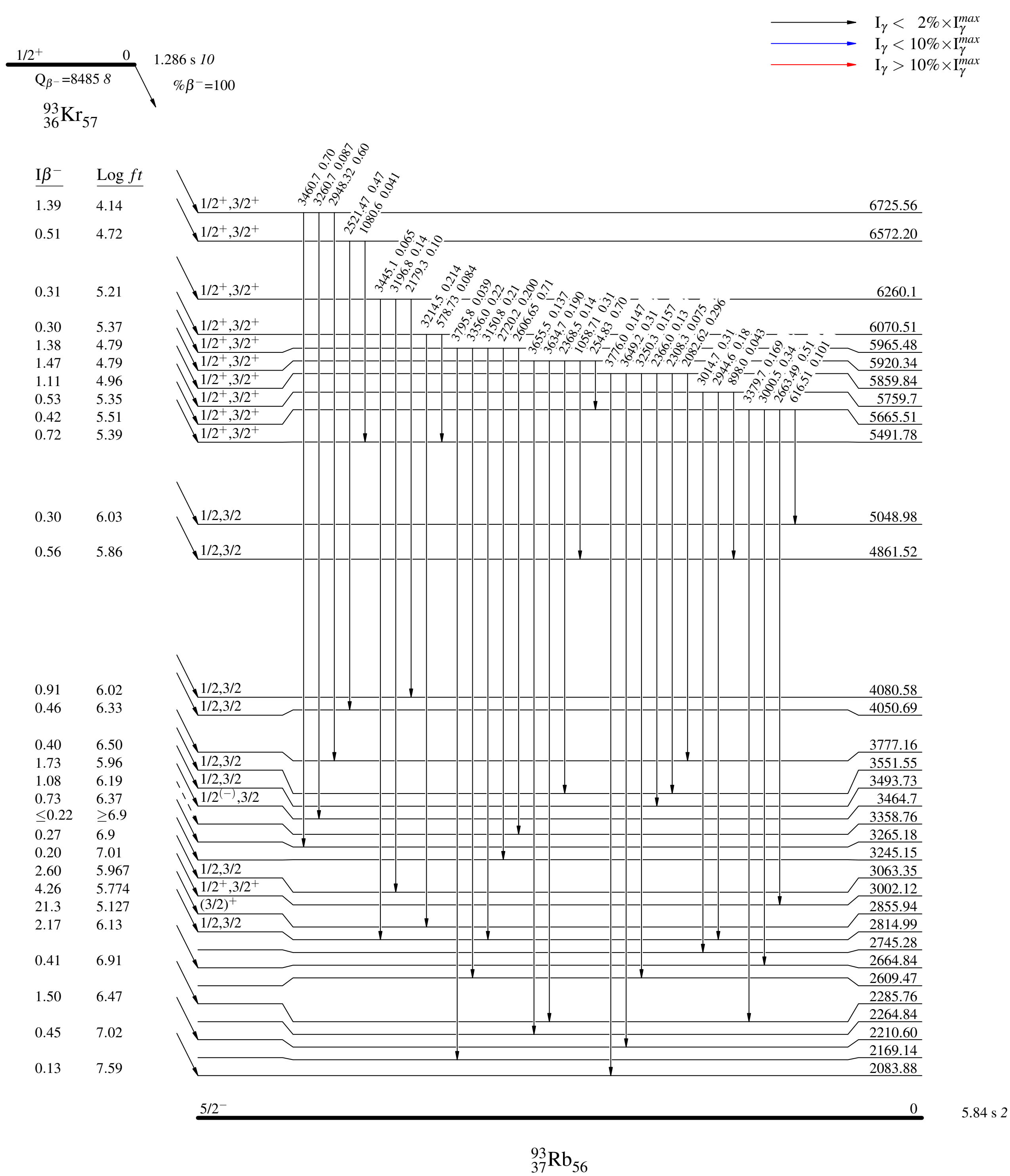
[#] From 1974Ac04 only.
[@] Other Eγ: 820.47 *2* (1974Ac04).
[&] Based on α(K)exp.
[a] Assigned by 1974Ac04 to deexcite a 3656 level which evaluator does not adopt; only two γ's deexcite this 3656 level, and their energy consistency is not good.
[b] Eγ is also correct for a transition connecting the 3494 and 1880 levels.
[c] α(K)exp for doublet consistent only with mult.=M1(+E2) for both components or with mult.=E2 for one component and mult.=E1 for the other. Since components connect levels having the same π (based on α(K)exp for 182γ and 323γ), the former alternative is dictated; in this case, 1974Ac04 deduce (0.0108≤α(K)exp(252.5)≤0.0142) and (0.0108≤α(K)exp(253.4)≤0.0137).
[d] Eγ at least 3σ from least-squares adjusted value.
[e] Probably same γ as 2548.0γ in 1977Bi01.
[f] For absolute intensity per 100 decays, multiply by 0.0241 *8*.
[g] 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.
[x] γ ray not placed in level scheme.

From ENSDF

^{93}Kr β^- decay 1977Bi01

Decay Scheme

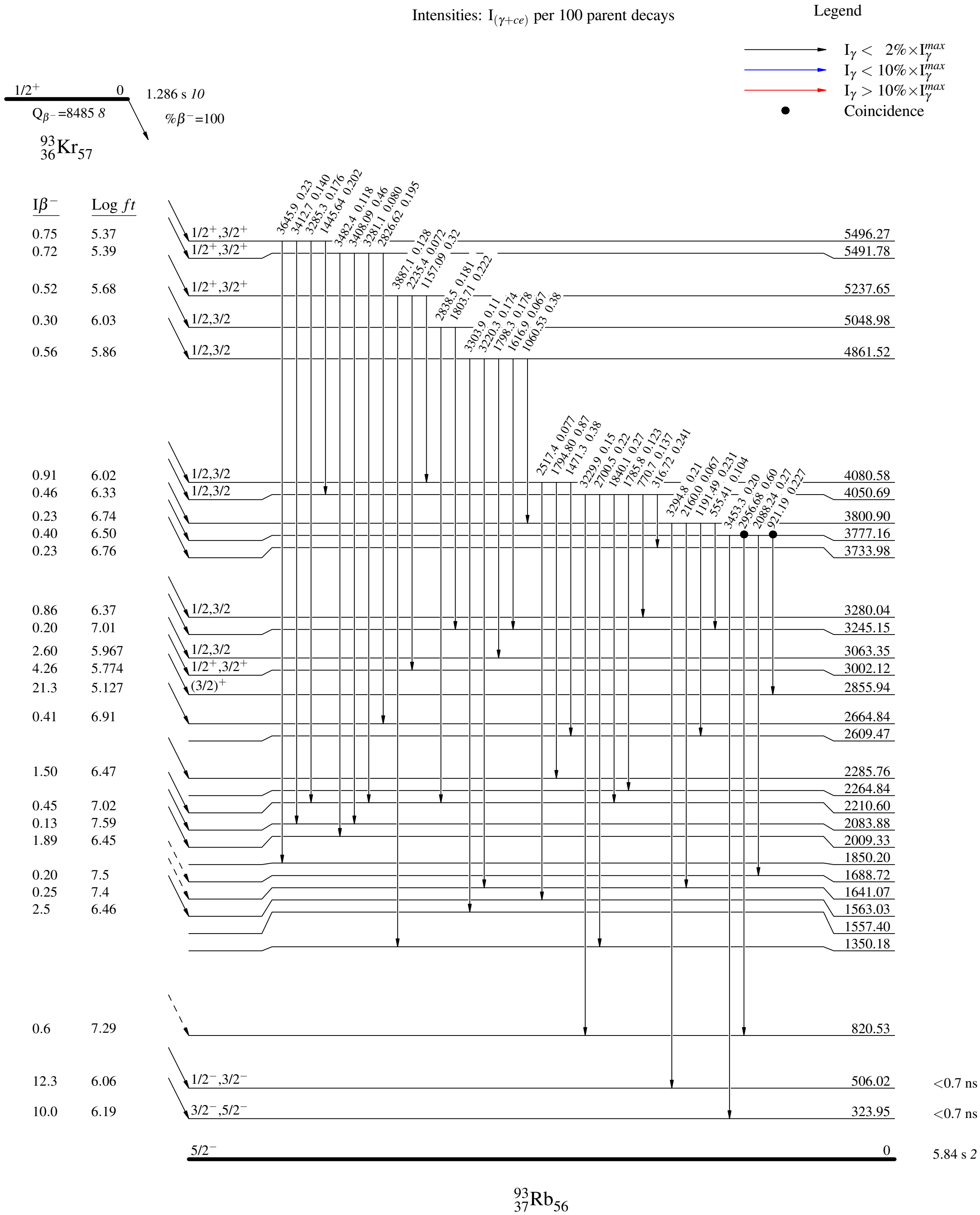
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



$^{93}Kr\ \beta^-$ decay 1977Bi01

Decay Scheme (continued)

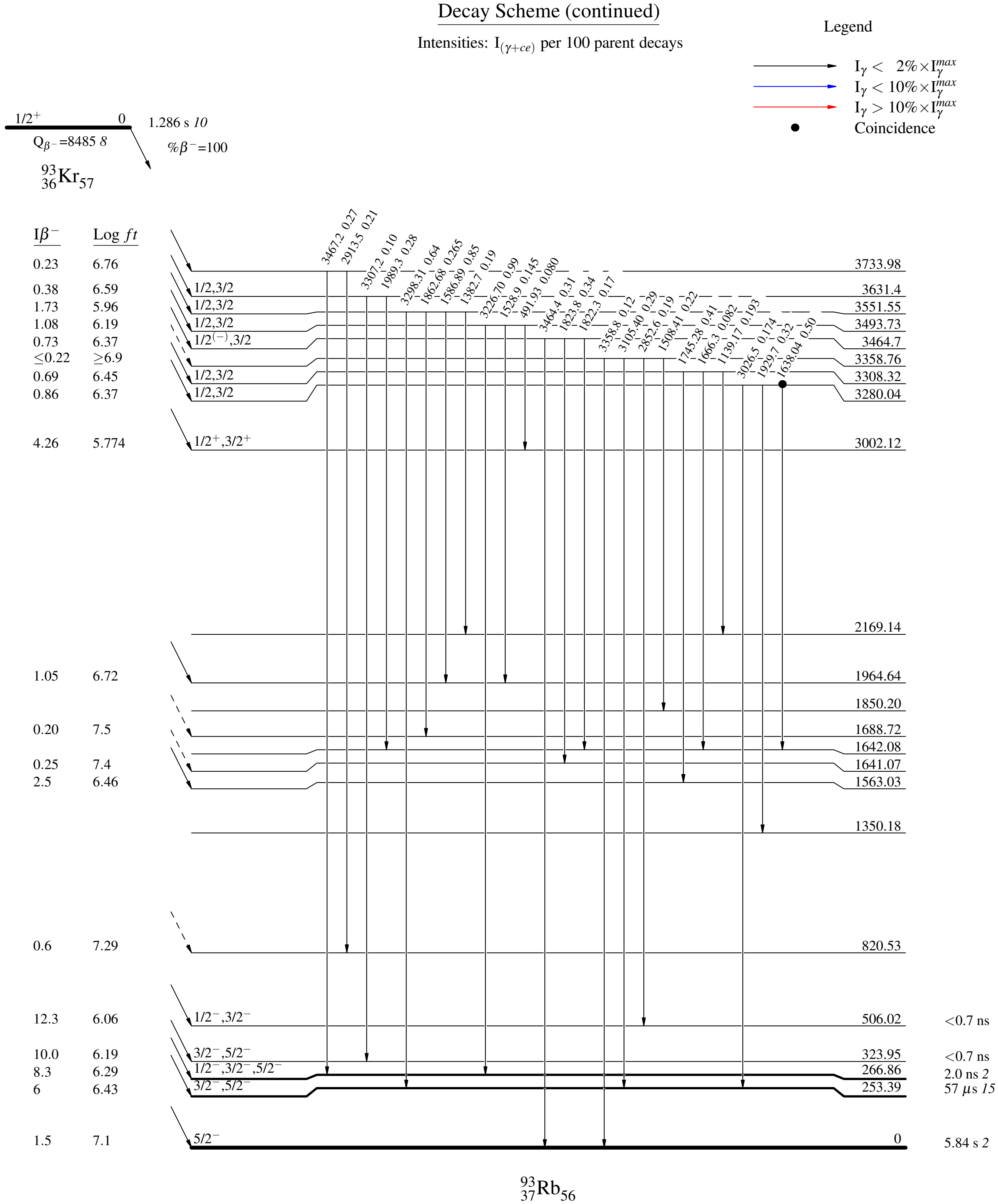
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{93}Kr β^- decay 1977Bi01

Decay Scheme (continued)

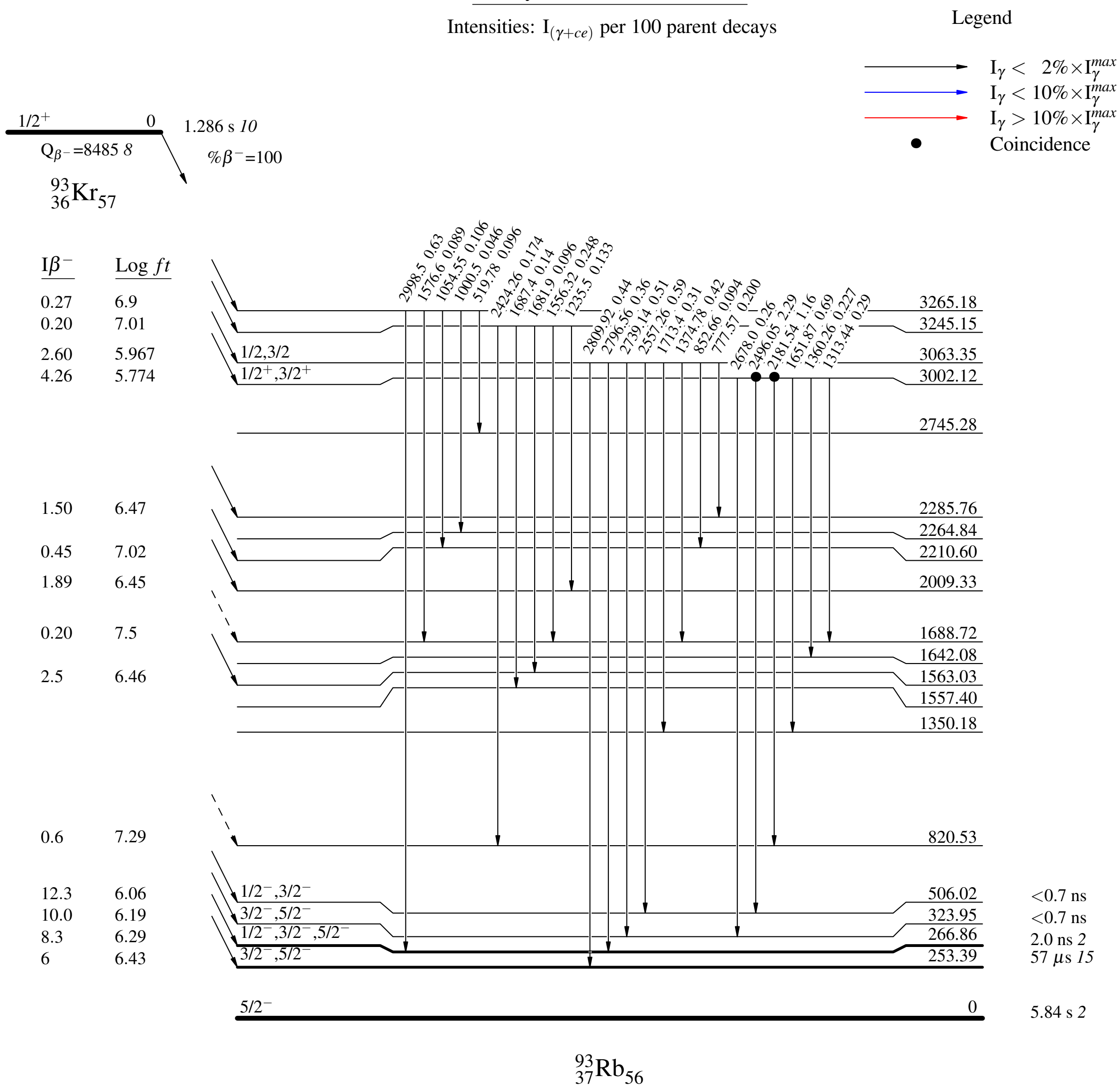
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{93}Kr β^- decay 1977Bi01

Decay Scheme (continued)

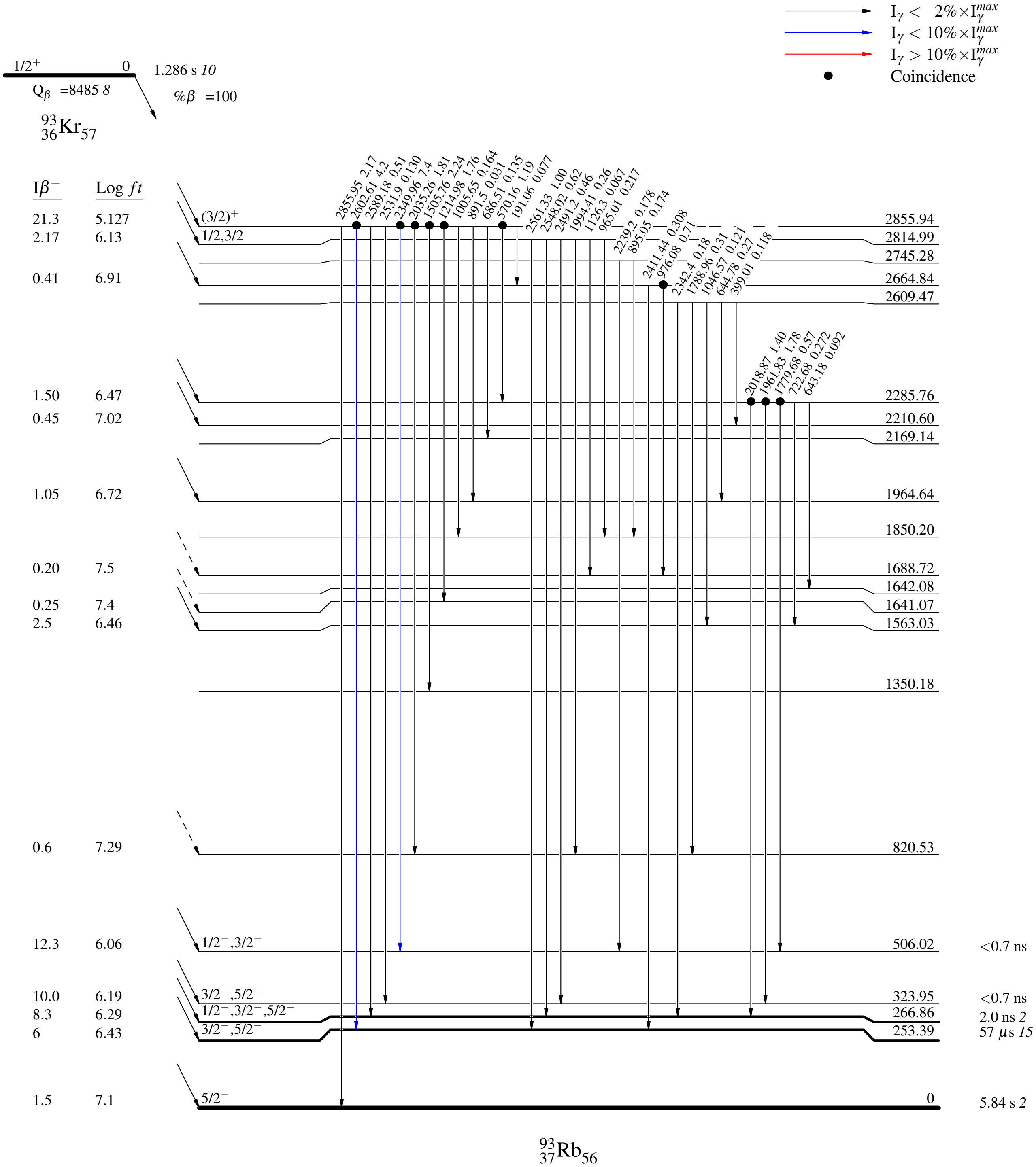
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{93}Kr β^- decay 1977Bi01

Decay Scheme (continued)

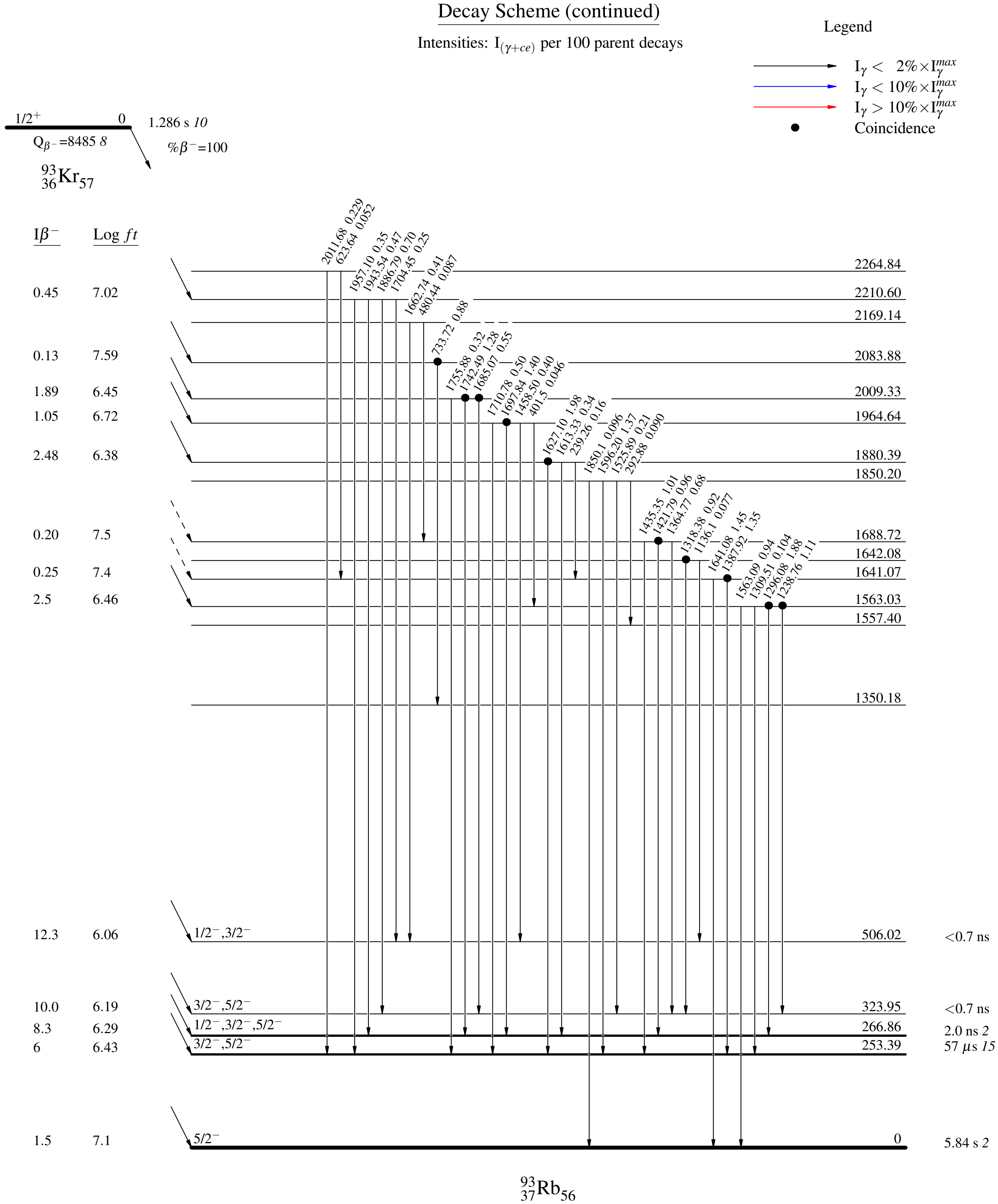
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{93}Kr β^- decay 1977Bi01

Decay Scheme (continued)

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



^{93}Kr β^- decay 1977Bi01

Decay Scheme (continued)

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