^{39}K(p,γ) 1990Ki07,1988Sc23

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 140, 1 (2017)	30-Sep-2015

$J^{\pi}(^{39}K$ g.s.)=3/2$^+$.

Includes data for resonances.

1990Ki07: E=0.3-2.9 MeV proton beams were produced from the Utrecht 3 MV Van de Graaff generator (FWHM=0.2 keV at E_p=1 MeV). Targets were 30-50 μg/cm^2 KI evaporated onto Ta backings. γ rays were detected with two hyperpure Ge detectors and one Ge(Li) detector. Measured yields, Eγ, Iγ, Doppler-shift attenuation. Deduced resonances, levels, lifetimes. Report 113 resonances and γ decays of 26 resonances.

1988Sc23: E=1.0-1.6 MeV. Measured Eγ, Iγ. Deduced levels, J, π, γ-ray transition strengths. Report 14 resonances and 32 bound and two unbound levels.

1985Se16: E=3.79-3.85 MeV. Measured Eγ, Iγ, resonances. Report 4 resonances.

1981Ch04: E=0.7-2.9 MeV. Measured Eγ, Iγ, $\gamma(\theta)$. Deduced resonances, γ-ray branching ratios.

1973Di02: E=6.5-17.5 MeV. Measured $\gamma(\theta)$, yields. Report 12 resonances.

1971Da08 (also 1973DaYL): E=2.6-2.82 MeV, measured resonances.

1971Ma03: E=1.344 MeV, measured Eγ, Iγ, resonance, lifetime by DSAM.

1968Ba22: E=2.9-6.0 MeV. Measured σ, resonances. Report 20 resonances.

1968Do12: E=1.344-1.575 keV, measured Eγ, Iγ, DSA, deduced levels, $T_{1/2}$. Report 12 levels.

1968Li12: E=1.1-2.5 MeV, measured Eγ, Iγ, DSA, deduced level, $T_{1/2}$, γ-ray branching ratios. Report 19 levels.

1966Le08, 1963Le08: E=0.5-2.9 MeV. Measured γ, deduced J^{π}'s, mixing ratios. Report 12 resonances.

1967Le12: E=1.1-2.1 MeV. Measured Eγ, Iγ, $\gamma\gamma(\theta)$, γ(pol). Deduced J, π, levels, γ-ray mixing ratios, branching ratios. Report 17 levels.

Others: 1988Al16, 1987Gu01, 1979Pa16 (also 1980PaZP), 1971Si29, 1971Ir01, 1970De30, 1970He08, 1967Fe04, 1966Go23, 1966En04, 1964Ta05, 1964Si16, 1964Ha35, 1963Si13, 1962Ra07, 1962Du05, 1961Po05, 1961Ec03.

^{40}Ca Levels

(p,γ) resonance strength is defined as S(p,γ)=(2J+1)$\Gamma_p\Gamma_\gamma/\Gamma$.

E(level)†	J$^{\pi}$‡	$T_{1/2}$@	Comments
0	0$^+$		
3352.64 *9*	0$^+$		E(level): 3352.64 *9* (1990Ki07), 3352.5 *5* (1988Sc23).
3736.69 *5*	3$^-$#	≥0.35 ps	E(level): 3736.67 *5* (1990Ki07), 3736.77 *10* (1988Sc23). $T_{1/2}$: from 1968Li12 by DSAM.
3904.38 *4*	2$^+$#	40 fs *7*	E(level): 3904.39 *4* (1990Ki07), 3904.37 *6* (1988Sc23). $T_{1/2}$: from 1971Ma03 by DSAM. Others: 13 fs *4* (1968Do12), 17 fs *4* (1968Li12).
4491.44 *4*	5$^-$#	≥0.17 ps	E(level): 4491.43 *4* (1990Ki07), 4491.57 *14* (1988Sc23). $T_{1/2}$: from 1968Li12 by DSAM.
5211.7 *3*	0$^+$		E(level): 5211.56 *17* (1990Ki07), 5212.4 *4* (1988Sc23).
5248.81 *6*	2$^+$#	0.15 ps *7*	E(level): 5248.79 *5* (1990Ki07), 5248.98 *16* (1988Sc23). $T_{1/2}$: from 1968Li12 by DSAM.
5278.81 *6*	4$^+$#	0.16 ps *+13−4*	E(level): 5278.80 *6* (1990Ki07), 5279.0 *3* (1988Sc23). $T_{1/2}$: from 1968Do12 by DSAM. Other: ≥0.13 ps (1968Li12).
5613.53 *3*	4$^-$#	69 fs *55*	E(level): 5613.52 *3* (1990Ki07), 5613.59 *15* (1988Sc23). $T_{1/2}$: from 1968Li12 by DSAM. Other: >0.55 ps (1968Do12).
5629.43 *8*	2$^+$		E(level): 5629.41 *6* (1990Ki07), 5629.72 *22* (1988Sc23).
5902.63 *8*	1$^-$		E(level): 5902.63 *8* (1990Ki07), 5902.64 *11* (1988Sc23).
6025.47 *5*	2$^-$		E(level): 6025.47 *5* (1990Ki07), 6025.38 *25* (1988Sc23).
6029.71 *6*	3$^+$		E(level): 6029.71 *6* (1990Ki07), 6029.7 *4* (1988Sc23).
6285.15 *4*	3$^-$	0.27 ps *8*	E(level): 6285.15 *4* (1990Ki07), 6285.17 *10* (1988Sc23). $T_{1/2}$: weighted average of 0.26 ps *+11−6* (1968Do12), and 0.35 ps *21* (1968Li12). J$^{\pi}$: spin from $\gamma\gamma(\theta)$ and γ(pol) together (1967Le12).

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

^{40}Ca Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[@]	S(p,γ) (eV)[b]	Comments
6507.84 *13*	4^+			E(level): 6507.87 *15* (1990Ki07), 6507.7 *3* (1988Sc23).
6542.78 *9*	4^+			E(level): 6542.80 *9* (1990Ki07), 6542.5 *3* (1988Sc23).
6582.54 *15*	3^-			E(level): 6582.47 *10* (1990Ki07), 6582.84 *20* (1988Sc23).
6750.41 *7*	2^-			E(level): 6750.42 *7* (1990Ki07), 6750.38 *17* (1988Sc23).
6908.70 *8*	2^+	≤35 fs		E(level): 6908.70 *8* (1990Ki07), 6908.67 *24* (1988Sc23). $T_{1/2}$: from 1968Li12 by DSAM.
6931.29 *6*	3^-	1.4 ps *6*		
6950.49 *7*	1^-			E(level): 6950.48 *7* (1990Ki07), 6950.8 *4* (1988Sc23). Jπ: $\gamma\gamma(\theta)$ in 1967Le12 gives J=(1,2).
7113.73 *6*	4^-	76 fs *28*		E(level): 7113.72 *6* (1990Ki07), 7113.79 *12* (1988Sc23). $T_{1/2}$: other: 0.31 ps *9* (1968Li12).
7114.0 *5*	1^-			
7239.07 *17*	$(3^-,4,5^-)$			
7277.82 *8*	$(2,3)^+$			
7300.74 *20*	0^+[#]			E(level): 7300.67 *11* (1990Ki07), 7301.3 *3* (1988Sc23).
7446.23 *6*	$3^+,4^+$			
7466.37 *8*	2^+[#]	8 fs *4*		E(level): 7466.35 *7* (1990Ki07), 7466.7 *3* (1988Sc23). $T_{1/2}$: weighted average of 7 fs *4* (1968Do12) and 18 fs *14* (1990Ki07).
7481?				E(level): from 1971Da08 only.
7532.26 *5*	2^-	0.22 ps *7*		E(level): 7532.25 *5* (1990Ki07), 7532.29 *11* (1988Sc23).
7561.18 *7*	4^+	0.18 ps *+10–5*		E(level): 7561.17 *7* (1990Ki07), 7561.3 *3* (1988Sc23). $T_{1/2}$: from 1968Do12 by DSAM. Other: 36 fs *13* (1968Li12).
7623.11 *8*	$(2^-,3,4^+)$			
7658.23 *5*	4^-			E(level): 7658.23 *5* (1990Ki07), 7658.3 *2* (1988Sc23).
7676.6	(6^+)			E(level): from Adopted Levels. Seen by 1990Ki07 but energy could not be determined accurately.
7694.08 *4*	3^-	≤6 fs		E(level): from 1990Ki07. Other: 7695.07 *15* from 1988Sc23) is discrepant and is probably a typo. $T_{1/2}$: from 1968Li12 by DSAM.
7701.8 *4*	0^+			E(level): 7701.9 *4* (1990Ki07), 7701.4 *7* (1988Sc23).
7769.4	$(3,4,5)^-$			E(level): from Adopted Levels. Seen by 1990Ki07 but energy could not be determined accurately.
7872.18 *9*	2^+			E(level): 7872.18 *9* (1990Ki07), 7872.1 *5* (1988Sc23).
7928.37 *22*	4^+			E(level): 7928.42 *10* (1990Ki07), 7927.5 *4* (1988Sc23).
7976?				E(level): from 1971Da08 only.
8091.61 *17*	2^+			
8134.76 *10*	(3^-)			E(level): 8134.77 *10* (1990Ki07), 8134.4 *5* (1988Sc23).
8187.69 *13*	$(3,4,5^-)$			
8323.16 *8*	$(1^-,2^+)$	83 fs *28*		
8338.0 *3*	$(2^+,3,4)$			
8373.94 *15*	4^+			
8424.81 *11*	2^-			
8439.0 *5*	0^+			
8484.02 *13*	$(1^-,2^-,3^-)$			
8578.80 *9*	2^+			
8678.29 *10*	4^+	42 fs *35*		
8748.20 *9*	2^+			E(level): 8748.22 *9* (1990Ki07), 8747.7 *5* (1988Sc23).
8764.18 *6*	3^-			≈9% γ-branching undetermined.
8934.81 *7*	2^+		0.09 *4*	
8978?				E(level): from 1971Da08 only.
8994.50 *11*	$(1^-,2^+)$		0.15 *6*	
9031.9 *3*	4^-			Γ_p=1.5Γ_γ from intensity balance.
9091.70 *6*	3^-		0.28 *11*	E(p)(lab)=783.23 *11*.
9135.66 *5*	$(2,3)^-$		0.6 *2*	

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

^{40}Ca Levels (continued)

E(level)[†]	Jπ[‡]	S(p,γ) (eV)[b]	Comments
9209.77 *5*	(2,3)$^-$	0.39 *16*	
9226.69 *5*	(1$^-$,2,3$^-$)	0.28 *11*	S(p,γ) (eV): for 9226.69+9227.43.
9227.43 *7*	(1,2$^+$)	0.28 *11*	S(p,γ) (eV): for 9226.69+9227.43.
9362.54 *6*	3$^-$	0.43 *17*	
9377.7 *2*	(2,3,4)$^-$	0.24 *10*	E(p)(lab)=1076.70 *18*.
9388.20 *19*	2$^+$	0.26 *10*	E(p)(lab)=1087.35 *17*.
9395.6 *3*		0.09 *4*	E(p)(lab)=1095.0 *3*.
9404.85 *19*	2$^-$#	0.36 *14*	E(p)(lab)=1104.43 *17*.
9406.3 *6*	0$^+$	0.40 *10*	E(p)(lab)=1106.0 *6*.
9412.3 *2*		0.18 *7*	E(p)(lab)=1112.2 *2*.
9418.8 *2*	3$^-$	0.6 *2*	E(p)(lab)=1118.76 *18*.
9429.11 *5*	(3,4)$^-$	0.2 *2*	
9432.46 *18*	1$^-$	2.6 *11*	E(p)(lab)=1132.8 *4*.
9453.95 *5*	3$^-$	0.8 *3*	E(p)(lab)=1154.85 *11*.
9499.9 *15*	2$^+$	0.42 *17*	E(p)(lab)=1202.0 *15*.
9536.24 *16*		1.1 *4*	E(p)(lab)=1239.33 *13*.
9537.8 *5*	1$^-$	0.24 *10*	E(p)(lab)=1240.9 *5*.
9603.0 *4*	3$^-$#	2.4 *10*	E(p)(lab)=1307.7 *4*. Jπ: parity from Adopted Levels, but positive parity from 1967Le12 based on a resonance formation fit.
9604.6 *4*	1$^-$	5 *2*	E(p)(lab)=1309.7 *4*.
9632.7 *11*		≈0.2	S(p,γ) (eV): 1981Ch04. Not observed by 1990Ki07 (S<0.15). E(p)(lab)=1337.2 *10*.
9640.89 *7*	2$^-$#	5 *2*	Jπ: positive parity is impossible for a resonance formation fit (1967Le12).
9655.5 *9*		0.22 *9*	E(p)(lab)=1361.7 *9*.
9662.2 *2*		0.6 *2*	E(p)(lab)=1368.6 *2*.
9668.71 *8*	3$^-$	2.4 *10*	
9779.49 *7*	3#	2.2 *9*	E(p)(lab)=1488.53 *12*.
9785.3 *2*	(1,2$^+$)	1.0 *4*	E(p)(lab)=1494.68 *19*.
9802.1 *7*		0.37 *15*	E(p)(lab)=1512.2 *7*.
9807.2 *11*		≈0.2	E(p)(lab)=1516.2 *10*. From 1981Ch04. Not observed by 1990Ki07 (S<0.2).
9811.0 *2*	(3$^-$,4$^-$,5$^-$)	0.27 *11*	E(p)(lab)=1521.18 *18*.
9829.43 *16*		0.8 *3*	E(p)(lab)=1540.11 *14*.
9834.97 *19*		0.6 *3*	E(p)(lab)=1545.79 *17*.
9854.43 *17*		1.1 *4*	E(p)(lab)=1565.76 *15*.
9859.6 *3*	4$^-$,5$^-$,6$^-$	0.5 *2*	E(p)(lab)=1571.1 *3*.
9865.15 *11*	1#	6 *2*	E(p)(lab)=1576.74 *15*.
9869.3 *4*	1$^+$	3.1 *12*	E(p)(lab)=1580.9 *4*.
9898.5 *3*		0.6 *2*	E(p)(lab)=1611.0 *3*.
9921.3 *2*	(3$^-$,4$^-$,5$^-$)	0.43 *17*	E(p)(lab)=1634.33 *18*.
9939.7 *2*		0.13 *5*	E(p)(lab)=1653.2 *2*.
9954.00 *9*	4$^+$#	1.6 *6*	
9977.09 *17*	(3,4,5)	1.1 *4*	E(p)(lab)=1691.60 *15*.
9993.6 *15*		0.5 *2*	E(p)(lab)=1708.6 *15*.
10040.54 *9*	(2$^-$,3$^-$)	0.5 *2*	
10045.6 *5*			E(p)(lab)=1761.9 *5*.
10049.38 *7*	4$^-$	4.5 *19*	E(p)(lab)=1765.58 *12*.
10057.9 *3*		0.17 *7*	E(p)(lab)=1774.5 *2*.
10080.6 *2*		0.9 *4*	E(p)(lab)=1797.78 *18*.
10130.59 *19*	(3$^-$,4$^+$)	1.4 *6*	E(p)(lab)=1849.07 *17*.
10136.6? *16*		≈0.5	E(p)(lab)=1854.1 *15*. from 1981Ch04. Not observed by 1990Ki07 (S<0.3).
10199.1 *4*	1$^-$	0.6 *2*	E(p)(lab)=1919.3 *4*.
10205.0 *8*		0.23 *9*	E(p)(lab)=1925.4 *8*.

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

^{40}Ca Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	S(p,γ) (eV)[b]	Comments
10210.5 *2*	3$^-$,4$^-$	1.4 *6*	E(p)(lab)=1931.0 *2*.
10232.7 *7*		1.3 *5*	E(p)(lab)=1953.8 *7*.
10262.53 *10*	3$^-$	1.3 *5*	
10267.6 *5*	1$^-$	0.19 *8*	E(p)(lab)=1989.6 *5*.
10274.7 *3*	3$^+$,4$^+$,5$^+$	0.28 *11*	E(p)(lab)=1996.9 *3*.
10277.8 *2*	(1$^-$)	0.7 *3*	E(p)(lab)=2000.1 *2*.
10284.9 *3*	1$^-$	0.7 *3*	E(p)(lab)=2007.4 *3*.
10318.8 *4*	1$^+$[#]	14.3 *10*	J$^{\pi}$: 1963Le08. S(p,γ) (eV): from 1981Ch04, used for calibration.
10332.5 *15*	(3)$^-$	0.8 *3*	E(p)(lab)=2056.2 *15*.
10358.5 *15*		0.6 *2*	E(p)(lab)=2082.9 *15*.
10361.4 *15*		2.1 *8*	E(p)(lab)=2085.9 *15*.
10375.4 *15*	1$^-$	1.2 *5*	E(p)(lab)=2100.2 *15*.
10383.79 *16*	(1$^-$,2$^+$)	2.0 *8*	E(p)(lab)=2108.83 *13*.
10415.06 *6*	3	5.8 *19*	
10420.6 *10*	1$^-$	0.8 *3*	E(p)(lab)=2146.6 *10*.
10430.47 *19*	(2$^+$)	3.1 *10*	E(p)(lab)=2156.72 *17*.
10441.3 *6*		2.5 *8*	E(p)(lab)=2167.8 *6*.
10443.8 *2*	2$^-$	1.7 *5*	E(p)(lab)=2170.4 *2*.
10469.9 *15*	(3,5)$^-$	0.6 *2*	E(p)(lab)=2197.2 *15*.
10478.6 *15*		1.0 *4*	E(p)(lab)=2206.1 *15*.
10503.0 *15*	(3,4,5)$^-$	1.1 *4*	E(p)(lab)=2231.1 *15*.
10514.7 *15*	(3$^-$,4$^+$,5$^-$)	2.5 *10*	E(p)(lab)=2243.1 *15*.
10527.7 *15*	(1$^+$)	3.7 *15*	E(p)(lab)=2256.5 *15*.
10539.9 *15*	2$^+$	1.0 *3*	E(p)(lab)=2269.0 *15*.
10552.1 *15*		1.8 *7*	E(p)(lab)=2281.5 *15*.
10632.6 *2*	(1,3)$^-$	2.1 *8*	E(p)(lab)=2364.04 *19*.
10639.07 *7*	(3$^-$,4,5$^-$)	11 *4*	
10646.3 *4*	NATURAL	1.5 *6*	E(p)(lab)=2378.1 *4*.
10653.12 *16*		8 *3*	E(p)(lab)=2385.14 *14*.
10670.3 *3*		18 *7*	E(p)(lab)=2402.8 *3*.
10673.58 *17*	2$^-$	5 *2*	E(p)(lab)=2406.13 *15*.
10677? *3*	1$^-$	0.7 *2*	E(p)(lab)=2408 *3*. from 1981Ch04. Not observed by 1990Ki07 (S<0.6).
10690.9 *3*		3.4 *14*	E(p)(lab)=2423.9 *3*.
10699.50 *10*	3	10 *4*	
10720.7 *3*	(3,5)$^-$	2.1 *7*	E(p)(lab)=2454.5 *3*.
10737.7 *3*	1$^-$	4.6 *18*	24% *3* γ-branching undetermined.
10747.8 *4*	(4$^+$)	15 *6*	
10753.74 *18*		4.5 *18*	E(p)(lab)=2488.37 *16*.
10770.2 *3*	(1$^+$)	7 *3*	E(p)(lab)=2505.1 *3*.
10776.2 *3*		16 *6*	E(p)(lab)=2511.4 *3*.
10780.8 *3*	3$^-$	6 *2*	E(p)(lab)=2516.1 *3*.
10787.6 *3*		3.0 *12*	E(p)(lab)=2523.1 *3*.
10799.9 *10*		1.1 *4*	E(p)(lab)=2535.7 *10*.
10813.6 *5*	(3$^-$,4$^+$,5$^-$)	12.0 *5*	E(p)(lab)=2549.8 *5*.
10829.9 *6*		2.7 *10*	E(p)(lab)=2566.5 *6*.
10848.4 *4*	(3,4,5)$^-$	4.4 *17*	E(p)(lab)=2585.5 *4*.
10868.7 *4*	1$^-$	5.2 *19*	E(p)(lab)=2606.3 *4*.
10910.0 *4*	(3,4,5$^-$)	7 *3*	E(p)(lab)=2648.6 *4*.
10921.1 *4*	(2$^+$,3,4$^-$)	9 *4*	E(p)(lab)=2659.9 *4*.
10934.3 *5*		5 *2*	E(p)(lab)=2673.6 *5*.
10951.4 *4*	1$^-$	16 *4*	E(p)(lab)=2691.1 *4*.
10956.0 *4*	3$^-$	4.0 *16*	E(p)(lab)=2695.8 *4*.
10976.2 *5*	(3,4,5)	9 *3*	E(p)(lab)=2716.6 *5*.
10988.0 *4*	(3$^-$,4$^+$)	8 *3*	E(p)(lab)=2728.6 *4*.

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

^{40}Ca Levels (continued)

E(level)[†]	J$^\pi$[‡]	S(p,γ) (eV)[b]	Comments
10994.7 *4*	(2$^+$,3,4$^+$)	11 *4*	E(p)(lab)=2735.5 *4*.
11002.3 *5*		2.9 *12*	E(p)(lab)=2743.4 *5*.
11011.0 *4*	3$^-$	14 *5*	
11023.8 *5*	(1,3)$^-$	6 *2*	E(p)(lab)=2765.3 *5*.
11042.0 *5*	(1$^-$ to 4$^+$)	6 *2*	E(p)(lab)=2784.0 *5*.
11070.6 *4*	(3)	31 *12*	J$^\pi$: from 1971Da08; (3,4$^+$) in Adopted Levels. E(p)(lab)=2813.3 *4*.
11080	1$^-$		E(level): level from 1971Da08. E(p)(lab)=2821.
11117.0 *5*		5 *2*	E(p)(lab)=2861.0 *5*.
11127.1 *5*		6 *2*	E(p)(lab)=2871.4 *5*.
11165.2 *4*		2.0 *8*	E(p)(lab)=2910.5 *4*.
12038[d] *3*	(3,4,5)$^-$		E(p)(lab)=3804 *3*. Γ_p(to 3352)=0.07 keV *3*. Resonance strengths: 0.9 eV *4* to g.s., 1.0 eV *5* (first 2$^+$ to g.s.), 2.3 eV *8* (first 3$^-$ to g.s.) (1985Se16).
12049[d] *3*	2$^+$		E(p)(lab)=3815 *3*. Γ_p(to 3352)=0.66 keV *13*. Resonance strengths: 0.7 eV *3* to g.s., 1.2 eV *6* (first 2$^+$ to g.s.), 0.5 eV *2* (first 3$^-$ to g.s.) (1985Se16).
12068[d] *3*			E(p)(lab)=3834 *3*. Resonance strengths: 9 eV *3* to g.s. (1985Se16).
12074[d] *3*			E(p)(lab)=3841 *3*. Γ_p(to 3352)=0.030 keV *17*. Resonance strengths: 0.7 eV *3* to g.s., 1.5 eV *6* (first 2$^+$ to g.s.), 1.1 eV *5* (first 3$^-$ to g.s.) (1985Se16).
12099[a] *10*		5.1[c]	E(p)(lab)=3863 *10*.
12111[a] *10*		3.5[c]	E(p)(lab)=3875 *10*.
12204[a] *10*		2.5[c]	E(p)(lab)=3970 *10*.
12334[a] *10*		3.4[c]	E(p)(lab)=4104 *10*.
12423[a] *10*		2.3[c]	E(p)(lab)=4195 *10*.
12604[a] *10*		5.9[c]	E(p)(lab)=4380 *10*.
12647[a] *10*		[c]	E(p)(lab)=4425 *10*.
12668[a] *10*		14.5[c]	E(p)(lab)=4446 *10*.
12688[a] *10*		4.4[c]	E(p)(lab)=4467 *10*.
12875[a] *10*		6.1[c]	E(p)(lab)=4658 *10*.
12980[a] *10*		4.2[c]	E(p)(lab)=4766 *10*.
12996[a] *10*		[c]	E(p)(lab)=4783 *10*.
13086[a] *10*		2.1[c]	E(p)(lab)=4875 *10*.
13113[a] *10*		18.4[c]	E(p)(lab)=4903 *10*.
13194[a] *10*		13.9[c]	E(p)(lab)=4986 *10*.
13203[a] *10*		6.1[c]	E(p)(lab)=4995 *10*.
13289[a] *10*		8.1[c]	E(p)(lab)=5083 *10*.
13822[a] *10*		2.9[c]	E(p)(lab)=5630 *10*.
13913[a] *10*		56.0[c]	E(p)(lab)=5723 *10*.
13993[a] *10*		112.0[c]	E(p)(lab)=5805 *10*.
18260[&] *5*	1		E(p)(lab)=10190.
18680[&] *5*	1		E(p)(lab)=10620.
19070[&] *5*	1		E(p)(lab)=11020.
19450[&] *5*	1		E(p)(lab)=11410.
19850[&] *5*	1		E(p)(lab)=11820.
20130[&] *5*			E(p)(lab)=12110.

Continued on next page (footnotes at end of table)

^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

^{40}Ca Levels (continued)

E(level)[†]	J$^\pi$[‡]	Comments
20430[&] *5*	1	E(p)(lab)=12420.
20650[&] *5*	1	E(p)(lab)=12640.
20940[&] *5*	1	E(p)(lab)=12940.
21490[&] *5*		E(p)(lab)=13500.
21690[&] *5*		E(p)(lab)=13710.
22060[&] *5*		E(p)(lab)=14090.

[†] From 1990Ki07, unless otherwise noted. Values are from a least-squares fit to γ-ray energies by authors where levels are connected by γ rays, and otherwise are deduced from E(p)(lab) as given under comments and S(p)(^{40}Ca). Where value (below 8750) is also available in 1988Sc23, weighted average is taken. For levels deduced from E(p)(lab), 1990Ki07 use S(p)(^{40}Ca)=8328.28 *9* determined in their work; the evaluator has corrected their values using the Adopted S(p)=8328.17 *2* (2012Wa38). E(p)(lab) values are from 1990Ki07 up to 2910, from 1985Se16 for 3804-3841, from 1968Ba22 for 3863-5805, and from 1973Di02 for 10190-14090.

[‡] From Adopted Levels, unless otherwise noted. 1967Le12 and 1963Le08 report assignments based on measured $\gamma\gamma(\theta)$ and γ(pol), which have been considered for J^π assignments in Adopted Levels.

[#] Spin from p$\gamma\gamma(\theta)$ (1967Le12).

[@] From DSAM (1990Ki07), unless otherwise noted.

[&] From 1973Di02; E(p)=6.5-17.5 MeV (Δ(E(p))≈5 keV).

[a] From 1968Ba22.

[b] From 1990Ki07, unless otherwise stated.

[c] From 1968Ba22, using Γ=26 eV for E(p)=2050 resonance (2042.0 resonance listed here).

[d] From 1985Se16.

γ(^{40}Ca)

E$_i$(level)	J$_i^\pi$	E$_\gamma$[†]	I$_\gamma$[‡]	E$_f$	J$_f^\pi$	Mult.[#]	Comments
3352.64	0$^+$	3352.5		0	0$^+$	[E0]	Decay is mainly by e$^+$e$^-$ pair emission.
3736.69	3$^-$	384.1[h]	<0.04	3352.64	0$^+$		
		3736.8 *3*	100	0	0$^+$	[E3]	E$_\gamma$: from 1968Li12, 3736.5 from level-energy difference.
3904.38	2$^+$	167.7[h]	<0.9	3736.69	3$^-$		
		551.8[h]	<0.1	3352.64	0$^+$		
		3904.5 *3*	100	0	0$^+$		E$_\gamma$: from 1968Li12, 3904.2 from level-energy difference.
4491.44	5$^-$	754.8 *3*	100	3736.69	3$^-$	E2	E$_\gamma$: from 1968Li12, 754.7 from level-energy difference. δ(M3/E2)=−0.01 *2* (1967Le12), −0.05 *3* (1963Le08).
		1138.8[h]	<0.9	3352.64	0$^+$		
		4491.2[h]	<1.6	0	0$^+$		
5211.7	0$^+$	720.2[h]	<1.3	4491.44	5$^-$		
		1307.3	100	3904.38	2$^+$		
		1475.0[h]	<1.3	3736.69	3$^-$		
5248.81	2$^+$	757.4[h]	<1.1	4491.44	5$^-$		
		1344.4	15.1 *9*	3904.38	2$^+$		I$_\gamma$: 14.8 *11* (1988Sc23), 15.3 *9* (1990Ki07).
		1512.1[h]	<0.6	3736.69	3$^-$		
		1896.1	5.1 *6*	3352.64	0$^+$		I$_\gamma$: 5.4 *8* (1988Sc23), 4.9 *6* (1990Ki07).
		5248.9 *6*	79.8 *12*	0	0$^+$		E$_\gamma$: from 1968Li12, 5248.4 from level-energy difference. I$_\gamma$: 79.8 *23* (1988Sc23), 79.8 *12* (1990Ki07).
5278.81	4$^+$	787.4	3.0 *15*	4491.44	5$^-$		I$_\gamma$: from 1988Sc23. Other: <1.1 (1990Ki07).

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
5278.81	4^+	1374.5 *4*	97.0 *15*	3904.38	2^+	E2		E_γ: from 1968Li12, 1374.4 from level-energy difference. I_γ: from 1988Sc23. Other: 100 (1990Ki07). δ(M3/E2)=−0.02 *5* (1967Le12).
		1542.1[h]	<0.9	3736.69	3^-			
		5278.4[h]	<1.8	0	0^+			I_γ: from 1990Ki07. Other: <6 (1988Sc23).
5613.53	4^-	334.7[h]	<7	5278.81	4^+			
		364.7[h]	<6	5248.81	2^+			
		401.8[h]	<6	5211.7	0^+			
		1121.5 *6*	29.5 *20*	4491.44	5^-	M1+E2	−0.7 *2*	E_γ: from 1968Li12, 1122.1 from level-energy difference. I_γ: 27.5 *14* (1988Sc23), 31.4 *14* (1990Ki07).
		1709.1[h]	<2	3904.38	2^+			
		1877.0 *3*	70.5 *20*	3736.69	3^-	M1+E2	−0.27 *5*	E_γ: from 1968Li12, 1876.8 from level-energy difference. I_γ: 72.5 *14* (1988Sc23), 68.6 *14* (1990Ki07).
		2260.8[h]	<3	3352.64	0^+			
5629.43	2^+	350.6[h]	<1.1	5278.81	4^+			
		380.6[h]	<1.0	5248.81	2^+			
		417.7[h]	<1.6	5211.7	0^+			
		1138.0[h]	<0.6	4491.44	5^-			
		1725.0[h]	<0.8	3904.38	2^+			
		1892.7[h]	<1.1	3736.69	3^-			
		2276.7	12.3 *9*	3352.64	0^+			I_γ: 13.4 *16* (1988Sc23), 12.0 *9* (1990Ki07).
		5628.3 *13*	87.7 *9*	0	0^+			E_γ: from 1968Li12, 5629.0 from level-energy difference. I_γ: 86.6 *16* (1988Sc23), 88.0 *9* (1990Ki07).
5902.63	1^-	289.1[h]	<0.6	5613.53	4^-			
		623.8[h]	<0.5	5278.81	4^+			
		653.8[h]	<0.5	5248.81	2^+			
		690.9[h]	<0.5	5211.7	0^+			
		1411.2[h]	<0.7	4491.44	5^-			
		1998.2[h]	<0.8	3904.38	2^+			
		2165.9[h]	<9	3736.69	3^-			
		2549.9[h]	<5	3352.64	0^+			
		5902.7 *11*	100	0	0^+			E_γ: from 1968Li12, 5902.2 from level-energy difference.
6025.47	2^-	122.8[h]	<3	5902.63	1^-			
		396.0[h]	<0.4	5629.43	2^+			
		411.9[h]	<0.4	5613.53	4^-			
		746.7[h]	<0.4	5278.81	4^+			
		776.7[h]	<0.4	5248.81	2^+			
		813.8[h]	<0.4	5211.7	0^+			
		1534.0[h]	<0.5	4491.44	5^-			
		2121.0	18.5 *22*	3904.38	2^+			I_γ: 22.4 *16* (1988Sc23), 17.3 *9* (1990Ki07).
		2288.7	81.5 *22*	3736.69	3^-			I_γ: 77.6 *16* (1988Sc23), 82.7 *9* (1990Ki07).
		2672.8[h]	<0.7	3352.64	0^+			
		6025.0[h]	<1.8	0	0^+			

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
6029.71	3+	127.1[h]	<4	5902.63	1−			
		400.3[h]	<2	5629.43	2+			
		416.2[h]	<2	5613.53	4−			
		750.9[h]	<1	5278.81	4+			
		780.9	20 *3*	5248.81	2+			I_γ: 12 *4* (1988Sc23), 21.2 *17* (1990Ki07).
		818.0[h]	<1	5211.7	0+			
		1538.2[h]	<6	4491.44	5−			
		2125.3	80 *3*	3904.38	2+			I_γ: 88 *4* (1988Sc23), 78.8 *17* (1990Ki07).
		2293.0[h]	<6	3736.69	3−			
		2677.0[h]	<5	3352.64	0+			
		6029.2[h]	<4	0	0+			
6285.15	3−	255.4	<0.3	6029.71	3+			
		259.7[h]	<0.3	6025.47	2−			
		382.5[h]	<0.3	5902.63	1−			
		655.7[h]	<0.6	5629.43	2+			
		671.6	0.9 *2*	5613.53	4−			
		1006.3[h]	<0.4	5278.81	4+			
		1036.3[h]	<0.3	5248.81	2+			
		1073.4[h]	<0.3	5211.7	0+			
		1793.9 *6*	72.0 *8*	4491.44	5−	Q+O	+0.03 *2*	E_γ: from 1968Li12, 1793.7 from level-energy difference. I_γ: 72.0 *8* (1988Sc23), 72.6 *11* (1990Ki07).
		2380.1 *10*	19.7 *5*	3904.38	2+			E_γ: from 1968Li12, 2380.7 from level-energy difference. I_γ: 19.7 *5* (1988Sc23), 19.8 *6* (1990Ki07).
		2548.4	3.2 *4*	3736.69	3−			I_γ: 3.0 *5* (1988Sc23), 3.5 *4* (1990Ki07).
		2932.4[h]	<0.7	3352.64	0+			
		6284.6	4.2 *5*	0	0+			I_γ: 5.3 *5* (1988Sc23), 3.1 *5* (1990Ki07).
6507.84	4+	605.2[h]	<3	5902.63	1−			
		878.4[h]	<2	5629.43	2+			
		894.3[h]	<2	5613.53	4−			
		1229.0[h]	<3	5278.81	4+			
		1259.0	15 *3*	5248.81	2+			
		1296.1[h]	<3	5211.7	0+			
		2016.4[h]	<2	4491.44	5−			
		2603.4	85 *3*	3904.38	2+			
		2771.1[h]	<3	3736.69	3−			
		3155.1[h]	<3	3352.64	0+			
		6507.3[h]	<9	0	0+			
6542.78	4+	513.1[h]	<5	6029.71	3+			
		517.3[h]	<2	6025.47	2−			
		640.1[h]	<1	5902.63	1−			
		913.3	19 *2*	5629.43	2+			
		929.2[h]	<2	5613.53	4−			
		1264.0	8 *2*	5278.81	4+			
		1294.0	14 *2*	5248.81	2+			
		2051.3[h]	<2	4491.44	5−			
		2638.3	59 *2*	3904.38	2+			

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Comments
6542.78	4$^+$	2806.0[h]	<3	3736.69	3$^-$	
		6542.2[h]	<4	0	0$^+$	
6582.54	3$^-$	552.8[h]	<0.5	6029.71	3$^+$	
		557.1[h]	<0.6	6025.47	2$^-$	
		679.9[h]	<0.5	5902.63	1$^-$	
		953.1[h]	<0.5	5629.43	2$^+$	
		969.0	17 *3*	5613.53	4$^-$	I_γ: 8 *4* (1988Sc23), 17.8 *15* (1990Ki07).
		1303.7[h]	<0.9	5278.81	4$^+$	
		1333.7[h]	<0.8	5248.81	2$^+$	
		1370.8[h]	<0.8	5211.7	0$^+$	
		2091.0	<0.7	4491.44	5$^-$	I_γ: other: 3 *2* (1988Sc23).
		2678.1	16.1 *12*	3904.38	2$^+$	I_γ: 21 *4* (1988Sc23), 15.8 *10* (1990Ki07).
		2845.7	66.5 *13*	3736.69	3$^-$	I_γ: 68 *6* (1988Sc23), 66.4 *13* (1990Ki07).
		3229.8[h]	<3	3352.64	0$^+$	
		6582.0[h]	<2	0	0$^+$	
6750.41	2$^-$	720.7[h]	<3	6029.71	3$^+$	
		724.9[h]	<2	6025.47	2$^-$	
		847.8[h]	<3	5902.63	1$^-$	
		1121.0[h]	<7	5629.43	2$^+$	
		1136.9[h]	<2	5613.53	4$^-$	
		1471.6[h]	<3	5278.81	4$^+$	
		1501.6[h]	<8	5248.81	2$^+$	
		1538.7[h]	<3	5211.7	0$^+$	
		2258.9[h]	<3	4491.44	5$^-$	
		2845.9[h]	<10	3904.38	2$^+$	
		3013.6	100	3736.69	3$^-$	
		3397.6[h]	<8	3352.64	0$^+$	
		6749.8[h]	<8	0	0$^+$	
6908.70	2$^+$	879.0[h]	<0.3	6029.71	3$^+$	
		883.2[h]	<0.3	6025.47	2$^-$	
		1006.1[h]	<0.3	5902.63	1$^-$	
		1279.3[h]	<0.6	5629.43	2$^+$	
		1295.2[h]	<0.4	5613.53	4$^-$	
		1629.9[h]	<0.9	5278.81	4$^+$	
		1659.9[h]	<0.4	5248.81	2$^+$	
		1697.0[h]	<0.4	5211.7	0$^+$	
		2417.2[h]	<0.6	4491.44	5$^-$	
		3004.2[h]	<0.7	3904.38	2$^+$	
		3171.9[h]	<0.9	3736.69	3$^-$	
		3555.9[h]	<1.2	3352.64	0$^+$	
		6908.1	100	0	0$^+$	
6931.29	3$^-$	905.8[h]	<0.2	6025.47	2$^-$	
		1028.7[h]	<0.2	5902.63	1$^-$	
		1301.8	5.8 *3*	5629.43	2$^+$	
		1317.7	2.0 *3*	5613.53	4$^-$	
		1652.4[h]	<0.3	5278.81	4$^+$	

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Comments
6931.29	3$^-$	1682.4	6.1 *3*	5248.81	2$^+$	
		1719.6[h]	<0.2	5211.7	0$^+$	
		2439.8	1.4 *3*	4491.44	5$^-$	
		3026.8	2.0 *5*	3904.38	2$^+$	
		3194.5	82.7 *7*	3736.69	3$^-$	
		3578.5[h]	<0.4	3352.64	0$^+$	
		6930.7[h]	<3	0	0$^+$	
6950.49	1$^-$	920.8[h]	<2	6029.71	3$^+$	
		925.0[h]	<2	6025.47	2$^-$	
		1047.9[h]	<2	5902.63	1$^-$	
		1321.0[h]	<2	5629.43	2$^+$	
		1336.9[h]	<8	5613.53	4$^-$	
		1671.6[h]	<5	5278.81	4$^+$	
		1701.6[h]	<2	5248.81	2$^+$	
		1738.8[h]	<2	5211.7	0$^+$	
		2459.0[h]	<6	4491.44	5$^-$	
		3046.0[h]	<4	3904.38	2$^+$	
		3213.7[h]	<5	3736.69	3$^-$	
		3597.7[h]	<6	3352.64	0$^+$	
		6949.8	100	0	0$^+$	
7113.73	4$^-$	1084.0[h]	<0.3	6029.71	3$^+$	
		1088.2	1.1 *3*	6025.47	2$^-$	
		1211.1[h]	<0.5	5902.63	1$^-$	
		1484.3[h]	<0.4	5629.43	2$^+$	
		1500.2	6.7 *7*	5613.53	4$^-$	I_γ: 7.7 *6* (1988Sc23), 6.2 *4* (1990Ki07).
		1834.9	1.7 *3*	5278.81	4$^+$	
		1864.9[h]	<0.6	5248.81	2$^+$	
		1902.0[h]	<0.4	5211.7	0$^+$	
		2622.4 *10*	26.4 *13*	4491.44	5$^-$	E_γ: from 1968Li12, 2622.2 from level-energy difference. I_γ: 30.0 *14* (1988Sc23), 25.9 *5* (1990Ki07).
		3209.2[h]	<0.8	3904.38	2$^+$	
		3377.0 *10*	64.8 *9*	3736.69	3$^-$	E_γ: from 1968Li12, 3376.9 from level-energy difference. I_γ: 62.3 *20* (1988Sc23), 65.1 *7* (1990Ki07).
		3760.9[h]	<1.0	3352.64	0$^+$	
		7113.1[h]	<1.2	0	0$^+$	
7114.0	1$^-$	3208.5		3904.38	2$^+$	
		7113.3		0	0$^+$	
7239.07	(3$^-$,4,5$^-$)	3502.2		3736.69	3$^-$	
7277.82	(2,3)$^+$	1248.1[h]	<3	6029.71	3$^+$	
		1252.3[h]	<6	6025.47	2$^-$	
		1648.4[h]	<5	5629.43	2$^+$	
		1664.3[h]	<4	5613.53	4$^-$	
		1999.0[h]	<10	5278.81	4$^+$	
		2029.0[h]	<6	5248.81	2$^+$	
		2066.1[h]	<5	5211.7	0$^+$	
		2786.3[h]	<7	4491.44	5$^-$	
		3541.0	100	3736.69	3$^-$	
		3925.0[h]	<5	3352.64	0$^+$	

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Comments
7277.82	$(2,3)^+$	7277.1[h]	<3	0	0^+	
7300.74	0^+	1271.0[h]	<1.2	6029.71	3^+	
		1275.3[h]	<1.2	6025.47	2^-	
		1398.1[h]	<6	5902.63	1^-	
		1671.3	5.0 *15*	5629.43	2^+	I_γ: other: 3 *1* (1988Sc23). 1988Sc23 report unobserved branching of 12%.
		1687.2[h]	<1.0	5613.53	4^-	
		2021.9[h]	<1.3	5278.81	4^+	
		2051.9	95.0 *15*	5248.81	2^+	I_γ: other: 85 *5* (1988Sc23). 1988Sc23 report unobserved branching of 12%.
		2809.2[h]	<6	4491.44	5^-	
		3396.2[h]	<5	3904.38	2^+	
		3563.9[h]	<2	3736.69	3^-	
7446.23	$3^+,4^+$	1416.5[h]	<0.4	6029.71	3^+	
		1420.7[h]	<0.4	6025.47	2^-	
		1543.6[h]	<0.4	5902.63	1^-	
		1816.8	12.8 *7*	5629.43	2^+	
		1832.7	20.7 *8*	5613.53	4^-	
		2167.4	23.8 *12*	5278.81	4^+	
		2196.9 *19*	42.7 *11*	5248.81	2^+	E_γ: from 1968Li12, 2197.4 from level-energy difference.
		2234.5[h]	<0.4	5211.7	0^+	
		2954.7[h]	<1.4	4491.44	5^-	
		3541.7[h]	<2	3904.38	2^+	
		3709.4[h]	<0.9	3736.69	3^-	
		4093.4[h]	<0.7	3352.64	0^+	
		7445.5[h]	<0.8	0	0^+	
7466.37	2^+	1436.6[h]	<0.4	6029.71	3^+	
		1440.9[h]	<0.4	6025.47	2^-	
		1563.7[h]	<0.4	5902.63	1^-	
		1836.9[h]	<0.6	5629.43	2^+	
		1852.8[h]	<1.1	5613.53	4^-	
		2187.5[h]	<0.6	5278.81	4^+	
		2217.5	13.2 *17*	5248.81	2^+	I_γ: from 1990Ki07, not observed in 1988Sc23.
		2254.6[h]	<0.6	5211.7	0^+	
		2974.8[h]	<1.0	4491.44	5^-	
		3561.8	19.9 *14*	3904.38	2^+	I_γ: other: 28 *4* (1988Sc23).
		3729.5[h]	<1.7	3736.69	3^-	
		4113.5	11.6 *10*	3352.64	0^+	I_γ: other: 10 *2* (1988Sc23).
		7465.6	55.3 *19*	0	0^+	I_γ: other: 62 *4* (1988Sc23).
7481?		7480		0	0^+	
7532.26	2^-	1247.1	9.8 *9*	6285.15	3^-	I_γ: from 1990Ki07, not reported in 1988Sc23.
		1502.5[h]	<1.4	6029.71	3^+	
		1506.8	4.8 *4*	6025.47	2^-	I_γ: from 1990Ki07, not reported in 1988Sc23.
		1629.6	3.4 *10*	5902.63	1^-	I_γ: from 1990Ki07, not reported in 1988Sc23.
		1902.8[h]	<0.6	5629.43	2^+	
		1918.7	24.2 *14*	5613.53	4^-	I_γ: other: 30.5 *12* (1988Sc23).
		2253.4[h]	<1.4	5278.81	4^+	
		2283.4[h]	<3	5248.81	2^+	

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

γ(^{40}Ca) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Comments
7532.26	2$^-$	2320.5[h]	<0.7	5211.7	0$^+$	
		3040.7[h]	<0.9	4491.44	5$^-$	
		3627.7	15.3 *14*	3904.38	2$^+$	I_γ: other: 14.2 *8* (1988Sc23).
		3795.4 *10*	42.5 *16*	3736.69	3$^-$	E_γ: from 1968Li12, 3795.4 from level-energy difference. I_γ: other: 55.3 *13* (1988Sc23).
		4179.4[h]	<0.9	3352.64	0$^+$	
		7531.5[h]	<2	0	0$^+$	
7561.18	4$^+$	1531.4	28 *3*	6029.71	3$^+$	I_γ: 30 *3* (1988Sc23), 27 *3* (1990Ki07).
		1535.7[h]	<1.8	6025.47	2$^-$	
		1658.5[h]	<0.6	5902.63	1$^-$	
		1931.7[h]	<0.8	5629.43	2$^+$	
		1947.6[h]	<0.9	5613.53	4$^-$	
		2282.3[h]	<0.9	5278.81	4$^+$	
		2313.0 *6*	63 *8*	5248.81	2$^+$	E_γ: from 1968Li12, 2312.3 from level-energy difference. I_γ: 61 *8* (1988Sc23), 65 *8* (1990Ki07).
		2349.4[h]	<1.5	5211.7	0$^+$	
		3069.6[h]	<0.8	4491.44	5$^-$	
		3656.6[h]	<4	3904.38	2$^+$	
		3824.3	9 *2*	3736.69	3$^-$	I_γ: 9 *2* (1988Sc23), 8 *5* (1990Ki07).
		4208.3[h]	<0.6	3352.64	0$^+$	
		7560.4[h]	<1.5	0	0$^+$	
7623.11	(2$^-$,3,4$^+$)	1593.4[h]	<0.5	6029.71	3$^+$	
		1597.6[h]	<0.5	6025.47	2$^-$	
		1720.4[h]	<0.7	5902.63	1$^-$	
		1993.6	35.9 *10*	5629.43	2$^+$	I_γ: other: 35 *10* (1988Sc23).
		2011.4 *12*	32.2 *10*	5613.53	4$^-$	E_γ: from 1968Li12, 2009.5 from level-energy difference. I_γ: other: 10 *6* (1988Sc23).
		2344.2[h]	<0.9	5278.81	4$^+$	
		2374.2	11.3 *7*	5248.81	2$^+$	I_γ: not reported in 1988Sc23.
		2411.3[h]	<0.5	5211.7	0$^+$	
		3131.5[h]	<0.7	4491.44	5$^-$	
		3718.5[h]	<1.0	3904.38	2$^+$	
		3886.2	20.6 *7*	3736.69	3$^-$	I_γ: other: 55 *15* (1988Sc23).
		4270.3[h]	<0.9	3352.64	0$^+$	
		7622.3[h]	<0.5	0	0$^+$	
7658.23	4$^-$	1373.1	13 *2*	6285.15	3$^-$	I_γ: not reported in 1988Sc23.
		2044.6	39 *3*	5613.53	4$^-$	I_γ: other: 43 *6* (1988Sc23).
		2379.3[h]	<2	5278.81	4$^+$	
		2446.5[h]	<2	5211.7	0$^+$	
		3166.7	22 *3*	4491.44	5$^-$	I_γ: other: 22 *4* (1988Sc23).
		3753.7[h]	<4	3904.38	2$^+$	
		3921.3	26 *3*	3736.69	3$^-$	I_γ: other: 35 *6* (1988Sc23).
		4305.4[h]	<4	3352.64	0$^+$	
		7657.4[h]	<0.3	0	0$^+$	
7676.6	(6$^+$)	2397.7	100	5278.81	4$^+$	
7694.08	3$^-$	1664.4[h]	<1.2	6029.71	3$^+$	
		1668.6[h]	<1.3	6025.47	2$^-$	
		1791.5[h]	<8	5902.63	1$^-$	

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Comments
7694.08	3$^-$	2064.7[h]	<1.2	5629.43	2$^+$	
		2080.6	9.2 *12*	5613.53	4$^-$	I_γ: other: 9.3 *18* (1988Sc23).
		2415.3[h]	<1.5	5278.81	4$^+$	
		2445.3[h]	<1.5	5248.81	2$^+$	
		2482.4[h]	<1.7	5211.7	0$^+$	
		3202.6[h]	<2	4491.44	5$^-$	
		3789.6[h]	<2	3904.38	2$^+$	
		3958.6 *13*	90.8 *12*	3736.69	3$^-$	E_γ: from 1968Li12, 3957.3 from level-energy difference. I_γ: other: 90.7 *18* (1988Sc23).
		4341.3[h]	<1.9	3352.64	0$^+$	
		7693.4[h]	<3	0	0$^+$	
7701.8	0$^+$	1672.1[h]	<5	6029.71	3$^+$	
		1676.3[h]	<5	6025.47	2$^-$	
		3797.2	100	3904.38	2$^+$	
7769.4	(3,4,5)$^-$	2155.8	34 *6*	5613.53	4$^-$	
		4032.5	66 *6*	3736.69	3$^-$	
7872.18	2$^+$	2258.6[h]	<6	5613.53	4$^-$	
		2593.3[h]	<5	5278.81	4$^+$	
		2623.3[h]	<11	5248.81	2$^+$	
		3967.6[h]	<5	3904.38	2$^+$	
		7871.4	100[&]	0	0$^+$	
7928.37	4$^+$	1898.7[h]	<4	6029.71	3$^+$	
		1902.9[h]	<4	6025.47	2$^-$	
		2025.7[h]	<3	5902.63	1$^-$	
		2298.9[h]	<4	5629.43	2$^+$	
		2314.8	50 *9*	5613.53	4$^-$	
		2649.5[h]	<3	5278.81	4$^+$	
		2679.5[h]	<6	5248.81	2$^+$	
		2716.6[h]	<3	5211.7	0$^+$	
		3436.8	50 *9*	4491.44	5$^-$	
		4023.8[h]	<5	3904.38	2$^+$	
		4191.5[h]	<7	3736.69	3$^-$	
		4575.5[h]	<4	3352.64	0$^+$	
		7927.6[h]	<6	0	0$^+$	
7976?		1433		6542.78	4$^+$	
8091.61	2$^+$	8090.7	100	0	0$^+$	
8134.76	(3$^-$)	2505.3	28 *3*	5629.43	2$^+$	I_γ: from 1988Sc23.
		2521.2	8 *3*	5613.53	4$^-$	I_γ: from 1988Sc23.
		3643.1[h]	<5	4491.44	5$^-$	I_γ: from 1988Sc23.
		4230.1	34 *10*	3904.38	2$^+$	I_γ: from 1988Sc23, 60 *20* from 1990Ki07. 1988Sc23 report 30% γ-branching undetermined, 1990Ki07 report 40% *20*.
8187.69	(3,4,5$^-$)	4450.7	100	3736.69	3$^-$	
8323.16	(1$^-$,2$^+$)	1572.7	7.4 *6*	6750.41	2$^-$	
		2038.0	1.3 *3*	6285.15	3$^-$	
		2297.6	15.6 *10*	6025.47	2$^-$	
		2420.5	1.1 *7*	5902.63	1$^-$	
		2693.6[h]	<0.4	5629.43	2$^+$	
		2709.5[h]	<0.3	5613.53	4$^-$	

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Comments
8323.16	(1$^-$,2$^+$)	3044.2[h]	<0.3	5278.81	4$^+$	
		3074.2	2.7 *5*	5248.81	2$^+$	
		3111.3[h]	<0.3	5211.7	0$^+$	
		3831.5[h]	<0.5	4491.44	5$^-$	
		4418.5[h]	<1.3	3904.38	2$^+$	
		4586.2	59.4 *19*	3736.69	3$^-$	1990Ki07 report 11% *2* γ-branching undetermined.
		4970.2[h]	<0.3	3352.64	0$^+$	
		8322.2	2.0 *7*	0	0$^+$	
8338.0	(2$^+$,3,4)	1795.2	60 *6*	6542.78	4$^+$	1990Ki07 report 15% *8* γ-branching undetermined.
		1830.1	25 *6*	6507.84	4$^+$	
8373.94	4$^+$	4469.3	70 *20*	3904.38	2$^+$	1990Ki07 report 30% *20* γ-branching undetermined.
8424.81	2$^-$	2395.0[h]	<3	6029.71	3$^+$	
		2399.3	13 *3*	6025.47	2$^-$	
		2522.1	17 *3*	5902.63	1$^-$	
		2795.3[h]	<6	5629.43	2$^+$	
		2811.2[h]	<3	5613.53	4$^-$	
		3145.9[h]	<4	5278.81	4$^+$	
		3175.9[h]	<4	5248.81	2$^+$	
		3213.0[h]	<4	5211.7	0$^+$	
		3933.2[h]	<4	4491.44	5$^-$	
		4520.2[h]	<4	3904.38	2$^+$	
		4687.8	70 *4*	3736.69	3$^-$	
		5071.9[h]	<6	3352.64	0$^+$	
		8423.9[h]	<1.5	0	0$^+$	
8439.0	0$^+$	2809.5	>80	5629.43	2$^+$	
8484.02	(1$^-$,2$^-$,3$^-$)	2581.3	37 *7*	5902.63	1$^-$	
		4747.0	63 *7*	3736.69	3$^-$	
8578.80	2$^+$	2549.0[h]	<4	6029.71	3$^+$	
		2553.2[h]	<4	6025.47	2$^-$	
		2949.3[h]	<4	5629.43	2$^+$	
		2965.2[h]	<4	5613.53	4$^-$	
		3299.8[h]	<5	5278.81	4$^+$	
		3329.8[h]	<5	5248.81	2$^+$	
		3367.0[h]	<5	5211.7	0$^+$	
		4087.1[h]	<4	4491.44	5$^-$	
		4674.1[h]	<4	3904.38	2$^+$	
		4841.8[h]	<6	3736.69	3$^-$	
		5225.8[h]	<7	3352.64	0$^+$	
		8577.8	100	0	0$^+$	
8678.29	4$^+$	2393.1	13 *5*	6285.15	3$^-$	
		4941.3	65 *15*	3736.69	3$^-$	1990Ki07 report 22% *16* γ-branching undetermined.
8748.20	2$^+$	8747.2	>80	0	0$^+$	
8764.18	3$^-$	2734.4	16 *6*	6029.71	3$^+$	
		3134.6	19 *7*	5629.43	2$^+$	
		3485.2	34 *10*	5278.81	4$^+$	1990Ki07 report ≈9% γ-branching undetermined.
		4859.5	22 *6*	3904.38	2$^+$	
8934.81	2$^+$	1402.5	4.6 *4*	7532.26	2$^-$	
		1657.0	1.3 *2*	7277.82	(2,3)$^+$	
		1821.0	0.65 *16*	7113.73	4$^-$	

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Comments
8934.81	2^+	1984.3	2.1 *3*	6950.49	1^-	
		2184.3	2.1 *3*	6750.41	2^-	
		2352.2	0.70 *10*	6582.54	3^-	
		2905.0	1.2 *4*	6029.71	3^+	
		2909.2	6.6 *7*	6025.47	2^-	
		3032.1	0.63 *17*	5902.63	1^-	
		3305.2	1.1 *2*	5629.43	2^+	
		3685.8	2.1 *9*	5248.81	2^+	
		3722.9	1.3 *3*	5211.7	0^+	
		5030.1	37.6 *17*	3904.38	2^+	
		5197.8	1.1 *5*	3736.69	3^-	
		5581.8	8.2 *8*	3352.64	0^+	
		8933.7	29 *2*	0	0^+	
8978?		5241		3736.69	3^-	E_γ: seen in 1971Da08 only.
8994.50	$(1^-,2^+)$	1880.7	0.33 *8*	7113.73	4^-	
		2085.7	0.46 *11*	6908.70	2^+	
		2244.0	0.45 *6*	6750.41	2^-	
		2411.9	0.33 *10*	6582.54	3^-	
		2709.3	0.48 *12*	6285.15	3^-	
		2968.9	1.1 *2*	6025.47	2^-	
		3364.9	6.5 *5*	5629.43	2^+	
		3782.6	6.1 *5*	5211.7	0^+	
		5089.8	6.2 *6*	3904.38	2^+	
		5257.4	1.8 *3*	3736.69	3^-	
		5641.5	1.6 *4*	3352.64	0^+	
		8993.4	74.6 *16*	0	0^+	
9031.9	4^-	1337.7	10 *3*	7694.08	3^-	
		2746.6	10 *3*	6285.15	3^-	
		3129.1[h]	<3	5902.63	1^-	
		3402.3[h]	<3	5629.43	2^+	
		3418.2	40 *5*	5613.53	4^-	
		3752.9	12 *5*	5278.81	4^+	
		3782.9[h]	<3	5248.81	2^+	
		3820.0[h]	<3	5211.7	0^+	
		4540.2	28 *5*	4491.44	5^-	
		5127.2[h]	<5	3904.38	2^+	
		5678.8[h]	<5	3352.64	0^+	
		9030.8[h]	<5	0	0^+	
9091.70	3^-	1397.5	2.14 *17*	7694.08	3^-	
		1468.6	0.76 *9*	7623.11	$(2^-,3,4^+)$	
		1625.3	0.41 *3*	7466.37	2^+	
		1813.8	1.26 *14*	7277.82	$(2,3)^+$	
		1852.6	0.73 *10*	7239.07	$(3^-,4,5^-)$	
		1977.9	0.55 *9*	7113.73	4^-	
		2341.2	0.57 *14*	6750.41	2^-	
		2509.1	1.04 *14*	6582.54	3^-	
		2806.4	5.1 *3*	6285.15	3^-	
		3061.9	2.5 *4*	6029.71	3^+	
		3066.1	2.9 *5*	6025.47	2^-	
		3188.9	1.5 *2*	5902.63	1^-	
		3812.7	8.5 *4*	5278.81	4^+	
		3842.7	4.5 *2*	5248.81	2^+	
		5187.0	9.4 *4*	3904.38	2^+	
		5354.6	58.1 *10*	3736.69	3^-	

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Comments
9135.66	(2,3)$^-$	710.8	1.01 *9*	8424.81	2$^-$	
		1263.5	0.32 *5*	7872.18	2$^+$	
		1441.5	5.2 *2*	7694.08	3$^-$	
		1603.4	3.7 *2*	7532.26	2$^-$	
		1857.8	0.25 *4*	7277.82	(2,3)$^+$	
		2021.9	1.84 *12*	7113.73	4$^-$	
		2185.1	0.46 *8*	6950.49	1$^-$	
		2385.2	0.62 *9*	6750.41	2$^-$	
		2553.0	2.03 *16*	6582.54	3$^-$	
		2850.4	13.8 *4*	6285.15	3$^-$	
		3110.1	0.25 *10*	6025.47	2$^-$	
		3232.9	3.0 *2*	5902.63	1$^-$	
		3522.0	0.30 *10*	5613.53	4$^-$	
		3886.7	0.49 *17*	5248.81	2$^+$	
		5230.9	8.0 *4*	3904.38	2$^+$	
		5398.6	58.7 *9*	3736.69	3$^-$	
9209.77	(2,3)$^-$	725.7	0.94 *10*	8484.02	(1$^-$,2$^-$,3$^-$)	
		785.0	3.3 *2*	8424.81	2$^-$	
		1515.6	4.5 *2*	7694.08	3$^-$	
		2096.0	1.60 *12*	7113.73	4$^-$	
		2259.2	2.8 *2*	6950.49	1$^-$	
		2459.3	1.95 *17*	6750.41	2$^-$	
		2627.1	2.2 *2*	6582.54	3$^-$	
		2924.5	4.0 *2*	6285.15	3$^-$	
		3184.2	1.6 *2*	6025.47	2$^-$	
		3307.0	10.7 *3*	5902.63	1$^-$	
		3580.2	2.1 *2*	5629.43	2$^+$	
		5305.0	2.9 *3*	3904.38	2$^+$	
		5472.7	61.6 *10*	3736.69	3$^-$	
9226.69	(1$^-$,2,3$^-$)	1694.4	13.3 *7*	7532.26	2$^-$	
		2276.1	2.11 *18*	6950.49	1$^-$	
		2476.2	3.2 *2*	6750.41	2$^-$	
		2941.4	3.7 *2*	6285.15	3$^-$	
		3323.9	0.29[a] *11*	5902.63	1$^-$	
		3977.7	1.63[b] *18*	5248.81	2$^+$	
		5321.9	0.30[c] *10*	3904.38	2$^+$	
		5489.6	5.2 *4*	3736.69	3$^-$	
		9225.6	11.8[d] *10*	0	0$^+$	
9227.43	(1,2$^+$)	3201.8	13.6 *5*	6025.47	2$^-$	
		3324.7	0.29[a] *11*	5902.63	1$^-$	
		3978.4	1.63[b] *18*	5248.81	2$^+$	
		5322.7	0.30[c] *10*	3904.38	2$^+$	
		5874.4	39.8 *12*	3352.64	0$^+$	1990Ki07 report 5% *2* γ-branching undetermined.
		9226.3	11.8[d] *10*	0	0$^+$	
9362.54	3$^-$	937.7	1.8 *3*	8424.81	2$^-$	
		1668.4	41.0 *10*	7694.08	3$^-$	1990Ki07 report 14% *3* γ-branching undetermined.
		1704.3	10.9 *8*	7658.23	4$^-$	
		1739.4	1.6	7623.11	(2$^-$,3,4$^+$)	
		2412.0	1.3	6950.49	1$^-$	
		2612.0	1.5	6750.41	2$^-$	
		2779.9	2.6 *3*	6582.54	3$^-$	
		3077.3	3.9 *10*	6285.15	3$^-$	
		3748.8	12.2 *9*	5613.53	4$^-$	
		4113.5	4.4 *8*	5248.81	2$^+$	

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]
9362.54	3^-	5457.8	5.9 *8*	3904.38	2^+		
		5625.4	3.4 *6*	3736.69	3^-		
9388.20	2^+	1694.0	2.9	7694.08	3^-		
		2087.4	1.0	7300.74	0^+		
		2845.3	11	6542.78	4^+		
		2880.3	3.6	6507.84	4^+		
		3102.9	1.3	6285.15	3^-		
		3362.6	2.5	6025.47	2^-		
		3758.6	7.6	5629.43	2^+		
		4109.2	5.9	5278.81	4^+		
		4139.2	3.1	5248.81	2^+		
		4176.3	11	5211.7	0^+		
		5483.4	3.4	3904.38	2^+		
		5651.1	6.7	3736.69	3^-		
		9387.0	40	0	0^+		
9404.85	2^-	1872.5	16	7532.26	2^-		
		2127.0	0.8	7277.82	$(2,3)^+$		
		2291.1	7.4	7113.73	4^-		
		2454.3	1.5	6950.49	1^-		
		2496.1	2.9	6908.70	2^+		
		2822.2	3.8	6582.54	3^-		
		3119.6	37	6285.15	3^-	D(+Q)	0.0 *3*
		3502.1	7.3	5902.63	1^-		
		5500.1	2.7	3904.38	2^+		
		5667.7	18	3736.69	3^-	D+Q	−0.03 *2*
		9403.7	2.6	0	0^+		
9418.8	3^-	1724.6	4.4	7694.08	3^-		
		1760.5	2.8	7658.23	4^-		
		1795.6	1.7	7623.11	$(2^-,3,4^+)$		
		1886.5	2.0	7532.26	2^-		
		2305.0	26	7113.73	4^-		
		2668.3	2.6	6750.41	2^-		
		3133.5	42	6285.15	3^-		
		3393.2	2.3	6025.47	2^-		
		3516.0	4.9	5902.63	1^-		
		3805.1	2.0	5613.53	4^-		
		4169.8	1.8	5248.81	2^+		
		5681.7	7.5	3736.69	3^-		
9429.11	$(3,4)^-$	1734.9	7.7 *10*	7694.08	3^-		
		1770.8	36 *2*	7658.23	4^-		
		1806.0	1.2 *4*	7623.11	$(2^-,3,4^+)$		
		2315.3	1.3 *3*	7113.73	4^-		
		2846.5	9.2 *16*	6582.54	3^-		
		3143.8	3.4 *6*	6285.15	3^-		
		4937.3	29 *2*	4491.44	5^-		
		5692.0	12 *2*	3736.69	3^-		
9432.46	1^-	1900.2	2.3	7532.26	2^-		
		2481.9	0.7	6950.49	1^-		
		2681.9	0.9	6750.41	2^-		
		3406.8	2.1	6025.47	2^-		
		5527.7	1.0	3904.38	2^+		
		9431.3	93	0	0^+		
9453.95	3^-	1029.1	1.47 *18*	8424.81	2^-		
		1759.8	22.2 *7*	7694.08	3^-		
		1795.7	7.1 *6*	7658.23	4^-		
		1830.8	1.8 *3*	7623.11	$(2^-,3,4^+)$		

Continued on next page (footnotes at end of table)

^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
9453.95	3$^-$	1921.6	1.0 *2*	7532.26	2$^-$			
		2007.7	0.7 *2*	7446.23	3$^+$,4$^+$			
		2340.2	10.5 *5*	7113.73	4$^-$			
		2703.4	2.1 *2*	6750.41	2$^-$			
		3168.7	30.3 *7*	6285.15	3$^-$			
		3428.3	1.8 *3*	6025.47	2$^-$			
		3824.3	2.5 *3*	5629.43	2$^+$			
		3840.2	10.2 *6*	5613.53	4$^-$			
		4174.9	1.6	5278.81	4$^+$			
		5549.2	4.9 *6*	3904.38	2$^+$			
		5716.8	3.4 *4*	3736.69	3$^-$			
9603.0	3$^-$	2489.2	33	7113.73	4$^-$			
		3317.7	54	6285.15	3$^-$	D+Q	0.42 *6*	
		5865.8	13	3736.69	3$^-$	D+Q	+0.18 *3*	
9604.6	1$^-$	2072.3	5.0	7532.26	2$^-$			
		2654.0	1.1	6950.49	1$^-$			
		2854.1	1.7	6750.41	2$^-$			
		3579.0	4.1	6025.47	2$^-$			
		5699.8	0.9	3904.38	2$^+$			
		6251.4	1.2	3352.64	0$^+$			
		9603.4	86	0	0$^+$			
9640.89	2$^-$	2174.5	7.9 *3*	7466.37	2$^+$	D(+Q)	0.00 *4*	
		2690.3	0.15 *3*	6950.49	1$^-$			
		2732.1	0.50 *5*	6908.70	2$^+$			
		3355.6	0.47 *11*	6285.15	3$^-$			
		4011.2	4.70 *10*	5629.43	2$^+$			
		5736.1	47.3 *5*	3904.38	2$^+$	D+Q	−0.09 *4*	δ: other: +0.03 *3* (1963Le08).
		5903.7	39.0 *5*	3736.69	3$^-$	D+Q	+0.05 *3*	δ: other: −0.29 *6* (1963Le08).
		9639.6	1.5	0	0$^+$			
9668.71	3$^-$	1974.5	0.65 *13*	7694.08	3$^-$			
		2136.4	1.83 *15*	7532.26	2$^-$			
		2222.4	0.68 *11*	7446.23	3$^+$,4$^+$			
		2554.9	26.9 *7*	7113.73	4$^-$			
		2759.9	0.67 *14*	6908.70	2$^+$			
		2918.2	2.06 *18*	6750.41	2$^-$			
		3383.4	44.4 *6*	6285.15	3$^-$			
		3643.1	3.0 *3*	6025.47	2$^-$			
		5176.9	3.00 *10*	4491.44	5$^-$			
		5763.9	3.6 *2*	3904.38	2$^+$			
		5931.6	13.2 *6*	3736.69	3$^-$			
9779.49	3	1031.3	3.4 *3*	8748.20	2$^+$			
		1101.2	3.3 *4*	8678.29	4$^+$			
		1200.7	5.0 *3*	8578.80	2$^+$			
		1644.7	2.7 *2*	8134.76	(3$^-$)			
		1851.0	5.3 *3*	7928.37	4$^+$			
		1907.3	5.7 *5*	7872.18	2$^+$			
		2218.2	18.9 *8*	7561.18	4$^+$			
		2313.1	3.0	7466.37	2$^+$			
		2870.7	4.2 *5*	6908.70	2$^+$			
		3196.8	1.5 *4*	6582.54	3$^-$			
		3236.6	1.3 *3*	6542.78	4$^+$			
		3271.5	0.7 *2*	6507.84	4$^+$			
		3749.6	1.1	6029.71	3$^+$			
		4149.8	2.0 *2*	5629.43	2$^+$			
		4165.7	19.9 *8*	5613.53	4$^-$	D+Q	+0.07 *4*	
		4500.4	5.4 *4*	5278.81	4$^+$			

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
9779.49	3	4530.4	0.7 *2*	5248.81	2^+			
		5874.7	14.6 *9*	3904.38	2^+			
		6042.3	5.4 *6*	3736.69	3^-			
9785.3	$(1,2^+)$	2484.5	2.2	7300.74	0^+			
		2876.5	0.7	6908.70	2^+			
		5880.5	2.5	3904.38	2^+			
		6432.1	9.6	3352.64	0^+			
		9784.0	85	0	0^+			
9865.15	1	1426.1	0.18 *5*	8439.0	0^+			
		1773.5	0.73 *8*	8091.61	2^+			
		1992.9	0.21 *3*	7872.18	2^+			
		2163.3	0.53 *18*	7701.8	0^+			
		2398.7	0.41 *6*	7466.37	2^+			
		2564.3	3.2 *2*	7300.74	0^+			
		2587.2	0.20 *7*	7277.82	$(2,3)^+$			
		2914.6	0.32 *4*	6950.49	1^-			
		2956.3	1.10 *10*	6908.70	2^+			
		3114.6	0.21 *2*	6750.41	2^-			
		3962.3	0.34 *5*	5902.63	1^-			
		4235.5	0.41 *7*	5629.43	2^+			
		4616.1	0.25 *3*	5248.81	2^+			
		4653.2	0.46 *7*	5211.7	0^+			
		5960.3	5.1 *2*	3904.38	2^+	D+Q	−0.18 *3*	
		6512.0	15.0 *5*	3352.64	0^+			
		9863.8	71.4 *12*	0	0^+			Γ_γ=1.06 eV *15* (1988Al16).
9869.3	1^+	2167.4	0.8	7701.8	0^+			
		2568.5	2.3	7300.74	0^+			
		2960.5	0.9	6908.70	2^+			
		4620.2	0.8	5248.81	2^+			
		4657.3	0.6	5211.7	0^+			
		5964.4	5.6	3904.38	2^+			
		6516.1	13	3352.64	0^+			
		9868.0	76	0	0^+			
9954.00	4^+	1580.0	3.8 *3*	8373.94	4^+			
		3022.6	3.0 *3*	6931.29	3^-			
		3371.3	1.2 *3*	6582.54	3^-			
		3411.1	10.6 *6*	6542.78	4^+			
		3446.0	4.2 *2*	6507.84	4^+			
		4340.2	4.8 *4*	5613.53	4^-			
		4674.9	58.2 *17*	5278.81	4^+	M1+E2	+0.04 *3*	1990Ki07 report 5% *2* γ-branching undetermined.
		5462.2	2.7 *4*	4491.44	5^-			
		6216.8	6.5 *6*	3736.69	3^-			
10040.54	$(2^-,3^-)$	1276.3	5.4 *7*	8764.18	3^-			
		1556.5	1.8 *3*	8484.02	$(1^-,2^-,3^-)$			
		1717.3	51.7 *10*	8323.16	$(1^-,2^+)$			
		2417.4	2.3 *3*	7623.11	$(2^-,3,4^+)$			
		2508.2	0.93 *18*	7532.26	2^-			
		2762.6	8.3 *3*	7277.82	$(2,3)^+$			
		2926.7	4.4 *3*	7113.73	4^-			
		3089.9	6.6 *6*	6950.49	1^-			
		3457.8	1.4 *2*	6582.54	3^-			
		4014.9	2.0 *2*	6025.47	2^-			
		4137.7	13.6 *6*	5902.63	1^-			
		6303.3	2.0 *2*	3736.69	3^-			
10049.38	4^-	1017.5	11.5 *5*	9031.9	4^-			

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
10049.38	4^-	1861.6	0.51 *5*	8187.69	$(3,4,5^-)$			
		2279.9	2.37 *14*	7769.4	$(3,4,5)^-$			
		2810.2	0.76 *13*	7239.07	$(3^-,4,5^-)$			
		2935.5	14.0 *4*	7113.73	4^-			
		3466.7	7.3 *3*	6582.54	3^-			
		3764.0	1.26 *9*	6285.15	3^-			
		4023.7	1.30 *10*	6025.47	2^-			
		4435.6	0.95 *9*	5613.53	4^-			
		5557.5	16.3 *4*	4491.44	5^-			
		6312.2	43.7 *9*	3736.69	3^-			
10262.53	3^-	2639.3	1.4 *2*	7623.11	$(2^-,3,4^+)$			
		2796.1	15.6 *9*	7466.37	2^+			
		2816.2	4.7 *4*	7446.23	$3^+,4^+$			
		3148.7	1.4 *3*	7113.73	4^-			
		3679.8	4.1 *3*	6582.54	3^-			
		4232.6	16.1 *13*	6029.71	3^+			
		4359.7	2.7 *4*	5902.63	1^-			
		4632.8	2.9 *4*	5629.43	2^+			
		5013.4	3.6 *4*	5248.81	2^+			
		6357.6	36.0 *10*	3904.38	2^+			
		6525.3	11.5 *10*	3736.69	3^-			
10318.8	1^+	2616.9	0.71 *7*	7701.8	0^+			
		3368.2	0.41 *7*	6950.49	1^-			
		4689.1	0.27 *7*	5629.43	2^+			
		5106.8	0.77 *6*	5211.7	0^+			
		6413.9	3.4 *2*	3904.38	2^+	D+Q	−0.16 *3*	δ: other: +0.09 *2* (1963Le08).
		6965.5	11.9 *4*	3352.64	0^+			
		10317.4	82.5 *7*	0	0^+			Γ_γ=5.8 eV *8* (1988Al16).
10415.06	3	2720.8	0.4 *2*	7694.08	3^-			
		2791.8	16.7 *5*	7623.11	$(2^-,3,4^+)$			
		2853.8	1.13 *11*	7561.18	4^+			
		2948.6	5.9 *2*	7466.37	2^+			
		2968.7	17.4 *4*	7446.23	$3^+,4^+$			1990Ki07 report 2.5% *18* γ-branching undetermined.
		3137.1	0.88 *14*	7277.82	$(2,3)^+$			
		3301.2	1.57 *17*	7113.73	4^-			
		3483.6	4.0 *2*	6931.29	3^-			
		3506.2	15.7 *4*	6908.70	2^+			
		3664.5	2.50 *10*	6750.41	2^-			
		3832.3	1.34 *14*	6582.54	3^-			
		3907.0	1.02 *16*	6507.84	4^+			
		4129.7	0.36 *9*	6285.15	3^-			
		4389.3	5.9 *3*	6025.47	2^-			
		4785.3	0.81 *16*	5629.43	2^+			
		4801.2	6.9 *3*	5613.53	4^-			
		5135.9	2.7 *2*	5278.81	4^+			
		5165.9	1.69 *17*	5248.81	2^+			
		6510.1	3.5 *3*	3904.38	2^+			
		6677.8	7.1 *4*	3736.69	3^-			
10639.07	$(3^-,4,5^-)$	2504.2	1.3 *2*	8134.76	(3^-)			
		3525.2	4.0 *3*	7113.73	4^-			
		3707.6	42.1 *12*	6931.29	3^-			
		4056.3	1.6 *2*	6582.54	3^-			
		4096.1	2.90 *10*	6542.78	4^+			
		4131.0	4.0 *2*	6507.84	4^+			
		5025.2	13.6 *6*	5613.53	4^-			

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Comments
10639.07	(3$^-$,4,5$^-$)	5359.9	4.4 *4*	5278.81	4$^+$	
		6147.1	3.6 *3*	4491.44	5$^-$	
		6901.7	22.5 *10*	3736.69	3$^-$	
10699.50	3	2325.5	1.01 *14*	8373.94	4$^+$	
		2607.8	0.72 *9*	8091.61	2$^+$	
		3167.1	1.01 *16*	7532.26	2$^-$	
		3233.0	0.9 *2*	7466.37	2$^+$	
		3253.1	0.92 *15*	7446.23	3$^+$,4$^+$	
		3790.6	2.6 *2*	6908.70	2$^+$	
		4156.5	2.0 *2*	6542.78	4$^+$	
		4414.1	1.4 *2*	6285.15	3$^-$	
		4669.5	3.8 *3*	6029.71	3$^+$	
		5069.7	5.5 *3*	5629.43	2$^+$	
		5085.6	2.0 *2*	5613.53	4$^-$	
		5420.3	9.2 *5*	5278.81	4$^+$	
		6794.5	51.3 *16*	3904.38	2$^+$	1990Ki07 report 9.6% *18* γ-branching undetermined.
		6962.2	8.0 *17*	3736.69	3$^-$	
10737.7	1$^-$	3043.4	9.2 *17*	7694.08	3$^-$	
		3828.8	4.3 *14*	6908.70	2$^+$	
		4452.3	7.8 *13*	6285.15	3$^-$	
		10736.2	55 *3*	0	0$^+$	
10747.8	(4$^+$)	5118.0	12.5 *9*	5629.43	2$^+$	
		6842.8	84.3 *10*	3904.38	2$^+$	
		7010.5	3.2 *6*	3736.69	3$^-$	
10770.2	(1$^+$)	3656.3	3.3 *7*	7113.73	4$^-$	
		3861.3	6.0 *7*	6908.70	2$^+$	
		5521.0	42 *2*	5248.81	2$^+$	1990Ki07 report 17% *2* γ-branching undetermined.
		10768.6	32 *2*	0	0$^+$	
10910.0	(3,4,5$^-$)	7172.6	100[e]	3736.69	3$^-$	
10921.1	(2$^+$,3,4$^-$)	4895.3	10[e]	6025.47	2$^-$	
		5641.9	50[e]	5278.81	4$^+$	1971Da08 report 40% γ-branching uncertain.
10956.0	3$^-$	2768.2	5[e]	8187.69	(3,4,5$^-$)	
		3474.8	10[e]	7481?		
		3509.6[h]	<5[e]	7446.23	3$^+$,4$^+$	
		5053.0	10[e]	5902.63	1$^-$	
		5342.1	8[e]	5613.53	4$^-$	
		5676.8	44[e]	5278.81	4$^+$	
		7218.6	25[e]	3736.69	3$^-$	
10988.0	(3$^-$,4$^+$)	2010[h]	5[e]	8978?		
		4079.1	5[e]	6908.70	2$^+$	
		4702.6	10[e]	6285.15	3$^-$	
		5358.2	10[e]	5629.43	2$^+$	
		7083.0	40[e]	3904.38	2$^+$	
		7250.6	35[e]	3736.69	3$^-$	
10994.7	(2$^+$,3,4$^+$)	5715.5		5278.81	4$^+$	E_γ: seen in 1971Da08.
		5745.5		5248.81	2$^+$	E_γ: seen in 1971Da08.
		7257.3		3736.69	3$^-$	E_γ: seen in 1971Da08.
11011.0	3$^-$	2672.9	12 *3*	8338.0	(2$^+$,3,4)	
		3034.9[h]		7976?		
		3334.3	7 *2*	7676.6	(6$^+$)	
		3710.1[h]		7300.74	0$^+$	
		4079.5[h]		6931.29	3$^-$	
		4981.0[h]		6029.71	3$^+$	

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^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [‡]	E_f	J_f^π	Mult. [#]	Comments
11011.0	3$^-$	6519.0	45 *3*	4491.44	5$^-$		I_γ: 1990Ki07 report 36% *5* γ-branching undetermined.
		7105.9[h]		3904.38	2$^+$		
		7273.6		3736.69	3$^-$		
		11009.4		0	0$^+$		
11042.0	(1$^-$ to 4$^+$)	7136.9		3904.38	2$^+$		E_γ: seen in 1971Da08.
		7304.6		3736.69	3$^-$		E_γ: seen in 1971Da08.
11070.6	(3)	5456.1	5[e]	5613.53	4$^-$		
		5790.7	10[e]	5278.81	4$^+$		
		5820.7	10[e]	5248.81	2$^+$		
		7164.9	65[e]	3904.38	2$^+$		
		7332.6	10[e]	3736.69	3$^-$		
11080	1$^-$	11078		0	0$^+$		E_γ: seen in 1971Da08.
12038	(3,4,5)$^-$	12036		0	0$^+$		E_γ: seen in 1985Se16.
12049	2$^+$	12047		0	0$^+$		E_γ: seen in 1985Se16.
12068		12066		0	0$^+$		E_γ: seen in 1985Se16.
12074		12072		0	0$^+$		E_γ: seen in 1985Se16.
12099		12097[f]		0	0$^+$		
12111		12109[f]		0	0$^+$		
12204		12202[f]		0	0$^+$		
12334		12332[f]		0	0$^+$		
12423		12421[f]		0	0$^+$		
12604		12602[f]		0	0$^+$		
12647		9293[f]		3352.64	0$^+$		
12668		9314[f]		3352.64	0$^+$		
		12666[f]		0	0$^+$		
12688		12686[f]		0	0$^+$		
12875		9521[f]		3352.64	0$^+$		
		12873[f]		0	0$^+$		
12980		12978[f]		0	0$^+$		
12996		9642[f]		3352.64	0$^+$		
13086		13084[f]		0	0$^+$		
13113		9759[f]		3352.64	0$^+$		
		13111[f]		0	0$^+$		
13194		9840[f]		3352.64	0$^+$		
		13192[f]		0	0$^+$		
13203		13201[f]		0	0$^+$		
13289		9935[f]		3352.64	0$^+$		
		13287[f]		0	0$^+$		
13822		13819[f]		0	0$^+$		
13913		10559[f]		3352.64	0$^+$		
		13910[f]		0	0$^+$		
13993		10639[f]		3352.64	0$^+$		
		13990[f]		0	0$^+$		
18260	1	18256[g]		0	0$^+$	D[@]	A_2=−0.3 *1*
18680	1	18675[g]		0	0$^+$	D[@]	A_2=−0.5 *1*
19070	1	19065[g]		0	0$^+$	D[@]	A_2=−0.25 *10*
19450	1	19445[g]		0	0$^+$	D[@]	A_2=−0.3 *1*

Continued on next page (footnotes at end of table)

^{39}K(p,γ) 1990Ki07,1988Sc23 (continued)

$\gamma(^{40}Ca)$ (continued)

E_i(level)	J_i^π	E_γ[†]	E_f	J_f^π	Mult.[#]	Comments
19850	1	19845[g]	0	0^+	D[@]	A_2=−0.25 *10*
20130		20125[g]	0	0^+		
20430	1	20424[g]	0	0^+	D[@]	A_2=−0.3 *1*
20650	1	20644[g]	0	0^+	D[@]	A_2=−0.3 *2*
20940	1	20934[g]	0	0^+	D[@]	A_2=−0.5 *1*
21490		21484[g]	0	0^+		
21690		21684[g]	0	0^+		
22060		22053[g]	0	0^+		

[†] Values are deduced from level-energy differences by evaluator, with recoil correction removed, unless otherwise noted. 1990Ki07 and 1988Sc23 don′t list the data of γ-ray energies with uncertainties, but state that the energies of levels connected by these observed γ rays were obtained from a least-squares fit to the γ-ray energies. Many transitions with upper limits on intensities are unlikely since they would require high multipolarities, like E4, M4, E5, and so on.

[‡] For levels up to 9000, values are from 1990Ki07, or where values with uncertainties are also available in 1988Sc23, weighted averages are taken; above 9000, values without uncertainties are from 1988Sc23 and the others are from 1990Ki07, unless otherwise noted. Quoted values are %branching from each level.

[#] From $\gamma\gamma(\theta)$ and γ(pol) in 1967Le12, unless otherwise noted.

[@] From $\gamma(\theta)$ in 1973Di02. Quoted values of A_2 in comments are read from Fig.4 of 1973Di02.

[&] From 1988Sc23. 30% *20* γ-branching undetermined in 1990Ki07.

[a] For 3323.9+3324.7.

[b] For 3977.7+3978.4.

[c] For 5321.9+5322.7.

[d] For 9225.6+9226.3.

[e] From 1971Da08.

[f] Seen in 1968Ba22.

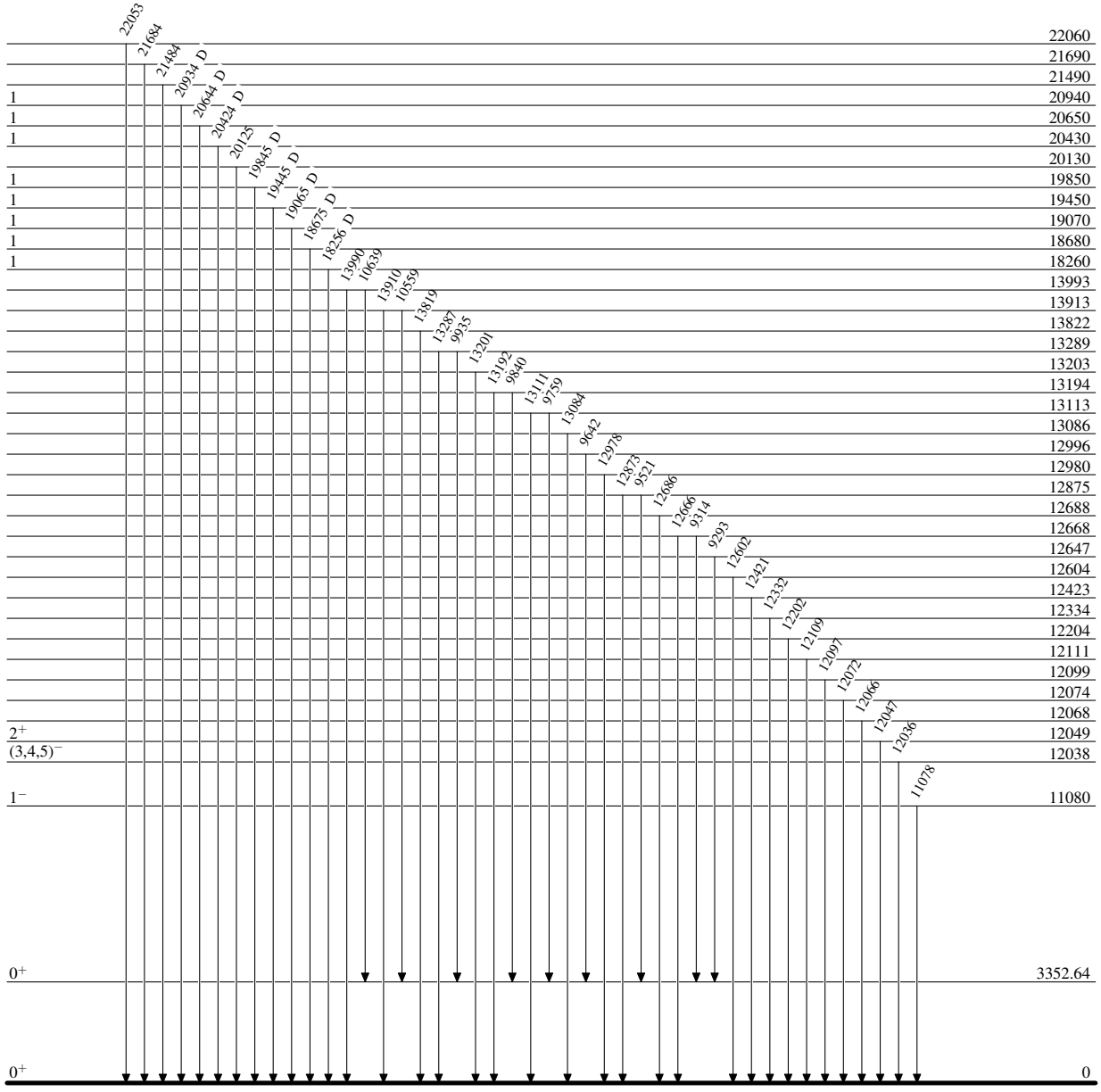
[g] Seen in 1973Di02.

[h] Placement of transition in the level scheme is uncertain.

^{39}K(p,γ) 1990Ki07,1988Sc23

Level Scheme

Intensities: % photon branching from each level



$^{40}_{20}Ca_{20}$

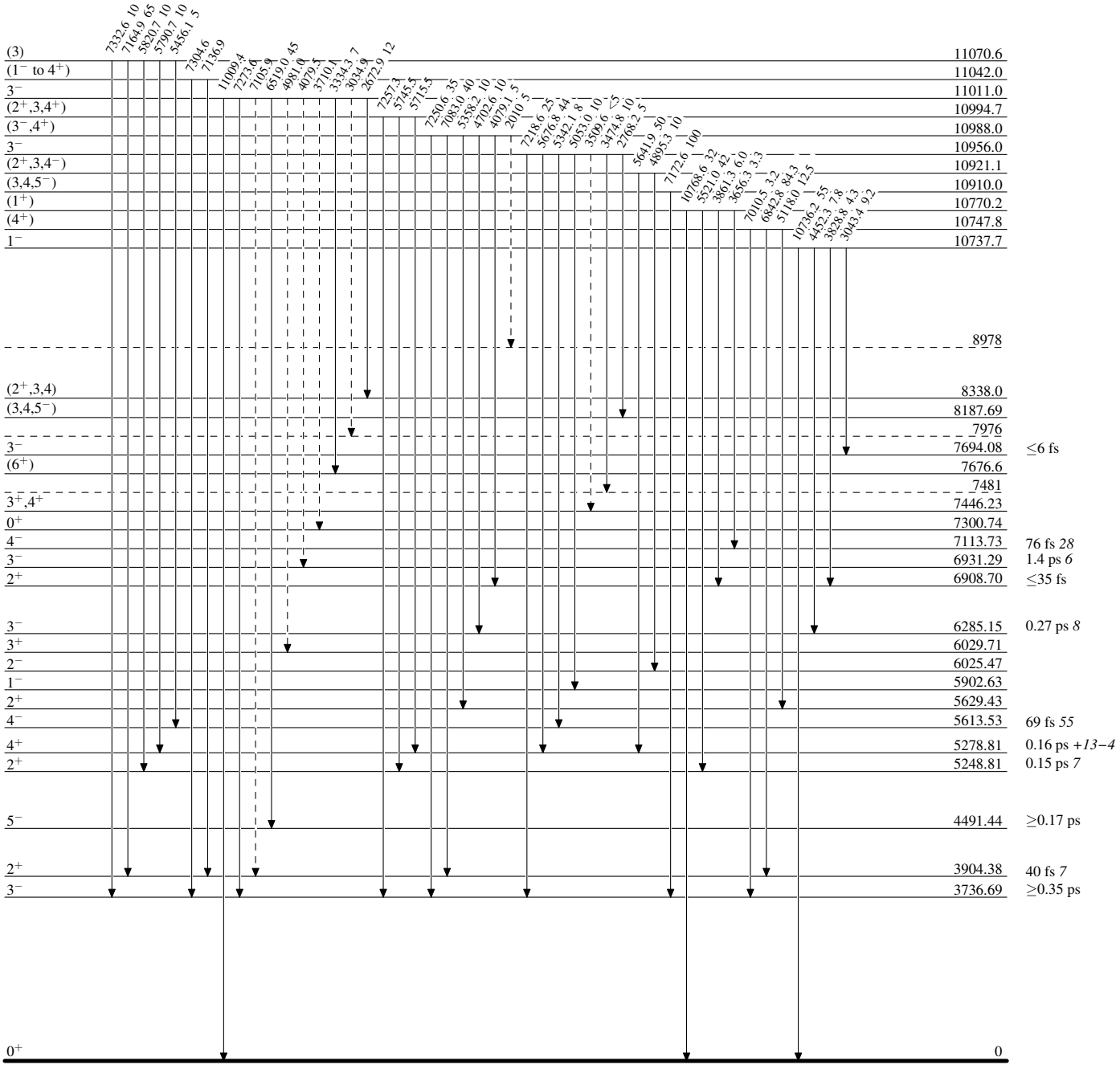
^{39}K(p,γ) 1990Ki07,1988Sc23

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

- - - - - - ► γ Decay (Uncertain)

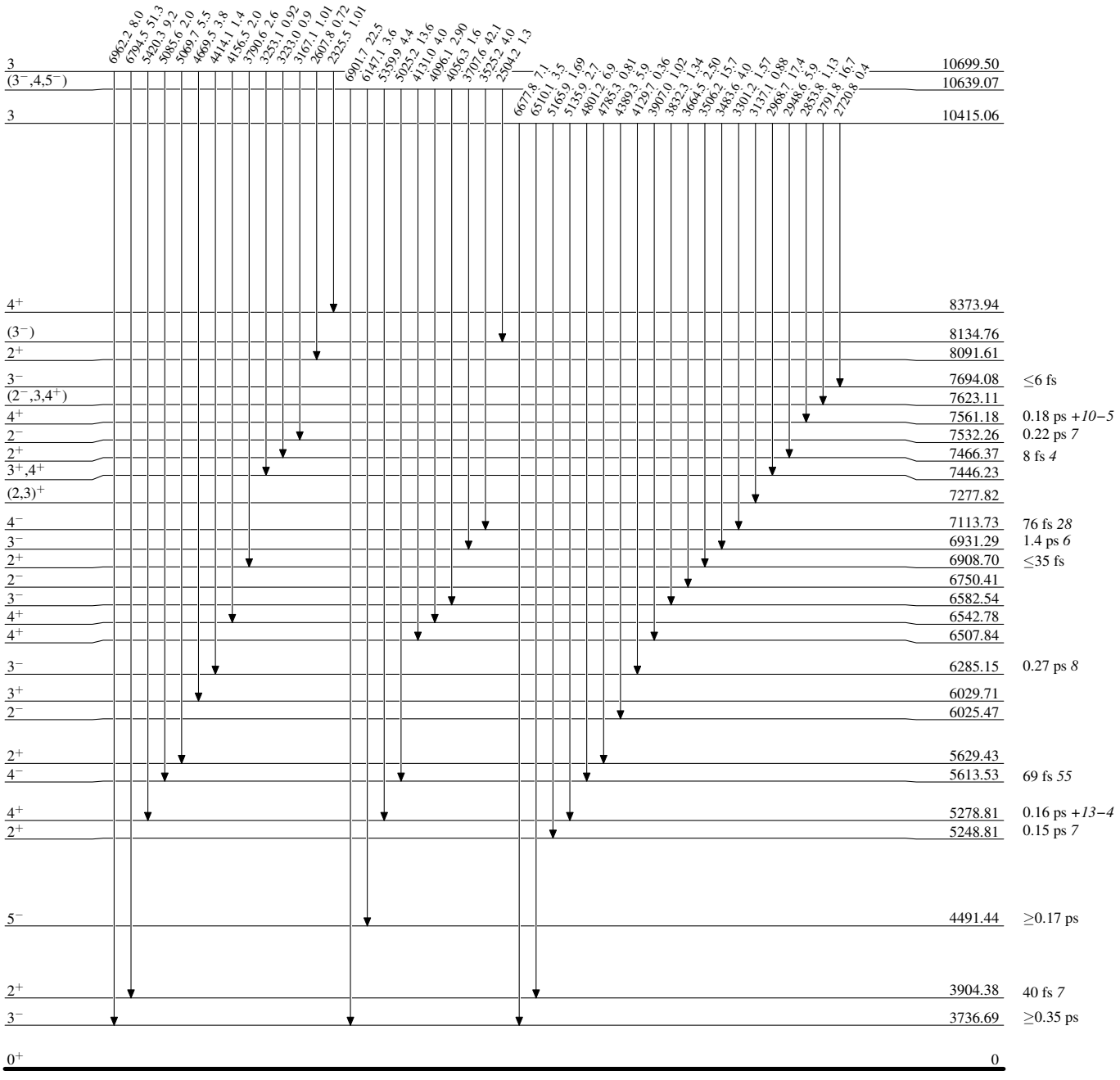


$^{40}_{20}Ca_{20}$

^{39}K(p,γ) 1990Ki07,1988Sc23

Level Scheme (continued)

Intensities: % photon branching from each level

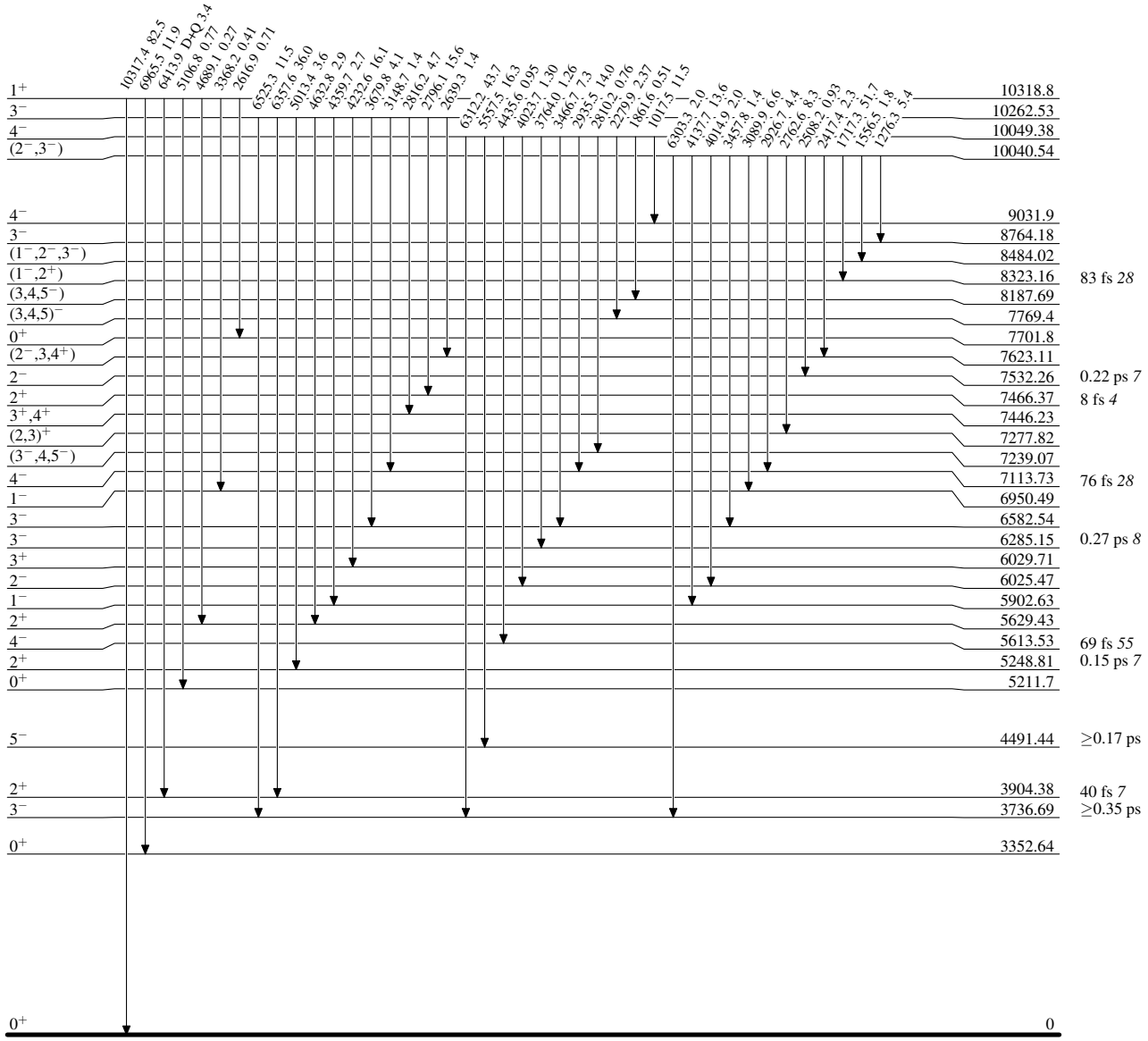


$^{40}_{20}Ca_{20}$

^{39}K(p,γ) 1990Ki07,1988Sc23

Level Scheme (continued)

Intensities: % photon branching from each level

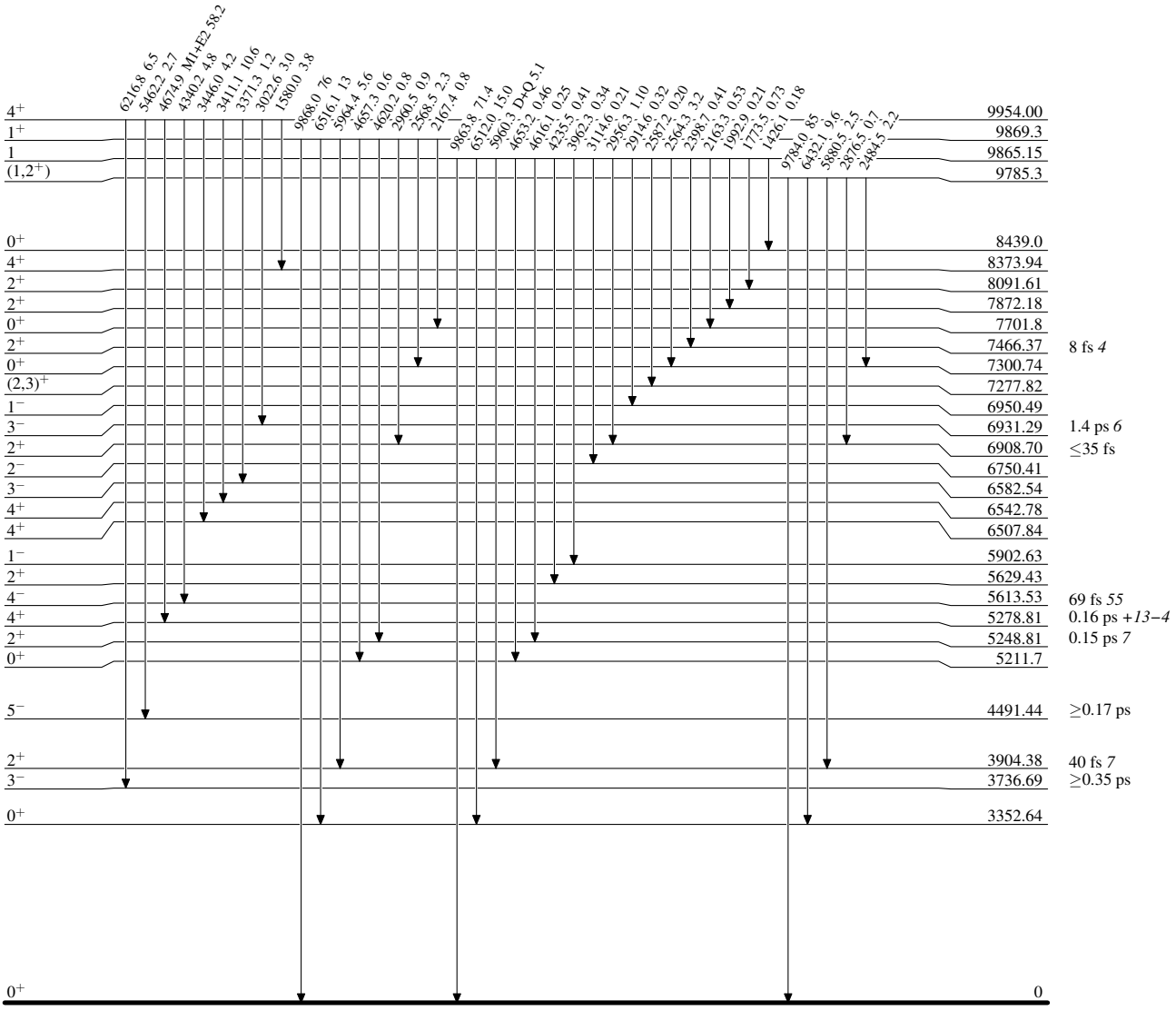


$^{40}_{20}Ca_{20}$

^{39}K(p,γ) 1990Ki07,1988Sc23

Level Scheme (continued)

Intensities: % photon branching from each level

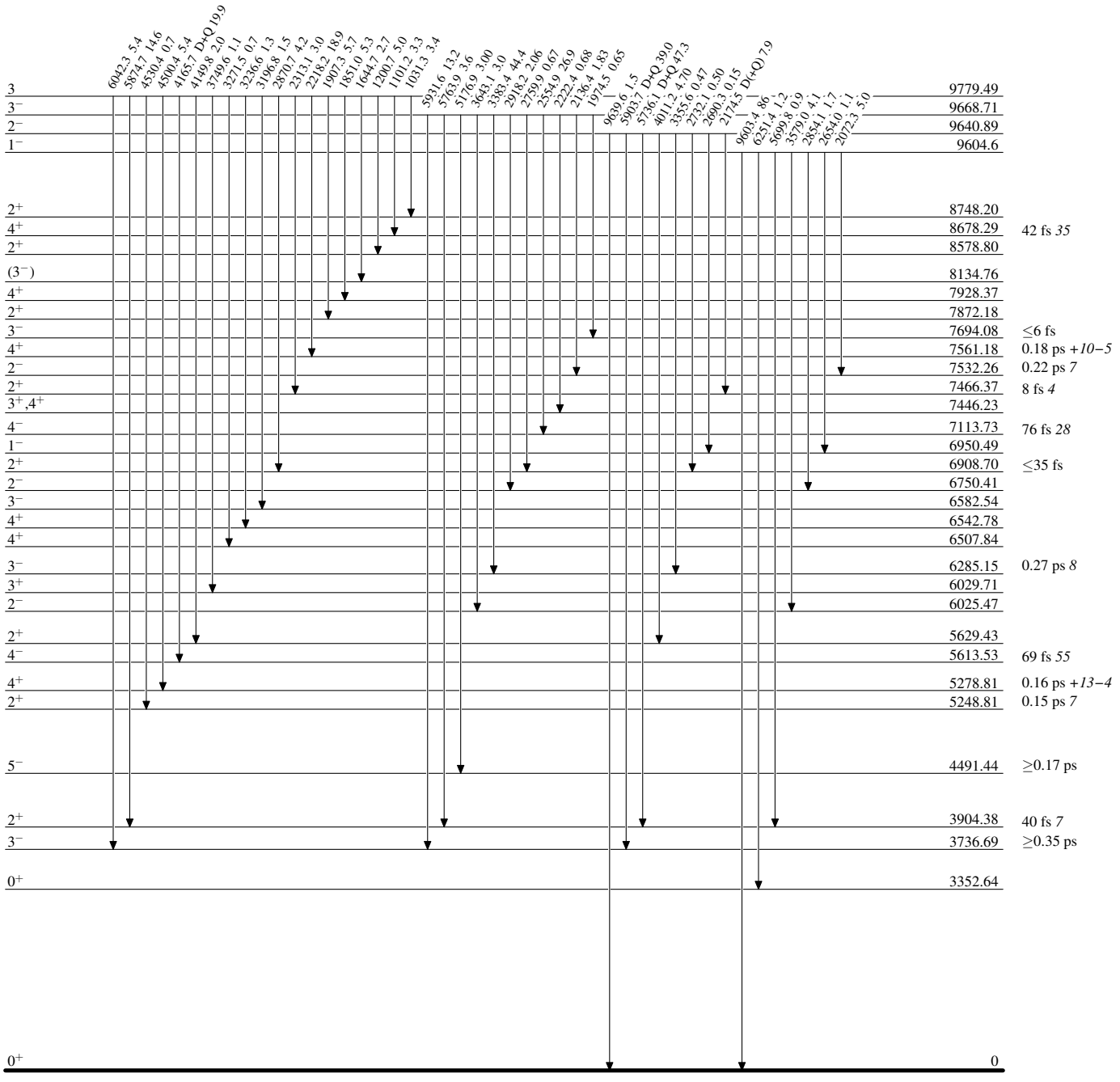


$^{40}_{20}Ca_{20}$

^{39}K(p,γ) 1990Ki07,1988Sc23

Level Scheme (continued)

Intensities: % photon branching from each level

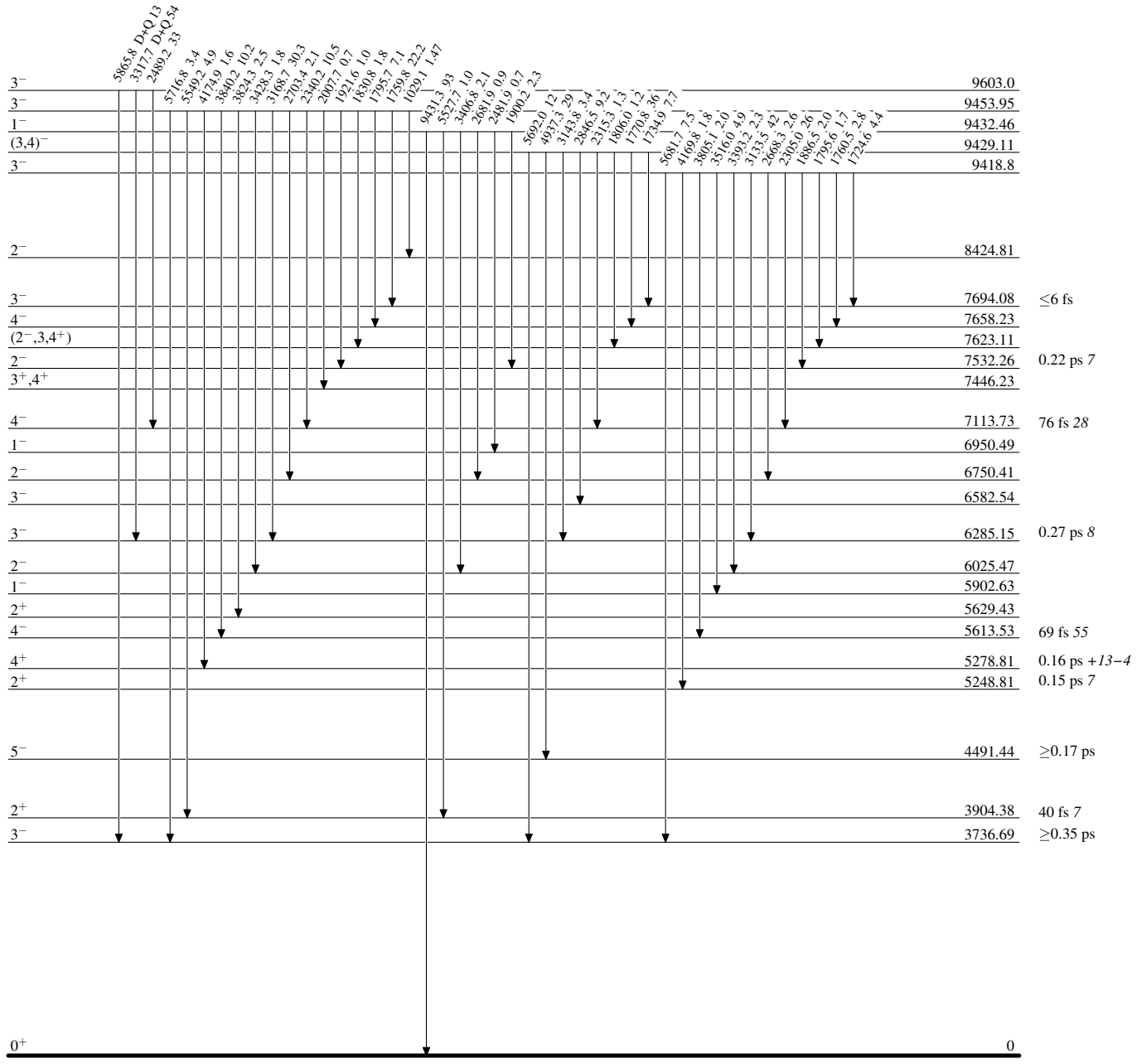


$^{40}_{20}Ca_{20}$

^{39}K(p,γ) 1990Ki07,1988Sc23

Level Scheme (continued)

Intensities: % photon branching from each level

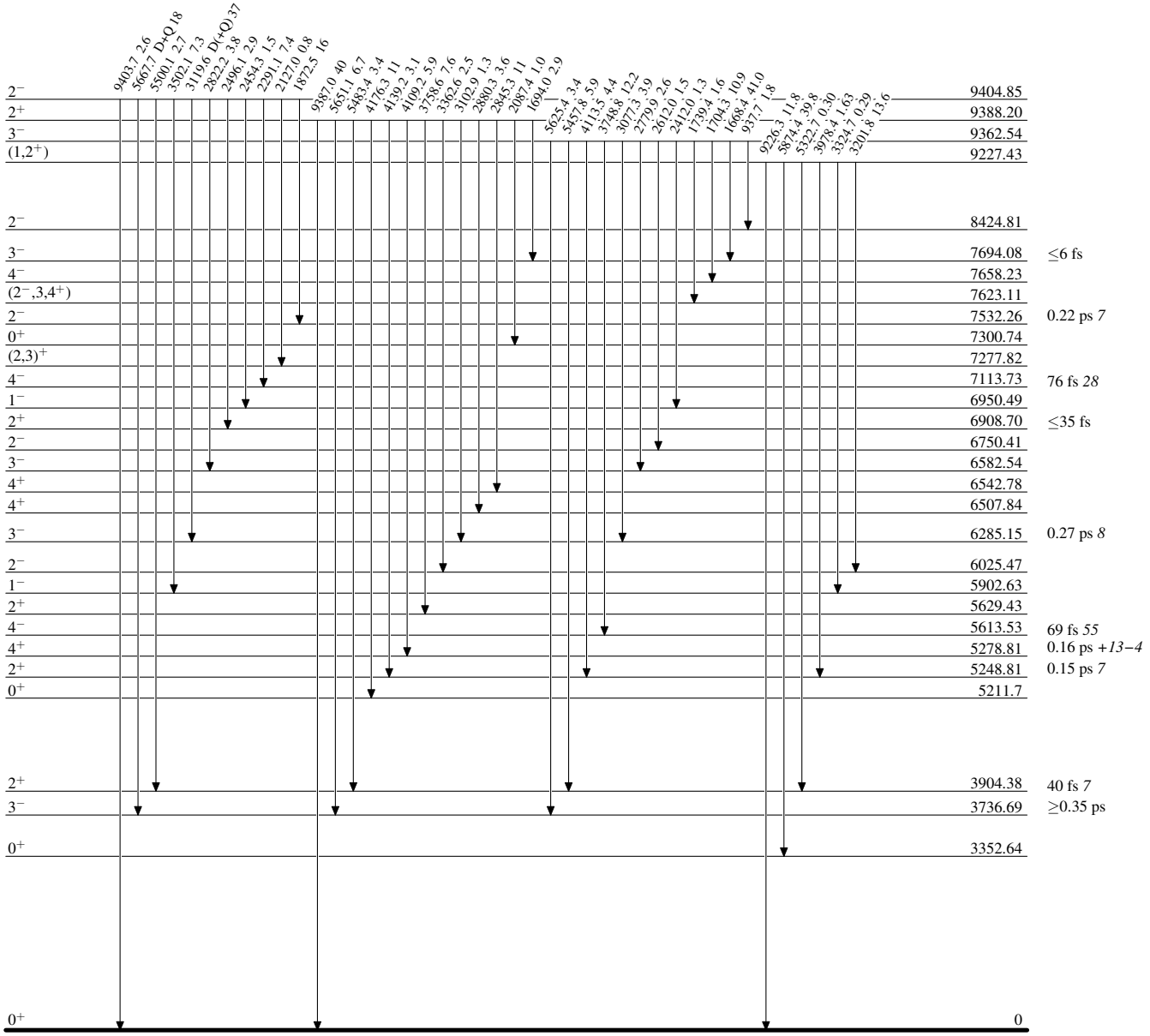


$^{40}_{20}Ca_{20}$

^{39}K(p,γ) 1990Ki07,1988Sc23

Level Scheme (continued)

Intensities: % photon branching from each level

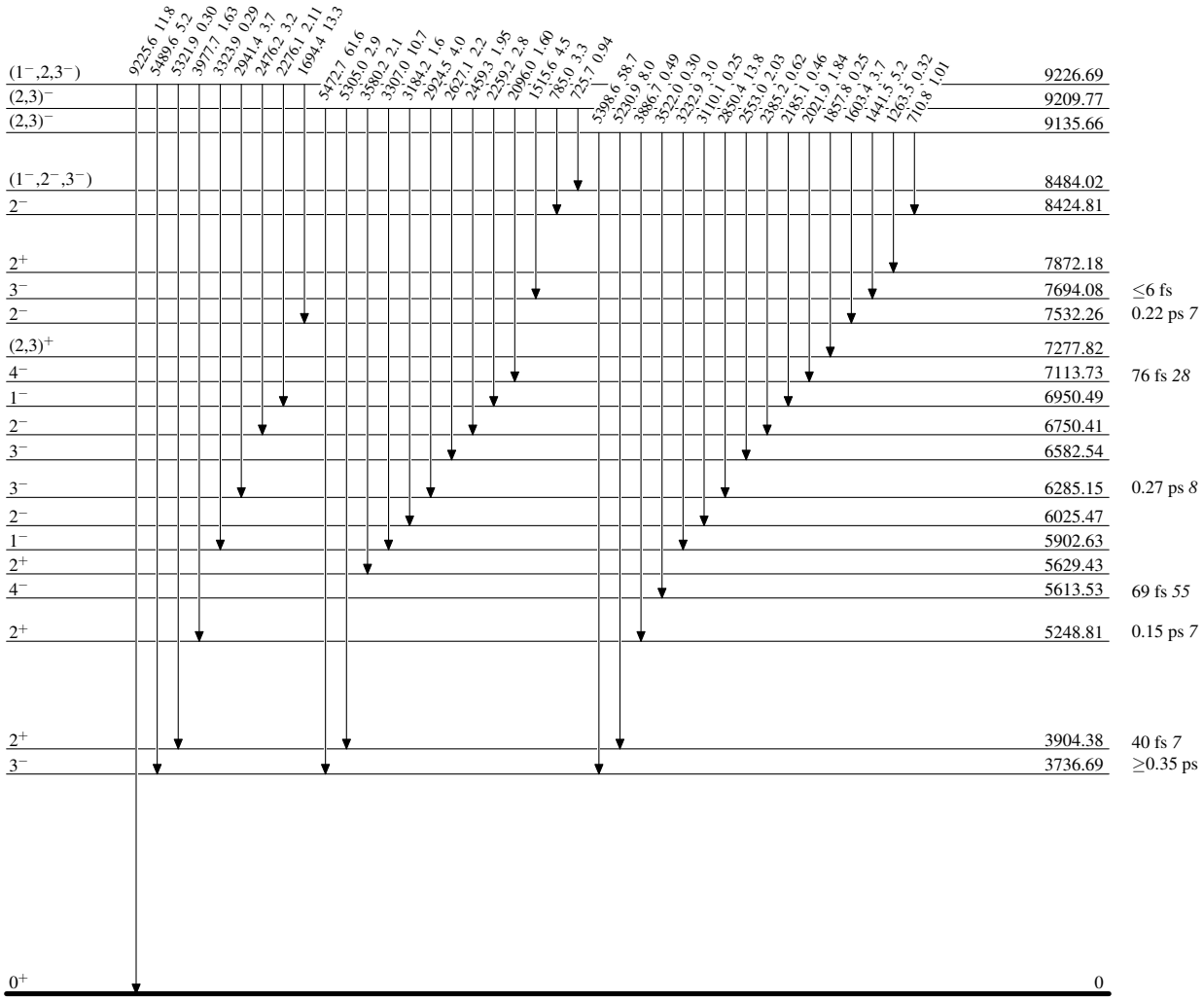


$^{40}_{20}Ca_{20}$

^{39}K(p,γ) 1990Ki07,1988Sc23

Level Scheme (continued)

Intensities: % photon branching from each level



$^{40}_{20}Ca_{20}$

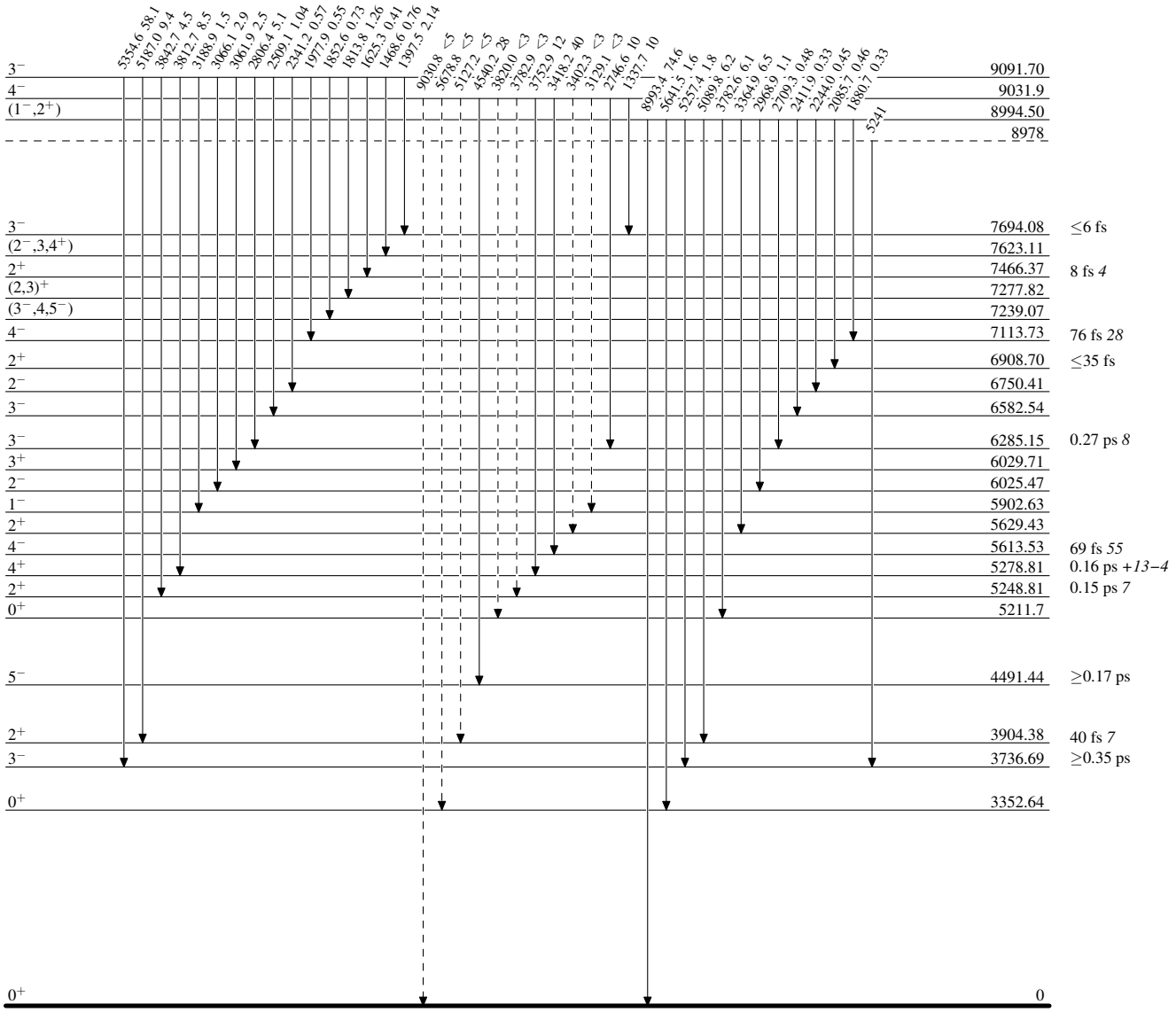
^{39}K(p,γ) 1990Ki07,1988Sc23

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{40}_{20}Ca_{20}$

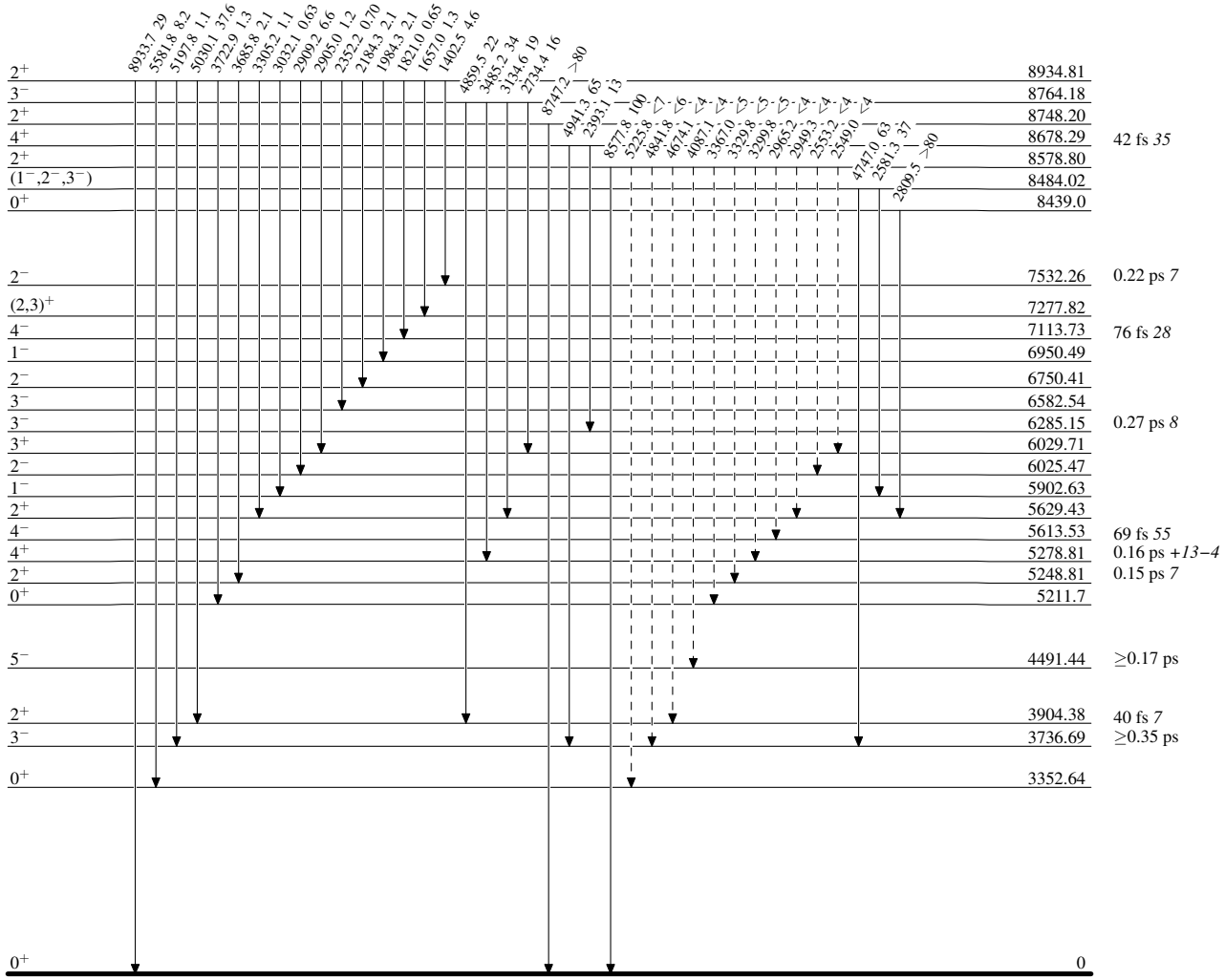
^{39}K(p,γ) 1990Ki07,1988Sc23

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{40}_{20}Ca_{20}$

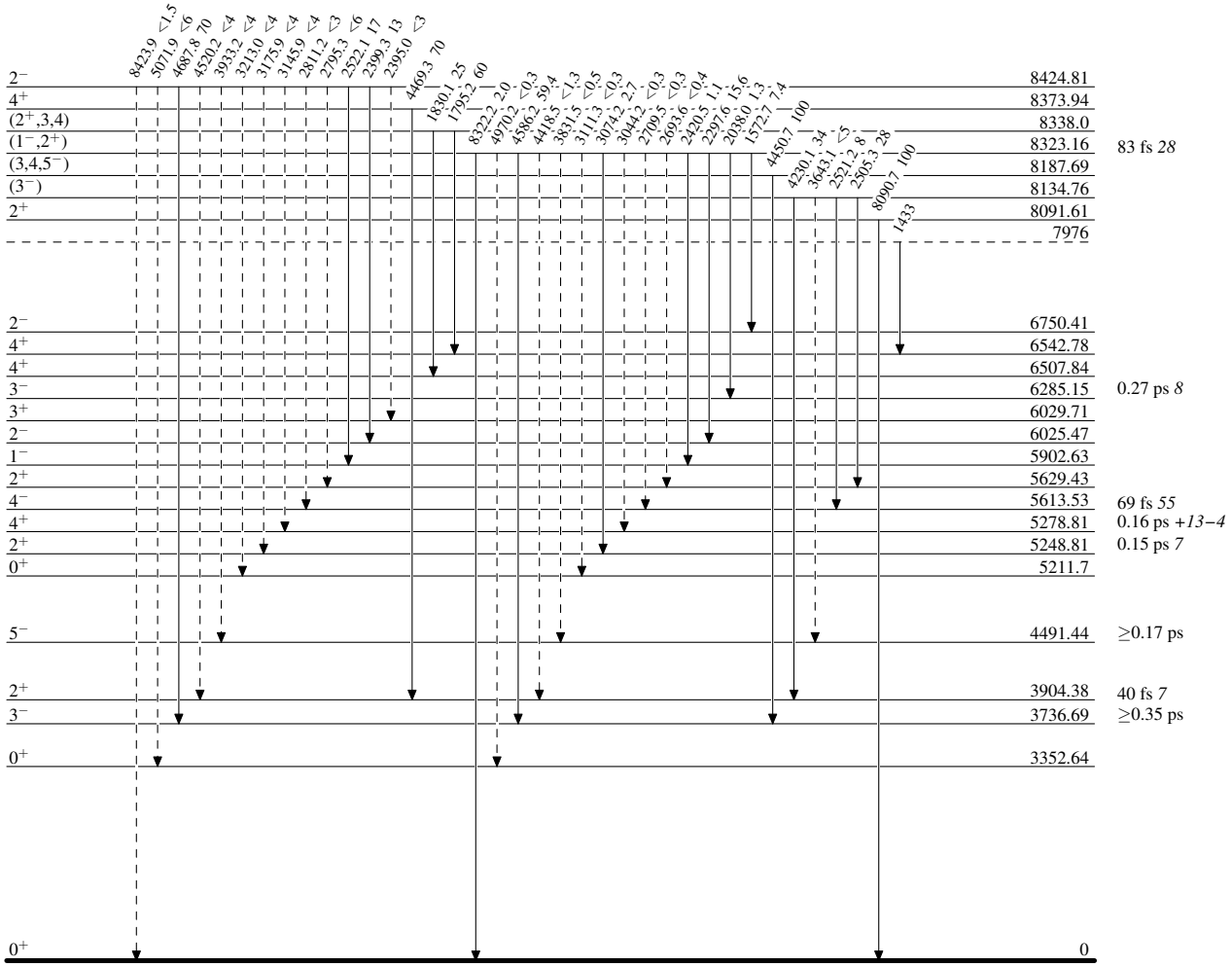
^{39}K(p,γ) 1990Ki07,1988Sc23

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{40}_{20}Ca_{20}$

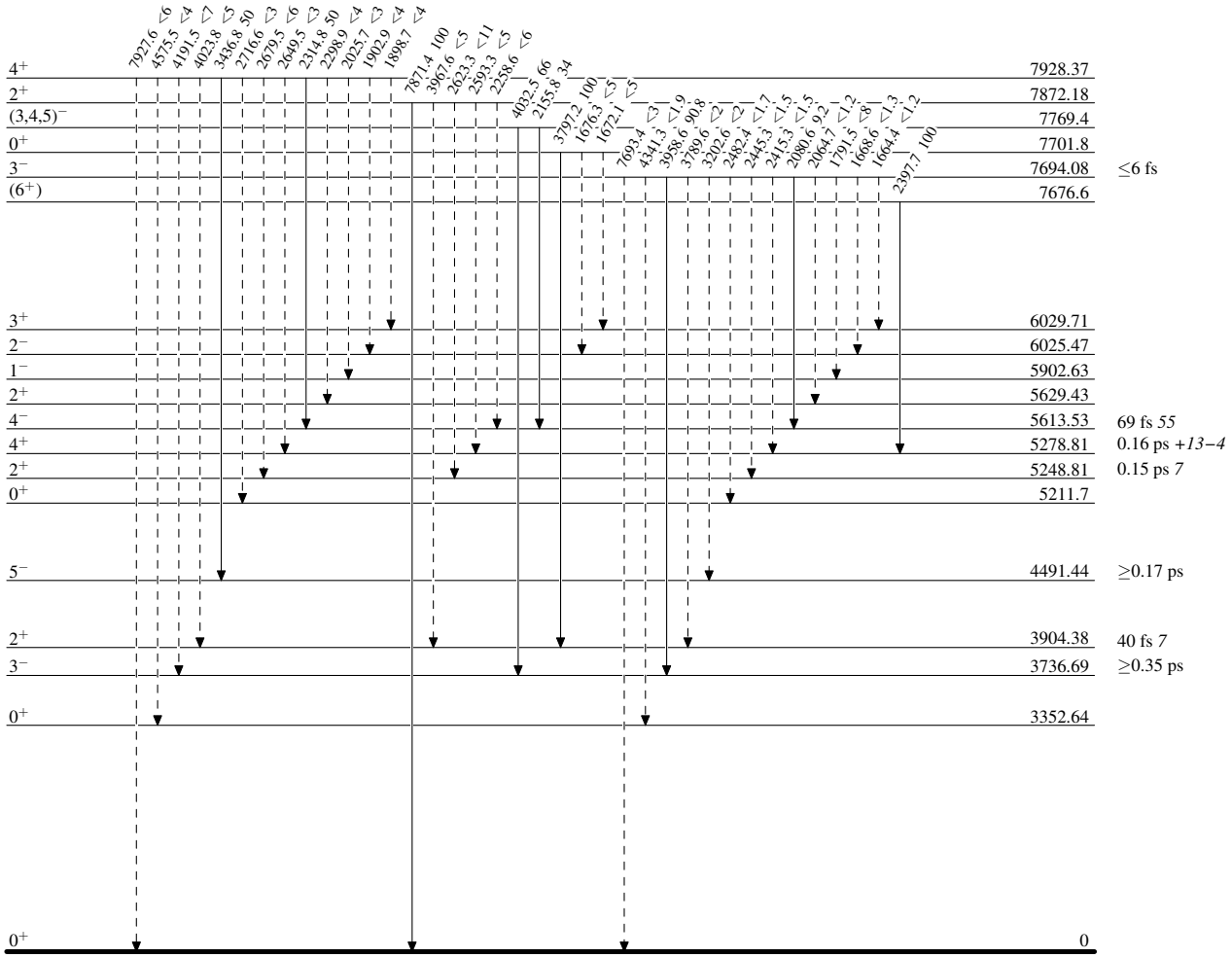
^{39}K(p,γ) 1990Ki07,1988Sc23

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{40}_{20}Ca_{20}$

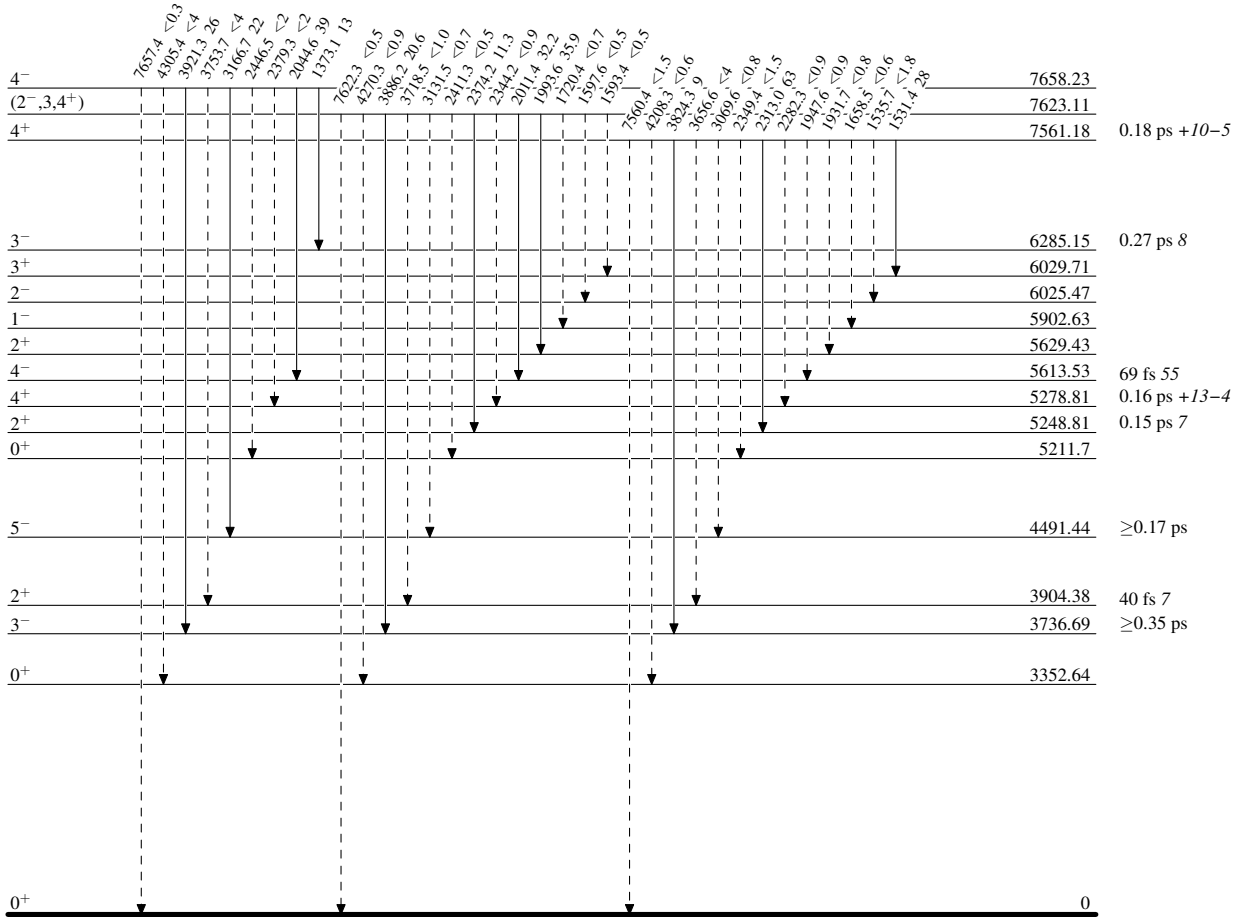
^{39}K(p,γ) 1990Ki07,1988Sc23

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{40}_{20}Ca_{20}$

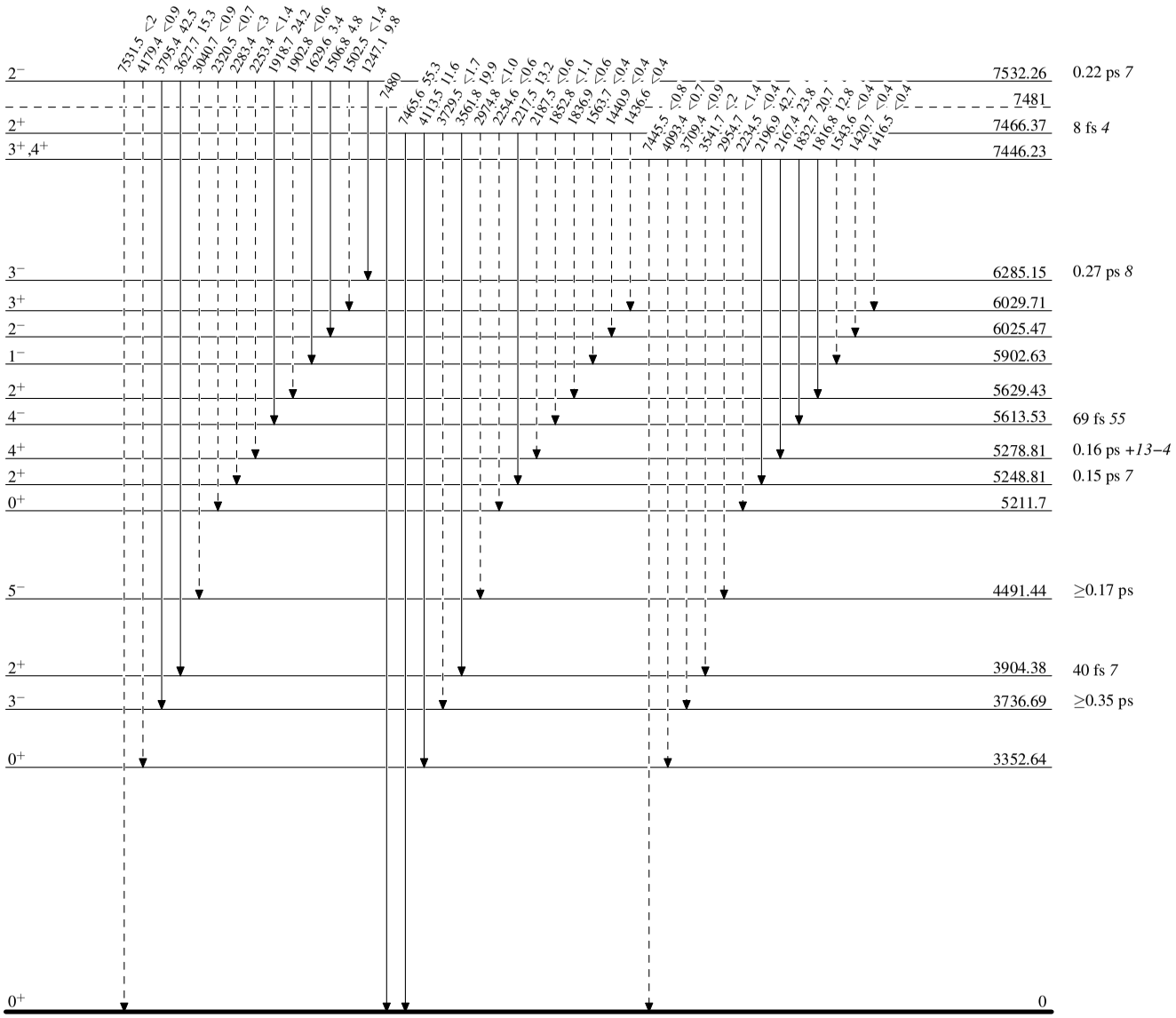
^{39}K(p,γ) 1990Ki07,1988Sc23

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



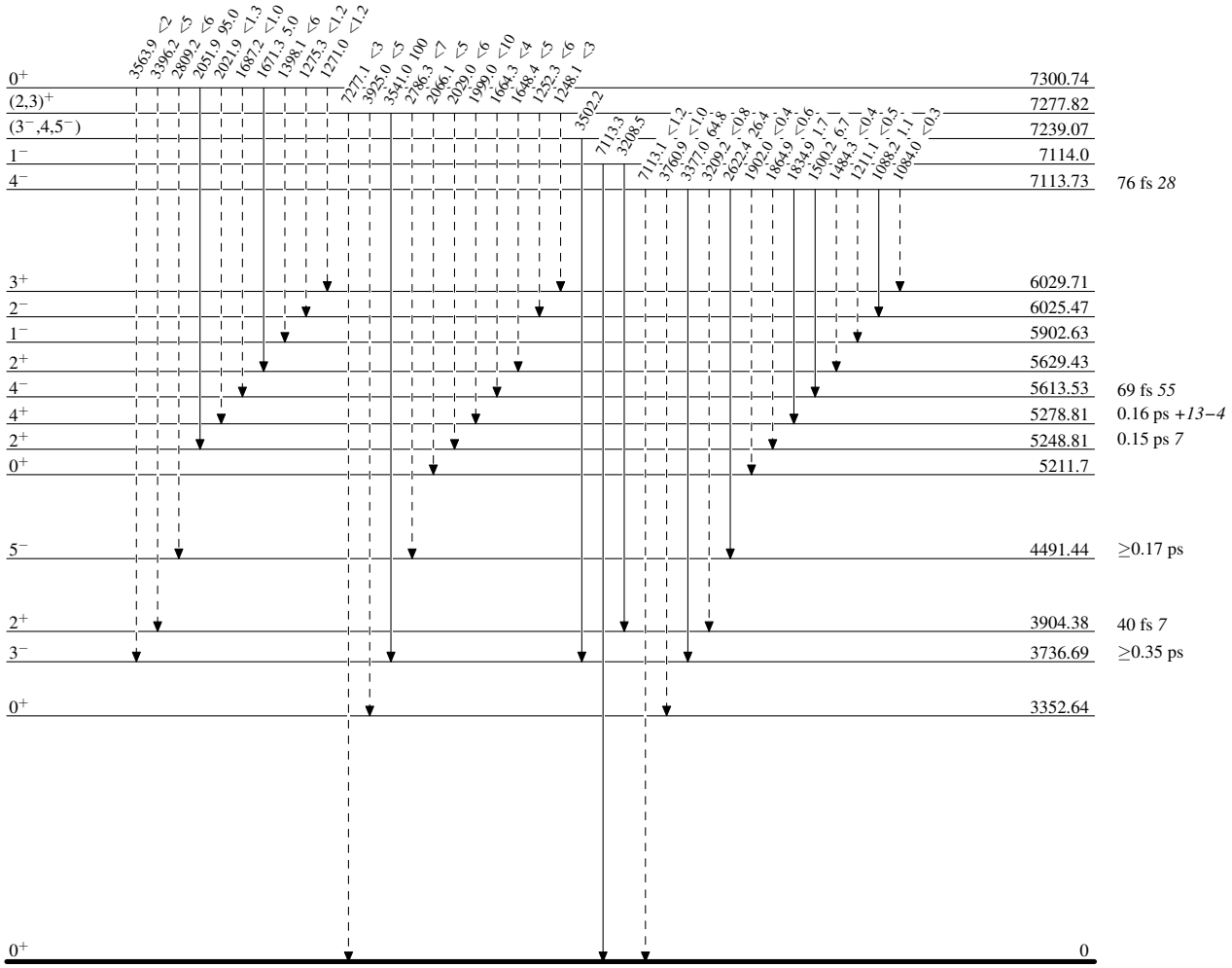
^{39}K(p,γ) 1990Ki07,1988Sc23

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{40}_{20}Ca_{20}$

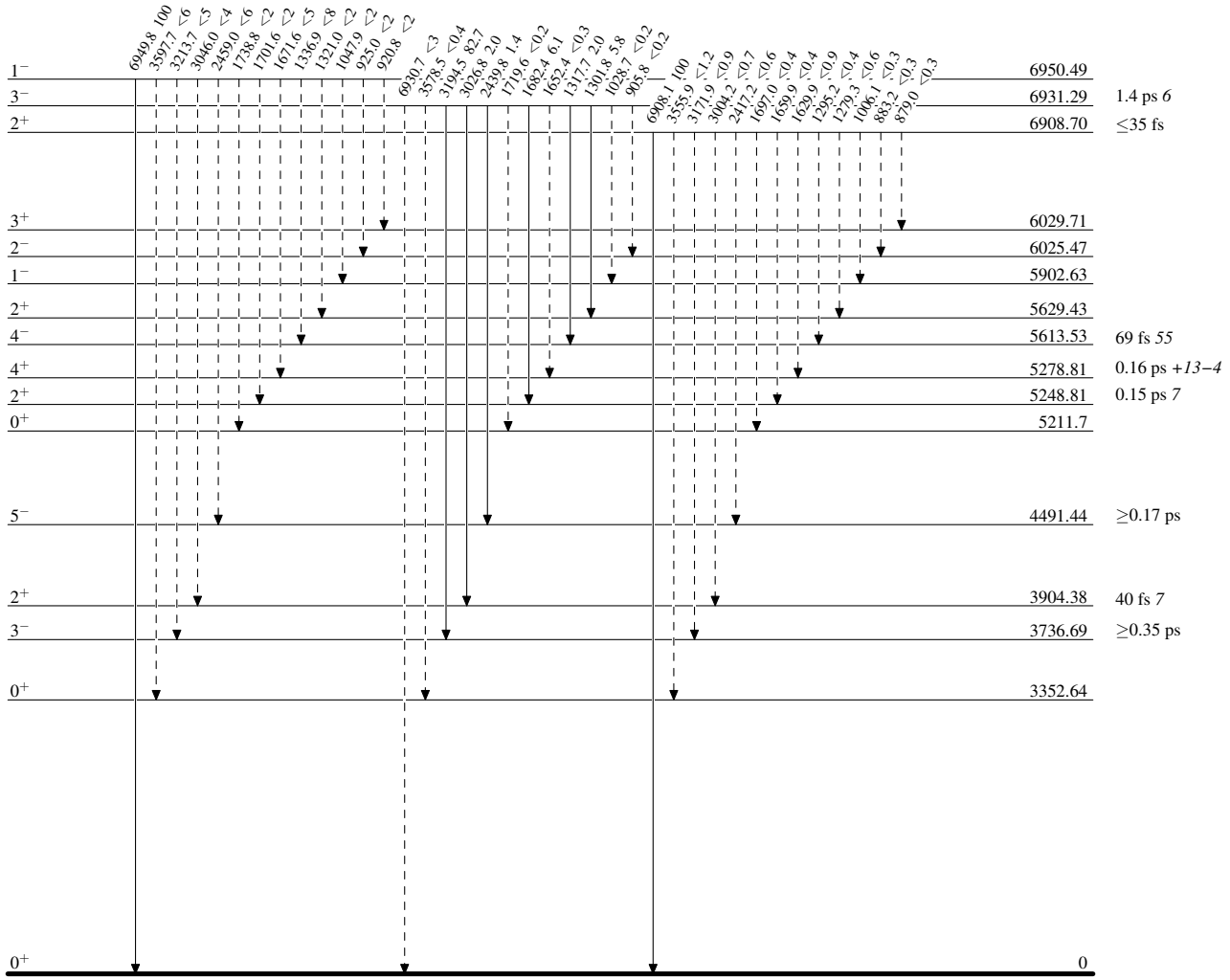
^{39}K(p,γ) 1990Ki07,1988Sc23

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



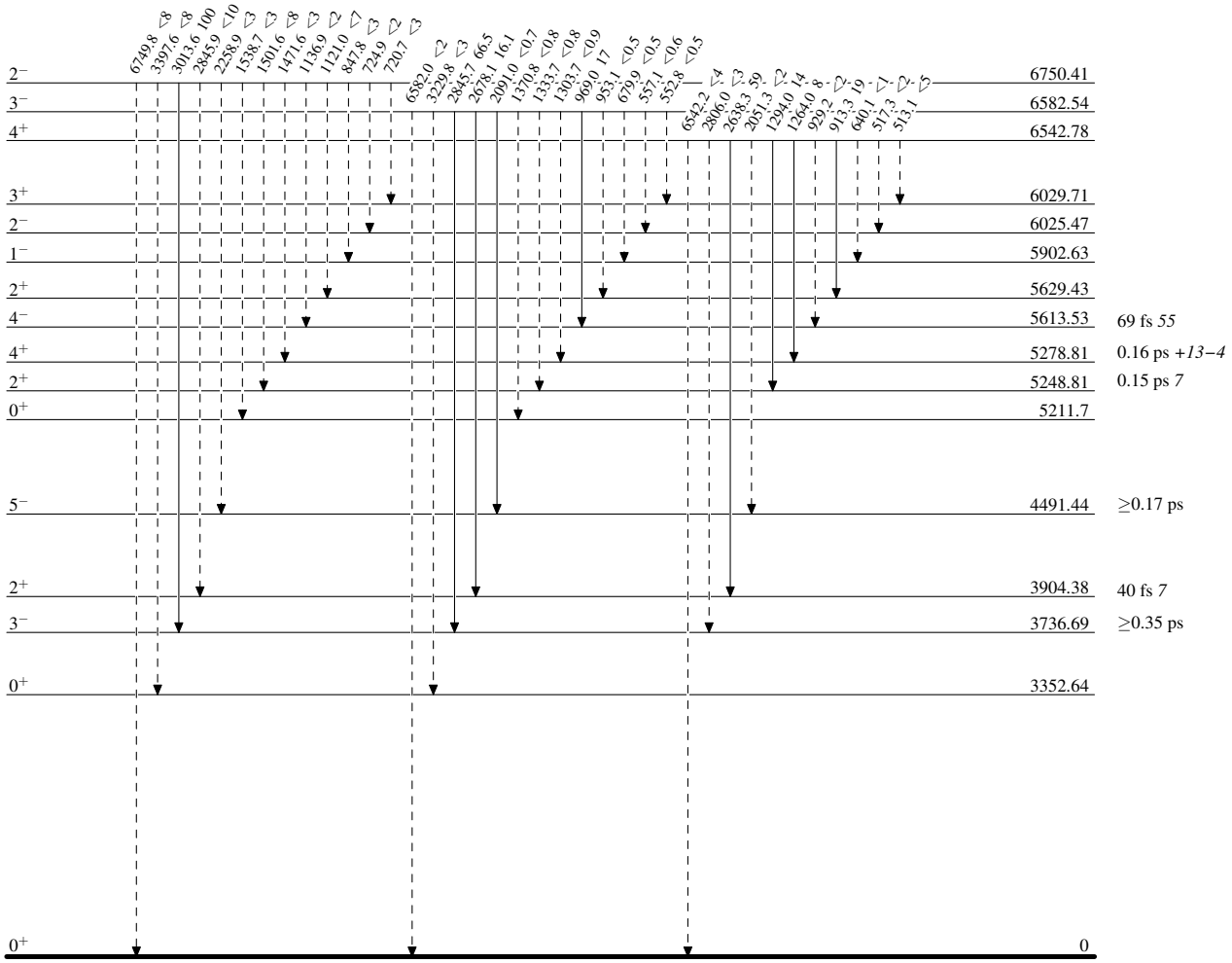
$^{40}_{20}Ca_{20}$

^{39}K(p,γ) 1990Ki07,1988Sc23 Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{40}_{20}Ca_{20}$

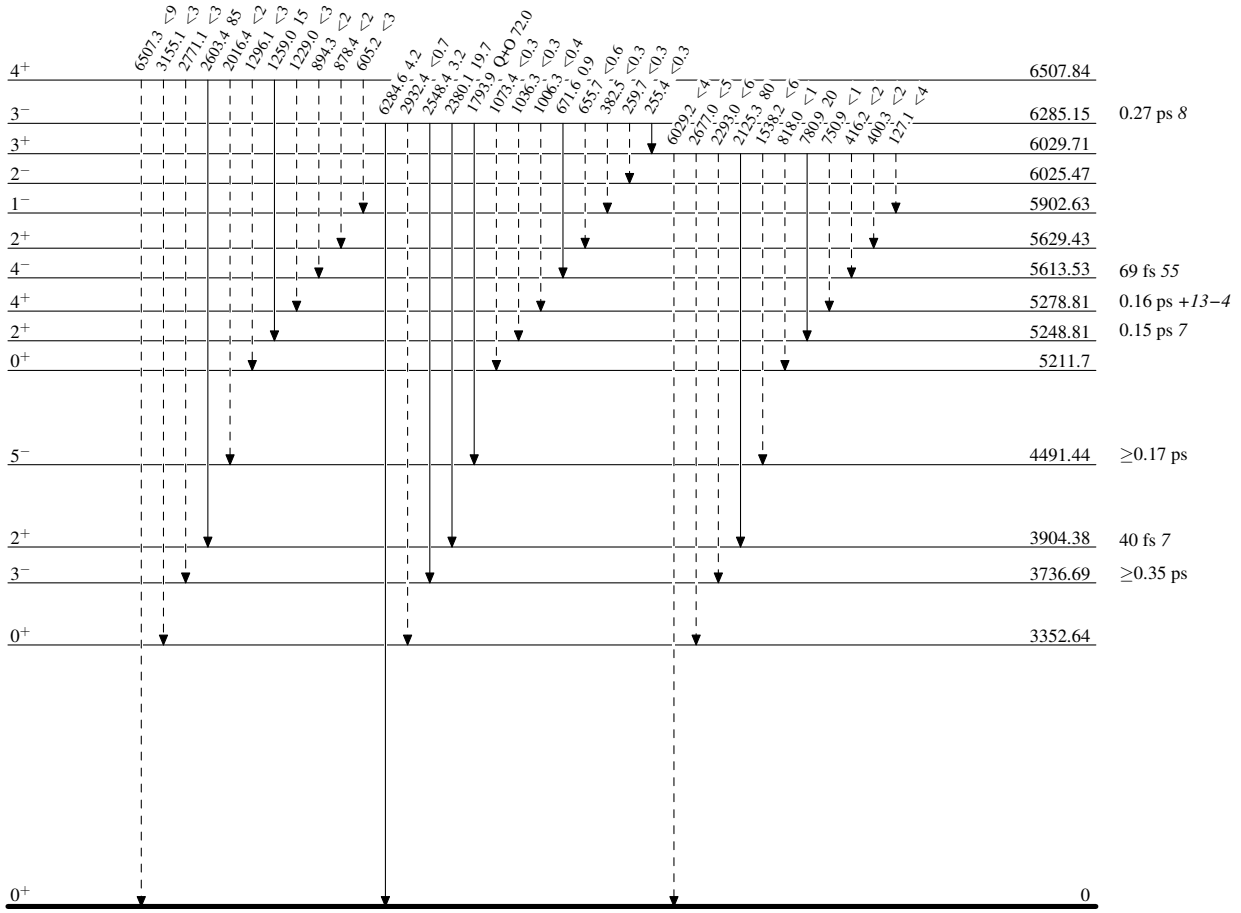
^{39}K(p,γ) 1990Ki07,1988Sc23

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{40}_{20}Ca_{20}$

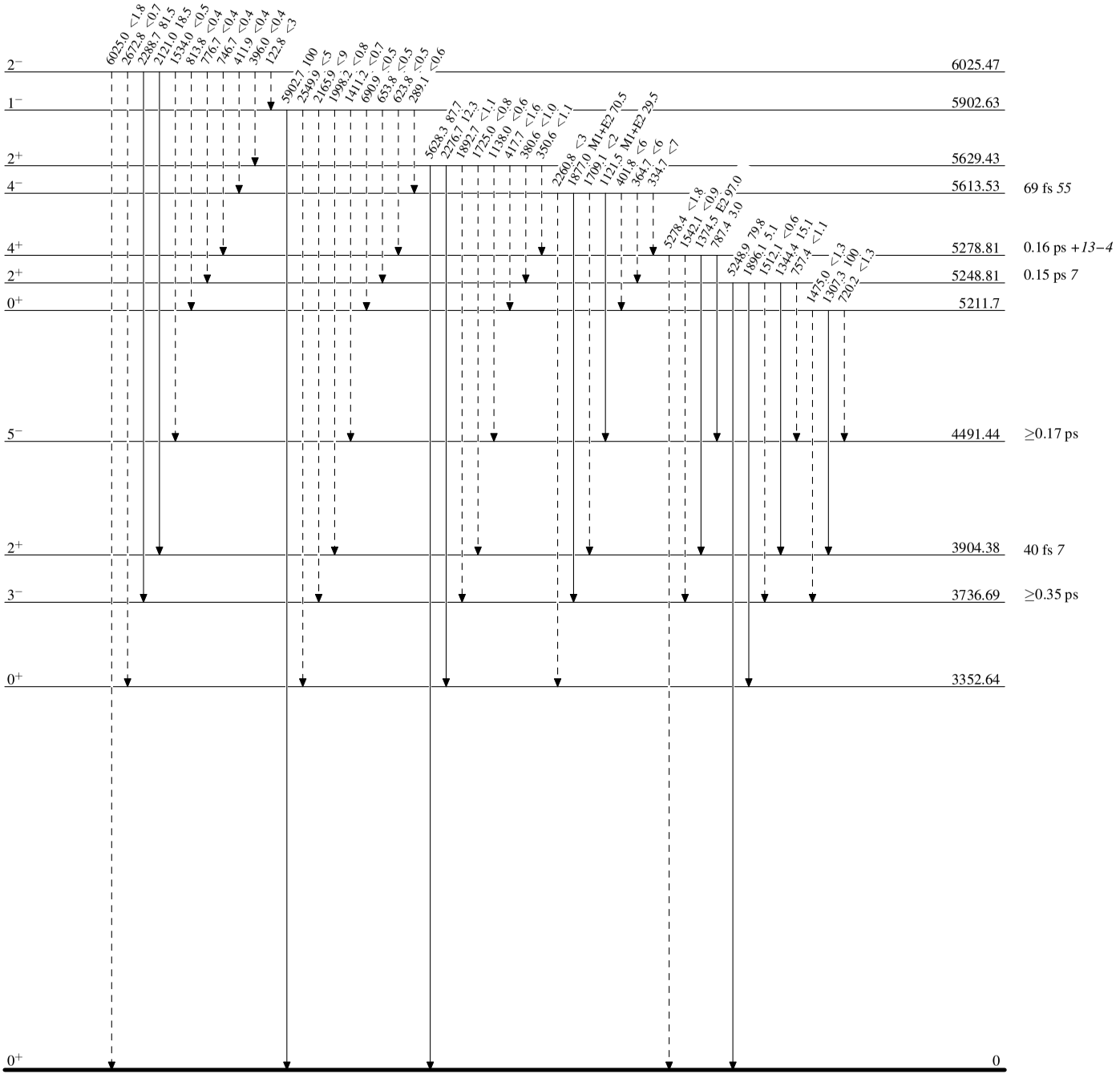
^{39}K(p,γ) 1990Ki07,1988Sc23

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{40}_{20}Ca_{20}$

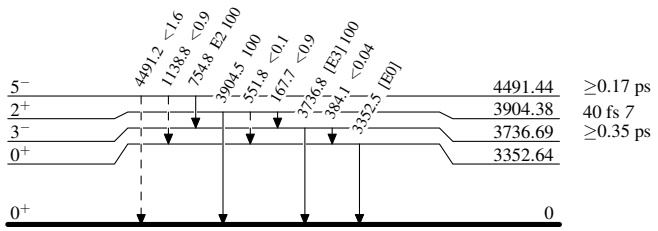
^{39}K(p,γ) 1990Ki07,1988Sc23

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{40}_{20}Ca_{20}$