Adopted Levels, Gammas

Type	Author	Citation	Literature Cutoff Date
	History		
Full Evaluation	T. D. Johnson, D. Symochko(a), M. Fadil(b), and J. K. Tuli	NDS 112,1949 (2011)	1-Jun-2010

Q(β^-)=7325 *9*; S(n)=4112 *12*; S(p)=9610 *8*; Q(α)=−963 *10* 2012Wa38
Note: Current evaluation has used the following Q record 7320 114116 149617 11-1.04e$^+$3syst 2011AuZZ.
Uncertainty associated with Q(α) is ΔQ(α)=10.
Q(β^-n)=1136 *12*, Q(εp)=−17510 *13* 2011AuZZ.
Values in 2003Au03: Q(β^-)=7308 *11*, S(n)=4110 *15*, S(p)=9480 *9*, Q(α)=−610 *8*, Q(β^-n)=1139 *13* Q(εp)=−17280 *20*.
Data from β- decay and ^{252}Cf SF decay do not overlap. Most likely the lowest level found in SF decay is an isomer with unknown excitation energy (marked as 0+X) and spin (given as J).

^{142}Cs Levels

Cross Reference (XREF) Flags

A ^{142}Xe β^- decay
B ^{252}Cf SF decay

E(level)‡	J$^\pi$†	T$_{1/2}$	XREF	Comments
0.0	0$^-$	1.684 s *14*	A	%β^-=100; %β^-n=0.090 *4* (1993Ru01) J$^\pi$: atomic-beam magnetic resonance (1979Ek02); see also 1979Bo01, 1981Th06 (LASER spectroscopy); π from log *ft*=5.59 to 1$^-$. Isotope shift and mean-square charge radii (1981Th06). T$_{1/2}$: from n,β^- (1993Ru01); others: 1.75 s *6* (1981En05,1979En02), 1.70 s *9* (1977Re05); from n,γ: 1.69 s *9* (1976Lu02), 1.70 s *2* (1975Re10), 2.04 s *2* (1974Gr29), 1.8 s *2* (1971Kr22), 1.68 s *2* (1969Ca03), 1.69 s *9* (1985Bu28) (1962Fr03), 2.3 s *2*. %β^-n: 0.091 *3* weighted average of 0.082% *8* (1981En05), 0.097% *7* (1980Lu04), 0.096% *8* (1977Re05). Others: 0.285% *26* (1975As05), 0.27% *7* (1969Ta04). Average E(n)=240 keV *6* (or 130 keV *10*) (1977Re06), E(n) spectra (1977Sh01).
12.929 *20*			A	
39.436 *20*			A	
70.58 *15*			A	
85.41 *6*			A	
204.000 *19*			A	
210.113 *21*			A	
242.89 *6*			A	
250.70 *7*			A	
304.42 *6*			A	
419.34 *8*			A	
598.14 *9*			A	
600.07 *16*			A	
657.17 *3*			A	
718.86 *9*			A	
732.63 *7*			A	
757.42 *9*			A	
777.01 *11*			A	
886.65 *14*			A	
944.33 *4*			A	
1066.96 *16*			A	
1068.26 *16*			A	
1089.94 *11*			A	
1195.49 *7*			A	
1312.38 *5*			A	
1614.53 *8*			A	
1875.76 *12*			A	

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Adopted Levels, Gammas (continued)

^{142}Cs Levels (continued)

E(level)‡	Jπ†	$T_{1/2}$	XREF	Comments
1961.32 *14*			A	
1984.61 *24*			A	
2095.5? *6*			A	
2281.79? *25*			A	
2500.04 *13*			A	
0+x	J(−)		B	E(level): most likely this level is not the ground state, since there is no overlap with the data from β-decay of ^{142}Xe. Jπ,$T_{1/2}$: possible μs or ms isomer with J≥1, negative parity is suggested from systematics of isomeric states in neighboring nuclides.
25.51+x *24*	J+1(−)			Jπ: from systematics of the bands in neighboring nuclides.
96.69+x# *24*	J+2(−)		B	Jπ: E2 to J(−).
122.9+x@ *3*	J+3(−)	11 ns *3*	B	Jπ: from systematics of the bands in neighboring nuclides. $T_{1/2}$: from ^{252}Cf SF decay, γ timing measurement using the Gammasphere array (2009Rz02).
315.0+x# *4*	J+4(−)		B	Jπ: E2 to J+2(−).
328.5+x@ *4*	J+5(−)		B	
723.6+x# *4*	J+6(−)		B	Jπ: E2 to J+4(−).
733.3+x@ *4*	J+7(−)		B	
1073.1+xb	J+5(+)		B	
1150.2+x&	J+6(+)		B	
1272.4+x# *5*	J+8(−)		B	Jπ: E2 to J+6(−).
1278.2+x@ *5*	J+9(−)		B	
1342.4+xb *5*	J+7(+)		B	Jπ: E1 to J+6(−).
1449.1+x& *5*	J+8(+)		B	
1652.8+x *5*			B	
1730.0+xb *5*	J+9(+)		B	
1793.7+xa *5*			B	
1862.6+x& *5*	J+10(+)		B	
1974.5+x# *5*	J+10(−)		B	
1978.2+x@ *5*	J+11(−)		B	
1995.4+xa *5*			B	
2233.2+xb *5*	J+11(+)		B	
2322.6+xa *5*			B	
2399.9+x& *5*	J+12(+)		B	
2731.1+x#	J+12(−)		B	
2765.4+x@ *6*	J+13(−)		B	
2785.1+xa *5*			B	
2849.0+xb *6*	J+13(+)		B	
3078.4+x& *6*	J+14(+)		B	
3363.3+xa *6*			B	
3554.3+xb	J+15(+)		B	
3661.8+x@	J+15(−)		B	
3862.3+x&	J+16(+)		B	
4001.3+xa			B	

† From band assignments, unless otherwise noted.

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Adopted Levels, Gammas (continued)

^{142}Cs Levels (continued)

‡ From least-squares fit to Eγ. Unknown uncertainties assumed to be 1.0 kev for the data from β- decay and 0.3 kev for the data from ^{252}Cf SF decay.
# Band(A): Band based on 96+x.
@ Band(B): Band based on 11-ns isomer.
& Band(C): Band based on 1150+x.
a Band(D): Band based on 1793+x.
b Band(E): Band based on 1073+x.

γ(^{142}Cs)

E_i(level)	E_γ	I_γ	E_f	J^π_f	E_i(level)	E_γ	I_γ	E_f	J^π_f
12.929	(12.9)		0.0	0⁻	732.63	428.20 *4*	100 *13*	304.42	
39.436	38.83# *30*	100#	0.0	0⁻		661.9 *5*	56 *15*	70.58	
70.58	(57.50)		12.929			693.60 *20*	95 *7*	39.436	
	70.1 *4*		0.0	0⁻	757.42	100.8# *6*	5.0# *16*	657.17	
85.41	46.13 *20*	18 *3*	39.436			547.69 *21*	91 *15*	210.113	
	72.86 *20*	100 *6*	12.929			672.20 *19*	100 *10*	85.41	
204.000	164.563 *7*	61 *4*	39.436			718.2# *4*	10# *3*	39.436	
	191.069 *7*	100 *6*	12.929			744.36 *24*	42 *5*	12.929	
	204.034 *20*	77 *4*	0.0	0⁻	777.01	19.77 *13*	25 *7*	757.42	
210.113	124.52 *25*	100 *21*	85.41			119.9 *4*	20 *3*	657.17	
	170.677 *7*	17 *5*	39.436			737.37 *17*	100 *13*	39.436	
	197.44 *14*	79 *9*	12.929			776.05 *50*	22 *3*	0.0	0⁻
242.89	(33.0)		210.113		886.65	582.49 *24*	71 *10*	304.42	
	38.83# *40*	36# *3*	204.000			801.24 *19*	100 *11*	85.41	
	157.485 *7*	27 *2*	85.41			815.88 *21*	58 *10*	70.58	
	203.79 *20*	100 *4*	39.436		944.33	167.4 *6*	10 *4*	777.01	
	242.8 *6*	4.1 *20*	0.0	0⁻		287.160 *19*	100 *5*	657.17	
250.70	211.7 *4*	12 *3*	39.436			943.8 *5*	19 *6*	0.0	0⁻
	250.68 *9*	100 *7*	0.0	0⁻	1066.96	862.90 *21*	75 *11*	204.000	
304.42	94.6 *3*	8.6 *51*	210.113			996.41 *21*	100 *14*	70.58	
	100.8# *6*	2.1# *7*	204.000		1068.26	468.17# *7*	100# *6*	600.07	
	219.1 *3*	31 *6*	85.41			983.5 *5*	74 *18*	85.41	
	264.3 *6*	9 *2*	39.436			1068.3 *3*	79 *15*	0.0	0⁻
	291.95 *30*	100 *6*	12.929		1089.94	432.36 *20*	100 *10*	657.17	
	304.3 *4*	10 *3*	0.0	0⁻		1089.7 *5*	11 *3*	0.0	0⁻
419.34	379.90 *8*	100 *6*	39.436		1195.49	105.61 *24*	2.6 *4*	1089.94	
	418.5 *4*	35 *6*	0.0	0⁻		438.19 *17*	8 *1*	757.42	
598.14	394.20 *10*	100	204.000			538.24 *7*	100 *5*	657.17	
600.07	349.0 *3*	100	250.70			891.40 *20*	15 *1*	304.42	
657.17	(57.50)		600.07			991.23 *30*	11 *1*	204.000	
	352.74 *6*	13 *1*	304.42			1183.5 *8*	3.5 *7*	12.929	
	406.47 *10*	11 *1*	250.70			1195.4 *3*	6 *1*	0.0	0⁻
	414.52 *20*	47 *3*	242.89		1312.38	1108.3 *6*	2.3 *1*	204.000	
	447.048 *21*	17 *1*	210.113			1227.01 *7*	62 *4*	85.41	
	453.15 *25*	20 *1*	204.000			1300.09 *30*	100 *5*	12.929	
	571.83 *20*	100 *5*	85.41			1312.29 *6*	70 *4*	0.0	0⁻
	587.1 *4*	3 *1*	70.58		1614.53	524.44 *11*	100 *8*	1089.94	
	618.06 *16*	72 *4*	39.436			957.27 *21*	88 *13*	657.17	
	644.80 *30*	63 *4*	12.929			1410.60 *10*	78 *6*	204.000	
	657.05 *6*	79 *4*	0.0	0⁻		1602.2 *3*	25 *5*	12.929	
718.86	468.17# *7*	100# *6*	250.70		1875.76	807.4 *3*	86 *14*	1068.26	
	718.2# *4*	3.4# *12*	0.0	0⁻		1156.80 *14*	100 *8*	718.86	
732.63	312.99 *23*	56 *9*	419.34			1219.23 *32*	94 *14*	657.17	

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Adopted Levels, Gammas (continued)

γ(^{142}Cs) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α‡	Comments
1875.76		1456.5 *6*	18 *6*	419.34				
		1624.8 *7*	12 *5*	250.70				
		1632.9 *4*	21 *6*	242.89				
		1789.5 *8*	17 *6*	85.41				
		1804.6 *5*	18 *6*	70.58				
		1837.1 *5*	29 *8*	39.436				
		1875.8 *5*	26 *8*	0.0	0^-			
1961.32		765.66 *21*	100 *12*	1195.49				
		1304.0 *3*	71 *12*	657.17				
		1363.3 *3*	53 *12*	598.14				
		1710.9 *3*	62 *12*	250.70				
		1718.9 *8*	26 *12*	242.89				
1984.61		917.6 *3*	100 *20*	1066.96				
		1040.4 *5*	53 *13*	944.33				
		1384.5 *4*	57 *10*	600.07				
		1972.1 *15*	20 *17*	12.929				
2095.5?		1338.3@ *3*	100 *21*	757.42				
		1376.6@ *3*	76 *10*	718.86				
		1844.5@ *3*	69 *14*	250.70				
2281.79?		1395.0@ *3*	100 *18*	886.65				
		1862.2@ *6*	88 *29*	419.34				
		2077.7@ *5*	100 *29*	204.000				
2500.04		404.5 *5*	26 *7*	2095.5?				
		1187.39 *18*	76 *8*	1312.38				
		1431.7 *6*	16 *5*	1068.26				
		1781.7 *4*	22 *8*	718.86				
		1902.05 *18*	100 *9*	598.14				
25.51+x	J+1$^{(-)}$	25.3	100 *31*	0+x	J$^{(-)}$			
96.69+x	J+2$^{(-)}$	71.1	38 *11*	25.51+x	J+1$^{(-)}$			
		96.9	100 *6*	0+x	J$^{(-)}$	E2	2.09	α(K)=1.332 *19*; α(L)=0.597 *9*; α(M)=0.1293 *18*; α(N+..)=0.0293 *5* α(N)=0.0262 *4*; α(O)=0.00308 *5*; α(P)=3.67×10^{-5} *6*
122.9+x	J+3$^{(-)}$	26.4	100 *16*	96.69+x	J+2$^{(-)}$			
		97.3	69 *4*	25.51+x	J+1$^{(-)}$	(E2)†	2.06	α(K)=1.315 *19*; α(L)=0.586 *9*; α(M)=0.1269 *18*; α(N+..)=0.0288 *4* α(N)=0.0257 *4*; α(O)=0.00302 *5*; α(P)=3.63×10^{-5} *5*
315.0+x	J+4$^{(-)}$	192.1	23 *4*	122.9+x	J+3$^{(-)}$			
		218.3	100 *13*	96.69+x	J+2$^{(-)}$	E2	0.1237	α(K)=0.0981 *14*; α(L)=0.0204 *3*; α(M)=0.00429 *6*; α(N+..)=0.000999 *14* α(N)=0.000884 *13*; α(O)=0.0001117 *16*; α(P)=3.17×10^{-6} *5*
328.5+x	J+5$^{(-)}$	205.6	100 *5*	122.9+x	J+3$^{(-)}$	(E2)	0.1515	α(K)=0.1192 *17*; α(L)=0.0257 *4*; α(M)=0.00542 *8*; α(N+..)=0.001260 *18* α(N)=0.001116 *16*; α(O)=0.0001402 *20*; α(P)=3.81×10^{-6} *6*
723.6+x	J+6$^{(-)}$	395.1	23 *5*	328.5+x	J+5$^{(-)}$			
		408.6	100 *7*	315.0+x	J+4$^{(-)}$	E2	0.01678	α(K)=0.01402 *20*; α(L)=0.00220 *3*; α(M)=0.000456 *7*; α(N+..)=0.0001082 *16* α(N)=9.50×10^{-5} *14*; α(O)=1.262×10^{-5} *18*; α(P)=4.95×10^{-7} *7*

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Adopted Levels, Gammas (continued)

γ(^{142}Cs) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α‡	Comments
733.3+x	J+7(−)	404.8	100 *6*	328.5+x	J+5(−)	E2	0.01725	α(K)=0.01441 *21*; α(L)=0.00227 *4*; α(M)=0.000470 *7*; α(N+..)=0.0001115 *16* α(N)=9.80×10^{-5} *14*; α(O)=1.300×10^{-5} *19*; α(P)=5.08×10^{-7} *8*
1073.1+x	J+5(+)	744.4		328.5+x	J+5(−)			
		757.9		315.0+x	J+4(−)			
1150.2+x	J+6(+)	821.5		328.5+x	J+5(−)			
1272.4+x	J+8(−)	539.1		733.3+x	J+7(−)			
		548.8	100 *6*	723.6+x	J+6(−)	E2	0.00730 *11*	α(K)=0.00618 *9*; α(L)=0.000892 *13*; α(M)=0.000184 *3*; α(N+..)=4.39×10^{-5} *7* α(N)=3.85×10^{-5} *6*; α(O)=5.20×10^{-6} *8*; α(P)=2.24×10^{-7} *4*
1278.2+x	J+9(−)	544.9	100 *12*	733.3+x	J+7(−)	E2	0.00744 *11*	α(K)=0.00630 *9*; α(L)=0.000910 *13*; α(M)=0.000188 *3*; α(N+..)=4.48×10^{-5} *7* α(N)=3.93×10^{-5} *6*; α(O)=5.31×10^{-6} *8*; α(P)=2.28×10^{-7} *4*
1342.4+x	J+7(+)	609.1	33 *8*	733.3+x	J+7(−)			
		618.8	100 *8*	723.6+x	J+6(−)	E1	0.00192 *3*	α(K)=0.001660 *24*; α(L)=0.000205 *3*; α(M)=4.17×10^{-5} *6*; α(N+..)=1.008×10^{-5} *15* α(N)=8.80×10^{-6} *13*; α(O)=1.221×10^{-6} *18*; α(P)=5.99×10^{-8} *9*
1449.1+x	J+8(+)	715.8	100 *9*	733.3+x	J+7(−)	E1	0.001404 *20*	α(K)=0.001217 *17*; α(L)=0.0001498 *21*; α(M)=3.04×10^{-5} *5*; α(N+..)=7.35×10^{-6} α(N)=6.42×10^{-6} *9*; α(O)=8.92×10^{-7} *13*; α(P)=4.41×10^{-8} *7*
1652.8+x		919.5	100 *50*	733.3+x	J+7(−)			
1730.0+x	J+9(+)	387.6	100 *14*	1342.4+x	J+7(+)			
		451.8		1278.2+x	J+9(−)			
		457.6		1272.4+x	J+8(−)			
1793.7+x		1060.4	100 *50*	733.3+x	J+7(−)			
1862.6+x	J+10(+)	413.5	100 *14*	1449.1+x	J+8(+)			
		584.4	43 *14*	1278.2+x	J+9(−)			
1974.5+x	J+10(−)	702.1	100 *25*	1272.4+x	J+8(−)			
1978.2+x	J+11(−)	700.0	100 *10*	1278.2+x	J+9(−)			
1995.4+x		717.2	100 *25*	1278.2+x	J+9(−)			
		1262.1		733.3+x	J+7(−)			
2233.2+x	J+11(+)	255.0		1978.2+x	J+11(−)			
		258.7		1974.5+x	J+10(−)			
		503.2	100 *20*	1730.0+x	J+9(+)			
2322.6+x		327.2	100 *20*	1995.4+x				
		344.4@		1978.2+x	J+11(−)			
2399.9+x	J+12(+)	421.7	18 *8*	1978.2+x	J+11(−)			
		537.3	100 *25*	1862.6+x	J+10(+)			
2731.1+x	J+12(−)	756.4		1974.5+x	J+10(−)			
2765.4+x	J+13(−)	787.2	100 *33*	1978.2+x	J+11(−)			
2785.1+x		462.5	100 *33*	2322.6+x				

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Adopted Levels, Gammas (continued)

$\gamma(^{142}Cs)$ (continued)

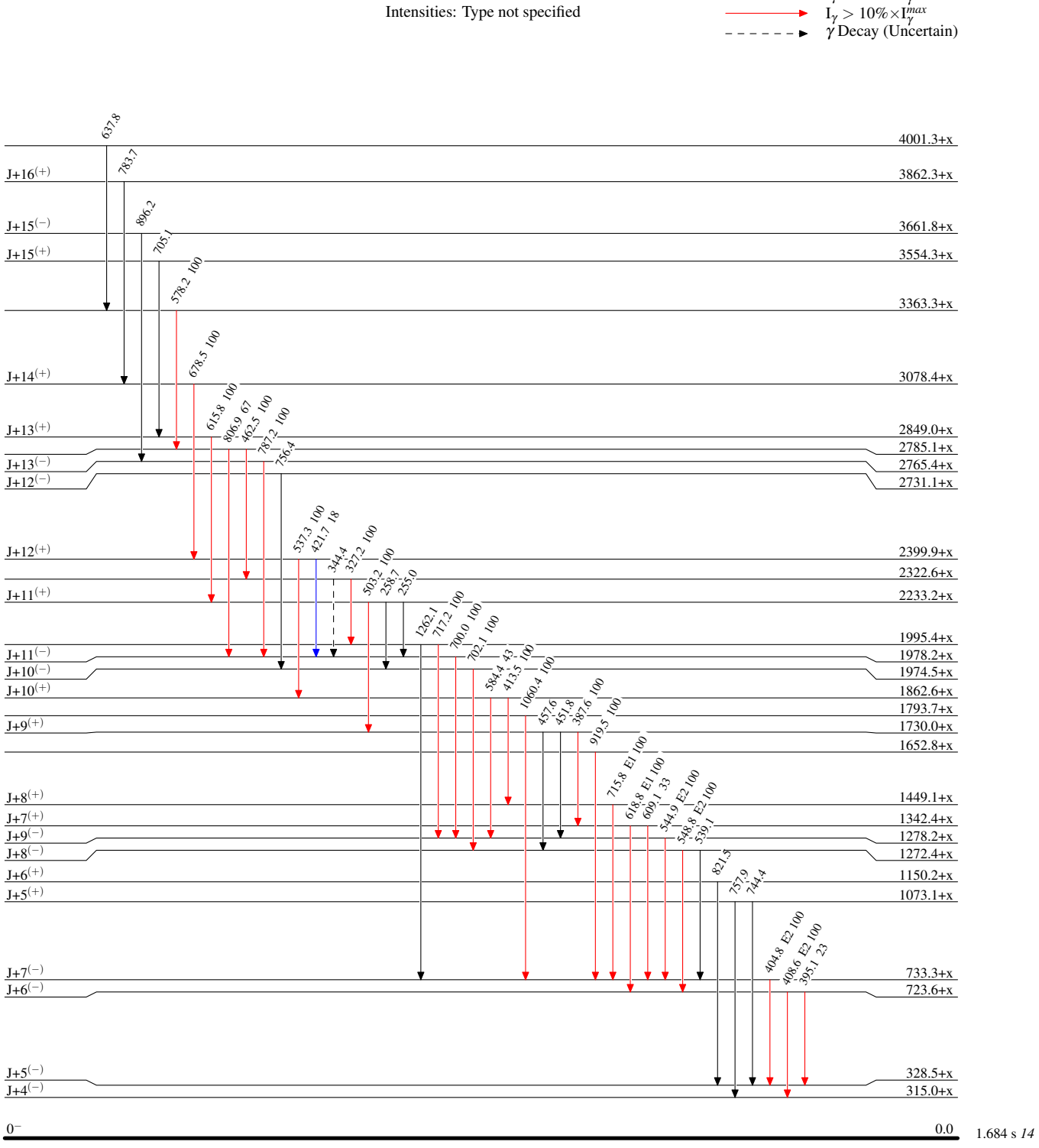
E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π
2785.1+x		806.9	67 *22*	1978.2+x	J+11$^{(-)}$
2849.0+x	J+13$^{(+)}$	615.8	100 *50*	2233.2+x	J+11$^{(+)}$
3078.4+x	J+14$^{(+)}$	678.5	100 *50*	2399.9+x	J+12$^{(+)}$
3363.3+x		578.2	100 *50*	2785.1+x	
3554.3+x	J+15$^{(+)}$	705.1		2849.0+x	J+13$^{(+)}$
3661.8+x	J+15$^{(-)}$	896.2		2765.4+x	J+13$^{(-)}$
3862.3+x	J+16$^{(+)}$	783.7		3078.4+x	J+14$^{(+)}$
4001.3+x		637.8		3363.3+x	

† Based on the half−life value of the 123+X keV level, which rules out M2.
‡ 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.
# Multiply placed with undivided intensity.
@ Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified

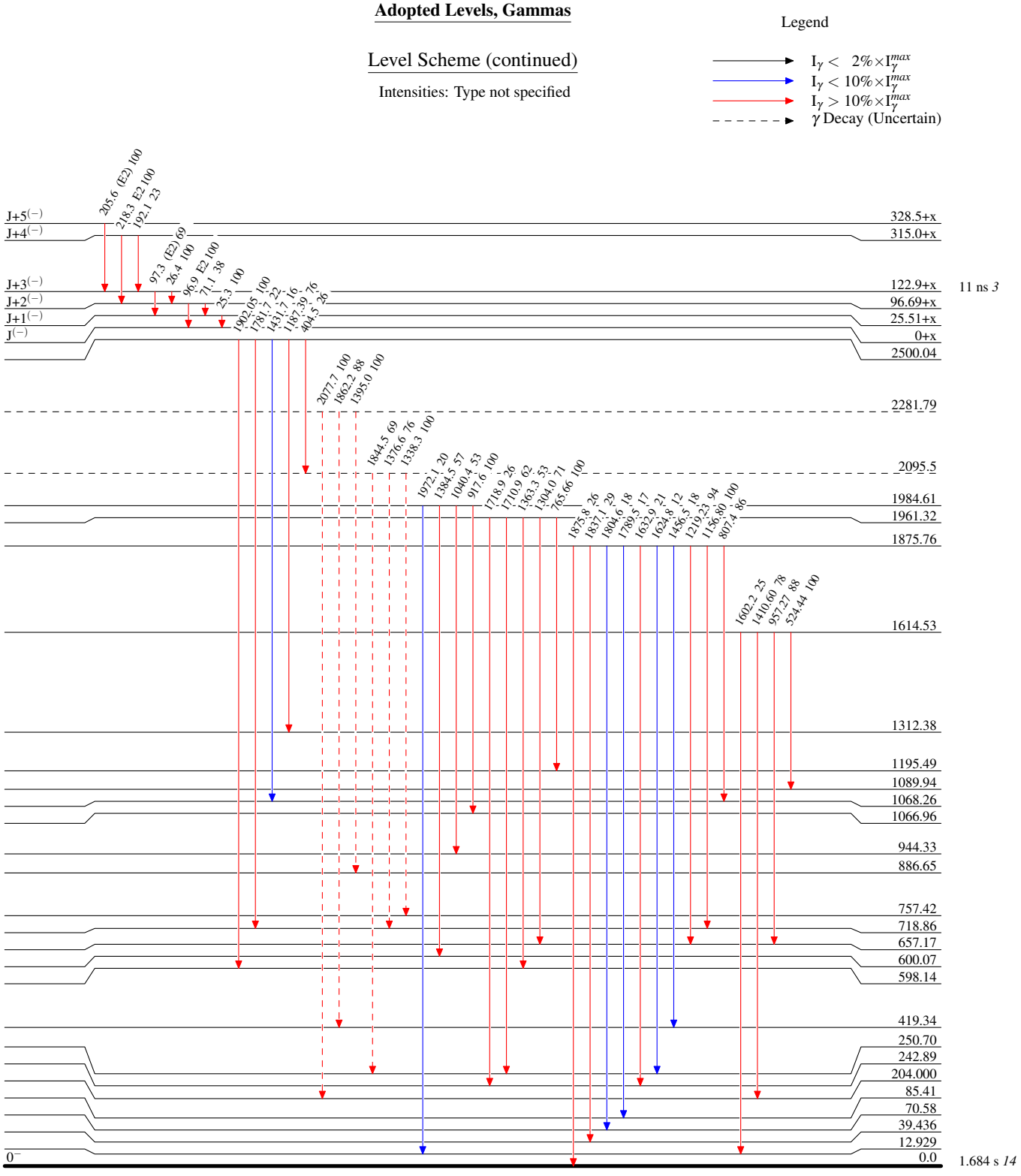


$^{142}_{55}Cs_{87}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



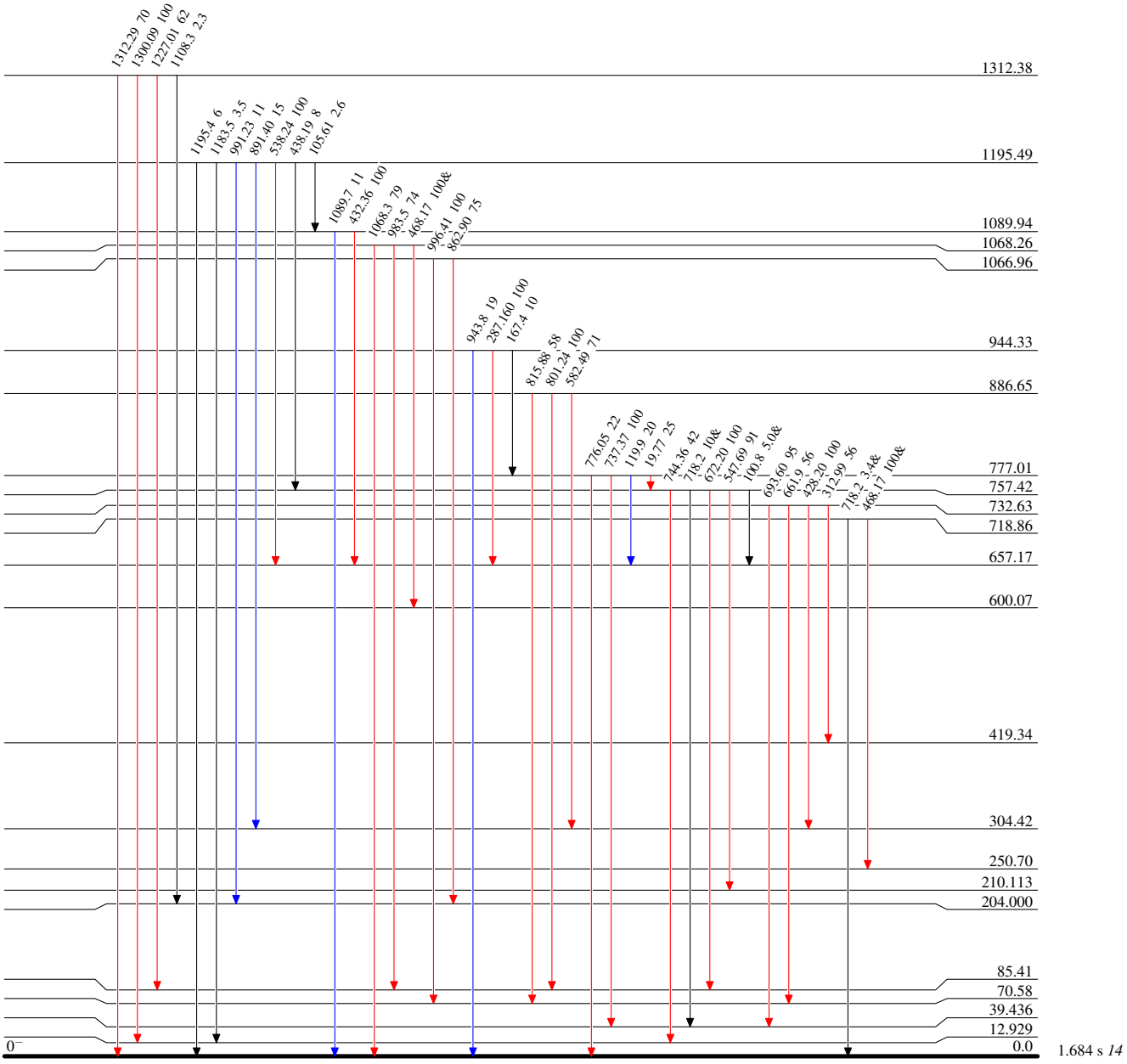
$^{142}_{55}Cs_{87}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$

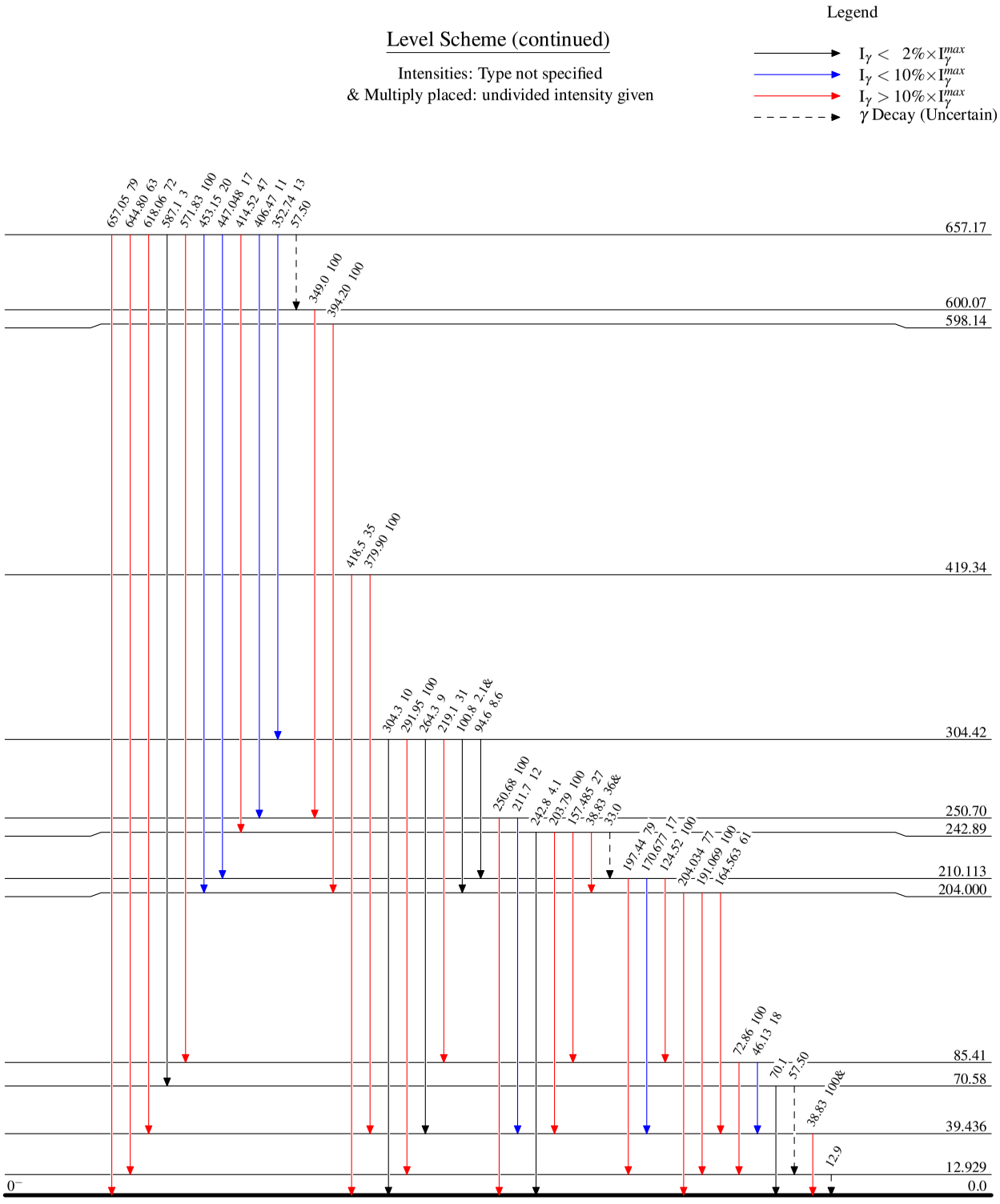


$^{142}_{55}Cs_{87}$

Adopted Levels, Gammas

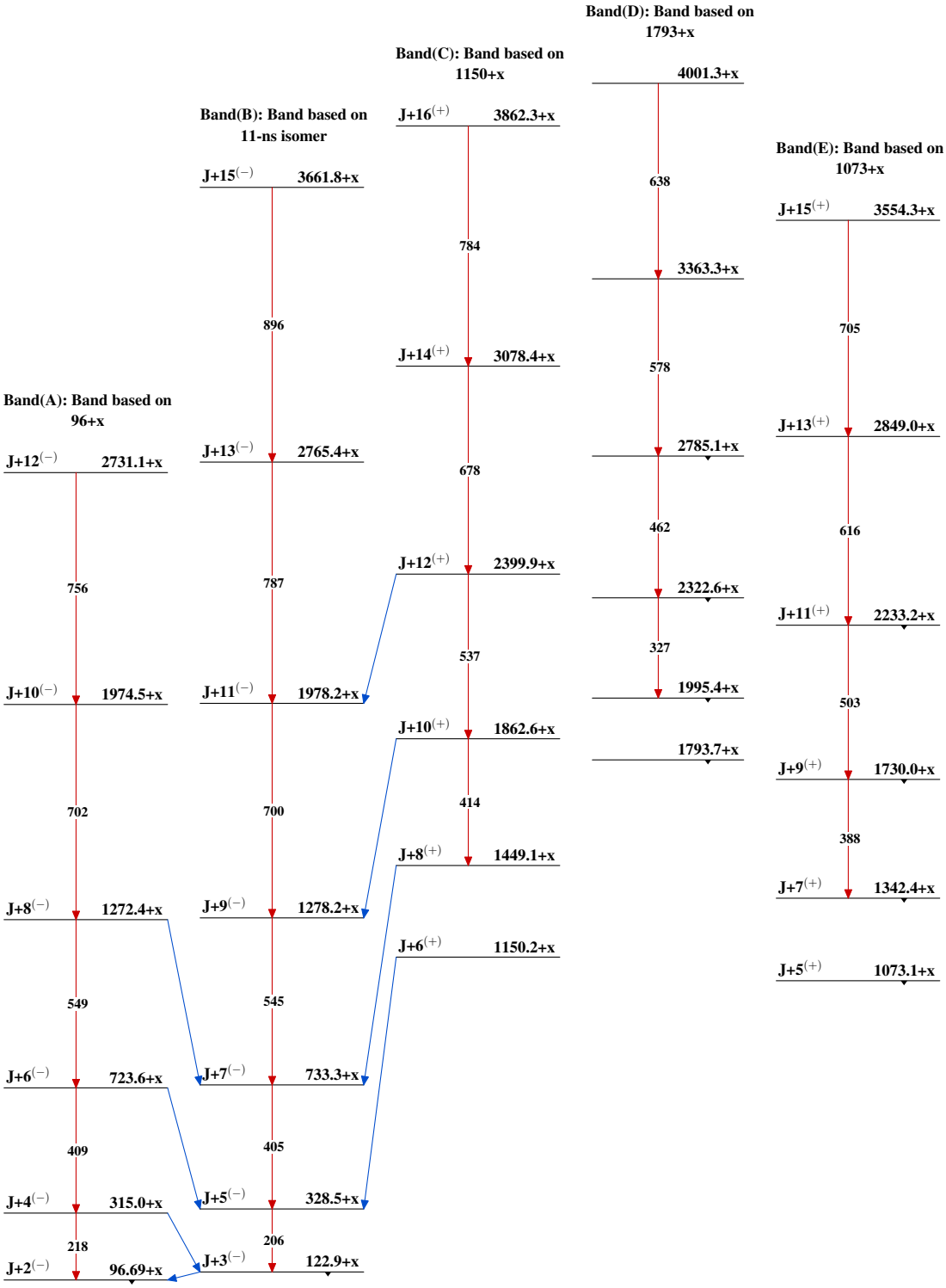
Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given



$^{142}_{55}Cs_{87}$

Adopted Levels, Gammas



$^{142}_{55}Cs_{87}$