

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	T. Tamura	NDS 108,455 (2007)	30-Sep-2006

$Q(\beta^-) = -3.54 \times 10^3$ 5; $S(n) = 9.11 \times 10^3$ 4; $S(p) = 2.95 \times 10^3$ 4; $Q(\alpha) = 4.0 \times 10^2$ 4 [2012Wa38](#)

Note: Current evaluation has used the following Q record -3530 409110 302960 30410 40 [2003Au03](#).

 ^{122}Cs LevelsCross Reference (XREF) Flags

A	^{122}Cs IT decay (0.36 s)	D	$^{107}\text{Ag}(^{19}\text{F}, p3n\gamma)$
B	^{122}Ba ε decay	E	$^{112}\text{Sn}(^{12}\text{C}, pn\gamma)$
C	$^{109}\text{Ag}(^{16}\text{O}, 3n\gamma), ^{94}\text{Mo}(^{31}\text{P}, 2pn\gamma)$		

E(level) [†]	J ^π [‡]	T _{1/2}	XREF	Comments
0.0	1 ⁺	21.18 s <i>19</i>	ABCDE	$\% \varepsilon + \% \beta^+ = 100$ $\mu = -0.1333$ 9; $Q = -0.19$ 1 J^π : J=1 from atomic beam magnetic resonance (1977Ek02); log <i>ft</i> =5.39 to 0 ⁺ and 5.40 to 2 ⁺ in ^{122}Xe . μ : Laser-induced optical pumping of thermal atomic beam with magnetic state selection; reference to ^{133}Cs (1977Ek02, 2005St24). Other: 0.133 2 (1977Ek02, 2005St24). Q : Laser-induced optical pumping of thermal atomic beam with magnetic state selection; reference to ^{133}Cs (1989Ra17). Nuclear rms charge radius=4.7776 fm <i>70</i> (2004An14). T _{1/2} : from 1993Al03 . Others: 21.0 s <i>7</i> (1969Ch18), 23 s <i>6</i> (1972Dr06).
15.56 <i>14</i>			B	
45.87 <i>12</i>	(3) ⁺	>1 μ s	AB	J^π : see 127 level. T _{1/2} : estimated from $\gamma\gamma(t)$ coin (1987WeZW).
69.53 <i>13</i>			B	
116.90 <i>20</i>	0,1,2		B	
122.27 <i>23</i>			B	
124.94 <i>13</i>			B	
127.07 <i>16</i>	(5) ⁻	0.36 s <i>2</i>	A	$\% \text{IT} = 100$ J^π : M2 γ decays to 45.9 keV level followed by E2 γ to 1 ⁺ ; T _{1/2} suggests $J^\pi(127.07) = (5)^-$ and $J^\pi(45.9) = (3)^+$. T _{1/2} : from ce-multiscaler counting (1983We07). Other: 0.35 s <i>7</i> (1969NeZX). See ^{122}Cs IT decay for the decay mode of this level.
140.30	8 ⁽⁻⁾	3.70 min <i>11</i>	BCDE	$\% \varepsilon + \% \beta^+ = 100$ $\mu = +4.77$ 2; $Q = +3.29$ 8 Additional information 1 . E(level): Mass difference of the g.s. and this isomers (2003Au02); 135 keV <i>15</i> from direct mass measurement in Penning trap mass spectrometer (ISOLTRAP) (1999Am05). J^π : J=8 from atomic-beam magnetic resonance (1977Ek02); $\pi = -$ from μ . μ : Laser induced optical pumping of thermal atomic beam with magnetic state selection; reference to ^{133}Cs (1989Ra17). however, μ is incorrectly cited in 2005St24 ; μ Ne +5.41 3 (evaluator). Q : Laser induced optical pumping of thermal atomic beam with magnetic state selection; reference to ^{133}Cs and Sternheimer correction included (1977Ek02, 2005St24). T _{1/2} : from 1993Al03 . Others: 4.5 min <i>2</i> (1969Ch18), 4.2 min <i>5</i> (1972Dr06), 4.0 min <i>6</i> (1969NeZY).
142.36 <i>14</i>			B	Additional information 2 .
161.36 <i>13</i>			B	

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Adopted Levels, Gammas (continued) ^{122}Cs Levels (continued)

E(level) [†]	J ^π [‡]	XREF	E(level) [†]	J ^π [‡]	XREF	E(level) [†]	J ^π [‡]	XREF
177.70 22		B	787.79 ^{&} 19	(12 ⁻)	CDE	3262.8 ^a 4	(19 ⁻)	CDE
205.63 21		B	814.81 [@] 23	(13 ⁺)	CDE	3391.4 [#] 4	(20 ⁺)	CDE
223.7 4		B	891.6 ^c 4	(11 ⁻)	CD	3407.2 ^c 8	(19 ⁻)	CD
235.30 ^a 14	(9 ⁻)	CDE	909.5 4	(11 ⁻)	CD	3706.4 ^{&} 4	(20 ⁻)	CDE
237.65 16		B	981.13 [#] 25	(14 ⁺)	CDE	3757.4 11	(20 ⁺)	D
261.1 4		B	1055.9 ^b 3	(13 ⁺)	CD	3848.0 [@] 6	(21 ⁺)	CD
265.75 24		B	1072.59 ^a 21	(13 ⁻)	CDE	4020.2 ^d 13	(20 ⁻)	D
272.38 [@] 16	(9 ⁺)	CDE	1082.8 ^d 5	(12 ⁻)	CD	4156.6 ^a 4	(21 ⁻)	CD
273.67 19		B	1358.3 ^c 4	(13 ⁻)	CD	4189.2 ^b 5	(21 ⁺)	D
280.0 4		B	1361.43 ^{&} 21	(14 ⁻)	CDE	4279.9 ^c 9	(21 ⁻)	CD
301.90 20		B	1373.7 [@] 3	(15 ⁺)	CDE	4287.5 9	(21 ⁻)	CD
307.40 20		B	1632.7 ^b 3	(15 ⁺)	CD	4426.2 [#] 5	(22 ⁺)	CDE
319.93 18		B	1640.4 [#] 3	(16 ⁺)	CDE	4585.4 11	(22 ⁺)	D
323.79 [#] 23	(10 ⁺)	CDE	1699.6 ^d 6	(14 ⁻)	CD	4652.6 ^{&} 5	(22 ⁻)	CD
332.90 21		B	1707.26 ^a 25	(15 ⁻)	CDE	4873.4 [@] 6	(23 ⁺)	CD
339.00 24		B	1937.8 ^c 6	(15 ⁻)	CD	4886.2 ^d 17	(22 ⁻)	D
350.2 3		B	2051.7 ^{&} 3	(16 ⁻)	CDE	5120.9 ^a 6	(23 ⁻)	CD
364.71 16		B	2078.0 [@] 3	(17 ⁺)	CDE	5251.9 ^c 14	(23 ⁻)	D
365.72 ^{&} 15	(10 ⁻)	CDE	2368.5 ^b 3	(17 ⁺)	CD	5528.2 [#] 12	(24 ⁺)	CD
411.22 19		B	2398.7 ^d 8	(16 ⁻)	CD	5651.6 ^{&} 12	(24 ⁻)	D
427.08 [@] 21	(11 ⁺)	CDE	2444.0 ^a 3	(17 ⁻)	CDE	5837.2 ^d 20	(24 ⁻)	D
453.8 4	(10)	CD	2454.4 [#] 4	(18 ⁺)	CDE	5961.4 [@] 12	(25 ⁺)	CD
484.82 15		B	2624.0 ^c 7	(17 ⁻)	CD	6165.9 ^a 12	(25 ⁻)	D
508.55 [#] 23	(12 ⁺)	CDE	2836.3 ^{&} 4	(18 ⁻)	CDE	6667.2 [#] 15	(26 ⁺)	CD
537.9 5		B	2910.0 [@] 4	(19 ⁺)	CDE	7105? [@] 5	(27 ⁺)	C
550.56 16		B	3194.2 ^d 9	(18 ⁻)	CD	7873? [#] 5	(28 ⁺)	C
569.00 ^a 18	(11 ⁻)	CDE	3234.4 ^b 4	(19 ⁺)	CD			

[†] Least-squares fit to γ rays compiled from all reactions and ^{122}Cs IT decay, ^{122}Ba ε decay. All the level associated with the band 1 through band 7 are built on the 8⁽⁻⁾ state at 140 keV 30 (1999Am05), the uncertainty 30 keV is not reflected on the upper members of these bands. The energies may subject to a revised value of this state.

[‡] Based on band structures observed in $^{109}\text{Ag}(^{16}\text{O},3n\gamma)$ and $^{94}\text{Mo}(^{31}\text{P},2p n\gamma)$, $^{107}\text{Ag}(^{19}\text{F},p3n\gamma)$, $^{112}\text{Sn}(^{12}\text{C},pn\gamma)$, unless noted otherwise. Evaluator takes J^π assignments of band heads of 2005Ku34, 2000Mo16 and 1998Sm07. Different assignments were given in 1996Li13, 1998Li36.

Band(A): band 1, $\pi h_{11/2} \otimes \nu h_{11/2}$, $\alpha=0$.

@ Band(a): band 2, $\pi h_{11/2} \otimes \nu h_{11/2}$, $\alpha=1$.

& Band(B): band 3, $\pi h_{11/2} \otimes \nu d_{5/2}$, $\alpha=0$.

^a Band(b): band 4, $\pi h_{11/2} \otimes \nu d_{5/2}$, $\alpha=1$.

^b Band(C): band 5, Band based on (13⁺).

^c Band(D): band 6, Band based on (11⁻).

^d Band(E): band 7, Band based on (12⁻).

Adopted Levels, Gammas (continued)

$\gamma(^{122}\text{Cs})$								
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\oplus$	E_f	J_f^π	Mult. &	α^a	Comments
15.56		15.6 3		0.0	1 ⁺			
45.87	(3) ⁺	45.85 15	100	0.0	1 ⁺	E2	33.8	B(E2)(W.u.)<2.3
69.53		54.0 3		15.56				
		69.6 3		0.0	1 ⁺			
116.90	0,1,2	101.3 3		15.56				
		116.9 3		0.0	1 ⁺			
122.27		122.4 3		0.0	1 ⁺			
124.94		55.5 3		69.53				
		79.1 3		45.87	(3) ⁺			
		109.3 3		15.56				
		124.9 3		0.0	1 ⁺			
127.07	(5) ⁻	81.20 10	100	45.87	(3) ⁺	M2	20.24	B(M2)(W.u.)=4.7×10 ⁻⁵ 3
142.36		72.7 3		69.53				
		96.5 3		45.87	(3) ⁺			
		126.7 3		15.56				
		142.1 3		0.0	1 ⁺			
161.36		≈39 ^b		122.27				
		≈44 ^b		116.90	0,1,2			
		91.6 3		69.53				
		≈115		45.87	(3) ⁺			
		161.4 3		0.0	1 ⁺			
177.70		132.0 3		45.87	(3) ⁺			
205.63		88.7 3		116.90	0,1,2			
		136.0 3		69.53				
		190.2 3		15.56				
223.7		106.8 3		116.90	0,1,2			
		223.3 ^b 3		0.0	1 ⁺			
235.30	(9 ⁻)	95.2 2	100	140	8 ⁽⁻⁾	D(+Q)		
237.65		≈60 ^b		177.70				
		76.8 3		161.36				
		113.1 3		124.94				
		168.3 3		69.53				
		238.0 3		0.0	1 ⁺			
261.1		55.5 3		205.63				
		144.2 ^b 3		116.90	0,1,2			
		261 1		0.0	1 ⁺			
265.75		88.0 3		177.70				
		219.8 ^b 3		45.87	(3) ⁺			
		265.8 3		0.0	1 ⁺			
272.38	(9 ⁺)	37.0 2		235.30	(9 ⁻)			
		132.3 2	100	140	8 ⁽⁻⁾	E1		
273.67		157 ^b 1		116.90	0,1,2			
		258.2 3		15.56				
		273.5 3		0.0	1 ⁺			
280.0		102.3 3		177.70				
		263.7 ^b 3		15.56				
301.90		140.5 3		161.36				
		232.5 3		69.53				
307.40		146.0 3		161.36				
		190.2 ^b 3		116.90	0,1,2			
		238.0 3		69.53				
319.93		81.5 ^b 3		237.65				
		177.7 3		142.36				

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Adopted Levels, Gammas (continued)

$\gamma(^{122}\text{Cs})$ (continued)						
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\oplus$	E_f	J_f^π	Mult. &
319.93		195.1 3		124.94		
		197.8 3		122.27		
		304.1 ^b 3		15.56		
323.79	(10 ⁺)	51.3 3	100	272.38	(9 ⁺)	(D+Q)
332.90		155.4 3		177.70		
		170.9 3		161.36		
339.00		177.7 3		161.36		
		214.0 3		124.94		
350.2		207.8 3		142.36		
		349.9 ^b 3		0.0	1 ⁺	
364.71		57.4 3		307.40		
		62.9 3		301.90		
		84.5 ^b 3		280.0		
		222.3 3		142.36		
		318.6 3		45.87	(3) ⁺	
365.72	(10 ⁻)	130.3 2	100 5	235.30	(9 ⁻)	D+Q
		225.9 2	5.9 4	140	8 ⁽⁻⁾	Q
411.22		91.6 ^b 3		319.93		
		250.3 3		161.36		
		268.7 3		142.36		
		286.0 3		124.94		
427.08	(11 ⁺)	103.3 2	100 5	323.79	(10 ⁺)	D+Q
		154.6 2	3.3 5	272.38	(9 ⁺)	Q
453.8	(10)	218.5 [‡] 4	100	235.30	(9 ⁻)	D+Q
484.82		74.9 ^b 3		411.22		
		120.0 3		364.71		
		151.5 3		332.90		
		223.3 ^b 3		261.1		
		248.6 3		237.65		
		341.8 3		142.36		
		359.7 3		124.94		
		≈439 ^b		45.87	(3) ⁺	
508.55	(12 ⁺)	81.4 2	100 6	427.08	(11 ⁺)	D+Q
		184.7 2	10.0 10	323.79	(10 ⁺)	Q
537.9		276.8 3		261.1		
		≈332 ^b		205.63		
550.56		65.8 3		484.82		
		231.0 3		319.93		
		276.8 3		273.67		
		388.7 3		161.36		
		550.7 3		0.0	1 ⁺	
569.00	(11 ⁻)	203.3 2	100 5	365.72	(10 ⁻)	M1+E2
		333.8 2	12.7 20	235.30	(9 ⁻)	Q
787.79	(12 ⁻)	218.8 [‡] 2	98 5	569.00	(11 ⁻)	(M1+E2)
		422.1 2	100 5	365.72	(10 ⁻)	Q
814.81	(13 ⁺)	306.2 2	100 5	508.55	(12 ⁺)	M1+E2
		387.7 2	10.5 7	427.08	(11 ⁺)	Q
891.6	(11 ⁻)	525.9 4	100	365.72	(10 ⁻)	M1+E2
909.5	(11 ⁻)	455.6 [‡] 4	100 15	453.8	(10)	D+Q
		543.8 4	95 14	365.72	(10 ⁻)	M1+E2
981.13	(14 ⁺)	166.3 2	41 2	814.81	(13 ⁺)	D+Q
		472.5 2	100 5	508.55	(12 ⁺)	E2
1055.9	(13 ⁺)	547.3 2	100	508.55	(12 ⁺)	M1+E2

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Adopted Levels, Gammas (continued) $\gamma(^{122}\text{Cs})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\oplus$	E_f	J_f^π	Mult.&
1072.59	(13 ⁻)	284.9 2	100 5	787.79	(12 ⁻)	M1+E2
		503.7 2	62 6	569.00	(11 ⁻)	E2
1082.8	(12 ⁻)	513.8 4	100 15	569.00	(11 ⁻)	M1+E2
1358.3	(13 ⁻)	448.8 4	100 15	909.5	(11 ⁻)	Q
		466.7 2	58 12	891.6	(11 ⁻)	Q
1361.43	(14 ⁻)	289.1 2	56 3	1072.59	(13 ⁻)	D+Q
		546.3 3		814.81	(13 ⁺)	
		573.6 2	100 5	787.79	(12 ⁻)	E2
1373.7	(15 ⁺)	392.5 [#] 2	100 5	981.13	(14 ⁺)	M1+E2
		559.0 2	35 4	814.81	(13 ⁺)	Q
1632.7	(15 ⁺)	576.8 3	45 3	1055.9	(13 ⁺)	Q
		651.6 2	100 5	981.13	(14 ⁺)	M1+E2
		817.8 3		814.81	(13 ⁺)	
1640.4	(16 ⁺)	266.8 2	9.6 7	1373.7	(15 ⁺)	D+Q
		659.2 2	100 5	981.13	(14 ⁺)	E2
1699.6	(14 ⁻)	616.8 4	100	1082.8	(12 ⁻)	Q
1707.26	(15 ⁻)	345.8 3	61 6	1361.43	(14 ⁻)	D+Q
		634.6 2	100 9	1072.59	(13 ⁻)	E2
1937.8	(15 ⁻)	579.5 4	100	1358.3	(13 ⁻)	E2
2051.7	(16 ⁻)	344.4 4	46 5	1707.26	(15 ⁻)	D(+Q)
		678 1	44 5	1373.7	(15 ⁺)	(E1)
		690.3 2	100 10	1361.43	(14 ⁻)	Q
2078.0	(17 ⁺)	437.6 2	100 5	1640.4	(16 ⁺)	M1+E2
		704.3 2	80 4	1373.7	(15 ⁺)	Q
2368.5	(17 ⁺)	728.1 3		1640.4	(16 ⁺)	
		735.9 [‡] 3	100 15	1632.7	(15 ⁺)	Q
		994.8 2		1373.7	(15 ⁺)	
2398.7	(16 ⁻)	699.1 4	100	1699.6	(14 ⁻)	E2
2444.0	(17 ⁻)	392.4 [#] 2	32 4	2051.7	(16 ⁻)	M1+E2
		736.7 [‡] 2	100 4	1707.26	(15 ⁻)	E2
2454.4	(18 ⁺)	376.9 3	≤8.9	2078.0	(17 ⁺)	
		813.8 3	100 5	1640.4	(16 ⁺)	E2
2624.0	(17 ⁻)	686.2 4	100	1937.8	(15 ⁻)	E2
2836.3	(18 ⁻)	392.5 [#] 4		2444.0	(17 ⁻)	D(+Q)
		758 1		2078.0	(17 ⁺)	
		784.9 4	100 15	2051.7	(16 ⁻)	Q
2910.0	(19 ⁺)	455.8 [‡] 3	71 7	2454.4	(18 ⁺)	M1+E2
		831.8 3	100 10	2078.0	(17 ⁺)	E2
3194.2	(18 ⁻)	795.5 4	100	2398.7	(16 ⁻)	E2
3234.4	(19 ⁺)	780.1 3		2454.4	(18 ⁺)	
		865.8 4	100 15	2368.5	(17 ⁺)	Q
3262.8	(19 ⁻)	427.1 3	69 10	2836.3	(18 ⁻)	D+Q
		818.5 3	100 10	2444.0	(17 ⁻)	E2
3391.4	(20 ⁺)	481 1	≤28	2910.0	(19 ⁺)	
		937.0 2	100	2454.4	(18 ⁺)	Q
3407.2	(19 ⁻)	783.2 4	100	2624.0	(17 ⁻)	E2
3706.4	(20 ⁻)	443.7 2	52 6	3262.8	(19 ⁻)	
		870.0 2	100 15	2836.3	(18 ⁻)	E2
3757.4	(20 ⁺)	1303 1	100	2454.4	(18 ⁺)	Q
3848.0	(21 ⁺)	456.6 6	23 4	3391.4	(20 ⁺)	D(+Q)
		938.4 10	100 16	2910.0	(19 ⁺)	Q
4020.2	(20 ⁻)	826 1	100	3194.2	(18 ⁻)	Q
4156.6	(21 ⁻)	450 1	36 7	3706.4	(20 ⁻)	
		893.8 2	100 15	3262.8	(19 ⁻)	Q

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Adopted Levels, Gammas (continued) $\gamma(^{122}\text{Cs})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	I_γ°	E_f	J_f^π	Mult. &
4189.2	(21 ⁺)	954.8 3	100	3234.4	(19 ⁺)	
4279.9	(21 ⁻)	872.7 4	100	3407.2	(19 ⁻)	Q
4287.5	(21 ⁻)	880.3 4	100	3407.2	(19 ⁻)	Q
4426.2	(22 ⁺)	1034.7 4	100	3391.4	(20 ⁺)	Q
4585.4	(22 ⁺)	1194 1	100	3391.4	(20 ⁺)	Q
4652.6	(22 ⁻)	946.1 4	100	3706.4	(20 ⁻)	Q
4873.4	(23 ⁺)	447.2 3	100 20	4426.2	(22 ⁺)	
		1025.4 3	55 20	3848.0	(21 ⁺)	Q
4886.2	(22 ⁻)	866 1	100	4020.2	(20 ⁻)	E2
5120.9	(23 ⁻)	468 1	42 8	4652.6	(22 ⁻)	
		964.4 4	100 17	4156.6	(21 ⁻)	Q
5251.9	(23 ⁻)	972 1	100	4279.9	(21 ⁻)	
5528.2	(24 ⁺)	1102 1	100	4426.2	(22 ⁺)	Q
5651.6	(24 ⁻)	999 1	100	4652.6	(22 ⁻)	
5837.2	(24 ⁻)	951 1	100	4886.2	(22 ⁻)	
5961.4	(25 ⁺)	1088 1	100	4873.4	(23 ⁺)	
6165.9	(25 ⁻)	1045 1	100	5120.9	(23 ⁻)	Q
6667.2	(26 ⁺)	1139 1	100	5528.2	(24 ⁺)	Q
7105?	(27 ⁺)	1140 ^b 3	100	5961.4	(25 ⁺)	
7873?	(28 ⁺)	1200 ^b 3	100	6667.2	(26 ⁺)	

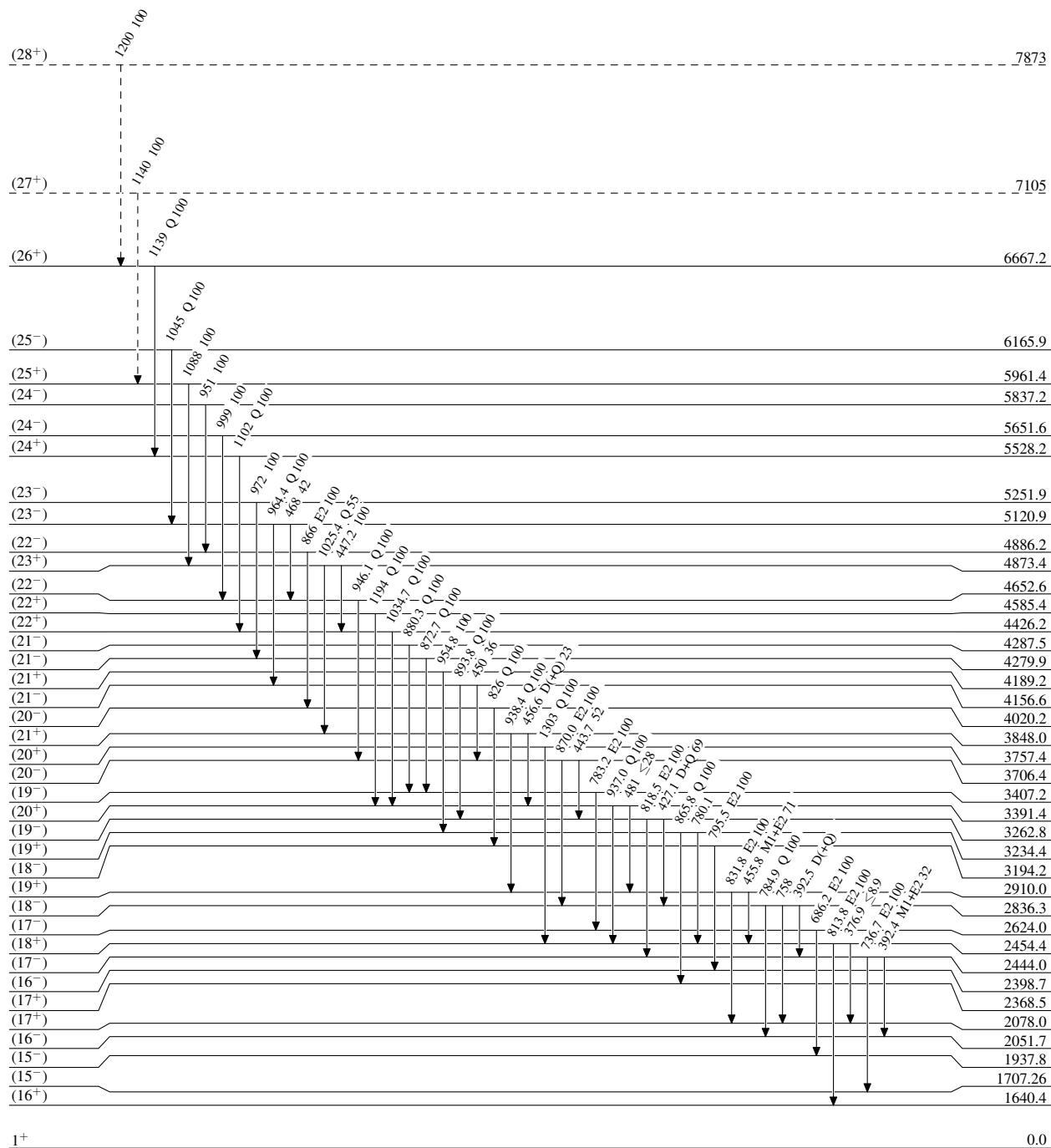
[†] Weighted av. of γ rays compiled.[‡] Doublet in $^{109}\text{Ag}(^{16}\text{O},3n\gamma)$, $^{94}\text{Mo}(^{31}\text{P},2pn\gamma)$.[#] Triplet of 392.4, 392.5 and 392.6 in $^{109}\text{Ag}(^{16}\text{O},3n\gamma)$, $^{94}\text{Mo}(^{31}\text{P},2pn\gamma)$; intensity suitably divided.[@] Weighted av. of γ rays compiled. No I_γ data are available from ^{122}Ba ε decay.[&] From $\alpha(\text{K})\text{exp}$ (1987WeZW), DCO ratio in $^{109}\text{Ag}(^{16}\text{O},3n\gamma)$, $^{94}\text{Mo}(^{31}\text{P},2pn\gamma)$, DCO ratio and integral polarization DCO in $^{107}\text{Ag}(^{19}\text{F},p3n\gamma)$, $\gamma(\theta)$ and DCO ratio in $^{112}\text{Sn}(^{12}\text{C},pn\gamma)$.^a Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multiplicities, and mixing ratios, unless otherwise specified.^b Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

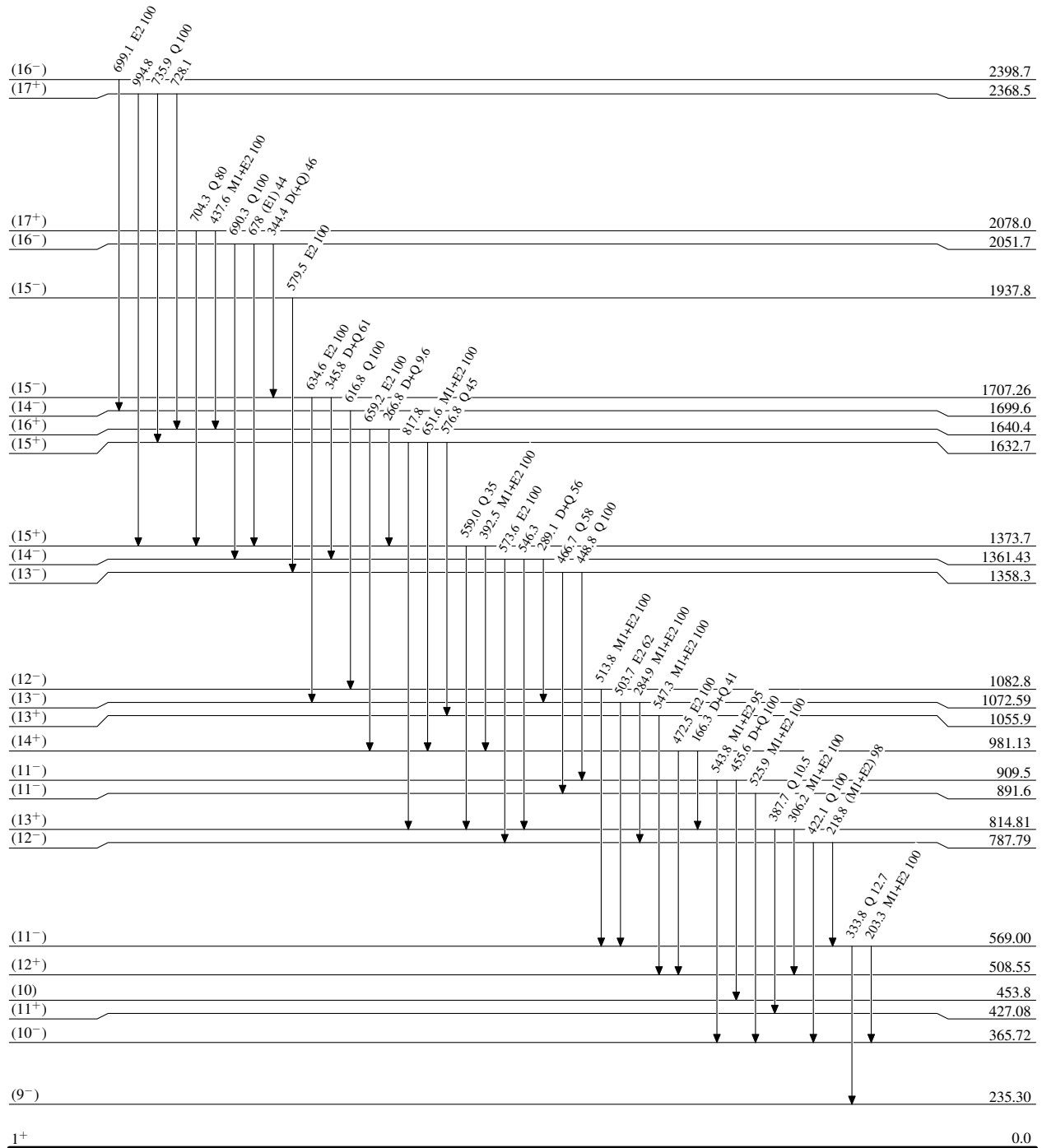
-----► γ Decay (Uncertain) 1^+

0.0

21.18 s 19

Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Relative photon branching from each level

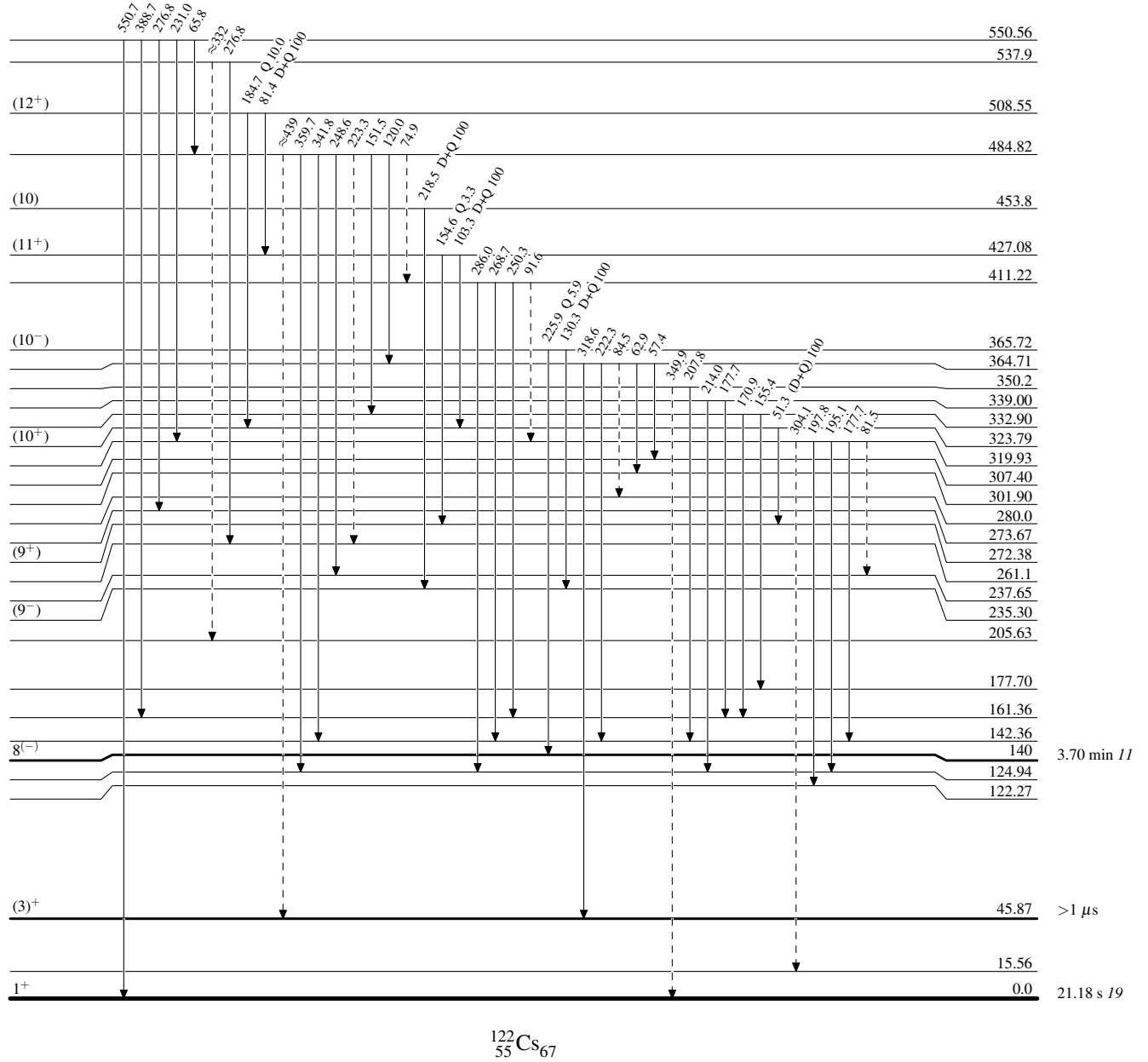


Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

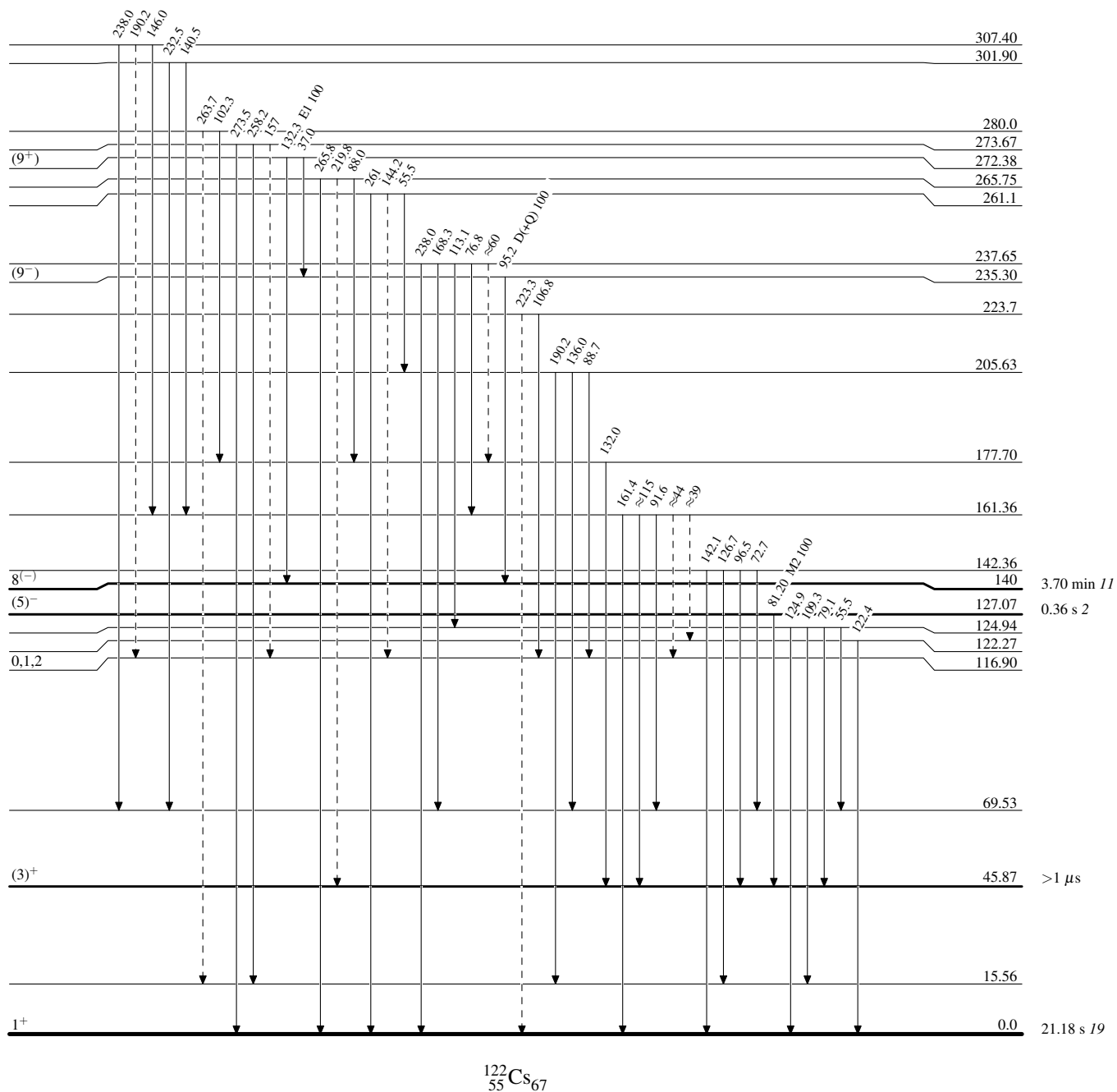
-----► γ Decay (Uncertain)

Adopted Levels, Gammas

Legend

Level Scheme (continued)

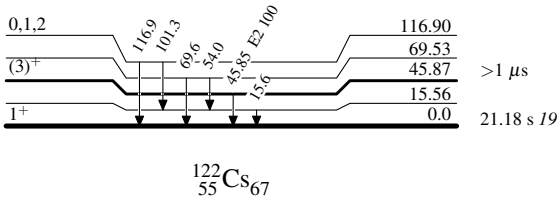
Intensities: Relative photon branching from each level

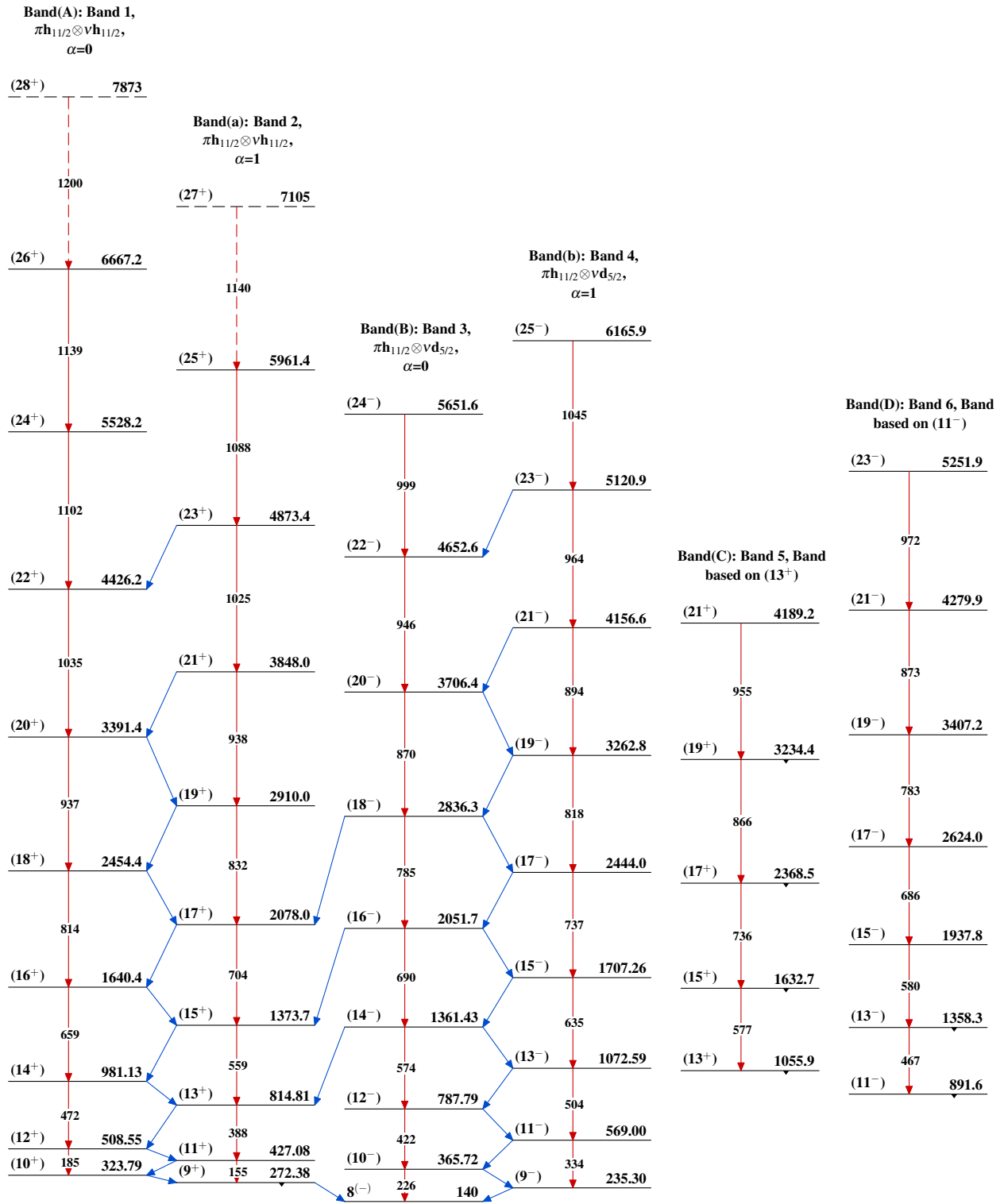
-----► γ Decay (Uncertain)


Adopted Levels, Gammas

Level Scheme (continued)

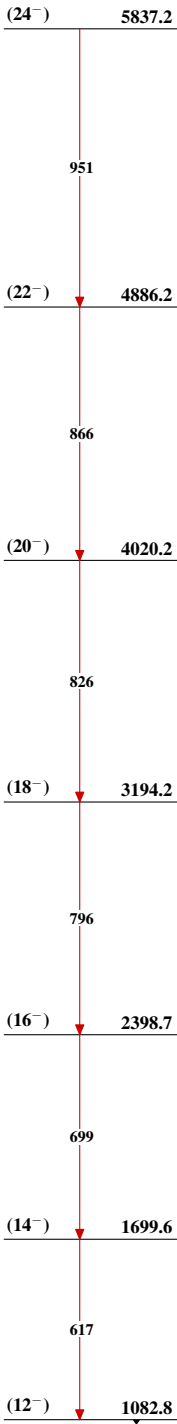
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Adopted Levels, Gammas (continued)

Band(E): Band 7, Band
based on (12⁻)



$^{122}_{55}\text{Cs}_{67}$