

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	K. Kitao	NDS 75,99 (1995)	1-Feb-1993

$Q(\beta^-)=-9670$  17;  $S(n)=11965$  15;  $S(p)=4.93\times 10^3$  3;  $Q(\alpha)=1.38\times 10^3$  3 2012Wa38

Note: Current evaluation has used the following Q record  $-9.3E3$  1011.8E3 104.6E3 101800 syst 1993Au05.

 $^{118}\text{Xe}$  LevelsCross Reference (XREF) Flags

A  $^{118}\text{Cs}$   $\beta^+$  decay (14 s+17 s)  
 B (HI,xn $\gamma$ )

E(level) <sup>†</sup>	J $^\pi$	T <sub>1/2</sub> <sup>g</sup>	XREF	Comments
0.0 <sup>‡</sup>	0 <sup>+</sup> e	3.8 min 9	AB	% $\epsilon$ +% $\beta^+$ =100 T <sub>1/2</sub> : from 1976Be61. Previously reported values of 6 min 1 (1965An05) and 6 min (1969Ho03) seem to belong to $^{119}\text{Xe}$ .
337.32 <sup>‡</sup> 13	2 <sup>+</sup> e	45 ps 2	AB	
810.27 <sup>‡</sup> 16	4 <sup>+</sup> e	7.48 ps 12	AB	
830.36 <sup>#</sup> 17	0 <sup>+</sup> f		A	J $^\pi$ : E0 transition to 0 <sup>+</sup> .
928.10 <sup>@</sup> 15	2 <sup>+</sup> f		AB	J $^\pi$ : $\gamma$ to 0 <sup>+</sup> ; E2,M1 $\gamma$ to 2 <sup>+</sup> .
1228.31 <sup>#</sup> 14	2 <sup>+</sup> f		A	J $^\pi$ : strong $\gamma$ to 0 <sup>+</sup> , $\gamma$ to 4 <sup>+</sup> .
1366.18 <sup>&amp;</sup> 17	(3 <sup>+</sup> ) <sup>f</sup>		AB	J $^\pi$ : M1,E2 $\gamma$ to 2 <sup>+</sup> and M1,E2 $\gamma$ to 4 <sup>+</sup> .
1396.81 <sup>‡</sup> 20	6 <sup>+</sup> e	3.2 ps 8	AB	
1441.16 <sup>@</sup> 22	4 <sup>+</sup> f		AB	J $^\pi$ : $\gamma$ 's to 2 <sup>+</sup> and 4 <sup>+</sup> , no $\gamma$ to 0 <sup>+</sup> .
1640.34 23	1,2 <sup>+</sup>		A	J $^\pi$ : $\gamma$ to 0 <sup>+</sup> .
1701.73 23	3,4 <sup>+</sup>		A	J $^\pi$ : $\gamma$ 's to 2 <sup>+</sup> and 4 <sup>+</sup> , no $\gamma$ to 0 <sup>+</sup> .
1721.20? 22	0 <sup>+</sup>		A	J $^\pi$ : E0 transition to 0 <sup>+</sup> .
1730.41 <sup>#</sup> 25	(4 <sup>+</sup> ) <sup>f</sup>		A	J $^\pi$ : strong $\gamma$ to 2 <sup>+</sup> .
1838.23 21	1,2 <sup>+</sup>		A	J $^\pi$ : $\gamma$ to 0 <sup>+</sup> .
1896.3 3			A	
1922.12 <sup>&amp;</sup> 18	(5 <sup>+</sup> ) <sup>f</sup>		AB	J $^\pi$ : $\gamma$ to 4 <sup>+</sup> , $\gamma$ to (3 <sup>+</sup> ) <sup>f</sup> .
1995.09 <sup>a</sup> 22	(5 <sup>-</sup> ) <sup>f</sup>		AB	J $^\pi$ : d $\gamma$ to 4 <sup>+</sup> , $\gamma$ from (7 <sup>-</sup> ) <sup>f</sup> .
1997.00 <sup>@</sup> 25	6 <sup>+</sup> f		AB	J $^\pi$ : $\gamma$ 's to 4 <sup>+</sup> and 6 <sup>+</sup> .
2073.4 <sup>‡</sup> 3	8 <sup>+</sup> e	2.8 ps 10	AB	
2129.2? 3	1,2 <sup>+</sup>		A	J $^\pi$ : $\gamma$ to 0 <sup>+</sup> .
2143.48 22	(3 <sup>-</sup> ,4 <sup>+</sup> )		A	J $^\pi$ : $\gamma$ 's to 2 <sup>+</sup> and (5 <sup>-</sup> ) <sup>f</sup> .
2163.7 3			A	
2418.65 <sup>a</sup> 23	(7 <sup>-</sup> ) <sup>f</sup>		AB	J $^\pi$ : E1 $\gamma$ to 6 <sup>+</sup> , no $\gamma$ to 4 <sup>+</sup> .
2486.7 3			A	
2540.19 22	(5,6 <sup>+</sup> )		AB	J $^\pi$ : (D) $\gamma$ to 6 <sup>+</sup> , $\gamma$ to 3,4 <sup>+</sup> .
2559.8 <sup>&amp;</sup> 3	(7 <sup>+</sup> ) <sup>f</sup>		B	J $^\pi$ : $\gamma$ 's to (5 <sup>+</sup> ) <sup>f</sup> and 6 <sup>+</sup> .
2624.5 <sup>@</sup> 5	(8 <sup>+</sup> ) <sup>f</sup>		B	J $^\pi$ : $\gamma$ to (6 <sup>+</sup> ) <sup>f</sup> .
2816.3 <sup>‡</sup> 3	10 <sup>+</sup> e	<1.2 ps	B	J $^\pi$ : E2 $\gamma$ to 8 <sup>+</sup> .
2919.1 <sup>a</sup> 3	(9 <sup>-</sup> ) <sup>f</sup>		B	J $^\pi$ : E1 $\gamma$ to 8 <sup>+</sup> , no $\gamma$ to 6 <sup>+</sup> .
2997.2 4			B	
3206.0 4	(9 <sup>-</sup> )		B	J $^\pi$ : stretched D $\gamma$ to 8 <sup>+</sup> , no $\gamma$ 6 <sup>+</sup> .
3239.8 <sup>&amp;</sup> 6	(9 <sup>+</sup> ) <sup>f</sup>		B	J $^\pi$ : $\gamma$ to (7 <sup>+</sup> ) <sup>f</sup> .
3255.0 <sup>@</sup> 4	(10 <sup>+</sup> ) <sup>f</sup>		B	J $^\pi$ : $\gamma$ 's to (8 <sup>+</sup> ) <sup>f</sup> and 10 <sup>+</sup> .
3260.8 4			B	

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Adopted Levels, Gammas (continued) $^{118}\text{Xe}$  Levels (continued)

E(level) <sup>†</sup>	J <sup>π</sup>	XREF	Comments
3452.1 4		B	
3535.1 5		B	
3541.7 <sup>a</sup> 4	(11) <sup>-f</sup>	B	J <sup>π</sup> : Q γ to (9) <sup>-</sup> .
3592.1 <sup>‡</sup> 4	12 <sup>+e</sup>	B	
3721.1 5		B	
3847.0 <sup>@</sup> 5	(12 <sup>+</sup> ) <sup>f</sup>	B	J <sup>π</sup> : γ's to (10 <sup>+</sup> ) and (12 <sup>+</sup> ).
4040.1 6		B	
4172.8? 6		B	
4261.3 <sup>a</sup> 5	(13) <sup>-f</sup>	B	J <sup>π</sup> : Q γ to (11) <sup>-</sup> .
4367.9 <sup>‡</sup> 5	14 <sup>+e</sup>	B	
4385.1 6		B	
4539.3 <sup>@</sup> 6	(14 <sup>+</sup> ) <sup>f</sup>	B	J <sup>π</sup> : γ to (12 <sup>+</sup> ).
4909.9? 6		B	
5057.9 <sup>c</sup> 6		B	
5155.7 <sup>‡</sup> 6	(16 <sup>+</sup> ) <sup>e</sup>	B	
5354.6 <sup>d</sup> 7		B	
5924.9 <sup>c</sup> 7		B	
6002.7 <sup>b</sup> 7		B	
6810.9? <sup>c</sup> 12		B	
6934.1 <sup>b</sup> 9		B	
7670.9? <sup>c</sup> 16		B	
7957.1 <sup>b</sup> 10		B	
9071.8 <sup>b</sup> 12		B	
10270.0 <sup>b</sup> 13		B	
11553.5 <sup>b</sup> 14		B	
12815.0 <sup>b</sup> 15		B	
14086.9 <sup>b</sup> 15		B	
15398.9 <sup>b</sup> 16		B	

<sup>†</sup> Energy values are from a least-squares fit to adopted E(γ's).

<sup>‡</sup> Band(A): yrast band.

# Band(B): quasi-β band built on the 0<sup>+</sup> 830 level.

@ Band(C): quasi-γ band built on the 2<sup>+</sup> 928 level (even spin).

& Band(D): quasi-γ band built on the 3<sup>+</sup> level (odd even).

<sup>a</sup> Band(E): ΔJ=2 negative-parity band built on the 5<sup>-</sup> level.

<sup>b</sup> Tentatively assigned by 1991Ju03 as a member of yrast band.

<sup>c</sup> Tentatively assigned by 1985JaZY as a members of ΔJ=2 negative parity band built on the 5<sup>-</sup> state.

<sup>d</sup> Possible even-spin member of quasi-γ band.

<sup>e</sup> E2 γ cascades and from assignment to the yrast band.

<sup>f</sup> From expected band structure, and in addition to the assignment to the argument given.

<sup>g</sup> From (HL,xnγ), except as noted.

Adopted Levels, Gammas (continued)

$\gamma(^{118}\text{Xe})$							
$E_i(\text{level})$	$J_i^\pi$	$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_f$	$J_f^\pi$	Mult. &	Comments
337.32	2 <sup>+</sup>	337.4 <sup>@</sup> 2	100	0.0	0 <sup>+</sup>	E2	B(E2)(W.u.)=84 4
810.27	4 <sup>+</sup>	472.8 <sup>@</sup> 2	100	337.32	2 <sup>+</sup>	E2	B(E2)(W.u.)=93.1 15 Mult.: from $\gamma(\theta)$ in (HI,xn $\gamma$ ) and decay scheme.
830.36	0 <sup>+</sup>	493.0 2	100 11	337.32	2 <sup>+</sup>	(E2) <sup>b</sup>	
		830.2		0.0	0 <sup>+</sup>	E0	
928.10	2 <sup>+</sup>	117.6 <sup>c</sup> 4	<5.5 <sup>c</sup>	810.27	4 <sup>+</sup>		
		590.6 <sup>@</sup> 2	100 15	337.32	2 <sup>+</sup>	E2,M1	
		928.1 3	38 5	0.0	0 <sup>+</sup>		
1228.31	2 <sup>+</sup>	300.3 2	3.9 8	928.10	2 <sup>+</sup>		
		397.5 2	23.9 14	830.36	0 <sup>+</sup>	(E2) <sup>b</sup>	
		417.9 2	16.1 20	810.27	4 <sup>+</sup>	(E2) <sup>b</sup>	
		891.5 <sup>c</sup> 3	<16.4 <sup>c</sup>	337.32	2 <sup>+</sup>		
		1228.3 2	100 11	0.0	0 <sup>+</sup>		
1366.18	(3) <sup>+</sup>	437.9 2	28.7 15	928.10	2 <sup>+</sup>	M1,E2	
		555.9 <sup>c</sup> 2	<85 <sup>c</sup>	810.27	4 <sup>+</sup>	M1,E2	
		1028.9 <sup>@</sup> 2	100 15	337.32	2 <sup>+</sup>		
1396.81	6 <sup>+</sup>	586.6 <sup>@</sup> 2	100	810.27	4 <sup>+</sup>	E2	B(E2)(W.u.)=74 19
1441.16	4 <sup>+</sup>	512.9 5	100 29	928.10	2 <sup>+</sup>		
		631.0 <sup>@</sup> 3	76 14	810.27	4 <sup>+</sup>		
		1103.9 <sup>#</sup> 3	25 15	337.32	2 <sup>+</sup>		$I_\gamma$ : relative to I(631 $\gamma$ )<16 in 1990Mo07.
1640.34	1,2 <sup>+</sup>	810.2 3	17 9	830.36	0 <sup>+</sup>		
		1640.1 3	100 17	0.0	0 <sup>+</sup>		
1701.73	3,4 <sup>+</sup>	891.5 3	<110	810.27	4 <sup>+</sup>		
		1364.5 3	100 2	337.32	2 <sup>+</sup>		
1721.20?	0 <sup>+</sup>	492.5 3	100	1228.31	2 <sup>+</sup>	(E2) <sup>b</sup>	
		891		830.36	0 <sup>+</sup>	E0	
1730.41	(4) <sup>+</sup>	502 <sup>‡</sup>		1228.31	2 <sup>+</sup>		
		802.0 3	40 15	928.10	2 <sup>+</sup>		
		1393.4 3	100 15	337.32	2 <sup>+</sup>		
1838.23	1,2 <sup>+</sup>	117.6 <sup>c</sup> 4	<43 <sup>c</sup>	1721.20?	0 <sup>+</sup>		
		1500.5 3	50 11	337.32	2 <sup>+</sup>		
		1838.3 3	100 21	0.0	0 <sup>+</sup>		
1896.3		530.5 <sup>d</sup> 3	100 20	1366.18	(3) <sup>+</sup>		
		1085.7 3	42 8	810.27	4 <sup>+</sup>		
1922.12	(5) <sup>+</sup>	555.9 <sup>c@</sup> 1	<313 <sup>c</sup>	1366.18	(3) <sup>+</sup>	M1,E2	$I_\gamma$ : other: <700 in (HI,xn $\gamma$ ).
		1112.0 <sup>@</sup> 2	100 27	810.27	4 <sup>+</sup>		
1995.09	(5) <sup>-</sup>	1184.6 <sup>@</sup> 3	100	810.27	4 <sup>+</sup>	(E1) <sup>a</sup>	Mult.: from $\gamma(\theta)$ in (HI,xn $\gamma$ ) and decay scheme.
1997.00	6 <sup>+</sup>	555.9 2	<590	1441.16	4 <sup>+</sup>		$I_\gamma$ : other: <175 in (HI,xn $\gamma$ ).
		600.1 <sup>@</sup> 3	100 25	1396.81	6 <sup>+</sup>	Q <sup>a</sup>	
2073.4	8 <sup>+</sup>	676.6 <sup>@</sup> 2	100	1396.81	6 <sup>+</sup>	E2	B(E2)(W.u.)=41 15 Mult.: from mult=Q in (HI,xn $\gamma$ ), but mult=M2 is ruled out by RUL.
2129.2?	1,2 <sup>+</sup>	408.0 3	100 40	1721.20?	0 <sup>+</sup>		
		901.0 4	92 12	1228.31	2 <sup>+</sup>		
2143.48	(3 <sup>-</sup> ,4 <sup>+</sup> )	148.3 3	75 11	1995.09	(5) <sup>-</sup>		
		914.9 3	30 4	1228.31	2 <sup>+</sup>		
		1806.5 3	100 21	337.32	2 <sup>+</sup>		
2163.7		1353.4 2	100	810.27	4 <sup>+</sup>		
2418.65	(7) <sup>-</sup>	423.5 <sup>@</sup> 2	5.5 12	1995.09	(5) <sup>-</sup>		
		1021.9 <sup>@</sup> 2	100 14	1396.81	6 <sup>+</sup>	E1 <sup>a</sup>	

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Adopted Levels, Gammas (continued)

$\gamma(^{118}\text{Xe})$ (continued)							
$E_i(\text{level})$	$J_i^\pi$	$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_f$	$J_f^\pi$	Mult. &	Comments
2486.7		590.0 3	100 50	1896.3			
		1089.6 3	22 11	1396.81	6 <sup>+</sup>		
2540.19	(5,6 <sup>+</sup> )	52.9 3	100 17	2486.7			
		545.1 @ 3	22 3	1995.09	(5) <sup>-</sup>		
		838.6 3	17 6	1701.73	3,4 <sup>+</sup>		
		1143.6 @ 2	91 23	1396.81	6 <sup>+</sup>	(D) <sup>a</sup>	
2559.8	(7) <sup>+</sup>	637.7 <sup>c</sup> 3	<sup>c</sup>	1922.12	(5 <sup>+</sup> )		
		1162.9 3		1396.81	6 <sup>+</sup>		
2624.5	(8 <sup>+</sup> )	627.6 5	100	1997.00	6 <sup>+</sup>		
2816.3	10 <sup>+</sup>	742.8 2	100	2073.4	8 <sup>+</sup>	E2	B(E2)(W.u.)>61 Mult.: from mult=Q in (HI,xn $\gamma$ ), but mult=M2 is ruled out by RUL.
2919.1	(9) <sup>-</sup>	500.5 3	46 6	2418.65	(7) <sup>-</sup>	Q <sup>a</sup>	
		845.7 5	100 11	2073.4	8 <sup>+</sup>	E1 <sup>a</sup>	I $\gamma$ : deduced from composite transition of 845.7 $\gamma$ +847 $\gamma$ .
2997.2		457.0 3	100 40	2540.19	(5,6 <sup>+</sup> )		
		923.8 <sup>d</sup> 3	133 35	2073.4	8 <sup>+</sup>		
3206.0	(9) <sup>-</sup>	286.9 3	<500	2919.1	(9) <sup>-</sup>	Q <sup>a</sup>	
		1132.6 3	100 25	2073.4	8 <sup>+</sup>	D <sup>a</sup>	Mult.: stretched D.
3239.8	(9) <sup>+</sup>	680.0 5	100	2559.8	(7) <sup>+</sup>		
3255.0	(10 <sup>+</sup> )	438.7 3		2816.3	10 <sup>+</sup>		
		630.6 5		2624.5	(8 <sup>+</sup> )		
3260.8		1187.3 5	100	2073.4	8 <sup>+</sup>		
3452.1		191.3 3	<17	3260.8			
		246.0 5	100 17	3206.0	(9) <sup>-</sup>		
3535.1		274.3 3	100	3260.8			
		538.0 5		2997.2			
3541.7	(11) <sup>-</sup>	622.6 3	100 9	2919.1	(9) <sup>-</sup>	Q <sup>a</sup>	
		725.4 5	7 4	2816.3	10 <sup>+</sup>		
3592.1	12 <sup>+</sup>	775.8 3	100	2816.3	10 <sup>+</sup>	(E2) <sup>a</sup>	
3721.1		269.0 3	100 13	3452.1			
		515.0 5	89 12	3206.0	(9) <sup>-</sup>		
3847.0	(12 <sup>+</sup> )	254.9 3		3592.1	12 <sup>+</sup>		
		592.0 5		3255.0	(10 <sup>+</sup> )		
4040.1		319.0 5	100	3721.1			
4172.8?		637.7 <sup>c</sup> 3	100 <sup>c</sup>	3535.1			
4261.3	(13) <sup>-</sup>	719.6 3	100	3541.7	(11) <sup>-</sup>	Q <sup>a</sup>	
4367.9	14 <sup>+</sup>	775.8 3	100	3592.1	12 <sup>+</sup>	(E2) <sup>a</sup>	
4385.1		345.0 5	60 16	4040.1			
		664.0 5	100 18	3721.1			
4539.3	(14 <sup>+</sup> )	692.3 3	100	3847.0	(12 <sup>+</sup> )	(Q) <sup>a</sup>	
4909.9?		737.1 3	100	4172.8?			
5057.9		796.6 3	100	4261.3	(13) <sup>-</sup>		
5155.7	(16 <sup>+</sup> )	787.8 3	100	4367.9	14 <sup>+</sup>	(E2) <sup>a</sup>	
5354.6		815.3 3	100	4539.3	(14 <sup>+</sup> )		
5924.9		867.0 3	100	5057.9			
6002.7		847.0 4	100	5155.7	(16 <sup>+</sup> )		
6810.9?		886	100	5924.9			
6934.1		931.4 5	100	6002.7			
7670.9?		860	100	6810.9?			
7957.1		1023.0 5	100	6934.1			
9071.8		1114.7 5	100	7957.1			
10270.0		1198.2 5	100	9071.8			
11553.5		1283.5 5	100	10270.0			
12815.0		1261.5 5	100	11553.5			

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**Adopted Levels, Gammas (continued)**

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 $\gamma(^{118}\text{Xe})$  (continued)

<u><math>E_i(\text{level})</math></u>	<u><math>E_\gamma</math></u> <sup>†</sup>	<u><math>I_\gamma</math></u> <sup>†</sup>	<u><math>E_f</math></u>
14086.9	1271.9 5	100	12815.0
15398.9	1312.0 5	100	14086.9

<sup>†</sup> From  $^{118}\text{Cs}$   $\beta^+$  decay for  $\gamma$ 's depopulating levels up to 2540 keV, unless otherwise noted. Others are from (HI,xn $\gamma$ ).

<sup>‡</sup> Weak  $\gamma$  ray; no intensity was given in  $^{118}\text{Cs}$   $\beta^+$  decay.

<sup>#</sup> From (HI,xn $\gamma$ ).

<sup>@</sup> Weighted av from  $^{118}\text{Cs}$   $\beta^+$  decay and (HI,xn $\gamma$ ).

<sup>&</sup> From  $\alpha(\text{K})\text{exp}$  in  $^{118}\text{Cs}$   $\beta^+$  decay, except as noted.

<sup>a</sup> From  $\gamma(\theta)$  in (HI,xn $\gamma$ ).

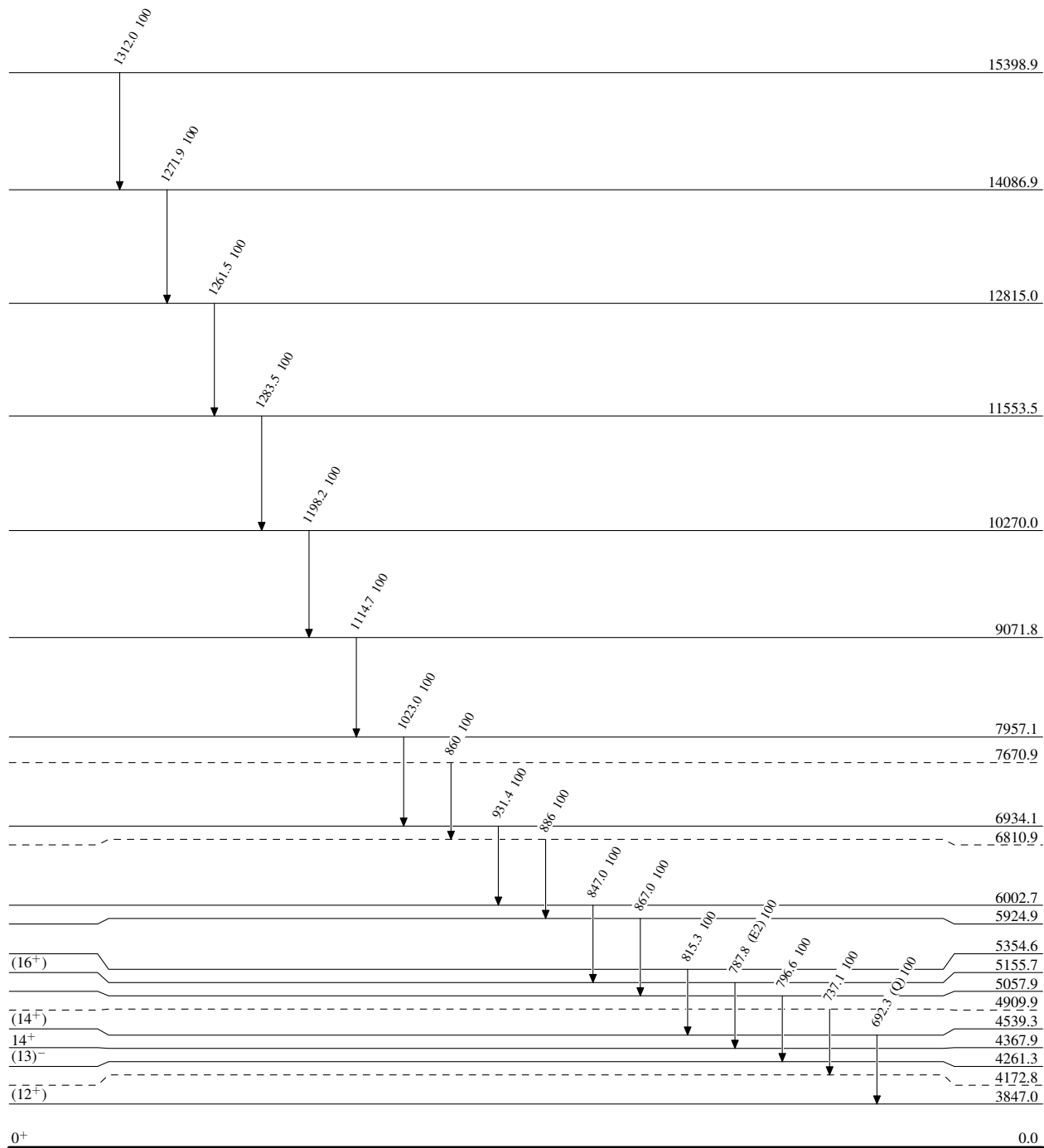
<sup>b</sup> From  $\alpha(\text{K})\text{exp}$  in  $^{118}\text{Cs}$   $\beta^+$  decay and decay scheme.

<sup>c</sup> Multiply placed with undivided intensity.

<sup>d</sup> Placement of transition in the level scheme is uncertain.

Adopted Levels, GammasLevel Scheme

Intensities: Relative photon branching from each level

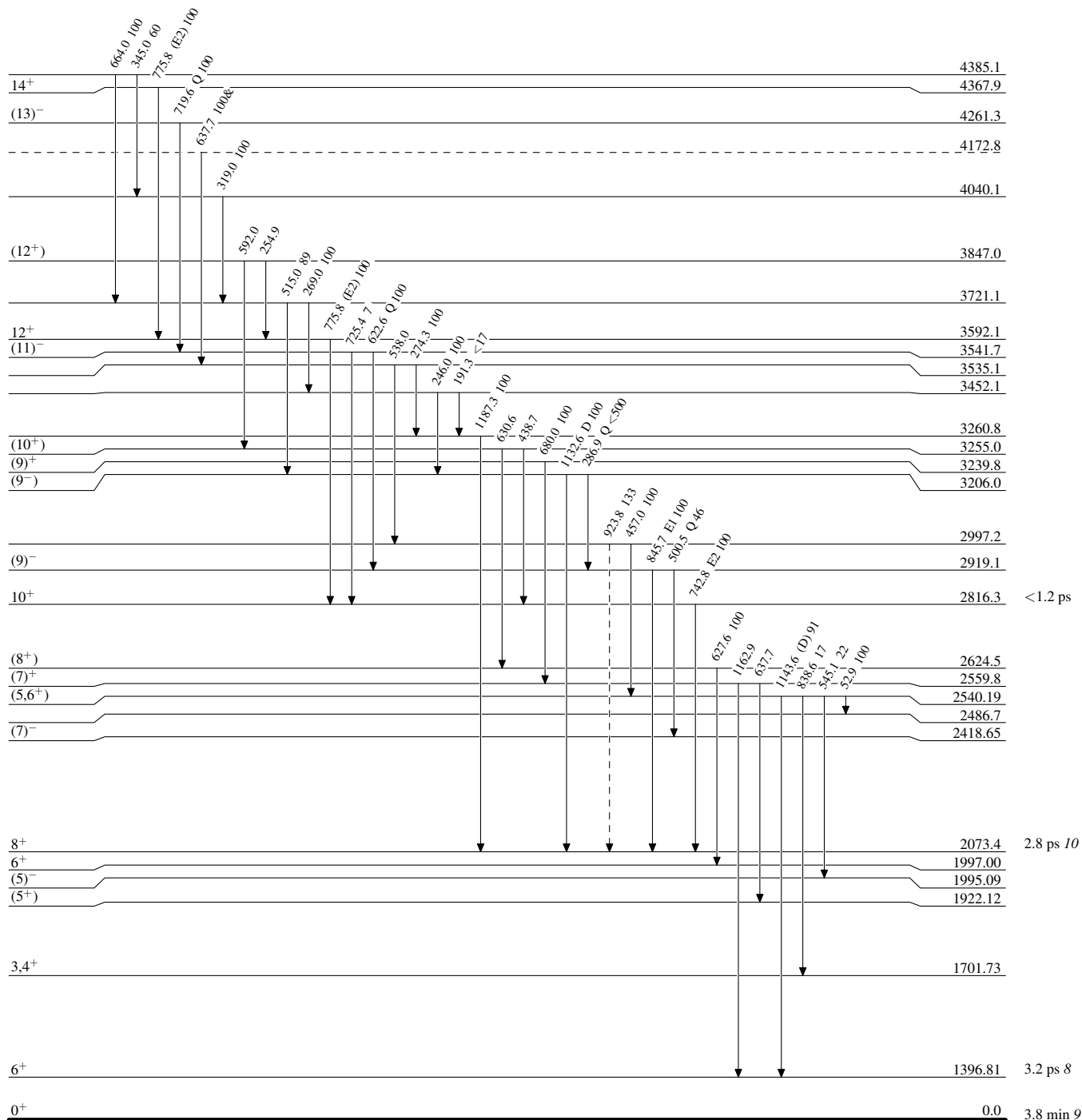


**Adopted Levels, Gammas**

Legend

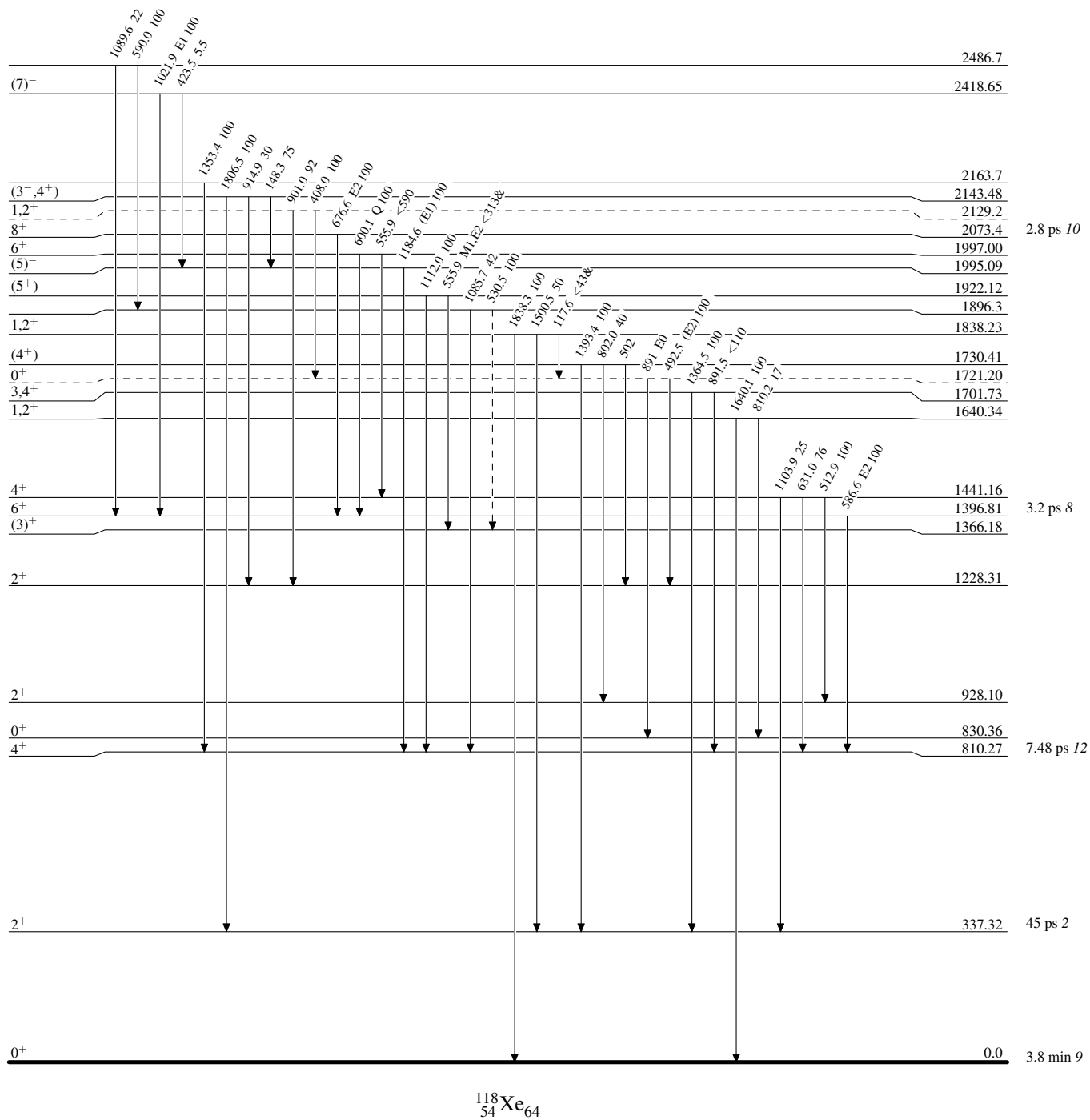
**Level Scheme (continued)**

Intensities: Relative photon branching from each level  
& Multiply placed: undivided intensity given

-----▶  $\gamma$  Decay (Uncertain) $^{118}_{54}\text{Xe}_{64}$

**Adopted Levels, Gammas**

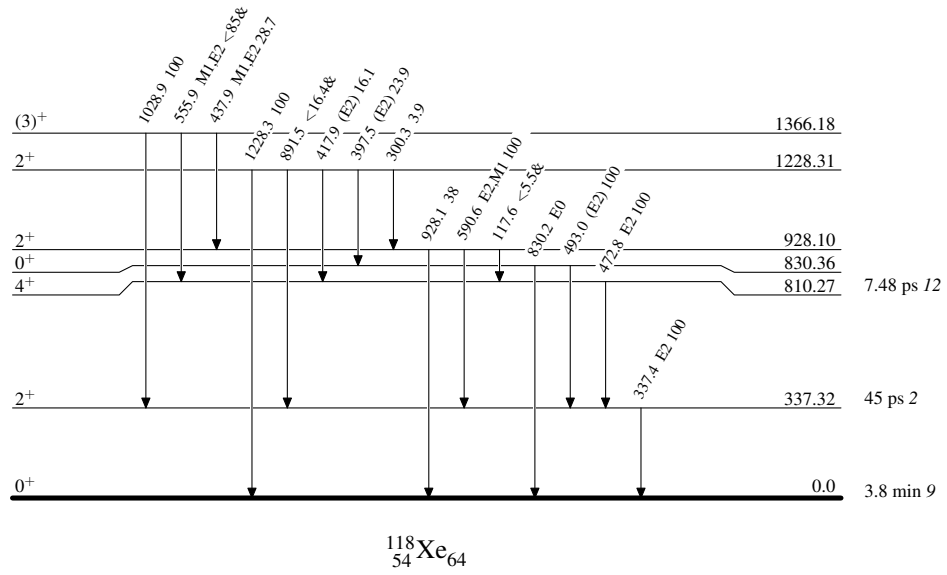
Legend

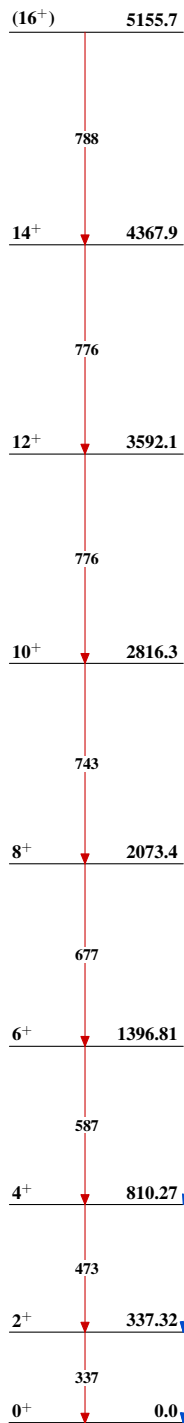
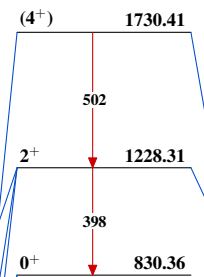
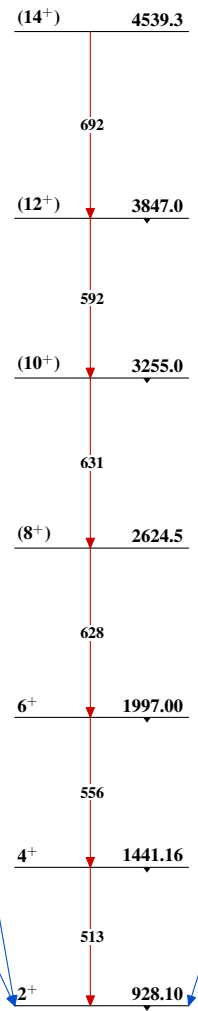
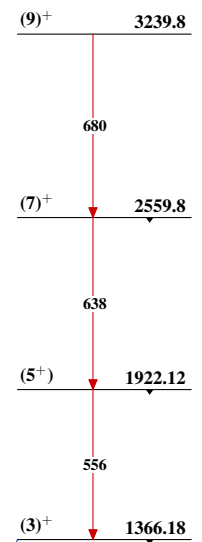
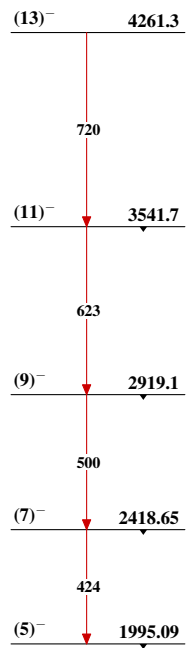
**Level Scheme (continued)**Intensities: Relative photon branching from each level  
& Multiply placed: undivided intensity given-----▶  $\gamma$  Decay (Uncertain)



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

Intensities: Relative photon branching from each level  
& Multiply placed: undivided intensity given

 $^{118}_{54}\text{Xe}_{64}$

Adopted Levels, Gammas**Band(A): Yrast band****Band(B): Quasi- $\beta$  band built on the 0<sup>+</sup> 830 level****Band(C): Quasi- $\gamma$  band built on the 2<sup>+</sup> 928 level (even spin)****Band(D): Quasi- $\gamma$  band built on the 3<sup>+</sup> level (odd even)****Band(E):  $\Delta J=2$  negative-parity band built on the 5<sup>-</sup> level** $^{118}_{54}\text{Xe}_{64}$