

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 111,717 (2010)	1-Dec-2009

$Q(\beta^-) = -1.098 \times 10^4$ syst; S(n)=12461 18; S(p)= 4.00×10^3 4; Q(α)=2096 16 [2012Wa38](#)

Note: Current evaluation has used the following Q record -10979.0 SY12461 184000 30 2096 16 [2003Au03,2009AuZZ](#).

 ^{116}Xe Levels
Cross Reference (XREF) Flags

A	$^{106}\text{Cd}(^{12}\text{C}, 2n\gamma)$	D	$^{92}\text{Mo}(^{27}\text{Al}, p2n\gamma)$
B	$^{116}\text{Cs} \beta^+$ decay (0.70 s)	E	$^{58}\text{Ni}(^{64}\text{Zn}, 2p\alpha\gamma)$
C	$^{116}\text{Cs} \beta^+$ decay (3.85 s)		

E(level)#	J^π	$T_{1/2}$	XREF	Comments
0.0 ^b	0 ⁺	59 s 2	ABC E	$\% \epsilon + \% \beta^+ = 100$ $T_{1/2}$: weighted average of 55 s 3 (1969Ha03) and 60 s 2 (1974Ha10).
393.6 ^b 2	2 ⁺	24.3 ps 9	ABC E	J^π : stretched E2 γ .
917.9 ^b 3	4 ⁺	3.33 ps 14	A C E	J^π : stretched E2 γ .
1015.8 ^b	(2 ⁺)		C E	
1321.5 ^h	(2 ⁺)		C	
1474.2	(3 ⁺)		C	
1533.7 ^b 3	6 ⁺	1.66 ps 14	A C E	J^π : stretched E2 γ .
1557.0 ^{&}	(4 ⁺)		C E	
1838.8 ^h	(4 ⁺)		C	
1979.9 ^f 3	5 ⁻		CDE	
2085.5	(5 ⁺)		C	
2117.2 ^{&}	6 ⁺		C E	
2210.7 ^b 3	8 ⁺	1.18 ps 14	A CDE	J^π : from syst, g.s. band member.
2445.2 ^f 3	7 ⁻	2.1 ps 8	C E	
2498.4 ^h	(6 ⁺)		C	
2607.2 ^d 3	6 ⁻		C E	
2774.7 ^{&} 3	8 ⁺		E	
2931.9 ^b 3	10 ⁺	0.76 ps 14	E	
2981.9 ^f 3	9 ⁻	2.6 ps 3	E	
3079.1 ^d 3	8 ⁻		E	
3271.8 ^d 3	9 ⁻		E	
3457.3 ^a 3	10 ⁺		E	
3555.2 ^g 14	(9 ⁺)		E	
3627.9 ^f 3	11 ⁻	1.7 ps 2	E	
3633.4 ^d 3	10 ⁻		E	
3683.5 ^b 4	12 ⁺		E	
3855.7 ^d 3	11 ⁻		E	
3856.4 ^g 20	(10 ⁺)		E	
3960.7 3			E	
3979.0 ^a 4	12 ⁺		E	
4171.4 ^g 24	(11 ⁺)		E	
4238.3 ^d 3	12 ⁻		E	

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Adopted Levels, Gammas (continued) ^{116}Xe Levels (continued)

<u>E(level)[#]</u>	<u>J^π</u>	<u>XREF</u>
4363.4 ^f 4	13 ⁻	E
4465.5 ^b 4	14 ⁺	E
4486 ^g 3	(12 ⁺)	E
4548.0 ^d 4	13 ⁻	E
4699.1 ^a 4	14 ⁺	E
4934.3 ^d 4	14 ⁻	E
5163.0 ^f 4	15 ⁻	E
5300.6 ^b 4	16 ⁺	E
5302.1 ^d 4	15 ⁻	E
5393.1 8	(15 ⁻)	E
5541.9 ^a 4	16 ⁺	E
5713.4 ^d 4	16 ⁻	E
5990.3 9	(16 ⁻)	E
6016.1 ^f 5	17 ⁻	E
6110.8 ^d 4	(17 ⁻)	E
6195.2 ^b 4	(18 ⁺)	E
6468.7 ^a 4	(18 ⁺)	E
6756.9 16	(18 ⁻)	E
6920.1 ^f 5	(19 ⁻)	E
6982.2 ^d 5	(19 ⁻)	E
7147.8 ^b 5	(20 ⁺)	E
7467.0 ^a 5	(20 ⁺)	E
7852.8 6	(21 ⁻)	E
7923.1 ^f 13	(21 ⁻)	E
8150.5 ^b 6	(22 ⁺)	E
8490.1 ^a 6	(22 ⁺)	E
8868.1 7	(23 ⁻)	E
8993.1 ^f 19	(23 ⁻)	E
9198.2 ^b 7	(24 ⁺)	E
9467.1 13	(23)	E
9970.1 15	(25 ⁻)	E
10063.1 ^f 24	(25 ⁻)	E
10294.0 ^b 10	(26 ⁺)	E
10422.7 18	(25)	E
11201 ^f 3	(27 ⁻)	E
11457.8 ^b 10	(28 ⁺)	E
12408 ^f 3	(29 ⁻)	E
12702.9 ^b 11	(30 ⁺)	E
13654 ^f 3	(31 ⁻)	E
14028.0 ^b 12	(32 ⁺)	E
14926 ^f 3	(33 ⁻)	E
15433.2 ^b 14	(34 ⁺)	E
16908.5 ^b 20	(36 ⁺)	E
18392 ^b 3	(38 ⁺)	E
20009 ^b 3	(40 ⁺)	E
20148 3	(40 ⁺)	E

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Adopted Levels, Gammas (continued) ^{116}Xe Levels (continued)

E(level) [#]	J ^π [‡]	XREF	Comments
21707 ^b 3	(42 ⁺)	E	
21996 4	(42 ⁺)	E	
23483 ^b 4	(44 ⁺)	E	
x		E	
2775+x [@]	(10 ⁺)	E	E(level): this level feeds 2775, 8 ⁺ level.
3517+x [@]	(12 ⁺)	E	
4269+x [@]	(14 ⁺)	E	
5031+x [@]	(16 ⁺)	E	
5870+x [@]	(18 ⁺)	E	
y		E	
3633+y ^e	(12 ⁻)	E	E(level): this level feeds 3633, 10 ⁻ level.
4312+y ^e	(14 ⁻)	E	E(level): this level feeds 3855, 11 ⁻ level.
5060+y ^e	(16 ⁻)	E	
5867+y ^e	(18 ⁻)	E	
6699+y ^e	(20 ⁻)	E	
7531+y ^e	(22 ⁻)	E	
8398+y ^e	(24 ⁻)	E	
9358+y ^e	(26 ⁻)	E	
10473+y ^e	(28 ⁻)	E	
z		E	
5300+z ^c	(20 ⁺)	E	E(level): this level feeds 5300, 16 ⁺ level.
6062+z ^c	(22 ⁺)	E	
6926+z ^c	(24 ⁺)	E	
7817+z ^c	(26 ⁺)	E	
8716+z ^c	(28 ⁺)	E	
9807+z ^c	(30 ⁺)	E	
11093+z ^c	(32 ⁺)	E	
12556+z ^c	(34 ⁺)	E	
14409+z ^c	(36 ⁺)	E	

[†] From RDM (1998De29).

[‡] Based on $\gamma\gamma(\theta)$ (DCO) data and band assignments.

[#] From least-squares fit (by compiler) to E γ 's.

[@] Band(A): Band 1 based on (10⁺), not connected.

[&] Band(B): Band 2: quasi-rotational band.

^a Band(C): Band 3 based on 10⁺.

^b Band(D): Band 4: Ground-state, Yrast band.

^c Band(E): Band 5 based on (20⁺), not connected.

^d Band(F): Band 6 based on 6⁻.

^e Band(G): Band 7 based on (12⁻), not connected.

^f Band(H): Band 8 based on 5⁻.

^g Band(I): Band 9.

^h Band(J): γ band.

Adopted Levels, Gammas (continued)

$E_i(\text{level})$	J_i^π	$\gamma(^{116}\text{Xe})$						Comments
		E_γ	I_γ	E_f	J_f^π	Mult.		
393.6	2 ⁺	393.5 2	100	0.0 0 ⁺		E2	B(E2)(W.u.)=73 3	
917.9	4 ⁺	524.3 2	100	393.6 2 ⁺		E2	B(E2)(W.u.)=128 6	
1015.8	(2 ⁺)	622.3 3	100 9	393.6 2 ⁺				
		1015.8 4	32 4	0.0 0 ⁺				
1321.5	(2 ⁺)	927.9 8	20 10	393.6 2 ⁺				
		1321.5 8	100 20	0.0 0 ⁺				
1474.2	(3 ⁺)	458.3 3	40 6	1015.8 (2 ⁺)				
		556.6 4	20 3	917.9 4 ⁺				
		1080.7 4	100 10	393.6 2 ⁺				
1533.7	6 ⁺	615.1 3	100	917.9 4 ⁺	E2		B(E2)(W.u.)=115 10	
1557.0	(4 ⁺)	541.2 3	81 8	1015.8 (2 ⁺)				
		639.3 3	100 10	917.9 4 ⁺				
1838.8	(4 ⁺)	517.3 4	100 20	1321.5 (2 ⁺)				
		921.4 6	36 12	917.9 4 ⁺				
		1446.0 8	64 16	393.6 2 ⁺				
1979.9	5 ⁻	1061.5 4	100	917.9 4 ⁺	E1			
2085.5	(5 ⁺)	552.9 6	15 4	1533.7 6 ⁺				
		611.3 3	100 9	1474.2 (3 ⁺)				
2117.2	6 ⁺	560.2 3	100 8	1557.0 (4 ⁺)				
		584.2 4	22 4	1533.7 6 ⁺				
2210.7	8 ⁺	677.4 6	100	1533.7 6 ⁺				
2445.2	7 ⁻	465.2 2	24.0 8	1979.9 5 ⁻	E2		B(E2)(W.u.)=7.E+1 3	
		911.6 2	100 3	1533.7 6 ⁺	E1		B(E1)(W.u.)=0.00014 6	
2498.4	(6 ⁺)	659.5 6	63 19	1838.8 (4 ⁺)				
		965.6 6	100 25	1533.7 6 ⁺				
2607.2	6 ⁻	627.4 2	28 4	1979.9 5 ⁻				
		1073.4 2	100 6	1533.7 6 ⁺	E1			
2774.7	8 ⁺	656.5 2	100	2117.2 6 ⁺				
2931.9	10 ⁺	721.2 2	100	2210.7 8 ⁺	E2		B(E2)(W.u.)=114 21	
2981.9	9 ⁻	536.9 2	100 3	2445.2 7 ⁻	E2		B(E2)(W.u.)=88 11	
		771.1 2	65 3	2210.7 8 ⁺	E1		B(E1)(W.u.)=9.4×10 ⁻⁵ 12	
3079.1	8 ⁻	472.0 2	68 6	2607.2 6 ⁻	E2			
		634.0 2	14.0 19	2445.2 7 ⁻				
		868.4 2	100 5	2210.7 8 ⁺	E1			
3271.8	9 ⁻	290.0 2	100 4	2981.9 9 ⁻	M1+E2			
		826.4 2	28 4	2445.2 7 ⁻				
		1061.3 2	63.8 21	2210.7 8 ⁺				
3457.3	10 ⁺	525.4 4	≤38	2931.9 10 ⁺				
		682.5 2	100 8	2774.7 8 ⁺				
		1246.8 2	≤38	2210.7 8 ⁺				
3555.2	(9 ⁺)	1344.5 14	100	2210.7 8 ⁺				
3627.9	11 ⁻	645.9 2	100	2981.9 9 ⁻	E2		B(E2)(W.u.)=88 11	
3633.4	10 ⁻	554.3 2	100 6	3079.1 8 ⁻	E2			
		651.5 2	38 6	2981.9 9 ⁻				
3683.5	12 ⁺	751.7 2	100	2931.9 10 ⁺	E2			
3855.7	11 ⁻	227.8 2	37.8 10	3627.9 11 ⁻	M1+E2			
		583.8 2	100 3	3271.8 9 ⁻	E2			
3856.4	(10 ⁺)	301.2 14	100	3555.2 (9 ⁺)				
3960.7		327.4 2	≤23	3633.4 10 ⁻				
		332.6 2	100 5	3627.9 11 ⁻				
3979.0	12 ⁺	295.4 2	100 5	3683.5 12 ⁺	M1+E2			
		521.6 2	50 9	3457.3 10 ⁺				
4171.4	(11 ⁺)	315.0 [†] 14	100 [†]	3856.4 (10 ⁺)				
4238.3	12 ⁻	277.6 2	74 4	3960.7				
		382.6 2	41 4	3855.7 11 ⁻	M1+E2			

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Adopted Levels, Gammas (continued) $\gamma(^{116}\text{Xe})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.
4238.3	12 ⁻	605.0 2	100 11	3633.4	10 ⁻	E2
4363.4	13 ⁻	735.7 2	100	3627.9	11 ⁻	
4465.5	14 ⁺	782.1 2	100	3683.5	12 ⁺	E2
4486	(12 ⁺)	315.0 [†] 14	100 [†]	4171.4	(11 ⁺)	
4548.0	13 ⁻	184.8 2	11.6 11	4363.4	13 ⁻	M1+E2
		309.5 2	48 5	4238.3	12 ⁻	M1+E2
		692.2 2	100 11	3855.7	11 ⁻	
4699.1	14 ⁺	233.7 2	48.9 21	4465.5	14 ⁺	M1+E2
		720.0 2	100 4	3979.0	12 ⁺	
4934.3	14 ⁻	386.3 2	57 5	4548.0	13 ⁻	M1+E2
		696.0 2	100 10	4238.3	12 ⁻	E2
5163.0	15 ⁻	799.6 2	100	4363.4	13 ⁻	E2
5300.6	16 ⁺	835.2 2	100	4465.5	14 ⁺	E2
5302.1	15 ⁻	367.7 2	34 4	4934.3	14 ⁻	M1+E2
		754.2 2	100 10	4548.0	13 ⁻	E2
5393.1	(15 ⁻)	230.1 7	100	5163.0	15 ⁻	
5541.9	16 ⁺	241.4 2	34.0 20	5300.6	16 ⁺	M1+E2
		842.7 2	100 6	4699.1	14 ⁺	E2
5713.4	16 ⁻	411.2 2	37 5	5302.1	15 ⁻	
		779.1 2	100 9	4934.3	14 ⁻	
5990.3	(16 ⁻)	597.2 4	100	5393.1	(15 ⁻)	
6016.1	17 ⁻	853.1 2	100	5163.0	15 ⁻	E2
6110.8	(17 ⁻)	808.7 2	100	5302.1	15 ⁻	(E2)
6195.2	(18 ⁺)	894.5 2	100	5300.6	16 ⁺	
6468.7	(18 ⁺)	273.3 3	17.0 21	6195.2	(18 ⁺)	
		926.9 2	100.0 21	5541.9	16 ⁺	
6756.9	(18 ⁻)	766.6 13	100	5990.3	(16 ⁻)	
6920.1	(19 ⁻)	904.0 2	100	6016.1	17 ⁻	
6982.2	(19 ⁻)	871.4 3	100.0	6110.8	(17 ⁻)	
7147.8	(20 ⁺)	952.6 3	100	6195.2	(18 ⁺)	
7467.0	(20 ⁺)	319.2 3	31.8 23	7147.8	(20 ⁺)	
		998.3 4	100 5	6468.7	(18 ⁺)	
7852.8	(21 ⁻)	932.7 3	100	6920.1	(19 ⁻)	
7923.1	(21 ⁻)	1003.0 12	100	6920.1	(19 ⁻)	
8150.5	(22 ⁺)	1002.7 3	100	7147.8	(20 ⁺)	
8490.1	(22 ⁺)	1023.1 3	100	7467.0	(20 ⁺)	
8868.1	(23 ⁻)	1015.3 3	100	7852.8	(21 ⁻)	
8993.1	(23 ⁻)	1070.0 [†] 14	100 [†]	7923.1	(21 ⁻)	
9198.2	(24 ⁺)	1047.7 3	100	8150.5	(22 ⁺)	
9467.1	(23)	977.0 12	100	8490.1	(22 ⁺)	
9970.1	(25 ⁻)	1102.0 14	100	8868.1	(23 ⁻)	
10063.1	(25 ⁻)	1070.0 [†] 14	100 [†]	8993.1	(23 ⁻)	
10294.0	(26 ⁺)	1095.8 7	100	9198.2	(24 ⁺)	
10422.7	(25)	955.6 12	100	9467.1	(23)	
11201	(27 ⁻)	1138.0 12	100	10063.1	(25 ⁻)	
11457.8	(28 ⁺)	1163.8 4	100	10294.0	(26 ⁺)	
12408	(29 ⁻)	1207.0 12	100	11201	(27 ⁻)	
12702.9	(30 ⁺)	1245.1 3	100	11457.8	(28 ⁺)	
13654	(31 ⁻)	1246.0 12	100	12408	(29 ⁻)	
14028.0	(32 ⁺)	1325.1 4	100	12702.9	(30 ⁺)	
14926	(33 ⁻)	1272.0 [‡] 12	100	13654	(31 ⁻)	
15433.2	(34 ⁺)	1405.2 8	100	14028.0	(32 ⁺)	
16908.5	(36 ⁺)	1475.3 14	100	15433.2	(34 ⁺)	
18392	(38 ⁺)	1483.5 17	100	16908.5	(36 ⁺)	

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Adopted Levels, Gammas (continued) $\gamma(^{116}\text{Xe})$ (continued)

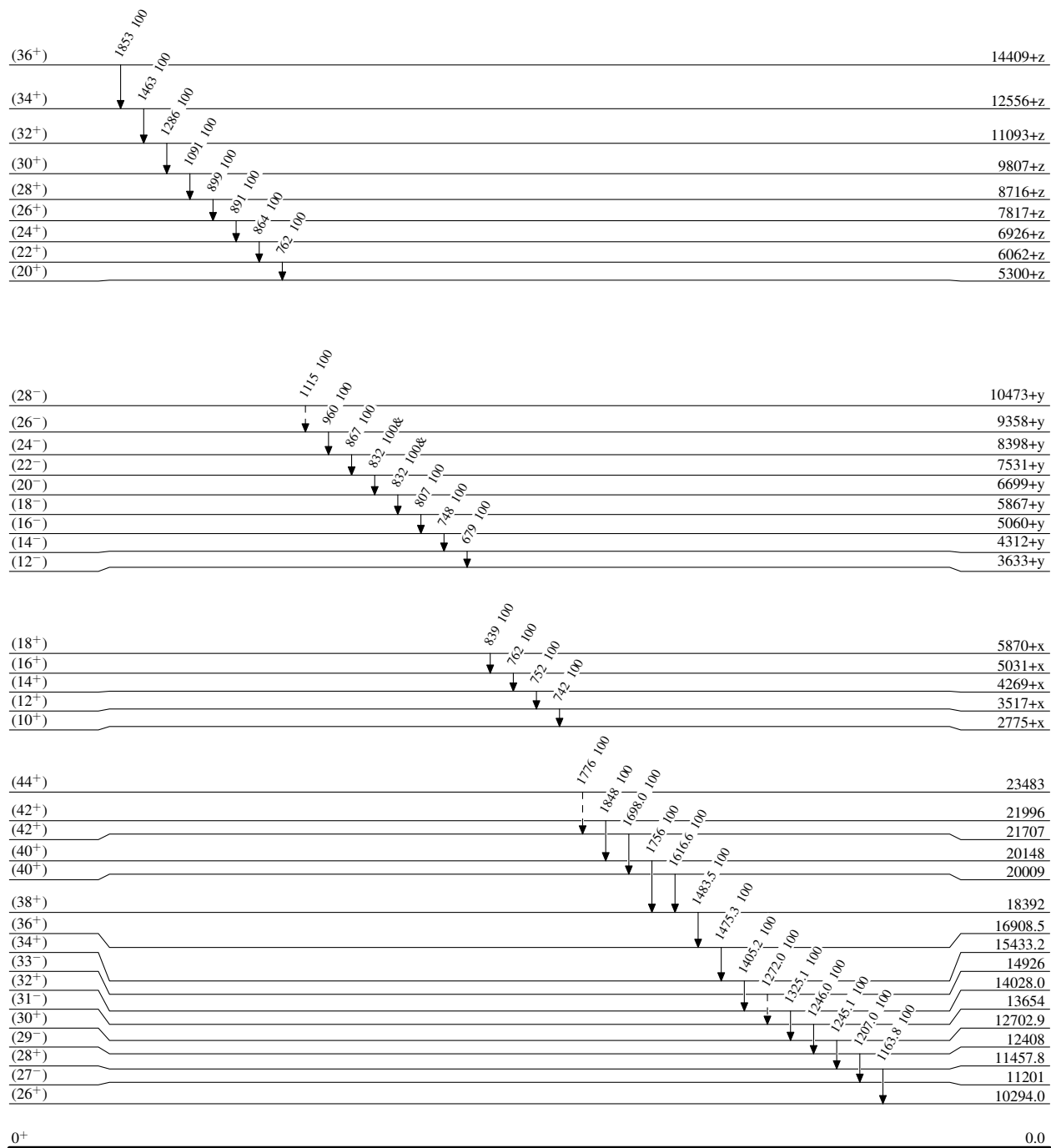
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π
20009	(40 ⁺)	1616.6 <i>15</i>	100	18392	(38 ⁺)	7531+y	(22 ⁻)	832 [†] <i>1</i>	100 [†]	6699+y	(20 ⁻)
20148	(40 ⁺)	1756 <i>2</i>	100	18392	(38 ⁺)	8398+y	(24 ⁻)	867 <i>1</i>	100	7531+y	(22 ⁻)
21707	(42 ⁺)	1698.0 <i>17</i>	100	20009	(40 ⁺)	9358+y	(26 ⁻)	960 <i>1</i>	100	8398+y	(24 ⁻)
21996	(42 ⁺)	1848 <i>2</i>	100	20148	(40 ⁺)	10473+y	(28 ⁻)	1115 [‡] <i>1</i>	100	9358+y	(26 ⁻)
23483	(44 ⁺)	1776 [‡] <i>2</i>	100	21707	(42 ⁺)	6062+z	(22 ⁺)	762 <i>1</i>	100	5300+z	(20 ⁺)
3517+x	(12 ⁺)	742 <i>1</i>	100	2775+x	(10 ⁺)	6926+z	(24 ⁺)	864 <i>1</i>	100	6062+z	(22 ⁺)
4269+x	(14 ⁺)	752 <i>1</i>	100	3517+x	(12 ⁺)	7817+z	(26 ⁺)	891 <i>1</i>	100	6926+z	(24 ⁺)
5031+x	(16 ⁺)	762 <i>1</i>	100	4269+x	(14 ⁺)	8716+z	(28 ⁺)	899 <i>1</i>	100	7817+z	(26 ⁺)
5870+x	(18 ⁺)	839 <i>1</i>	100	5031+x	(16 ⁺)	9807+z	(30 ⁺)	1091 <i>1</i>	100	8716+z	(28 ⁺)
4312+y	(14 ⁻)	679 <i>1</i>	100	3633+y	(12 ⁻)	11093+z	(32 ⁺)	1286 <i>1</i>	100	9807+z	(30 ⁺)
5060+y	(16 ⁻)	748 <i>1</i>	100	4312+y	(14 ⁻)	12556+z	(34 ⁺)	1463 <i>1</i>	100	11093+z	(32 ⁺)
5867+y	(18 ⁻)	807 <i>1</i>	100	5060+y	(16 ⁻)	14409+z	(36 ⁺)	1853 <i>1</i>	100	12556+z	(34 ⁺)
6699+y	(20 ⁻)	832 [†] <i>1</i>	100 [†]	5867+y	(18 ⁻)						

[†] Multiply placed with undivided intensity.

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

Adopted Levels, Gammas

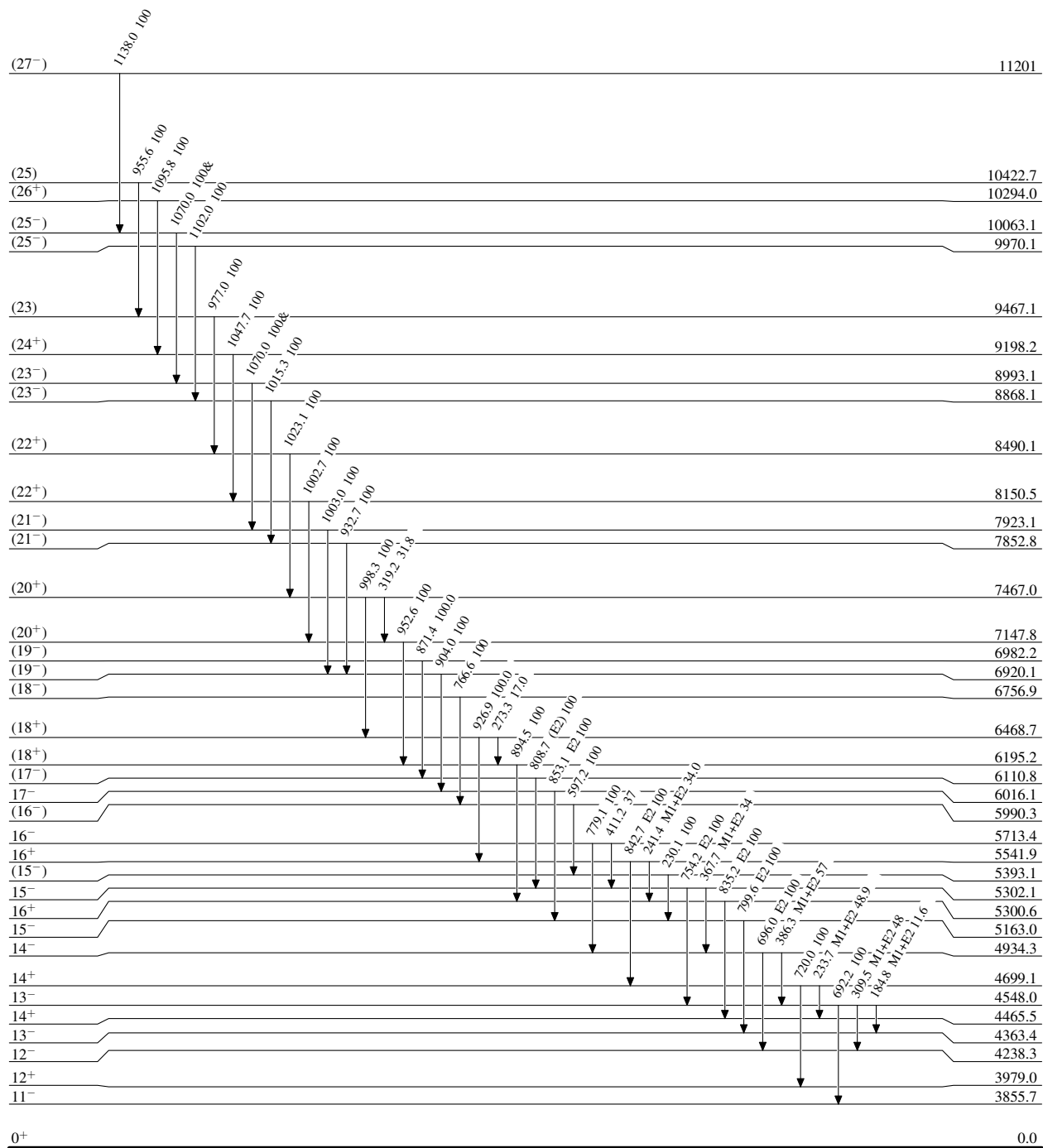
Legend

Level SchemeIntensities: Relative photon branching from each level
& Multiply placed: undivided intensity given-----► γ Decay (Uncertain)

Adopted Levels, Gammas

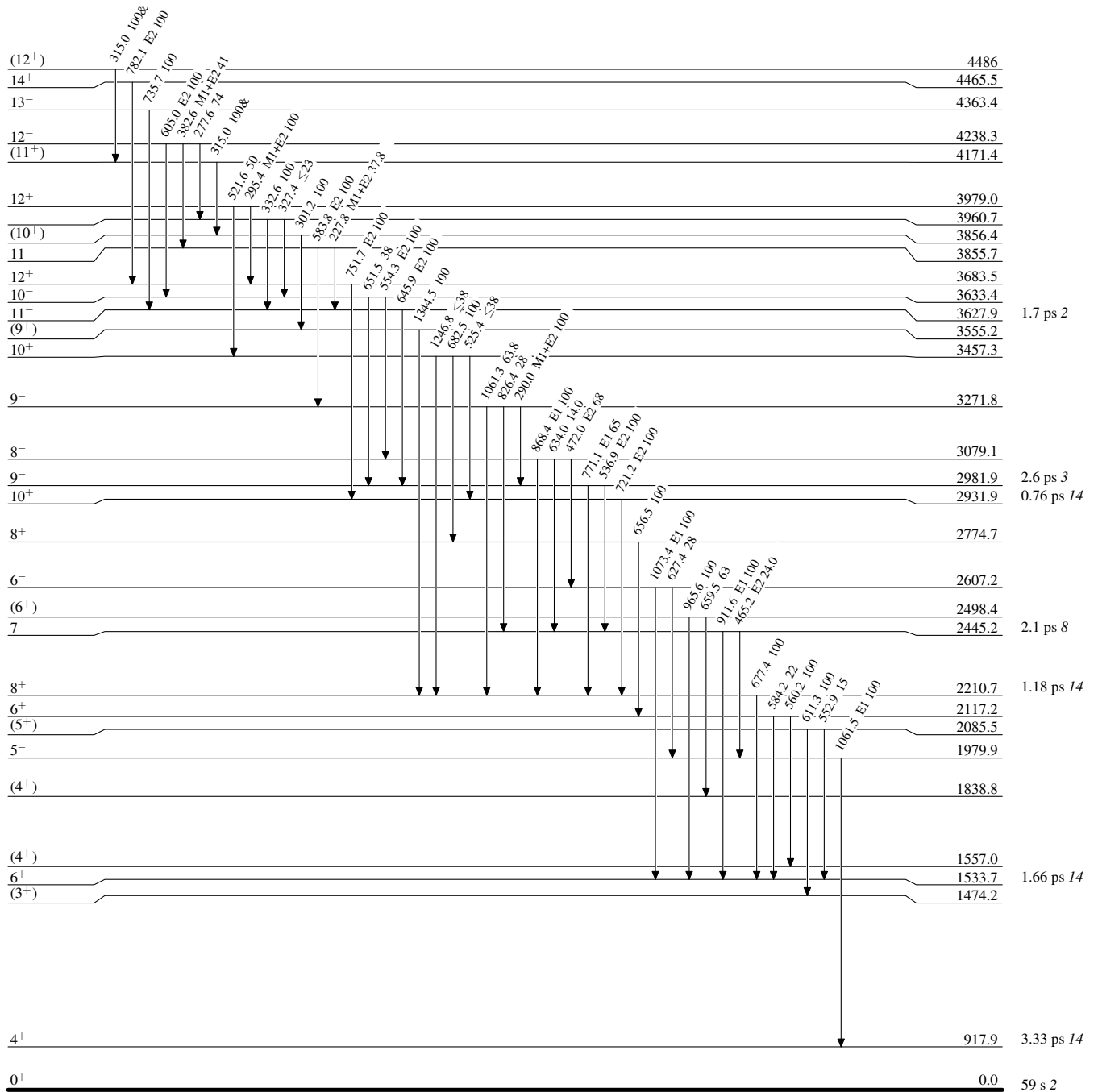
Level Scheme (continued)

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



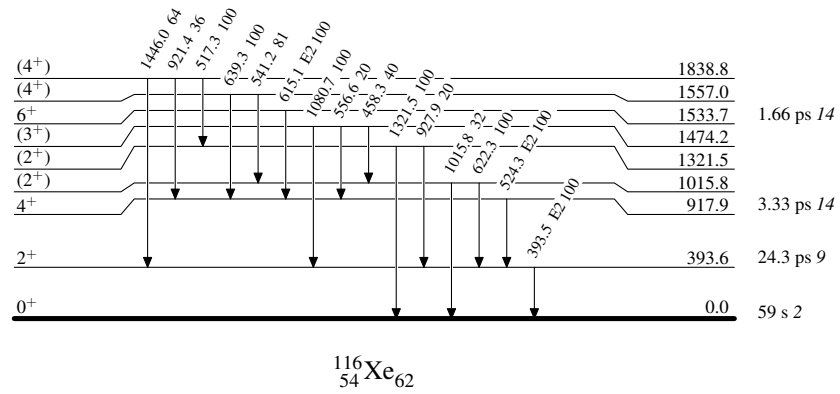
Adopted Levels, Gammas**Level Scheme (continued)**

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



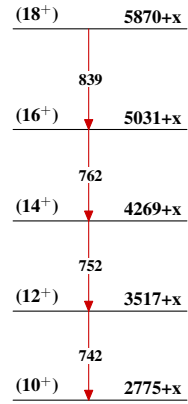
Adopted Levels, Gammas**Level Scheme (continued)**

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

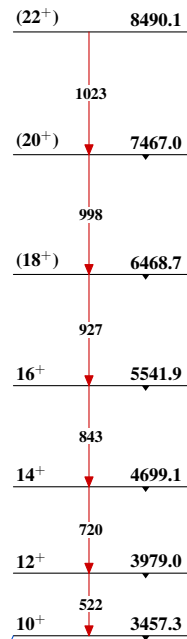
 $^{116}_{54}\text{Xe}_{62}$

Adopted Levels, Gammas

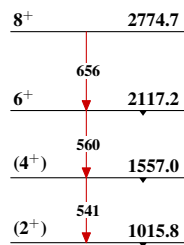
Band(A): Band 1 based on
(10⁺), not connected



Band(C): Band 3 based on
10⁺



Band(B): Band 2:
quasi-rotational band



$^{116}_{54}\text{Xe}_{62}$

Adopted Levels, Gammas (continued)
Band(E): Band 5 based on (20⁺), not connected

(36 ⁺)	14409+z
(34 ⁺)	12556+z
(32 ⁺)	11093+z
(30 ⁺)	9807+z
(28 ⁺)	8716+z
(26 ⁺)	7817+z
(24 ⁺)	6926+z
(22 ⁺)	6062+z
(20 ⁺)	5300+z

Band(G): Band 7 based on (12⁻), not connected

(28 ⁻)	10473+y
(26 ⁻)	9358+y
(24 ⁻)	8398+y
(22 ⁻)	7531+y
(20 ⁻)	6699+y
(18 ⁻)	5867+y
(16 ⁻)	5060+y
(14 ⁻)	4312+y
(12 ⁻)	3633+y

Band(D): Band 4: Ground-state, Yrast band

(44 ⁺)	23483
(42 ⁺)	21707
(40 ⁺)	20009
(38 ⁺)	18392
(36 ⁺)	16908.5
(34 ⁺)	15433.2
(32 ⁺)	14028.0
(30 ⁺)	12702.9
(28 ⁺)	11457.8
(26 ⁺)	10294.0
(24 ⁺)	9198.2
(22 ⁺)	8150.5
(20 ⁺)	7147.8
(18 ⁺)	6195.2
16 ⁺	5300.6
14 ⁺	4465.5
12 ⁺	3683.5
10 ⁺	2931.9
8 ⁺	2210.7
6 ⁺	1533.7
(2 ⁺)	1015.8
4 ⁺	917.9
2 ⁺	393.6
0 ⁺	0.0

Band(F): Band 6 based on 6⁻

(19 ⁻)	6982.2
(17 ⁻)	6110.8
16 ⁻	5713.4
15 ⁻	5302.1
14 ⁻	4934.3
13 ⁻	4548.0
12 ⁻	4238.3
11 ⁻	3855.7
10 ⁻	3633.4
9 ⁻	3271.8
8 ⁻	3079.1
6 ⁻	2607.2

Band(H): Band 8 based on 5⁻

(33 ⁻)	14926
(31 ⁻)	13654
(29 ⁻)	12408
(27 ⁻)	11201
(25 ⁻)	10063.1
(23 ⁻)	8993.1
(21 ⁻)	7923.1
(19 ⁻)	6920.1
17 ⁻	6016.1
15 ⁻	5163.0
13 ⁻	4363.4
11 ⁻	3627.9
9 ⁻	2981.9
7 ⁻	2445.2
5 ⁻	1979.9

Band(I): Band 9

(12 ⁺)	4486
(11 ⁺)	4171.4
(10 ⁺)	3856.4
(9 ⁺)	3555.2

Adopted Levels, Gammas (continued)