Adopted Levels, Gammas

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

Q(β^-)=−4.35×10^3 *5*; S(n)=9.46×10^3 *4*; S(p)=2.67×10^3 *4*; Q(α)=1.20×10^3 *4* 2012Wa38
Note: Current evaluation has used the following Q record −4.35E+3 4 *9.46×10^3 3* 2670 *30* 1200 *40* 2011AuZZ.
Q(β^-n)=−16160 Q(εp)=1920 *30* (2011AuZZ).
Values in 2003Au03: Q(β^-)=−4360 *4*, S(n)=9460 *3*, S(p)=2670 *3*, Q(α)=1200 *4*, Q(β^-n)=−16160 *4*, Q(εp)=1910 *3* (syst.).
Theory, calculations: 1997Pa41, 1996Af02.
1992Le09: measured optical isotope shift, derived $\Delta<r^2>$.

^{142}Eu Levels

Cross Reference (XREF) Flags

A ^{142}Gd ε decay
B (HI,xnγ)
C (HI,xnγ):SDB

E(level)	J$^\pi$[†]	T$_{1/2}$[‡]	XREF	Comments
0.0	1$^+$	2.34 s *12*	A	%ε+%β^+=100 μ=+1.536 *19* (1985Ah02,2005St24) Q=+0.12 *5* (1985Ah02,2005St24) J$^\pi$: J=1 hfs (1985Ah02), log *ft*≤5.1 to 0$^+$ and 2$^+$. Configuration=((π d$_{5/2}$)$^{-1}$(ν d$_{3/2}$)$^{-1}$) (1996Pi11). T$_{1/2}$: from 1991Fi03. Other: 2.4 s *2* (1975Ke08).
178.87? *5*	(2)$^-$		A	J$^\pi$: γ to 1$^+$ is E1, syst.
280.33 *7*	1$^+$,2$^+$		A	J$^\pi$: γ to 1$^+$ is M1+E2.
284.26 *5*	0$^+$,1$^+$,2$^+$		A	J$^\pi$: γ to 1$^+$ is M1.
496.45 *11*			A	
503.23 *6*	+		A	J$^\pi$: γ to 1$^+$,2$^+$ is M1+E2.
526.30 *7*	+		A	J$^\pi$: γ to 1$^+$ is E2.
544.53 *12*			A	
550.60 *10*	+		A	J$^\pi$: γ to 1$^+$ is E2.
585.84 *10*			A	
591.23 *8*			A	
614.52 *7*	+		A	J$^\pi$: E2 γ to 1$^+$.
619.72 *10*			A	
631.70 *10*			A	
660.89 *8*			A	
704.93 *10*			A	
732.07 *7*			A	
750.33 *8*			A	
935.59 *8*			A	
1000.20 *10*			A	
1210.23? *25*			A	
1383.28 *12*			A	
1412.94 *8*			A	
1438.33 *7*			A	
1480.9 *10*			A	
1485.9 *10*			A	
1779.01 *8*			A	
1948.6 *3*			A	
1956.6 *3*			A	
2025.59 *21*			A	
2160.9 *10*			A	

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Adopted Levels, Gammas (continued)

^{142}Eu Levels (continued)

E(level)	J^{π} †	$T_{1/2}$ ‡	XREF	Comments
0.0+x	8^-	1.223 min *8*	B	%ε+%β^+=100 μ=+2.978 *11* (1985Ah02,2005St24) Q=+1.41 *6* (1985Ah02,2005St24) Additional information 1. J^{π}: J=8 hfs (1985Ah02), log *ft*=5.1 to level with π=−. Configuration=((π $d_{5/2})^{-1}(\nu\ h_{11/2})^{-1}$) (1996Pi11). $T_{1/2}$: from 1993Al03. Others: 1.22 min *2* (1975Ke08), 1.20 min *15* (1973VaYZ), 1.2 min *2* (1966Ma15), ≈1.1 min (1987FiZW). E(level): x=520 *50* (1997Au04) based on Q(ε)(^{142}Eu 8^-)=8150 *60*, Q(ε)(^{142}Eu,1^+)=7670 *30* (1994Po26). Others: Q(ε)(^{142}Eu 8^-)=8175 *50* (1983Al06), 7480 *100* (1993Al03) Q(ε)(^{142}Eu,1^+)=8000 *300* (1975Ke08).
282.60+x *10*	8^+	6.2 ns *4*	B	μ=(+)4.08 *24* (2005St24,1993Bi13,1997StZR) Configuration=$\pi h_{11/2}\nu h^{-1}_{11/2}$ (1996Pi11).
292.70+x *18*	9^+		B	Configuration=$\pi h_{11/2}\nu h^{-1}_{11/2}$ (1996Pi11).
353.20+x *19*	9^-		B	Possible configuration=((π $g_{7/2})^{-1}(\nu\ h_{11/2})^{-1}$) (1996Pi11).
376.29+x *19*	10^+		B	Configuration=$\pi h_{11/2}\nu h^{-1}_{11/2}$ (1996Pi11).
679.4+x *3*	(8,10)		B	
796.02+x *22*	11^+		B	Configuration=$\pi h_{11/2}\nu h^{-1}_{11/2}$ (1996Pi11).
1000.9+x *3*	11^-		B	Possible 4-quasi-particle state (1996Pi11).
1066.50+x *25*	11^+		B	
1099.24+x *22*	12^+		B	
1281.2+x *4*	(10)		B	
1397.3+x@ *3*	11^+		B	J^{π}: 1990Bi07 proposed 12^+ as the first band member.
1630.64+x *25*	12^+		B	
1669.11+x *25*	13^+		B	
2001.76+x *25*	13^+		B	
2034.3+x *3*	12		B	
2046.0+x *3*	12^-		B	
2085.2+x *3*	13^-		B	
2130.95+x& *24*	14^+		B	
2209.3+x@ *4*	13^+		B	
2231.3+x *3*	14^+		B	
2283.2+x *3*	$12^{(-)}$		B	
2289.0+x& *3*	15^+	4.6 ps *4*	B	
2359.1+x *3*	12^-		B	
2442.8+x *3*	$13^{(-)}$		B	
2483.98+x*b* *23*	13^-		B	
2543.7+x& *3*	16^+	1.8 ps *6*	B	
2610.75+x*b* *24*	14^-	3.9 ps *7*	B	
2751.33+x*b* *25*	15^-	3.1 ps *6*	B	
2935.9+x*b* *3*	16^-	1.8 ps *3*	B	
3057.6+x& *4*	17^+		B	
3116.9+x@ *4*	15^+		B	
3154.5+x*b* *3*	17^-	1.73 ps *21*	B	
3435.0+x& *4*	18^+		B	
3441.5+x *4*	17^-		B	
3548.9+x*b* *4*	18^-	1.32 ps *14*	B	
3574.8+x *4*	16^+		B	
3577.6+x@ *5*	17^+	37 ps *3*	B	
3819.2+x *4*	17		B	

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Adopted Levels, Gammas (continued)

^{142}Eu Levels (continued)

E(level)	J^{π}[†]	$T_{1/2}$[‡]	XREF	Comments
3974.5+x *4*	19^-		B	
4109.7+x[@] *5*	19^+	5.7 ps *8*	B	
4114.5+x *6*	18		B	
4114.7+x *4*	19^-		B	
4186.5+x *5*	18		B	
4218.5+x[&] *4*	19^+		B	
4380.3+x *5*	19^-		B	
4515.7+x[b] *5*	20^-		B	
4650.4+x *6*	19		B	
4651.4+x *4*	20^-		B	
4803.7+x[&] *5*	20^+		B	
4909.2+x *5*	21		B	
4928.3+x *7*			B	
4930.0+x[@] *6*	21^+	<1.4 ps	B	
5078.0+x[b] *6*	21^-		B	
5165.6+x *7*	20		B	
5300.4+x *6*	21^-		B	
5467.1+x *6*	22		B	
5511.6+x *6*	22		B	
5533.5+x[&] *5*	21^+		B	
5729.6+x *6*	22		B	
5819.4+x *6*	22		B	
6006.0+x[@] *6*	23^+		B	
6163.7+x *7*	23		B	
6525.4+x *7*	24		B	
6539.1+x *7*	24		B	
7073.8+x[@] *8*	(25^+)		B	
y[a]	J		B	Additional information 2. E >3 MeV. J^{π}: J≥18.
602.8+y[a] *3*	J+2		B	
1211.2+y[a] *5*	J+4		B	
1956.8+y[a] *6*	J+6	0.49[#] ps *3*	B	
2875.9+y[a] *8*	J+8	0.21[#] ps *3*	B	
3996.6+y[a] *9*	J+10	<0.21[#] ps	B	
5170.4+y[a] *11*	J+12		B	
z[c]	J1		B	Additional information 3. E >2.6 MeV. J^{π}: J_1≥12.
753.6+z[c] *3*	J1+2		B	
1374.3+z[c] *4*	J1+4		B	
2154.9+z[c] *5*	J1+6	0.26[#] ps *3*	B	
3093.2+z[c] *6*	J1+8	0.12[#] ps *2*	B	
4011.6+z[c] *8*	J1+10	0.08[#] ps *6*	B	
5015.8+z[c] *10*	J1+12	<0.21[#] ps	B	
6157.0+z[c] *12*	J1+14		B	
u[d]	J2		C	Additional information 4. J^{π}: J_2=(27,29) from 1995Mu11.
699.7+u[d] *3*	J2+2		C	
1461.6+u[d] *5*	J2+4		C	

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Adopted Levels, Gammas (continued)

^{142}Eu Levels (continued)

E(level)	Jπ†	XREF	E(level)	Jπ†	XREF	E(level)	Jπ†	XREF
2284.4+u[d] *6*	J2+6	C	7324.9+u[d] *9*	J2+16	C	13864.6+u[d] *3*	J2+26	C
3170.7+u[d] *6*	J2+8	C	8512.0+u[d] *11*	J2+18	C	15351.4+u[d] *4*	J2+28	C
4117.8+u[d] *7*	J2+10	C	9759.9+u[d] *13*	J2+20	C	16899+u?[d]	J2+30	C
5126.1+u[d] *8*	J2+12	C	11067.8+u[d] *16*	J2+22	C			
6195.5+u[d] *8*	J2+14	C	12436.1+u[d] *20*	J2+24	C			

† J≥8 from γ(θ), linear polarization of γ, α(K)exp in (HI,xnγ), band assignments.
‡ From plunger experiment in ^{110}Pd(^{37}Cl,4n) (1996Pi11), unless indicated otherwise.
# From DSA line-shape analysis. Uncertainty given is statistical only (1996Pi11).
@ Band(A): ΔJ=2 band-1 based on 11$^+$.
& Band(B): ΔJ=1 band-1 based on 14$^+$.
a Band(C): ΔJ=2 band-2.
b Band(D): ΔJ=1 band-2 based on 13$^-$.
c Band(E): ΔJ=2 band-3.
d Band(F): SD band (1995Mu11). Percent population=1.2 *2* (1995Mu11). Possible particle structures (1995Mu11) are: configuration=((π 6)$^{+1}$(ν 6)$^{+3}$) (α=+1, π=+). This configuration assumes a hole in the N=6 neutron orbital. Another possibility is a hole in the 3/2[532] (α=−1/2) neutron orbital which would give negative parity for the SD band. The SD band reported by 1994At01 with the following (very different) transitions in the cascade was not seen by 1995Mu11: 821, 880, 940, 995, 1053, 1113, 1174, 1237, 1298, 1360, 1422, 1486, 1551, 1616, 1681. The SD band seen by 1994At01 (percent population=0.3) probably belongs to some other nucleus.

γ(^{142}Eu)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.‡	α†	Comments
178.87?	(2)$^-$	178.9 *1*	100	0.0	1$^+$	E1	0.0590	α(K)=0.0500 *7*; α(L)=0.00706 *10*; α(M)=0.001517 *22*; α(N+..)=0.000401 *6* α(N)=0.000344 *5*; α(O)=5.28×10^{-5} *8*; α(P)=4.51×10^{-6} *7*
280.33	1$^+$,2$^+$	101.4 *1*	2.6 *7*	178.87?	(2)$^-$	[E1]	0.273	α(K)=0.230 *4*; α(L)=0.0342 *5*; α(M)=0.00736 *11*; α(N+..)=0.00192 *3* α(N)=0.001656 *24*; α(O)=0.000249 *4*; α(P)=1.92×10^{-5} *3*
		280.3 *1*	100.0 *23*	0.0	1$^+$	E2+M1	0.089 *17*	α(K)=0.072 *18*; α(L)=0.0129 *4*; α(M)=0.00285 *15*; α(N+..)=0.00075 *3* α(N)=0.00065 *3*; α(O)=9.82×10^{-5} *14*; α(P)=7.4×10^{-6} *24*
284.26	0$^+$,1$^+$,2$^+$	284.4 *1*	100.0	0.0	1$^+$	M1	0.1014	α(K)=0.0860 *12*; α(L)=0.01205 *17*; α(M)=0.00260 *4*; α(N+..)=0.000699 *10* α(N)=0.000595 *9*; α(O)=9.46×10^{-5} *14*; α(P)=9.43×10^{-6} *14*
496.45		212.2 *1*	100 *10*	284.26	0$^+$,1$^+$,2$^+$			
		216 *1*	≈32.68	280.33	1$^+$,2$^+$			
503.23	+	222.8 *1*	100 *5*	280.33	1$^+$,2$^+$	M1+E2	0.173 *23*	α(K)=0.14 *3*; α(L)=0.028 *5*; α(M)=0.0061 *11*; α(N+..)=0.0016 *3* α(N)=0.00139 *24*; α(O)=0.000208 *25*; α(P)=1.4×10^{-5} *5*
		503.0 *1*	44 *11*	0.0	1$^+$			
526.30	+	241.7 *2*	2.8 *8*	284.26	0$^+$,1$^+$,2$^+$	M1	0.1570	α(K)=0.1331 *19*; α(L)=0.0187 *3*; α(M)=0.00404 *6*; α(N+..)=0.001087 *16*

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Adopted Levels, Gammas (continued)

γ(^{142}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.‡	α†	Comments
								α(N)=0.000926 *14*; α(O)=0.0001470 *21*; α(P)=1.463×10^{-5} *21*
526.30	+	347.6 *1*	7.6 *12*	178.87?	(2)$^-$			
		526.2 *1*	100 *3*	0.0	1$^+$	E2	0.01170	α(K)=0.00960 *14*; α(L)=0.001646 *23*; α(M)=0.000362 *5*; α(N+..)=9.55×10^{-5} *14* α(N)=8.21×10^{-5} *12*; α(O)=1.252×10^{-5} *18*; α(P)=9.60×10^{-7} *14*
544.53		264.2 *1*	100.00	280.33	1$^+$,2$^+$			
550.60	+	550.6 *1*	100.0	0.0	1$^+$	E2	0.01041	α(K)=0.00857 *12*; α(L)=0.001443 *21*; α(M)=0.000317 *5*; α(N+..)=8.37×10^{-5} *12* α(N)=7.19×10^{-5} *10*; α(O)=1.100×10^{-5} *16*; α(P)=8.60×10^{-7} *12*
585.84		407.0 *1*	100 *9*	178.87?	(2)$^-$			
		585.7 *2*	98 *13*	0.0	1$^+$			
591.23		306.9 *1*	73 *6*	284.26	0$^+$,1$^+$,2$^+$			
		591.3 *1*	100 *8*	0.0	1$^+$			
614.52	+	330.4 *1*	22 *4*	284.26	0$^+$,1$^+$,2$^+$			
		335 *1*	≈15.38	280.33	1$^+$,2$^+$			
		614.5 *1*	100 *7*	0.0	1$^+$	E2	0.00790 *11*	α(K)=0.00655 *10*; α(L)=0.001060 *15*; α(M)=0.000232 *4*; α(N+..)=6.15×10^{-5} *9* α(N)=5.27×10^{-5} *8*; α(O)=8.11×10^{-6} *12*; α(P)=6.63×10^{-7} *10*
619.72		336 *1*	≈2.732	284.26	0$^+$,1$^+$,2$^+$			
		619.7 *1*	100 *5*	0.0	1$^+$			
631.70		105 *1*	≈10.53	526.30	+			
		136 *1*	≈10.53	496.45				
		631.7 *1*	100 *9*	0.0	1$^+$			
660.89		482.0 *1*	60 *12*	178.87?	(2)$^-$			
		660.9 *1*	100 *12*	0.0	1$^+$			
704.93		704.9 *1*	100.0	0.0	1$^+$			
732.07		228.1 *1*	≈17.65	503.23	+			
		448.2 *1*	35 *8*	284.26	0$^+$,1$^+$,2$^+$			
		553 *1*	≈98.04	178.87?	(2)$^-$			
		732.4 *1*	100 *8*	0.0	1$^+$			
750.33		247.2 *1*	22 *4*	503.23	+			
		466 *1*		284.26	0$^+$,1$^+$,2$^+$			
		472 *1*	≈13.89	280.33	1$^+$,2$^+$			
		572 *1*	≈69.44	178.87?	(2)$^-$			
		750.2 *1*	100 *10*	0.0	1$^+$			
935.59		203 *1*	≈18.18	732.07				
		651.3 *1*	66 *9*	284.26	0$^+$,1$^+$,2$^+$			
		935.6 *1*	100 *12*	0.0	1$^+$			
1000.20		821 *1*	≈14.29	178.87?	(2)$^-$			
		1000.2 *1*	100 *15*	0.0	1$^+$			
1210.23?		274.3 *4*		935.59				
		595.9 *3*	1.0×10^2 *8*	614.52	+			
1383.28		1204.4 *1*	100.0	178.87?	(2)$^-$			
1412.94		862 *1*	≈20.00	550.60	+			
		910.0 *1*	16 *4*	503.23	+			
		1133 *1*	≈8.667	280.33	1$^+$,2$^+$			
		1233.9 *1*	100 *6*	178.87?	(2)$^-$			
		1412.4 *2*	45 *10*	0.0	1$^+$			

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Adopted Levels, Gammas (continued)

γ(^{142}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.‡	α†	Comments
1438.33		823.9 *1*	28 *7*	614.52	+			
		853 *1*	≈2.880	585.84				
		912.0 *2*	7.6 *16*	526.30	+			
		1153.8 *1*	5.5 *13*	284.26	$0^+,1^+,2^+$			
		1259.6 *1*	100 *4*	178.87?	$(2)^-$			
		1438.4 *2*	29 *11*	0.0	1^+			
1480.9		1302 *1*	≈100.0	178.87?	$(2)^-$			
1485.9		1307 *1*	≈100.0	178.87?	$(2)^-$			
1779.01		1073.6 *4*		704.93				
		1158 *1*	≈9.050	619.72				
		1187 *1*	≈27.15	591.23				
		1275 *1*	≈9.050	503.23	+			
		1495.0 *2*	27 *7*	284.26	$0^+,1^+,2^+$			
		1599.7 *2*	81 *14*	178.87?	$(2)^-$			
		1779.1 *1*	100 *11*	0.0	1^+			
1948.6		1948.6 *3*	100.0	0.0	1^+			
1956.6		1956.6 *3*	100.0	0.0	1^+			
2025.59		1846.7 *2*	100.0	178.87?	$(2)^-$			
2160.9		1982 *1*	100.0	178.87?	$(2)^-$			
282.60+x	8^+	282.6 *1*	100.0	0.0+x	8^-	E1	0.01782	B(E1)(W.u.)=1.74×10^{-6} *12* α(K)=0.01516 *22*; α(L)=0.00209 *3*; α(M)=0.000448 *7*; α(N+..)=0.0001190 *17* α(N)=0.0001017 *15*; α(O)=1.581×10^{-5} *23*; α(P)=1.432×10^{-6} *20*
292.70+x	9^+	(10)		282.60+x	8^+			
		292.7 *2*	100.0	0.0+x	8^-	E1	0.01630	α(K)=0.01387 *20*; α(L)=0.00190 *3*; α(M)=0.000409 *6*; α(N+..)=0.0001087 *16* α(N)=9.29×10^{-5} *14*; α(O)=1.446×10^{-5} *21*; α(P)=1.314×10^{-6} *19*
353.20+x	9^-	353.2 *2*	100.0	0.0+x	8^-			
376.29+x	10^+	83.6 *1*	100.0	292.70+x	9^+	M1	3.09	α(K)=2.61 *4*; α(L)=0.375 *6*; α(M)=0.0810 *12*; α(N+..)=0.0218 *4* α(N)=0.0185 *3*; α(O)=0.00294 *5*; α(P)=0.000289 *5*
679.4+x	(8,10)	386.7 *3*	100.0	292.70+x	9^+			
		396.8 *4*	36.36	282.60+x	8^+			
796.02+x	11^+	419.7 *2*	100.0	376.29+x	10^+			
1000.9+x	11^-	647.7 *3*	100.0	353.20+x	9^-			
1066.50+x	11^+	690.2 *2*	100.0	376.29+x	10^+			
1099.24+x	12^+	303.2 *1*	100.0	796.02+x	11^+			
		723.0 *2*	93.61	376.29+x	10^+			
1281.2+x	(10)	601.8 *4*	100.0	679.4+x	(8,10)			
1397.3+x	11^+	116.2 *3*	3.333	1281.2+x	(10)			
		601.5 *4*	100.0	796.02+x	11^+			
		1021.0 *4*	13.33	376.29+x	10^+			
		1104.5 *4*	10.00	292.70+x	9^+			
1630.64+x	12^+	834.5 *2*	100.0	796.02+x	11^+			
		1254.5 *4*	14.29	376.29+x	10^+			
1669.11+x	13^+	569.8 *2*	100.0	1099.24+x	12^+			
		873.1 *4*	18.35	796.02+x	11^+			
2001.76+x	13^+	371.0 *3*	53.13	1630.64+x	12^+			

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Adopted Levels, Gammas (continued)

γ(^{142}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.‡	α†	Comments
2001.76+x	13^+	902.6 *4*	56.25	1099.24+x	12^+			
		935.2 *3*	65.63	1066.50+x	11^+			
		1205.9 *3*	100.0	796.02+x	11^+			
2034.3+x	12	1238.3 *3*	100.0	796.02+x	11^+			
2046.0+x	12^-	1250.0 *3*	100.0	796.02+x	11^+			
2085.2+x	13^-	1084.2 *3*	100.0	1000.9+x	11^-			
2130.95+x	14^+	129.2 *2*	11.15	2001.76+x	13^+	M1	0.890	α(K)=0.753 *11*; α(L)=0.1073 *16*; α(M)=0.0232 *4*; α(N+..)=0.00624 *10* α(N)=0.00531 *8*; α(O)=0.000842 *13*; α(P)=8.32×10^{-5} *13*
		461.8 *2*	15.99	1669.11+x	13^+			
		1031.7 *2*	100.0	1099.24+x	12^+			
2209.3+x	13^+	811.9 *2*	100.0	1397.3+x	11^+			
2231.3+x	14^+	1132.0 *2*	100.0	1099.24+x	12^+			
2283.2+x	$12^{(-)}$	1216.8 *4*	88.89	1066.50+x	11^+			
		1487.3 *4*	100.0	796.02+x	11^+			
2289.0+x	15^+	158.0 *1*	100.00	2130.95+x	14^+	M1	0.505	B(M1)(W.u.)=1.21 *11* α(K)=0.428 *6*; α(L)=0.0608 *9*; α(M)=0.01313 *19*; α(N+..)=0.00353 *5* α(N)=0.00301 *5*; α(O)=0.000477 *7*; α(P)=4.72×10^{-5} *7*
2359.1+x	12^-	1358.3 *3*	100.0	1000.9+x	11^-			
2442.8+x	$13^{(-)}$	396.7 *2*	65.22	2046.0+x	12^-			
		408.5 *4*	34.78	2034.3+x	12			
		1343.7 *3*	100.0	1099.24+x	12^+			
2483.98+x	13^-	125.0 *3*	9.836	2359.1+x	12^-			
		200.8 *2*	26.23	2283.2+x	$12^{(-)}$			
		398.5 *4*	6.557	2085.2+x	13^-			
		438.0 *2*	40.98	2046.0+x	12^-			
		449.6 *3*	32.79	2034.3+x	12			
		853.3 *3*	60.66	1630.64+x	12^+			
		1384.8 *3*	100.0	1099.24+x	12^+			
2543.7+x	16^+	254.7 *1*	100.0	2289.0+x	15^+	M1(+E2)	0.117 *20*	α(K)=0.094 *22*; α(L)=0.0176 *14*; α(M)=0.0039 *4*; α(N+..)=0.00103 *9* α(N)=0.00088 *9*; α(O)=0.000134 *7*; α(P)=1.0×10^{-5} *3*
2610.75+x	14^-	126.8 *1*	100.0	2483.98+x	13^-	M1	0.938	B(M1)(W.u.)=1.5 *3* α(K)=0.794 *12*; α(L)=0.1132 *16*; α(M)=0.0245 *4*; α(N+..)=0.00658 *10* α(N)=0.00560 *8*; α(O)=0.000889 *13*; α(P)=8.78×10^{-5} *13*
		167.9 *2*	29.89	2442.8+x	$13^{(-)}$	(M1+E2)	0.408 *20*	α(K)=0.31 *5*; α(L)=0.076 *25*; α(M)=0.017 *6*; α(N+..)=0.0044 *15* α(N)=0.0038 *13*; α(O)=0.00056 *16*; α(P)=3.1×10^{-5} *10*
		479.8 *4*	11.49	2130.95+x	14^+	E1	0.00495 *7*	B(E1)(W.u.)=3.6×10^{-5} *7* α(K)=0.00423 *6*; α(L)=0.000567 *8*; α(M)=0.0001215 *18*; α(N+..)=3.24×10^{-5} *5* α(N)=2.77×10^{-5} *4*; α(O)=4.35×10^{-6} *7*; α(P)=4.14×10^{-7} *6*
		525.5 *4*	12.64	2085.2+x	13^-	M1(+E2)	0.016 *5*	α(K)=0.014 *4*; α(L)=0.0020 *4*; α(M)=0.00044 *8*; α(N+..)=0.000118 *22* α(N)=0.000100 *19*; α(O)=1.6×10^{-5} *4*; α(P)=1.4×10^{-6} *5*

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Adopted Levels, Gammas (continued)

γ(^{142}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.‡	α†	Comments
2610.75+x	14⁻	941.6 *3*	29.89	1669.11+x	13⁺	E1	0.001213 *17*	B(E1)(W.u.)=1.24×10^{-5} *23* α(K)=0.001041 *15*; α(L)=0.0001352 *19*; α(M)=2.89×10^{-5} *4*; α(N+..)=7.75×10^{-6} α(N)=6.60×10^{-6} *10*; α(O)=1.045×10^{-6} *15*; α(P)=1.041×10^{-7} *15*
2751.33+x	15⁻	140.6 *1*	100.0	2610.75+x	14⁻	M1	0.701	B(M1)(W.u.)=2.2 *5* α(K)=0.593 *9*; α(L)=0.0845 *12*; α(M)=0.0182 *3*; α(N+..)=0.00491 *7* α(N)=0.00418 *6*; α(O)=0.000663 *10*; α(P)=6.56×10^{-5} *10*
		620.3 *3*	15.54	2130.95+x	14⁺	E1	0.00281 *4*	B(E1)(W.u.)=4.5×10^{-5} *9* α(K)=0.00241 *4*; α(L)=0.000318 *5*; α(M)=6.81×10^{-5} *10*; α(N+..)=1.82×10^{-5} *3* α(N)=1.555×10^{-5} *22*; α(O)=2.45×10^{-6} *4*; α(P)=2.38×10^{-7} *4*
2935.9+x	16⁻	184.6 *1*	100.0	2751.33+x	15⁻	M1	0.328	B(M1)(W.u.)=1.7 *3* α(K)=0.278 *4*; α(L)=0.0394 *6*; α(M)=0.00850 *12*; α(N+..)=0.00229 *4* α(N)=0.00195 *3*; α(O)=0.000309 *5*; α(P)=3.06×10^{-5} *5*
		646.9 *3*	14.29	2289.0+x	15⁺	E1	0.00257 *4*	B(E1)(W.u.)=6.4×10^{-5} *11* α(K)=0.00220 *3*; α(L)=0.000291 *4*; α(M)=6.22×10^{-5} *9*; α(N+..)=1.666×10^{-5} *24* α(N)=1.420×10^{-5} *20*; α(O)=2.24×10^{-6} *4*; α(P)=2.18×10^{-7} *3*
3057.6+x	17⁺	513.9 *2*	100.0	2543.7+x	16⁺			
		768.6 *4*	21.18	2289.0+x	15⁺			
3116.9+x	15⁺	907.6 *2*	100.0	2209.3+x	13⁺			
3154.5+x	17⁻	218.6 *1*	100.0	2935.9+x	16⁻	M1	0.206	B(M1)(W.u.)=1.22 *15* α(K)=0.1748 *25*; α(L)=0.0247 *4*; α(M)=0.00532 *8*; α(N+..)=0.001432 *21* α(N)=0.001219 *18*; α(O)=0.000194 *3*; α(P)=1.92×10^{-5} *3*
3435.0+x	18⁺	377.4 *2*	100.0	3057.6+x	17⁺			
		891.4 *3*	72.73	2543.7+x	16⁺			
3441.5+x	17⁻	505.6 *3*	100.0	2935.9+x	16⁻			
3548.9+x	18⁻	394.4 *2*	100.0	3154.5+x	17⁻	M1(+E2)	0.034 *9*	α(K)=0.029 *8*; α(L)=0.0045 *6*; α(M)=0.00099 *10*; α(N+..)=0.00026 *3* α(N)=0.000226 *24*; α(O)=3.5×10^{-5} *5*; α(P)=3.0×10^{-6} *10*
3574.8+x	16⁺	1343.5 *3*	100.0	2231.3+x	14⁺			
		1444.0 *4*	26.32	2130.95+x	14⁺			
3577.6+x	17⁺	460.7 *2*	100.0	3116.9+x	15⁺	E2	0.01667	B(E2)(W.u.)=16.7 *14* α(K)=0.01353 *19*; α(L)=0.00246 *4*; α(M)=0.000542 *8*; α(N+..)=0.0001427 *20* α(N)=0.0001228 *18*; α(O)=1.86×10^{-5} *3*; α(P)=1.337×10^{-6} *19*
3819.2+x	17	244.4 *2*	100.0	3574.8+x	16⁺			
3974.5+x	19⁻	425.6 *2*	100.0	3548.9+x	18⁻			

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Adopted Levels, Gammas (continued)

γ(^{142}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[‡]	α[†]	Comments
3974.5+x	19$^-$	820.0 *4*	9.211	3154.5+x	17$^-$			
4109.7+x	19$^+$	532.1 *2*	100.0	3577.6+x	17$^+$	E2	0.01137	B(E2)(W.u.)=53 *8* α(K)=0.00933 *13*; α(L)=0.001593 *23*; α(M)=0.000350 *5*; α(N+..)=9.25×10^{-5} *13* α(N)=7.94×10^{-5} *12*; α(O)=1.212×10^{-5} *17*; α(P)=9.35×10^{-7} *14*
4114.5+x	18	673.0 *4*	100.0	3441.5+x	17$^-$			
4114.7+x	19$^-$	565.7 *3*	100.0	3548.9+x	18$^-$			
		960.2 *4*	17.50	3154.5+x	17$^-$			
4186.5+x	18	367.3 *2*	100.0	3819.2+x	17			
4218.5+x	19$^+$	783.5 *3*	100.0	3435.0+x	18$^+$			
		1160.8 *4*	22.58	3057.6+x	17$^+$			
4380.3+x	19$^-$	831.4 *4*	100.0	3548.9+x	18$^-$			
4515.7+x	20$^-$	541.2 *3*	100.0	3974.5+x	19$^-$			
		966.7 *5*	10.87	3548.9+x	18$^-$			
4650.4+x	19	463.9 *3*	100.0	4186.5+x	18			
4651.4+x	20$^-$	271.1 *2*	43.33	4380.3+x	19$^-$			
		536.6 *3*	100.0	4114.7+x	19$^-$			
		1102.5 *4*	16.67	3548.9+x	18$^-$			
4803.7+x	20$^+$	585.2 *5*	25.00	4218.5+x	19$^+$			
		1368.7 *3*	100.0	3435.0+x	18$^+$			
4909.2+x	21	257.8 *2*	100.0	4651.4+x	20$^-$			
4928.3+x		813.8 *4*	100.0	4114.5+x	18			
4930.0+x	21$^+$	820.3 *2*	100.0	4109.7+x	19$^+$	E2	0.00402 *6*	B(E2)(W.u.)>25 α(K)=0.00338 *5*; α(L)=0.000503 *7*; α(M)=0.0001091 *16*; α(N+..)=2.91×10^{-5} *4* α(N)=2.49×10^{-5} *4*; α(O)=3.88×10^{-6} *6*; α(P)=3.46×10^{-7} *5*
5078.0+x	21$^-$	562.3 *3*	100.0	4515.7+x	20$^-$			
5165.6+x	20	515.2 *4*	100.0	4650.4+x	19			
5300.4+x	21$^-$	1325.9 *4*	100.0	3974.5+x	19$^-$			
5467.1+x	22	557.9 *4*	100.0	4909.2+x	21			
5511.6+x	22	602.4 *4*	100.0	4909.2+x	21			
5533.5+x	21$^+$	729.8 *3*	100.0	4803.7+x	20$^+$			
		1315.0 *5*	24.00	4218.5+x	19$^+$			
5729.6+x	22	799.6 *3*	100.0	4930.0+x	21$^+$			
5819.4+x	22	285.9 *3*	100.0	5533.5+x	21$^+$			
6006.0+x	23$^+$	1076.0 *3*	100.0	4930.0+x	21$^+$			
6163.7+x	23	344.3 *3*	100.0	5819.4+x	22			
6525.4+x	24	361.7 *3*	100.0	6163.7+x	23			
6539.1+x	24	809.5 *3*	100.0	5729.6+x	22			
7073.8+x	(25$^+$)	1067.8 *4*	100.0	6006.0+x	23$^+$			
602.8+y	J+2	602.8 *3*	100.0	y	J			
1211.2+y	J+4	608.4 *3*	100.0	602.8+y	J+2			
1956.8+y	J+6	745.6 *3*	100.0	1211.2+y	J+4	E2	0.00499 *7*	B(E2)(W.u.)=114 *7* α(K)=0.00417 *6*; α(L)=0.000637 *9*; α(M)=0.0001386 *20*; α(N+..)=3.69×10^{-5} *6* α(N)=3.16×10^{-5} *5*; α(O)=4.90×10^{-6} *7*; α(P)=4.26×10^{-7} *6*
2875.9+y	J+8	919.1 *5*	100.0	1956.8+y	J+6	E2	0.00313 *5*	B(E2)(W.u.)=93 *14* α(K)=0.00264 *4*; α(L)=0.000384 *6*; α(M)=8.30×10^{-5} *12*; α(N+..)=2.22×10^{-5} *4* α(N)=1.89×10^{-5} *3*; α(O)=2.96×10^{-6} *5*; α(P)=2.71×10^{-7} *4*
3996.6+y	J+10	1120.7 *5*	100.0	2875.9+y	J+8	E2	0.00207 *3*	B(E2)(W.u.)>35

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

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

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.‡	α†	Comments
								α(K)=0.001754 *25*; α(L)=0.000246 *4*; α(M)=5.30×10^{-5} *8*; α(N+..)=1.484×10^{-5} *21* α(N)=1.209×10^{-5} *17*; α(O)=1.90×10^{-6} *3*; α(P)=1.81×10^{-7} *3*; α(IPF)=6.64×10^{-7} *15*
5170.4+y	J+12	1173.8 *6*	100.0	3996.6+y	J+10			
753.6+z	J1+2	753.6 *3*	100.0	z	J1			
1374.3+z	J1+4	620.7 *2*	100.0	753.6+z	J1+2			
2154.9+z	J1+6	780.6 *3*	100.0	1374.3+z	J1+4	E2	0.00449 *7*	B(E2)(W.u.)=171 *20* α(K)=0.00377 *6*; α(L)=0.000568 *8*; α(M)=0.0001234 *18*; α(N+..)=3.29×10^{-5} *5* α(N)=2.81×10^{-5} *4*; α(O)=4.37×10^{-6} *7*; α(P)=3.85×10^{-7} *6*
3093.2+z	J1+8	938.3 *3*	100.0	2154.9+z	J1+6	E2	0.00300 *5*	B(E2)(W.u.)=147 *25* α(K)=0.00253 *4*; α(L)=0.000366 *6*; α(M)=7.91×10^{-5} *11*; α(N+..)=2.11×10^{-5} *3* α(N)=1.80×10^{-5} *3*; α(O)=2.83×10^{-6} *4*; α(P)=2.60×10^{-7} *4*
4011.6+z	J1+10	918.4 *5*	100.0	3093.2+z	J1+8	E2	0.00314 *5*	B(E2)(W.u.)=2.5×10^2 *19* α(K)=0.00265 *4*; α(L)=0.000384 *6*; α(M)=8.32×10^{-5} *12*; α(N+..)=2.22×10^{-5} *4* α(N)=1.90×10^{-5} *3*; α(O)=2.97×10^{-6} *5*; α(P)=2.72×10^{-7} *4*
5015.8+z	J1+12	1004.2 *6*	100.0	4011.6+z	J1+10	E2	0.00259 *4*	B(E2)(W.u.)>60 α(K)=0.00219 *3*; α(L)=0.000313 *5*; α(M)=6.77×10^{-5} *10*; α(N+..)=1.81×10^{-5} *3* α(N)=1.544×10^{-5} *22*; α(O)=2.42×10^{-6} *4*; α(P)=2.26×10^{-7} *4*
6157.0+z	J1+14	1141.2 *7*	100.0	5015.8+z	J1+12			
699.7+u	J2+2	699.7 *3*		u	J2			
1461.6+u	J2+4	761.9 *3*		699.7+u	J2+2			
2284.4+u	J2+6	822.8 *3*		1461.6+u	J2+4			
3170.7+u	J2+8	886.3 *3*		2284.4+u	J2+6			
4117.8+u	J2+10	947.1 *3*		3170.7+u	J2+8			
5126.1+u	J2+12	1008.3 *3*		4117.8+u	J2+10			
6195.5+u	J2+14	1069.4 *3*		5126.1+u	J2+12			
7324.9+u	J2+16	1129.4 *4*		6195.5+u	J2+14			
8512.0+u	J2+18	1187.1 *6*		7324.9+u	J2+16			
9759.9+u	J2+20	1247.9 *6*		8512.0+u	J2+18			
11067.8+u	J2+22	1307.9 *10*		9759.9+u	J2+20			
12436.1+u	J2+24	1368.2 *12*		11067.8+u	J2+22			
13864.6+u	J2+26	1428.4 *18*		12436.1+u	J2+24			
15351.4+u	J2+28	1486.8 *20*		13864.6+u	J2+26			
16899+u?	J2+30	1548#		15351.4+u	J2+28			

† Additional information 5.
‡ From ce for γ's seen in ε decay. From $\gamma(\theta)$, DCO measurements, intensity balance for others.
# Placement of transition in the level scheme is uncertain.

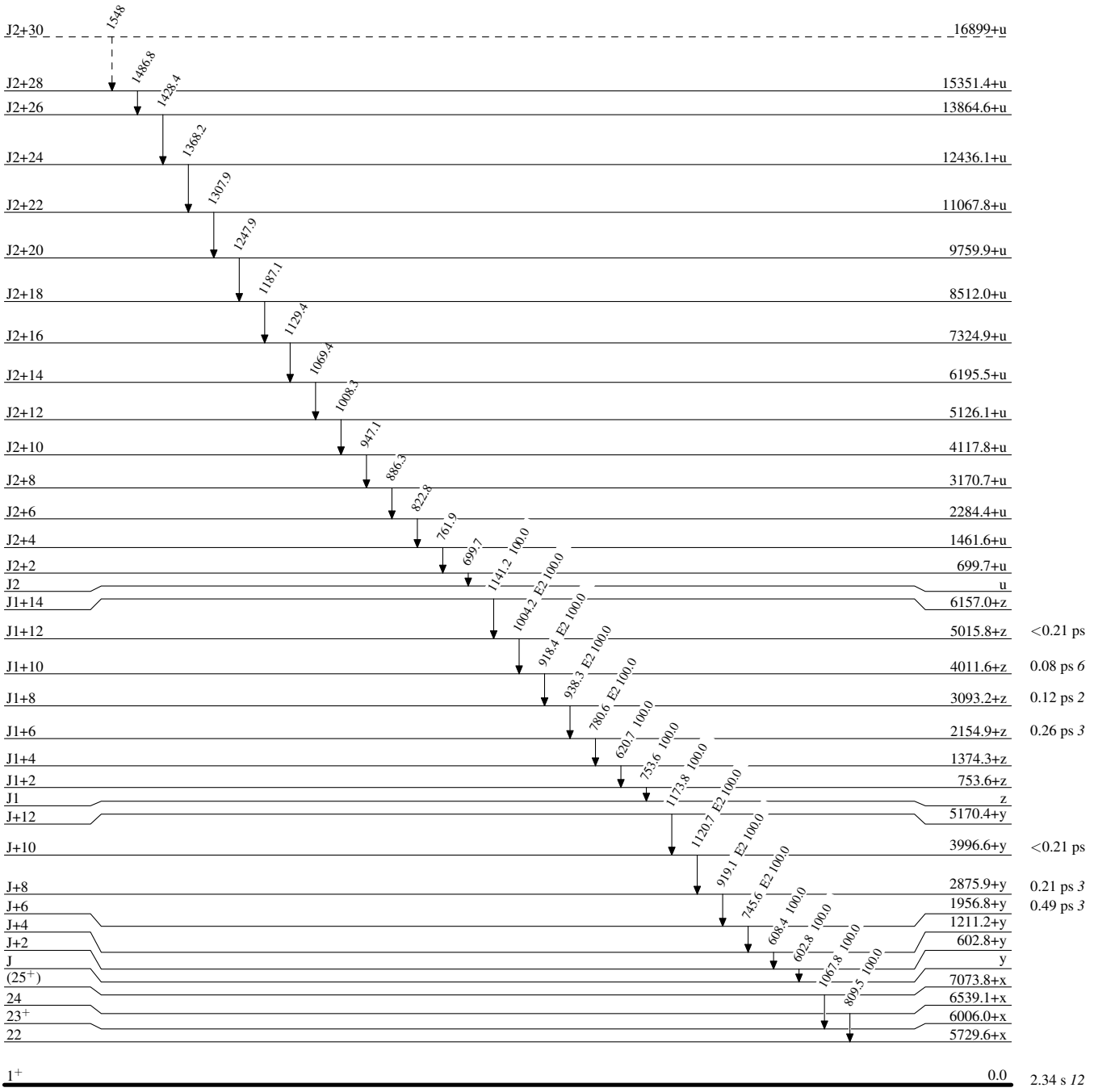
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

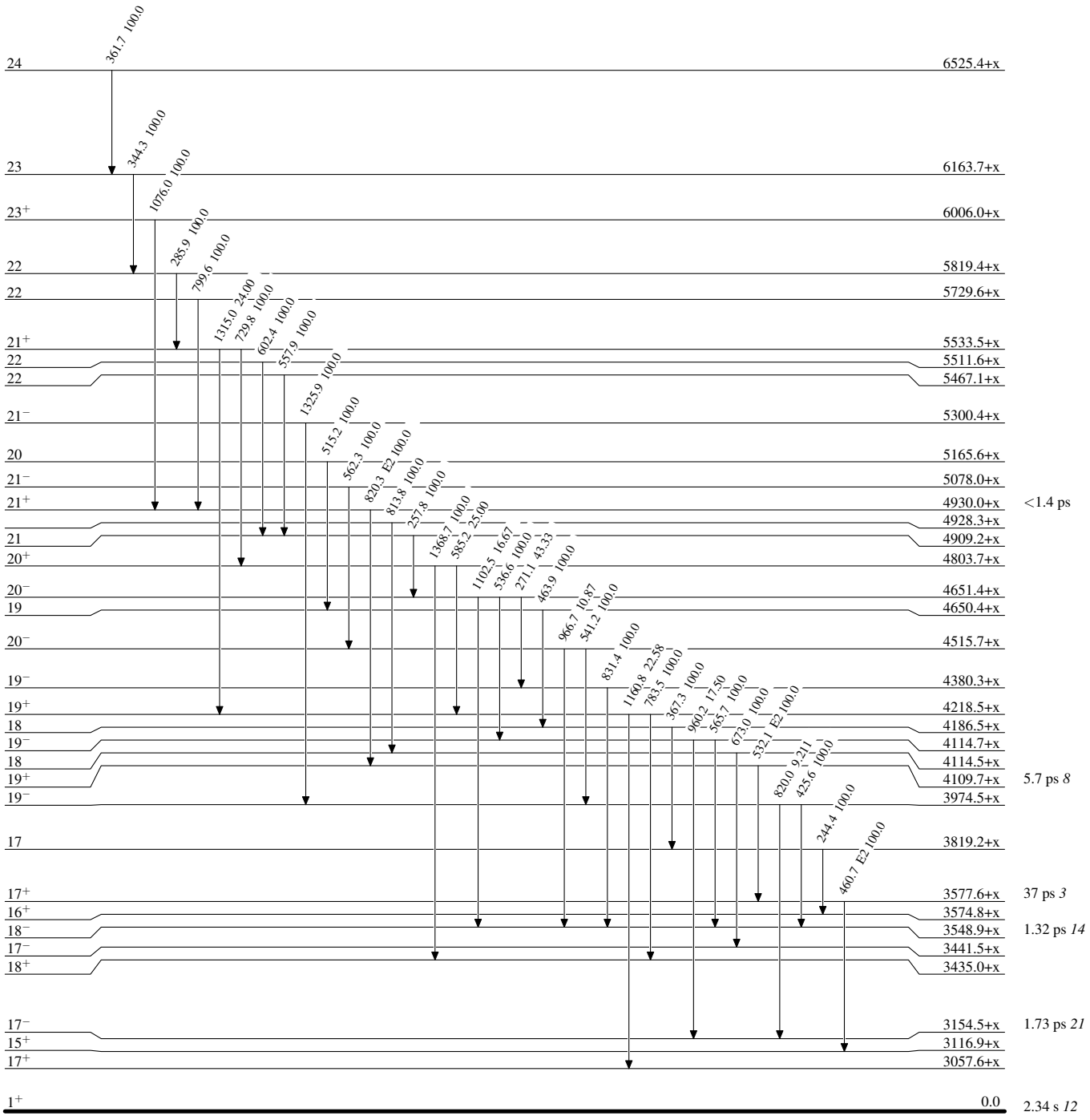


$^{142}_{63}Eu_{79}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

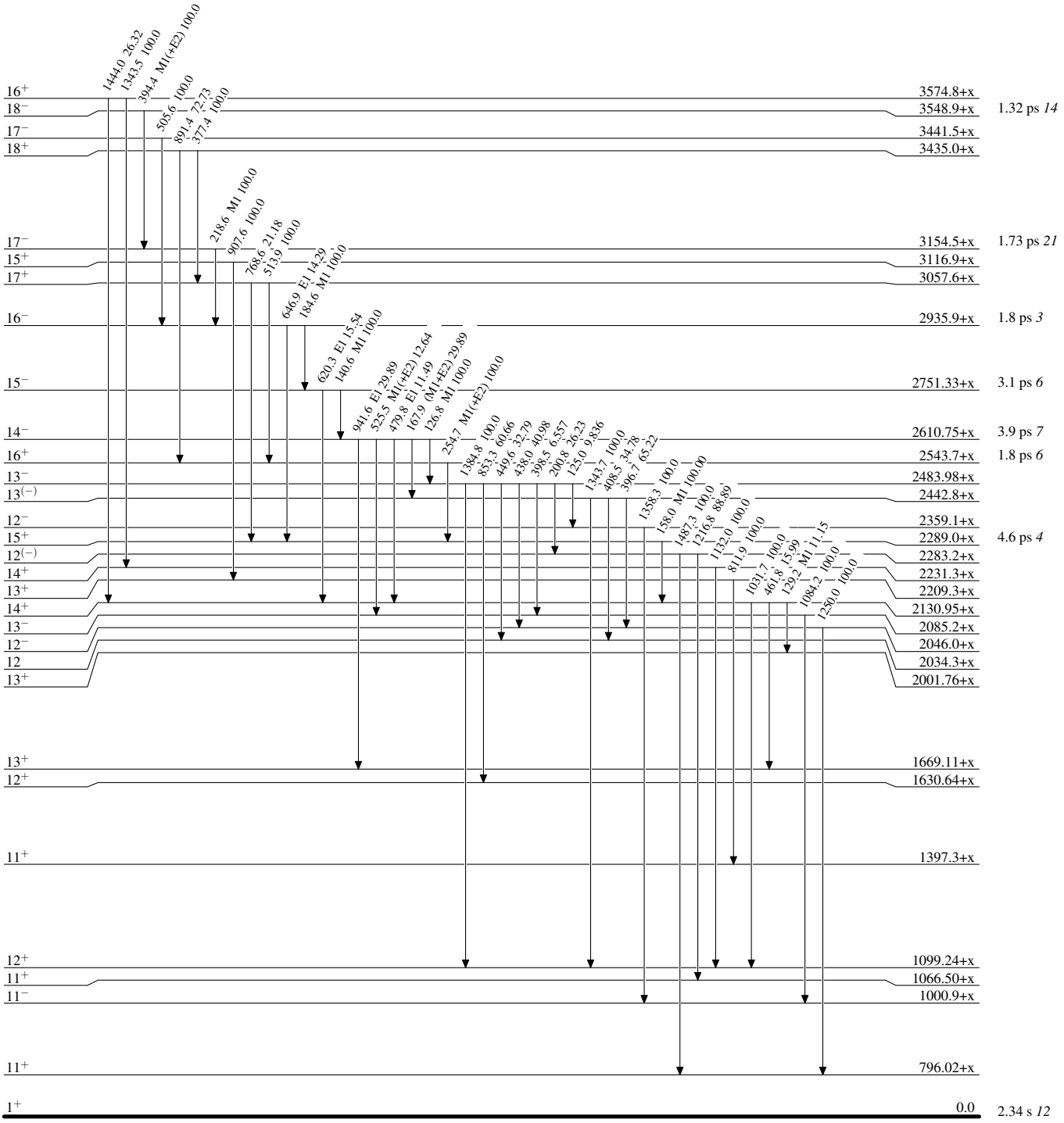


$^{142}_{63}Eu_{79}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{142}_{63}Eu_{79}$

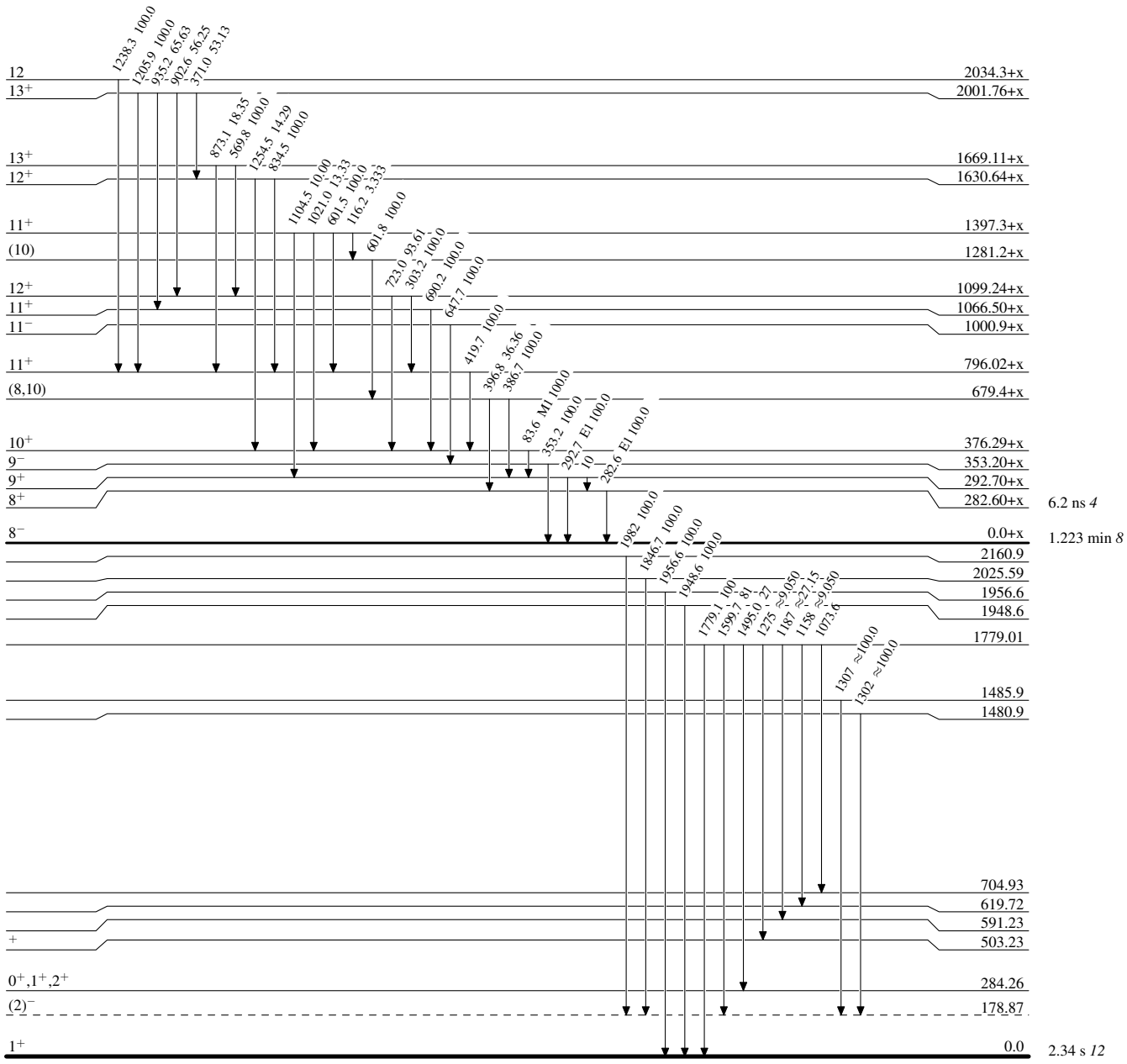
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

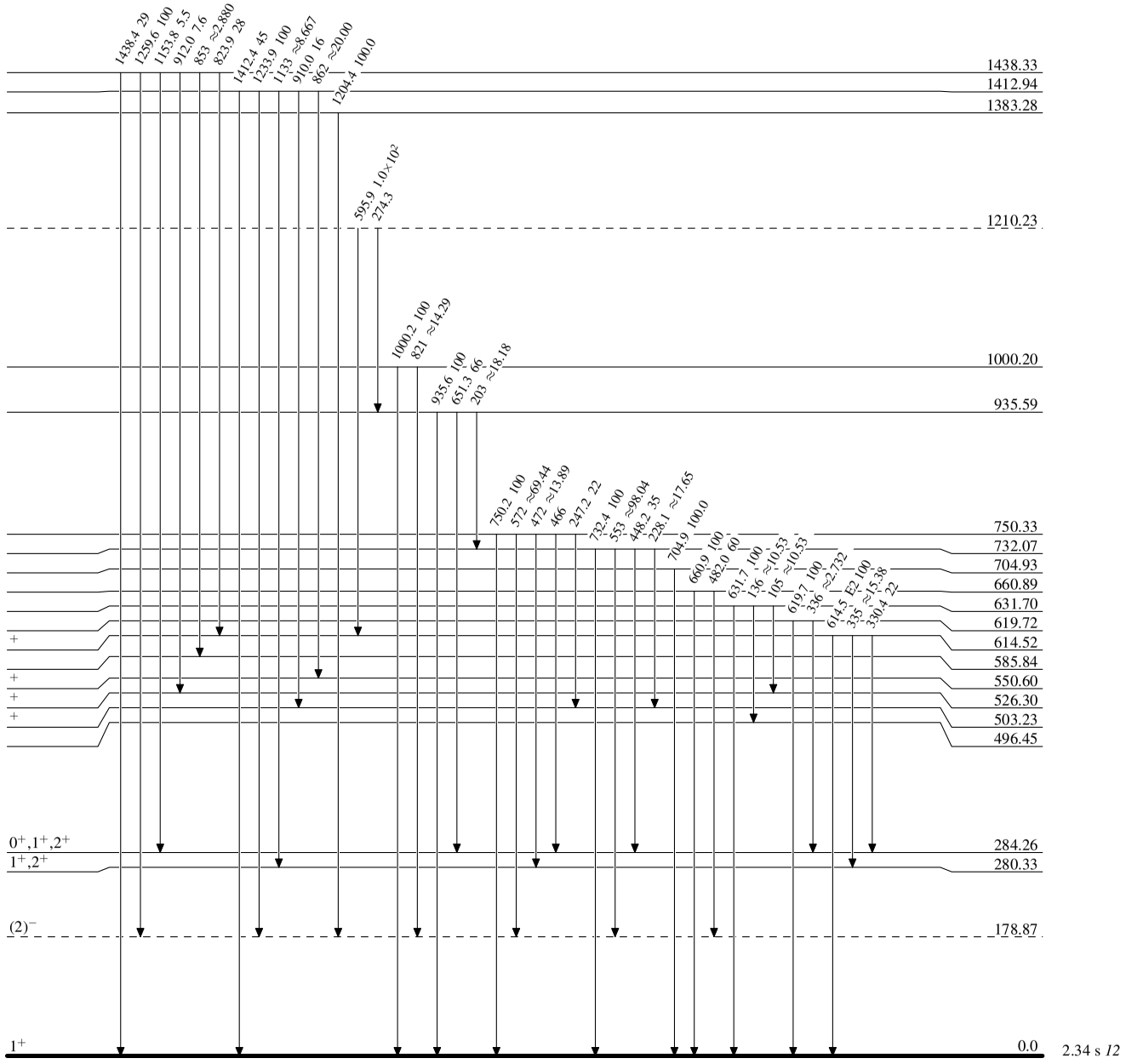


$^{142}_{63}Eu_{79}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

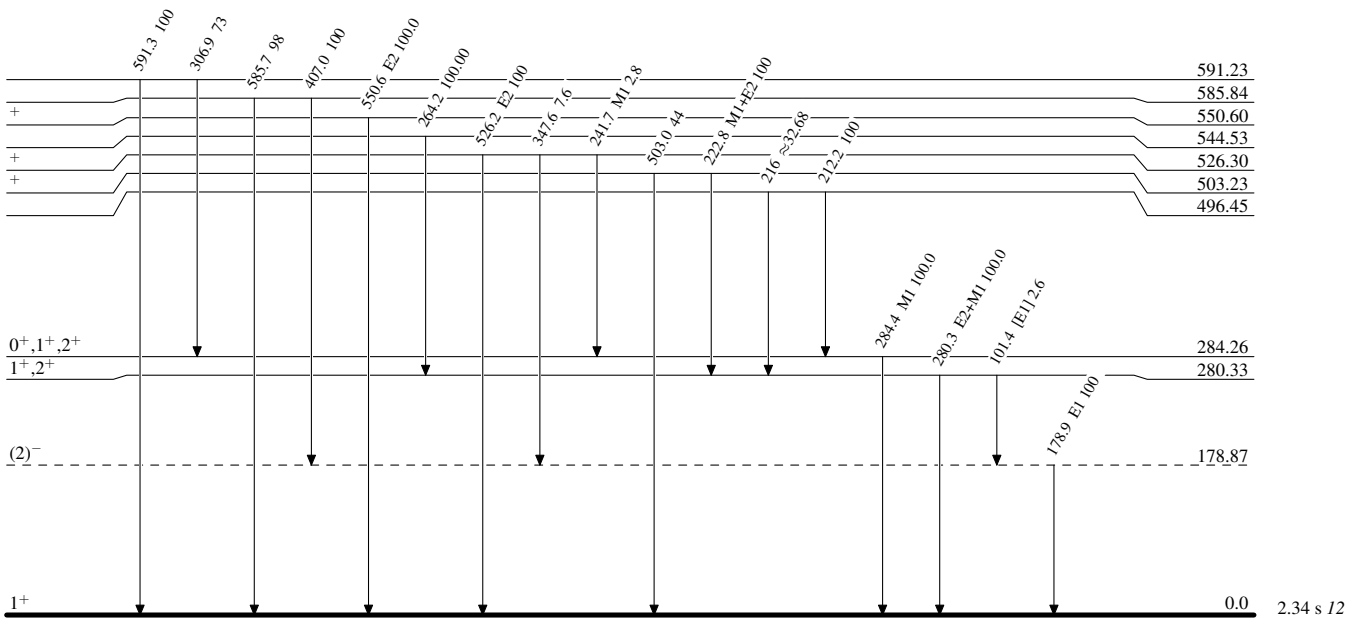


$^{142}_{63}Eu_{79}$

Adopted Levels, Gammas

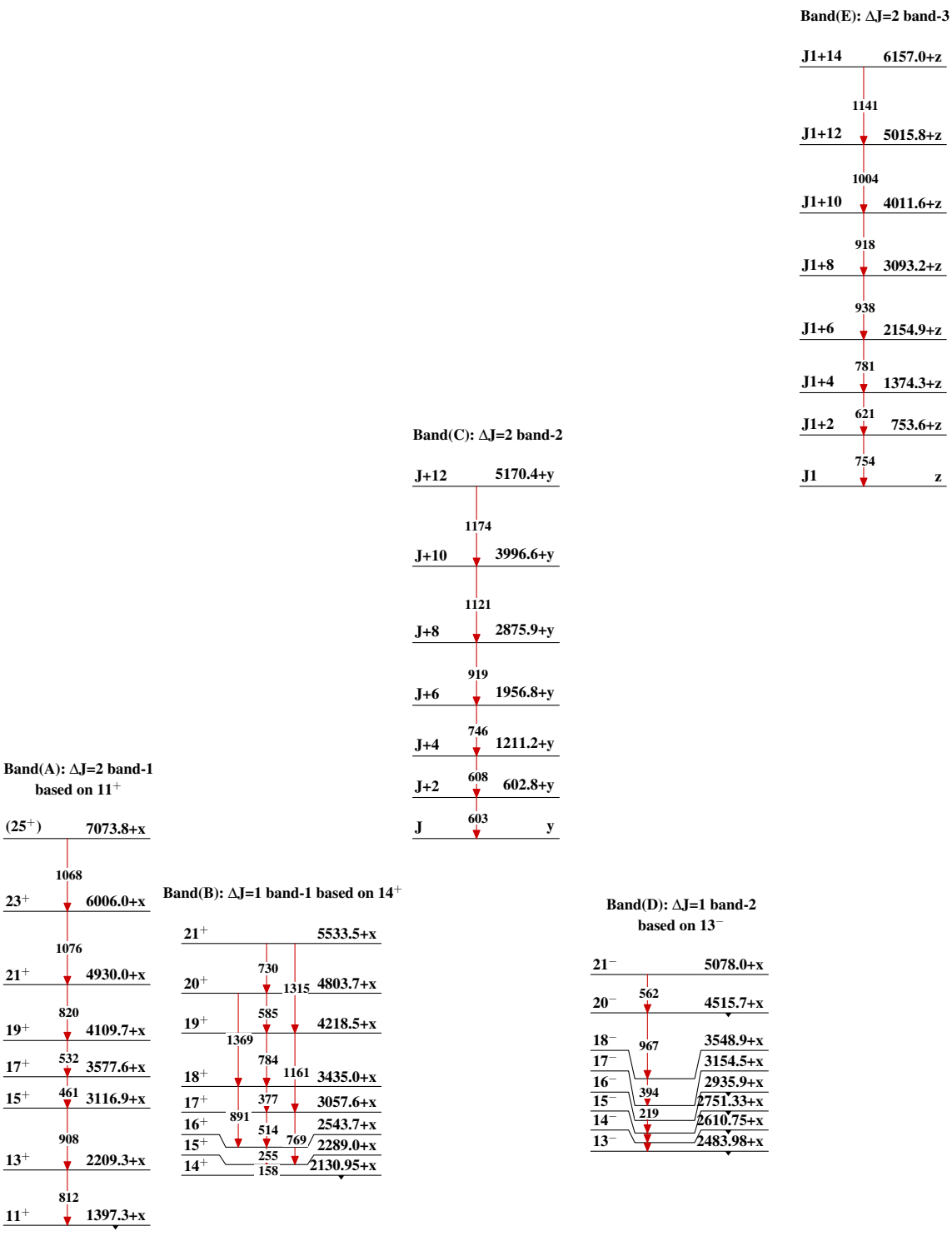
Level Scheme (continued)

Intensities: Relative photon branching from each level



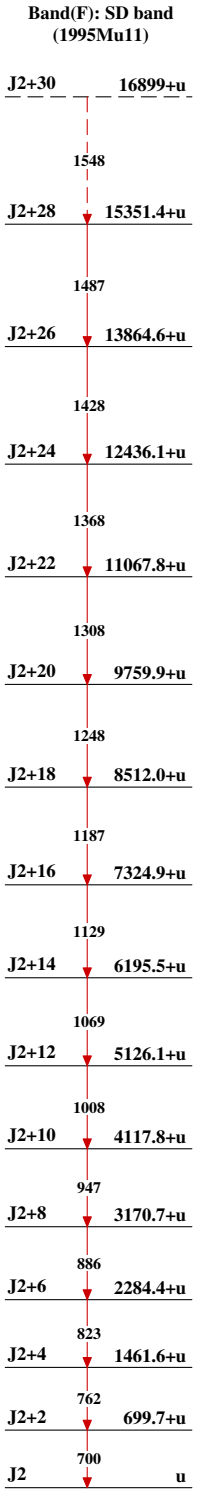
$^{142}_{63}Eu_{79}$

Adopted Levels, Gammas



$^{142}_{63}Eu_{79}$

Adopted Levels, Gammas (continued)



$^{142}_{63}Eu_{79}$