^{199}Pt β^- decay (30.8 min) 2004Mi09,1969Ok02,1974HeYW

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 108, 79 (2007)	15-Oct-2006

Parent: ^{199}Pt: E=0.0; $J^\pi=5/2^-$; $T_{1/2}$=30.8 min *4*; Q(β^-)=1703 *3*; %β^- decay=100.0

2004Mi09: measured Iγ, emission probability of 543γ.
1974HeYW: Measured Eγ, Iγ.
1970Ba37: Measured Eγ, Iγ, Ice.
1969Ok02: Measured Eγ, Iγ, Ice, $\gamma\gamma$, $\gamma\gamma(\theta)$.
1967Ba45: Measured Eγ, Iγ, Ice, $\beta\gamma$, $\gamma\gamma$, B(ce), B(ce)(t), (ce)(ce)(t), (ce)γ(t).
1966Pr05: Measured Eγ, Iγ, Ice, $\gamma\gamma(\theta)$, $\gamma\gamma$(t).
1965Bl18: Measured Eγ, Iγ.
1964Jo09: measured $\gamma\gamma$, $\beta\gamma$, $\beta\gamma$(t).
1956Le44: measured $\gamma\gamma$, $\beta\gamma$.

^{199}Au Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[#]	Comments
0.0	$3/2^+$		
77.170 *21*	$1/2^+$	1.3 ns *2*	$T_{1/2}$: av: 1.46 ns *12* (1966Pr05), 1.1 ns *1* (1967Ba63).
317.174 *24*	$5/2^+$	<55 ps	
323.605 *25*	$3/2^+$	35 ps *20*	
493.76 *3*	$(7/2)^+$	<35 ps	
542.884 *23*	$5/2^+$	<30 ps	
548.86 *4*	$(11/2)^-$	0.44 ms *3*	%IT=100 $T_{1/2}$: isomeric-state $T_{1/2}$ evaluated from decay of 494γ (1968Bo22).
734.64 *3*	$7/2^-$	0.36 ns *4*	7/2[514] orbital.
791.760 *25*	$3/2^+$	<50 ps	
822.7 *3*	$1/2^+$		
968.29 *4*	$3/2^+,5/2^+$	<100 ps	
1070.02 *14*	$3/2^+,5/2^+$		
1103.99 *13*	$(3/2,5/2,7/2)^{(+)}$		
1159.01 *7*	$(3/2^+,5/2^+,7/2^+)$		
1249.4 *3*	$3/2^+,5/2^+,7/2^+$		
1396.22 *19*	$5/2^+,7/2^+$		

[†] From least-squares fit to Eγ's.
[‡] From 'Adopted Levels'.
[#] From $\beta\gamma$(t), $\gamma\gamma$(t) (1967Ba45), unless otherwise noted.

β^- radiations

Four β groups resolved (Eβ=1690 *50*, Iβ=63%; Eβ=1380 *50*, I$\beta\approx$4%; Eβ=1140 *50*, Iβ=14%; Eβ=900 *50*, Iβ=18%) (1964Jo09).
Also: 1956Le44. However, except for the 1690-keV β, the β's are significant admixtures of decays to several levels.

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(307 *3*)	1396.22	0.0321 *13*	7.07 *2*	av Eβ=86.22 *93*
(454 *3*)	1249.4	0.0093 *6*	8.16 *3*	av Eβ=133.2 *10*
(544 *3*)	1159.01	0.086 *3*	7.46 *2*	av Eβ=163.7 *11*
(599 *3*)	1103.99	0.077 *3*	7.64 *2*	av Eβ=182.7 *11*
(633 *3*)	1070.02	0.069 *3*	7.77 *2*	av Eβ=194.6 *11*
(735 *3*)	968.29	1.037 *13*	6.82 *1*	av Eβ=231.0 *11*

Continued on next page (footnotes at end of table)

^{199}Pt β^- decay (30.8 min) 2004Mi09,1969Ok02,1974HeYW (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(880 *3*)	822.7	0.084 *3*	8.60[1u] *2*	av Eβ=287.6 *11*
(911 *3*)	791.760	4.26 *5*	6.53 *1*	av Eβ=296.4 *12*
(968 *3*)	734.64	6.36 *7*	6.45 *1*	av Eβ=318.1 *12*
(1160 *3*)	542.884	12.01 *12*	6.45 *1*	av Eβ=392.6 *12*
(1209 *3*)	493.76	0.37 *7*	8.03 *9*	av Eβ=412.0 *12*
(1379 *3*)	323.605	1.54 *10*	7.62 *3*	av Eβ=480.3 *13*
(1386 *3*)	317.174	3.28 *7*	7.30 *1*	av Eβ=482.9 *13*
(1626[‡] *3*)	77.170	<1.3	>8.8[1u]	av Eβ=567.6 *12*
(1703 *3*)	0.0	70.7 *12*	6.30 *1*	av Eβ=613.3 *13* Eβ=1690 *50*, Iβ=63 (1964Jo09).

[†] Absolute intensity per 100 decays.
[‡] Existence of this branch is questionable.

^{199}Pt β^- decay (30.8 min) 2004Mi09,1969Ok02,1974HeYW (continued)

$\gamma(^{199}Au)$

Iγ normalization, I(γ+ce) normalization: from absolute emission probability=0.1174 *7* for 543.0γ (2004Mi09) using 4πβ-γ coin system. In earlier evaluations (1994Ar13,1988Sc02), Iγ normalization=0.147 *25* based on %Iβ(g.s.)=63 *6* (1964Jo09) and Σ(I(γ+ce) of γ's to g.s.)+Iβ(g.s.)=100.

E_γ [†]	I_γ [‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ	α[e]	$I_{(\gamma+ce)}$[d]	Comments
55.15 *5*	0.106 *CA*	548.86	(11/2)$^-$	493.76	(7/2)$^+$	M2+E3	0.11 *6*	334 *40*	35.4 *5*	ce(L)/(γ+ce)=0.735 *3*; ce(M)/(γ+ce)=0.197 *3*; α(N+..)/$T_{1/2}$=0.0642 *7* E_γ: from ce data (1967Ba45). $I_{(\gamma+ce)}$: calculated from intensity balance in the level scheme, no direct β^- feeding is expected to this level (2U transition). I_γ: 0.106 *19* from I(γ+ce) and α. Others: 0.10 *3* from I(ce(L)) (1967Ba45), α(L)=247 *43*;<0.15 from γ spectrum (1967Ba45). Mult.,δ: from L1:L2:L3=100 *5*:16 *2*:36 *5* (1967Ba45). Additional information 9.
77.20[@] *3*	10.2 *20*	77.170	1/2$^+$	0.0	3/2$^+$	M1+E2	0.22 *+6−2*	3.5 *4*		α(L)= 2.6 *3*; α(M)= 0.63 *7*; α(N+..)= 0.197 *21* E_γ: direct measurement by 1969Ok02, deduced from ce spectra of 1967Ba45. I_γ: average of 9 *3* (1966Pr05) and 11.5 *30* (calculated from ce intensity of 1967Ba45). Mult.,δ: deduced from L1:L2:L3=100:27 *5*:14 *4* (1967Ba63). Additional information 1.
170.6[cg] *10*	0.15[c] *8*	493.76	(7/2)$^+$	323.605	3/2$^+$	[E2]		0.664		α(K)= 0.253; α(L)= 0.308; α(M)= 0.0791; α(N+..)=0.02463
176.2[cg] *10*	0.19[c] *10*	493.76	(7/2)$^+$	317.174	5/2$^+$	[M1,E2]		1.0 *5*		α(K)=0.7 *5*; α(L)= 0.24 *2*; α(M)= 0.058 *11*; α(N+..)=0.018 *3*
185.80 *3*	23.74 *22*	734.64	7/2$^-$	548.86	(11/2)$^-$	E2		0.490		α(K)= 0.206; α(L)= 0.213; α(M)= 0.0546; α(N+..)=0.0170 Mult.: from K/L=1.0 *2* (1966Pr05), α(K)exp=0.20 *2* (1970Ba37). Additional information 10.
191.69 *3*	15.04 *15*	734.64	7/2$^-$	542.884	5/2$^+$	E1		0.0807		α(K)= 0.0660; α(L)=0.0113; α(M)=0.00260; α(N+..)=0.00080 Mult.: from α(K)exp=0.070 *7* (1970Ba37), 0.051 *+12−6* (1967Ba45). (192γ)(543γ)(θ): A_2=+0.060 *18*, A_4=+0.014 *24* (1969Ok02). Additional information 11.

$^{199}_{79}Au_{120}$-3

^{199}Pt β^- decay (30.8 min) 2004Mi09,1969Ok02,1974HeYW (continued)

$\gamma(^{199}Au)$ (continued)

E_γ[†]	I_γ[‡][d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ	α[e]	Comments
219.36 *4*	2.60 *4*	542.884	5/2$^+$	323.605	3/2$^+$	M1+E2	0.60 *10*	0.67 *4*	α(K)=0.53 *4*; α(L)= 0.1099 *4*; α(M)=0.0261 *1*; α(N+..)=0.00817 Mult.,δ: from α(K)exp=0.52 *5* (1970Ba37). Additional information 5.
225.36 *4*	1.11 *3*	542.884	5/2$^+$	317.174	5/2$^+$	M1+E2	0.6 *2*	0.62 *7*	α(K)=0.49 *7*; α(L)= 0.100 *1*; α(M)=0.0238; α(N+..)=0.0074 E_γ: poor fit; level-energy difference=225.71. Mult.,δ: from α(K)exp=0.49 *6* (1970Ba37). Additional information 6.
240.01 *6*	1.10 *3*	317.174	5/2$^+$	77.170	1/2$^+$	[E2]		0.207	α(K)= 0.109; α(L)=0.0737; α(M)=0.0187; α(N+..)=0.00583
240.9[g] *10*	<0.4	734.64	7/2$^-$	493.76	(7/2)$^+$	[E1]		0.0459	α(K)= 0.0377; α(L)=0.00628; α(M)=0.00145; α(N+..)=0.00044 E_γ,I_γ: observed as weak line in γ and ce spectra (1967Ba45); also: 1965Bl18.
246.46 *3*	15.42 *7*	323.605	3/2$^+$	77.170	1/2$^+$	M1+E2	<0.45	0.56 *4*	α(K)=0.45 *3*; α(L)= 0.0792 *12*; α(M)=0.0184 *2*; α(N+..)=0.00578 *5* Mult.,δ: from α(K)exp=0.45 *4* (1970Ba37); other: α(K)exp=0.48 *8* (1967Ba45), −0.50<δ<0.22 from $\gamma\gamma(\theta)$ (1969Ok02); K/L=4.5 *10* (1966Pr05). Additional information 3.
298.2[a] *3*	0.25 *4*	791.760	3/2$^+$	493.76	(7/2)$^+$	[E2]		0.105	α(K)=0.0635; α(L)= 0.0315; α(M)=0.00792; α(N+..)=0.00247 I_γ: weighted average of values from 1967Ba45 and 1969Ok02.
317.03 *4*	33.06 *11*	317.174	5/2$^+$	0.0	3/2$^+$	M1+E2	−0.60 *10*	0.241 *14*	α(K)=0.194 *13*; α(L)= 0.0362 *10*; α(M)= 0.0085 *2*; α(N+..)=0.0027 *1* E_γ: poor fit; level-energy difference=317.17. Mult.,δ: from α(K)exp=0.194 *15* (1970Ba37), 0.194 *25* (1967Ba45), $\gamma\gamma(\theta)$ (1969Ok02); other: α(K)exp=0.186 *23* (1969Ok02); K/L=5.4 *6* (1969Ok02), 5 *1* (1966Pr05). Additional information 2.
323.60 *6*	1.82 *3*	323.605	3/2$^+$	0.0	3/2$^+$	[M1,E2]		0.18 *10*	α(K)= 0.14 *9*; α(L)=0.031 *7*; α(M)=0.0073 *15*; α(N+..)=0.0023 *5*
417.61 *5*	2.55 *3*	734.64	7/2$^-$	317.174	5/2$^+$	[E1]		0.0127	α(K)=0.0105; α(L)=0.00167; α(M)=0.000384; α(N+..)=0.00012 I_γ: from branching in (n,γ) Iγ=1.28 *6*, possibly a doublet.
425.34 *7*	1.02 *4*	968.29	3/2$^+$,5/2$^+$	542.884	5/2$^+$	[M1,E2]		0.09 *5*	α(K)=0.07 *4*; α(L)=0.014 *5*; α(M)=0.0032 *10*; α(N+..)=0.0010 *3*
465.76 *5*	6.2 *3*	542.884	5/2$^+$	77.170	1/2$^+$	E2		0.0311	α(K)=0.0222; α(L)=0.00667; α(M)=0.00163; α(N+..)=0.00051 I_γ: weighted av: 6.2 *3* (1969Ok02), 6.3 *5* (1970Ba37), 6.3 *9* (1974HeYW), 6.7 *5* (1967Ba45). 2004Mi09 give Iγ(468.09+465.76)=13.00 *9*. Mult.: from α(K)exp=0.018 *3* (1970Ba37),<0.03 (1967Ba45). Additional information 7.
468.09 *5*	6.8 *3*	791.760	3/2$^+$	323.605	3/2$^+$	M1(+E2)	<0.45	0.098 *7*	α(K)=0.081 *5*; α(L)= 0.0135 *7*; α(M)=0.00311 *14*; α(N+..)=0.00098 *5* I_γ: weighted average of values from 1969Ok02 and

$^{199}_{79}Au_{120}$-4

^{199}Pt β^- decay (30.8 min) 2004Mi09,1969Ok02,1974HeYW (continued)

$\gamma(^{199}Au)$ (continued)

E_γ [†]	I_γ [‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ	α[e]	Comments
									1974HeYW. 2004Mi09 give Iγ(468.09+465.76)=13.00 *9*. Mult.,δ: from α(K)exp=0.080 *6* (1970Ba37), 0.079 *18* (1969Ok02), 0.081 *25* (1967Ba45); and γγ(θ) (1969Ok02). (468γ)(246γ)(θ): A_2=−0.109, A_4=+0.01 *3* (1969Ok02). Additional information 12.
474.68[f&] *4*	7.79[f] *5*	791.760	$3/2^+$	317.174	$5/2^+$	M1+E2	0.12 *2*	0.0997 *4*	α(K)= 0.0821 *4*; α(L)=0.0134; α(M)=0.00311; α(N+..)=0.00098 Mult.,δ: from α(K)exp=0.090 *9* (1970Ba37), 0.095 *20* (1969Ok02), 0.10 *3* (1967Ba45) and γγ(θ) (1969Ok02). (475γ)(317γ)(θ): A_2=+0.15 *3*, A_4=−0.01 *4* (1969Ok02). Additional information 13.
474.68[f&g] *4*	[f]	968.29	$3/2^+$,$5/2^+$	493.76	$(7/2)^+$				
493.75 *3*	38.04 *20*	493.76	$(7/2)^+$	0.0	$3/2^+$	E2		0.0269	α(K)=0.0195; α(L)=0.00565; α(M)=0.00136; α(N+..)=0.00042 Mult.,δ: from α(K)exp=0.019 *3* (1970Ba37), 0.017 *3* (1969Ok02), 0.23 *5* (1967Ba45). Additional information 4.
505.5[a] *3*	0.70 *2*	822.7	$1/2^+$	317.174	$5/2^+$	[E2]		0.0254	α(K)= 0.0186; α(L)=0.00517
542.98 *4*	100.0 *6*	542.884	$5/2^+$	0.0	$3/2^+$	M1(+E2)	−0.06 +*7*−*10*	0.0709 *10*	α(K)=0.0583 *9*; α(L)= 0.00947 *11* Mult.,δ: from γγ(θ) (1969Ok02) and α(K)exp=0.059 *7* (1970Ba37), 0.062 *7* (1969Ok02), 0.062 *10* (1967Ba45); δ from γγ(θ); ; K/L=6 (1966Pr05), 7.3 *8* (1969Ok02). Additional information 8.
609.8[b] *6*	0.104 *12*	1103.99	$(3/2,5/2,7/2)^{(+)}$	493.76	$(7/2)^+$	[M1,E2]		0.034 *18*	α(K)=0.028 *15*; α(L)=0.0050 *20*
644.63 *7*	0.55 *2*	968.29	$3/2^+$,$5/2^+$	323.605	$3/2^+$	[M1,E2]		0.030 *15*	α(K)=0.024 *13*; α(L)=0.0043 *17*
649.8[b] *15*	0.063 *11*	968.29	$3/2^+$,$5/2^+$	317.174	$5/2^+$	[M1,E2]		0.029 *15*	α(K)=0.024 *13*; α(L)=0.0042 *17*
665.0 *1*	0.385 *14*	1159.01	$(3/2^+,5/2^+,7/2^+)$	493.76	$(7/2)^+$				
714.55 *4*	12.34 *8*	791.760	$3/2^+$	77.170	$1/2^+$	M1+E2	<0.6	0.032 *3*	α(K)=0.026 *3*; α(L)=0.0043 *4* Mult.,δ: from α(K)exp=0.026 *5* (1970Ba37); also γγ(θ) (1969Ok02). (714γ)(77γ)(θ): A_2=−0.003 *18*, A_4=−0.044 *24* (1969Ok02). Additional information 14.
746.4 *2*	0.182 *13*	1070.02	$3/2^+$,$5/2^+$	323.605	$3/2^+$	[M1,E2]		0.021 *10*	α(K)=0.017 *9*; α(L)=0.0029 *12*
752.9 *2*	0.311 *16*	1070.02	$3/2^+$,$5/2^+$	317.174	$5/2^+$	[M1,E2]		0.020 *10*	α(K)=0.017 *9*; α(L)=0.0029 *12*
780.5 *3*	0.205 *12*	1103.99	$(3/2,5/2,7/2)^{(+)}$	323.605	$3/2^+$	[M1,E2]		0.019 *9*	α(K)=0.015 *8*; α(L)=0.0026 *11*

$^{199}_{79}Au_{120}$-5

^{199}Pt β^- decay (30.8 min) 2004Mi09,1969Ok02,1974HeYW (continued)

$\gamma(^{199}Au)$ (continued)

E_γ[†]	I_γ[‡][d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ	α[e]	Comments
786.8 *2*	0.153 *12*	1103.99	(3/2,5/2,7/2)$^{(+)}$	317.174	5/2$^+$	[M1,E2]		0.018 *9*	α(K)=0.015 *7*; α(L)=0.0026 *10*
791.74 *4*	7.07 *5*	791.760	3/2$^+$	0.0	3/2$^+$	M1(+E2)	<0.46	0.0253 *15*	α(K)=0.0205 *15*; α(L)=0.00337 *17* Mult.,δ: from α(K)exp=0.023 *4* (1970Ba37); theory: α(K)=0.0205 *15*. Additional information 15.
835.5 *1*	0.163 *10*	1159.01	(3/2$^+$,5/2$^+$,7/2$^+$)	323.605	3/2$^+$				
842.4 *2*	0.118 *9*	1159.01	(3/2$^+$,5/2$^+$,7/2$^+$)	317.174	5/2$^+$				
891.30 *15*	0.161 *6*	968.29	3/2$^+$,5/2$^+$	77.170	1/2$^+$	[M1,E2]		0.014 *6*	α(K)=0.011 *5*; α(L)=0.0019 *7*
902.0[b] *6*	0.070 *6*	1396.22	5/2$^+$,7/2$^+$	493.76	(7/2)$^+$	[M1,E2]		0.013 *6*	α(K)=0.011 *5*; α(L)=0.0018 *7*
968.32 *5*	6.85 *5*	968.29	3/2$^+$,5/2$^+$	0.0	3/2$^+$	(M1,E2)		0.011 *5*	α(K)=0.009 *4*; α(L)=0.0015 *6* Mult.: from α(K)exp=0.010 *5* (1970Ba37); theory: α(K)(M1)=0.013, α(K)(E1)=0.0020, α(K)(E2)=0.0050. Additional information 16.
992.3[b] *7*	0.085 *7*	1070.02	3/2$^+$,5/2$^+$	77.170	1/2$^+$	[M1,E2]		0.010 *5*	α(K)=0.009 *4*; α(L)=0.0014 *6*
1072.7 *2*	0.137 *7*	1396.22	5/2$^+$,7/2$^+$	323.605	3/2$^+$	[M1,E2]		0.009 *4*	
1077.0[b] *14*	0.064 *5*	1396.22	5/2$^+$,7/2$^+$	317.174	5/2$^+$	[M1,E2]		0.009 *4*	
1104.0 *2*	0.182 *8*	1103.99	(3/2,5/2,7/2)$^{(+)}$	0.0	3/2$^+$	[M1,E2]		0.008 *3*	
1159.2 *5*	0.069 *5*	1159.01	(3/2$^+$,5/2$^+$,7/2$^+$)	0.0	3/2$^+$				
1249.4 *3*	0.079 *5*	1249.4	3/2$^+$,5/2$^+$,7/2$^+$	0.0	3/2$^+$	[M1,E2]		0.006 *2*	

[†] From 1974HeYW, unless otherwise noted.
[‡] From 2004Mi09 unless otherwise stated. Weighted average of values from 1974HeYW and 1969Ok02 are in good agreement with those in 2004Mi09 for most of the gamma rays, but the values from 2004Mi09 are adopted here due to the higher precision in this work.
[#] Deduced from α(K)exp or α(L)exp ratios for most γ's (1967Ba45,1970Ba37,1969Ok02,1966Pr05) and from $\gamma\gamma(\theta)$ of 1969Ok02. 1967Ba45 normalized α(K)exp to α(K)(185.79γ)=0.197 assuming pure E2 transition (adopted α(K)(185.79γ)=0.205). 1970Ba37 normalized α(K)exp to α(K)(542.98γ)=0.059 *7* assuming pure M1 transition (adopted value α(K)(542.98γ)=0.047 *16*). However, this normalization gives good agreement with theoretical α(K) for other pure transitions: 185.79γ (E2 from K/L), 191.69γ (E1 from α(K)exp of 1967Ba45). 1969Ok02 used other standard sources for calibration.
[@] Interference from ^{197}Au and K x-rays.
[&] Main placement from 792 level established from coin. Possible placement from 968 level supported only by energy fit; however, (n,γ) high resolution data do not support the placement from 968 level. Therefore, all the intensity is assigned to placement from the 792 level.
[a] From 1967Ba45.
[b] From 1969Ok02.
[c] γ reported by 1967Ba45 only.
[d] For absolute intensity per 100 decays, multiply by 0.1174 *7*.
[e] 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.

$^{199}_{79}Au_{120}$-6

^{199}Pt β^- decay (30.8 min) 2004Mi09,1969Ok02,1974HeYW (continued)

$\gamma(^{199}Au)$ (continued)

[f] Multiply placed with intensity suitably divided.
[g] Placement of transition in the level scheme is uncertain.

^{199}Pt β^- decay (30.8 min) 2004Mi09,1969Ok02,1974HeYW

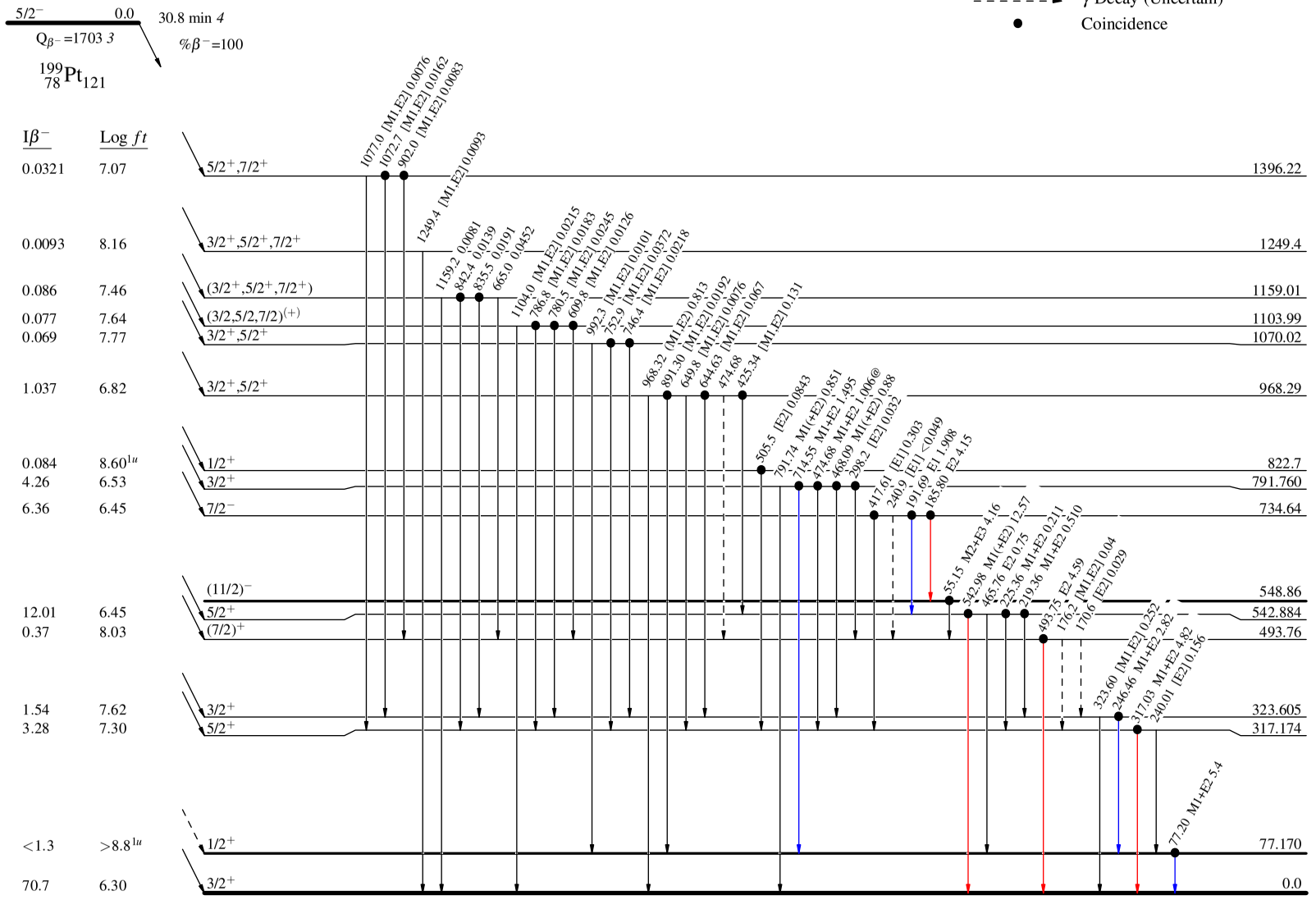
Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

@ Multiply placed: intensity suitably divided

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)
- Coincidence



$^{199}_{79}Au_{120}$

$^{199}_{79}Au_{120}$-8