^{180}Hf(p,nγ),(d,2nγ) 2002We01

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 126, 151 (2015)	1-Feb-2015

E(p)=8.9 MeV, E(d)=12.4 MeV. Measured Eγ, Iγ, γγ, E(ce), I(ce), ce-γ coincidences using an array of 5 Compton-suppressed HPGe detectors for γ-rays and iron-free orange spectrometer for electrons.
α: Additional information 1.

^{180}Ta Levels

E(level)[†]	Jπ[‡]	$T_{1/2}$	Comments
0.0[a]	1^+		
39.54[a] 5	2^+		
77.1[j] 8	9^-	>7.1×10^{15} y	E(level),$T_{1/2}$: from the Adopted Levels. Additional information 2.
107.78[i] 4	0^-		
110.77[a] 7	3^+		
130.49[i] 6	1^-		
171.11[i] 5	2^-		
177.85[f] 5	8^+		
184.93[a] 8	4^+		
234.35[i] 6	3^-		
280.10[j] 10	10^-		
310.92[a] 8	5^+		
318.22[i] 6	4^-		
320.24[k] 5	1^+		
356.94[d] 7	7^+		
370.82[k] 5	2^+		
374.20[f] 7	9^+		
416.36[a] 10	6^+		
419.86[i] 8	5^-		
423.48[l] 4	1^-		
447.87[k] 6	3^+		
463.49[g] 7	7^-		
478.08[l] 5	2^-		
505.40[j] 15	11^-		
515.83[e] 9	8^+		
519.97[b] 8	4^+		
x+519.97[c]	(5)		E(level): x=72.2 in 1999Sa59 and 1998Dr07. However, existence of 72.2 transition is not confirmed in ce data of 2002We01, which propose x≤80. Additional information 3.
544.23[l] 6	3^-		
547.70[i] 10	6^-		
547.92[k] 9	4^+		
549.34[n] 7	3^-		
559.52[m] 5	2^+		
574.79[h] 7	6^-	≈10 ns	$T_{1/2}$: from ce-γ(t).
575.95[d] 9	(8^+)		
595.46[f] 9	10^+		
600.44[a] 11	7^+		
624.14[m] 6	3^+		
641.43[b] 9	5^+		

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^{180}Hf(p,nγ),(d,2nγ) 2002We01 (continued)

^{180}Ta Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$	Comments
645.64[n] *9*	(4$^-$)		
653.51[o] *6*	1$^-$		
658.49[l] *10*	(4$^-$)		
x+660.75[c] *10*	(6)		
663.80[p] *9*	(4$^-$)		
671.97 *13*	(4)		
676.38[k] *11*	5$^+$		
680.74[g] *10*	8$^-$		
684.54 *12*			
685.89[i] *11*	7$^-$		
708.13[o] *6*	2$^-$		
708.62?[m] *12*	(4$^+$)		E(level): not included in Adopted Levels.
721.92 *7*	4$^-$	≈3 ns	Proposed configuration=$\pi 7/2^+[404]+\nu 1/2^-[521]$, $K^{\pi}=4^-$. T$_{1/2}$: from ce-γ(t). Given as a range from 1-5 ns.
723.52[e] *10*	9$^+$		
729.55 *10*			
731.17 *9*			
735.45[a] *12*	8$^+$		
738.45 *11*	(5)		
752.70[j] *18*	12$^-$		
756.72 *11*			
763.62[h] *9*	7$^-$		
784.34?[p] *9*	(5$^-$)		
787.15[b] *11*	6$^+$		
787.82?[o] *11*	(3$^-$)		
788.32[q] *10*	3$^-$		
792.47 *16*	(5)		
807.18[d] *10*	(9$^+$)		
809.37[#] *13*	(5$^-$)		
809.46[#] *10*	(5$^-$)	≈3 ns	Possible configuration=$\pi 7/2^+[404]+\nu 3/2^-[512]$, $K^{\pi}=(5^-)$. T$_{1/2}$: from ce-γ(t). Given as a range from 1-5 ns.
x+822.42[c] *13*	(7)		
830.57 *9*			
836.09 *12*			
841.23[f] *10*	11$^+$		
857.19[i] *12*	8$^-$		
863.84 *11*			
866.95 *13*			
876.80 *7*	(2$^-$)		Possible configuration=$\pi 7/2^+[404]-\nu 3/2^-[512]$, $K^{\pi}=2^-$.
880.68 *7*			
884.04 *12*			
891.76[@] *10*			
892.82[@] *12*			
892.95[@] *15*	(6)		
906.35[&] *11*			
907.57[&q] *10*	4$^-$		
915.92 *7*			
922.84[g] *14*	9$^-$		
935.06 *8*			
938.77 *19*	(6)		
951.52 *7*			

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^{180}Hf(p,nγ),(d,2nγ) 2002We01 (continued)

^{180}Ta Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
956.32[e] *14*	10^+	996.50 *9*		1043.07 *13*		1205.10 *11*	
956.45[b] *14*	7^+	x+1004.88[c] *13*	(8)	1053.5 *6*		1241.59[i] *19*	10^-
976.58[h] *9*	8^-	1016.87 *13*		1100.63 *13*		1447.49[i] *21*	11^-
977.35[a] *16*	9^+	1030.69[i] *16*	9^-	1113.10 *9*			
991.55 *11*		1037.03 *9*		1149.55[b] *14*	8^+		

† From a least-squares fit to Eγ by evaluator, assuming Δ(Eγ)=0.5 keV when not specified.
‡ As proposed in 2002We01. Rotational bands identified according to band structures and configuration assigned based on BCS calculations.
# 809.37 and 809.46 may correspond to one common level.
@ 891.76, 892.82, and 892.95 may correspond to one common level.
& 906.35 and 907.57 may correspond to one common level.
[a] Band(A): $\nu 9/2^+[624]$-$\pi 7/2^+[404]$, $K^\pi=1^+$ band.
[b] Band(B): $\pi 9/2^-[514]$-$\nu 1/2^-[521]$, $K^\pi=4^+$ band.
[c] Band(C): Band based on (5).
[d] Band(D): $\pi 5/2^+[402]$+$\nu 9/2^+[624]$, $K^\pi=7^+$ band.
[e] Band(E): $\pi 9/2^-[514]$+$\nu 7/2^-[503]$, $K^\pi=8^+$ band.
[f] Band(F): $\pi 7/2^+[404]$+$\nu 9/2^+[624]$, $K^\pi=8^+$ band.
[g] Band(G): $\pi 7/2^+[404]$+$\nu 7/2^-[514]$, $K^\pi=7^-$ band.
[h] Band(H): $\pi 7/2^+[404]$+$\nu 5/2^-[512]$, $K^\pi=6^-$ band.
[i] Band(I): $\pi 9/2^-[514]$-$\nu 9/2^+[624]$, $K^\pi=0^-$ band.
[j] Band(J): $\pi 9/2^-[514]$+$\nu 9/2^+[624]$, $K^\pi=9^-$ band.
[k] Band(K): $\pi 9/2^-[514]$-$\nu 7/2^-[514]$, $K^\pi=1^+$ band.
[l] Band(L): $\pi 7/2^+[404]$-$\nu 5/2^-[512]$, $K^\pi=1^-$ band.
[m] Band(M): $\nu 9/2^+[624]$-$\pi 5/2^+[402]$, $K^\pi=2^+$ band.
[n] Band(N): $\pi 7/2^+[404]$-$\nu 1/2^-[510]$, $K^\pi=3^-$ band.
[o] Band(O): $\nu 7/2^-[514]$-$\pi 5/2^+[402]$, $K^\pi=1^-$ band.
[p] Band(P): $\pi 7/2^+[404]$+$\nu 1/2^-[510]$, $K^\pi=4^-$ band.
[q] Band(Q): $\pi 7/2^+[404]$-$\nu 1/2^-[521]$, $K^\pi=3^-$ band.

γ(^{180}Ta)

E_i(level)	J_i^π	E_γ	I_γ†	E_f	J_f^π	Mult.‡	α	Comments
39.54	2^+	39.5 *1*		0.0	1^+			
107.78	0^-	107.71 *5*		0.0	1^+			
110.77	3^+	71.2 *1*		39.54	2^+			
130.49	1^-	(22.7[@])		107.78	0^-			
171.11	2^-	40.6 *1*		130.49	1^-			
177.85	8^+	100.75 *5*		77.1	9^-			
184.93	4^+	74.1 *1*	100	110.77	3^+			
		145.3[a]	≈8	39.54	2^+			
234.35	3^-	63.2 *1*		171.11	2^-			
280.10	10^-	203.0 *1*		77.1	9^-			
310.92	5^+	126.0 *1*	100	184.93	4^+			
		200.2 *1*	≈13	110.77	3^+			
318.22	4^-	83.86 *5*		234.35	3^-			
320.24	1^+	280.7 *1*	66 *4*	39.54	2^+	M1	0.242	α(K)=0.201 *3*; α(L)=0.0312 *5*; α(M)=0.00706 *10*;

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^{180}Hf(p,nγ),(d,2nγ) 2002We01 (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
									α(N+..)=0.00198 *3* α(K)exp=0.25 *5*.
320.24	1+	320.2 *1*	100	0.0	1+	M1+E2	<1.1	0.14 *3*	α(K)=0.12 *3*; α(L)=0.0201 *17*; α(M)=0.0046 *4*; α(N+..)=0.00128 *10* Iγ(320.2γ)/Iγ(315.6γ)=50/100. α(K)exp=0.12 *3*.
356.94	7+	179.12 *5*		177.85	8+				Iγ(179.1γ)/Iγ(315.6γ)=25/100.
370.82	2+	50.6 *1*	1.7 *4*	320.24	1+				
		260.1 *1*	59 *4*	110.77	3+	M1		0.297	α(K)=0.248 *4*; α(L)=0.0384 *6*; α(M)=0.00871 *13*; α(N+..)=0.00244 *4* α(K)exp=0.25 *5*.
		331.3 *1*	45 *3*	39.54	2+				
		370.8 *1*	100	0.0	1+	M1+E2	<1.1	0.095 *20*	α(K)=0.078 *18*; α(L)=0.0132 *15*; α(M)=0.0030 *3*; α(N+..)=0.00084 *9* Iγ(370.8γ)/Iγ(315.6γ)=39/100. α(K)exp=0.08 *2*.
374.20	9+	196.35 *5*		177.85	8+				
416.36	6+	105.4 *1*	100 *20*	310.92	5+				
		231.4 *1*	36 *7*	184.93	4+				
419.86	5−	101.64 *5*		318.22	4−				
		185.51[&]		234.35	3−				
423.48	1−	252.39 *5*	37 *3*	171.11	2−	M1		0.323	α(K)=0.269 *4*; α(L)=0.0418 *6*; α(M)=0.00946 *14*; α(N+..)=0.00265 *4* α(K)exp=0.29 *6*.
		293.0 *1*	≤3.4	130.49	1−				Iγ: 2.9 *5*, with authors indicating possible contamination.
		315.63 *5*	100	107.78	0−	M1		0.1760	α(K)=0.1467 *21*; α(L)=0.0227 *4*; α(M)=0.00513 *8*; α(N+..)=0.001436 *21* α(K)exp=0.16 *3*.
		383.8 *1*	18 *4*	39.54	2+				
		423.5 *1*	9 *2*	0.0	1+				
447.87	3+	262.8 *1*	32 *3*	184.93	4+				
		337.2 *1*	25 *3*	110.77	3+				
		408.4 *1*	100	39.54	2+				Eγ: 408.5 in Table X of 2002We01.
463.49	7−	285.60 *5*		177.85	8+				Iγ(285.6γ)/Iγ(315.6γ)=23/100.
478.08	2−	54.5 *1*	273 *50*	423.48	1−				
		243.74 *5*	88 *8*	234.35	3−				
		307.2 *1*	≤33	171.11	2−				Eγ: 306.9 in Table X of 2002We01. Iγ: 27 *6*, with authors indicating possible contamination.
		347.53 *5*	100	130.49	1−				Iγ(347.5γ)/Iγ(315.6γ)=11/100.
		367.4[a]	≤15	110.77	3+				
		438.7 *1*	93 *19*	39.54	2+				
		478.2 *1*	126 *25*	0.0	1+				
505.40	11−	225.3 *1*		280.10	10−				
515.83	8+	158.9 *1*	12 *3*	356.94	7+				
		338.0 *1*	100 *20*	177.85	8+				
519.97	4+	71.8		447.87	3+				Eγ: observed only in ce spectrum.
		209.1 *1*	16 *3*	310.92	5+	M1+E2	0.8 *4*	0.43 *8*	α(K)=0.33 *8*; α(L)=0.075 *4*; α(M)=0.0176 *11*; α(N+..)=0.00483 *25* α(K)exp=0.34 *7*.
		335.2 *1*	16 *3*	184.93	4+				
		409.14 *5*	100 *20*	110.77	3+	M1		0.0881	α(K)=0.0736 *11*; α(L)=0.01128 *16*; α(M)=0.00255 *4*; α(N+..)=0.000714 *10* Iγ(409.1γ)/Iγ(315.6γ)=98/100. α(K)exp=0.10 *2*.

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^{180}Hf(p,nγ),(d,2nγ) 2002We01 (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ	I_γ †	E_f	J_f^π	Mult.‡	α	Comments
519.97	4+	480.3[a]	≈1.5	39.54	2+			
x+519.97	(5)	x		519.97	4+			E_γ: x=72.2 in 1999Sa59 and 1998Dr07. However, existence of 72.2 transition is not confirmed in ce data of 2002We01, which propose x≤80.
544.23	3−	66.2 *1*	49 *10*	478.08	2−			
		120.8 *1*	≈2	423.48	1−			
		226.04 *5*	13 *2*	318.22	4−			
		309.7 *1*	≤7	234.35	3−			E_γ: 309.9 in Table X of 2002We01. I_γ: 5 *2*, with authors indicating possible contamination.
		359.2[a]	≈2	184.93	4+			
		373.07 *5*	100	171.11	2−	M1	0.1125	α(K)=0.0939 *14*; α(L)=0.01443 *21*; α(M)=0.00327 *5*; α(N+..)=0.000914 *13* Iγ(373.1)/Iγ(315.6)=41/100. α(K)exp=0.09 *2*.
		433.4[a]	≤3	110.77	3+			
		504.6[a]	≈3	39.54	2+			
547.70	6−	127.84 *5*		419.86	5−			
		229.49[&]		318.22	4−			
547.92	4+	237.0 *1*	21 *4*	310.92	5+			
		363.0[a]	≤10	184.93	4+			
		437.2 *1*	100 *20*	110.77	3+			
549.34	3−	71.3		478.08	2−	(M1)	11.49	α(K)=9.52 *14*; α(L)=1.527 *22*; α(M)=0.346 *5*; α(N+..)=0.0969 *14* E_γ: observed only in ce spectrum. Mult.: from ce data; no details given.
		378.2 *1*	100	171.11	2−			Iγ(378.2γ)/Iγ(315.6γ)=14/100.
559.52	2+	188.8 *1*	2.0 *4*	370.82	2+			
		239.2 *1*	13 *3*	320.24	1+	(M1,E2)	0.27 *11*	α(K)=0.21 *11*; α(L)=0.0480 *8*; α(M)=0.0113 *4*; α(N+..)=0.00310 *6* Mult.: E1 excluded by ce data.
		429.3 *1*	≤15	130.49	1−			
		448.7 *1*	53 *11*	110.77	3+			
		519.9 *1*	100 *20*	39.54	2+			Iγ(519.9γ)/Iγ(315.6γ)=56/100.
		559.6 *1*	23 *5*	0.0	1+			
574.79	6−	111.32 *5*	50 *10*	463.49	7−			
		217.88 *5*	100 *20*	356.94	7+			
575.95	(8+)	219.0 *1*	50 *10*	356.94	7+			
		398.1 *1*	100 *20*	177.85	8+			
595.46	10+	221.22 *5*		374.20	9+			
600.44	7+	184.0 *1*	100 *20*	416.36	6+			
		289.6 *1*	29 *6*	310.92	5+			
624.14	3+	64.7		559.52	2+	(M1)	2.62	α(L)=2.03 *3*; α(M)=0.460 *7*; α(N+..)=0.1286 *18* E_γ: observed only in ce spectrum. Mult.: from ce data; no details given.
		176.2 *1*	22 *5*	447.87	3+			
		253.3 *1*	78 *16*	370.82	2+			
		303.9 *1*	63 *13*	320.24	1+			
		624.3 *1*	100 *20*	0.0	1+			Iγ(624.3γ)/Iγ(315.6γ)=12/100.
641.43	5+	121.44 *5*		519.97	4+			
645.64	(4−)	101.4 *1*	100[#]	544.23	3−			
		411.3 *1*	100[#]	234.35	3−			
653.51	1−	175.5 *1*	28[#]	478.08	2−			
		230.1 *1*	100[#]	423.48	1−			

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^{180}Hf(p,nγ),(d,2nγ) 2002We01 (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[‡]	α	Comments
653.51	1⁻	282.6 *1*	27[#]	370.82	2⁺			
		333.2 *1*	51[#]	320.24	1⁺			
		653.4[a] *1*		0.0	1⁺			
658.49	(4⁻)	114.3 *1*		544.23	3⁻	(M1)	2.97	α(K)=2.47 *4*; α(L)=0.389 *6*; α(M)=0.0882 *13*; α(N+..)=0.0247 *4* Mult.: from comparison of Iγ in γγ and ce-γ spectra.
		180.4[&a]		478.08	2⁻			
x+660.75	(6)	140.8 *1*		x+519.97	(5)			
663.80	(4⁻)	114.5 *1*	100[#]	549.34	3⁻	(M1)	2.96	α(K)=2.46 *4*; α(L)=0.387 *6*; α(M)=0.0878 *13*; α(N+..)=0.0246 *4* Mult.: from comparison of Iγ in γγ and ce-γ spectra.
		429.4 *1*	≈70[#]	234.35	3⁻			
671.97	(4)	152.0 *1*		519.97	4⁺			
676.38	5⁺	128.5 *1*		547.92	4⁺			
		491.4 *1*		184.93	4⁺			
680.74	8⁻	217.2 *1*		463.49	7⁻			
684.54		327.6 *1*		356.94	7⁺			
685.89	7⁻	138.19 *5*		547.70	6⁻			
		266.1[&]		419.86	5⁻			
708.13	2⁻	158.7 *1*	≈6[#]	549.34	3⁻			
		230.06[&a]		478.08	2⁻			
		260.4 *1*	32[#]	447.87	3⁺			
		284.7 *1*	100[#]	423.48	1⁻			
		337.2 *1*	15[#]	370.82	2⁺			
		387.9 *1*	60[#]	320.24	1⁺			
		708.0[a]		0.0	1⁺			
708.62?	(4⁺)	149.1 *1*		559.52	2⁺			
721.92	4⁻	172.6 *1*	≈20[#]	549.34	3⁻			
		177.68 *5*	100[#]	544.23	3⁻			
723.52	9⁺	207.7 *1*	100	515.83	8⁺			
		349.3 *1*	≤10	374.20	9⁺			
729.55		88.1 *1*	≈1	641.43	5⁺			
		209.6 *1*	100	519.97	4⁺			
731.17		412.9 *1*	55[#]	318.22	4⁻			
		560.1 *1*	100[#]	171.11	2⁻			
735.45	8⁺	135.0 *1*	76[#]	600.44	7⁺			
		319.1 *1*	100[#]	416.36	6⁺			
738.45	(5)	96.9 *1*	20 *4*	641.43	5⁺			
		218.6 *1*	100 *20*	519.97	4⁺			
752.70	12⁻	247.3 *1*		505.40	11⁻			
756.72		181.9 *1*		574.79	6⁻			
763.62	7⁻	188.9 *1*	92 *18*	574.79	6⁻			
		300.1 *1*	100 *20*	463.49	7⁻			
784.34?	(5⁻)	466.0 *1*	53[#]	318.22	4⁻			
		550.1 *1*	100[#]	234.35	3⁻			
787.15	6⁺	145.7 *1*	100 *20*	641.43	5⁺			
		267.2 *1*	10 *2*	519.97	4⁺			
787.82?	(3⁻)	417.0 *1*		370.82	2⁺			
788.32	3⁻	310.3 *1*		478.08	2⁻			
792.47	(5)	120.5 *1*		671.97	(4)			

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^{180}Hf(p,nγ),(d,2nγ) 2002We01 (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[‡]	α	Comments
807.18	(9$^+$)	231.2 *1*	100	575.95	(8$^+$)			
		433.0 *1*	≈70	374.20	9$^+$			
809.37	(5$^-$)	289.4 *1*		519.97	4$^+$			
809.46	(5$^-$)	151.0 *1*	100[#]	658.49	(4$^-$)			
		265.2 *1*	100[#]	544.23	3$^-$			
x+822.42	(7)	161.6 *1*		x+660.75	(6)			
830.57		255.8 *1*	81	574.79	6$^-$			
		367.1 *1*	≈5	463.49	7$^-$			
		473.6 *1*	100	356.94	7$^+$			
836.09		261.3 *1*		574.79	6$^-$			
841.23	11$^+$	245.6 *1*	18 *4*	595.46	10$^+$			
		467.2 *1*	100 *20*	374.20	9$^+$			
857.19	8$^-$	171.30 *5*		685.89	7$^-$			
		309.49[&]		547.70	6$^-$			
863.84		343.8 *1*		519.97	4$^+$			
866.95		291.0 *1*		575.95	(8$^+$)			
876.80	(2$^-$)	398.8 *1*	13[#]	478.08	2$^-$			
		453.3 *1*	100[#]	423.48	1$^-$			
		556.7 *1*	16[#]	320.24	1$^+$			
		705.5 *1*		171.11	2$^-$			
880.68		256.6 *1*	100[#]	624.14	3$^+$			
		321.4 *1*	58[#]	559.52	2$^+$			
		456.9 *1*	70[#]	423.48	1$^-$			E_γ: level-energy difference=457.2.
884.04		154.5 *1*		729.55				
		242.6 *1*	100	641.43	5$^+$			
891.76		316.9 *1*	100 *20*	574.79	6$^-$			
		534.9 *1*	8 *2*	356.94	7$^+$			
892.82		170.9 *1*		721.92	4$^-$			
892.95	(6)	154.5 *1*		738.45	(5)	(M1)	1.263	α(K)=1.050 *15*; α(L)=0.1646 *24*; α(M)=0.0373 *6*; α(N+..)=0.01045 *15*
906.35		149.6 *1*	≈10	756.72				
		331.6 *1*	100	574.79	6$^-$			
907.57	4$^-$	119.3 *1*	27[#]	788.32	3$^-$			
		185.6 *1*	100[#]	721.92	4$^-$			
915.92		492.4 *1*	42[#]	423.48	1$^-$			
		545.2 *1*	22[#]	370.82	2$^+$			
		595.6 *1*	100[#]	320.24	1$^+$			
922.84	9$^-$	242.1 *1*		680.74	8$^-$			
935.06		457.0 *1*	100[#]	478.08	2$^-$			
		614.8 *1*	70[#]	320.24	1$^+$			
		934.9[a] *1*		0.0	1$^+$			
938.77	(6)	146.3 *1*		792.47	(5)	(M1)	1.473	α(K)=1.225 *18*; α(L)=0.192 *3*; α(M)=0.0436 *7*; α(N+..)=0.01219 *18*
951.52		528.0 *1*	89[#]	423.48	1$^-$			
		580.7 *1*	100[#]	370.82	2$^+$			
		631.3 *1*	95[#]	320.24	1$^+$			
956.32	10$^+$	232.8 *1*	100	723.52	9$^+$			
956.45	7$^+$	169.4 *1*		787.15	6$^+$			
976.58	8$^-$	213.0 *1*		763.62	7$^-$			
		295.8 *1*		680.74	8$^-$			
		402.0 *1*		574.79	6$^-$			

Continued on next page (footnotes at end of table)

^{180}Hf(p,nγ),(d,2nγ) 2002We01 (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ	I_γ [†]	E_f	J_f^π
976.58	8^-	512.9 *1*		463.49	7^-
977.35	9^+	241.9 *1*		735.45	8^+
991.55		350.2 *1*	100 *20*	641.43	5^+
		471.5 *1*	51 *10*	519.97	4^+
996.50		548.6 *1*	61[#]	447.87	3^+
		625.7 *1*	100[#]	370.82	2^+
x+1004.88	(8)	182.4 *1*	100	x+822.42	(7)
		344.2 *1*	83	x+660.75	(6)
1016.87		186.3 *1*		830.57	
1030.69	9^-	173.5 *1*		857.19	8^-
1037.03		666.2 *1*	84[#]	370.82	2^+
		716.8 *1*	100[#]	320.24	1^+
1043.07		523.1 *1*		519.97	4^+
1053.5		169.5[&]		884.04	
1100.63		459.2 *1*		641.43	5^+
1113.10		665.2 *1*	100[#]	447.87	3^+
		742.3 *1*	63[#]	370.82	2^+
1149.55	8^+	193.2 *1*	53 *10*	956.45	7^+
		362.3 *1*	100 *20*	787.15	6^+
1205.10		341.2 *1*	≈60	863.84	
		685.2 *1*	100	519.97	4^+
1241.59	10^-	210.9 *1*		1030.69	9^-
1447.49	11^-	205.9 *1*		1241.59	10^-

[†] 2002We01 make a general statement of 20% uncertainty on Iγ which has been included by the evaluator. Iγ's from the first excited $K^\pi=1^+$ and 1^- are given more precisely in Table X. Some transitions are indicative values only, as noted.
[‡] From conversion electron data, except where noted.
[#] Indicative values only.
[@] γ not observed but implied from γγ coin. Energy is from level-energy difference.
[&] Transition shown in level scheme figures 11-14 of 2002We01. Energy from level-energy difference.
[a] Placement of transition in the level scheme is uncertain.

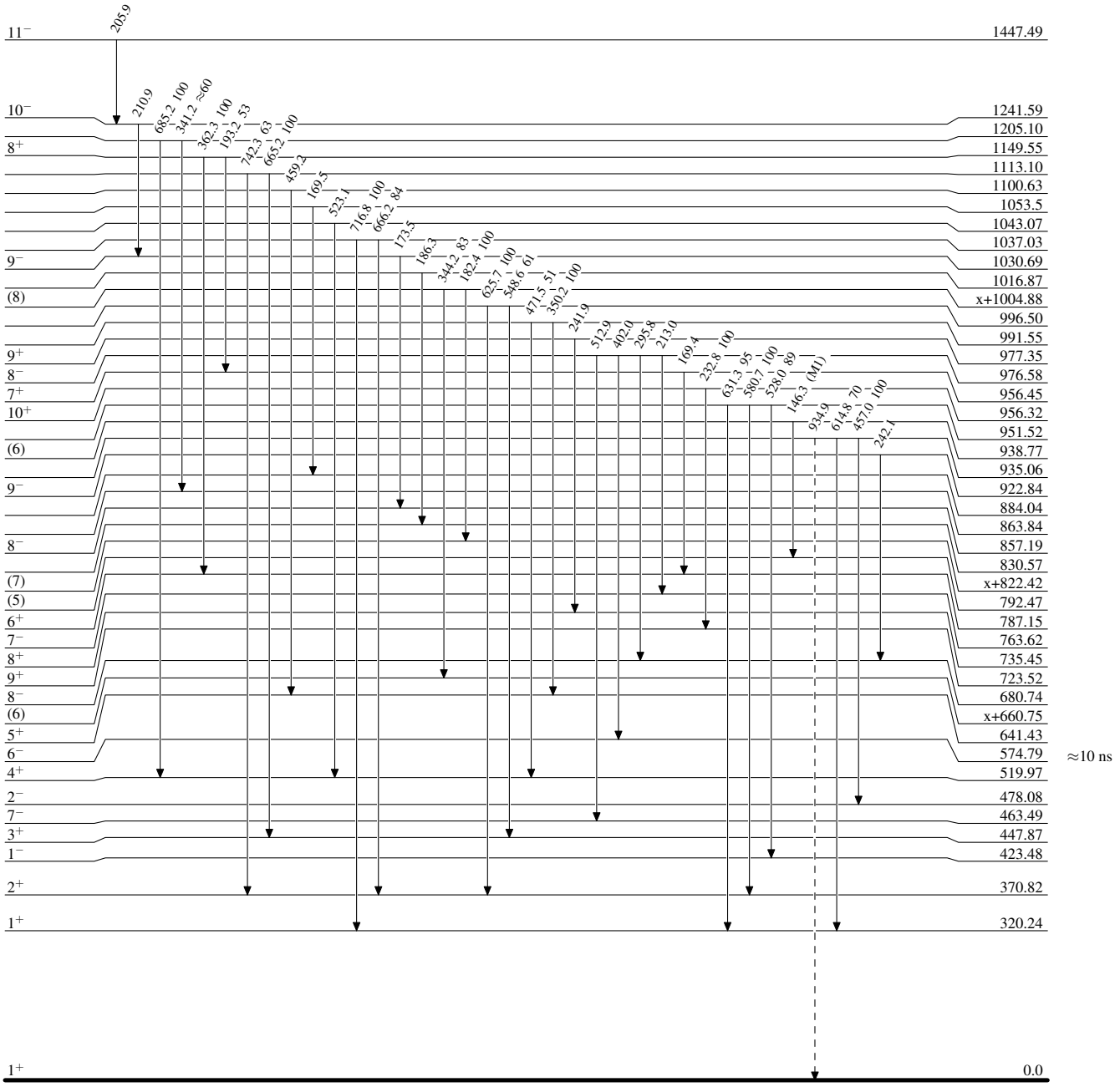
^{180}Hf(p,nγ),(d,2nγ) 2002We01

Legend

Level Scheme

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)

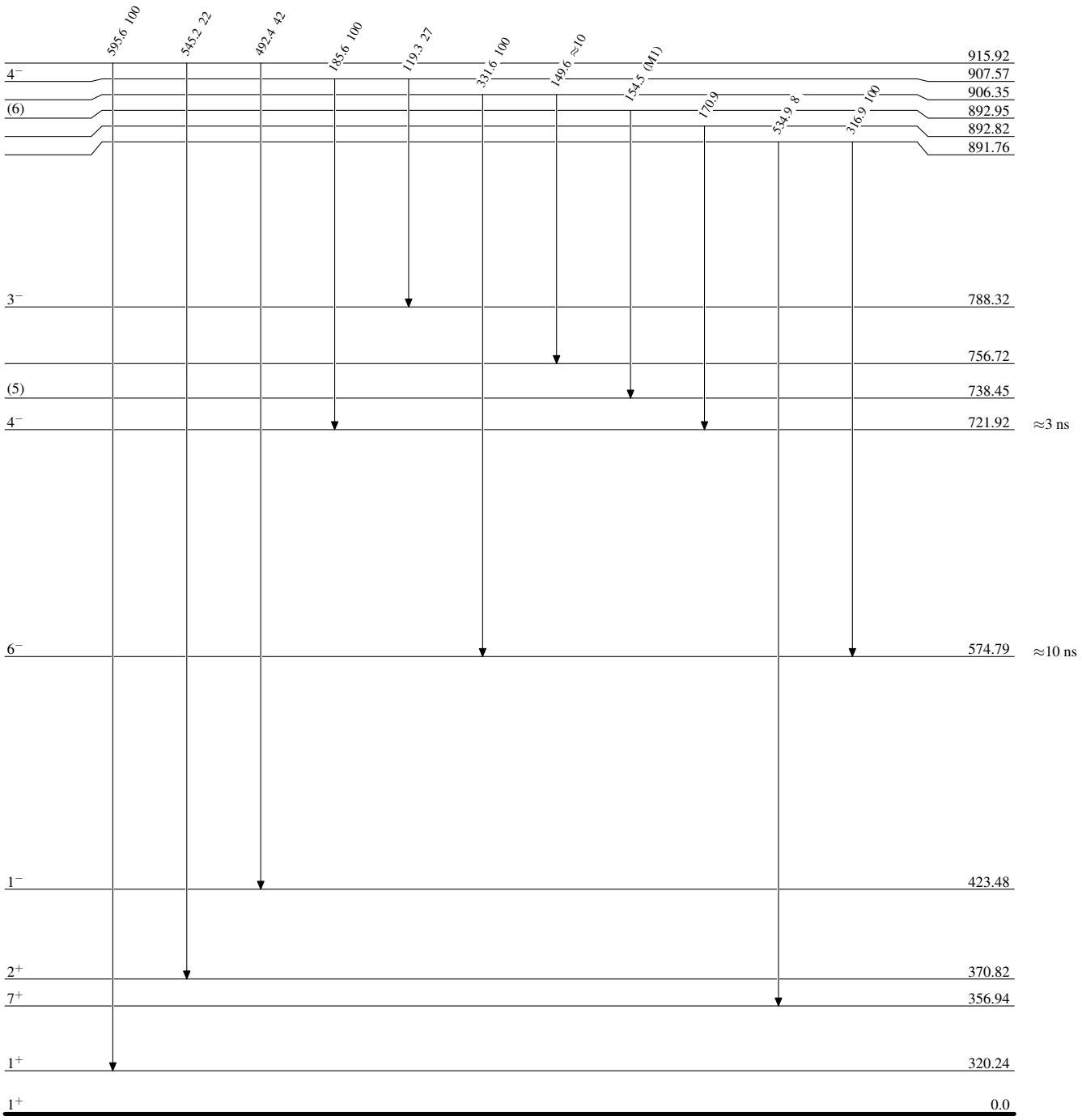


$^{180}_{73}Ta_{107}$

^{180}Hf(p,nγ),(d,2nγ) 2002We01

Level Scheme (continued)

Intensities: Relative photon branching from each level

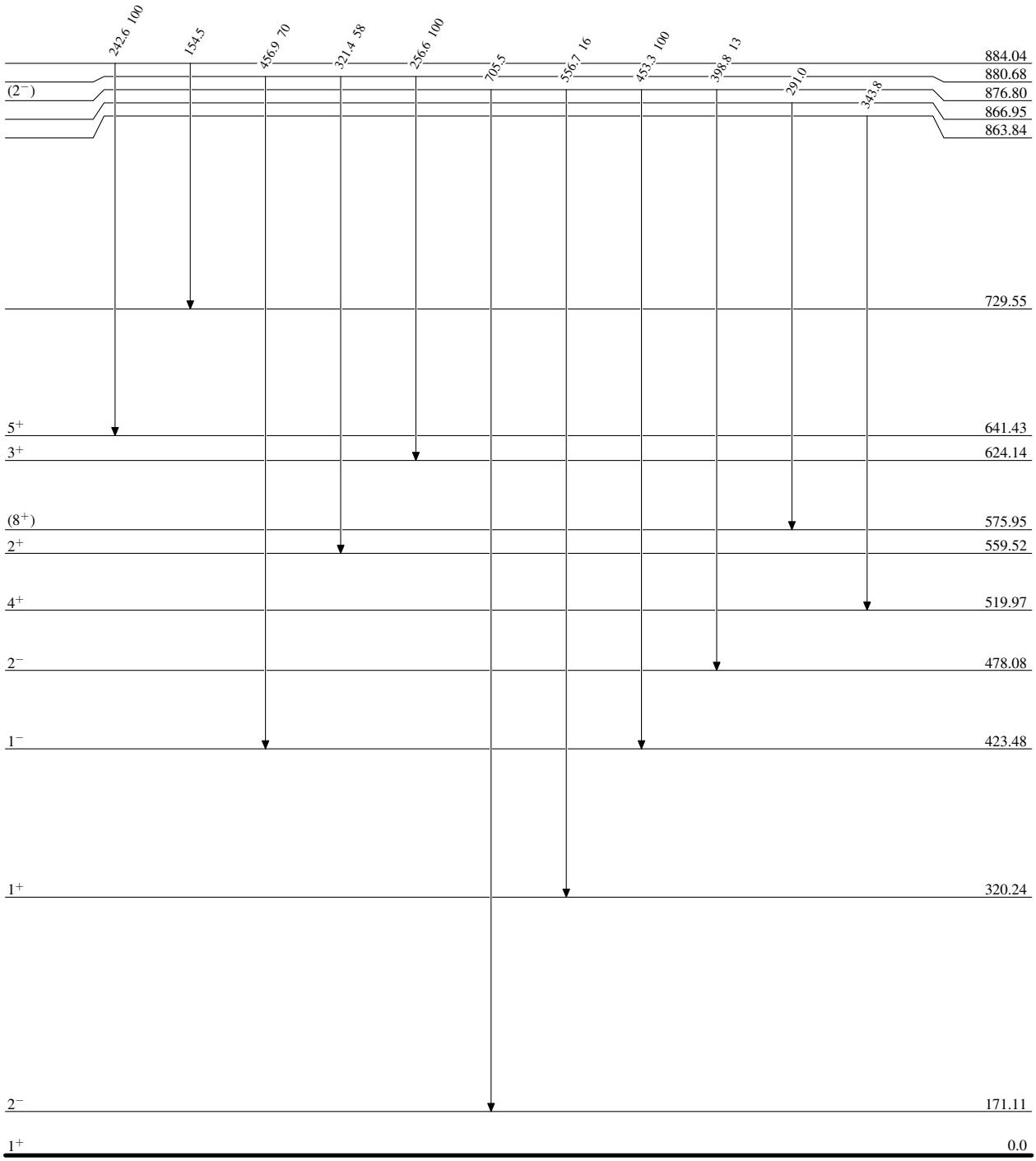


$^{180}_{73}Ta_{107}$

^{180}Hf(p,nγ),(d,2nγ) 2002We01

Level Scheme (continued)

Intensities: Relative photon branching from each level

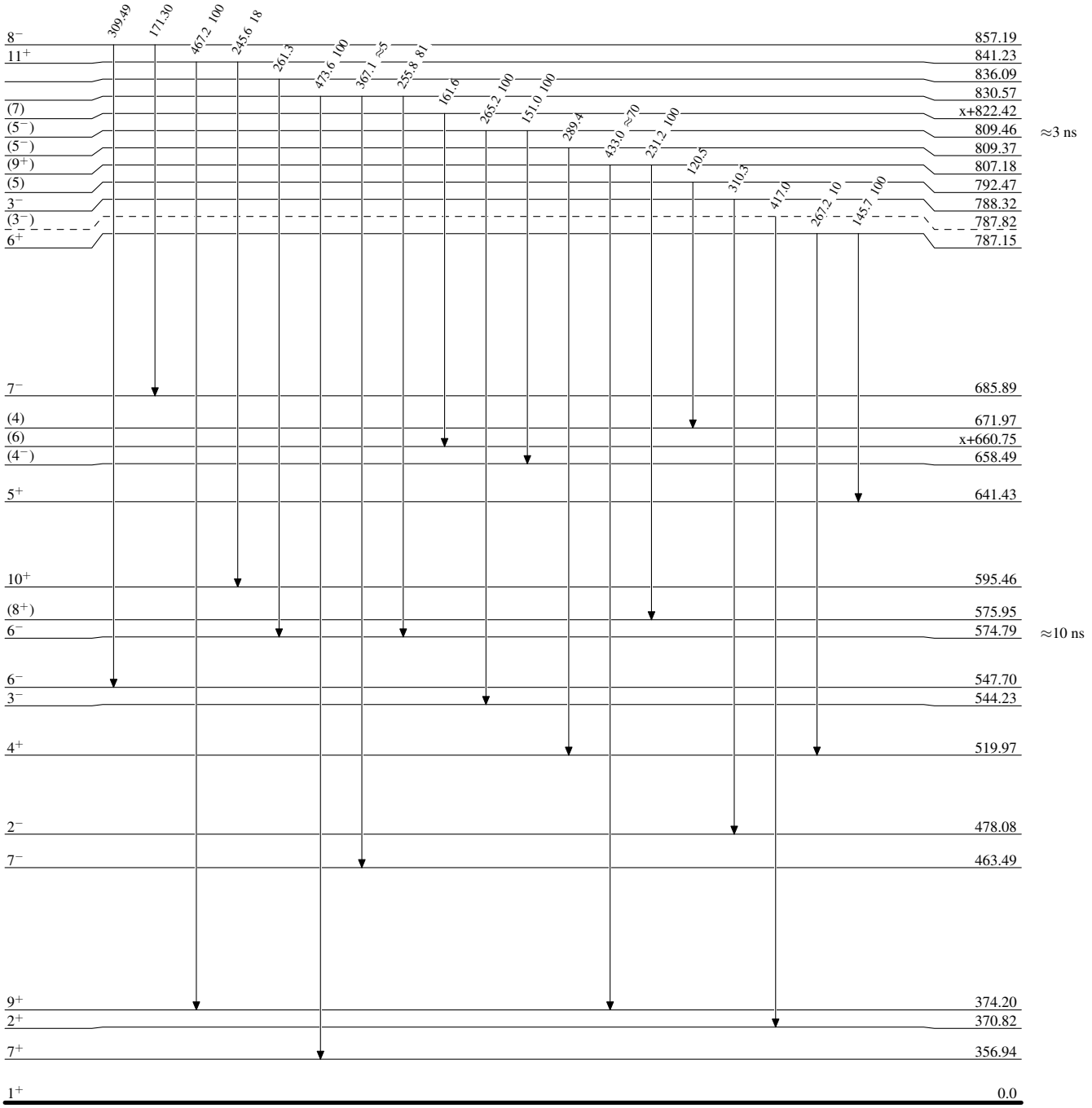


$^{180}_{73}Ta_{107}$

^{180}Hf(p,nγ),(d,2nγ) 2002We01

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{180}_{73}Ta_{107}$

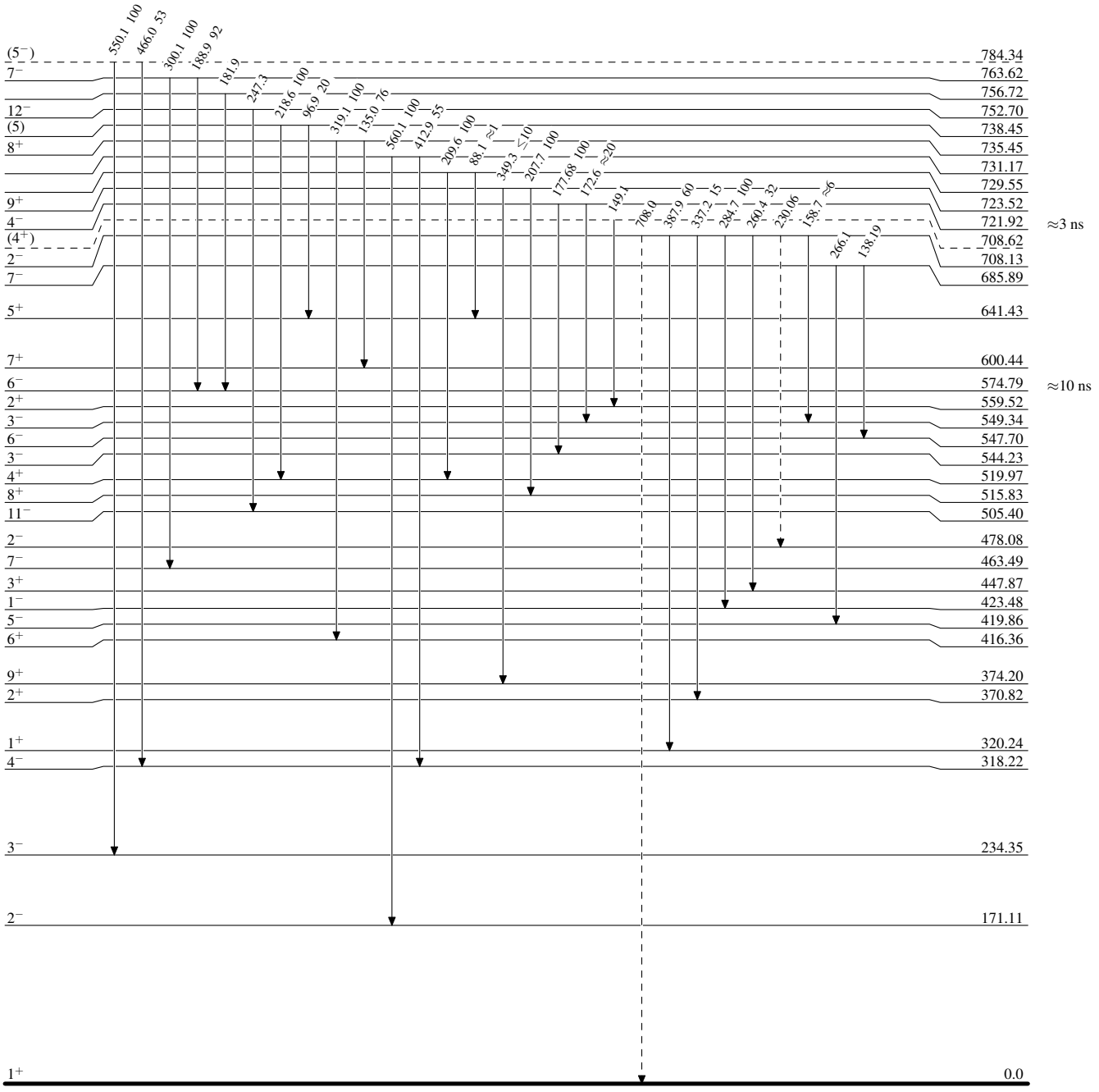
^{180}Hf(p,nγ),(d,2nγ) 2002We01

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{180}_{73}Ta_{107}$

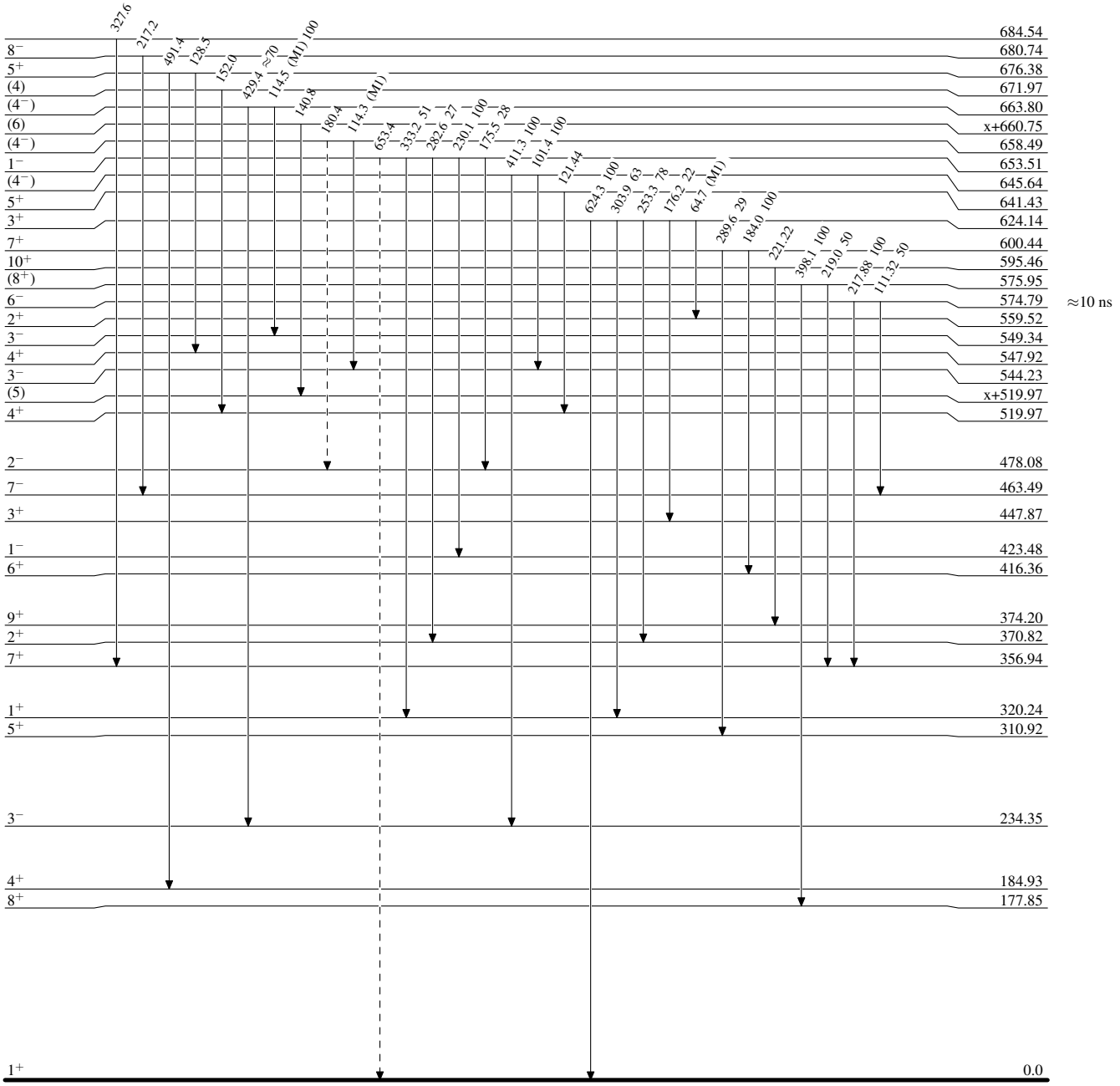
^{180}Hf(p,nγ),(d,2nγ) **2002We01**

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)



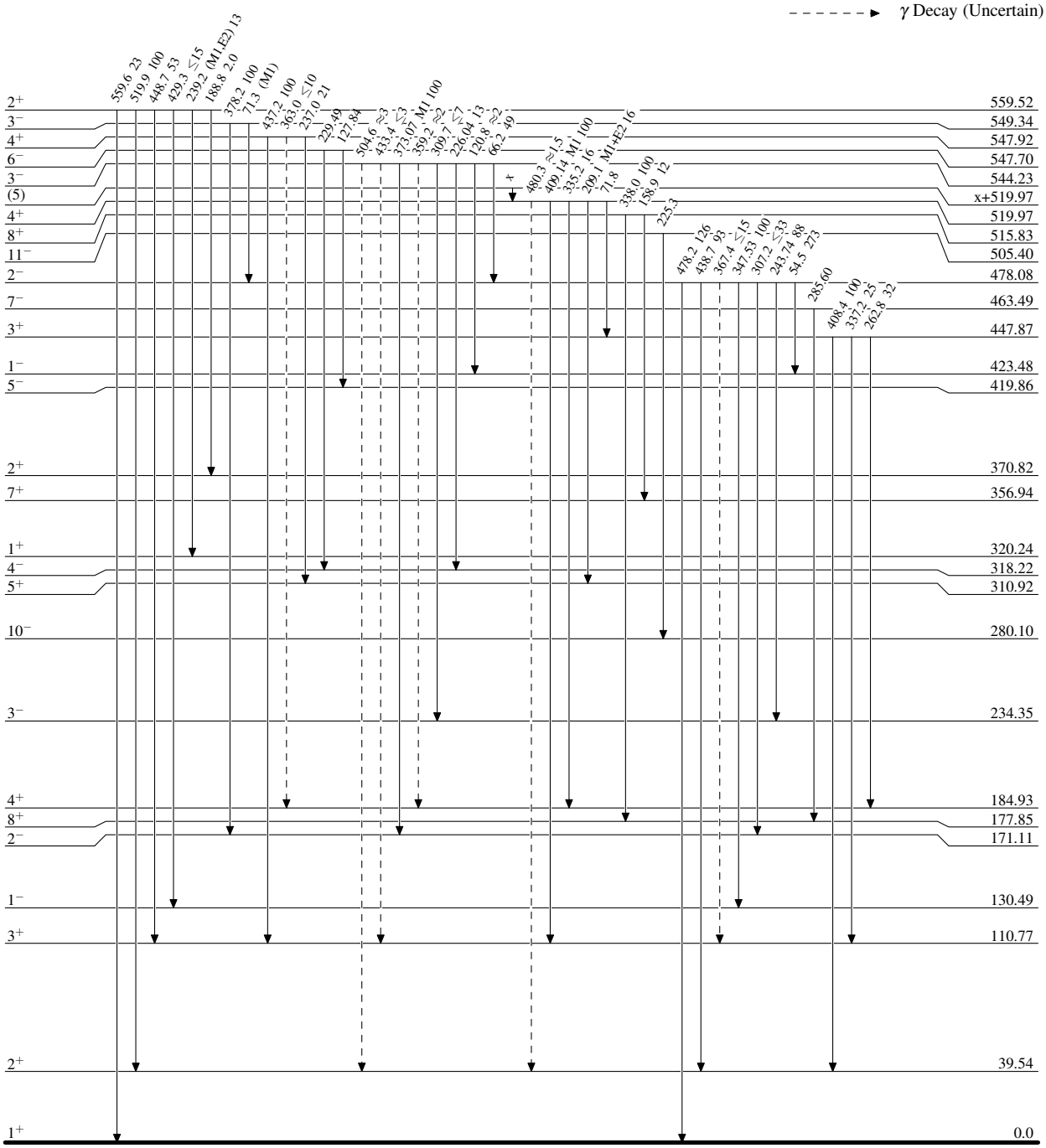
$^{180}_{73}Ta_{107}$

^{180}Hf(p,nγ),(d,2nγ) 2002We01

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{180}_{73}Ta_{107}$

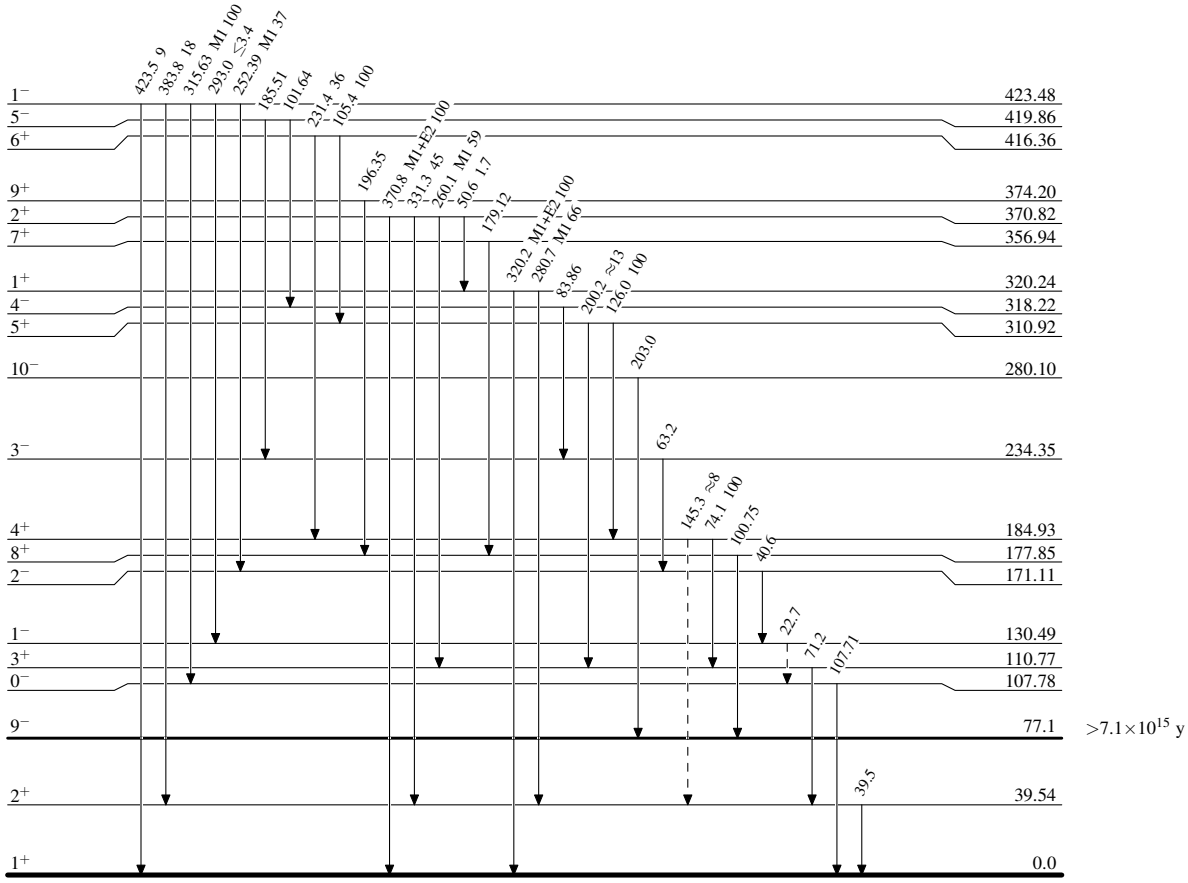
^{180}Hf(p,nγ),(d,2nγ) 2002We01

Legend

Level Scheme (continued)

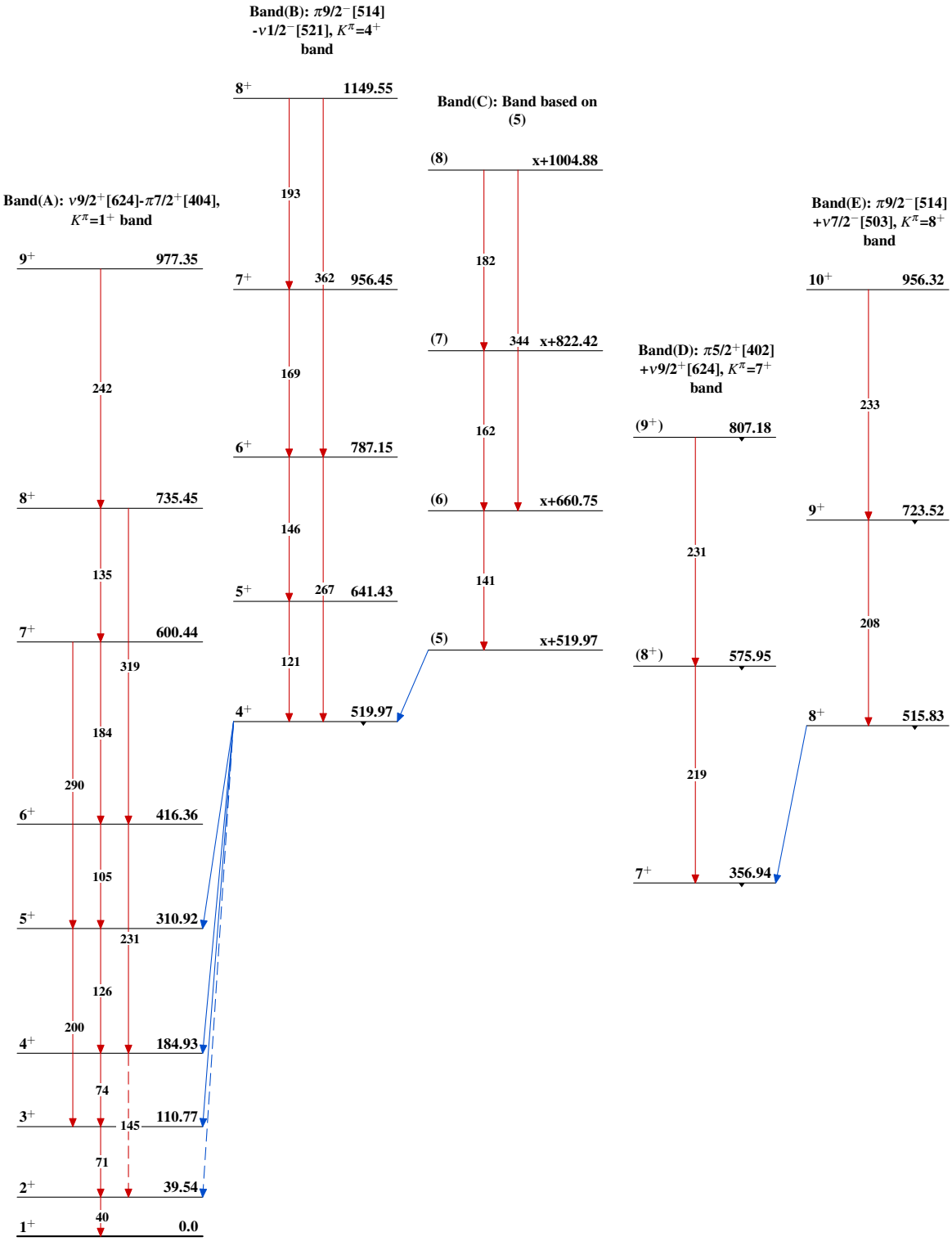
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



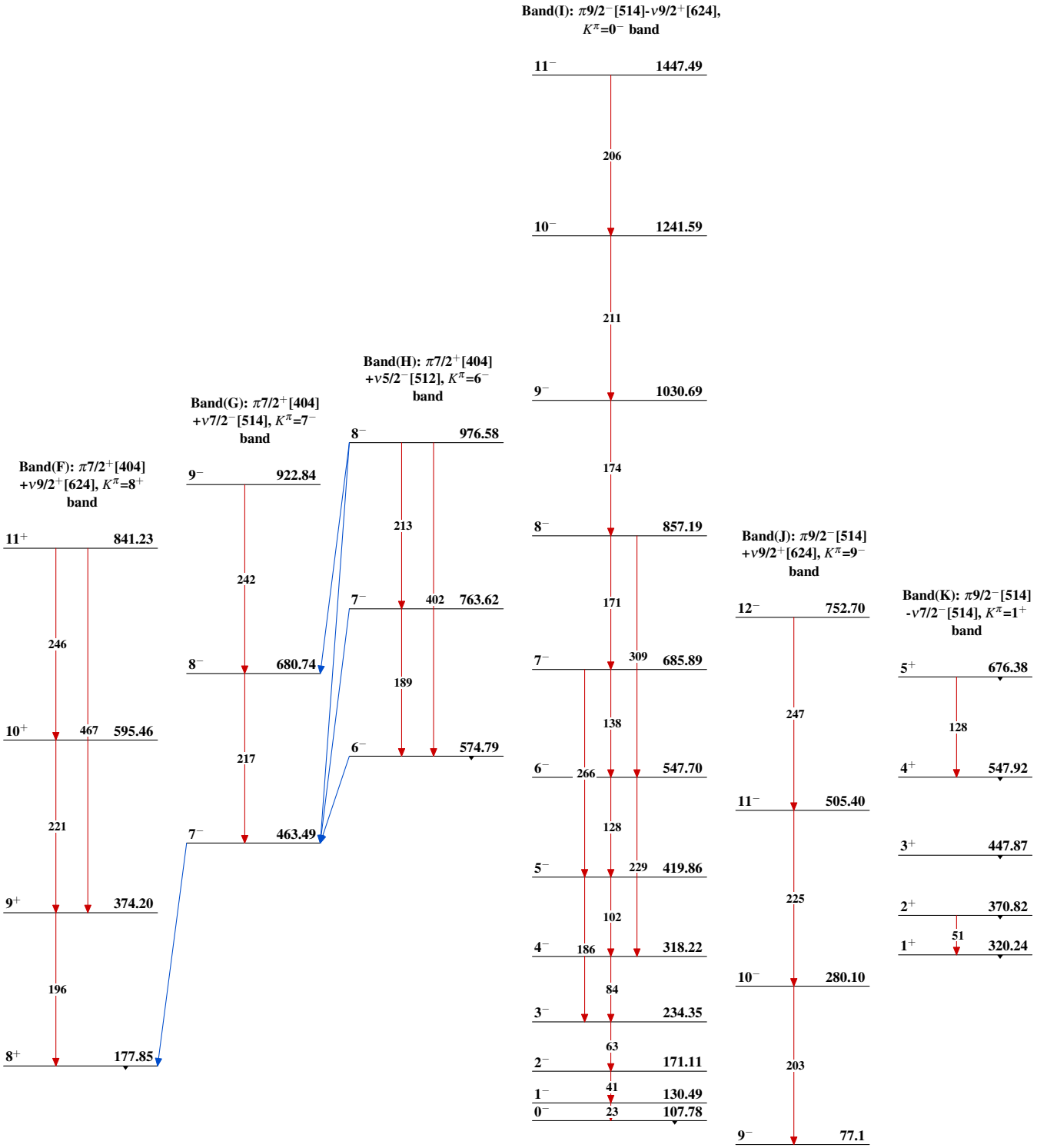
$^{180}_{73}Ta_{107}$

^{180}Hf(p,nγ),(d,2nγ) 2002We01



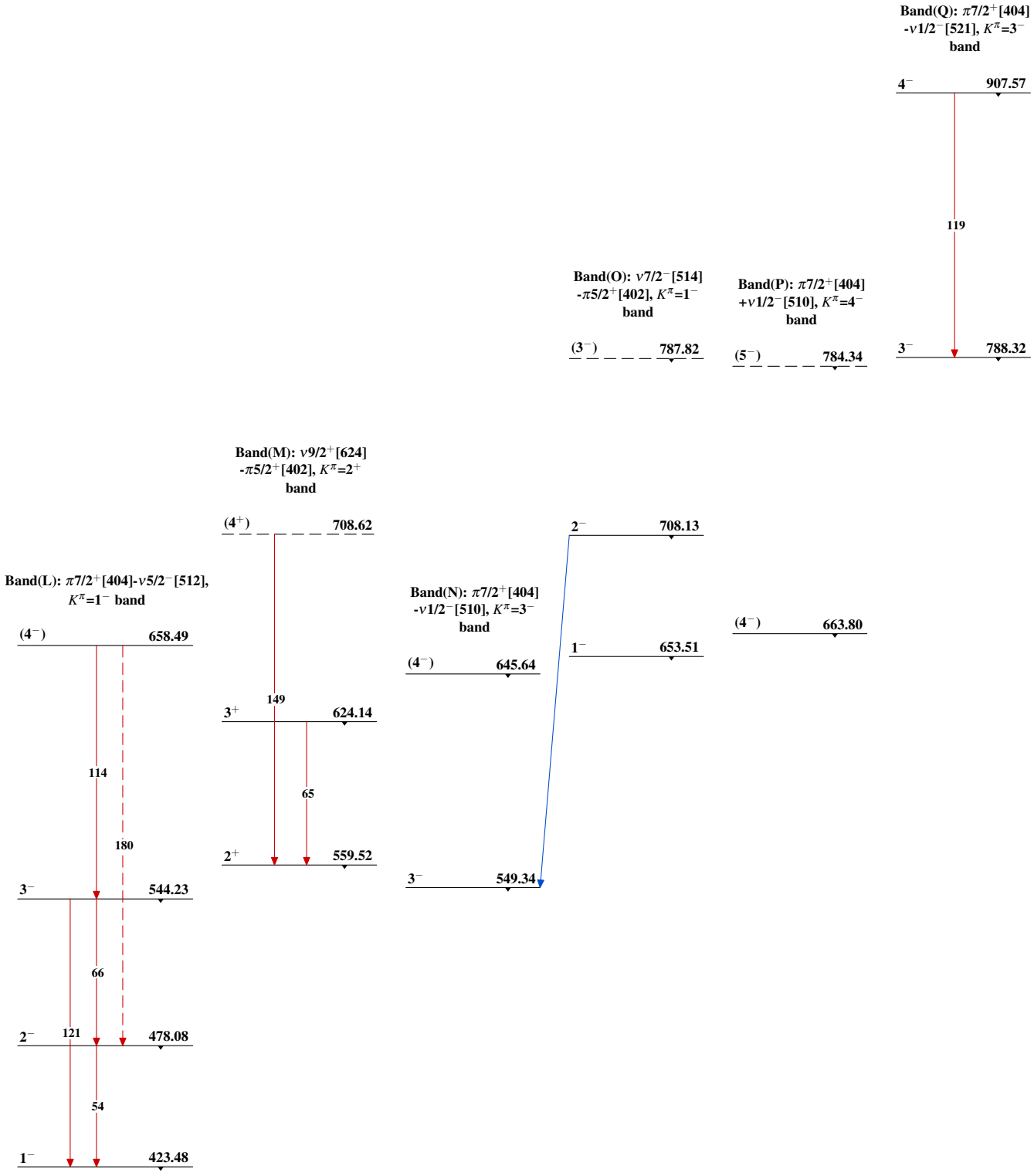
$^{180}_{73}Ta_{107}$

^{180}Hf(p,nγ),(d,2nγ) 2002We01 (continued)



$^{180}_{73}Ta_{107}$

^{180}Hf(p,nγ),(d,2nγ) 2002We01 (continued)



$^{180}_{73}Ta_{107}$