(HI,xnγ) 1995Ba67,1986Wa32,1972Le04

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 159, 1 (2019)	30-Aug-2019

1995Ba67: Produced using the ^{130}Te(^{51}V,4nγ) and ^{163}Dy(^{19}F,5nγ) reactions. Projectiles: ^{51}V, E=225 MeV and ^{19}F, E=105 MeV. Targets: ^{130}Te, two stacked foils of 500 μg/cm^2 thickness, each supported by a 500 μg/cm^2 gold layer; ^{163}Dy, a 1 mg/cm^2 in thickness with a 10 mg/cm^2 thick gold backing, sufficient to stop the recoil nuclei. Detectors: nineteen HPGe Compton-suppressed detectors and one (in the ^{51}V experiment), two (in the ^{19}F experiment) low energy photon detectors, 60 element BaF$_2$ multiplicity filter. Measured: Eγ, Iγ, $\gamma\gamma$(t), $\gamma\gamma$(fold), and $\gamma\gamma(\theta)$. Deduced: level scheme, DCO ratios, transition multipolarities.

1986Wa32: Produced using the ^{165}Ho(^{16}O,4nγ) reaction. Projectile: ^{16}O, E=78-84.5 MeV. Detectors: Ge(Li) anti-Compton spectrometer. Measured Eγ, Iγ, $\gamma(\theta)$, $\gamma\gamma$ coin, γ(t), γ-ray excitation functions. Deduced: level scheme, transition multipolarities, mixing ratios.

1972Le04: Produced using the ^{169}Tm(^{12}C,4nγ) reaction. Projectile: ^{12}C, E=62-76 MeV. Detectors: Ge(Li) spectrometer. Measured: Eγ, Iγ, $\gamma\gamma$ coin, $\gamma(\theta)$, γ-ray excitation functions, γ(t). Deduced: level scheme, transition multipolarities, T$_{1/2}$.

Others: 1983Ya08, 2002Ch43.

^{177}Re Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	Comments
0.0[g]	5/2$^-$	14 min *1*	J$^\pi$,T$_{1/2}$: From Adopted Levels.
0.0+x[n]	9/2$^-$	>100 ns	Additional information 1. E(level): An upper energy limit of about 40 keV is suggested (1986Wa32, 1983Ya08), since no transitions (photon and conversion electron) depopulating this level were observed in either in-beam or out-of-beam time region. T$_{1/2}$: No direct γ-ray decay from the bandhead has been observed. The value is a lower limit based on the applied coincidence window in 1995Ba67.
63.50[g] *20*	9/2$^-$		
84.70[b] *10*	5/2$^+$	50 μs *10*	T$_{1/2}$: From 1972Le04.
163.65+x[n] *8*	11/2$^-$		
207.42[b] *13*	7/2$^+$		
248.10[g] *18*	13/2$^-$		
355.98+x[n] *7*	13/2$^-$		
358.20[b] *13*	9/2$^+$	30.2[@] ps *+14−15*	
361.00[a] *14*	7/2$^+$		
490.35[a] *14*	9/2$^+$		
534.28[b] *13*	11/2$^+$		
552.21[g] *17*	17/2$^-$	14.1[@] ps *6*	
561.34[h] *25*	11/2$^-$		
569.89+x[n] *8*	15/2$^-$	5.3[@] ps *+4−6*	
642.73[a] *14*	11/2$^+$		
727.71[b] *14*	13/2$^+$	8.5[@] ps *+6−19*	
805.14+x[n] *9*	17/2$^-$		
815.41[a] *14*	13/2$^+$		
880.64[h] *20*	15/2$^-$		
935.89[b] *14*	15/2$^+$		
963.17+x[m] *10*	(13/2$^-$)		
965.58[g] *17*	21/2$^-$	3.19[@] ps *+42−21*	
975.12[c] *22*	(9/2$^+$)		
1009.45[a] *14*	15/2$^+$		
1052.88+x[n] *10*	19/2$^-$	1.66[@] ps *7*	

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(HI,xnγ) 1995Ba67,1986Wa32,1972Le04 (continued)

^{177}Re Levels (continued)

E(level)[†]	J^π[‡]	$T_{1/2}$[#]
1086.91[c] 19	13/2+	
1151.00[b] 15	17/2+	4.6[@] ps +10−6
1197.33+x[m] 10	(15/2−)	
1220.16[a] 14	17/2+	
1223.12[e] 19	15/2+	
1232.3+x 4		
1296.64[h] 19	19/2−	
1315.63+x[n] 11	21/2−	
1318.16[c] 16	17/2+	
1375.36[b] 15	19/2+	
1442.28+x[p] 8	15/2+	≤0.4 ns
1446.95[a] 15	19/2+	
1461.09+x[m] 11	(17/2−)	
1474.43[g] 19	25/2−	0.69[@] ps 21
1494.82[i] 24	17/2−	
1514.65[e] 17	19/2+	
1567.11+x[q] 10	17/2+	
1582.43+x[n] 12	23/2−	0.97[@] ps +21−28
1586.79+x[l] 12	(17/2−)	
1606.67[b] 15	21/2+	<3.1[@] ps
1640.16[c] 15	21/2+	
1676.11+x[q] 14	19/2+	
1680.28[f] 19	19/2+	
1686.04[a] 15	21/2+	
1723.8+x?[&] 4	(19/2)	
1799.35[h] 20	23/2−	
1806.68[d] 21	(21/2+)	
1817.67+x[q] 17	21/2+	
1825.16+x[r] 17	21/2+	≤0.5 ns
1829.42+x[l] 13	(19/2−)	
1848.00[b] 16	23/2+	
1851.02[i] 20	21/2−	
1859.45+x[n] 13	25/2−	
1885.82[e] 16	23/2+	
1934.58[a] 16	23/2+	
1952.8+x?[&] 4	(21/2)	
1959.85+x[s] 20	23/2+	≤0.5 ns
1965.05[f] 18	23/2+	
1975.86+x[r] 20	23/2+	
1988.55+x[q] 19	23/2+	
2021.16 25		
2031.74 24		
2039.94[c] 16	25/2+	
2040.46 25		
2048.44[k] 21	(23/2)	
2064.96[g] 20	29/2−	<0.6[@] ps
2069.43 24		
2074.49+x[l] 17	(21/2−)	
2080.55 23		

E(level)[†]	J^π[‡]	$T_{1/2}$[#]
2092.28+x[s] 23	25/2+	
2105.52[b] 17	25/2+	
2135.13[d] 17	25/2+	
2138.80+x[n] 14	27/2−	<0.76[@] ps
2155.95+x[r] 22	25/2+	
2179.9+x?[&] 4	(23/2)	
2184.61+x[q] 20	25/2+	
2191.74[a] 17	25/2+	
2214.47 23		
2215.04[i] 19	25/2−	
2252.6 4		
2273.64+x[s] 24	27/2+	
2304.95[e] 17	27/2+	
2309.79[j] 21		
2331.21+x[l] 20	(23/2−)	
2337.31[f] 18	27/2+	
2367.05+x[r] 22	27/2+	
2374.91[h] 20	27/2−	
2381.21[b] 17	(27/2+)	
2406.12+x[q] 21	27/2+	
2407.9+x?[&] 3	(25/2)	
2428.36+x[n] 14	29/2−	
2462.71[a] 18	27/2+	
2489.64+x[s] 25	29/2+	
2489.68[c] 18	29/2+	
2559.75 25	(27/2)	
2564.3[k] 3	(27/2)	
2570.71[d] 17	29/2+	
2572.94[i] 20	29/2−	
2578.48 25	(27/2)	
2603.79+x[l] 21	(25/2−)	
2604.60+x[r] 23	29/2+	
2626.9+x?[&] 3	(27/2)	
2643.02[b] 18	(29/2+)	
2648.24+x[q] 22	29/2+	
2720.74[g] 21	33/2−	
2722.64+x[n] 15	31/2−	
2726.14 24		
2733.99+x[s] 25	31/2+	
2748.82[a] 19	29/2+	
2780.19[j] 21		
2783.11[e] 18	31/2+	
2809.52[f] 18	31/2+	
2863.03+x[t] 25	(29/2+)	
2864.96+x[r] 23	31/2+	
2913.39+x[q] 23	31/2+	
2942.40[b] 19	(31/2+)	
2955.9 3	(31/2+)	
2990.24[c] 19	33/2+	

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(HI,xnγ) 1995Ba67,1986Wa32,1972Le04 (continued)

^{177}Re Levels (continued)

E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	$T_{1/2}$[#]
2993.14[i] 21	$33/2^-$	4169.70[h] 25	$39/2^-$	
3001.45[h] 22	$31/2^-$	4213.63[c] 21	$41/2^+$	
3002.7+x[s] 3	$33/2^+$	4248.95[i] 23	$(41/2^-)$	
3017.43+x[n] 16	$33/2^-$	4258.8+x[s] 3	$41/2^+$	
3041.11[a] 19	$31/2^+$	4267.45[d] 21	$41/2^+$	
3057.44+x[o] 18	$33/2^-$	4377.08+x[n] 19	$43/2^-$	
3080.5 11		4381.8+x[o] 3	$41/2^-$	
3085.8+x[t] 3	$(31/2^+)$	4391.5+x[r] 3	$(41/2^+)$	
3094.43[d] 18	$33/2^+$	4449.0+x[t] 4	$(41/2^+)$	
3123.8 3	(29/2,31/2)	4458.0+x[v] 8	(41/2)	<1 ns
3144.86+x[r] 24	$33/2^+$	4522.7[j] 3		
3182.1 11		4607.2+x[s] 3	$43/2^+$	
3187.32[b] 20	$33/2^+$	4613.73[e] 25	$43/2^+$	
3198.15+x[q] 25	$33/2^+$	4646.4[f] 3	$(43/2^+)$	
3208.70 22	$(33/2^+)$	4675.66[g] 25	$45/2^-$	
3251.91+x[n] 17	$35/2^-$	4703.1 3		
3291.8+x[s] 3	$35/2^+$	4722.42+x[n] 20	$45/2^-$	
3306.05[j] 25		4736.6+x[r] 4	$(43/2^+)$	
3316.3+x[t] 3	$(33/2^+)$	4748.1+x[o] 3	$(43/2^-)$	
3327.53[e] 19	$35/2^+$	4771.0+x[t] 4	$(43/2^+)$	
3343.88 22	$(33/2^+)$	4781.9+x[v] 8	(43/2)	
3349.49[a] 22	$(33/2^+)$	4915.09[d] 22	$45/2^+$	
3355.97[f] 21	$35/2^+$	4932.86[c] 22	$45/2^+$	
3356.09+x[o] 21	$35/2^-$	4964.0+x[s] 3	$45/2^+$	
3398.79[g] 22	$37/2^-$	5051.7[i] 3	$(45/2^-)$	
3439.9+x[r] 3	$(35/2^+)$	5071.70+x[n] 21	$47/2^-$	
3468.83[b] 21	$35/2^+$	5073.3+x[r] 4	$(45/2^+)$	
3498.68+x[n] 17	$37/2^-$	5106.6+x[t] 4	$(45/2^+)$	
3526.45[i] 22	$37/2^-$	5116.8+x[o] 11	$(45/2^-)$	
3565.27[c] 20	$37/2^+$	5120.5+x[v] 8	(45/2)	
3572.5+x[t] 3	$(35/2^+)$	5332.4+x[s] 3	$47/2^+$	
3584.8[h] 3	$35/2^-$	5341.1[e] 3	$47/2^+$	
3599.4+x[s] 3	$37/2^+$	5375.7[f] 3	$(47/2^+)$	
3660.57[d] 20	$37/2^+$	5400.9[g] 3	$(49/2^-)$	
3685.69+x[o] 20	$37/2^-$	5457.0+x[t] 4	$(47/2^+)$	
3747.2+x[r] 3	$(37/2^+)$	5460.97+x[n] 22	$49/2^-$	
3766.74+x[n] 18	$39/2^-$	5472.2+x[v] 8	(47/2)	
3848.3+x[t] 3	$(37/2^+)$	5523.6+x[o] 4	$(47/2^-)$	
3883.8[j] 3		5617.56[d] 25	$(49/2^+)$	
3903.8+x[u] 8	(37/2)	5703.7[c] 3	$(49/2^+)$	
3922.5+x[s] 3	$39/2^+$	5709.7+x[s] 4	$(49/2^+)$	
3941.08[e] 22	$39/2^+$	5819.6+x[t] 11	$(49/2^+)$	
3969.29[f] 24	$39/2^+$	5835.7+x[v] 9	(49/2)	
4017.80[g] 23	$41/2^-$	5835.74+x[n] 23	$51/2^-$	
4024.82+x[o] 24	$39/2^-$	5890.3[i] 3	$(49/2^-)$	
4063.64+x[n] 19	$41/2^-$	6121.7[e] 4	$(51/2^+)$	
4066.6+x[r] 3	$(39/2^+)$	6138.4[f] 4	$(51/2^+)$	
4117.0 3		6188.8[g] 3	$(53/2^-)$	
4141.0+x[t] 4	$(39/2^+)$	6198.9+x[t] 11	$(51/2^+)$	
4163.2+x[u] 8	(39/2)	6210.9+x[v] 9	(51/2)	

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(HI,xnγ) 1995Ba67,1986Wa32,1972Le04 (continued)

^{177}Re Levels (continued)

E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]
6260.07+x[n] 25	53/2⁻	6646.5+x[n] 3	(55/2⁻)	7167.8[d] 4	(57/2⁺)	8915.4[d] 7	(65/2⁺)
6367.8[d] 3	(53/2⁺)	6756.5[i] 4	(53/2⁻)	7922.7[g] 4	(61/2⁻)	9849.0[d] 10	(69/2⁺)
6547.6[c] 4	(53/2⁺)	6951.2[e] 5	(55/2⁺)	8017.4[d] 6	(61/2⁺)	10824.2[d] 11	(73/2⁺)
6598.1+x[v] 9	(53/2)	7031.7[g] 4	(57/2⁻)	8856.7[g] 11	(65/2⁻)		

[†] From a least-squares fit to Eγ.

[‡] Based on the deduced transition multipolarities determined from the measured angular distributions (1972Le04,1986Wa32) and DCO ratios (1995Ba67), total electron-conversion coefficients deduced from intensity balance consideration, the apparent band structures with both cascade (ΔJ=1) and crossover (ΔJ=2) transitions, and the complex decay pattern.

[#] From 1995Ba67, unless otherwise stated.

[@] From recoil-distance method (RDM) in 2002Ch43.

[&] The placement of this level is tentative.

[a] Band(a): K^{π}=7/2⁺: π7/2[404] ($g_{7/2}$) band. The assignment is supported by the observed in-band properties, such as alignment and g_K-g_R values, and systematics of similar structures in neighboring nuclei. The increase of the g_K-g_R values as spin increases implies a significant mixing with the π5/2[402] ($d_{5/2}$) band.

[b] Band(b): K^{π}=5/2⁺: π5/2[402] ($d_{5/2}$) band. The assignment is supported by the observed in-band properties, such as alignment and g_K-g_R values, and systematics of similar structures in neighboring nuclei. The decrease in the g_K-g_R values as spin increases implies a significant mixing with the π7/2[404] ($g_{7/2}$) band.

[c] Band(c): Low-K band (α=+1/2). See 1995Ba67 for details.

[d] Band(d): Low-K band (α=+1/2). Probable π1/2[660]⊗ν$(i_{13/2})^2$ configuration. The assignment is supported by the observed in-band properties.

[e] Band(e): Low-K band (α=−1/2). See 1995Ba67 for details.

[f] Band(f): Low-K band (α=−1/2). Probable π1/2[660]⊗ν$(i_{13/2})^2$ configuration. The assignment is supported by the observed in-band properties.

[g] Band(g): K^{π}=1/2⁻: π1/2[541] ($h_{9/2}$) (α=+1/2) band. At high spin the band is associated with the π1/2[541]⊗ν$(i_{13/2})^2$ configuration. The assignment is supported by the observed in-band properties, such as alignment and large signature splittings, and systematics of similar structures in neighboring nuclei.

[h] Band(h): K^{π}=1/2⁻: π1/2[541] ($h_{9/2}$) (α=−1/2) band. The assignment is supported by the observed in-band properties, such as alignment and large signature splittings, and systematics of similar structures in neighboring nuclei.

[i] Band(i): Low-K band (α=+1/2). At low spin it is associated with the π1/2[541]⊗ν$(i_{13/2})^2$ configuration; at high spin it evolves to π1/2[541] ($h_{9/2}$) (α=+1/2) orbital. The assignment is supported by the observed in-band properties.

[j] Band(j): Low-K band at 2310 keV.

[k] Band(k): Low-K band at 2049 keV.

[l] Band(B): K^{π}=15/2⁻: probable π9/2[514]⊗ν^2(1/2[521],5/2[512]) configuration.

[m] Band(D): K^{π}=(13/2⁻): π9/2[514]⊗2⁺ (β or γ vibration).

[n] Band(G): K^{π}=9/2⁻: π9/2[514] ($h_{11/2}$) band. The assignment is supported by the observed in-band properties, such as alignment, g_K-g_R values, and systematics of similar structures in neighboring nuclei.

[o] Band(I): π9/2[514] ($h_{11/2}$) orbital coupled to a configuration where a pair of protons occupies the π 1/2[541] ($h_{9/2}$) orbital.

[p] Band(A): K^{π}=15/2⁺: probable π^3(1/2[541],5/2[402],9/2[514]) or π9/2[514]⊗3⁻ (octupole phonon) configuration.

[q] Band(C): K^{π}=17/2⁺: probable π^3(1/2[541],7/2[404],9/2[514]) or π9/2[514]⊗ν^2(1/2[521],7/2[633]) configuration. The assignment is supported by the observed in-band properties, such as alignment, g_K-g_R values, and systematics of similar structures in neighboring nuclei.

[r] Band(J): K^{π}=21/2⁺: configuration=π9/2[514]⊗ν^2(5/2[512],7/2[633]). The assignment is supported by the observed in-band properties, such as alignment, g_K-g_R values, and systematics of similar structures in neighboring nuclei.

[s] Band(F): K^{π}=23/2⁺: configuration=π9/2[514]⊗ν^2(7/2[514],7/2[633]). The assignment is supported by the observed in-band properties, such as alignment, g_K-g_R values, and systematics of similar structures in neighboring nuclei.

[t] Band(E): K^{π}=(29/2⁺): probable configuration= π^3(5/2[402],7/2[404],9/2[514])⊗ν^2(1/2[521],7/2[633]). The assignment is

Continued on next page (footnotes at end of table)

(HI,xnγ) 1995Ba67,1986Wa32,1972Le04 (continued)

^{177}Re Levels (continued)

supported by the observed in-band properties, such as alignment, g_K-g_R values, and systematics of similar structures in neighboring nuclei.

[u] Band(K): K^{π}=(37/2): probable configuration= π^3(1/2[541],7/2[404],9/2[514])⊗ν^4(1/2[521],5/2[512],7/2[514], 7/2[633]). The assignment is tentative.

[v] Band(H): K^{π}=(41/2): probable configuration= π^3(5/2[402],7/2[404],9/2[514])⊗ν^4(1/2[521],5/2[512],7/2[514], 7/2[633]). The assignment is tentative.

γ(^{177}Re)

Mixing ratios values in the Comments section were deduced from the branching ratios and the rotational model, and by assuming pure K. The sign of δ was determined from $\gamma(\theta)$ and it is assumed that it does not change within a given band.

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[#]	Comments
63.5 *10*	>57.4[@]	63.50	9/2$^-$	0.0	5/2$^-$	E2		Mult.: α(exp)=23 *7* from intensity balance considerations (1995Ba67), consistent with the proposed E2 multipolarity. E_γ: The proposed before 77.5γ assignment (1986Wa32 and 1972Le04) is rejected by 1995Ba67. For details see 1995Ba67.
84.7 *1*		84.70	5/2$^+$	0.0	5/2$^-$	[E1]		E_γ: From 1972Le04.
109.00 *10*	104 *7*	1676.11+x	19/2$^+$	1567.11+x	17/2$^+$	M1+E2		Mult.: DCO=1.02 *19* is obtained by gating on the dipole (E1, ΔJ=1) 1086.4 keV γ ray (1995Ba67). α(exp) deduced from intensity balance considerations is consistent with the proposed assignment (1995Ba67).
111.79 *12*	>14[@]	1086.91	13/2$^+$	975.12	(9/2$^+$)	[E2]		
116.3 *10*	<8	2092.28+x	25/2$^+$	1975.86+x	23/2$^+$			
117.2 *10*	<16	2273.64+x	27/2$^+$	2155.95+x	25/2$^+$			
122.87 *10*	>469[@]	207.42	7/2$^+$	84.70	5/2$^+$	M1+E2	+0.19 *9*	Mult.: DCO=0.63 *4* (1995Ba67). A_2=0.01 *3*, A_4=0.03 *3* (1986Wa32); A_2=0.036 *61*, A_4=−0.056 *63* (1972Le04).
124.90 *10*	67 *4*	1567.11+x	17/2$^+$	1442.28+x	15/2$^+$	M1+E2		Mult.: DCO=0.83 *51* (1995Ba67); DCO=1.02 *15* is obtained by gating on the dipole (E1, ΔJ=1) 1086.4 keV γ ray (1995Ba67). α: α(exp)=2.10 *14* from intensity balance considerations (1995Ba67).
129.5 *3*	4.0 *14*	490.35	9/2$^+$	361.00	7/2$^+$	[M1+E2]		
132.43 *10*	124 *6*	2092.28+x	25/2$^+$	1959.85+x	23/2$^+$	M1+E2		Mult.: DCO=0.92 *19* is obtained by gating on the dipole (E1, ΔJ=1) 1086.4 keV γ ray (1995Ba67).
134.70 *11*	47 *3*	1959.85+x	23/2$^+$	1825.16+x	21/2$^+$	(M1)		Mult.: DCO=0.8 *5* is obtained by gating on the dipole (E1, ΔJ=1) 1086.4 keV γ ray (1995Ba67). α(exp) deduced from intensity balance considerations is consistent with the proposed assignment (1995Ba67).
141.45 *10*	133 *8*	1817.67+x	21/2$^+$	1676.11+x	19/2$^+$	M1+E2		Mult.: DCO=1.08 *13* is obtained by gating on the dipole (E1, ΔJ=1) 1086.4 keV γ ray (1995Ba67). α(exp) deduced from intensity balance considerations is consistent with the proposed assignment (1995Ba67).
142.5 *10*	117 *4*	1959.85+x	23/2$^+$	1817.67+x	21/2$^+$	(M1)		Mult.: DCO=1.08 *13* is obtained by gating on the dipole (E1, ΔJ=1) 1086.4 keV γ ray (1995Ba67). α(exp) deduced from intensity balance considerations is consistent with the proposed assignment (1995Ba67).
149.05 *10*	102 *7*	1825.16+x	21/2$^+$	1676.11+x	19/2$^+$	M1		Mult.: DCO=0.98 *24* is obtained by gating on the dipole (E1, ΔJ=1) 1086.4 keV γ ray (1995Ba67). α(exp) deduced from intensity balance considerations is consistent with the proposed assignment (1995Ba67).
150.70 *10*	75 *6*	1975.86+x	23/2$^+$	1825.16+x	21/2$^+$	(M1+E2)		Mult.: DCO=2.5 *5* is obtained by gating on the dipole (E1, ΔJ=1) 1086.4 keV γ ray (1995Ba67). α(exp) deduced from intensity balance considerations is consistent with the proposed assignment (1995Ba67).
151.04 *10*	570 *31*	358.20	9/2$^+$	207.42	7/2$^+$	M1+E2	+0.19 *5*	Mult.: DCO=0.69 *4* (1995Ba67). A_2=0.03 *2*, A_4=0.03 *2* (1986Wa32); A_2=0.031 *29*, A_4=−0.005 *29* (1972Le04). δ: +0.18 *1* assuming K=5/2.
152.59 *14*	19 *3*	642.73	11/2$^+$	490.35	9/2$^+$	[M1+E2]		δ: +0.83 *17* assuming K=7/2.

$^{177}_{75}$Re$_{102}$-6

(HI,xnγ) 1995Ba67,1986Wa32,1972Le04 (continued)

$\gamma(^{177}\mathrm{Re})$ (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	δ [#]	Comments
158.4 *10*	<22.0	1975.86+x	23/2$^+$	1817.67+x	21/2$^+$			
158.58 *22*	3.5 *9*	1965.05	23/2$^+$	1806.68	(21/2$^+$)			
163.72 *10*	>968 [@]	163.65+x	11/2$^-$	0.0+x	9/2$^-$	M1+E2	+0.21 *3*	Mult.: DCO=0.72 *4* (1995Ba67); DCO=1.05 *11* is obtained by gating on the dipole (E1, ΔJ=1) 1086.4 keV γ ray (1995Ba67). A_2=0.08 *1*, A_4=−0.01 *2* (1986Wa32); A_2=0.097 *26*, A_4=−0.025 *27* (1972Le04).
170.2 *10*	10.7 *20*	2135.13	25/2$^+$	1965.05	23/2$^+$			
170.82 *10*	85 *5*	1988.55+x	23/2$^+$	1817.67+x	21/2$^+$	[M1+E2]		δ: δ<0.32, assuming K=17/2.
173.11 *12*	38 *4*	815.41	13/2$^+$	642.73	11/2$^+$	[M1+E2]		δ: +0.49 *5* assuming K=7/2.
176.18 *10*	573 *23*	534.28	11/2$^+$	358.20	9/2$^+$	M1+E2	+0.11 *5*	Mult.: DCO=0.71 *4* (1995Ba67). A_2=−0.06 *3*, A_4=0.00 *4* (1986Wa32); A_2=0.106 *53*, A_4=−0.159 *58* (1972Le04). δ: 0.16 *1* assuming K=5/2.
180.19 *10*	74 *5*	2155.95+x	25/2$^+$	1975.86+x	23/2$^+$	M1+E2		Mult.: DCO=1.15 *16* is obtained by gating on the dipole (E1, ΔJ=1) 1086.4 keV γ ray (1995Ba67).
181.31 *10*	194 *8*	2273.64+x	27/2$^+$	2092.28+x	25/2$^+$	M1+E2		Mult.: DCO=1.15 *16* is obtained by gating on the dipole (E1, ΔJ=1) 1086.4 keV γ ray (1995Ba67).
184.60 *10*	11.7×10^2 *16*	248.10	13/2$^-$	63.50	9/2$^-$	E2		Mult.: α(exp) deduced from intensity balance considerations is consistent with the proposed assignment (1995Ba67). A_2=0.27 *2*, A_4=−0.07 *2* (1986Wa32); A_2=0.352 *24*, A_4=−0.115 *26* (1972Le04).
192.48 *10*	1061 *40*	355.98+x	13/2$^-$	163.65+x	11/2$^-$	M1+E2	+0.23 *4*	Mult.: DCO=0.69 *4* (1995Ba67); A_2=0.10 *2*, A_4=0.00 *2* (1986Wa32); A_2=0.099 *17*, A_4=−0.009 *19* (1972Le04). Iγ contaminated with 193.5γ. δ: +0.21 *1*, assuming K=9/2.
193.52 *10*	542 *20*	727.71	13/2$^+$	534.28	11/2$^+$	M1+E2	+0.23 *4*	Mult.: DCO=0.64 *4* (1995Ba67). A_2=0.10 *2*, A_4=0.00 *4* (1986Wa32); A_2=0.099 *17*, A_4=−0.009 *19* (1972Le04). Iγ contaminated with 192.5γ. δ: +0.15 *1*, assuming K=5/2.
194.63 *13*	49 *6*	1009.45	15/2$^+$	815.41	13/2$^+$	[M1+E2]		
194.7 *10*	42 *2*	3251.91+x	35/2$^-$	3057.44+x	33/2$^-$	M1+E2		Mult.: DCO=0.64 *14* (1995Ba67).
196.0 *10*	<30	2155.95+x	25/2$^+$	1959.85+x	23/2$^+$			
196.10 *10*	86 *5*	2184.61+x	25/2$^+$	1988.55+x	23/2$^+$	[M1+E2]		δ: 0.23 *2*, assuming K=17/2.
202.2 *10*	10.3 *24*	2337.31	27/2$^+$	2135.13	25/2$^+$			
208.22 *10*	359 *13*	935.89	15/2$^+$	727.71	13/2$^+$	M1+E2	+0.27 *12*	Mult.: DCO=0.70 *4* (1995Ba67). A_2=0.17 *7*, A_4=−0.05 *7* (1986Wa32). δ: +0.15 *1*, assuming K=5/2.
211.10 *11*	64 *5*	1220.16	17/2$^+$	1009.45	15/2$^+$	[M1+E2]		δ: +0.32 *2*, assuming K=7/2.
211.33 *10*	59 *4*	2367.05+x	27/2$^+$	2155.95+x	25/2$^+$	[M1+E2]		δ: 0.50 *5*, assuming K=21/2.
213.87 *10*	853 *30*	569.89+x	15/2$^-$	355.98+x	13/2$^-$	M1+E2		Mult.: DCO=0.67 *4* (1995Ba67); A_2=0.038 *40*, A_4=0.060 *42* (1972Le04). δ: +0.21 *1* assuming K=9/2.
215.14 *10*	242 *10*	1151.00	17/2$^+$	935.89	15/2$^+$	M1+E2	+0.18 *5*	Mult.: DCO=0.72 *15* (1995Ba67). A_2=0.02 *2*, A_4=0.04 *2* (1986Wa32). δ: +0.16 *1*, assuming K=5/2.

${}^{177}_{75}\mathrm{Re}_{102}$-7

γ(^{177}Re) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	δ [#]	Comments
216.14 *10*	190 *8*	2489.64+x	29/2+	2273.64+x	27/2+	[M1+E2]		δ: 0.21 *2*, assuming K=23/2.
219.02 *11*	16 *2*	2626.9+x?	(27/2)	2407.9+x?	(25/2)			
221.50 *11*	42 *4*	2406.12+x	27/2+	2184.61+x	25/2+	[M1+E2]		δ: 0.22 *3*, assuming K=17/2.
222.80 *10*	88 *5*	3085.8+x	(31/2+)	2863.03+x	(29/2+)	[M1+E2]		
224.36 *10*	142 *6*	1375.36	19/2+	1151.00	17/2+	M1+E2	+0.4 *4*	Mult.: DCO=0.73 *8* (1995Ba67). A_2=0.32 *16*, A_4=0.02 *18* (1986Wa32). δ: +0.18 *1*, assuming K=5/2.
227.08 *14*	<9	2179.9+x?	(23/2)	1952.8+x?	(21/2)			
227.16 *11*	71 *6*	1446.95	19/2+	1220.16	17/2+	[M1+E2]		δ: +0.26 *1*, assuming K=7/2.
228.00 *17*	20 *3*	2407.9+x?	(25/2)	2179.9+x?	(23/2)			
229.00 *12*	<7	1952.8+x?	(21/2)	1723.8+x?	(19/2)			
230.44 *10*	85 *5*	3316.3+x	(33/2+)	3085.8+x	(31/2+)	[M1+E2]		
231.26 *10*	54 *7*	1318.16	17/2+	1086.91	13/2+	E2		Mult.: DCO=1.03 *11* (1995Ba67).
231.26 *11*	118 *6*	1606.67	21/2+	1375.36	19/2+	M1+E2	+0.23 *5*	Mult.: A_2=0.33 *8*, A_4=−0.45 *9* (1986Wa32). δ: +0.16 *1*, assuming K=5/2.
234.16 *17*	10 *4*	1197.33+x	(15/2−)	963.17+x	(13/2−)	[M1+E2]		
234.41 *10*	134 *6*	3251.91+x	35/2−	3017.43+x	33/2−	M1+E2		Mult.: DCO=0.57 *11* (1995Ba67). δ: +0.05 *1*, assuming K=9/2.
235.37 *10*	671 *23*	805.14+x	17/2−	569.89+x	15/2−	M1+E2	+0.21 *5*	Mult.: DCO=0.65 *4* (1995Ba67); A_2=0.09 *3*, A_4=0.01 *1* (1986Wa32); A_2=0.052 *41*, A_4=0.002 *44* (1972Le04). δ: +0.19 *1*, assuming K=9/2.
236.09 *11*	14.6 *18*	2863.03+x	(29/2+)	2626.9+x?	(27/2)			
237.65 *11*	33 *4*	2604.60+x	29/2+	2367.05+x	27/2+	[M1+E2]		δ: 0.53 *5*, assuming K=21/2.
239.22 *11*	51 *5*	1686.04	21/2+	1446.95	19/2+	[M1+E2]		δ: +0.26 *1*, assuming K=7/2.
241.35 *11*	61 *4*	1848.00	23/2+	1606.67	21/2+	[M1+E2]		δ: +0.19 *1*, assuming K=5/2.
242.09 *11*	44 *4*	2648.24+x	29/2+	2406.12+x	27/2+	[M1+E2]		δ: 0.21 *2*, assuming K=17/2.
242.52 *11*	50 *5*	1829.42+x	(19/2−)	1586.79+x	(17/2−)	[M1+E2]		
244.38 *10*	167 *7*	2733.99+x	31/2+	2489.64+x	29/2+	M1+E2		Mult.: DCO=0.80 *17* (1995Ba67). δ: 0.29 *1*, assuming K=23/2.
244.96 *14*	20 *3*	3187.32	33/2+	2942.40	(31/2+)	[M1+E2]		δ: +0.06 *1*, assuming K=5/2.
245.07 *11*	91 *6*	2074.49+x	(21/2−)	1829.42+x	(19/2−)	[M1+E2]		
246.67 *10*	181 *7*	3498.68+x	37/2−	3251.91+x	35/2−	M1+E2		Mult.: DCO=0.46 *7* (1995Ba67); δ: +0.05 *1*, assuming K=9/2.
247.76 *10*	496 *18*	1052.88+x	19/2−	805.14+x	17/2−	M1+E2	+0.49 *11*	Mult.: DCO=0.74 *4* (1995Ba67); A_2=0.41 *5*, A_4=−0.02 *6* (1986Wa32); δ: +0.19 *1*, assuming K=9/2.
248.24 *12*	44 *5*	1934.58	23/2+	1686.04	21/2+	[M1+E2]		δ: +0.20 *1*, assuming K=7/2.
250.5 [b]		1817.67+x	21/2+	1567.11+x	17/2+	[E2]		
256.29 *10*	80 *4*	3572.5+x	(35/2+)	3316.3+x	(33/2+)	[M1+E2]		
256.43 *11*	60 *4*	2331.21+x	(23/2−)	2074.49+x	(21/2−)	[M1+E2]		
257.05 *11*	51 *5*	2191.74	25/2+	1934.58	23/2+	[M1+E2]		δ: +0.18 *1*, assuming K=7/2.
257.50 *12*	31 *3*	2105.52	25/2+	1848.00	23/2+	[M1+E2]		δ: +0.20 *1*, assuming K=5/2.
259.35 *11*	28 *3*	4163.2+x	(39/2)	3903.8+x	(37/2)			
260.20 *11*	21 *3*	2864.96+x	31/2+	2604.60+x	29/2+	[M1+E2]		δ: 0.80 *11*, assuming K=21/2.
261.32 *16*	17 *3*	2643.02	(29/2+)	2381.21	(27/2+)	[M1+E2]		δ: +0.17 *1*, assuming K=5/2.

From ENSDF

$^{177}_{75}Re_{102}$-8

γ(^{177}Re) (continued)

E_γ †	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult. ‡	δ #	Comments
262.71 *10*	366 *13*	1315.63+x	21/2⁻	1052.88+x	19/2⁻	M1+E2	+0.19 *7*	Mult.: DCO=0.67 *4* (1995Ba67); A_2=0.07 *6*, A_4=0.03 *6* (1986Wa32). δ: +0.20 *1*, assuming K=9/2.
264.11 *16*	13 *3*	1461.09+x	(17/2⁻)	1197.33+x	(15/2⁻)	[M1+E2]		δ: δ<0.11, assuming K=9/2.
264.88 *10*	75 *4*	1640.16	21/2⁺	1375.36	19/2⁺	M1(+E2)		Mult.: DCO=0.72 *8* (1995Ba67).
265.14 *11*	35 *3*	2913.39+x	31/2⁺	2648.24+x	29/2⁺	[M1+E2]		δ: 0.24 *2*, assuming K=17/2.
266.71 *10*	308 *11*	1582.43+x	23/2⁻	1315.63+x	21/2⁻	M1+E2		Mult.: DCO=0.56 *6* (1995Ba67); A_2=−0.06 *6*, A_4=0.15 *5* (1986Wa32); δ: +0.17 *1*, assuming K=9/2.
268.15 *10*	136 *6*	3766.74+x	39/2⁻	3498.68+x	37/2⁻	[M1+E2]		δ: +0.08 *1*, assuming K=9/2.
268.69 *10*	109 *5*	3002.7+x	33/2⁺	2733.99+x	31/2⁺	M1+E2		Mult.: DCO=0.92 *14* (1995Ba67). δ: 0.43 *2*, assuming K=23/2.
270.95 *15*	21 *4*	2462.71	27/2⁺	2191.74	25/2⁺	[M1+E2]		δ: +0.24 *2*, assuming K=7/2.
272.24 *12*	37 *4*	2603.79+x	(25/2⁻)	2331.21+x	(23/2⁻)	[M1+E2]		δ: 0.28 *3*, assuming K=15/2.
273.45 *10*	113 *9*	358.20	9/2⁺	84.70	5/2⁺	[E2]		
275.58 *11*	50 *4*	2381.21	(27/2⁺)	2105.52	25/2⁺	[M1+E2]		δ: +0.13 *1*, assuming K=5/2.
275.81 *10*	70 *4*	3848.3+x	(37/2⁺)	3572.5+x	(35/2⁺)	[M1+E2]		
276.18 *11*	>45.6 @	361.00	7/2⁺	84.70	5/2⁺	M1(+E2)		Mult.: DCO=0.63 *19* (1995Ba67).
276.95 *10*	253 *9*	1859.45+x	25/2⁻	1582.43+x	23/2⁻	M1+E2	+0.19 *11*	Mult.: DCO=0.73 *6* (1995Ba67); A_2=0.04 *6*, A_4=−0.01 *7* (1986Wa32); δ: +0.17 *1*, assuming K=7/2.
278.86 *12*	27 *4*	1885.82	23/2⁺	1606.67	21/2⁺			
279.35 *10*	209 *8*	2138.80+x	27/2⁻	1859.45+x	25/2⁻	M1+E2	+0.19 *7*	Mult.: DCO=0.75 *6* (1995Ba67); A_2=0.09 *6*, A_4=−0.01 *7* (1986Wa32). δ: +0.16 *1*, assuming K=9/2.
279.80 *12*	29 *3*	3144.86+x	33/2⁺	2864.96+x	31/2⁺	[M1+E2]		δ: 0.46 *4*, assuming K=21/2.
280.83 *12*	62 *7*	815.41	13/2⁺	534.28	11/2⁺	M1(+E2)		Mult.: DCO=0.42 *8* (1995Ba67).
281.46 *15*	35 *6*	642.73	11/2⁺	361.00	7/2⁺	[E2]		
281.51 *12*	17 *3*	3468.83	35/2⁺	3187.32	33/2⁺	[M1+E2]		δ: +0.07 *1*, assuming K=5/2.
281.83 *11*	89 *8*	1009.45	15/2⁺	727.71	13/2⁺	M1(+E2)		Mult.: DCO=0.42 *8* (1995Ba67). δ: +0.40 *3*, assuming K=7/2.
283.00 *11*	53 *17*	490.35	9/2⁺	207.42	7/2⁺	M1(+E2)		Mult.: DCO=0.62 *7* (1995Ba67).
284.38 *11*	75 *6*	1220.16	17/2⁺	935.89	15/2⁺	M1(+E2)		Mult.: DCO=0.62 *7* (1995Ba67).
284.78 *11*	81 *10*	642.73	11/2⁺	358.20	9/2⁺	M1(+E2)		Mult.: DCO=0.62 *7* (1995Ba67).
284.79 *12*	27 *3*	3198.15+x	33/2⁺	2913.39+x	31/2⁺	[M1+E2]		δ: 0.15 *3*, assuming K=17/2.
284.79 *11*	7.2 *14*	1965.05	23/2⁺	1680.28	19/2⁺	[E2]		
288.98 *10*	75 *4*	3291.8+x	35/2⁺	3002.7+x	33/2⁺	[M1+E2]		δ: 0.40 *2*, assuming K=23/2.
289.45 *10*	169 *7*	2428.36+x	29/2⁻	2138.80+x	27/2⁻	M1+E2	+0.16 *9*	Mult.: DCO=0.76 *8* (1995Ba67); A_2=0.02 *7*, A_4=0.03 *7* (1986Wa32). δ: +0.17 *1*, assuming K=9/2.
291.54 *11*	41 *5*	1514.65	19/2⁺	1223.12	15/2⁺	E2		Mult.: DCO=1.37 *26* (1995Ba67).
292.34 *12*	29 *4*	3041.11	31/2⁺	2748.82	29/2⁺	[M1+E2]		δ: +0.13 *1*, assuming K=7/2.
292.60 *10*	49 *3*	4141.0+x	(39/2⁺)	3848.3+x	(37/2⁺)	[M1+E2]		
294.07 *10*	112 *6*	2722.64+x	31/2⁻	2428.36+x	29/2⁻	(M1+E2)		Mult.: A_2=−0.09 *5*, A_4=0.05 *7* (1986Wa32); Iγ contaminated with 294.8γ. δ: +0.16 *1*, assuming K=9/2.
294.79 *12*	23.1 *25*	4458.0+x	(41/2)	4163.2+x	(39/2)	[M1]		
294.80 *10*	122 *6*	3017.43+x	33/2⁻	2722.64+x	31/2⁻	(M1+E2)		Mult.: A_2=−0.09 *5*, A_4=0.05 *7* (1986Wa32); Iγ contaminated with

$^{177}_{75}Re_{102}$-9

γ(^{177}Re) (continued)

E_γ †	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult. ‡	Comments
							294.1γ.
							δ: +0.13 *1*, assuming K=9/2.
295.73 *12*	36 *5*	1446.95	19/2$^+$	1151.00	17/2$^+$	M1(+E2)	Mult.: DCO=0.50 *19* (1995Ba67).
296.94 *10*	83 *4*	4063.64+x	41/2$^-$	3766.74+x	39/2$^-$	M1+E2	Mult.: DCO=0.84 *16* (1995Ba67). δ: +0.08 *1*, assuming K=9/2.
298.83 *16*	15 *3*	3356.09+x	35/2$^-$	3057.44+x	33/2$^-$	M1+E2	Mult.: DCO=0.92 *33* (1995Ba67).
299.29 *16*	15 *3*	2942.40	(31/2$^+$)	2643.02	(29/2$^+$)	[M1+E2]	δ: +0.16 *1*, assuming K=5/2.
304.17 *10*	2067 *68*	552.21	17/2$^-$	248.10	13/2$^-$	E2	Mult.: DCO=1.04 *4* (1995Ba67); A_2=0.29 *4*, A_4=−0.08 *4* (1986Wa32); A_2=0.367 *29*, A_4=−0.124 *34* (1972Le04).
307.57 *11*	61 *4*	3599.4+x	37/2$^+$	3291.8+x	35/2$^+$	[M1+E2]	δ: 0.38 *2*, assuming K=23/2.
307.97 *11*	37 *3*	4449.0+x	(41/2$^+$)	4141.0+x	(39/2$^+$)	[M1+E2]	δ: 0.18 *3*, assuming K=29/2.
310.32 *14*	19 *4*	1686.04	21/2$^+$	1375.36	19/2$^+$	M1(+E2)	Mult.: DCO=0.19 *25* (1995Ba67).
313.16 *25*	<24.0	1988.55+x	23/2$^+$	1676.11+x	19/2$^+$	[E2]	
313.36 *10*	75 *4*	4377.08+x	43/2$^-$	4063.64+x	41/2$^-$	[M1+E2]	δ: +0.08 *1*, assuming K=9/2.
319.32 *23*	13 *4*	880.64	15/2$^-$	561.34	11/2$^-$	[E2]	
320.0 *10*	10 *2*	2809.52	31/2$^+$	2489.68	29/2$^+$		
321.99 *10*	158 *8*	1640.16	21/2$^+$	1318.16	17/2$^+$	E2	Mult.: DCO=0.91 *7* (1995Ba67).
322.00 *11*	34 *3*	4771.0+x	(43/2$^+$)	4449.0+x	(41/2$^+$)	[M1+E2]	δ: 0.19 *3*, assuming K=29/2.
323.19 *12*	31 *3*	3922.5+x	39/2$^+$	3599.4+x	37/2$^+$	[M1+E2]	δ: 0.49 *4*, assuming K=23/2.
323.97 *12*	33 *6*	4781.9+x	(43/2)	4458.0+x	(41/2)		
325.01 *11*	79 *8*	815.41	13/2$^+$	490.35	9/2$^+$	[E2]	
326.68 *10*	235 *12*	534.28	11/2$^+$	207.42	7/2$^+$	E2	Mult.: DCO=0.95 *6* (1995Ba67). A_2=0.24 *4*, A_4=−0.07 *4* (1986Wa32);
327.97 *12*	43 *5*	1934.58	23/2$^+$	1606.67	21/2$^+$		
328.35 *15*	35 *7*	2135.13	25/2$^+$	1806.68	(21/2$^+$)		
329.83 *20*	17 *3*	3685.69+x	37/2$^-$	3356.09+x	35/2$^-$	[M1+E2]	δ: 0.10 *2*, assuming K=9/2.
331.5 *10*	10.8 *20*	3903.8+x	(37/2)	3572.5+x	(35/2$^+$)		
335.57 *12*	23 *2*	5106.6+x	(45/2$^+$)	4771.0+x	(43/2$^+$)	[M1+E2]	δ: δ<0.16, assuming K=29/2.
336.60 *12*	28 *3*	4258.8+x	41/2$^+$	3922.5+x	39/2$^+$	[M1+E2]	δ: 0.41 *3*, assuming K=23/2.
337.22 *14*	16.2 *22*	3327.53	35/2$^+$	2990.24	33/2$^+$	M1(+E2)	Mult.: DCO=0.47 *12* (1995Ba67).
338.59 *14*	25 *4*	5120.5+x	(45/2)	4781.9+x	(43/2)		
338.9 *10*	21 *2*	3356.09+x	35/2$^-$	3017.43+x	33/2$^-$	[M1+E2]	
343.9 *10*	14 *3*	2191.74	25/2$^+$	1848.00	23/2$^+$		
345.24 *11*	46 *3*	4722.42+x	45/2$^-$	4377.08+x	43/2$^-$	[M1+E2]	δ: +0.09 *1*, assuming K=9/2.
348.20 *15*	13 *3*	4607.2+x	43/2$^+$	4258.8+x	41/2$^+$	[M1+E2]	δ: 0.55 *7*, assuming K=23/2.
349.32 *11*	30 *3*	5071.70+x	47/2$^-$	4722.42+x	45/2$^-$	[M1+E2]	δ: +0.10 *1*, assuming K=9/2.
350.34 *14*	10 *2*	5457.0+x	(47/2$^+$)	5106.6+x	(45/2$^+$)	[M1+E2]	δ: 0.26 *6*, assuming K=29/2.
351.64 *13*	20 *3*	5472.2+x	(47/2)	5120.5+x	(45/2)		
355.87 *10*	156 *9*	355.98+x	13/2$^-$	0.0+x	9/2$^-$	E2	Mult.: DCO=2.0 *9* is obtained by gating on the dipole (E1, ΔJ=1) 1086.4 keV γ ray (1995Ba67).
355.95 *22*	8.3 *21*	1851.02	21/2$^-$	1494.82	17/2$^-$	[E2]	
357.05 *14*	16 *3*	4964.0+x	45/2$^+$	4607.2+x	43/2$^+$	[M1+E2]	δ: 0.38 *3*, assuming K=23/2.
357.2 *10*	12 *4*	2462.71	27/2$^+$	2105.52	25/2$^+$		
357.82 *11*	41 *4*	2572.94	29/2$^-$	2215.04	25/2$^-$	[E2]	

γ(^{177}Re) (continued)

E_γ †	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult. ‡	Comments
358.6 *10*	4 *3*	4381.8+x	41/2⁻	4024.82+x	39/2⁻	[M1+E2]	δ: 0.26 *9*, assuming K=9/2.
362 *3*	4 *2*	5819.6+x	(49/2⁺)	5457.0+x	(47/2⁺)	[M1+E2]	δ: δ<0.34, assuming K=29/2.
363.60 *18*	14 *3*	5835.7+x	(49/2)	5472.2+x	(47/2)		
363.97 *14*	25 *4*	2215.04	25/2⁻	1851.02	21/2⁻	[E2]	
366.60 *11*	117 *9*	1009.45	15/2⁺	642.73	11/2⁺	[E2]	
366.80 *17*	23 *5*	2184.61+x	25/2⁺	1817.67+x	21/2⁺	[E2]	
367.9 *10*	35 *4*	2748.82	29/2⁺	2381.21	(27/2⁺)		
368.44 *11*	59 *6*	1829.42+x	(19/2⁻)	1461.09+x	(17/2⁻)		
368.91 *12*	18 *3*	5332.4+x	47/2⁺	4964.0+x	45/2⁺	[M1+E2]	δ: 0.28 *4*, assuming K=23/2.
369.43 *10*	350 *15*	727.71	13/2⁺	358.20	9/2⁺	E2	Mult.: DCO=0.99 *7* (1995Ba67).
371.19 *11*	74 *5*	1885.82	23/2⁺	1514.65	19/2⁺	[E2]	
372.36 *12*	49 *6*	2337.31	27/2⁺	1965.05	23/2⁺	E2	Mult.: DCO=0.93 *13* (1995Ba67).
374.75 *12*	18.4 *24*	5835.74+x	51/2⁻	5460.97+x	49/2⁻	[M1+E2]	δ: +0.08 *1*, assuming K=9/2.
375.12 *14*	12.0 *21*	6210.9+x	(51/2)	5835.7+x	(49/2)		
376.0 *10*	9 *2*	3941.08	39/2⁺	3565.27	37/2⁺	M1(+E2)	Mult.: DCO=0.53 *22* (1995Ba67).
386.28 *15*	13.1 *22*	6646.5+x	(55/2⁻)	6260.07+x	53/2⁻	[M1+E2]	δ: +0.06 *1*, assuming K=9/2.
387.24 *19*	8.8 *18*	6598.1+x	(53/2)	6210.9+x	(51/2)		
389.0 *10*		5460.97+x	49/2⁻	5071.70+x	47/2⁻	[M1+E2]	
389.35 *17*	15 *4*	1586.79+x	(17/2⁻)	1197.33+x	(15/2⁻)		
391.01 *13*	30 *4*	2367.05+x	27/2⁺	1975.86+x	23/2⁺	[E2]	
397.07 *17*	18 *3*	2489.64+x	29/2⁺	2092.28+x	25/2⁺	[E2]	
399.59 *10*	357 *14*	2039.94	25/2⁺	1640.16	21/2⁺	E2	Mult.: DCO=0.95 *10* (1995Ba67). A_2=0.21 *4*, A_4=−0.08 *4* (1986Wa32). Iγ contaminated with 401.6γ.
401.63 *10*	384 *15*	935.89	15/2⁺	534.28	11/2⁺	E2	Mult.: A_2=0.21 *4*, A_4=−0.08 *4* (1986Wa32). Iγ contaminated with 399.6γ.
404.54 *10*	161 *10*	1220.16	17/2⁺	815.41	13/2⁺	[E2]	
406.13 *10*	281 *12*	569.89+x	15/2⁻	163.65+x	11/2⁻	E2	Mult.: DCO=0.98 *10* (1995Ba67); A_2=0.25 *2*, A_4=−0.05 *2* (1986Wa32).
413.19 *10*	1690 *54*	965.58	21/2⁻	552.21	17/2⁻	E2	Mult.: A_2=0.28 *3*, A_4=−0.08 *3* (1986Wa32); A_2=0.233 *47*, A_4=−0.048 *51* (1972Le04).
415.96 *16*	38 *6*	1296.64	19/2⁻	880.64	15/2⁻	[E2]	
417.62 *19*	15 *3*	2406.12+x	27/2⁺	1988.55+x	23/2⁺	[E2]	
419.18 *10*	102 *6*	2304.95	27/2⁺	1885.82	23/2⁺	E2	Mult.: DCO=0.98 *10* (1995Ba67).
419.86 *12*	52 *5*	1640.16	21/2⁺	1220.16	17/2⁺	[E2]	
420.07 *11*	56 *4*	2993.14	33/2⁻	2572.94	29/2⁻	[E2]	
423.22 *10*	424 *16*	1151.00	17/2⁺	727.71	13/2⁺	E2	Mult.: A_2=0.21 *3*, A_4=−0.11 *4* (1986Wa32).
423.9 *3*	6.1 *25*	6260.07+x	53/2⁻	5835.74+x	51/2⁻	[M1+E2]	δ: +0.14 *3*, assuming K=9/2.
433.29 *10*	110 *5*	2039.94	25/2⁺	1606.67	21/2⁺	E2	Mult.: DCO=0.91 *9* (1995Ba67).
435.6 *10*	28 *8*	642.73	11/2⁺	207.42	7/2⁺	[E2]	
435.73 *11*	65 *5*	2570.71	29/2⁺	2135.13	25/2⁺	E2	Mult.: DCO=0.97 *11* (1995Ba67).
437.48 *10*	174.1 *10*	1446.95	19/2⁺	1009.45	15/2⁺	[E2]	
439.41 *10*	401 *15*	1375.36	19/2⁺	935.89	15/2⁺	E2	Mult.: DCO=1.00 *6* (1995Ba67).
448.41 *14*	31 *5*	2604.60+x	29/2⁺	2155.95+x	25/2⁺	[E2]	
449.08 *10*	325 *13*	805.14+x	17/2⁻	355.98+x	13/2⁻	(E2)	Mult.: A_2=0.24 *2*, A_4=−0.045 *20* (1986Wa32). Iγ contaminated with 449.6γ.
449.60 *10*	270 *11*	2489.68	29/2⁺	2039.94	25/2⁺	E2	Mult.: DCO=1.18 *20* (1995Ba67). A_2=0.24 *2*, A_4=−0.045 *20* (1986Wa32). Iγ contaminated with 449.1γ.

$^{177}_{75}Re_{102}$-11

γ(^{177}Re) (continued)

E_γ †	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult. ‡	Comments
453.0 *4*	<5	3316.3+x	(33/2$^+$)	2863.03+x	(29/2$^+$)	[E2]	
455.0 *11*	<5	2407.9+x?	(25/2)	1952.8+x?	(21/2)		
455.1 *10*	<5	2863.03+x	(29/2$^+$)	2407.9+x?	(25/2)		
455.62 *10*	347 *14*	1606.67	21/2$^+$	1151.00	17/2$^+$	E2	Mult.: DCO=0.94 *6* (1995Ba67). A_2=0.36 *10*, A_4=−0.15 *10* (1986Wa32).
456.98 *11*	73 *5*	2304.95	27/2$^+$	1848.00	23/2$^+$	E2	Mult.: DCO=0.86 *12* (1995Ba67).
457.3 *10*	32 *8*	815.41	13/2$^+$	358.20	9/2$^+$	[E2]	
458.72 *21*	12 *3*	2309.79		1851.02	21/2$^-$		
460.32 *11*	49 *4*	2733.99+x	31/2$^+$	2273.64+x	27/2$^+$	[E2]	
463.61 *17*	19 *4*	2648.24+x	29/2$^+$	2184.61+x	25/2$^+$	[E2]	
465.87 *10*	161 *9*	1686.04	21/2$^+$	1220.16	17/2$^+$	[E2]	
470.49 *11*	57 *4*	2780.19		2309.79			
472.14 *11*	91 *7*	2809.52	31/2$^+$	2337.31	27/2$^+$	[E2]	
472.50 *10*	296 *12*	1848.00	23/2$^+$	1375.36	19/2$^+$	E2	Mult.: DCO=1.12 *6* (1995Ba67). A_2=0.32 *4*, A_4=−0.16 *4* (1986Wa32).
475.2 *10*	40 *7*	1009.45	15/2$^+$	534.28	11/2$^+$	[E2]	
478.19 *10*	102 *6*	2783.11	31/2$^+$	2304.95	27/2$^+$	E2	Mult.: DCO=1.02 *6* (1995Ba67).
478.90 *20*	8.8 *15*	1442.28+x	15/2$^+$	963.17+x	(13/2$^-$)	[E1]	
481.47 *12*	49 *4*	3498.68+x	37/2$^-$	3017.43+x	33/2$^-$	[E2]	
482.99 *10*	353 *14*	1052.88+x	19/2$^-$	569.89+x	15/2$^-$	E2	Mult.: A_2=0.28 *4*, A_4=−0.08 *4* (1986Wa32).
487.69 *11*	113 *8*	1934.58	23/2$^+$	1446.95	19/2$^+$	[E2]	
489.14 *12*	44 *5*	2337.31	27/2$^+$	1848.00	23/2$^+$	E2	Mult.: DCO=1.20 *10* (1995Ba67).
489.26 *10*	150 *8*	1640.16	21/2$^+$	1151.00	17/2$^+$	E2	Mult.: DCO=1.15 *11* (1995Ba67). A_2=0.35 *6*, A_4=−0.21 *7* (1986Wa32).
491.19 *13*	28 *3*	4017.80	41/2$^-$	3526.45	37/2$^-$	[E2]	
492.4 *10*	30 *6*	1220.16	17/2$^+$	727.71	13/2$^+$	[E2]	
495.17 *11*	68 *7*	2135.13	25/2$^+$	1640.16	21/2$^+$	E2	Mult.: DCO=0.92 *28* (1995Ba67).
497.86 *23*	>13.4@	561.34	11/2$^-$	63.50	9/2$^-$		
497.87 *24*	<2.0	1461.09+x	(17/2$^-$)	963.17+x	(13/2$^-$)	[E2]	
497.96 *11*	52 *5*	2864.96+x	31/2$^+$	2367.05+x	27/2$^+$	[E2]	
498.90 *10*	186 *9*	2105.52	25/2$^+$	1606.67	21/2$^+$	E2	Mult.: A_2=0.25 *3*, A_4=−0.12 *3* (1986Wa32). Iγ contaminated with 500.6γ.
500.55 *10*	202 *9*	2990.24	33/2$^+$	2489.68	29/2$^+$	E2	Mult.: DCO=1.01 *6* (1995Ba67). A_2=0.25 *3*, A_4=−0.12 *3* (1986Wa32). Iγ contaminated with 498.8γ.
502.58 *16*	29 *4*	1318.16	17/2$^+$	815.41	13/2$^+$		
502.88 *12*	62 *7*	1799.35	23/2$^-$	1296.64	19/2$^-$	[E2]	
504.65 *12*	46 *4*	2809.52	31/2$^+$	2304.95	27/2$^+$	E2	Mult.: DCO=0.78 *30* (1995Ba67).
505.84 *11*	124 *8*	2191.74	25/2$^+$	1686.04	21/2$^+$	[E2]	
507.33 *15*	26 *5*	2913.39+x	31/2$^+$	2406.12+x	27/2$^+$	[E2]	
508.91 *10*	1378 *44*	1474.43	25/2$^-$	965.58	21/2$^-$	E2	Mult.: DCO=1.10 *5* (1995Ba67).
510.48 *10*	379 *15*	1315.63+x	21/2$^-$	805.14+x	17/2$^-$	E2	Mult.: DCO=0.93 *6* (1995Ba67).
510.77 *11*	93 *7*	1885.82	23/2$^+$	1375.36	19/2$^+$		
511.1 *10*	37 *8*	1446.95	19/2$^+$	935.89	15/2$^+$	[E2]	
513.04 *11*	98 *6*	3002.7+x	33/2$^+$	2489.64+x	29/2$^+$	[E2]	
514.78 *10*	96 *5*	3766.74+x	39/2$^-$	3251.91+x	35/2$^-$	[E2]	
515.79 *15*	29 *5*	2564.3	(27/2)	2048.44	(23/2)	[E2]	
523.84 *10*	165 *8*	3094.43	33/2$^+$	2570.71	29/2$^+$	E2	Mult.: DCO=1.12 *12* (1995Ba67).

From ENSDF

$^{177}_{75}Re_{102}$-12

(HI,xnγ) 1995Ba67,1986Wa32,1972Le04 (continued)

γ(^{177}Re) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	Comments
525.86 12	52 4	3306.05		2780.19		[E2]	
526.43 14	25 4	3468.83	35/2$^+$	2942.40	(31/2$^+$)	E2	Mult.: DCO=0.83 13 (1995Ba67).
528.10 11	109 8	2462.71	27/2$^+$	1934.58	23/2$^+$	[E2]	
529.13 12	58 6	3251.91+x	35/2$^-$	2722.64+x	31/2$^-$	[E2]	
529.61 10	326 14	1582.43+x	23/2$^-$	1052.88+x	19/2$^-$	E2	Mult.: DCO=1.04 7 (1995Ba67); A_2=0.24 2, A_4=−0.12 2 (1986Wa32).
529.98 17	28 6	2603.79+x	(25/2$^-$)	2074.49+x	(21/2$^-$)	[E2]	
530.75 11	104 7	2570.71	29/2$^+$	2039.94	25/2$^+$	E2	Mult.: DCO=0.99 8 (1995Ba67).
533.14 12	50 4	3526.45	37/2$^-$	2993.14	33/2$^-$	[E2]	
533.17 10	142 7	2381.21	(27/2$^+$)	1848.00	23/2$^+$	[E2]	
537.64 10	130 7	2643.02	(29/2$^+$)	2105.52	25/2$^+$	[E2]	
540.36 12	44 5	3144.86+x	33/2$^+$	2604.60+x	29/2$^+$	[E2]	
543.85 10	329 12	1859.45+x	25/2$^-$	1315.63+x	21/2$^-$	E2	Mult.: DCO=1.02 7 (1995Ba67); A_2=0.29 3, A_4=−0.04 3 (1986Wa32).
544.24 14	36 5	3187.32	33/2$^+$	2643.02	(29/2$^+$)	[E2]	
544.46 11	83 6	3327.53	35/2$^+$	2783.11	31/2$^+$	E2	Mult.: DCO=1.03 9 (1995Ba67).
546.45 11	116 7	3355.97	35/2$^+$	2809.52	31/2$^+$	E2	Mult.: DCO=1.05 8 (1995Ba67).
546.72 17	30 6	2021.16		1474.43	25/2$^-$		
549.7 3	11 4	3198.15+x	33/2$^+$	2648.24+x	29/2$^+$	[E2]	
554.2[b]		4458.0+x	(41/2)	3903.8+x	(37/2)		
556.40 10	303 12	2138.80+x	27/2$^-$	1582.43+x	23/2$^-$	E2	Mult.: DCO=0.95 8 (1995Ba67); A_2=0.24 11, A_4=−0.11 12 (1986Wa32).
557.11 11	121 8	2748.82	29/2$^+$	2191.74	25/2$^+$		
557.77 11	79 5	3291.8+x	35/2$^+$	2733.99+x	31/2$^+$	[E2]	
561.28 11	80 6	2942.40	(31/2$^+$)	2381.21	(27/2$^+$)	[E2]	
564.91 11	64 4	4063.64+x	41/2$^-$	3498.68+x	37/2$^-$	[E2]	
565.68 12	56 5	3208.70	(33/2$^+$)	2643.02	(29/2$^+$)	[E2]	
566.02 16	35 7	2040.46		1474.43	25/2$^-$		
566.13 10	142 8	3660.57	37/2$^+$	3094.43	33/2$^+$	E2	Mult.: DCO=0.91 6 (1995Ba67).
568.87 10	308 12	2428.36+x	29/2$^-$	1859.45+x	25/2$^-$	E2	Mult.: DCO=1.02 6 (1995Ba67); A_2=0.31 8, A_4=−0.07 9 (1986Wa32).
574.66 21	65 6	2955.9	(31/2$^+$)	2381.21	(27/2$^+$)	E2	Mult.: DCO=0.86 11 (1995Ba67).
574.90 12	37 5	3439.9+x	(35/2$^+$)	2864.96+x	31/2$^+$		
575.05 10	147 7	3565.27	37/2$^+$	2990.24	33/2$^+$	E2	Mult.: DCO=1.10 7 (1995Ba67).
575.59 12	84 8	2374.91	27/2$^-$	1799.35	23/2$^-$	[E2]	
577.78 12	47 5	3883.8		3306.05		[E2]	
578.36 11	62 6	3041.11	31/2$^+$	2462.71	27/2$^+$		
583.93 20	22 8	3584.8	35/2$^-$	3001.45	31/2$^-$	[E2]	
583.98 10	220 9	2722.64+x	31/2$^-$	2138.80+x	27/2$^-$	E2	Mult.: DCO=1.17 15 (1995Ba67); A_2=0.25 3, A_4=−0.01 3 (1986Wa32).
584.0 5	17 7	4169.70	39/2$^-$	3584.8	35/2$^-$	[E2]	
587.3 10	10.6 20	3903.8+x	(37/2)	3316.3+x	(33/2$^+$)		
589.14 10	185 8	3017.43+x	33/2$^-$	2428.36+x	29/2$^-$	[E2]	
589.18 12	28 4	2863.03+x	(29/2$^+$)	2273.64+x	27/2$^+$	[M1+E2]	
590.45 10	997 32	2064.96	29/2$^-$	1474.43	25/2$^-$	E2	Mult.: DCO=1.13 5 (1995Ba67); A_2=0.19 2, A_4=−0.09 7 (1986Wa32); A_2=0.353 59, A_4=−0.039 63 (1972Le04).
595.00 15	40 7	2069.43		1474.43	25/2$^-$		
595.06 12	46 5	3343.88	(33/2$^+$)	2748.82	29/2$^+$		

$^{177}_{75}Re_{102}$-13

γ(^{177}Re) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	Comments
596.83 *11*	76 *5*	3599.4+x	37/2$^+$	3002.7+x	33/2$^+$	[E2]	
600.67 *11*	83 *6*	3349.49	(33/2$^+$)	2748.82	29/2$^+$		
600.7 *3*	7 *3*	4449.0+x	(41/2$^+$)	3848.3+x	(37/2$^+$)	[E2]	
602.36 *12*	48 *5*	3747.2+x	(37/2$^+$)	3144.86+x	33/2$^+$		
604.53 *13*	36 *4*	3094.43	33/2$^+$	2489.68	29/2$^+$	[E2]	
606.12 *13*	62 *7*	2080.55		1474.43	25/2$^-$		
606.86 *10*	121 *7*	4267.45	41/2$^+$	3660.57	37/2$^+$	E2	Mult.: DCO=1.00 *8* (1995Ba67).
610.35 *11*	64 *4*	4377.08+x	43/2$^-$	3766.74+x	39/2$^-$	[E2]	
613.32 *11*	81 *7*	3969.29	39/2$^+$	3355.97	35/2$^+$	E2	Mult.: DCO=1.21 *11* (1995Ba67).
613.55 *11*	78 *6*	3941.08	39/2$^+$	3327.53	35/2$^+$	E2	Mult.: DCO=1.4 *2* (1995Ba67).
619.10 *10*	280 *10*	4017.80	41/2$^-$	3398.79	37/2$^-$	E2	Mult.: DCO=1.17 *6* (1995Ba67); A_2=0.44 *16*, A_4=−0.05 *18* (1986Wa32).
623.69 *21*	13 *4*	1586.79+x	(17/2$^-$)	963.17+x	(13/2$^-$)	[E2]	
626.68 *11*	94 *8*	3001.45	31/2$^-$	2374.91	27/2$^-$	[E2]	
626.74 *13*	46 *5*	4066.6+x	(39/2$^+$)	3439.9+x	(35/2$^+$)		
627.7 *3*	16 *4*	3685.69+x	37/2$^-$	3057.44+x	33/2$^-$	[E2]	
629.09 *11*	107 *7*	3057.44+x	33/2$^-$	2428.36+x	29/2$^-$	E2	Mult.: DCO=1.13 *12* (1995Ba67).
630.3 *3*	9 *3*	4771.0+x	(43/2$^+$)	4141.0+x	(39/2$^+$)	[E2]	
630.67 *11*	72 *5*	3922.5+x	39/2$^+$	3291.8+x	35/2$^+$	[E2]	
632.51 *14*	65 *13*	880.64	15/2$^-$	248.10	13/2$^-$		
633.5 *10*	73 *3*	3356.09+x	35/2$^-$	2722.64+x	31/2$^-$	E2	Mult.: DCO=0.93 *9* (1995Ba67).
637.06 *12*	40 *4*	1442.28+x	15/2$^+$	805.14+x	17/2$^-$	[E1]	
638.90 *14*	30 *4*	4522.7		3883.8		[E2]	
644.25 *13*	34 *4*	4391.5+x	(41/2$^+$)	3747.2+x	(37/2$^+$)		
647.83 *11*	57 *5*	4915.09	45/2$^+$	4267.45	41/2$^+$	E2	Mult.: DCO=0.89 *10* (1995Ba67).
648.36 *10*	110 *6*	4213.63	41/2$^+$	3565.27	37/2$^+$	E2	Mult.: DCO=1.09 *9* (1995Ba67).
655.75 *10*	759 *25*	2720.74	33/2$^-$	2064.96	29/2$^-$	E2	Mult.: A_2=0.25 *3*, A_4=−0.07 *3* (1986Wa32). Iγ contaminated with 657.9γ.
657.86 *10*	166 *8*	4675.66	45/2$^-$	4017.80	41/2$^-$	E2	Mult.: DCO=1.15 *5* (1995Ba67); A_2=0.25 *3*, A_4=−0.07 *3* (1986Wa32). Iγ contaminated with 655.8γ.
658.0 *10*	<5	5106.6+x	(45/2$^+$)	4449.0+x	(41/2$^+$)	[E2]	
658.86 *11*	52 *4*	4722.42+x	45/2$^-$	4063.64+x	41/2$^-$	[E2]	
659.33 *11*	58 *5*	4258.8+x	41/2$^+$	3599.4+x	37/2$^+$	[E2]	
661.18 *14*	45 *7*	2726.14		2064.96	29/2$^-$		
662.4 *3*	32 *7*	1232.3+x		569.89+x	15/2$^-$		
662.6[b]		5120.5+x	(45/2)	4458.0+x	(41/2)		
665.05 *14*	23 *4*	4932.86	45/2$^+$	4267.45	41/2$^+$	[E2]	
668.23 *15*	31 *5*	3685.69+x	37/2$^-$	3017.43+x	33/2$^-$	[E2]	
668.75 *11*	65 *5*	4024.82+x	39/2$^-$	3356.09+x	35/2$^-$	E2	Mult.: DCO=0.86 *13* (1995Ba67).
669.98 *13*	33 *4*	4736.6+x	(43/2$^+$)	4066.6+x	(39/2$^+$)		
672.64 *11*	78 *5*	4613.73	43/2$^+$	3941.08	39/2$^+$	E2	Mult.: DCO=1.01 *16* (1995Ba67).
674.42 *13*	42 *4*	1640.16	21/2$^+$	965.58	21/2$^-$	[E1]	
677.06 *12*	59 *5*	4646.4	(43/2$^+$)	3969.29	39/2$^+$		
678.12 *10*	459 *16*	3398.79	37/2$^-$	2720.74	33/2$^-$	E2	Mult.: A_2=0.33 *4*, A_4=−0.19 *5* (1986Wa32).
681.79 *15*	24 *4*	5073.3+x	(45/2$^+$)	4391.5+x	(41/2$^+$)		

$^{177}_{75}Re_{102}$-14

γ(^{177}Re) (continued)

E_γ †	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult.‡	Comments
684.60 *11*	53 *5*	4607.2+x	43/2$^+$	3922.5+x	39/2$^+$	[E2]	
685.28 *16*	29 *5*	4703.1		4017.80	41/2$^-$		
686.2 *3*	7 *3*	5457.0+x	(47/2$^+$)	4771.0+x	(43/2$^+$)	[E2]	
690.2[b]		5472.2+x	(47/2)	4781.9+x	(43/2)		
694.63 *11*	58 *4*	5071.70+x	47/2$^-$	4377.08+x	43/2$^-$	[E2]	
696.02 *18*	36 *5*	4381.8+x	41/2$^-$	3685.69+x	37/2$^-$	[E2]	
701.10 *15*	27 *3*	4915.09	45/2$^+$	4213.63	41/2$^+$	[E2]	
702.46 *12*	53 *5*	5617.56	(49/2$^+$)	4915.09	45/2$^+$		
705.43 *12*	42 *4*	4964.0+x	45/2$^+$	4258.8+x	41/2$^+$	[E2]	
713.0 *10*	<5	5819.6+x	(49/2$^+$)	5106.6+x	(45/2$^+$)	[E2]	
715.08 *14*	49 *5*	2780.19		2064.96	29/2$^-$		
715.2[b]		5835.7+x	(49/2)	5120.5+x	(45/2)		
718.22 *19*	35 *4*	4117.0		3398.79	37/2$^-$		Mult.: DCO=1.17 *6* (1995Ba67).
719.49 *12*	50 *4*	4932.86	45/2$^+$	4213.63	41/2$^+$	E2	Mult.: DCO=1.16 *18* (1995Ba67).
722.56 *11*	79 *6*	4248.95	(41/2$^-$)	3526.45	37/2$^-$	[E2]	
723.30 *14*	36 *5*	4748.1+x	(43/2$^-$)	4024.82+x	39/2$^-$	[E2]	
724.63 *14*	29 *4*	5332.4+x	47/2$^+$	4607.2+x	43/2$^+$	[E2]	
725.20 *11*	104 *5*	5400.9	(49/2$^-$)	4675.66	45/2$^-$	[E2]	
727.42 *13*	41 *5*	5341.1	47/2$^+$	4613.73	43/2$^+$	E2	Mult.: DCO=1.08 *27* (1995Ba67).
728.7 *10*	13 *15*	1086.91	13/2$^+$	358.20	9/2$^+$		
729.36 *13*	39 *4*	5375.7	(47/2$^+$)	4646.4	(43/2$^+$)		
735.0 *10*	14 *4*	5116.8+x	(45/2$^-$)	4381.8+x	41/2$^-$	[E2]	
738.48 *12*	48 *4*	5460.97+x	49/2$^-$	4722.42+x	45/2$^-$	[E2]	
738.7[b]		6210.9+x	(51/2)	5472.2+x	(47/2)		
740.03 *14*	41 *5*	2214.47		1474.43	25/2$^-$		
741.9 *10*	3.0 *25*	6198.9+x	(51/2$^+$)	5457.0+x	(47/2$^+$)	[E2]	
744.65 *13*	60 *8*	1296.64	19/2$^-$	552.21	17/2$^-$	M1(+E2)	Mult.: DCO=0.44 *6* (1995Ba67).
745.74 *17*	20 *4*	5709.7+x	(49/2$^+$)	4964.0+x	45/2$^+$	[E2]	
750.24 *15*	26 *4*	6367.8	(53/2$^+$)	5617.56	(49/2$^+$)		
762.10 *11*	68 *5*	1567.11+x	17/2$^+$	805.14+x	17/2$^-$	[E1]	
762.3[b]		6598.1+x	(53/2)	5835.7+x	(49/2)		
762.64 *18*	19 *4*	6138.4	(51/2$^+$)	5375.7	(47/2$^+$)		
764.13 *14*	32 *4*	5835.74+x	51/2$^-$	5071.70+x	47/2$^-$	[E2]	
766.03 *11*	69 *7*	1318.16	17/2$^+$	552.21	17/2$^-$	E1	Mult.: DCO=1.21 *13* (1995Ba67).
770.85 *14*	31 *4*	5703.7	(49/2$^+$)	4932.86	45/2$^+$	[E2]	
770.97 *12*	31 *4*	2863.03+x	(29/2$^+$)	2092.28+x	25/2$^+$	(E2)	Mult.: DCO≈1.5 is obtained by gating on the K^π=(29/2$^+$) in-band ΔJ=1 transitions (1995Ba67).
770.97 *12*	14 *4*	4169.70	39/2$^-$	3398.79	37/2$^-$		
775.50 *17*	23 *4*	5523.6+x	(47/2$^-$)	4748.1+x	(43/2$^-$)	[E2]	
778.2 *3*	15 *5*	2252.6		1474.43	25/2$^-$		Mult.: DCO=1.35 *18* (1995Ba67).
780.60 *16*	23 *4*	6121.7	(51/2$^+$)	5341.1	47/2$^+$		
787.94 *11*	52 *4*	6188.8	(53/2$^-$)	5400.9	(49/2$^-$)	[E2]	

γ(^{177}Re) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	Comments
799.03 *16*	23 *3*	6260.07+x	53/2−	5460.97+x	49/2−	[E2]	
800.00 *20*	15 *3*	7167.8	(57/2+)	6367.8	(53/2+)		
802.78 *12*	56 *5*	5051.7	(45/2−)	4248.95	(41/2−)	[E2]	
805.80 *11*	128 *7*	3526.45	37/2−	2720.74	33/2−	E2	Mult.: DCO=1.26 *8* (1995Ba67).
811.04 *18*	17 *3*	6646.5+x	(55/2−)	5835.74+x	51/2−	[E2]	
829.4 *3*	9 *3*	6951.2	(55/2+)	6121.7	(51/2+)		
833.44 *19*	39 *6*	1799.35	23/2−	965.58	21/2−		
835.51 *13*	43 *5*	2309.79		1474.43	25/2−		
838.52 *12*	32 *4*	5890.3	(49/2−)	5051.7	(45/2−)	[E2]	
841.56 *17*	22 *9*	1197.33+x	(15/2−)	355.98+x	13/2−		
842.93 *12*	67[&] *4*	7031.7	(57/2−)	6188.8	(53/2−)	[E2]	
843.9 *3*	13 *4*	6547.6	(53/2+)	5703.7	(49/2+)	[E2]	
849.6 *4*	10.6[a] *12*	8017.4	(61/2+)	7167.8	(57/2+)		
850.10 *12*	51 *4*	4248.95	(41/2−)	3398.79	37/2−	[E2]	
862.6 *3*	18 *5*	3584.8	35/2−	2720.74	33/2−		
866.21 *18*	13 *3*	6756.5	(53/2−)	5890.3	(49/2−)	[E2]	
872.37 *11*	91 *7*	1442.28+x	15/2+	569.89+x	15/2−	E1	Mult.: DCO=1.11 *32* (1995Ba67); A_2=0.29 *4*, A_4=−0.05 *4* (1986Wa32).
890.94 *19*	39[&] *4*	7922.7	(61/2−)	7031.7	(57/2−)	[E2]	
891.11 *17*	23 *6*	1461.09+x	(17/2−)	569.89+x	15/2−		
898.0 *3*	6.1[a] *11*	8915.4	(65/2+)	8017.4	(61/2+)		
900.64 *14*	48 *6*	2374.91	27/2−	1474.43	25/2−	M1(+E2)	Mult.: DCO=0.13 *6* (1995Ba67).
928.17 *12*	57 *5*	2993.14	33/2−	2064.96	29/2−	E2	Mult.: DCO=0.96 *16* (1995Ba67).
933.6 *7*	2.8[a] *11*	9849.0	(69/2+)	8915.4	(65/2+)		
934.0 *10*	19[&] *4*	8856.7	(65/2−)	7922.7	(61/2−)	[E2]	
938.6 *10*	10 *5*	3001.45	31/2−	2064.96	29/2−	M1(+E2)	Mult.: DCO=0.45 *13* (1995Ba67).
962.46 *14*	39 *5*	1514.65	19/2+	552.21	17/2−	E1	Mult.: DCO=0.55 *13* (1995Ba67).
963.09 *13*	>30.8[@]	963.17+x	(13/2−)	0.0+x	9/2−	[E2]	
975.02 *12*	53 *11*	1223.12	15/2+	248.10	13/2−	(E1)	Mult.: DCO=0.71 *12* (1995Ba67).
975.2 *4*	1.3[a] *13*	10824.2	(73/2+)	9849.0	(69/2+)		
997.00 *11*	66 *5*	1567.11+x	17/2+	569.89+x	15/2−	E1	Mult.: DCO=0.64 *36* (1995Ba67).
1015.5 *10*	6 *3*	3080.5		2064.96	29/2−		
1016.75 *21*	16 *4*	1586.79+x	(17/2−)	569.89+x	15/2−		
1033.75 *16*	24 *9*	1197.33+x	(15/2−)	163.65+x	11/2−		
1058.85 *19*	14 *3*	3123.8	(29/2,31/2)	2064.96	29/2−	D	Mult.: DCO=0.22 *17* (1995Ba67).
1066.16 *17*	20 *4*	2031.74		965.58	21/2−	D	Mult.: DCO=0.25 *12* (1995Ba67).
1082.84 *13*	60 *6*	2048.44	(23/2)	965.58	21/2−	D	Mult.: DCO=0.47 *16* (1995Ba67).
1085.31 *16*	30 *5*	2559.75	(27/2)	1474.43	25/2−	D	Mult.: DCO=0.59 *10* (1995Ba67).
1086.40 *10*	152 *11*	1442.28+x	15/2+	355.98+x	13/2−	E1	Mult.: DCO=0.53 *24* (1995Ba67); A_2=−0.43 *9*, A_4=0.17 *9* (1986Wa32).
1090.2 *6*	8 *5*	2564.3	(27/2)	1474.43	25/2−	D	Mult.: DCO=0.24 *17* (1995Ba67).
1098.43 *13*	40 *4*	2572.94	29/2−	1474.43	25/2−	E2	Mult.: DCO=1.16 *18* (1995Ba67).
1104.04 *17*	20 *4*	2578.48	(27/2)	1474.43	25/2−		Mult.: DCO=0.40 *11* (1995Ba67).
1105.07 *16*	25 *6*	1461.09+x	(17/2−)	355.98+x	13/2−		

(HI,xnγ) 1995Ba67,1986Wa32,1972Le04 (continued)

γ(^{177}Re) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	Comments
1128.09 *13*	21 *6*	1680.28	19/2$^+$	552.21	17/2$^-$	(E1)	Mult.: DCO=0.49 *10* (1995Ba67).
1217.0 *10*	15 *4*	3182.1		1965.05	23/2$^+$		
1230.5 *3*	11 *4*	1586.79+x	(17/2$^-$)	355.98+x	13/2$^-$	[E2]	
1246.42 *25*	9 *8*	1494.82	17/2$^-$	248.10	13/2$^-$		
1249.38 *14*	38 *5*	2215.04	25/2$^-$	965.58	21/2$^-$	E2	Mult.: DCO=0.83 *11* (1995Ba67).
1298.82 *17*	24 *5*	1851.02	21/2$^-$	552.21	17/2$^-$	E2	Mult.: DCO=1.4 *4* (1995Ba67).
1442.57 *18*	11 *3*	1442.28+x	15/2$^+$	0.0+x	9/2$^-$	[E3]	

[†] From 1995Ba67, unless otherwise stated.

[‡] From 1995Ba67, unless otherwise stated. The assignment is based on the measured angular distributions and DCO ratios, total electron- conversion coefficients deduced from intensity balance consideration, the apparent band structures with both cascade (ΔJ=1), and crossover (ΔJ=2) transitions, and the complex decay pattern. For the definition of the DCO ratios see 1995Ba67. The quoted DCO values are obtained by gating on stretched quadrupole transition, unless otherwise specified. A value of approximately unity is expected for a ΔJ=2 transition and about 0.3-0.6 for a ΔJ=1 transition.

[#] From $\gamma(\theta)$ in 1986Wa32.

[@] Estimated from the intensity of transitions feeding the level of interest.

[&] From 1995Ba67 using data from the ^{130}Te + ^{51}V reaction and normalized to the intensity of the 725.0 keV transition obtained from the ^{163}Dy + ^{19}F reaction.

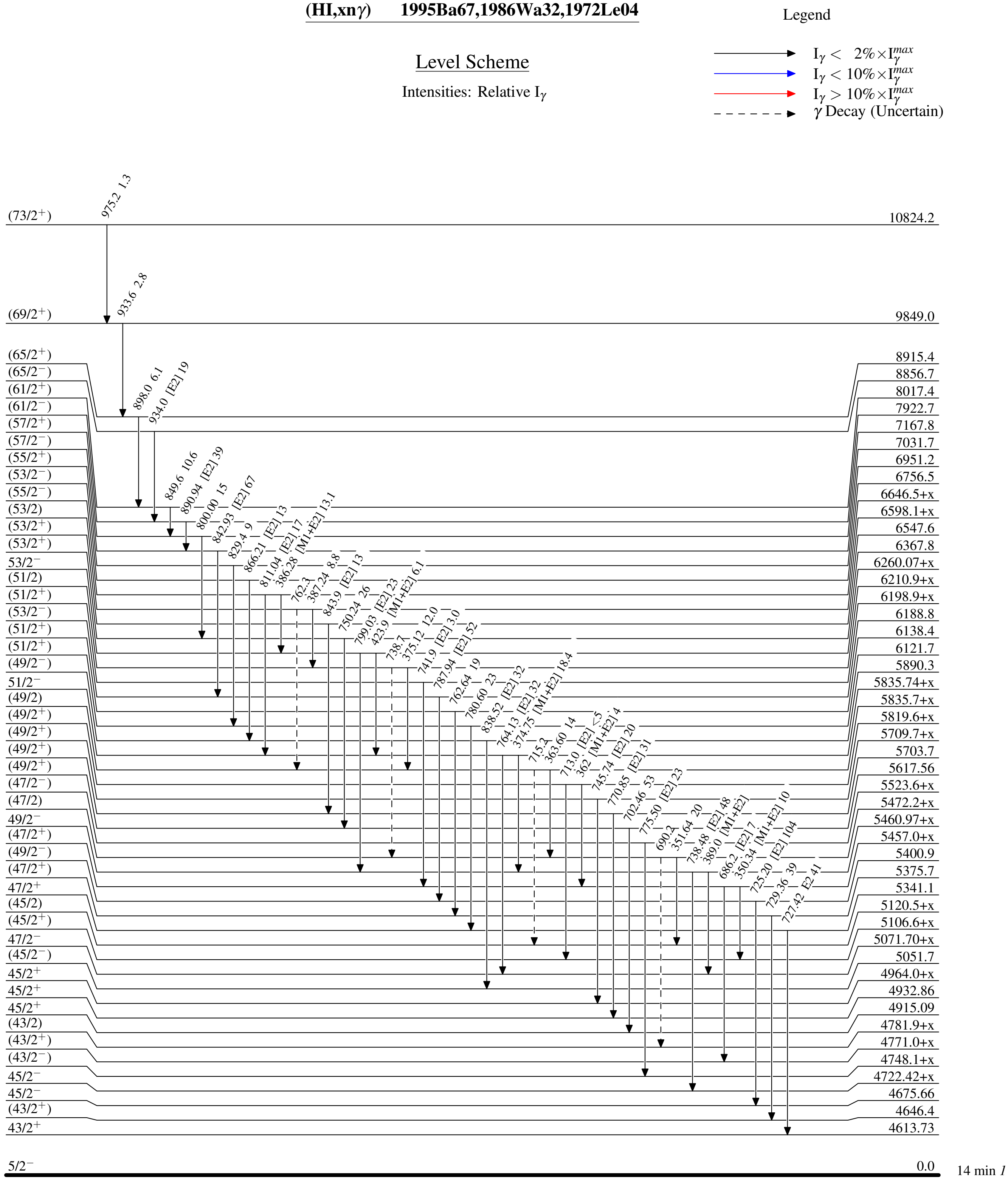
[a] From 1995Ba67 using data from the ^{130}Te + ^{51}V reaction and normalized to the intensity of the 800.0 keV transition obtained from the ^{163}Dy + ^{19}F reaction.

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

(HI,xnγ) 1995Ba67,1986Wa32,1972Le04

Level Scheme

Intensities: Relative I_γ



$^{177}_{75}Re_{102}$

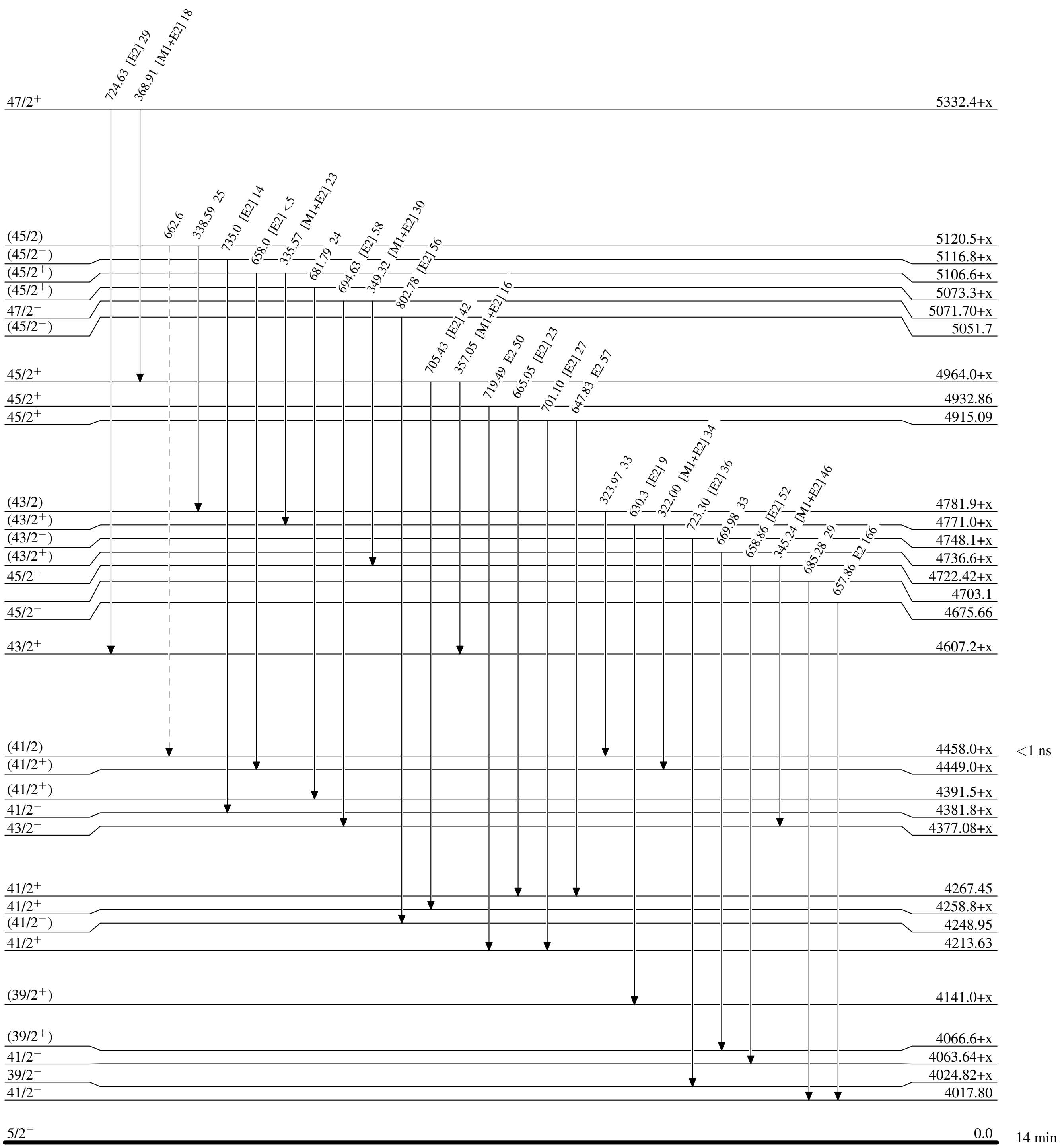
(HI,xnγ) 1995Ba67,1986Wa32,1972Le04

Legend

- Iγ < 2%×Iγ^max
- Iγ < 10%×Iγ^max
- Iγ > 10%×Iγ^max
- γ Decay (Uncertain)

Level Scheme (continued)

Intensities: Relative Iγ

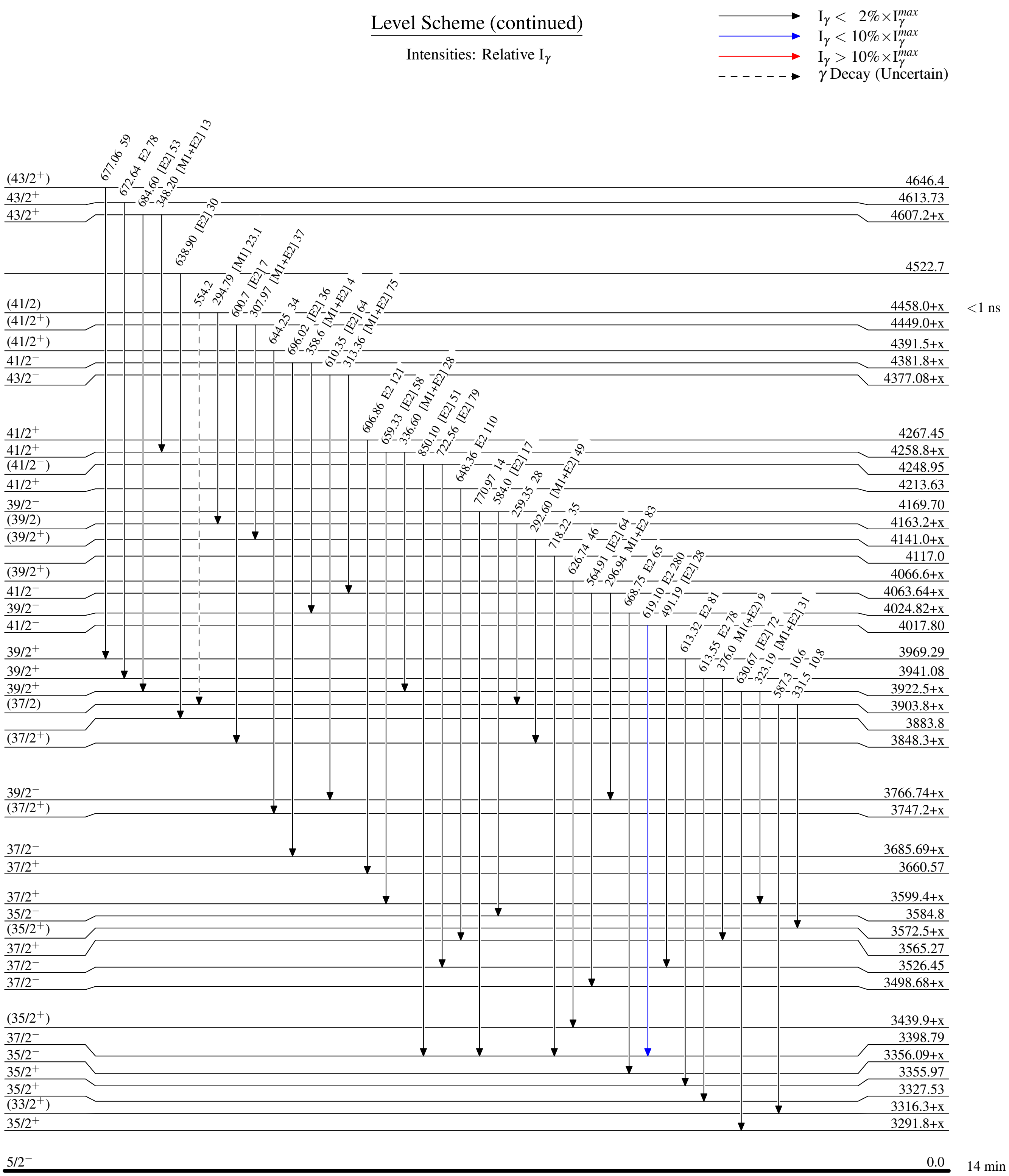


$^{177}_{75}Re_{102}$

(HI,xnγ) 1995Ba67,1986Wa32,1972Le04

Level Scheme (continued)

Intensities: Relative Iγ

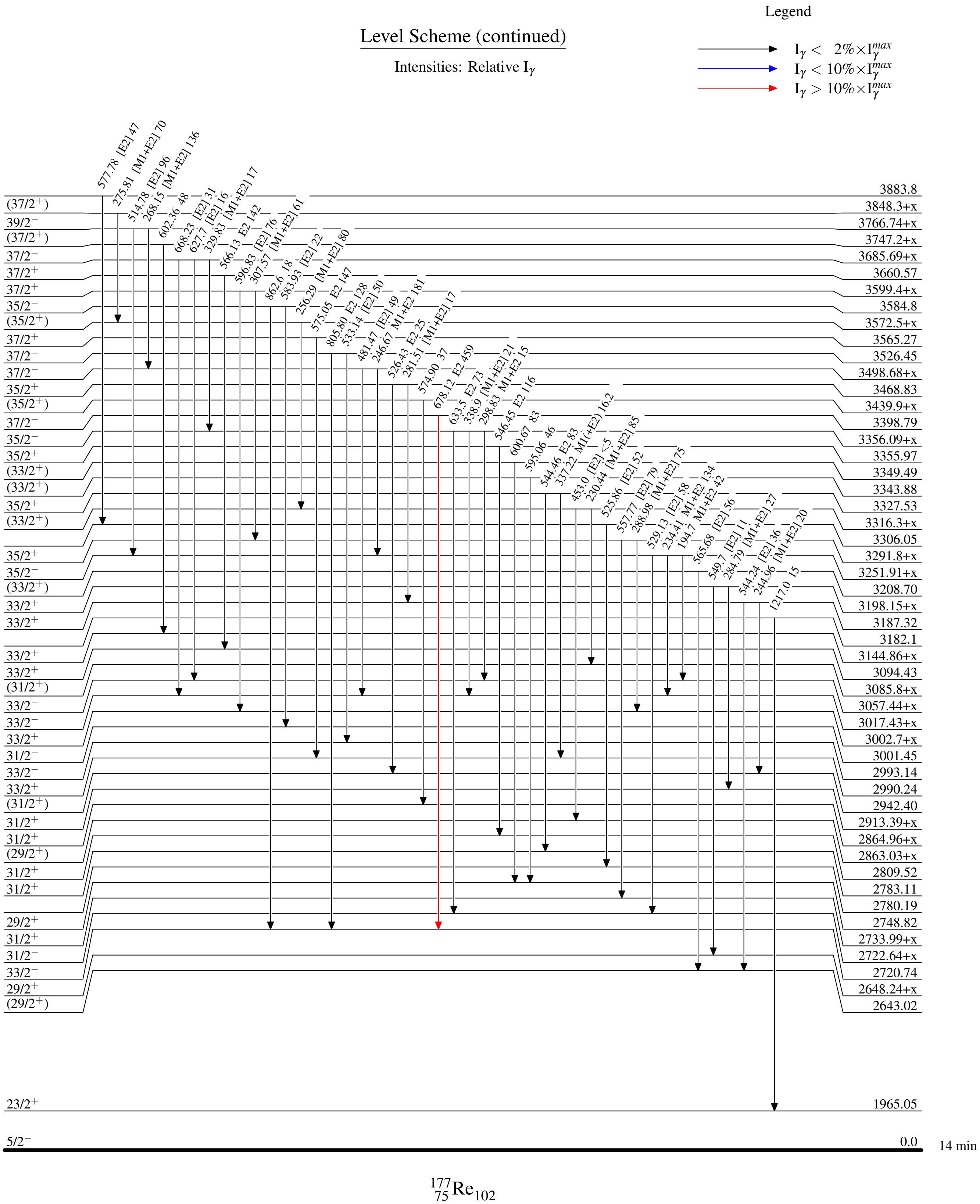


$^{177}_{75}Re_{102}$

(HI,xnγ) 1995Ba67,1986Wa32,1972Le04

Level Scheme (continued)

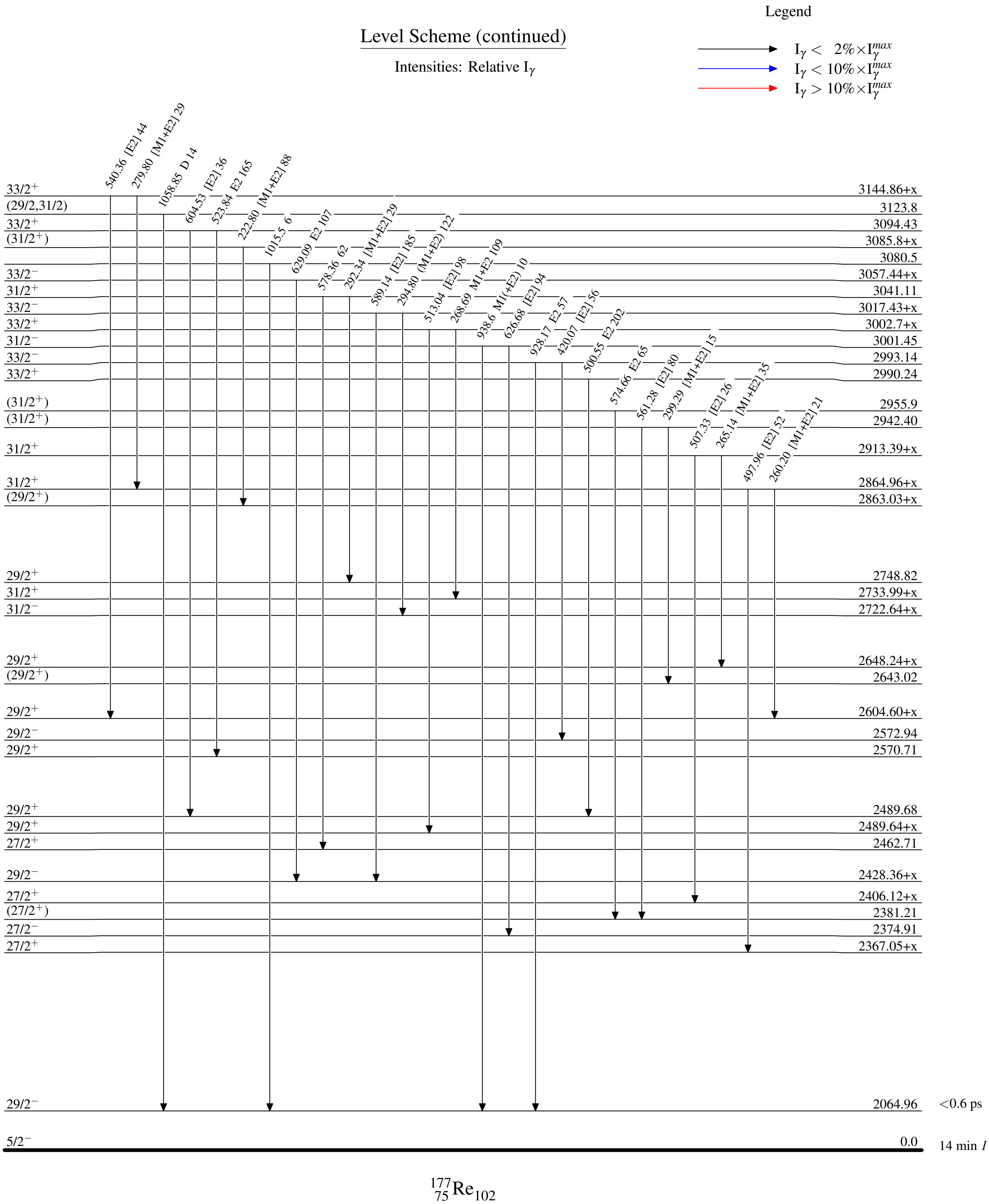
Intensities: Relative I_γ



(HI,xnγ) 1995Ba67,1986Wa32,1972Le04

Level Scheme (continued)

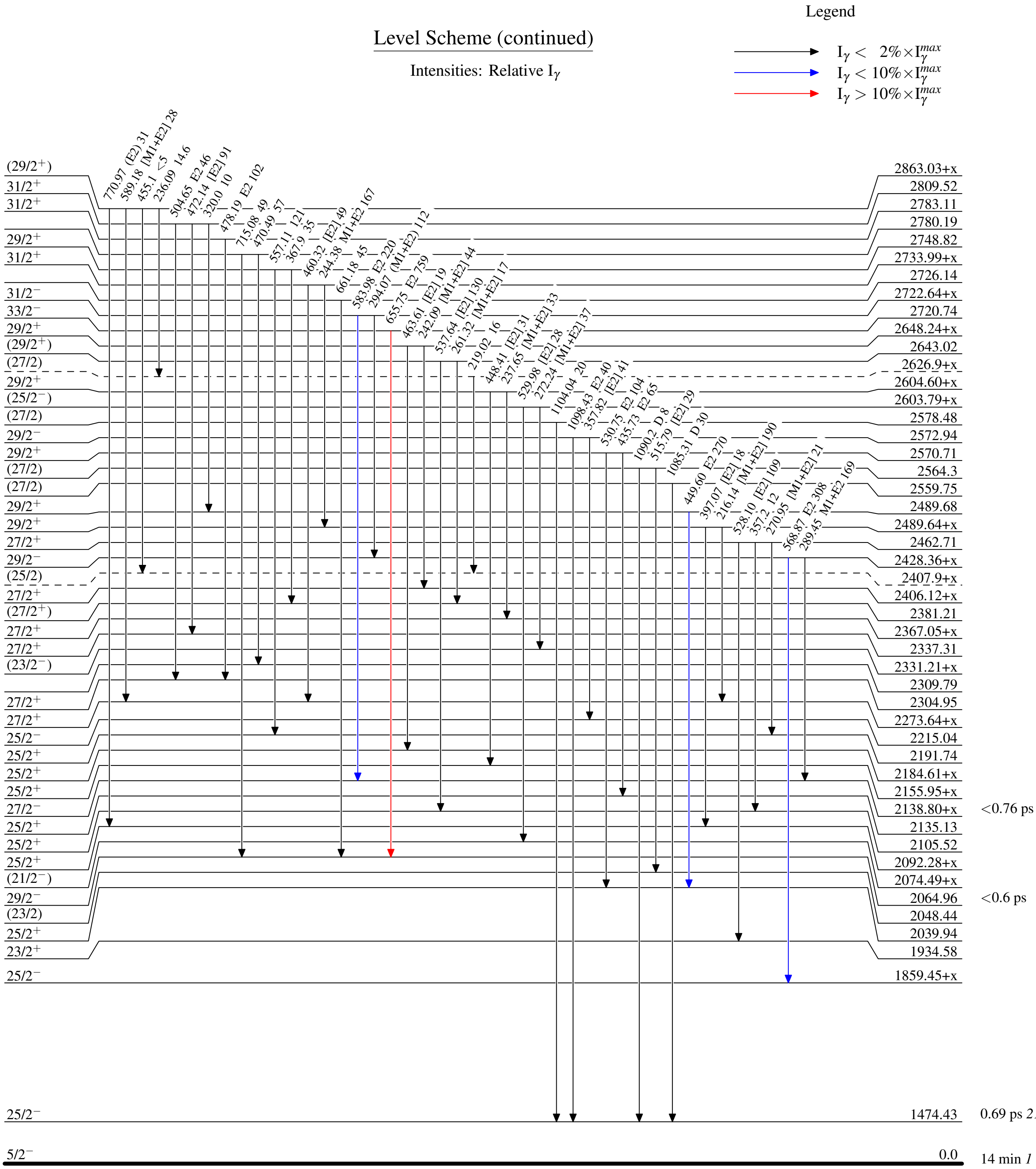
Intensities: Relative I_γ



(HI,xnγ) 1995Ba67,1986Wa32,1972Le04

Level Scheme (continued)

Intensities: Relative I_γ

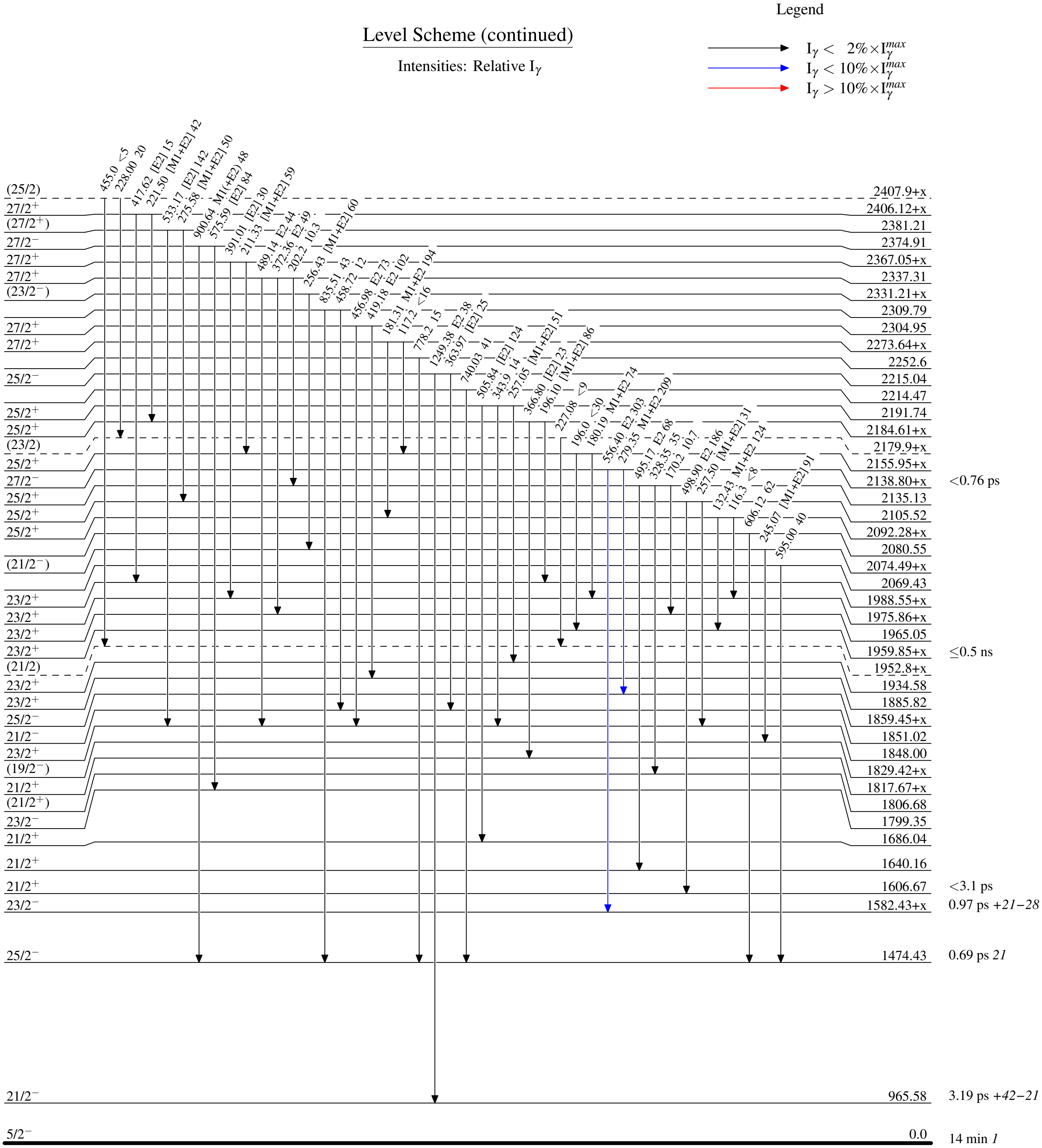


$^{177}_{75}Re_{102}$

(HI,xnγ) 1995Ba67,1986Wa32,1972Le04

Level Scheme (continued)

Intensities: Relative I_γ



$^{177}_{75}Re_{102}$

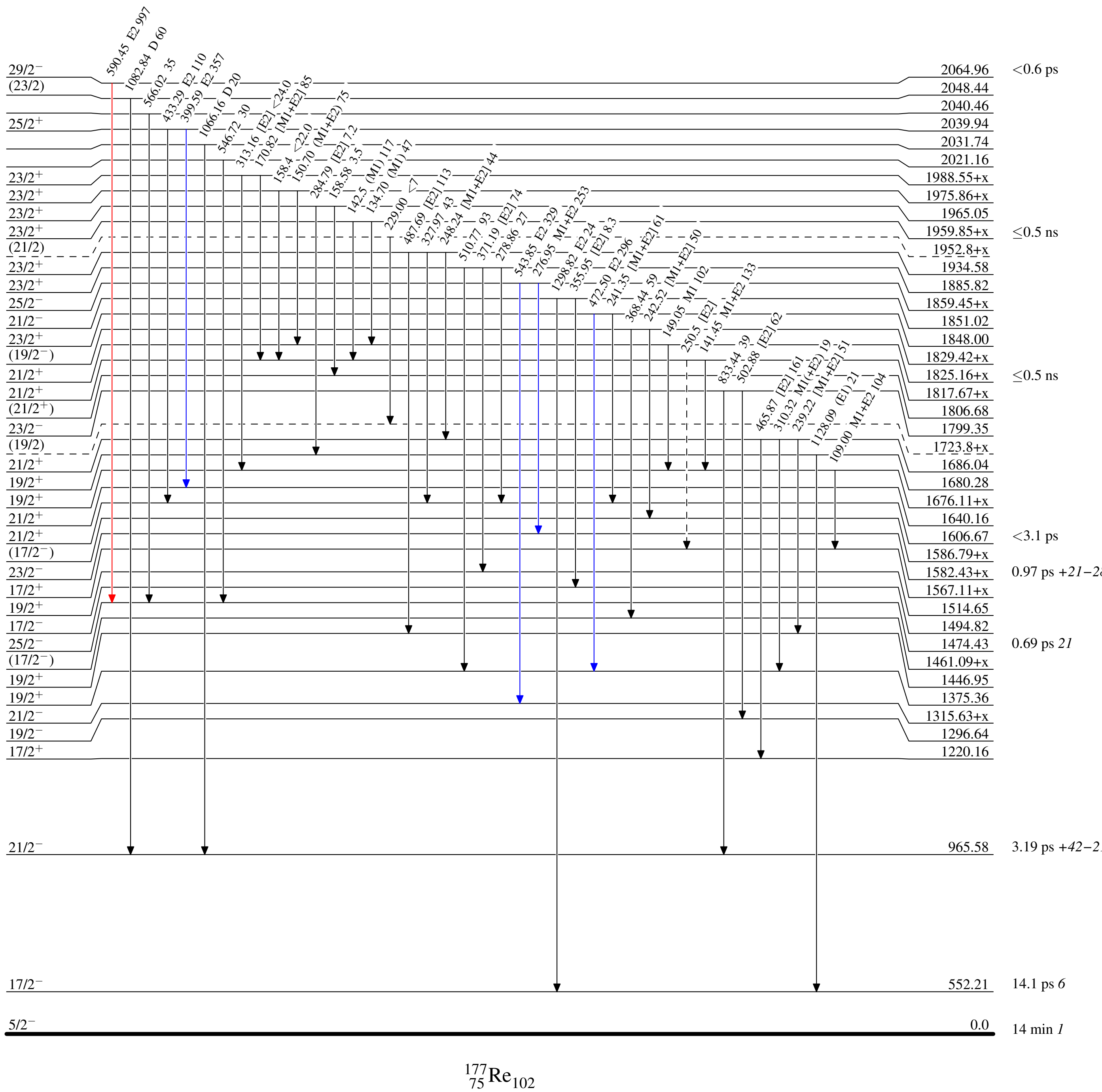
(HI,xnγ) 1995Ba67,1986Wa32,1972Le04

Level Scheme (continued)

Intensities: Relative I_γ

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)

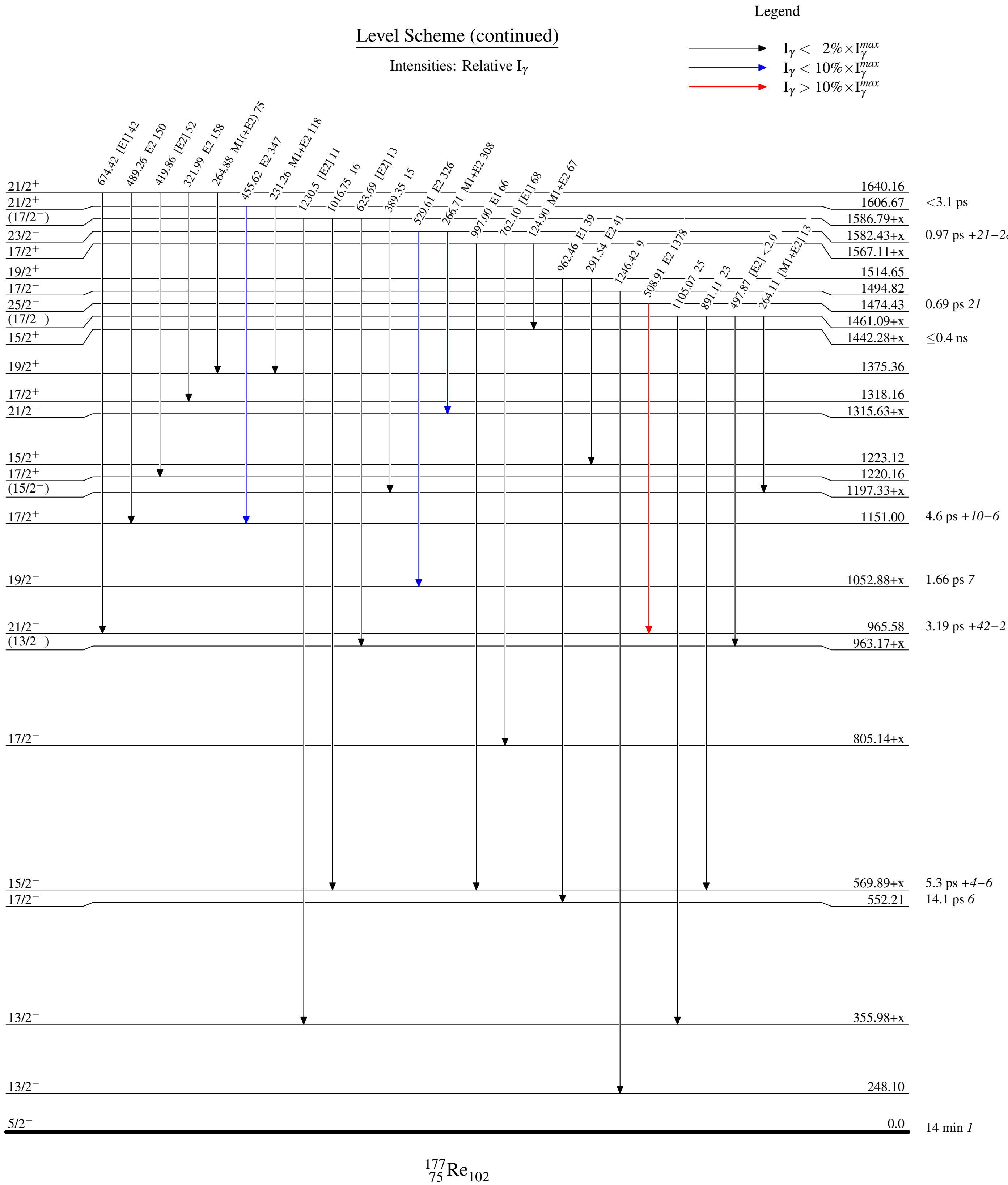


$^{177}_{75}Re_{102}$

(HI,xnγ) 1995Ba67,1986Wa32,1972Le04

Level Scheme (continued)

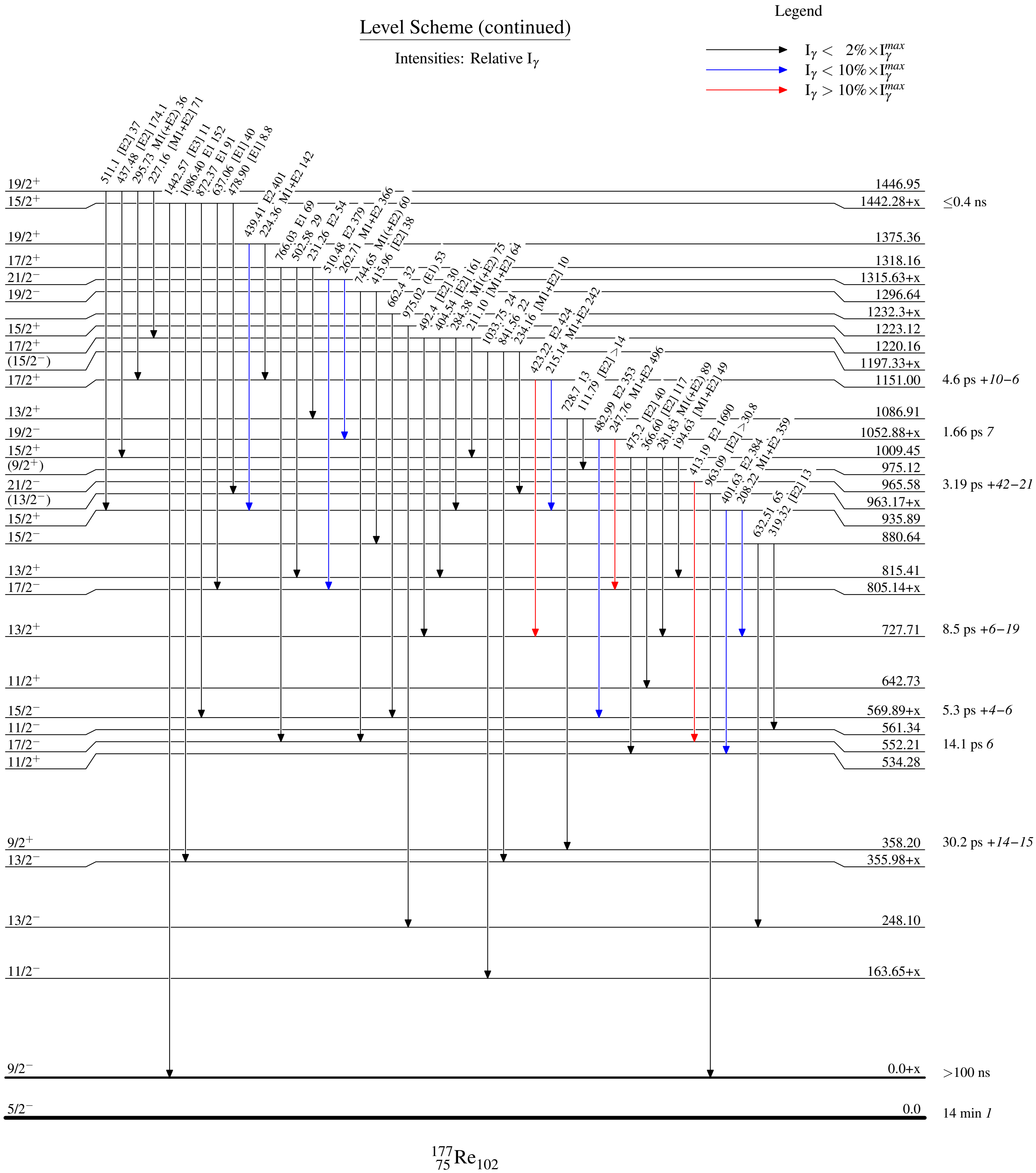
Intensities: Relative I_γ



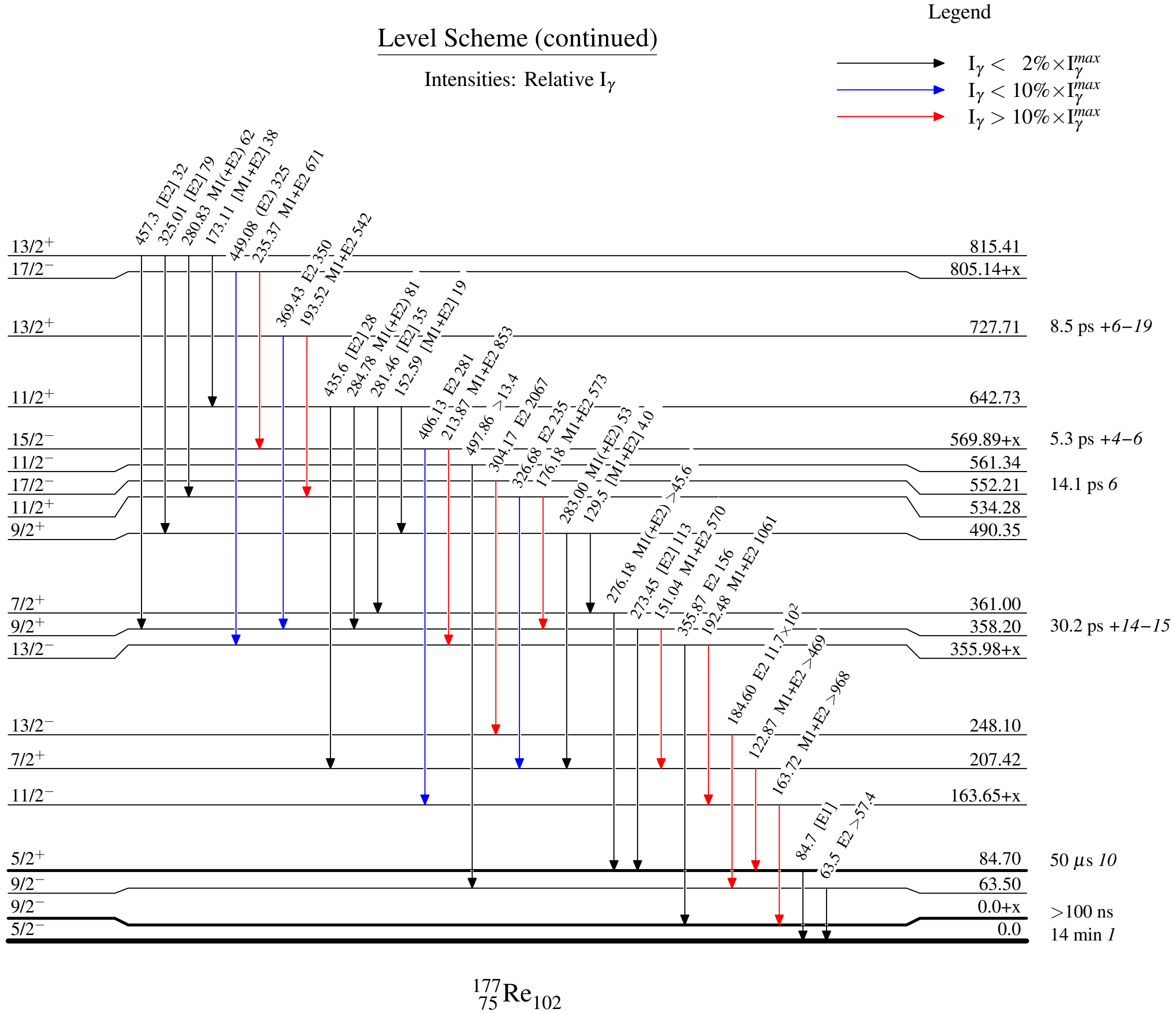
(HI,xnγ) 1995Ba67,1986Wa32,1972Le04

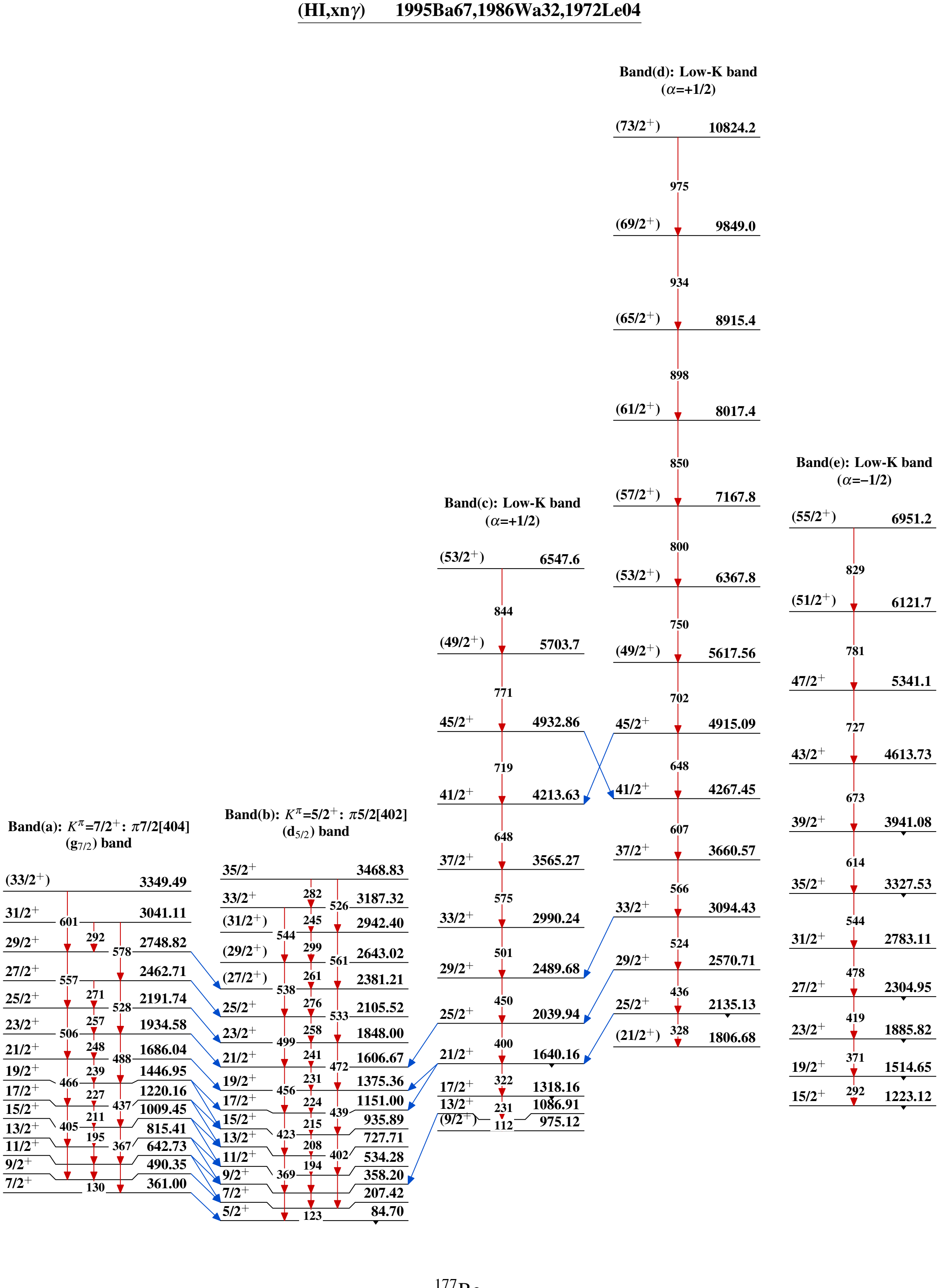
Level Scheme (continued)

Intensities: Relative I_γ

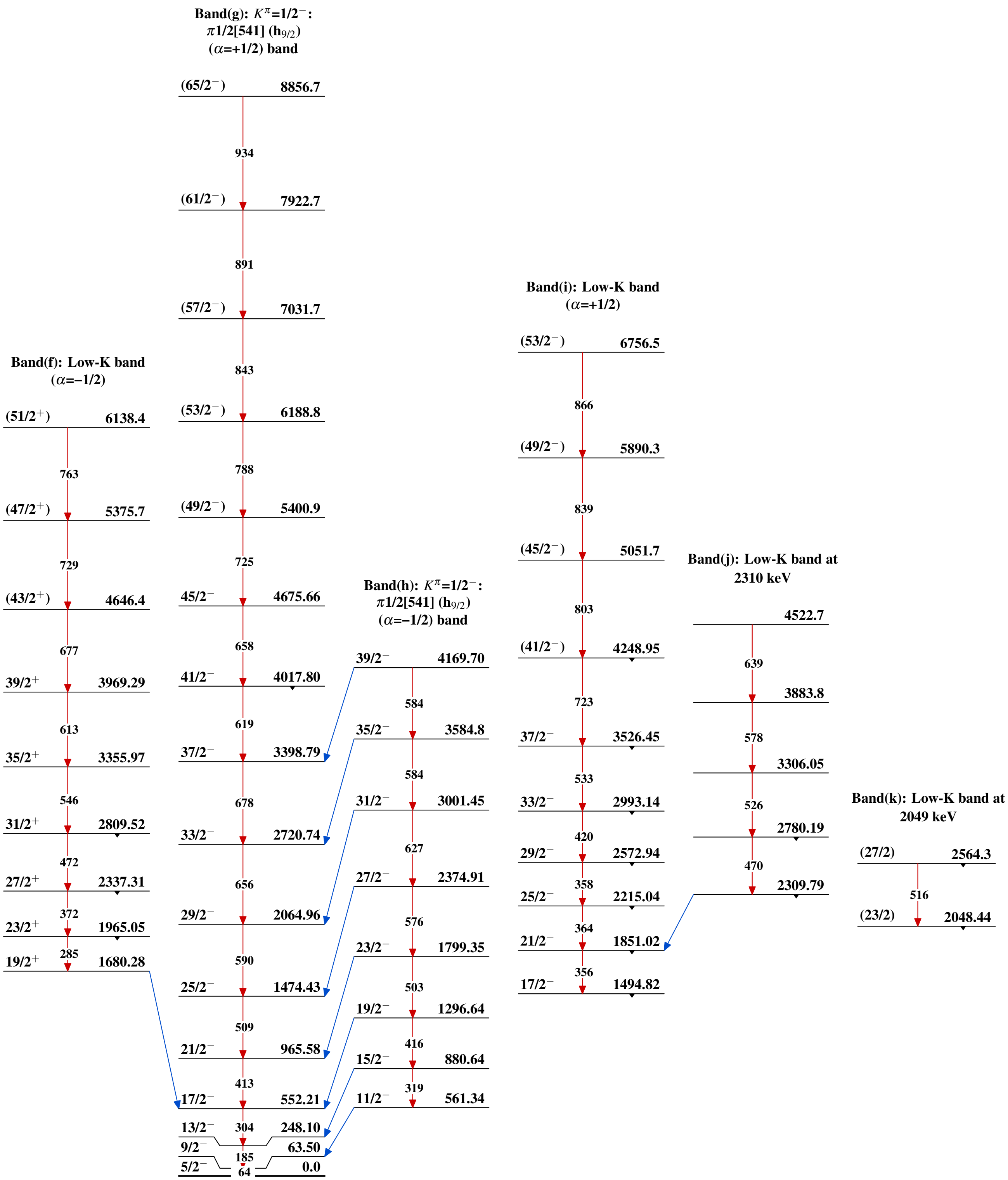


(HI,xnγ) 1995Ba67,1986Wa32,1972Le04



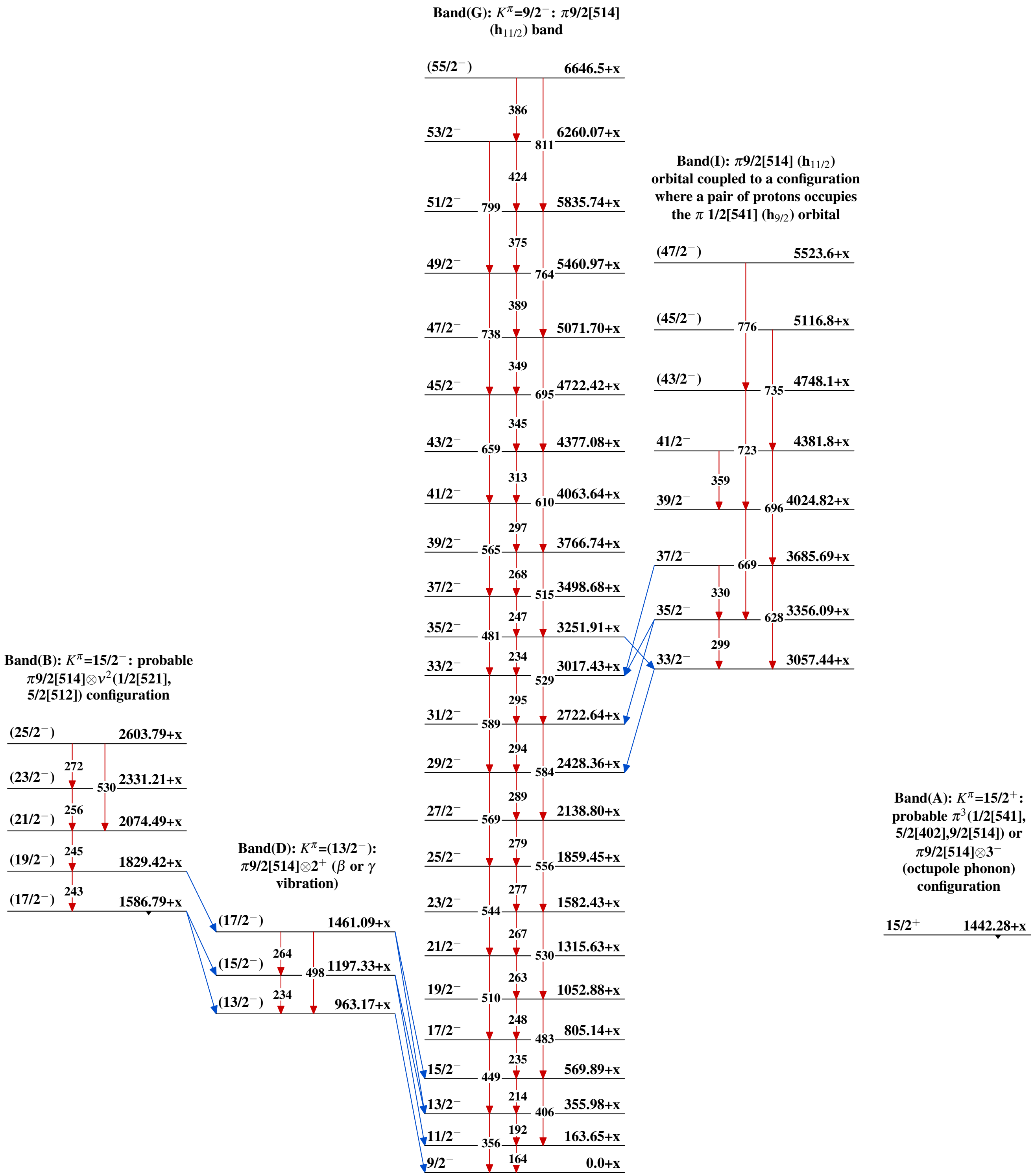

(HI,xnγ) 1995Ba67,1986Wa32,1972Le04
Band(a): K^π=7/2^+: π7/2[404] (g7/2) band
Band(b): K^π=5/2^+: π5/2[402] (d5/2) band
Band(c): Low-K band (α=+1/2)
Band(d): Low-K band (α=+1/2)
Band(e): Low-K band (α=−1/2)
(33/2+) 3349.49
31/2+ 3041.11
29/2+ 2748.82
27/2+ 2462.71
25/2+ 2191.74
23/2+ 1934.58
21/2+ 1686.04
19/2+ 1446.95
17/2+ 1220.16
15/2+ 1009.45
13/2+ 815.41
11/2+ 642.73
9/2+ 490.35
7/2+ 361.00
35/2+ 3468.83
33/2+ 3187.32
(31/2+) 2942.40
(29/2+) 2643.02
(27/2+) 2381.21
25/2+ 2105.52
23/2+ 1848.00
21/2+ 1606.67
19/2+ 1375.36
17/2+ 1151.00
15/2+ 935.89
13/2+ 727.71
11/2+ 534.28
9/2+ 358.20
7/2+ 207.42
5/2+ 84.70
(53/2+) 6547.6
(49/2+) 5703.7
45/2+ 4932.86
41/2+ 4213.63
37/2+ 3565.27
33/2+ 2990.24
29/2+ 2489.68
25/2+ 2039.94
21/2+ 1640.16
17/2+ 1318.16
13/2+ 1086.91
(9/2+) 975.12
(73/2+) 10824.2
(69/2+) 9849.0
(65/2+) 8915.4
(61/2+) 8017.4
(57/2+) 7167.8
(53/2+) 6367.8
(49/2+) 5617.56
45/2+ 4915.09
41/2+ 4267.45
37/2+ 3660.57
33/2+ 3094.43
29/2+ 2570.71
25/2+ 2135.13
(21/2+) 1806.68
(55/2+) 6951.2
(51/2+) 6121.7
47/2+ 5341.1
43/2+ 4613.73
39/2+ 3941.08
35/2+ 3327.53
31/2+ 2783.11
27/2+ 2304.95
23/2+ 1885.82
19/2+ 1514.65
15/2+ 1223.12
601 292 578 557 271 528 257 506 248 488 239 466 227 437 211 405 195 367 130
282 526 245 544 299 561 261 538 276 533 258 499 241 472 231 456 224 439 215 423 208 402 194 369 123
844 771 719 648 575 501 450 400 322 231 112
975 934 898 850 800 750 702 648 607 566 524 436 328
829 781 727 673 614 544 478 419 371 292
$^{177}_{75}Re_{102}$

(HI,xnγ) 1995Ba67,1986Wa32,1972Le04 (continued)



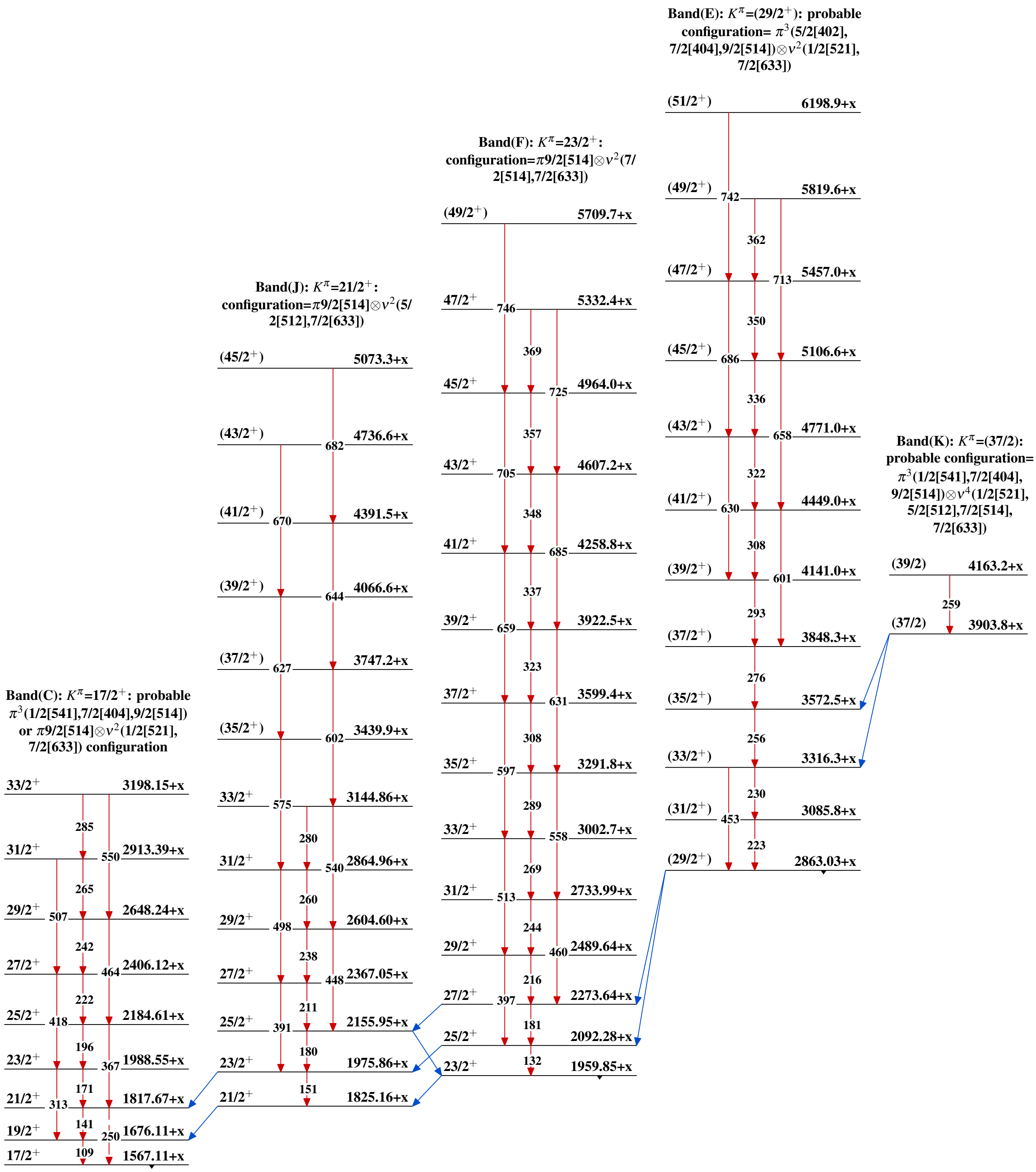
$^{177}_{75}Re_{102}$

(HI,xnγ) 1995Ba67,1986Wa32,1972Le04 (continued)



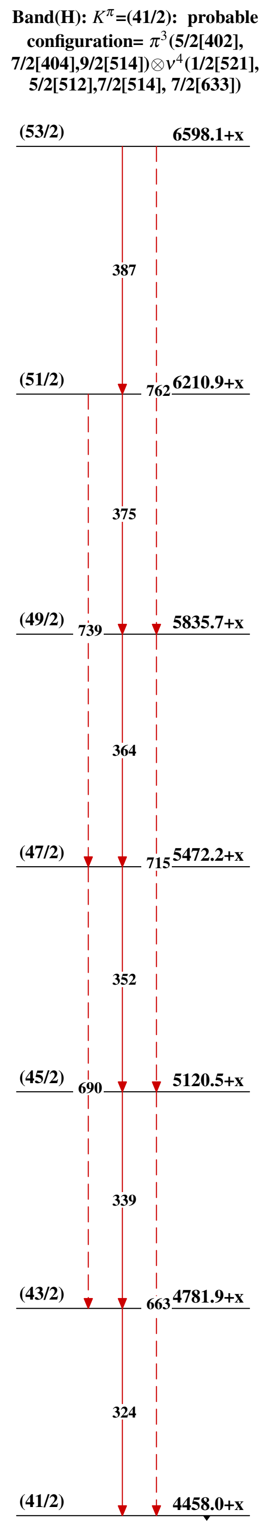
$^{177}_{75}Re_{102}$

(HI,xnγ) 1995Ba67,1986Wa32,1972Le04 (continued)



$^{177}_{75}Re_{102}$

(HI,xnγ) 1995Ba67,1986Wa32,1972Le04 (continued)



$^{177}_{75}Re_{102}$