^{170}Er(α,4nγ) 1998Ar08

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. M. Baglin[1], E. A. Mccutchan[2], S. Basunia[1]	NDS 153, 1 (2018)	1-Oct-2018

1998Ar08: E=40 MeV; array of 10 escape-suppressed Ge detectors with 28-element BGO multiplicity filter; measured Eγ, Iγ, γγ coin, DCO ratios (θ=35° (or 145°) and 90°). Supersedes preliminary report by 1994ArZZ.

1981Wa14: E=50 MeV; measured γ(θ) (see also ^{170}Er(α,2nγ)).

1972Mo44: E≈27.5 MeV; 97% ^{170}Er target; measured Eγ, Iγ, γ(θ), γγ coin (40 ns time resolution), excit (16-38.5 MeV).

^{170}Yb Levels

E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]
0.0[#]	0^+	1803.4[@] 4	8^+	2460.6 4	$10^{(-)}$	3307.3[a] 5	14^+
84.40[#] 20	2^+	1835.1[l] 4	7^+	2473.6[e] 4	12^-	3333.2?[k] 11	(14^+)
277.6[#] 3	4^+	1851.3[g] 4	6^-	2477.9[m] 4	10^-	3401.7[&] 4	15^-
573.4[#] 3	6^+	1872.1[f] 4	9^-	2524.3[@] 4	12^+	3437.9[m] 7	(14^-)
963.3[#] 3	8^+	1903.2[c] 4	7^-	2525.1[i] 4	9^-	3466.8?[i] 9	(13^-)
1258.5[e] 4	4^-	1954.2[a] 4	8^+	2580.4[#] 4	14^+	3533.8[e] 5	16^-
1292.3[@] 4	4^+	1964.7[h] 4	7^-	2603.6[c] 4	11^-	3547.3[@] 4	16^+
1329.5[a] 4	4^+	1983.4[#] 4	12^+	2603.9[b] 4	11^+	3558.2[b] 5	(15^+)
1345.2[f] 3	5^-	2005.4[&] 4	9^-	2680.7[f] 4	13^-	3567.4[c] 4	15^-
1408.9[k] 4	4^+	2009.4[k] 4	8^+	2732.3[j] 5	10^-	3742.1[j] 5	(14^-)
1437.5[#] 4	10^+	2044.7[d] 4	8^-	2815.7[d] 4	12^-	3756.7[f] 5	17^-
1450.4[e] 4	6^-	2056.6[e] 4	10^-	2826.8[a] 4	12^+	3806.8[#] 5	18^+
1459.8[b] 4	5^+	2096.9[m] 4	8^-	2847.1?[g] 11	(12^-)	3833.3[a] 5	(16^+)
1510.4[&] 6	5^-	2098.5[g] 4	8^-	2855.6[&] 4	13^-	3842.3[d] 7	(16^-)
1521.4[@] 4	6^+	2135.3[@] 4	10^+	2859.2[k] 4	(12^+)	3844.2?[k] 15	(16^+)
1528.9[l] 4	5^+	2170.1[b] 4	9^+	2927.3[m] 5	12^-	4011.9[m] 12	(16^-)
1572.7[f] 4	7^-	2189.7[i] 4	7^-	2938.6 4	$12^{(-)}$	4017.6[&] 6	(17^-)
1573.3[m] 4	4^-	2220.7[c] 4	9^-	2959.5[i] 5	11^-	4065.2?[b] 12	(17^+)
1601.4[a] 4	6^+	2242.0[f] 4	11^-	2966.4[e] 4	14^-	4174.0[e] 5	(18^-)
1660.4[c] 4	5^-	2253.5[h] 4	9^-	2986.7[@] 4	14^+	4207.1[@] 6	(18^+)
1669.1[k] 4	6^+	2341.7[j] 4	8^-	3050.0[c] 4	13^-	4390.5[f] 5	19^-
1712.5[&] 4	7^-	2372.8[a] 4	10^+	3067.1[b] 5	13^+	4436.5[#] 7	20^+
1715.8[e] 4	8^-	2388.1[&] 4	11^-	3186.4[f] 4	15^-	4885.9[e] 7	(20^-)
1762.7[d] 4	6^-	2398.5[d] 4	10^-	3195.1[#] 5	16^+	5085.0[f] 6	(21^-)
1780.6[b] 4	7^+	2412.4[k] 4	10^+	3202.1[j] 5	(12^-)		
1793.5[m] 4	6^-	2429.1[g] 4	10^-	3296.6[d] 4	14^-		

[†] From least-squares fit to Eγ omitting tentatively-placed transitions unless all gammas deexciting a given level are of that character.

[‡] From 1998Ar08, based on measured DCO ratios and deduced band structure.

[#] Band(A): $K^\pi=0^+$ g.s. band.

[@] Band(B): $K^\pi=(0^+)$, α=0 β band. Sharp rise in alignment at low rotational frequency probably indicates a change from vibrational to two-quasiparticle character as states gradually mix with low-spin members of $(\nu\ i_{13/2})^2$ band.

[&] Band(c): $K^\pi=1^-$, α=1 octupole band. Assignment supported by large B(E3) for J=3 member of this band and by observed alignment relative to g.s. band of ≈ $3\hbar\omega$. Large energy splitting relative to signature partner is observed, as expected.

[a] Band(D): $K^\pi=2^+$, α=0 γ band. Small alignment at low spin. At higher frequencies, vibrational states probably mix with two-quasiparticle (ν 5/2[512])⊗(ν 1/2[521]) band.

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^{170}Er(α,4nγ) 1998Ar08 (continued)

^{170}Yb Levels (continued)

[b] Band(d): $K^\pi=2^+$, α=1 γ band. Small alignment at low spin. At higher frequencies, vibrational states probably mix with two-quasiparticle (ν 5/2[512])⊗(ν 1/2[521]) band.
[c] Band(e): $K^\pi=3^-$, α=1. Signature partner of $K^\pi=3^-$, α=0 band. See comments on that band.
[d] Band(E): $K^\pi=3^-$, α=0. Bandhead energy very close to that calculated for the (ν 7/2[633])-(ν 1/2[521]) configuration; assignment supported by absence of a $(\nu\ i_{13/2})^2$ crossing in kinematic moment of inertia and by in-band transition strength ratios (B(M1)(cascade)/B(E2)(crossover)).
[e] Band(F): $K^\pi=4^-$, α=0. Configuration (ν 7/2[633])+(ν 1/2[521]) supported by two-quasiparticle plus rotor calculations, by large splitting from signature partner (as in 7/2[633] band in ^{171}Yb), by similarity of kinematic moment of inertia plot to that for (ν 7/2[633])+(ν 1/2[521]) band in ^{172}Yb, by alignment (which is close to sum of alignments for 7/2[633] and 1/2[521] bands in ^{171}Yb and ^{169}Tm), and by in-band transition strength ratios B(M1)(cascade)/B(E2)(crossover) (1998Ar08).
[f] Band(f): $K^\pi=4^-$, α=1. Signature partner of $K^\pi=4^-$, α=0 band. See comments on that band.
[g] Band(G): $K^\pi=6^-$, α=0. Configuration (ν 7/2[633])+(ν 5/2[512]), consistent with observed alignment and with behavior of ^{172}Yb band with same configuration.
[h] Band(g): $K^\pi=6^-$, α=1. Configuration (ν 7/2[633])+(ν 5/2[512]), consistent with observed alignment and with behavior of the ^{172}Yb band with same configuration.
[i] Band(h): $K^\pi=7^-$, α=1. Signature partner of $K^\pi=7^-$, α=0 band. See comments on that band.
[j] Band(H): $K^\pi=7^-$, α=0. Configuration (π 7/2[523])+(π 7/2[404]) consistent with observed alignment and with transition strength ratios B(M1)(cascade)/B(E2)(crossover) for J=9, 10, 11 (1998Ar08).
[k] Band(I): $K^\pi=(3)^+$, α=0. Band's decay characteristics imply K≤4; probably analogous (based on comparison of kinetic moment of inertia plots) to a $K^\pi=3^+$ band in ^{172}Yb which includes the (ν 5/2[512])+(ν 1/2[521]) configuration. 1998Ar08 suggest that configuration for this band also.
[l] Band(i): $K^\pi=(3)^+$, α=1. Signature partner of the $K^\pi=(3)^+$, α=0 band. See comments on that band.
[m] Band(C): $K^\pi=(1)^-$, α=0 octupole band. Large energy splitting relative to signature partner is observed, as expected.

γ(^{170}Yb)

E_γ[†]	I_γ[‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	α[a]	Comments
84.4 *2*		84.40	2+	0.0	0+			
86.8 *2*	2.0 *2*	1345.2	5−	1258.5	4−	D		DCO=0.50 *3* (1998Ar08).
102.4 *5*	0.3 *1*	1762.7	6−	1660.4	5−			
105.2 *2*	4.7 *3*	1450.4	6−	1345.2	5−	D		DCO=0.37 *1* (1998Ar08).
113.6 *5*	0.6 *2*	1964.7	7−	1851.3	6−			
122.6 *5*	0.9 *2*	1572.7	7−	1450.4	6−	D		DCO=0.72 *5* (1998Ar08).
132.9 *2*	0.7 *2*	1793.5	6−	1660.4	5−			
133.9 *2*	1.7 *2*	2098.5	8−	1964.7	7−			
141.0 *5*	0.2 *1*	1903.2	7−	1762.7	6−			
141.5 *2*	2.1 *2*	2044.7	8−	1903.2	7−			
143.2 *2*	4.7 *3*	1715.8	8−	1572.7	7−	D		DCO=0.35 *1* (1998Ar08).
152.0 *2*	2.4 *2*	2341.7	8−	2189.7	7−			
154.9 *2*	1.5 *2*	2253.5	9−	2098.5	8−			
156.4 *2*	1.7 *2*	1872.1	9−	1715.8	8−	D		DCO=0.37 *3* (1998Ar08).
175.4 *2*	1.4 *2*	2429.1	10−	2253.5	9−			
175.9 *2*	1.4 *2*	2220.7	9−	2044.7	8−			
177.8 *2*	2.6 *2*	2398.5	10−	2220.7	9−			
183.6 *2*	2.6 *2*	2525.1	9−	2341.7	8−			
184.6 *2*	3.0 *3*	2056.6	10−	1872.1	9−	D		DCO=0.31 *2* (1998Ar08).
185.3 *2*	1.1 *1*	2242.0	11−	2056.6	10−	D		DCO=0.39 *4* (1998Ar08).
191.9 *2*	5.3 *3*	1450.4	6−	1258.5	4−	Q		DCO=1.02 *8* (1998Ar08).
193.2 *2*	364 *10*	277.6	4+	84.40	2+	E2	0.302	A_2=+0.18 *1*, A_4=−0.07 *2* (1972Mo44); DCO=1.03 *1* (1998Ar08).
205.1 *2*	1.7 *1*	2603.6	11−	2398.5	10−	D		DCO=0.62 *4* (1998Ar08).
206.9 *5*	0.5 *2*	2680.7	13−	2473.6	12−			

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^{170}Er(α,4nγ) 1998Ar08 (continued)

γ(^{170}Yb) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	α[a]	Comments
207.3 2	3.1 3	2732.3	10⁻	2525.1	9⁻			
212.1 2	1.5 1	2815.7	12⁻	2603.6	11⁻	D		DCO=0.56 7 (1998Ar08).
220[b] 1	<0.3	3186.4	15⁻	2966.4	14⁻			
220.5 5	0.8 3	1793.5	6⁻	1573.3	4⁻	Q		DCO=0.9 1 (1998Ar08).
227.0 2	1.3 1	2959.5	11⁻	2732.3	10⁻			
227.5 2	2.9 2	1572.7	7⁻	1345.2	5⁻	Q		DCO=1.09 9 (1998Ar08).
228.2[b] 5	0.5 2	1521.4	6⁺	1292.3	4⁺			
231.6 2	1.9 3	2473.6	12⁻	2242.0	11⁻			
234.3 2	1.0 1	3050.0	13⁻	2815.7	12⁻			
242.5 2	1.5 2	3202.1	(12⁻)	2959.5	11⁻			
243.2 5	1.0 3	1903.2	7⁻	1660.4	5⁻	Q		DCO=1.1 1 (1998Ar08).
246.7 2	0.5 1	3296.6	14⁻	3050.0	13⁻			
247.0 5	0.5 2	2098.5	8⁻	1851.3	6⁻			
260.4 5	0.4 2	1669.1	6⁺	1408.9	4⁺			
265[b] 1	0.5 2	3466.8?	(13⁻)	3202.1	(12⁻)			
265.4 2	11.2 1	1715.8	8⁻	1450.4	6⁻	Q		DCO=1.16 4 (1998Ar08).
270.8 2	0.4 1	3567.4	15⁻	3296.6	14⁻			
271.6 5	0.2 1	1601.4	6⁺	1329.5	4⁺			
281.8 2	1.8 5	1803.4	8⁺	1521.4	6⁺			
281.9 2	2.4 3	2044.7	8⁻	1762.7	6⁻	(Q)		DCO=1.2 2 (1998Ar08).
285.7 2	1.2 2	2966.4	14⁻	2680.7	13⁻			
288.8 2	1.1 3	2253.5	9⁻	1964.7	7⁻			
292.9 5	0.6 2	2005.4	9⁻	1712.5	7⁻			
295.7 2	300	573.4	6⁺	277.6	4⁺	E2	0.0772	A_2=+0.24 2, A_4=−0.09 3 (1972Mo44).
299.2 2	8.7 3	1872.1	9⁻	1572.7	7⁻	Q		DCO=1.05 4 (1998Ar08).
303.3 2	3.2 6	2096.9	8⁻	1793.5	6⁻	Q		DCO=1.11 6 (1998Ar08).
306.1 5	0.7 4	1835.1	7⁺	1528.9	5⁺			
317.5 2	1.5 2	2220.7	9⁻	1903.2	7⁻	Q		DCO=1.0 1 (1998Ar08).
320.6 5	0.8 3	1780.6	7⁺	1459.8	5⁺			
330.7 2	1.5 2	2429.1	10⁻	2098.5	8⁻			
331.9 2	1.5 4	2135.3	10⁺	1803.4	8⁺	Q		DCO=0.9 1 (1998Ar08).
334.4 5	<0.5	2096.9	8⁻	1762.7	6⁻			
335.4 5	0.4 2	2525.1	9⁻	2189.7	7⁻			DCO=1.3 2 (1998Ar08).
338.3 2	3.1 2	2189.7	7⁻	1851.3	6⁻			
340.4 2	1.6 3	2009.4	8⁺	1669.1	6⁺			
340.8 2	16.9 3	2056.6	10⁻	1715.8	8⁻	Q		DCO=1.07 3 (1998Ar08).
352.8 2	1.2 3	1954.2	8⁺	1601.4	6⁺	Q		DCO=1.00 1 (1998Ar08).
353.9 2	3.9 2	2398.5	10⁻	2044.7	8⁻	Q		DCO=1.02 9 (1998Ar08).
369.9 2	10.3 3	2242.0	11⁻	1872.1	9⁻	Q		DCO=1.03 5 (1998Ar08).
381.0 2	1.5 3	2477.9	10⁻	2096.9	8⁻	Q		DCO=1.03 9 (1998Ar08).
382.6 2	0.8 2	2388.1	11⁻	2005.4	9⁻			
382.9 2	3.7 2	2603.6	11⁻	2220.7	9⁻			DCO=1.0 3 (1998Ar08).
389.1 2	11 2	2170.1	9⁺	1780.6	7⁺			
389.2 2	1.8 2	2524.3	12⁺	2135.3	10⁺	Q		DCO=0.88 4 (1998Ar08).
389.9 2	205 6	963.3	8⁺	573.4	6⁺	E2	0.0346	A_2=+0.28 1, A_4=−0.11 2 (1972Mo44); DCO=1.06 1 (1998Ar08).
390.5 2	1.3 2	2732.3	10⁻	2341.7	8⁻			
400.9 2	1.9 2	1851.3	6⁻	1450.4	6⁻			
403.1 2	1.6 3	2412.4	10⁺	2009.4	8⁺	Q		DCO=1.1 2 (1998Ar08).
417.0 2	14.5 3	2473.6	12⁻	2056.6	10⁻	Q		DCO=0.99 2 (1998Ar08).
417.2 2	3.2 2	2815.7	12⁻	2398.5	10⁻	Q		DCO=0.93 8 (1998Ar08).
418[b] 1	1.4 3	2847.1?	(12⁻)	2429.1	10⁻			
418.7 2	1.2 2	2372.8	10⁺	1954.2	8⁺	Q		DCO=1.0 1 (1998Ar08).
433.8 2	6.7 7	2603.9	11⁺	2170.1	9⁺	Q		DCO=0.86 4 (1998Ar08).
434.4 2	2.3 3	2959.5	11⁻	2525.1	9⁻	Q		DCO=0.9 1 (1998Ar08).

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$^{170}Er(\alpha,4n\gamma)$ 1998Ar08 (continued)

$\gamma(^{170}Yb)$ (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	α[a]	Comments
438.7 2	10.7 3	2680.7	13⁻	2242.0	11⁻	Q		DCO=1.02 4 (1998Ar08).
446.4 2	2.2 2	3050.0	13⁻	2603.6	11⁻	Q		DCO=1.0 1 (1998Ar08).
446.8 2	1.2 2	2859.2	(12⁺)	2412.4	10⁺			
449.4 2	1.0 2	2927.3	12⁻	2477.9	10⁻	Q		DCO=1.0 2 (1998Ar08).
454.0 2	1.8 2	2826.8	12⁺	2372.8	10⁺	Q		DCO=1.1 2 (1998Ar08).
462.4 2	1.8 3	2986.7	14⁺	2524.3	12⁺	Q		DCO=0.9 1 (1998Ar08).
463.2 2	2.9 4	3067.1	13⁺	2603.9	11⁺	Q		DCO=1.14 9 (1998Ar08).
467.5 2	0.9 2	2855.6	13⁻	2388.1	11⁻	Q		DCO=1.0 1 (1998Ar08).
469.9 2	0.9 2	3202.1	(12⁻)	2732.3	10⁻			
474[b] 1	1.0 5	3333.2?	(14⁺)	2859.2	(12⁺)			
474.2 2	120 4	1437.5	10⁺	963.3	8⁺	E2	0.0204	A_2=+0.30 2, A_4=−0.17 3 (1972Mo44); DCO=1.04 1 (1998Ar08).
478.0 2	0.9 1	2938.6	12$^{(-)}$	2460.6	10$^{(-)}$			DCO=1.1 4 (1998Ar08).
480.5 2	1.1 2	3307.3	14⁺	2826.8	12⁺	Q		DCO=1.1 2 (1998Ar08).
480.7 2	2.2 2	3296.6	14⁻	2815.7	12⁻			
491.1 2	1.4 2	3558.2	(15⁺)	3067.1	13⁺			
492.7 2	7.9 3	2966.4	14⁻	2473.6	12⁻	E2	0.0185	A_2=+0.34 4, A_4=−0.01 5 (1981Wa14); DCO=0.96 3 (1998Ar08).
505.7 2	7.1 3	3186.4	15⁻	2680.7	13⁻	Q		DCO=0.99 8 (1998Ar08).
505.9 2	4.1 4	1851.3	6⁻	1345.2	5⁻			
507[b] 1	1.0 2	3466.8?	(13⁻)	2959.5	11⁻			
507.0[b] 10	0.6 2	4065.2?	(17⁺)	3558.2	(15⁺)			
510.6 5	0.8 3	3437.9	(14⁻)	2927.3	12⁻			
511[b] 1	0.6 3	3844.2?	(16⁺)	3333.2?	(14⁺)			
514.3 2	1.2 2	1964.7	7⁻	1450.4	6⁻			
517.4 2	1.1 2	3567.4	15⁻	3050.0	13⁻			DCO=1.0 3 (1998Ar08).
526.0 2	0.8 2	3833.3	(16⁺)	3307.3	14⁺			
540.0 2	0.4 1	3742.1	(14⁻)	3202.1	(12⁻)			
540.6 2	2.9 5	2524.3	12⁺	1983.4	12⁺	@		DCO=0.88 4 (1998Ar08).
545.7 2	65 2	1983.4	12⁺	1437.5	10⁺	E2	0.01433	Mult.: A_2=+0.29 4, A_4=−0.06 7 (1972Mo44); DCO=1.04 1 (1998Ar08).
545.8 5	0.6 2	3842.3	(16⁻)	3296.6	14⁻			
546.1 5	1.0 5	3401.7	15⁻	2855.6	13⁻			
560.6 5	0.9 5	3547.3	16⁺	2986.7	14⁺			
567.4 2	4.3 3	3533.8	16⁻	2966.4	14⁻	E2	0.01302	A_2=+0.16 8, A_4=−0.26 11 (1981Wa14); DCO=0.96 4 (1998Ar08).
570.3 2	4.6 2	3756.7	17⁻	3186.4	15⁻	E2	0.01286	A_2=+0.22 4, A_4=−0.17 7 (1981Wa14); DCO=1.04 7 (1998Ar08).
574 1	<0.5	4011.9	(16⁻)	3437.9	(14⁻)			
597.0[&] 2	33 1	2580.4	14⁺	1983.4	12⁺	E2	0.01152	A_2=+0.27 4; A_4=−0.05 6 (1981Wa14); DCO=1.01 1 (1998Ar08).
609.2 2	4.7 3	1572.7	7⁻	963.3	8⁺	D		DCO=0.69 4 (1998Ar08).
611.7 2	3.4 4	3806.8	18⁺	3195.1	16⁺	E2	0.01087	A_2=+0.36 4, A_4=−0.05 7 (1981Wa14); DCO=1.03 4 (1998Ar08).
614.8 2	11.2 8	3195.1	16⁺	2580.4	14⁺	E2	0.01075	A_2=+0.37 3, A_4=−0.06 5 (1981Wa14); DCO=1.07 3 (1998Ar08).
616.0 5	0.6 3	4017.6	(17⁻)	3401.7	15⁻			
629.7 5	0.4 2	4436.5	20⁺	3806.8	18⁺	(E2)	0.01016	A_2=+0.29 12, A_4=−0.10 18 (1981Wa14); DCO=1.2 4 (1998Ar08).
633.8 2	0.4 1	4390.5	19⁻	3756.7	17⁻			DCO=1.3 2 (1998Ar08).
640.2 2	0.8 1	4174.0	(18⁻)	3533.8	16⁻			
659.4 5	0.3 2	4207.1	(18⁺)	3547.3	16⁺			
694.5 2	0.4 1	5085.0	(21⁻)	4390.5	19⁻			
697.5 2	5.3 2	2680.7	13⁻	1983.4	12⁺	D		DCO=0.64 4 (1998Ar08).

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^{170}Er(α,4nγ) 1998Ar08 (continued)

γ(^{170}Yb) (continued)

$E_γ$ †	$I_γ$ ‡	E_i(level)	$J^π_i$	E_f	$J^π_f$	Mult.#	Comments
697.8 2	3.4 6	2135.3	10+	1437.5	10+		DCO=0.84 4 (1998Ar08).
711.9 5	0.3 1	4885.9	(20−)	4174.0	(18−)		
732.9 2	0.8 2	2170.1	9+	1437.5	10+		
739.2 5	0.4 2	2189.7	7−	1450.4	6−		
771.8 2	8.3 4	1345.2	5−	573.4	6+	(D)	DCO=0.78 6 (1998Ar08).
783.1 2	1.5 2	2220.7	9−	1437.5	10+	(D)	DCO=0.72 8 (1998Ar08).
804.3 2	9.7 3	2242.0	11−	1437.5	10+	D	DCO=0.53 2 (1998Ar08).
817.1 2	2.9 4	1780.6	7+	963.3	8+	D	DCO=0.48 5 (1998Ar08).
821.4 2	1.9 3	3401.7	15−	2580.4	14+	D	DCO=0.6 1 (1998Ar08).
822 1	<0.3	4017.6	(17−)	3195.1	16+		
840.1 2	10 1	1803.4	8+	963.3	8+	@	DCO=1.0 1 (1998Ar08).
844.6 2	3.4 3	2189.7	7−	1345.2	5−	Q	DCO=1.1 1 (1998Ar08).
871.8 2	7.2 8	1835.1	7+	963.3	8+	D	DCO=0.55 3 (1998Ar08).
872.3 2	2.1 3	2855.6	13−	1983.4	12+	D	DCO=0.55 3 (1998Ar08).
886.5 5	1.4 5	1459.8	5+	573.4	6+		DCO=0.8 2 (1998Ar08).
908.8 2	14.5 5	1872.1	9−	963.3	8+	D	DCO=0.59 2 (1998Ar08).
935.3 2	1.3 3	2372.8	10+	1437.5	10+		DCO=0.9 3 (1998Ar08).
939.6 2	2.0 3	1903.2	7−	963.3	8+	D	DCO=0.60 9 (1998Ar08).
948.0 2	4.4 6	1521.4	6+	573.4	6+		
950.5 2	6.3 6	2388.1	11−	1437.5	10+	D	DCO=0.55 3 (1998Ar08).
955.2 5	1.5 6	1528.9	5+	573.4	6+		DCO=0.92 9 (1998Ar08).
955.3 5	0.5 2	2938.6	12(−)	1983.4	12+	@	DCO=1.1 2 (1998Ar08).
966.9 2	1.6 2	3547.3	16+	2580.4	14+		DCO=0.8 1 (1998Ar08).
974.8 2	0.9 2	2412.4	10+	1437.5	10+	@	DCO=0.9 1 (1998Ar08).
981.0 2	39 2	1258.5	4−	277.6	4+	@	DCO=1.12 3 (1998Ar08).
990.8 2	4.4 5	1954.2	8+	963.3	8+		DCO=0.6 1 (1998Ar08). Interpreted by 1998Ar08 as a ΔJ=0 transition.
999.3 2	13.8 6	1572.7	7−	573.4	6+	D	DCO=0.58 2 (1998Ar08).
1003.3 2	4.2 5	2986.7	14+	1983.4	12+		
1012.4 5	0.6 2	4207.1	(18+)	3195.1	16+		
1014.7 2	9 2	1292.3	4+	277.6	4+		DCO=1.2 2 (1998Ar08).
1023.0 2	0.8 2	2460.6	10(−)	1437.5	10+	@	DCO=1.0 2 (1998Ar08).
1028.1 2	2.8 6	1601.4	6+	573.4	6+		DCO=0.51 2 (1998Ar08). Interpreted by 1998Ar08 as a ΔJ=0 transition.
1042.1 2	10.3 9	2005.4	9−	963.3	8+	D	DCO=0.61 4 (1998Ar08).
1046.0 2	8.1 9	2009.4	8+	963.3	8+	@	DCO=0.97 7 (1998Ar08).
1051.8 2	5.5 9	1329.5	4+	277.6	4+		
1067.7 2	25 1	1345.2	5−	277.6	4+	D	DCO=0.64 3 (1998Ar08).
1086.8 2	5.2 5	1660.4	5−	573.4	6+		
1086.80 20	3.2 5	2524.3	12+	1437.5	10+	Q	DCO=1.1 1 (1998Ar08).
1095.8 2	2.7 5	1669.1	6+	573.4	6+		DCO=0.70 6 (1998Ar08). Interpreted by 1998Ar08 as a ΔJ=0 transition.
1131.3 2	2.5 8	1408.9	4+	277.6	4+	@	DCO=1.1 2 (1998Ar08).
1133.6 2	2.2 3	2096.9	8−	963.3	8+		
1139.1 2	4.0 6	1712.5	7−	573.4	6+	D	DCO=0.59 7 (1998Ar08).
1172.3 2	1.8 5	2135.3	10+	963.3	8+	Q	DCO=1.0 2 (1998Ar08).
1182.2 2	4.0 7	1459.8	5+	277.6	4+	D	DCO=0.69 7 (1998Ar08).
1207.0 2	16 2	1780.6	7+	573.4	6+	D	DCO=0.51 2 (1998Ar08).
1220.2 5	3 1	1793.5	6−	573.4	6+		DCO=1.2 3 (1998Ar08).
1230.3 2	6.3 9	1803.4	8+	573.4	6+		DCO=1.3 1 (1998Ar08).
1232.8 5	1.6 7	1510.4	5−	277.6	4+	(D)	DCO=0.7 1 (1998Ar08).
1243.6 2	4.6 9	1521.4	6+	277.6	4+		DCO=1.1 3 (1998Ar08).
1251.3 2	4.3 9	1528.9	5+	277.6	4+	(D)	DCO=0.7 1 (1998Ar08).
1257.6 2	6.0 4	2220.7	9−	963.3	8+	D	DCO=0.45 8 (1998Ar08).

Continued on next page (footnotes at end of table)

^{170}Er(α,4nγ) 1998Ar08 (continued)

γ(^{170}Yb) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	Comments
1261 *1*	2.2 *5*	1835.1	7^+	573.4	6^+	D	DCO=0.67 *8* (1998Ar08).
1295.7 *2*	4.0 *6*	1573.3	4^-	277.6	4^+		
1329.8 *2*	4.1 *5*	1903.2	7^-	573.4	6^+	D	DCO=0.62 *5* (1998Ar08).
1382.9 *2*	5.2 *6*	1660.4	5^-	277.6	4^+		DCO=0.8 *1* (1998Ar08).

† From 1998Ar08; ΔE_γ=0.2 keV for most lines, 0.5 keV for weak or contaminated transitions, and 1 keV when Eγ is quoted to only the nearest keV. The evaluator has assigned ΔE_γ=0.5 whenever ΔI_γ>30%.

‡ Relative Iγ for Eα=40 MeV; from 1998Ar08.

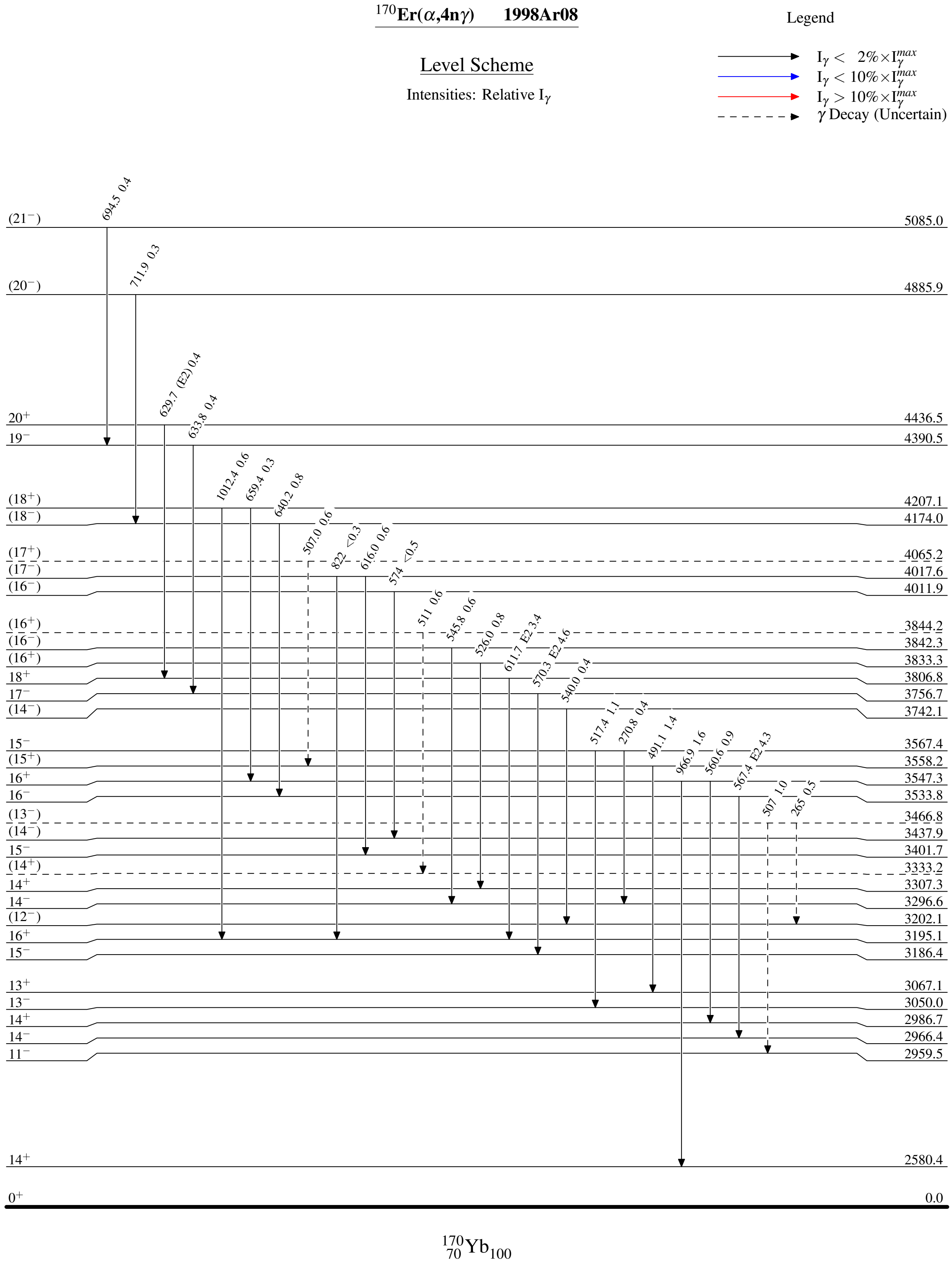
E2 (or (E2)) assignments follow from mult=stretched Q (or (Q)) from γ(θ) and mult not M2 from RUL, assuming $T_{1/2}\leq$40 ns and≤5 ns for data of 1972Mo44 and 1981Wa14, respectively (based on observation of prompt γγ coin). Other assignments are based on DCO ratio data of 1998Ar08; expected ratios are ≈ 1 for stretched Q (and D, ΔJ=0) and ≈ 0.5 for stretched D.

@ D (ΔJ=0) or stretched Q from DCO ratio; 1998Ar08 assign the former multipolarity.

& γ poorly resolved or unresolved from contaminant γ in 1981Wa14, so A_2 and A_4 values are subject to systematic error.

[a] 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.

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

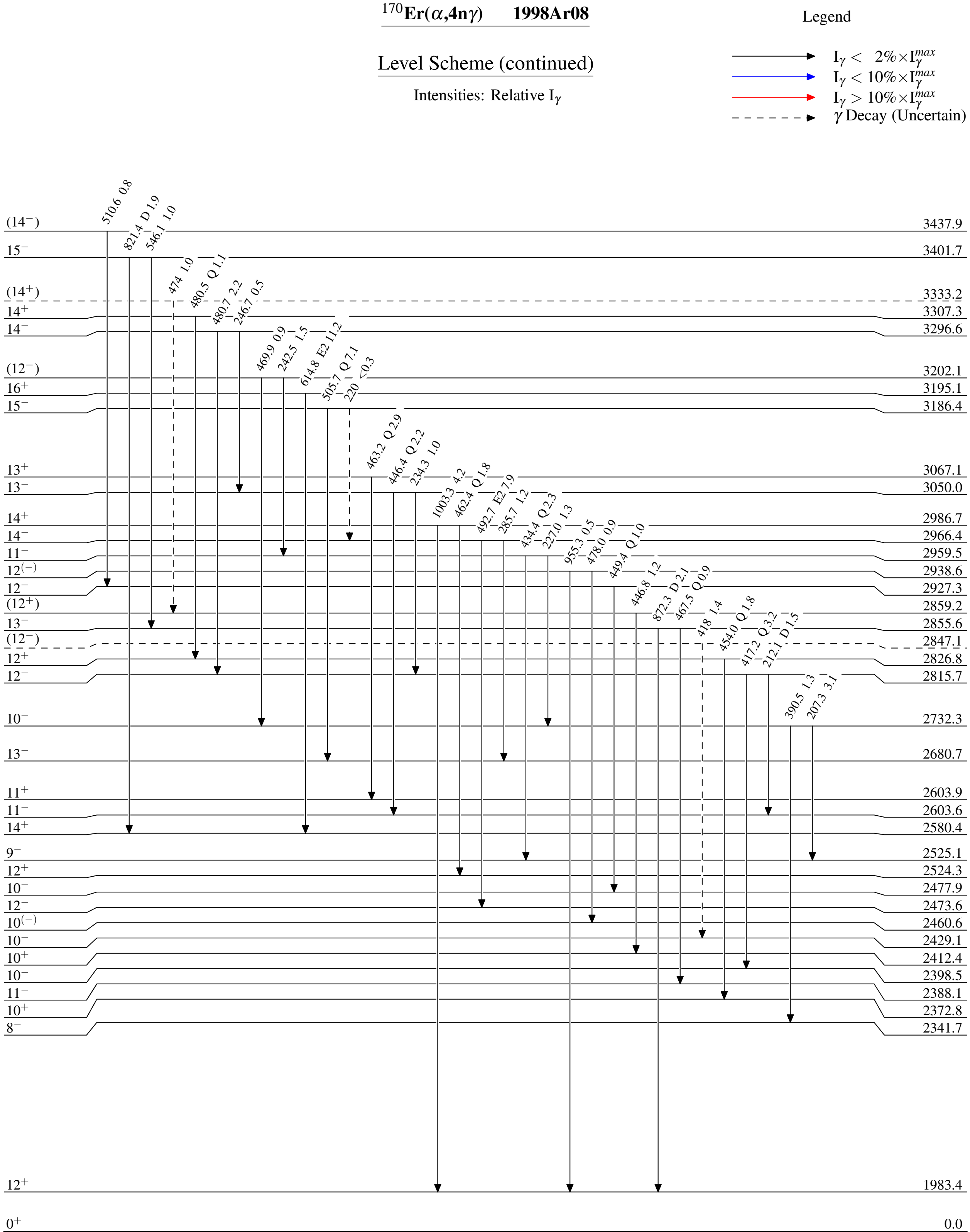


^{170}Er(α,4nγ) 1998Ar08
Level Scheme
Intensities: Relative I_γ
Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)
(21⁻) 5085.0
(20⁻) 4885.9
20⁺ 4436.5
19⁻ 4390.5
(18⁺) 4207.1
(18⁻) 4174.0
(17⁺) 4065.2
(17⁻) 4017.6
(16⁻) 4011.9
(16⁺) 3844.2
(16⁻) 3842.3
(16⁺) 3833.3
18⁺ 3806.8
17⁻ 3756.7
(14⁻) 3742.1
15⁻ 3567.4
(15⁺) 3558.2
16⁺ 3547.3
16⁻ 3533.8
(13⁻) 3466.8
(14⁻) 3437.9
15⁻ 3401.7
(14⁺) 3333.2
14⁺ 3307.3
14⁻ 3296.6
(12⁻) 3202.1
16⁺ 3195.1
15⁻ 3186.4
13⁺ 3067.1
13⁻ 3050.0
14⁺ 2986.7
14⁻ 2966.4
11⁻ 2959.5
14⁺ 2580.4
0⁺ 0.0
694.5 0.4
711.9 0.3
629.7 (E2) 0.4
633.8 0.4
1012.4 0.6
659.4 0.3
640.2 0.8
507.0 0.6
822 <0.3
616.0 0.6
574 <0.5
511 0.6
545.8 0.6
526.0 0.8
611.7 E2 3.4
570.3 E2 4.6
540.0 0.4
517.4 1.1
270.8 0.4
491.1 1.4
966.9 1.6
560.6 0.9
567.4 E2 4.3
507 1.0
265 0.5
$^{170}_{70}Yb_{100}$

^{170}Er(α,4nγ) 1998Ar08

Level Scheme (continued)

Intensities: Relative I_γ



$^{170}_{70}Yb_{100}$

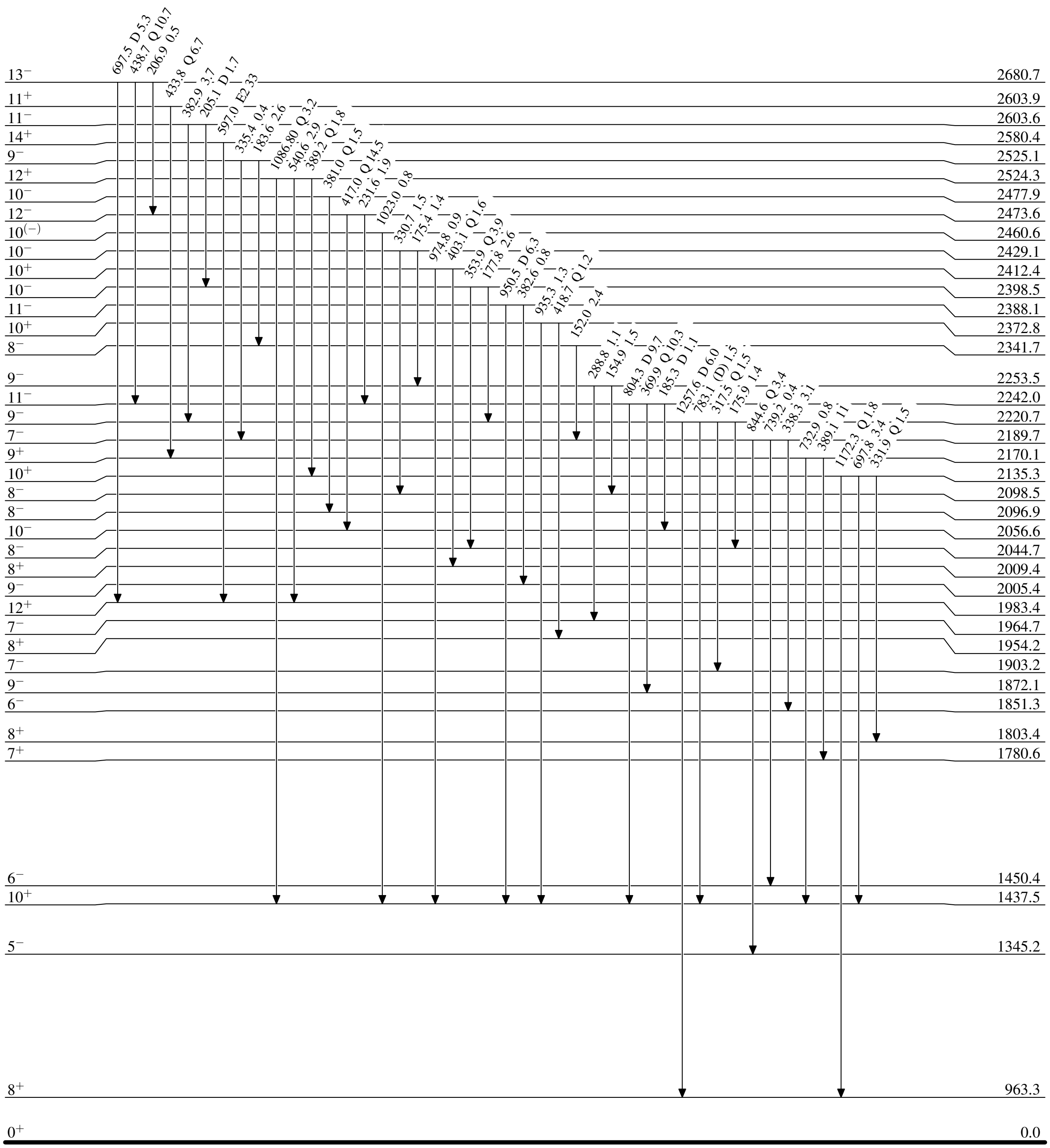
^{170}Er(α,4nγ) 1998Ar08

Level Scheme (continued)

Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$

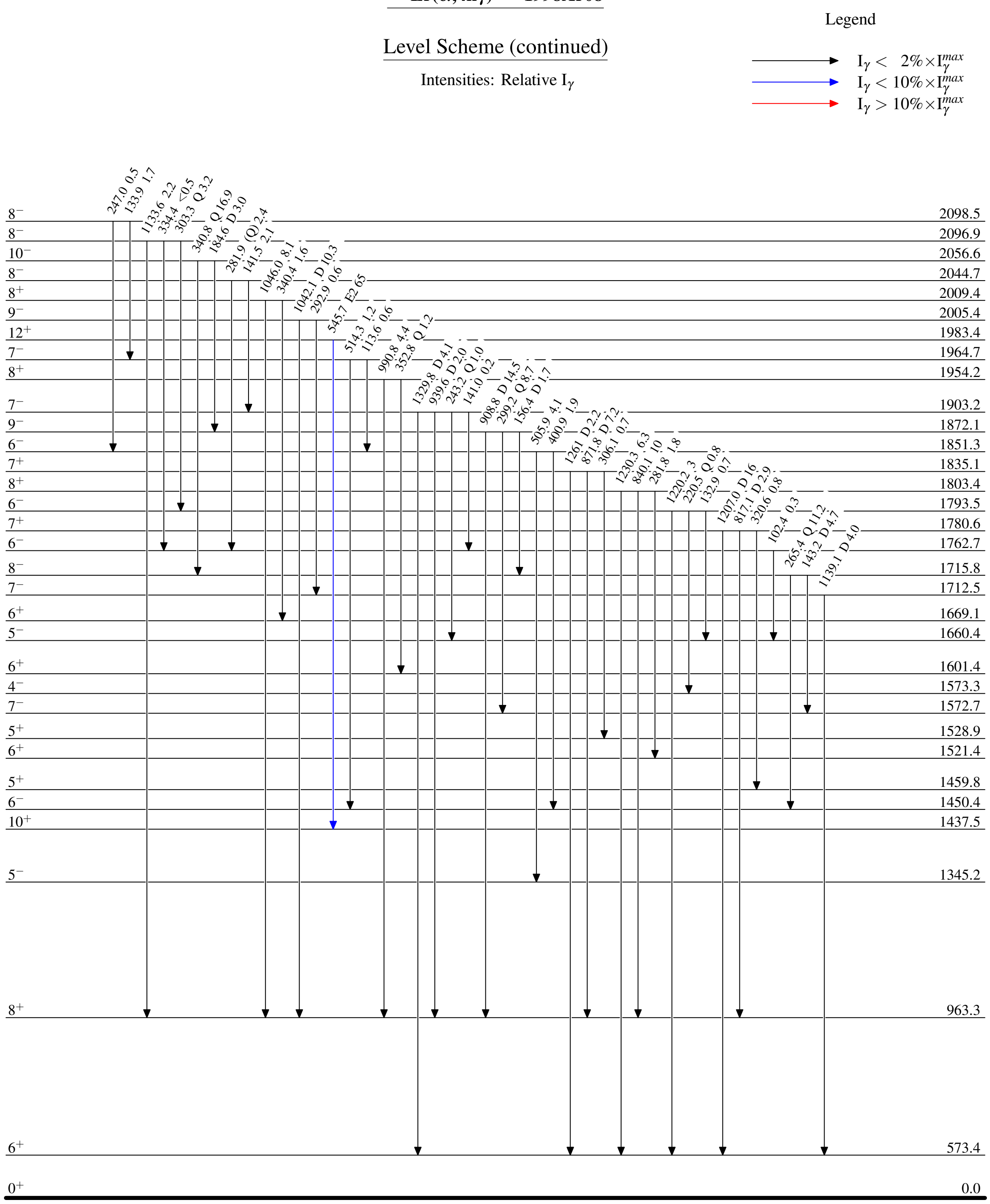


$^{170}_{70}Yb_{100}$

$^{170}Er(\alpha,4n\gamma)$ 1998Ar08

Level Scheme (continued)

Intensities: Relative I_γ



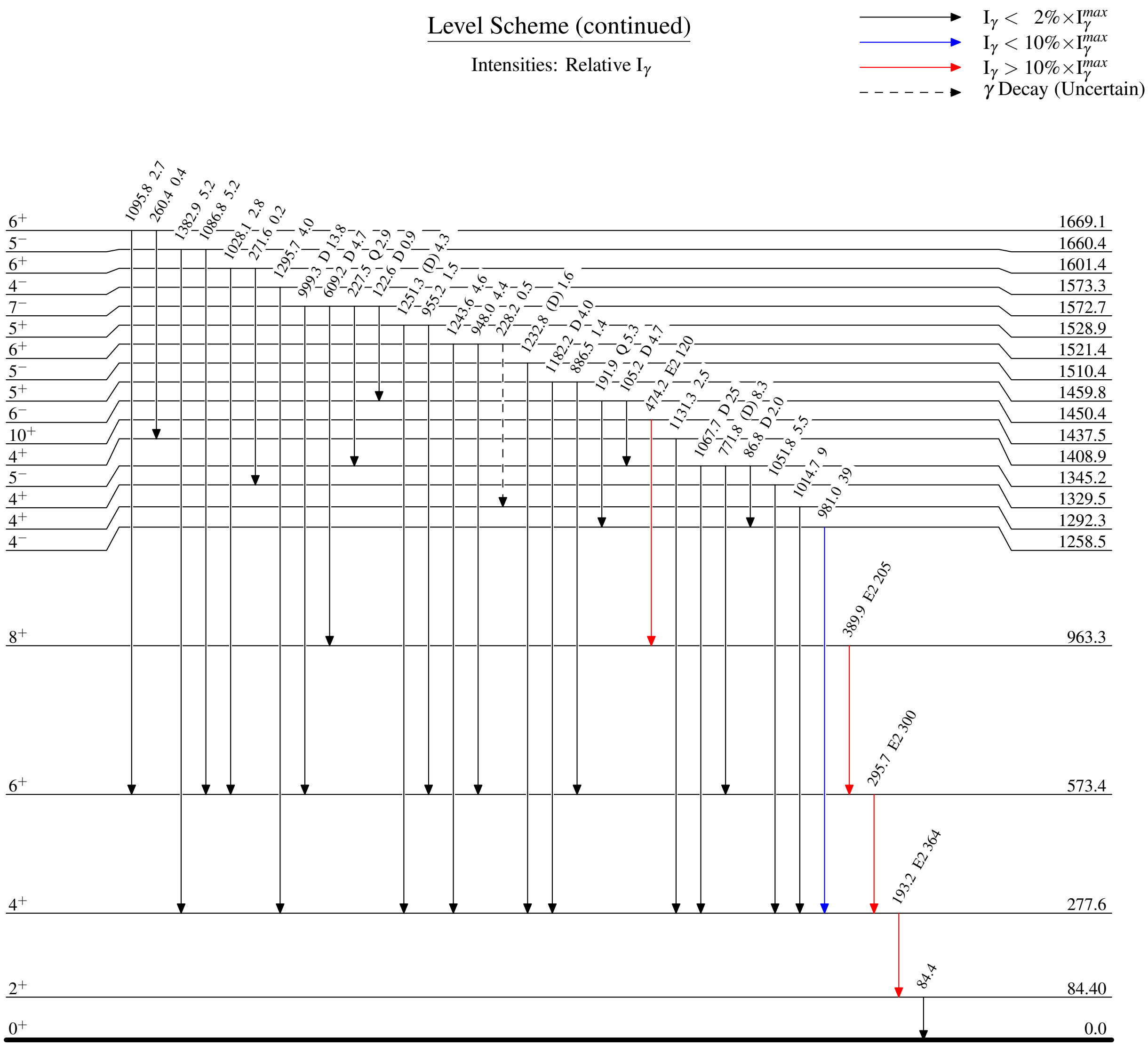
$^{170}_{70}Yb_{100}$

^{170}Er(α,4nγ) 1998Ar08

Legend

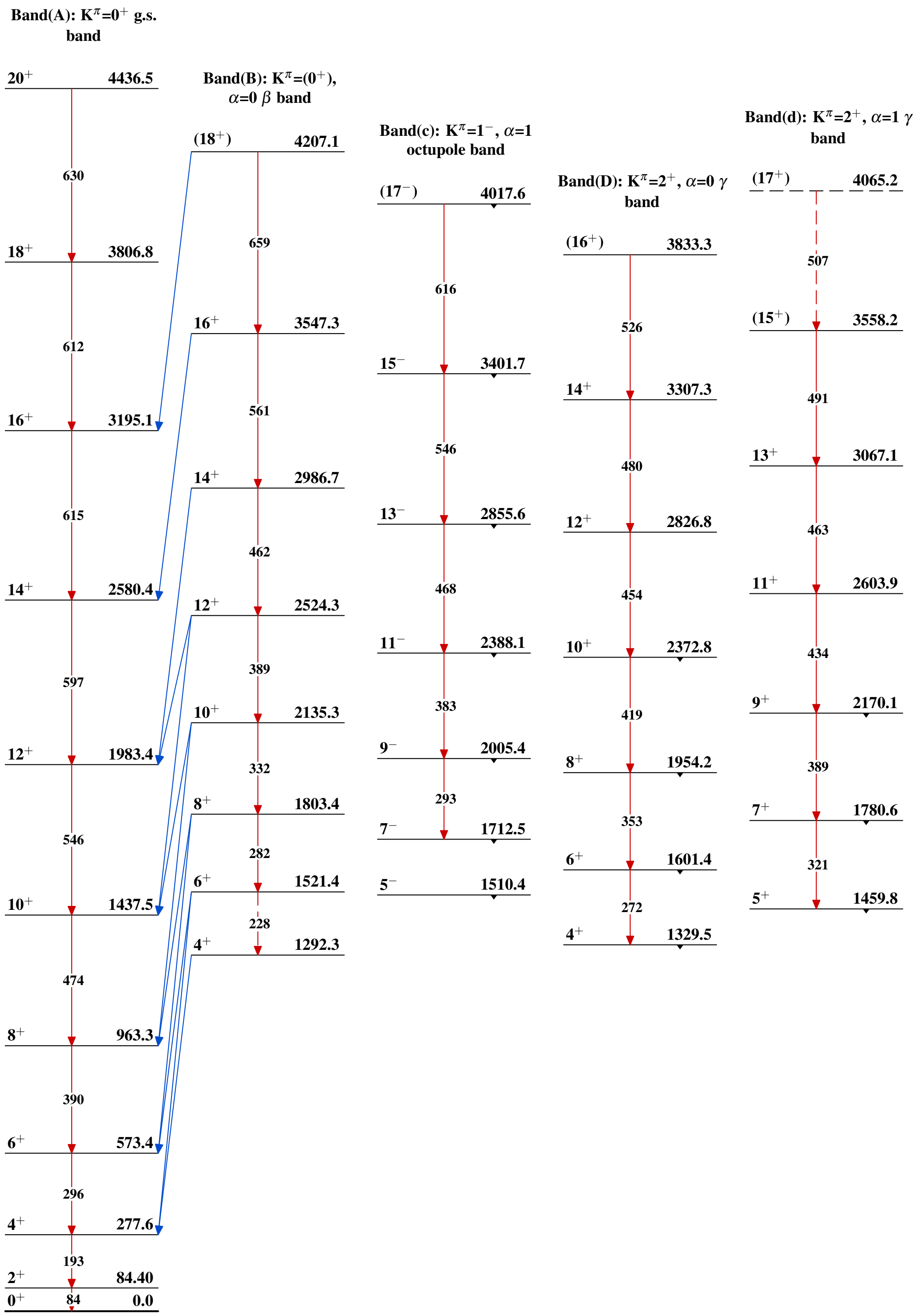
Level Scheme (continued)

Intensities: Relative I_γ



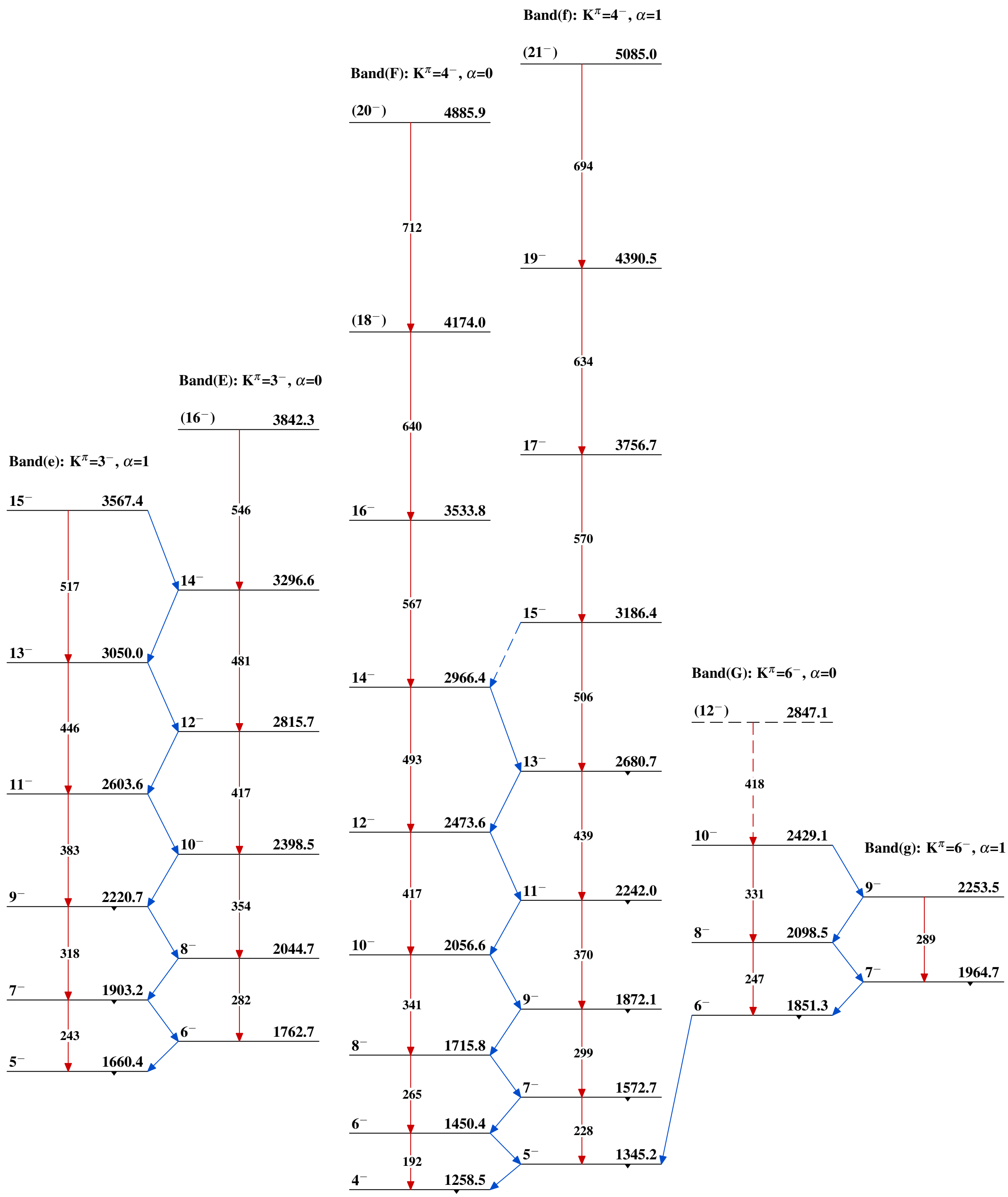
$^{170}_{70}Yb_{100}$

^{170}Er(α,4nγ) 1998Ar08



$^{170}_{70}Yb_{100}$

$^{170}Er(\alpha,4n\gamma)$ 1998Ar08 (continued)



$^{170}_{70}Yb_{100}$

^{170}Er(α,4nγ) 1998Ar08 (continued)