(HI,xnγ) 1979Dr08,1990IrZZ

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin, E. A. Mccutchan	NDS 151, 334 (2018)	30-Jun-2018

This dataset includes (α,3nγ), (^{10}B,4nγ), (^{11}B,5nγ), (^{12}C,3nγ), (^{13}C,4nγ), (^{16}O,5nγ), (^{50}Ti,3nγ). Please see separate datasets for data from ^{160}Gd(^{18}O,7nγ) and from ^{128}Te(^{48}Ca,5nγ).

See 1983Ma32 for neutron multiplicities at high excitation; see 1982Pe10 and 1983Pe21 for γ-ray multiplicities at high excitation.

1974La24 (also 1972Re13): ^{170}Yb(α,3nγ), E(α)=20-43 MeV; ^{165}Ho(^{10}B,4nγ), E(^{10}B)=45-60 MeV; ^{165}Ho(^{11}B,5nγ), E(^{11}B)=50-75 MeV; Ge(Li) detectors; measured Eγ, Iγ, γ(θ), γγ coin.

1979Dr08: ^{160}Gd(^{16}O,5nγ), E(^{16}O)=92 MeV; ^{162}Dy(^{13}C,4nγ), E(^{13}C)=64 MeV; ^{162}Dy(^{12}C,3nγ). Enriched metallic targets; measured Eγ, Iγ (Ge(Li), FWHM=2.2 keV at 1333 keV; HPGe, FWHM=750 eV at 122 keV), E(ce), Ice (Si(Li) (mag filter)), γγ and nγ coin, γγ(t), nγ(t), γ(θ) (7 angles, 0° to 90°).

1990IrZZ: ^{124}Sn(^{50}Ti,3nγ), E(^{50}Ti)=205 MeV; TESSA30 Ge detector array; measured Eγ, γγ, γγ(θ) (data not given).

Others: 1972Re13, 1974La24, 1979Dr02, 1982Pe10, 1983Ma32, 1983Pe21.

The level scheme is that of 1979Dr08 with the addition of structure from 1990IrZZ.

^{171}Hf Levels

E(level)†	Jπ‡	$T_{1/2}$	Comments
0.0@	7/2+		
21.93& *9*	1/2−		E(level): from Adopted Levels.
49.6a *2*	5/2−	64 ns *4*	$T_{1/2}$: γγ(t) in ^{162}Dy(^{12}C,3nγ) (1979Dr08).
61.84@ *13*	9/2+		
88.61& *20*	3/2−		
102.51& *20*	5/2−		
141.6a *3*	7/2−		
145.96@ *13*	11/2+		
244.82@ *18*	13/2+		
254.6& *3*	7/2−		
258.4a *3*	9/2−		
277.61& *25*	9/2−		
382.17@ *19*	15/2+		
398.5a *4*	11/2−		
507.9& *4*	11/2−		
512.07@ *21*	17/2+		
536.4& *4*	13/2−		
560.4a *4*	13/2−		
716.27@ *25*	19/2+		
741.3a *4*	15/2−		
838.2& *5*	15/2−		
866.1@ *3*	21/2+		
866.7& *5*	17/2−		
939.8a *5*	17/2−		
1145.3@ *4*	23/2+		
1152.8a *5*	19/2−		
1234.0& *6*	19/2−		
1256.7& *6*	21/2−		
1305.9@ *5*	25/2+		
1378.4a *7*	21/2−		
1631.0a *7*	(23/2−)		E(level): not adopted; see comment on 478.2γ.

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(HI,xnγ) 1979Dr08,1990IrZZ (continued)

^{171}Hf Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	Comments
1645.1[c] *5*	19/2$^+$	6.2 ns *14*	$T_{1/2}$: from γγ(t) (1979Dr08).
1661.4[@] *5*	27/2$^+$		
1688.0[&] *8*	23/2$^-$		
1697.6[&] *7*	25/2$^-$		
1794.0[b] *5*	21/2$^+$		
1827.6[@] *5*	29/2$^+$		
1876.9[a] *7*	25/2$^-$		E(level): not adopted; see comment on 498.5γ.
1977.2[c] *6*	23/2$^+$		
1984.6[e] *6*	23/2$^-$	18 ns *2*	$T_{1/2}$: γγ(t), nγ(t) (1979Dr08).
2160.9[d] *7*	(25/2)		
2183.5[&] *8*	29/2$^-$		
2195.7 *9*	27/2$^-$[#]		
2254.8[@] *5*	31/2$^+$		
2371.1[e] *7*	(27/2)		
2425.6[@] *6*	33/2$^+$		
2610.4[d] *8*	(29/2)		
2711.5[&] *8*	33/2$^-$		
2752.7 *13*	(31/2$^-$)[#]		
2875.8[e] *8*	(31/2)		
2914.2[@] *6*	35/2$^+$		
3092.2[@] *7*	37/2$^+$		
3165.0[d] *8*	(33/2)		
3282.9[&] *9*	37/2$^-$		
3356.5 *17*	(35/2$^-$)[#]		
3475.7[e] *9*	(35/2)		
3629.2[@] *8*	39/2$^+$		
3806.4[d] *11*	(37/2)		
3819.3 *8*	41/2$^+$[#]		
3903.7[&] *10*	41/2$^-$		
3998.4 *20*	(39/2$^-$)[#]		
4155.4[e] *12*	(39/2)		
4390.6[@] *12*	(43/2$^+$)		
4582.5 *10*	45/2$^-$[#]		
4593.1 *10*	45/2$^+$[#]		
4678.2 *22*	(43/2$^-$)[#]		
5200.8 *15*	(47/2$^+$)[#]		
5320.7 *15*	49/2$^-$[#]		
5377.7? *14*	(49/2$^+$)[#]		
6063.0 *18*	(51/2$^+$)[#]		
6119.9 *18*	(53/2$^-$)[#]		
6177.5? *17*	(53/2$^+$)[#]		
6980.4 *21*	(57/2$^-$)[#]		
7900.8 *23*	(61/2$^-$)[#]		
8880.8 *25*	(65/2$^-$)[#]		
9916 *3*	(69/2$^-$)[#]		

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(HI,xnγ) 1979Dr08,1990IrZZ (continued)

^{171}Hf Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	Comments
11001? *3*	(73/2^{-})[#]	Level not adopted; deexcitation γ not confirmed in subsequent (HI,xnγ) study (viz., 2000Cu01).

[†] From least-squares adjustment of Eγ.
[‡] From γ-ray multipolarities, coincidence data, and rotational structure, except where noted (1979Dr08). See ^{171}Hf Adopted Levels for evaluator's assignments.
[#] From 1990IrZZ; assignments based on angular correlation data and extension of scheme from 1979Dr08.
[@] Band(A): 7/2[633] band.
[&] Band(B): 1/2[521] band.
[a] Band(C): 5/2[512] band.
[b] Band(D): K$^{\pi}$=19/2^{+}, α=+1/2, 3-quasiparticle band. Likely configuration=((π 7/2[404])(π 5/2[402])6^{+})$\otimes$(ν 7/2[633]) (1979Dr08).
[c] Band(d): K$^{\pi}$=19/2^{+}, α=−1/2, 3-quasiparticle band. Likely configuration=((π 7/2[404])(π 5/2[402])6^{+})$\otimes$(ν 7/2[633]) (1979Dr08).
[d] Band(E): K$^{\pi}$=23/2^{-}, α=+1/2, 3-quasiparticle band. Likely configuration=((π 7/2[404])(π 9/2[514])8^{-})$\otimes$(ν 7/2[633]) (1979Dr08).
[e] Band(e): K$^{\pi}$=23/2^{-}, α=−1/2 3-quasiparticle band. Likely configuration=((π 7/2[404])(π 9/2[514])8^{-})$\otimes$(ν 7/2[633]) (1979Dr08).

γ(^{171}Hf)

E_γ	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[c]	δ[d]	α[e]	Comments
(13.9[&] *14*)		102.51	5/2$^-$	88.61	3/2$^-$				
(23.0[&] *14*)		277.61	9/2$^-$	254.6	7/2$^-$				
49.6 *2*		49.6	5/2$^-$	0.0	7/2$^+$				
61.80 *15*	44 *10*	61.84	9/2$^+$	0.0	7/2$^+$				
66.7 *2*	2.3 *8*	88.61	3/2$^-$	21.93	1/2$^-$				
80.6 *2*	7.1 *20*	102.51	5/2$^-$	21.93	1/2$^-$				
84.09 *15*	59 *6*	145.96	11/2$^+$	61.84	9/2$^+$	M1+E2	−0.18 *+12−14*	6.61 *11*	A_2=−0.44 *6*, A_4=+0.09 *13* (1972Re13).
92.0 *2*	13.7 *23*	141.6	7/2$^-$	49.6	5/2$^-$				
98.80 *15*	30 *3*	244.82	13/2$^+$	145.96	11/2$^+$	M1+E2	−0.28 *+16−26*	4.11 *10*	A_2=−0.534 *24*, A_4=−0.024 *22* (1979Dr08). A_2=−0.58 *8*, A_4=−0.01 *13* (1972Re13).
[x]110.0[†] *2*									
116.81 *15*	6.8 *10*	258.4	9/2$^-$	141.6	7/2$^-$	M1(+E2)	−0.11 *+11−12*	2.56 *5*	A_2=−0.46 *8*, A_4=−0.04 *8* (1979Dr08). A_2=−0.48 *13*, A_4=+0.10 *20* (1972Re13).
[x]123.6[†] *1*									
129.90 *15*	33.6 *19*	512.07	17/2$^+$	382.17	15/2$^+$	M1+E2	−0.9 *+7−19*	1.6 *3*	A_2=−0.66 *5*, A_4=+0.05 *6* (1979Dr08). A_2=−0.75 *13*, A_4=+0.02 *12* (1972Re13).
137.2 *2*	46.4[‡] *25*	382.17	15/2$^+$	244.82	13/2$^+$	M1+E2	−0.35 *+15−23*	1.56 *9*	A_2=−0.71 *5*, A_4=+0.12 *5* (1979Dr08). A_2=−0.76 *11*, A_4=−0.10 *15* (1972Re13).
140.1 *2*	9.7 *15*	398.5	11/2$^-$	258.4	9/2$^-$	M1(+E2)	−0.04 *10*	1.529 *25*	A_2=−0.38 *7*, A_4=−0.03 *6* (1979Dr08). A_2=−0.26 *8*, A_4=+0.11 *20* (1972Re13).
146.00 *15*	9.8[‡] *18*	145.96	11/2$^+$	0.0	7/2$^+$	E2		0.855	A_2=+0.26 *6*, A_4=−0.13 *6* (1979Dr08).
148.9 *2*	10.6 *9*	1794.0	21/2$^+$	1645.1	19/2$^+$	M1		1.288	Mult.: from delayed intensity balance for 190.6γ-148.9γ cascade (sidefeeding problem eliminated). M1 for 148.9γ and E1 for 190.6γ satisfy equation Iγ(148.9γ)(1+α(148.9γ))=Iγ(190.6γ)(1+α(190.6γ)). E1+M2 also gives required α, but with prohibitively large M2 strength. A_2=−0.05 *7*, A_4=+0.02 *7* (1979Dr08).
149.7 *2*	10.5 *9*	866.1	21/2$^+$	716.27	19/2$^+$	M1(+E2)	−0.04 *+10−11*	1.268 *21*	A_2=−0.60 *7*, A_4=+0.07 *7* (1979Dr08).
160.5 *3*	6.0[#] *10*	1305.9	25/2$^+$	1145.3	23/2$^+$				
161.90 *15*	5.3[#] *9*	560.4	13/2$^-$	398.5	11/2$^-$	M1+E2	−0.19 *+14−18*	1.00 *4*	A_2=−0.58 *11*, A_4=−0.01 *15* (1972Re13). A_2=−0.58 *11*, A_4=−0.01 *15* (1972Re13).
166.0 *2*	16.0 *9*	254.6	7/2$^-$	88.61	3/2$^-$	E2		0.543	A_2=+0.30 *15* (1972Re13).
166.2[a]		1827.6	29/2$^+$	1661.4	27/2$^+$				
175.10 *15*	45 *5*	277.61	9/2$^-$	102.51	5/2$^-$	E2		0.451	A_2=+0.30 *3*, A_4=−0.13 *3* (1979Dr08).
176.3 *3*	8.1[#] *20*	2160.9	(25/2)	1984.6	23/2$^-$				
180.9 *3*	5.3 *18*	741.3	15/2$^-$	560.4	13/2$^-$	M1(+E2)	−0.07 *+12−14*	0.744 *17*	A_2=−0.40 *21*, A_4=+0.07 *25* (1972Re13). A_2=−0.40 *21*, A_4=+0.07 *25* (1972Re13).
183.2[f] *3*	≥18.5[f]	244.82	13/2$^+$	61.84	9/2$^+$	E2		0.386	I_γ: deduced from total Iγ=33 *3* for both placements and

(HI,xnγ) 1979Dr08,1990IrZZ (continued)

γ(^{171}Hf) (continued)

E_γ	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[c]	δ[d]	α[e]	Comments
									Iγ≤11.6 for 1977, 2-level placement. A_2=+0.31 *11* (1972Re13) (where γ is not a doublet).
183.2[f] *3*	≤11.6[f]	1977.2	23/2$^+$	1794.0	21/2$^+$				I_γ: upper limit deduced from intensity balance at 1794.0 level.
190.6 *2*	13.6 *12*	1984.6	23/2$^-$	1794.0	21/2$^+$	E1		0.0667	A_2=−0.16 *5*, A_4=−0.04 *6* (1979Dr08). Mult.: see comment on 148.9γ from 1794 level.
198.3[@] *4*	≈3[@]	939.8	17/2$^-$	741.3	15/2$^-$				
204.2 *2*	25.5 *15*	716.27	19/2$^+$	512.07	17/2$^+$	M1+E2	−0.13 *+10−12*	0.528 *14*	A_2=−0.81 *4*, A_4=+0.07 *5* (1979Dr08).
209.0 *5*	≈5	258.4	9/2$^-$	49.6	5/2$^-$				
210.2 *3*	8.9[#] *15*	2371.1	(27/2)	2160.9	(25/2)				
213.0 *5*	≤3	1152.8	19/2$^-$	939.8	17/2$^-$				
225.6 *4*	4.2[#] *15*	1378.4	21/2$^-$	1152.8	19/2$^-$				
236.3 *2*	79 *4*	382.17	15/2$^+$	145.96	11/2$^+$	E2		0.1663	A_2=+0.201 *22*, A_4=−0.10 *3* (1979Dr08). A_2=+0.36 *9*, A_4=+0.05 *12* (1972Re13).
239.3 *3*	6.5[#] *15*	2610.4	(29/2)	2371.1	(27/2)				
253.3[@] *2*	20[@] *4*	507.9	11/2$^-$	254.6	7/2$^-$	E2		0.1333	A_2=+0.25 *6*, A_4=−0.05 *7* (1979Dr08).
256.5 *4*		398.5	11/2$^-$	141.6	7/2$^-$	E2		0.1282	A_2=+0.30 *10*, A_4=−0.07 *20* (1972Re13).
258.8 *3*	86 *5*	536.4	13/2$^-$	277.61	9/2$^-$	E2		0.1246	A_2=+0.270 *18*, A_4=−0.070 *22* (1979Dr08). A_2=+0.33 *14*, A_4=+0.02 *21* (1972Re13).
265.3 *3*	6.0[#] *15*	2875.8	(31/2)	2610.4	(29/2)				
267.3 *2*	123 *6*	512.07	17/2$^+$	244.82	13/2$^+$	E2		0.1127	A_2=+0.218 *15*, A_4=−0.053 *18* (1979Dr08). A_2=+0.27 *10*, A_4=−0.06 *19* (1972Re13).
[x]274.2[†] *2*									
279.1 *3*	13.1[#] *20*	1145.3	23/2$^+$	866.1	21/2$^+$	M1(+E2)	−0.01 *+8−9*	0.226	A_2=−0.30 *15* (1972Re13).
289.1 *3*	4.0 *12*	3165.0	(33/2)	2875.8	(31/2)				
[x]295.2[†] *1*									
302.0 *3*	10.8[#] *20*	560.4	13/2$^-$	258.4	9/2$^-$	E2		0.0776	A_2=+0.38 *11*, A_4=+0.03 *20* (1972Re13).
310.8 *4*	4.2[#] *7*	3475.7	(35/2)	3165.0	(33/2)				
330.3[f] *3*	21[f] *6*	838.2	15/2$^-$	507.9	11/2$^-$	E2		0.0596	I_γ: deduced from intensity balance at 508.2 level; Iγ=94 *5* for doublet. A_2=+0.260 *23*, A_4=−0.10 *3* (1979Dr08) for doublet.
330.3[f] *3*	73[f] *8*	866.7	17/2$^-$	536.4	13/2$^-$	E2		0.0596	I_γ: deduced from total Iγ=94 *5* for both placements and Iγ=21 *6* for 838.5-level placement.
330.7 *6*	≈1.7[#]	3806.4	(37/2)	3475.7	(35/2)				
334.0 *3*	100	716.27	19/2$^+$	382.17	15/2$^+$	E2		0.0577	A_2=+0.272 *17*, A_4=−0.099 *21* (1979Dr08). A_2=+0.46 *13*, A_4=+0.06 *15* (1972Re13).
342.8 *4*	12.4 *7*	741.3	15/2$^-$	398.5	11/2$^-$	E2		0.0535	A_2=+0.39 *9*, A_4=0.00 *13* (1972Re13).
[x]346.5[†] *2*									
349.0 *6*	≤1.4[#]	4155.4	(39/2)	3806.4	(37/2)				

$^{171}_{72}Hf_{99}$-5

(HI,xnγ) 1979Dr08,1990IrZZ (continued)

γ(^{171}Hf) (continued)

E_γ	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[c]	α[e]	Comments
354.1 *3*	137 *7*	866.1	21/2$^+$	512.07	17/2$^+$	E2	0.0488	A_2=+0.196 *14*, A_4=−0.098 *18* (1979Dr08). A_2=+0.36 *8*, A_4=−0.02 *13* (1972Re13).
355.1[a]		1661.4	27/2$^+$	1305.9	25/2$^+$			
x365.0† *2*								
x367.6† *2*								
379.6 *3*	16.3 *12*	939.8	17/2$^-$	560.4	13/2$^-$	E2	0.0401	A_2=+0.13 *6*, A_4=−0.08 *8* (1979Dr08). A_2=+0.46 *12*, A_4=+0.07 *17* (1972Re13).
390.0 *2*	81 *5*	1256.7	21/2$^-$	866.7	17/2$^-$	E2	0.0372	A_2=+0.224 *25*, A_4=−0.07 *3* (1979Dr08). A_2=+0.42 *11*, A_4=−0.01 *13* (1972Re13).
395.8 *3*	17.3 *17*	1234.0	19/2$^-$	838.2	15/2$^-$	E2	0.0357	A_2=+0.23 *6*, A_4=−0.12 *8* (1979Dr08). A_2=+0.38 *9*, A_4=−0.07 *14* (1972Re13).
x406.0† *2*								
411.5@ *4*	27@ *4*	1152.8	19/2$^-$	741.3	15/2$^-$			
427.0[a]		2254.8	31/2$^+$	1827.6	29/2$^+$			
429.2 *3*	78 *4*	1145.3	23/2$^+$	716.27	19/2$^+$	E2	0.0287	A_2=+0.28 *3*, A_4=−0.12 *3* (1979Dr08). A_2=+0.40 *10*, A_4=−0.04 *13* (1972Re13).
440.0[f] *3*	117[f] *40*	1305.9	25/2$^+$	866.1	21/2$^+$	E2	0.0269	A_2=+0.52 *19*, A_4=−0.10 *23* (1972Re13). Iγ for 440.9γ and the two placements of 440.0γ have been estimated from intensity balances at 866.1, 939.8, and 1257.0 levels. Iγ(exp)=246 *13* includes these three components, plus a possible 439.9γ component from ^{23}Na contaminant. A_2=+0.114 *10*, A_4=−0.029 *13* (1979Dr08) for multiplet.
440.0[f] *3*	≈17[f]	1378.4	21/2$^-$	939.8	17/2$^-$	E2	0.0269	I_γ: see comment on 440.0γ from 1306 level.
440.9 *4*	78 *9*	1697.6	25/2$^-$	1256.7	21/2$^-$	E2	0.0267	I_γ: see comment with 440.0γ from 1306 level.
x447.4† *2*						(Q)		A_2=+0.55 *24* (1972Re13).
454.0 *5*	16.5# *25*	1688.0	23/2$^-$	1234.0	19/2$^-$	E2	0.0248	A_2=+0.48 *17* (1972Re13).
x461.9† *2*						(Q)		A_2=+0.21 *10* (1972Re13).
x469.5† *2*								
478.2 *4*	10.0 *20*	1631.0	(23/2$^-$)	1152.8	19/2$^-$			E_γ: placement not adopted. In the Adopted Levels, Gammas, this γ is the 25/2 to 21/2 transition in the 5/2[512] band, not the 23/2 to 19/2 transition.
485.9 *3*	85 *15*	2183.5	29/2$^-$	1697.6	25/2$^-$	E2	0.0208	I_γ: evaluator's interpretation of '85.15' entered in table 1 of 1979Dr08. A_2=+0.52 *20*, A_4=0.0 *3* (1972Re13) but ^{172}Hf contamination present.
498.5@ *3*	18.2@ *13*	1876.9	25/2$^-$	1378.4	21/2$^-$	E2	0.0195	A_2=+0.26 *7*, A_4=−0.09 *8* (1979Dr08). E_γ: placement not adopted. In the Adopted Levels this γ is the 27/2 to 23/2 transition in the 5/2[512] band, not the 25/2 to 21/2 γ.
504.7 *5*	≈1.5#	2875.8	(31/2)	2371.1	(27/2)			
507.7 *4*	11.5# *20*	2195.7	27/2$^-$	1688.0	23/2$^-$			
516.1 *3*	64 *4*	1661.4	27/2$^+$	1145.3	23/2$^+$	E2	0.0179	A_2=+0.229 *25*, A_4=−0.09 *3* (1979Dr08).
521.7 *3*	94 *5*	1827.6	29/2$^+$	1305.9	25/2$^+$	E2	0.0174	A_2=+0.291 *23*, A_4=−0.12 *3* (1979Dr08).
528.0 *3*	60 *3*	2711.5	33/2$^-$	2183.5	29/2$^-$	E2	0.01689	A_2=+0.22 *3*, A_4=−0.06 *4* (1979Dr08).
x540.3† *2*								

$^{171}_{72}Hf_{99}$-6

(HI,xnγ) 1979Dr08,1990IrZZ (continued)

γ(^{171}Hf) (continued)

E_γ	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[c]	α[e]	Comments
555.1 *6*	≤1.5[#]	3165.0	(33/2)	2610.4	(29/2)			
557.0[a]		2752.7	(31/2$^-$)	2195.7	27/2$^-$			
[x]557.5[†] *2*								
[x]569.3[†] *4*								
571.4 *4*	63[‡] *6*	3282.9	37/2$^-$	2711.5	33/2$^-$	E2	0.01394	A_2=+0.18 *4*, A_4=−0.12 *5* (1979Dr08) for contaminated γ.
[x]576.5[†] *4*								
593.4 *3*	40.9 *24*	2254.8	31/2$^+$	1661.4	27/2$^+$	E2	0.01274	A_2=+0.35 *5*, A_4=−0.18 *6* (1979Dr08); may be unreliable due to difficult background subtraction.
598.0 *3*	69 *4*	2425.6	33/2$^+$	1827.6	29/2$^+$	E2	0.01251	A_2=+0.23 *4*, A_4=−0.15 *4* (1979Dr08).
599.8 *6*	≤1.0[#]	3475.7	(35/2)	2875.8	(31/2)			
603.8[a]		3356.5	(35/2$^-$)	2752.7	(31/2$^-$)			
620.8 *4*	28[‡] *5*	3903.7	41/2$^-$	3282.9	37/2$^-$	E2	0.01146	A_2=+0.17 *5*, A_4=−0.04 *6* (1979Dr08) for doublet with a Q ^{172}Hf transition.
641.9[a]		3998.4	(39/2$^-$)	3356.5	(35/2$^-$)			
659.4 *3*	24.2 *18*	2914.2	35/2$^+$	2254.8	31/2$^+$	E2		A_2=+0.29 *7*, A_4=−0.05 *8* (1979Dr08).
666.6 *3*	33[‡] *3*	3092.2	37/2$^+$	2425.6	33/2$^+$			Mult.: not assigned; 1979Dr08 report A_2=+0.26 *5*, A_4=−0.07 *6*, and 1972Re13, A_2=−0.39 *19*.
678.8 *4*	15.2[#] *20*	4582.5	45/2$^-$	3903.7	41/2$^-$			
679.8[a]		4678.2	(43/2$^-$)	3998.4	(39/2$^-$)			
715.0 *5*	9.6 *20*	3629.2	39/2$^+$	2914.2	35/2$^+$			
727.1 *4*	24 *4*	3819.3	41/2$^+$	3092.2	37/2$^+$			
738.2[a]		5320.7	49/2$^-$	4582.5	45/2$^-$			
761.4 *8*	4.0[#] *15*	4390.6	(43/2$^+$)	3629.2	39/2$^+$			Other Eγ: 764.8 (1990IrZZ).
773.8 *5*	7.1[#] *20*	4593.1	45/2$^+$	3819.3	41/2$^+$			Other Eγ: 774.0 (1990IrZZ).
784.6[ag]		5377.7?	(49/2$^+$)	4593.1	45/2$^+$			Probably same as unplaced 782γ in 1979Dr08 (placement consistent with coincidence data).
799.2[a]		6119.9	(53/2$^-$)	5320.7	49/2$^-$			
799.8[ag]		6177.5?	(53/2$^+$)	5377.7?	(49/2$^+$)			
810.2[a]		5200.8	(47/2$^+$)	4390.6	(43/2$^+$)			
860.5[a]		6980.4	(57/2$^-$)	6119.9	(53/2$^-$)			
862.2[a]		6063.0	(51/2$^+$)	5200.8	(47/2$^+$)			
920.4[a]		7900.8	(61/2$^-$)	6980.4	(57/2$^-$)			
980.0[a]		8880.8	(65/2$^-$)	7900.8	(61/2$^-$)			
1035.3[a]		9916	(69/2$^-$)	8880.8	(65/2$^-$)			
1085[ag]		11001?	(73/2$^-$)	9916	(69/2$^-$)			Eγ: differs from adopted value (viz., 1076.0 keV).
1133.0 *4*	22.3 *25*	1645.1	19/2$^+$	512.07	17/2$^+$	M1		α(K)exp=0.0048 *6* (simultaneous measurement of Iγ and Ice in calibrated system) (1979Dr08). Mult.: from α(K)exp. This value also consistent with E1(+50% M2), but angular distribution data (A_2=−0.31 *13*, A_4=+0.08 *16*) imply either <6% or >88% Q admixture (1979Dr08).

$^{171}_{72}Hf_{99}$-7

(HI,xnγ) 1979Dr08,1990IrZZ (continued)

$\gamma(^{171}Hf)$ (continued)

† From 1974La24 (not reported by 1979Dr08).
‡ Corrected for component from radioactive decay.
# From n-γ and/or $\gamma\gamma$ coincidence data (1979Dr08).
@ Partially obscured by contaminant or background in 1979Dr08.
& From level-energy differences; existence implied by coincidence data.
a From level scheme in 1990IrZZ; uncertainty unstated by authors.
b Arbitrary units for ^{160}Gd(^{16}O,5nγ), E(^{16}O)=92 MeV (1979Dr08). See 1974La24 for Iγ from (α,3nγ), (^{10}B,4nγ) and (^{11}B,5nγ).
c Inferred from $\gamma(\theta)$ (1972Re13 and/or 1979Dr08), except where noted. Stretched E2 assignments were based on large positive A_2, and M1+E2 assignments, on negative A_2 and placement relative to cascading E2 γ's.
d From analysis by 1976Kr21 of γ-ray angular distribution data in 1972Re13.
e Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
f Multiply placed with intensity suitably divided.
g Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

$^{171}_{72}Hf_{99}$-8

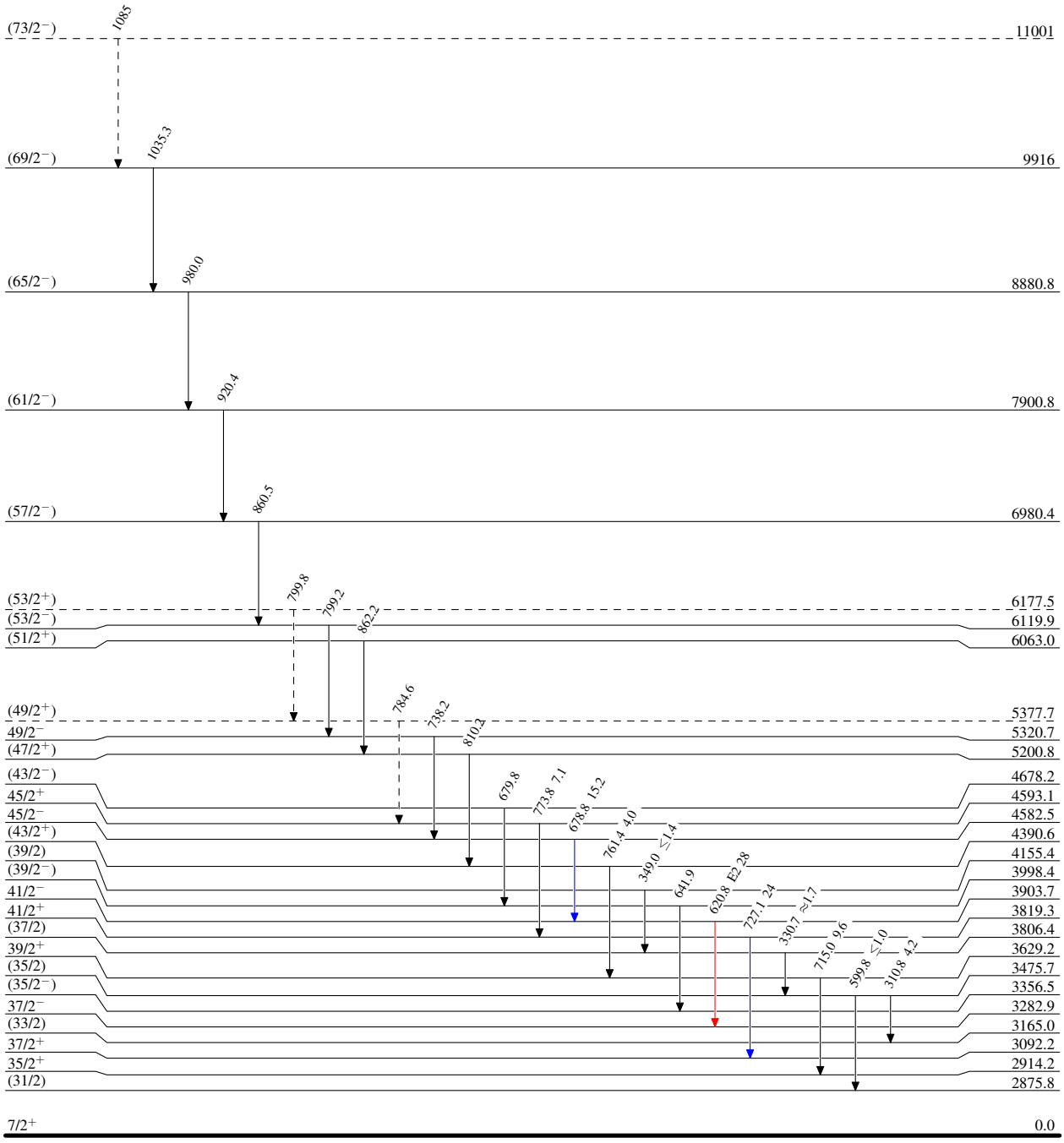
(HI,xnγ) 1979Dr08,1990IrZZ

Level Scheme

Intensities: Relative Iγ for ^{160}Gd(^{16}O,5nγ), E(^{16}O)=92 MeV

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)



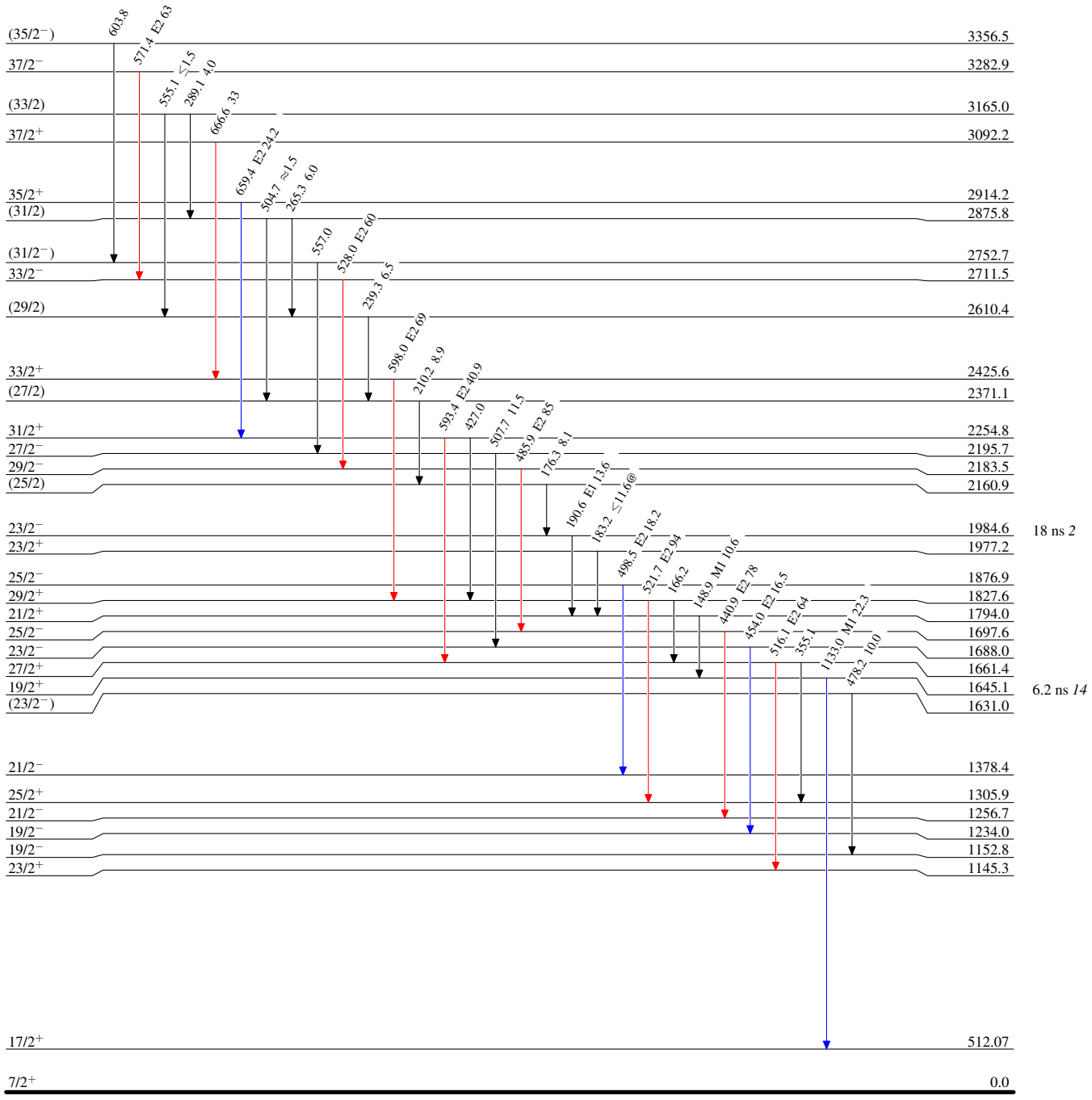
$^{171}_{72}Hf_{99}$

(HI,xnγ) 1979Dr08,1990IrZZ

Level Scheme (continued)

Intensities: Relative Iγ for ^{160}Gd(^{16}O,5nγ), E(^{16}O)=92 MeV
@ Multiply placed: intensity suitably divided

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



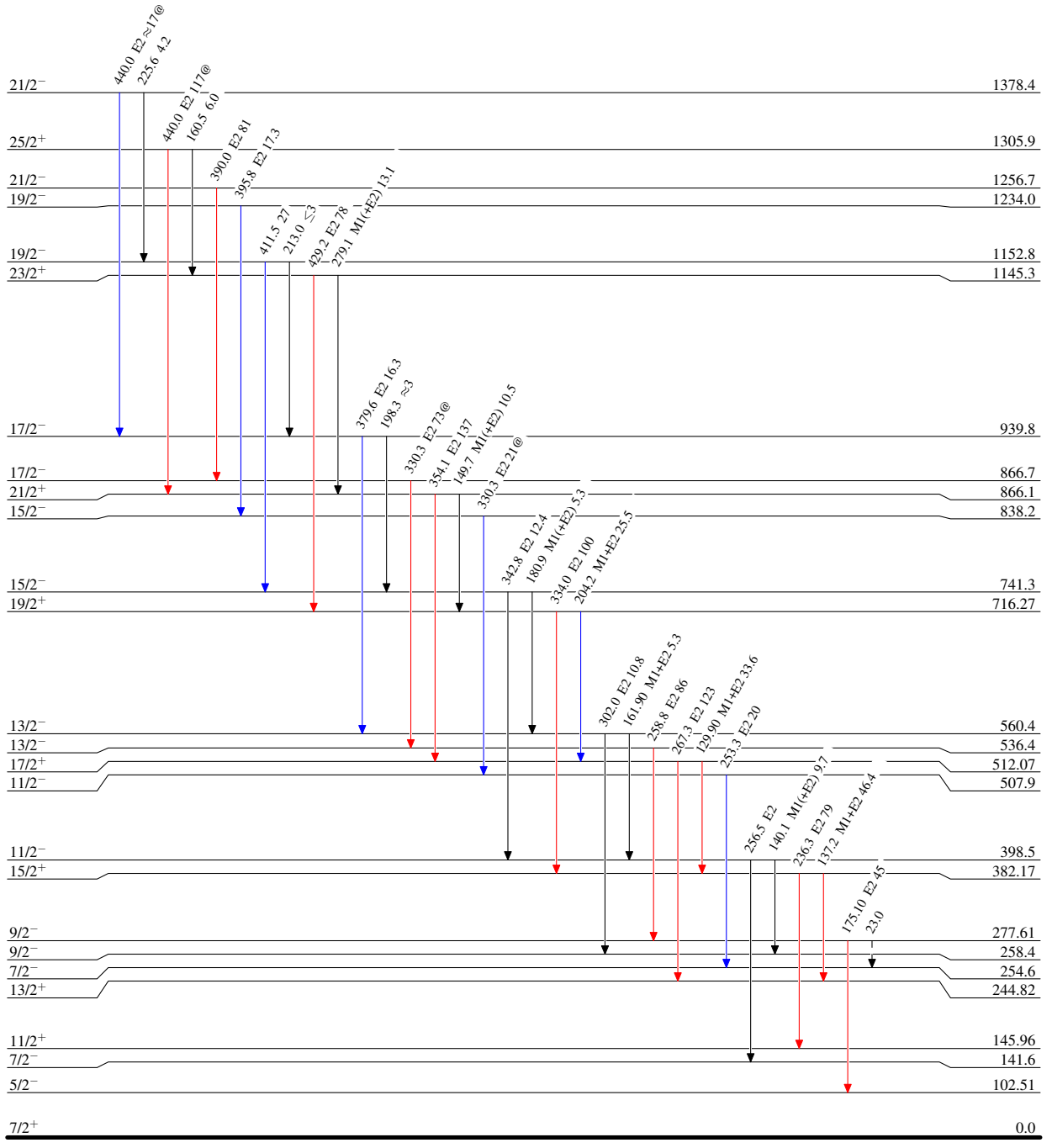
$^{171}_{72}Hf_{99}$

(HI,xnγ) 1979Dr08,1990IrZZ

Level Scheme (continued)

Intensities: Relative Iγ for ^{160}Gd(^{16}O,5nγ), E(^{16}O)=92 MeV
@ Multiply placed: intensity suitably divided

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

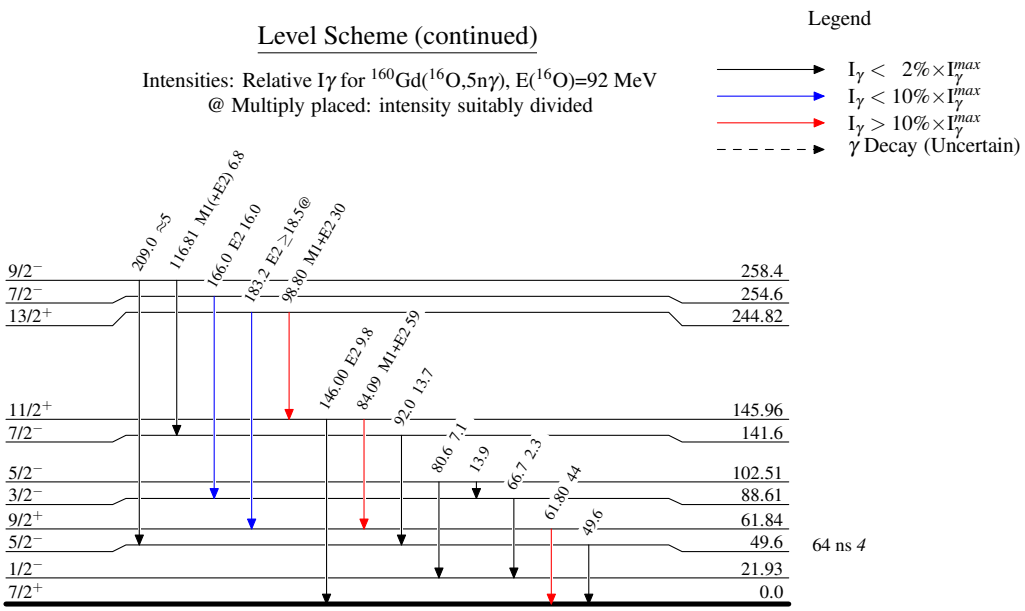


$^{171}_{72}Hf_{99}$

(HI,xnγ) 1979Dr08,1990IrZZ

Level Scheme (continued)

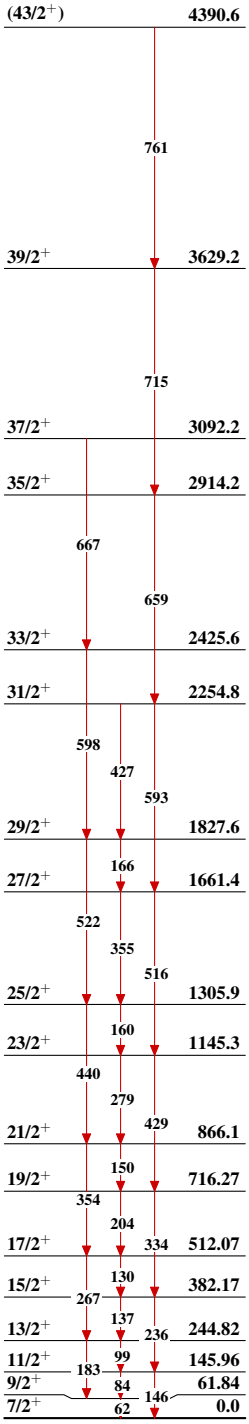
Intensities: Relative Iγ for ^{160}Gd(^{16}O,5nγ), E(^{16}O)=92 MeV
@ Multiply placed: intensity suitably divided



$^{171}_{72}Hf_{99}$

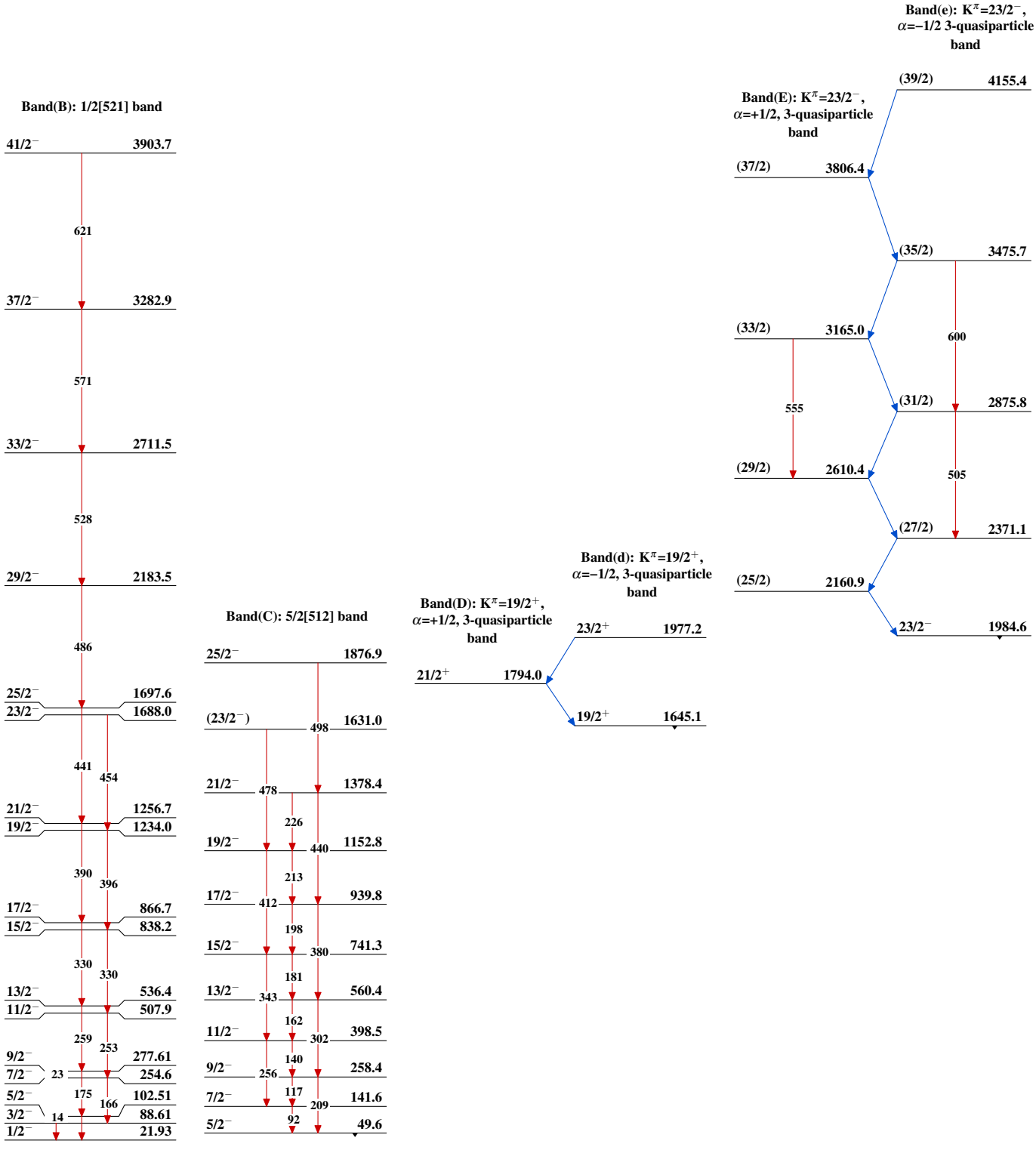
(HI,xnγ) 1979Dr08,1990IrZZ

Band(A): 7/2[633] band



$^{171}_{72}Hf_{99}$

(HI,xnγ) 1979Dr08,1990IrZZ (continued)



$^{171}_{72}Hf_{99}$