(HI,xnγ) 1987Bo10,1993Ha19,1996Th06

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	N. Nica and B. Singh	NDS 181, 1 (2022)	9-Mar-2022

See also (HI,xnγ): moments.

1998Ni06: ^{76}Ge(^{76}Ge,5nγ) E=323 MeV and ^{124}Sn(^{28}Si,5nγ) E=152 MeV. Measured relative intensity of population of yrast SD band and SD continuum in the symmetric and asymmetric reactions. γ-ray measurements made with GAMMASPHERE array of 97 HPGe detectors.

1998Ha53: survey of literature data for ΔI=4 bifurcation (staggering) finding that the SD-2, SD-3 and SD-4 bands present this phenomenon.

1997Zh03: ^{124}Sn(^{29}Si,6nγ) E=157 MeV. Measured spectra of discrete and continuum γ rays in coin using GASP array of 40 HPGe detectors. Deduced two SD bands and feeding intensities of SD bands.

1996Th06 (also 1994ViZV): ^{122}Sn(^{30}Si,5nγ) E=158 MeV. Measured γγγ with EUROGAM array of 54 HPGe detectors, deduced four new SD bands in addition to the two already known.

1995La18, 1996La23: ^{100}Mo(^{51}V,p3nγ) E=230 MeV. Gammasphere array with 36 detectors combined with microball arrangement for particle detection. Two hyperdeformed bands were reported (1995La18) from particle-γγ coin. But in later higher statistics work (1996La23) the existence of these bands was disproved.

1993Ha19: ^{122}Sn(^{30}Si,5nγ) E=155 MeV. Measured γ, γγ, DCO. Compton-suppressed HPGe detector array, 4π BGO ball.

1991Zu01: ^{122}Sn(^{30}Si,5nγ) E=155 MeV. Measured γ, sum spectra.

1987Bo10: ^{122}Sn(^{30}Si,5nγ) E=153 MeV. Measured γγ, recoil. Used HPGe detectors, NaI array, plunger, bunched beam.

1981Ha17: ^{124}Sn(^{28}Si,5nγ) E=110-149 MeV. Measured γγ, γ(θ), γγ(θ), γ(θ,t), linear polarization, recoil. Used pulsed beam, Ge(Li) detectors, NaI(Tl) array, plunger, polarimeter. Reported mults. Prompt transitions feeding the J=49/2 isomeric state were observed in coincidence with at least one event delayed 50 to 750 ns. Preliminary report of data of 1987Bo10 is given in 1984Sl03.

SD band references: 1998Ha53, 1997Zh03, 1996Th06, 1993Ha19, 1992Fl02, 1991Zu01 (also 1990Zu02).

1989Ha15: ^{76}Ge(^{76}Ge,5nγ), E=310 MeV. Measured γ, γ(θ,H). Used Rutgers magnetometers, 12 Compton-suppressed HPGe detectors. Deduced g factor (transient field integral perturbed angular correlation).

^{147}Gd Levels

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$	Comments
0.0			
8588	49/2$^+$	516 ns *20*	E(level),$T_{1/2}$: adopted value.
9241	(51/2)		
9507	(51/2$^+$)	<1 ps	
9691	53/2$^+$	3.1 ps *7*	$T_{1/2}$: from 1981Ha17.
9880	(53/2$^-$)	72 ps *11*	$T_{1/2}$: from weighted average of 64 ps *11* and 86 ps *14* (1981Ha17).
10272[#]	(55/2$^-$)		
10488	(55/2$^+$)		
10688	(57/2$^-$)	10 ps *3*	$T_{1/2}$: from 1981Ha17.
10747	(57/2$^+$)		
10993	(59/2$^-$)	0.80 ns *5*	g=+0.38 *7* (1989Ha15); μ=+11 *2* (2020StZV) $T_{1/2}$: from 1981Ha17. g,μ: deduced by 2020StZV based on g factor measured by 1989Ha15.
11232	(61/2$^-$)	9.7 ps *7*	$T_{1/2}$: from 1987Bo10. 1981Ha17 give 17 ps *4*.
11851	(65/2$^-$)		
11930	(61/2)		
12121			
12208	(65/2$^-$)	≈1.4 ps	
12548	(65/2)		
13104	(69/2$^-$)		
13265	(67/2)		
13416	(67/2)		
13446	(69/2)	8.3 ps *21*	$T_{1/2}$: from 1987Bo10.
13447	(69/2,71/2)		
14433	(71/2)	<0.7 ps	$T_{1/2}$: from 1987Bo10.

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(HI,xnγ) 1987Bo10,1993Ha19,1996Th06 (continued)

^{147}Gd Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$	Comments
14793?			
15175	(73/2)	38 ps *6*	$T_{1/2}$: from 1987Bo10.
15390	(73/2)	2.1 ps *+35−10*	
15690	(75/2)		
16776			
16936	(79/2)		
x[a]	J≈(55/2)		J$^{\pi}$: from 1993Ha19 and 1996Th06. 1993Ra07 suggest J=51/2, 55/2. A 663.9γ is shown by 1991Zu01 as the first transition in the SD band, but no evidence for such a line was found by 1993Ha19.
697.04+x[a] *5*	J+2		
1442.35+x[a] *8*	J+4		
2237.88+x[a] *10*	J+6		
3084.91+x[a] *12*	J+8		
3984.86+x[a] *14*	J+10		
4939.23+x[a] *16*	J+12		
5948.78+x[a] *17*	J+14		
7014.02+x[a] *18*	J+16		
8135.05+x[a] *20*	J+18		
9310.50+x[a] *21*	J+20		
10538.95+x[a] *22*	J+22		
11816.48+x[a] *24*	J+24		
13139.6+x[a] *3*	J+26		
14506.8+x[a] *3*	J+28		
15920.6+x[a] *3*	J+30		
17384.4+x[a] *4*	J+32		
18900.7+x[a] *4*	J+34		
20472.6+x[a] *5*	J+36		
22100.4+x[a] *9*	J+38		
y[b]	J1≈(61/2)[@]		
730.21+y[b] *12*	J1+2		
1509.15+y[b] *15*	J1+4		
2337.17+y[b] *17*	J1+6		
3214.90+y[b] *18*	J1+8		
4143.92+y[b] *20*	J1+10		
5125.52+y[b] *21*	J1+12		
6161.00+y[b] *23*	J1+14		
7251.42+y[b] *24*	J1+16		
8398.1+y[b] *3*	J1+18		
9601.6+y[b] *3*	J1+20		
10863.0+y[b] *3*	J1+22		
12183.4+y[b] *3*	J1+24		
13563.5+y[b] *4*	J1+26		
15003.3+y[b] *4*	J1+28		
16503.6+y[b] *4*	J1+30		
18065.0+y[b] *5*	J1+32		
19687.8+y[b] *6*	J1+34		
z[c]	J2≈(51/2)[&]		
704.8+z[c] *5*	J2+2		
1457.9+z[c] *6*	J2+4		

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(HI,xnγ) 1987Bo10,1993Ha19,1996Th06 (continued)

^{147}Gd Levels (continued)

E(level)[†]	J^{π}[‡]	E(level)[†]	J^{π}[‡]	E(level)[†]	J^{π}[‡]
2261.7+z[c] *6*	J2+6	5170.0+u[d] *8*	J3+12	11079.5+v[e] *9*	J4+20
3118.7+z[c] *6*	J2+8	6212.0+u[d] *8*	J3+14	12453.8+v[e] *10*	J4+22
4029.4+z[c] *6*	J2+10	7308.9+u[d] *9*	J3+16	13881.8+v[e] *10*	J4+24
4995.8+z[c] *6*	J2+12	8462.4+u[d] *9*	J3+18	15365.9+v[e] *12*	J4+26
6018.5+z[c] *6*	J2+14	9671.9+u[d] *9*	J3+20	w[f]	J5
7098.7+z[c] *7*	J2+16	10939.6+u[d] *9*	J3+22	890.8+w[f] *9*	J5+2
8236.3+z[c] *7*	J2+18	12265.7+u[d] *10*	J3+24	1832.6+w[f] *10*	J5+4
9431.6+z[c] *7*	J2+20	13650.1+u[d] *10*	J3+26	2829.3+w[f] *10*	J5+6
10684.6+z[c] *7*	J2+22	15093.7+u[d] *11*	J3+28	3875.8+w[f] *11*	J5+8
11995.3+z[c] *7*	J2+24	16596.4+u[d] *12*	J3+30	4971.8+w[f] *11*	J5+10
13363.0+z[c] *8*	J2+26	18159.8+u[d] *14*	J3+32	6115.0+w[f] *11*	J5+12
14786.2+z[c] *8*	J2+28	v[e]	J4≈(71/2)[&]	7305.6+w[f] *11*	J5+14
16263.5+z[c] *8*	J2+30	899.5+v[e] *4*	J4+2	8543.1+w[f] *12*	J5+16
17786.2+z[c] *9*	J2+32	1850.6+v[e] *5*	J4+4	9828.0+w[f] *12*	J5+18
19298.4+z?[c] *10*	J2+34	2844.6+v[e] *6*	J4+6	11162.3+w[f] *12*	J5+20
u[d]	J3≈(61/2)[&]	3880.7+v[e] *6*	J4+8	12547.1+w[f] *13*	J5+22
741.9+u[d] *4*	J3+2	4960.4+v[e] *7*	J4+10	13982.7+w[f] *13*	J5+24
1527.4+u[d] *6*	J3+4	6086.0+v[e] *7*	J4+12	15471.8+w[f] *14*	J5+26
2361.8+u[d] *7*	J3+6	7260.5+v[e] *7*	J4+14	17014.1+w[f] *15*	J5+28
3245.5+u[d] *7*	J3+8	8483.6+v[e] *8*	J4+16	18610.5+w[f] *18*	J5+30
4181.4+u[d] *8*	J3+10	9756.4+v[e] *9*	J4+18		

† For levels of normal deformation, level energies shown are ≈2 keV less than given by authors who gave energies relative to 8590 keV for the J=49/2$^+$ level instead of our adopted value of 8588 (8587.6) keV.

‡ Assigned from $\gamma(\theta)$ and comparison to RUL by 1987Bo10 (see Adopted Levels dataset for adopted J^{π} values).

Placed in decay scheme by 1981Ha17.

@ From 1993Ha19 and 1996Th06. Others: 57/2, 61/2 (1993Ra07), 57/2 (1995Xu01).

& From 1996Th06.

[a] Band(A): SD-1 band (1996Th06,1993Ha19,1991Zu01). Possible configuration=$\pi 6^2 \nu 7^1 \nu 6^2$. The two neutrons are possibly in 5/2[642] α=+1/2 or −1/2 orbit (1994ViZV). Percent feeding=0.87 *19* (1993Ha19), 1.0 (1991Zu01) in ^{122}Sn(^{30}Si,5nγ) 155 MeV; 2.1 *3* (1992Fl02) in ^{76}Ge(^{76}Ge,5nγ); 1.42 *12* (1997Zh03) in ^{124}Sn(^{29}Si,6nγ) E=157 MeV. 1998Ni06 find that population in (^{76}Ge,5nγ) reaction is 4.6 *2* times higher than in (^{28}Si,5nγ) reaction.

[b] Band(B): SD-2 band (1996Th06,1998Ha53,1993Ha19,1991Zu01). Possible configuration=$\pi 6^2 \nu 7^1 \nu 6^2$. The two neutrons are possibly in 5/2[642] α=+1/2 or −1/2 orbit (1994ViZV). Percent feeding=0.57 *15* (1993Ha19), 0.6 *2* (1991Zu01) in ^{122}Sn(^{30}Si,5nγ) E=155 MeV; 0.77 *20* (1997Zh03) in ^{124}Sn(^{29}Si,6nγ) E=157 MeV. Band intensity=50% *5* of SD-1 band (1996Th06).

[c] Band(C): SD-3 band (1996Th06,1998Ha53). Proposed (1996Th06) configuration: excitation of neutron from 1/2[770], α=−1/2 orbital to 1/2[651] α=−1/2. Band intensity=17% *5* of SD-1 band (1996Th06).

[d] Band(D): SD-4 band (1996Th06,1998Ha53). Proposed (1996Th06) configuration: excitation of neutron from 1/2[411] α=+1/2 orbital to 1/2[651] α=−1/2. Band intensity=25% *5* of SD-1 band (1996Th06).

[e] Band(E): SD-5 band (1996Th06). Proposed (1996Th06) configuration: excitation of a neutron from 1/2[411] α=+1/2 orbital to 1/2[651] α=+1/2. Band intensity=11% *3* of SD-1 band (1996Th06).

[f] Band(F): SD-6 band (1996Th06). Possible configuration: excitation of a proton from 1/2[301] α=−1/2 to intruder $\pi 6^3$ orbital. Band intensity=8% *2* of SD-1 band (1996Th06).

$\gamma(^{147}Gd)$

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	Comments
181.3	9.9 2	13446	(69/2)	13265	(67/2)	D		Mult.: A_2=−0.28 3, A_4=−0.05 3.
188.5	45.2 11	9880	(53/2⁻)	9691	53/2⁺	(E1)		Mult.: A_2=0.40 3, which according to 1987Bo10 is compatible with ΔJ=0, (E1).
215.5	3.2 2	15390	(73/2)	15175	(73/2)	D+Q	+0.34 +14−26	Mult.,δ: from γ(θ) 215.5γ is ΔJ=0, D+Q. Mult.: A_2=0.47 10, A_4=−0.12 10.
238.9	41.9 4	11232	(61/2⁻)	10993	(59/2⁻)	M1		Mult.: A_2=−0.33 2, A_4=0.03 2.
246.2	15.2 3	10993	(59/2⁻)	10747	(57/2⁺)	E1		Mult.: A_2=−0.31 3, A_4=0.07 3.
259.6	3.9 1	10747	(57/2⁺)	10488	(55/2⁺)	M1		Mult.: A_2=0.38 10, A_4=−0.04 11.
300.3	6.3 1	15690	(75/2)	15390	(73/2)	D		Mult.: A_2=−0.33 4, A_4=0.06 4.
304.5	56.0 8	10993	(59/2⁻)	10688	(57/2⁻)	M1+E2	+0.27 4	Mult.: A_2=0.21 3, A_4=0.03 3.
341.3		13447	(69/2,71/2)	13104	(69/2⁻)			
372.7	27.3 4	9880	(53/2⁻)	9507	(51/2⁺)	E1+(M2)	−0.05 4	Mult.: A_2=−0.35 3, A_4=0.04 3.
543.6	5.9 3	11232	(61/2⁻)	10688	(57/2⁻)	E2		Mult.: A_2=0.35 10, A_4=−0.09 10.
580.4[a]		10272	(55/2⁻)	9691	53/2⁺			
597.4	8.1 20	15390	(73/2)	14793?				Mult.: A_2=0.06 46, A_4=−0.09 50.
618[c]	23.2[c] 5	11851	(65/2⁻)	11232	(61/2⁻)	E2		
618[c]	23.2[c] 5	12548	(65/2)	11930	(61/2)	E2		I_γ: doublet with Iγ=23.2 5. Mult.: A_2=0.30 4, A_4=−0.14 4.
638.8		9880	(53/2⁻)	9241	(51/2)			
653.0	2.6 2	9241	(51/2)	8588	49/2⁺	D+(Q)	+0.09 8	Mult.: A_2=−0.18 17, A_4=0.19 19.
697.04 5	0.23 10	697.04+x	J+2	x	J≈(55/2)			I_γ: 0.79 16 (1991Zu01).
704.8 5		704.8+z	J2+2	z	J2≈(51/2)			
716.3	3.7 3	13265	(67/2)	12548	(65/2)			Mult.: A_2=0.01 13, A_4=−0.16 14.
721[ad]		10993	(59/2⁻)	10272	(55/2⁻)	E2[&]		
730.21 12	0.40 15	730.21+y	J1+2	y	J1≈(61/2)			E_γ: 729.9 1 (1998Ha53).
741.6	7.9 5	15175	(73/2)	14433	(71/2)	D		Mult.: A_2=−0.33 7.
741.9 4		741.9+u	J3+2	u	J3≈(61/2)			
745.31 6	0.77 10	1442.35+x	J+4	697.04+x	J+2			
753.1 2		1457.9+z	J2+4	704.8+z	J2+2			
778.94 8	0.52 15	1509.15+y	J1+4	730.21+y	J1+2			E_γ: 778.34 7 (1998Ha53).
785.5 4		1527.4+u	J3+4	741.9+u	J3+2			
795.53 6	0.90 10	2237.88+x	J+6	1442.35+x	J+4			
796.3	2.6 2	10488	(55/2⁺)	9691	53/2⁺	M1+E2	+0.29 4	Mult.: A_2=0.21 15, A_4=0.06 16.
803.8 2		2261.7+z	J2+6	1457.9+z	J2+4			
808.9	72.2 9	10688	(57/2⁻)	9880	(53/2⁻)	E2		Mult.: A_2=0.26 2, A_4=−0.09 2.
828.02 8	0.92 15	2337.17+y	J1+6	1509.15+y	J1+4			E_γ: 827.71 6 (1998Ha53).
834.4 3		2361.8+u	J3+6	1527.4+u	J3+4			
847.03 6	0.93 8	3084.91+x	J+8	2237.88+x	J+6			
857.0 1		3118.7+z	J2+8	2261.7+z	J2+6			E_γ: 856.6 2 (1998Ha53).
877.74 7	1.21 20	3214.90+y	J1+8	2337.17+y	J1+6			E_γ: 877.46 6 (1998Ha53).
883.7 3		3245.5+u	J3+8	2361.8+u	J3+6			
888.6	6	12121		11232	(61/2⁻)			
890.8 9		890.8+w	J5+2	w	J5			

$\gamma(^{147}Gd)$ (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	Comments
896.1	9.4 *3*	13104	$(69/2^-)$	12208	$(65/2^-)$	E2		Mult.: A_2=0.55 *7*, A_4=−0.13 *7*.
897.9	10.0 *3*	13446	(69/2)	12548	(65/2)	E2		Mult.: A_2=0.39 *6*.
899.5 *4*		899.5+v	J4+2	v	J4≈(71/2)			
899.95 *7*	1.06 *8*	3984.86+x	J+10	3084.91+x	J+8			
910.7 *1*		4029.4+z	J2+10	3118.7+z	J2+8			E_γ: 910.6 *2* (1998Ha53).
919.1	27.4 *5*	9507	$(51/2^+)$	8588	$49/2^+$	M1+E2	+0.65 *+16−12*	Mult.: A_2=0.57 *4*, A_4=0.14 *4*.
929.02 *7*	0.87 *15*	4143.92+y	J1+10	3214.90+y	J1+8			E_γ: 928.77 *5* (1998Ha53).
935.9 *2*		4181.4+u	J3+10	3245.5+u	J3+8			E_γ: 934.5 *4* (1998Ha53).
936.8	20.5 *6*	11930	(61/2)	10993	$(59/2^-)$	D+(Q)	−0.07 *6*	Mult.: A_2=−0.44 *5*, A_4=0.08 *5*.
941.8 *3*		1832.6+w	J5+4	890.8+w	J5+2			
951.1 *3*		1850.6+v	J4+4	899.5+v	J4+2			
954.36 *7*	1.05 *10*	4939.23+x	J+12	3984.86+x	J+10			
966.4 *1*		4995.8+z	J2+12	4029.4+z	J2+10			E_γ: 966.3 *2* (1998Ha53).
976.4	23.3 *8*	12208	$(65/2^-)$	11232	$(61/2^-)$	E2		Mult.: A_2=0.24 *6*, A_4=−0.10 *7*.
981.60 *8*	0.79 *15*	5125.52+y	J1+12	4143.92+y	J1+10			E_γ: 981.31 *5* (1998Ha53).
986.7	10.1 *3*	14433	(71/2)	13446	(69/2)	M1+E2	+0.55 *6*	Mult.: A_2=0.58 *7*, A_4=0.12 *7*.
988.6 *2*		5170.0+u	J3+12	4181.4+u	J3+10			E_γ: 988.2 *2* (1998Ha53).
994.0 *2*		2844.6+v	J4+6	1850.6+v	J4+4			
996.7 *2*		2829.3+w	J5+6	1832.6+w	J5+4			
1009.55 *7*	1.05 *10*	5948.78+x	J+14	4939.23+x	J+12			
1022.7 *1*		6018.5+z	J2+14	4995.8+z	J2+12			E_γ: 1022.1 *3* (1998Ha53).
1035.49 *8*	1.18 *20*	6161.00+y	J1+14	5125.52+y	J1+12			E_γ: 1035.32 *5* (1998Ha53).
1036.1 *2*		3880.7+v	J4+8	2844.6+v	J4+6			
1042.0 *2*		6212.0+u	J3+14	5170.0+u	J3+12			E_γ: 1041.9 *3* (1998Ha53).
1046.5 *3*		3875.8+w	J5+8	2829.3+w	J5+6			
1056.1	13.3 *7*	10747	$(57/2^+)$	9691	$53/2^+$	E2		Mult.: A_2=−0.33 *2*, A_4=0.03 *2*.
1065.24 *6*	0.89 *10*	7014.02+x	J+16	5948.78+x	J+14			
1079.7 *3*		4960.4+v	J4+10	3880.7+v	J4+8			
1080.2 *1*		7098.7+z	J2+16	6018.5+z	J2+14			E_γ: 1079.5 *1* (1998Ha53).
1086		16776		15690	(75/2)			
1090.42 *8*	1.01 *20*	7251.42+y	J1+16	6161.00+y	J1+14			E_γ: 1090.28 *5* (1998Ha53).
1096.0 *2*		4971.8+w	J5+10	3875.8+w	J5+8			
1096.9 *2*		7308.9+u	J3+16	6212.0+u	J3+14			E_γ: 1096.5 *2* (1998Ha53).
1103.4	67.4 *13*	9691	$53/2^+$	8588	$49/2^+$	E2		Mult.: A_2=0.25 *4*, A_4=−0.14 *4*.
1121.03 *7*	1.01 *10*	8135.05+x	J+18	7014.02+x	J+16			
1125.6 *2*		6086.0+v	J4+12	4960.4+v	J4+10			
1137.6 *1*		8236.3+z	J2+18	7098.7+z	J2+16			E_γ: 1137.3 *2* (1998Ha53).
1143.2 *2*		6115.0+w	J5+12	4971.8+w	J5+10			
1146.67 *8*	1.02 *20*	8398.1+y	J1+18	7251.42+y	J1+16			E_γ: 1146.26 *5* (1998Ha53).
1153.5 *2*		8462.4+u	J3+18	7308.9+u	J3+16			E_γ: 1152.9 *2* (1998Ha53).
1174.5 *2*		7260.5+v	J4+14	6086.0+v	J4+12			
1175.45 *8*	1.03 *10*	9310.50+x	J+20	8135.05+x	J+18			
1190.6 *2*		7305.6+w	J5+14	6115.0+w	J5+12			
1195.3 *1*		9431.6+z	J2+20	8236.3+z	J2+18			E_γ: 1194.9 *2* (1998Ha53).

$\gamma(^{147}Gd)$ (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	Comments
1203.52 *9*	0.80 *15*	9601.6+y	J1+20	8398.1+y	J1+18		E_γ: 1203.44 *6* (1998Ha53).
1208.0	4.0 *4*	13416	(67/2)	12208	$(65/2^-)$	D	Mult.: A_2=−0.39 *21*, A_4=0.05 *23*.
1209.5 *2*		9671.9+u	J3+20	8462.4+u	J3+18		E_γ: 1210.2 *4* (1998Ha53).
1223.1 *3*		8483.6+v	J4+16	7260.5+v	J4+14		
1228.44 *7*	0.73 *7*	10538.95+x	J+22	9310.50+x	J+20		
1237.5 *3*		8543.1+w	J5+16	7305.6+w	J5+14		
1246	<7.2	16936	(79/2)	15690	(75/2)	(Q)	I_γ: doublet with Iγ=7.2 *4*.
1246.9	<7.2	10488	$(55/2^+)$	9241	(51/2)		I_γ,Mult.: for doublet 1246γ Iγ=7.2 *4* and ΔJ=2.
							Mult.: A_2=0.17 *11*, A_4=−0.13 *12*.
1253.0 *2*		10684.6+z	J2+22	9431.6+z	J2+20		E_γ: 1252.7 *2* (1998Ha53).
1261.38 *9*	0.84 *15*	10863.0+y	J1+22	9601.6+y	J1+20		E_γ: 1261.37 *6* (1998Ha53).
1267.7 *2*		10939.6+u	J3+22	9671.9+u	J3+20		E_γ: 1267.7 *2* (1998Ha53).
1272.8 *3*		9756.4+v	J4+18	8483.6+v	J4+16		
1277.52 *9*	0.79 *8*	11816.48+x	J+24	10538.95+x	J+22		
1284.9 *3*		9828.0+w	J5+18	8543.1+w	J5+16		
1291.9	2.8 *3*	9880	$(53/2^-)$	8588	$49/2^+$	E3+M2	Mult.,δ: γ(θ) is compatible with E3+M2 with δ=−3.5 or −0.5.
							Mult.: A_2=−0.35 *20*, A_4=−0.13 *12*.
1310.7 *2*		11995.3+z	J2+24	10684.6+z	J2+22		E_γ: 1310.4 *2* (1998Ha53).
1320.44 *10*	0.79 *17*	12183.4+y	J1+24	10863.0+y	J1+22		E_γ: 1320.08 *7* (1998Ha53).
1323.1 *3*		11079.5+v	J4+20	9756.4+v	J4+18		
1323.14 *9*	0.70 *7*	13139.6+x	J+26	11816.48+x	J+24		
1326.1 *3*		12265.7+u	J3+24	10939.6+u	J3+22		E_γ: 1325.9 *2* (1998Ha53).
1334.3 *3*		11162.3+w	J5+20	9828.0+w	J5+18		
1367.21 *11*	0.49 *8*	14506.8+x	J+28	13139.6+x	J+26		
1367.7 *2*		13363.0+z	J2+26	11995.3+z	J2+24		E_γ: 1367.6 *2* (1998Ha53).
1374.3 *3*		12453.8+v	J4+22	11079.5+v	J4+20		
1380.04 *12*	0.54 *20*	13563.5+y	J1+26	12183.4+y	J1+24		E_γ: 1379.55 *8* (1998Ha53).
1384.4 *3*		13650.1+u	J3+26	12265.7+u	J3+24		E_γ: 1384.7 *4* (1998Ha53).
1384.8 *3*		12547.1+w	J5+22	11162.3+w	J5+20		
1413.74 *11*	0.41 *8*	15920.6+x	J+30	14506.8+x	J+28		I_γ: 0.13 *7* (1991Zu01).
1414.5	10.5 *5*	13265	(67/2)	11851	$(65/2^-)$	D	Mult.: A_2=−0.36 *6*.
1423.2 *2*		14786.2+z	J2+28	13363.0+z	J2+26		E_γ: 1423.3 *3* (1998Ha53).
1428.0 *4*		13881.8+v	J4+24	12453.8+v	J4+22		
1435.6 *4*		13982.7+w	J5+24	12547.1+w	J5+22		
1439.81 *13*	0.31 *20*	15003.3+y	J1+28	13563.5+y	J1+26		E_γ: 1439.6 *1* (1998Ha53).
1443.6 *3*		15093.7+u	J3+28	13650.1+u	J3+26		E_γ: 1444.4 *4* (1998Ha53).
1463.77 *16*	0.38 *8*	17384.4+x	J+32	15920.6+x	J+30		
1477.3 *3*		16263.5+z	J2+30	14786.2+z	J2+28		E_γ: 1476.9 *4* (1998Ha53).
1484.1 *6*		15365.9+v	J4+26	13881.8+v	J4+24		
1489.1 *4*		15471.8+w	J5+26	13982.7+w	J5+24		
1500.33 *16*	0.38 *20*	16503.6+y	J1+30	15003.3+y	J1+28		E_γ: 1500.2 *2* (1998Ha53).
1502.7 *5*		16596.4+u	J3+30	15093.7+u	J3+28		
1512.2[bd] *7*		19298.4+z?	J2+34	17786.2+z	J2+32		
1516.33 *23*	0.20 *10*	18900.7+x	J+34	17384.4+x	J+32		

$^{147}_{64}Gd_{83}$-6

γ(^{147}Gd) (continued)

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	E_γ †	E_i(level)	J_i^π	E_f	J_f^π
1522.7 *3*		17786.2+z	J2+32	16263.5+z	J2+30	1571.9 *3*	20472.6+x	J+36	18900.7+x	J+34
1542.3 *6*		17014.1+w	J5+28	15471.8+w	J5+26	1596.4 *10*	18610.5+w	J5+30	17014.1+w	J5+28
1561.34 *24*	0.17 *10*	18065.0+y	J1+32	16503.6+y	J1+30	1622.8 *4*	19687.8+y	J1+34	18065.0+y	J1+32
1563.4 *7*		18159.8+u	J3+32	16596.4+u	J3+30	1627.8 *7*	22100.4+x	J+38	20472.6+x	J+36

† From 1987Bo10 for γ's of normal-deformed region; from 1996Th06 for γ's of super-deformed region (SD-1 to SD-6); see also 1997Zh03, 1993Ha19, 1991Zu01 for SD-1 and SD-2 bands, and 1998Ha53 for SD-2, SD-3 and SD-4 bands.

‡ Relative intensities for γ's of normal-deformed region from 1987Bo10; relative intensities for SD-1 and SD-2 bands (normalized to 1.0 in the plateau region) from 1993Ha19.

Deduced from $\gamma(\theta)$ and comparison to RUL by 1987Bo10 (A_2, A_4 coeffcients from Table 2 are given in comments).

@ Deduced from $\gamma(\theta)$ by 1987Bo10.

& From 1981Ha17 based on $\gamma(\theta)$ and comparison to RUL.

[a] Observed by 1981Ha17.

[b] Indicates a backbend.

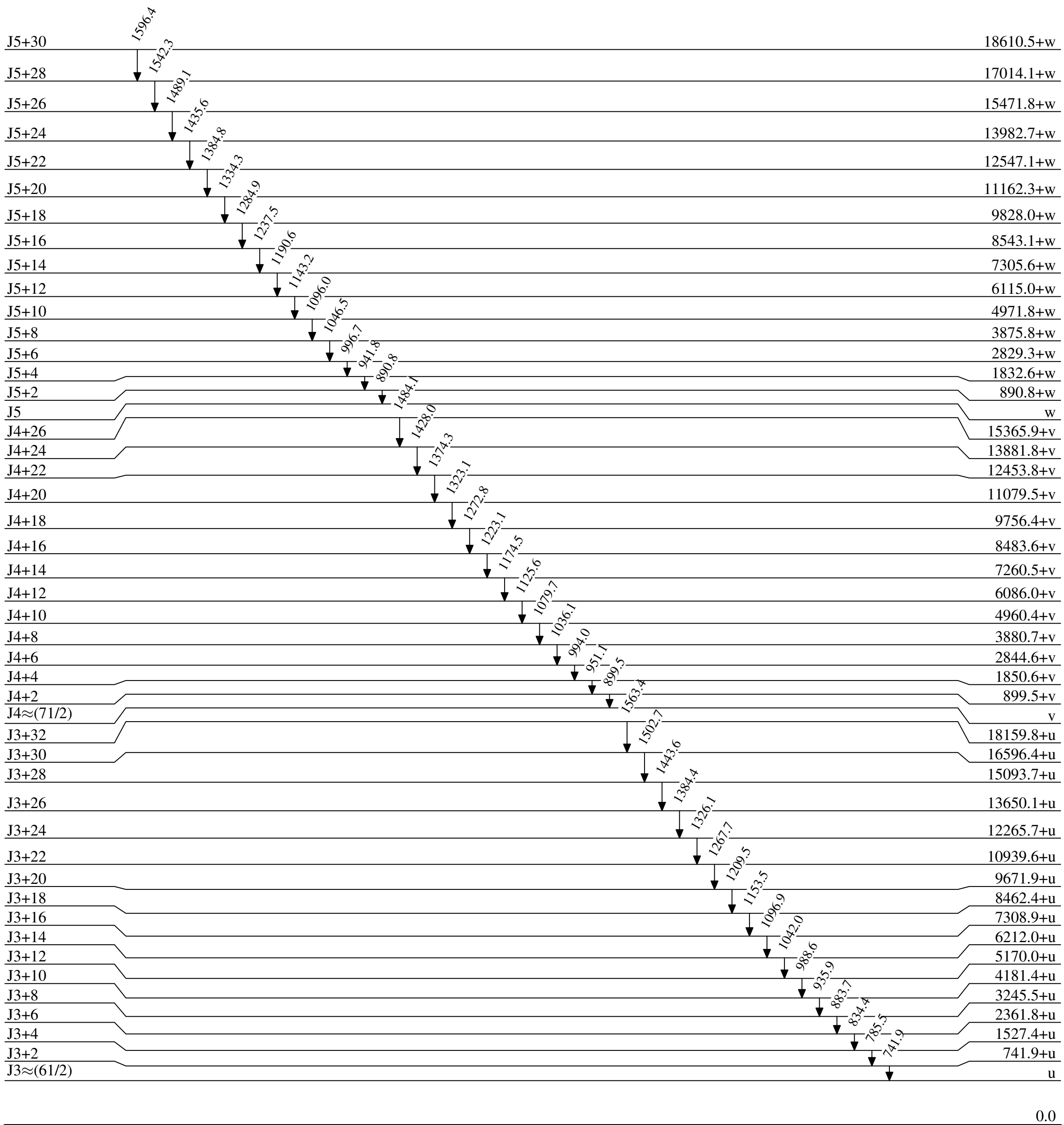
[c] Multiply placed with intensity suitably divided.

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

(HI,xnγ) 1987Bo10,1993Ha19,1996Th06

Level Scheme

Intensities: Relative I_{γ}

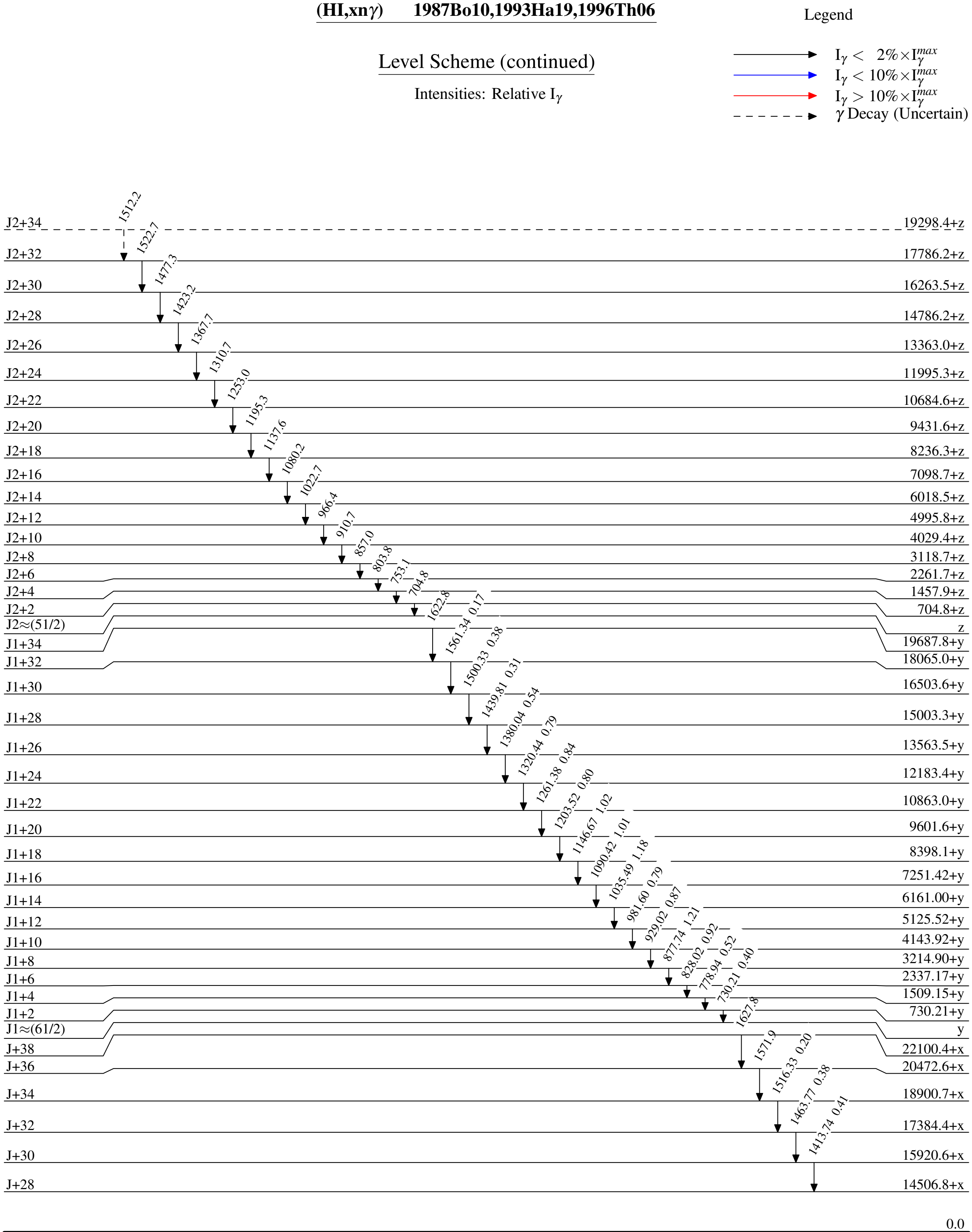


$^{147}_{64}Gd_{83}$

(HI,xnγ) 1987Bo10,1993Ha19,1996Th06

Level Scheme (continued)

Intentities: Relative I_γ



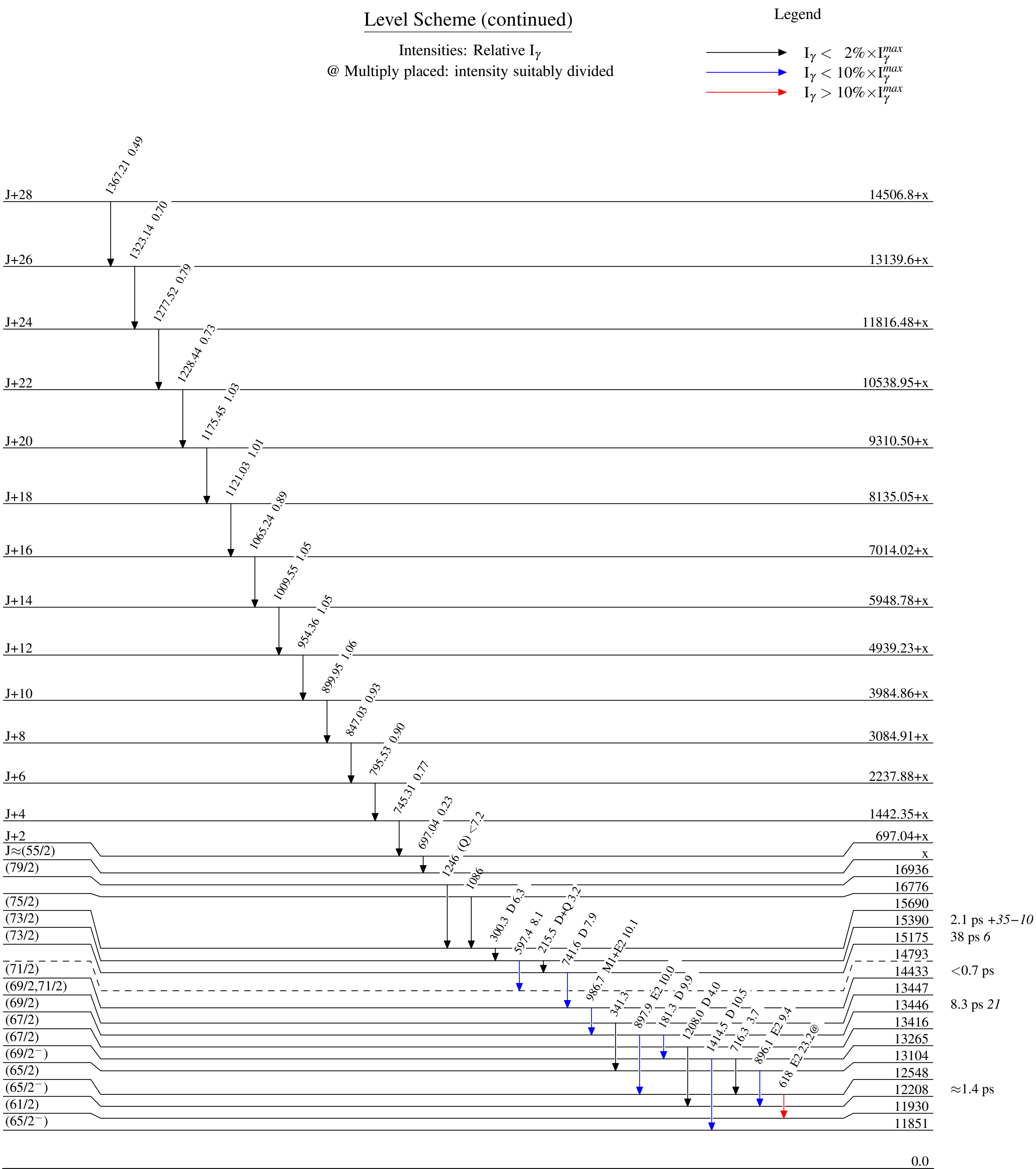
$^{147}_{64}Gd_{83}$

(HI,xnγ) 1987Bo10,1993Ha19,1996Th06

Level Scheme (continued)

Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided



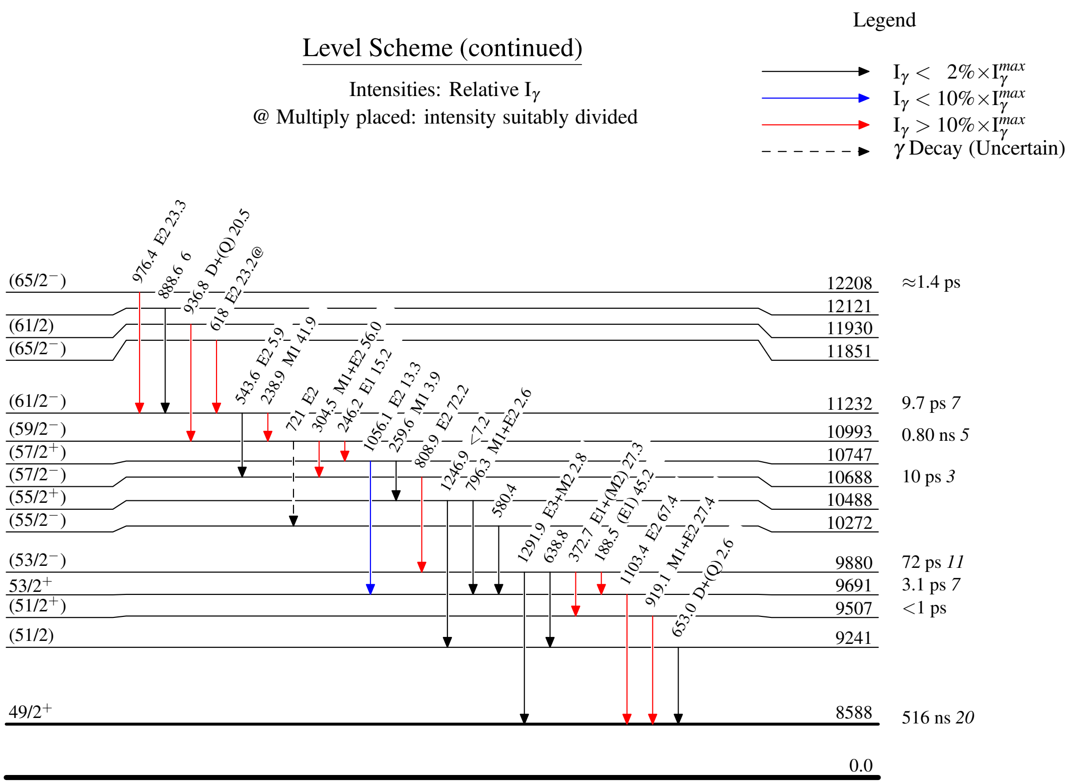
$^{147}_{64}Gd_{83}$

(HI,xnγ) 1987Bo10,1993Ha19,1996Th06

Level Scheme (continued)

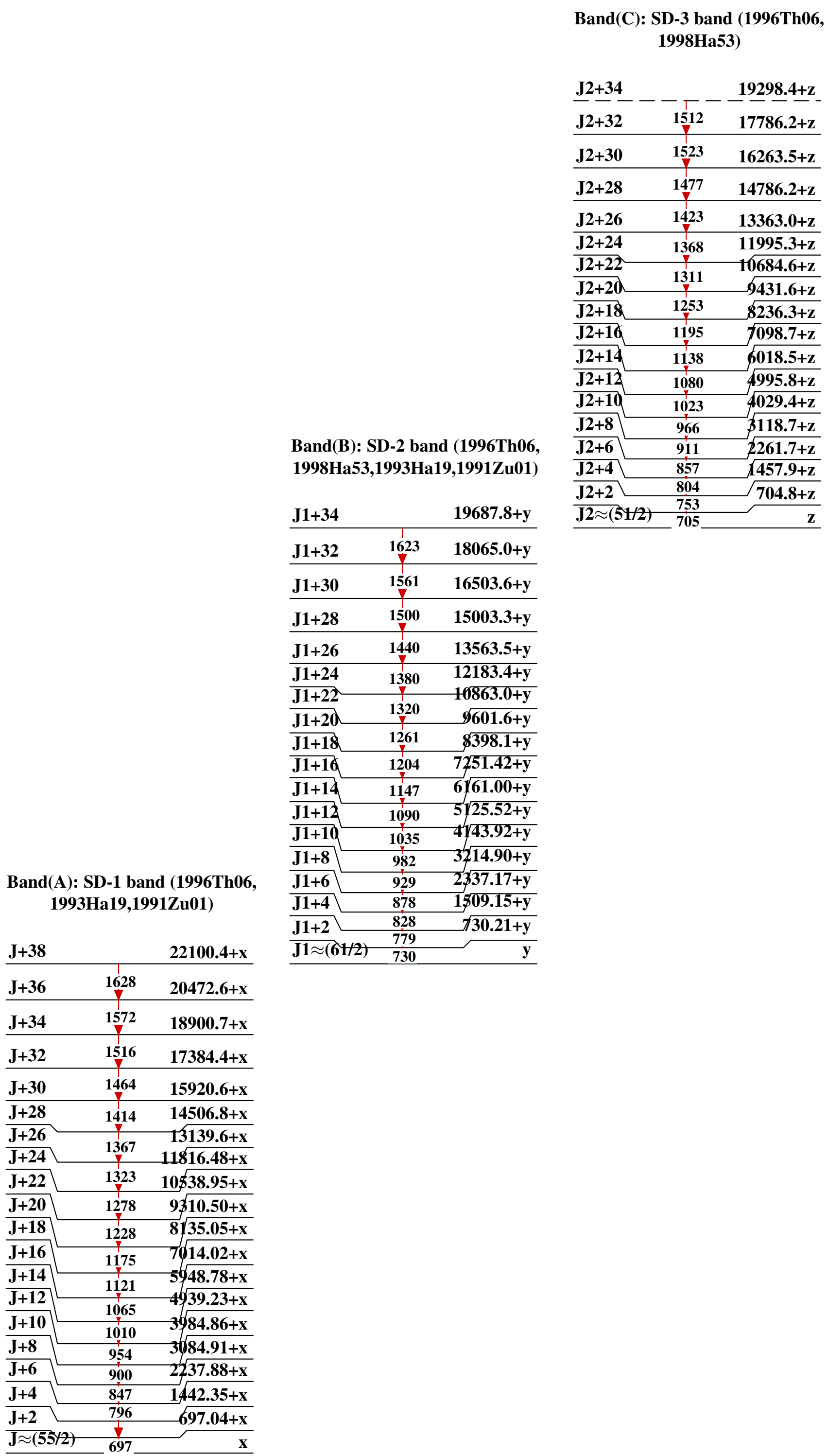
Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided



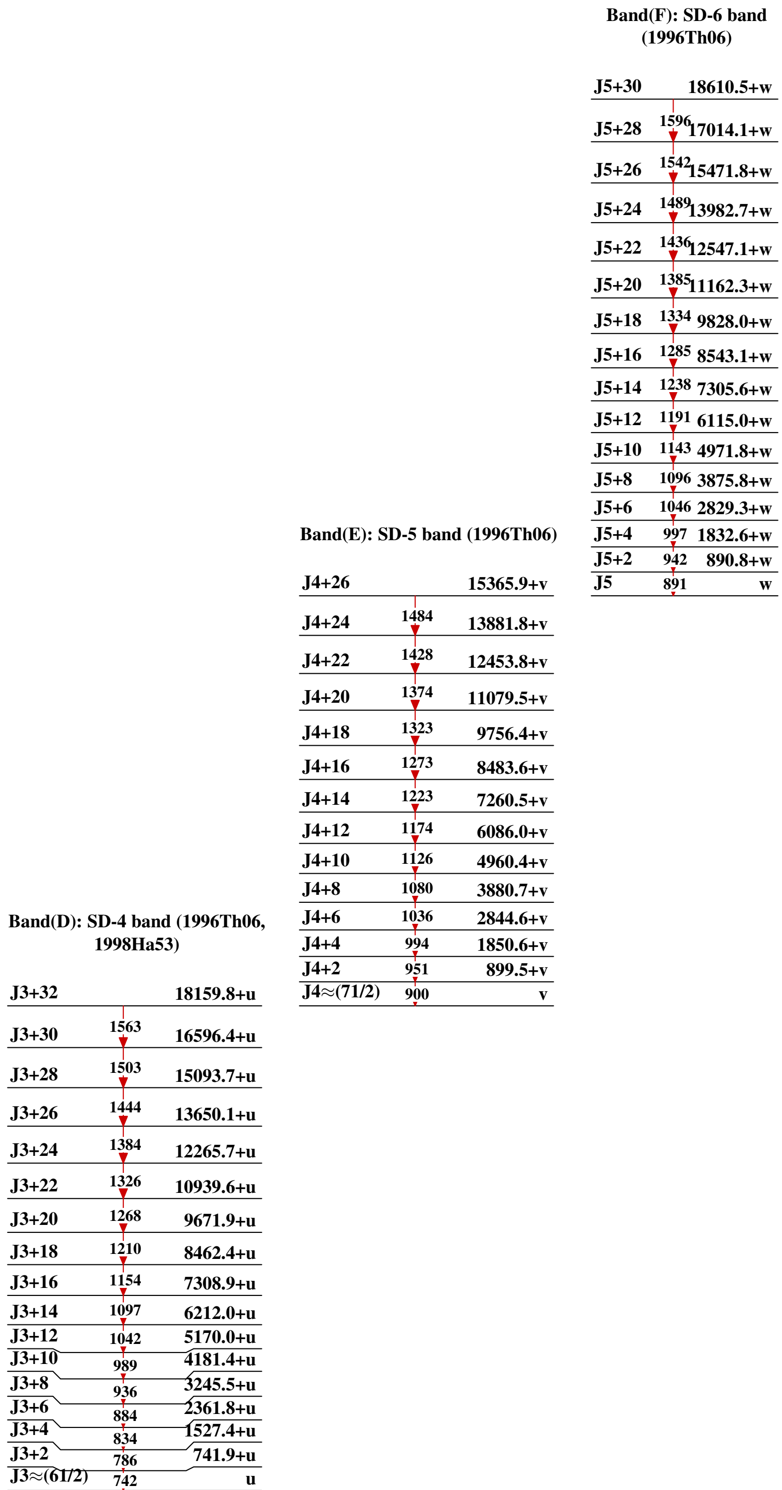
$^{147}_{64}Gd_{83}$

(HI,xnγ) 1987Bo10,1993Ha19,1996Th06



$^{147}_{64}Gd_{83}$

(HI,xnγ) 1987Bo10,1993Ha19,1996Th06 (continued)



$^{147}_{64}Gd_{83}$