(HI,xnγ) 1994Vl02,1996Fi08

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 160, 1 (2019)	21-Oct-2019

Additional information 1.

The level scheme is based primarily on the study by 1994Vl02. This study is meant to supersede that of 1984RiZX, which represents some preliminary results from the present study. Where appropriate, information from other studies is included. In particular, data on a superdeformed band is shown.

Recent theoretical studies related to properties of SD bands are given in: 1995Ch67 (including possible hyperdeformed shapes); 1998Af02 (cranked relativistic mean-field theory); and 1999Sa55 (particle-rotor calculations). Compilations of data on SD bands are given in 1999Ha56 and 2002Si26.

1994Vl02: ^{124}Sn(^{36}S,5nγ), E(^{36}S)=155 MeV. Self-supporting target, consisting of four stacked foils 350 μg/cm^2 thick, enriched to 97.9% in ^{124}Sn. γ radiation detected in the TESSA2 array of a 62-detector BGO crystal ball and 6 escape-suppressed Ge detectors. $\gamma\gamma(\theta)$ and DCO ratios were measured for the same reaction using the EUROGAM detector array. $\gamma(\theta)$ also measured using the ^{156}Gd(^{3}He,4nγ) reaction, E(^{3}He)=39 MeV.

1996Fi08: ^{124}Sn(^{36}S,5nγ) E(^{36}S)=175 MeV. Measured Eγ, $\gamma\gamma\gamma$ coin with GAMMASPHERE array (67 Ge detectors). Report Eγ and Iγ for an SD band.

1984RiZX: ^{124}Sn(^{36}S,5n), E(^{36}S)=155 MeV. Measured Eγ, $\gamma\gamma$. This work represents an early stage of that reported in 1994Vl02.

1973Kr12: ^{146}Nd(^{12}C,3n), E(^{12}C)=57-109 MeV. Measured Eγ, Iγ, $\gamma(\theta)$ at E(^{12}C)=67 and 87 MeV, $\gamma\gamma$, $\gamma\gamma$(t) at E(^{12}C)=70 MeV. 1973Kr12 assign J^π=13/2$^+$ to a level at 131 keV, upon which they based a strongly mixed positive-parity band consisting of states having ΔJ=2 up through the 33/2$^+$ member. However, the 13/2$^+$ state is now known to lie at 154.6 keV and the 131 level has J^π=9/2$^+$. This means that the energies of the members of this band, as reported by 1973Kr12, are not correct. These authors also report a rotational band, up through the 21/2$^-$ state, based on the 11/2[505] Nilsson orbital.

1975Be34: ^{156}Gd(α,5n), E(α)=76 MeV. Measured Eγ, Iγ, $\gamma(\theta)$, $\gamma\gamma$, $\gamma\gamma$(t). These authors report the observation of the strongly mixed positive-parity band (signature=+1/2 portion only) from the J^π=13/2$^+$ member up through the 45/2$^+$ member.

1989Em01: ^{124}Sn(^{36}S,5n), E(^{36}S)=155 MeV. Using an array of 14 BGO scintillators, together with 8 Compton-suppressed Ge detectors, these authors employ the Doppler-shift attenuation method to measure lifetimes for a number of the higher-spin yrast states of both positive and negative parity.

1982Ka36: ^{155}Gd(^{3}He,3n), E(^{3}He)=27 MeV. Measured the time distribution of the 45.4 γ, relative to the ^{3}He-beam pulses, using a small (2 cm^2 by 0.7 cm) planar intrinsic Ge detector.

1984Ha39: ^{24}Mg(^{136}Xe,5n), E(^{136}Xe)=610 MeV. From spin-precession measurements of γ radiation emitted from Dy nuclei rapidly recoiling through transient fields in ferromagnetic Gd, these authors report an average g-factor of 0.23 *6* for the 17/2$^+$ through the 29/2$^+$ states in the strongly mixed positive-parity band (this value assumes an intrinsic quadrupole moment of 4.5 b for the members of this band).

1986Xi01 give a discussion of the terminating and nonterminating band structure of ^{155}Dy at very high spins in terms of an extended Nilsson-Strutinsky cranking formalism.

```
Band-label (quasiparticle) conventions for neutrons:
        A      1/2[660], α=+1/2   , π=+
        B      1/2[660], α=-1/2   , π=+
        C      3/2[651], α=+1/2   , π=+
        D      3/2[651], α=-1/2   , π=+
        E      3/2[521], α=+1/2   , π=-  [a]
        F      3/2[521], α=-1/2   , π=-  [a]
        G     3/2[532], α=+1/2   , π=-
        H      3/2[532], α=-1/2   , π=-
        X     11/2[505], α=+1/2   , π=-
        Y     11/2[505], α=-1/2   , π=-
Band-label (quasiparticle) conventions for protons:
        Ap        7/2[523], α=+1/2   , π=-
        Bp        7/2[523], α=-1/2   , π=-
        Cp        5/2[532], α=+1/2   , π=-
        Dp        5/2[532], α=-1/2   , π=-
```

----
[a] 1994Vl02 report α=-1/2 and α=+1/2, respectively, for states E and F. The evaluator has assumed that this is incorrect, in that the proposed configurations for bands Bands 5 and 7, respectively (in the notation of 1994Vl02)

are not consistent with such a choice.

^{155}Dy Levels

Configuration assignments for the levels populated in these reactions are those proposed by 1994Vl02 based on comparison of experimental routhians and alignments with theoretically calculated ones.

E(level)[†]	Jπ[‡]	T1/2[#]	E(level)[†]	Jπ[‡]	T1/2[#]
0.0[e]	3/2−		3241.5[f]	33/2−	
39.4[f]	5/2−		3256.4[j]	35/2+	
86.8[e]	7/2−		3304.5[l]	35/2−	
132.2[i]	9/2+	51[a] ns 3	3472.6[g]	35/2−	
154.5[i]	13/2+		3481.8[m]	37/2+	
225.4[f]	9/2−		3556.5[k]	37/2−	
234.3[g]	11/2−	6[b] μs 1	3711.2[i]	41/2+	0.27 ps +76−24
381.9[i]	17/2+		3735.0[h]	37/2−	
436.5[h]	13/2−		3832.2[f]	37/2−	
577.8[f]	13/2−		3912.6[l]	39/2−	
645.2[j]	15/2+		3951.3[j]	39/2+	
657.7[g]	15/2−		4013.8[g]	39/2−	
744.9[i]	21/2+		4180.4[k]	41/2−	
892.7[m]	17/2+		4228.5[m]	41/2+	
896.4[h]	17/2−		4314.4[h]	41/2−	
1004.9[j]	19/2+		4454.0[i]	45/2+	0.13 ps 4
1031.9[f]	17/2−		4471.7[f]	41/2−	
1150.8[g]	19/2−		4574.4[l]	43/2−	
1209.2[i]	25/2+		4634.0[g]	43/2−	
1225.3[m]	21/2+		4686.0[j]	43/2+	
1419.1[h]	21/2−		4866.0[k]	45/2−	0.21 ps 11
1462.1[j]	23/2+		4973.8[h]	45/2−	
1533.7[f]	21/2−		5011.4[m]	45/2+	
1650.2[m]	25/2+		5158[f]	45/2−	
1688	23/2		5238.5[i]	49/2+	0.05 ps +3−2
1699.8[g]	23/2−		5290.2[@l]	47/2−	
1719	23/2+		5331.1[g]	47/2−	
1753.0[i]	29/2+		5459.5[j]	47/2+	
1991.2[h]	25/2−		5610.4[k]	49/2−	0.17 ps +3−6
1999.2[j]	27/2+		5706.5[h]	49/2−	
2012.5[k]	25/2−		5897[&f]	49/2−	
2082.8[f]	25/2−		6062.3[@l]	51/2−	
2169.7[m]	29/2+		6067.8[i]	53/2+	0.13 ps 5
2292.0[g]	27/2−		6097.8[g]	51/2−	
2358.1[i]	33/2+		6272.5[j]	51/2+	
2475.8[k]	29/2−		6405.4[k]	53/2−	0.18 ps 4
2599.6[h]	29/2−		6505.4[h]	53/2−	
2602.1[j]	31/2+		6685[&f]	53/2−	
2688.5[f]	29/2−		6892.6[@l]	55/2−	
2784.8[m]	33/2+		6927.8[g]	55/2−	
2911.0[g]	31/2−		6943.2[i]	57/2+	0.15 ps 4
2990.5[k]	33/2−		7241.6[k]	57/2−	≤0.07 ps
3012.4[i]	37/2+		7364.2[h]	57/2−	
3210.7[h]	33/2−		7505[&f]	57/2−	

Continued on next page (footnotes at end of table)

(HI,xnγ) 1994Vl02,1996Fi08 (continued)

^{155}Dy Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	E(level)[†]	Jπ[‡]	$T_{1/2}$[#]
7778.4[@l]	59/2⁻		12477?[h]	77/2⁻	
7815.3[g]	59/2⁻		12985[k]	81/2⁻	0.44[c] ps +24−17
7870.2[i]	61/2⁺	0.12 ps +76−7	13067?[g]	79/2⁻	
8109.9[k]	61/2⁻	0.16 ps 8	13344?[@l]	83/2⁻	
8278.4[h]	61/2⁻		14042[k]	85/2⁻	
8696.8[@l]	63/2⁻		14469[@l]	87/2⁻	
8756.2[g]	63/2⁻		15161[k]	89/2⁻	
8849.4[i]	65/2⁺	0.06 ps +28−3	15637?[@l]	91/2⁻	
9008.2[k]	65/2⁻	0.12 ps +7−10	16347?[k]	93/2⁻	
9248.8[h]	65/2⁻		x[n]	J[d]	
9625[@l]	67/2⁻		909.6+x[n] 9	J+2	
9751.1[g]	67/2⁻		1862.1+x[n] 10	J+4	
9882[i]	69/2⁺	≤0.8[c] ps	2860.2+x[n] 10	J+6	
9965.5[k]	69/2⁻	≤0.15 ps	3905.2+x[n] 11	J+8	
10272[h]	69/2⁻		4996.1+x[n] 11	J+10	
10521[@l]	71/2⁻	≥1.0 ps	6133.4+x[n] 11	J+12	
10802[g]	71/2⁻		7317.0+x[n] 11	J+14	
10969[i]	73/2⁺		8546.7+x[n] 11	J+16	
10973[k]	73/2⁻	0.4 ps +14−1	9823.0+x[n] 12	J+18	
11113?[i]	77/2⁺		11145.8+x[n] 12	J+20	
11349[h]	73/2⁻		12514.4+x[n] 12	J+22	
11451[@l]	75/2⁻	≥1.0 ps	13929.4+x[n] 12	J+24	
11905[g]	75/2⁻		15390.5+x[n] 12	J+26	
11973[k]	77/2⁻	≤0.14 ps	16897.8+x[n] 13	J+28	
12401[@l]	79/2⁻		18449.6+x[n] 14	J+30	

† From 1994Vl02, unless noted otherwise. Values for levels below 225 keV are from other studies and have been rounded to the nearest 0.1 keV.

‡ From adopted values. For those levels seen only in the heavy-ion reactions, these values are based on the DCO ratios, γ(θ), and the systematics of similar bands in this mass region. Stretched quadrupole transitions are taken to be E2.

\# From Doppler-shift attenuation (1989Em01), unless noted otherwise.

@ Energies of the members of this band for $J^{\pi}>43/2^-$ are 10 keV larger than those shown by 1994Vl02.

& Energies of the members of this band for $J^{\pi}>45/2^-$ are 10 keV larger than those shown by 1994Vl02.

a From 1982Ka36, γ(t).

b From IT decay (1970Bo02).

c Value is not corrected for the feeding time.

d From Cranked Relativistic Mean-Field Theory calculations, 1998Af02 suggest J=75/2⁻.

e Band(a): Ground-state band, signature=−1/2 portion. Conf=3/2(521).

f Band(A): Ground-state band. Signature=+1/2 portion. Conf=3/2(521). Band is crossed by AB, becomes EAB and at higher energies is crossed by A_pB_p.

g Band(B): Band built on the 11/2[505] orbital, signature=−1/2.

h Band(C): Band built on the 11/2[505] orbital, signature=+1/2 band is crossed by AB and, at higher energies, by A_pB_p.

i Band(D): Strongly mixed $i_{13/2}$-related band, signature=+1/2. Dominant component at low energies is 1/2[660]. Band crossings with BC and A_pB_p are proposed to occur in the same energy region. 1984Ha39 report an average g-factor of 0.23 6 for the 17/2⁺ through the 29/2⁺ states in this band, assuming an intrinsic quadrupole moment of 4.5 eb for the band.

j Band(E): Strongly mixed $i_{13/2}$-related band, signature=−1/2. Dominant component at low energies is 1/2[660]. Band crossings

Continued on next page (footnotes at end of table)

(HI,xnγ) 1994Vl02,1996Fi08 (continued)

^{155}Dy Levels (continued)

with AD and A_pB_p are proposed to occur in the same energy region.

[k] Band(F): Three-neutron-quasiparticle negative-parity band, signature=+1/2. Proposed configuration is EAB. Band is crossed by A_pB_p at higher energies and is seen to approach termination at the highest spins.

[l] Band(G): Three-neutron-quasiparticle negative-parity band, signature=−1/2. Proposed configuration is FAB. Band is crossed by A_pB_p at higher energies and is seen to approach termination at the highest spins.

[m] Band(H): Positive-parity band, signature=+1/2. Proposed "β vibration" based on ν $i_{13/2}$ (1994Vl02).

[n] Band(I): SD band. Proposed configuration is $\pi6^4\nu7^3$, with four $i_{13/2}$ proton and three $j_{15/2}$ intruder neutron orbitals involved (1996Fi08). Q(intrinsic)=17.9 *+39−26* (1996Fi08) from DSA data for 14 transitions in the cascade. Level lifetimes are estimated to be much less than 3 ps and population is ≤0.5% of the total ^{155}Dy feeding (1996Fi08).

γ(^{155}Dy)

Unless otherwise noted, the γ's shown as unplaced are those reported by 1973Kr12. In some cases, these were placed by 1973Kr12 but, because of changes in the level scheme, the evaluator has considered them to be unplaced.

E_γ[†]	I_γ[&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[b]	Comments
9.1[#]		234.3	11/2⁻	225.4	9/2⁻		
22.2[#]		154.5	13/2⁺	132.2	9/2⁺		
45.4[#]		132.2	9/2⁺	86.8	7/2⁻		
[x]73.7 *4*							
79.7[#]		234.3	11/2⁻	154.5	13/2⁺		
86.2[@] *4*		86.8	7/2⁻	0.0	3/2⁻		
103[@] *1*		234.3	11/2⁻	132.2	9/2⁺		
[x]109.8 *3*							
138.6 *5*	21 *2*	225.4	9/2⁻	86.8	7/2⁻		
147.2[@] *2*		234.3	11/2⁻	86.8	7/2⁻		
[x]162 *1*							γ may be depopulating the 202.4 level in the ^{155}Ho decay scheme (1973Kr12).
[x]186.0 *2*							γ may be depopulating the 224.4 level in the ^{155}Ho decay scheme (1973Kr12).
186.1 *5*	10 *1*	225.4	9/2⁻	39.4	5/2⁻		
[x]191 *1*							
202.2 *1*	100 *10*	436.5	13/2⁻	234.3	11/2⁻		DCO=1.1 *2*.
221.2 *1*	100 *10*	657.7	15/2⁻	436.5	13/2⁻		
227.3 *1*	820 *20*	381.9	17/2⁺	154.5	13/2⁺	E2[c]	DCO=1.0 *1*.
238.7 *1*	65 *5*	896.4	17/2⁻	657.7	15/2⁻		DCO=1.2 *4*.
252.9 *5*	16 *3*	1462.1	23/2⁺	1209.2	25/2⁺		
254.4 *1*	54 *3*	1150.8	19/2⁻	896.4	17/2⁻		
260.4 *5*	18 *3*	1004.9	19/2⁺	744.9	21/2⁺		DCO=0.4 *4*.
261.8 *5*		3472.6	35/2⁻	3210.7	33/2⁻		
262.5 *5*		3735.0	37/2⁻	3472.6	35/2⁻		
263.4 *5*	9 *2*	645.2	15/2⁺	381.9	17/2⁺		
268.3 *5*	48 *5*	1419.1	21/2⁻	1150.8	19/2⁻		
278.7 *5*	11 *2*	4013.8	39/2⁻	3735.0	37/2⁻		
280.6 *5*	35 *3*	1699.8	23/2⁻	1419.1	21/2⁻		
291.5 *5*	32 *3*	1991.2	25/2⁻	1699.8	23/2⁻		
293 *1*		2012.5	25/2⁻	1719	23/2⁺		
300 *1*		3210.7	33/2⁻	2911.0	31/2⁻		
301 *1*		2292.0	27/2⁻	1991.2	25/2⁻		
301 *1*		4314.4	41/2⁻	4013.8	39/2⁻		
307.7 *5*	23 *2*	2599.6	29/2⁻	2292.0	27/2⁻		
311.3 *5*	19 *2*	2911.0	31/2⁻	2599.6	29/2⁻		

Continued on next page (footnotes at end of table)

(HI,xnγ) 1994Vl02,1996Fi08 (continued)

γ(^{155}Dy) (continued)

E_γ[†]	I_γ[&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[b]	Comments
319.5 *5*	12 *2*	4634.0	43/2⁻	4314.4	41/2⁻		
324 *1*		2012.5	25/2⁻	1688	23/2		
332.9 *1*	53 *10*	1225.3	21/2⁺	892.7	17/2⁺		DCO=1.1 *4*.
340.0 *5*	9 *2*	4973.8	45/2⁻	4634.0	43/2⁻		
[x]344.7 *2*							
352.5 *1*	78 *8*	577.8	13/2⁻	225.4	9/2⁻		DCO=1.1 *3*.
357.3 *5*	10 *2*	5331.1	47/2⁻	4973.8	45/2⁻		
359.3 *5*		1004.9	19/2⁺	645.2	15/2⁺		
363.0 *1*	1000	744.9	21/2⁺	381.9	17/2⁺	E2[c]	DCO=1.0 *1*.
375.5 *5*	7 *1*	5706.5	49/2⁻	5331.1	47/2⁻		
[x]380.0 *4*							
391.1 *5*	9 *1*	6097.8	51/2⁻	5706.5	49/2⁻		
407.8 *5*	5 *1*	6505.4	53/2⁻	6097.8	51/2⁻		
[x]418[d]							
423.5 *5*	45 *5*	657.7	15/2⁻	234.3	11/2⁻		
424.9 *1*	117 *20*	1650.2	25/2⁺	1225.3	21/2⁺		DCO=1.0 *2*.
430.6 *5*	18 *2*	3912.6	39/2⁻	3481.8	37/2⁺		
440.4 *5*	27 *4*	1650.2	25/2⁺	1209.2	25/2⁺		
454.1 *1*	80 *10*	1031.9	17/2⁻	577.8	13/2⁻		DCO=1.0 *5*.
457.1 *1*	66 *7*	1462.1	23/2⁺	1004.9	19/2⁺		DCO=1.3 *4*.
459.9 *1*	50 *3*	896.4	17/2⁻	436.5	13/2⁻		DCO=1.9 *4*.
463.7 *5*		2475.8	29/2⁻	2012.5	25/2⁻		
464.3 *1*	910 *40*	1209.2	25/2⁺	744.9	21/2⁺	E2[c]	DCO=1.1 *1*.
476.2 *5*	32 *6*	2475.8	29/2⁻	1999.2	27/2⁺		
479.0 *5*	31 *3*	2012.5	25/2⁻	1533.7	21/2⁻		DCO=0.9 *3*.
480.5 *5*	24 *3*	1225.3	21/2⁺	744.9	21/2⁺		
490.6 *5*		645.2	15/2⁺	154.5	13/2⁺		
493.1 *1*	50 *3*	1150.8	19/2⁻	657.7	15/2⁻		DCO=1.8 *3*.
501.8 *1*	78 *8*	1533.7	21/2⁻	1031.9	17/2⁻		DCO=1.0 *1*.
510.6 *5*	27 *4*	892.7	17/2⁺	381.9	17/2⁺		DCO=0.6 *3*.
514.6 *1*	172 *8*	2990.5	33/2⁻	2475.8	29/2⁻		DCO=1.1 *1*.
519.5 *5*		2169.7	29/2⁺	1650.2	25/2⁺		
520 *1*	57 *5*	3304.5	35/2⁻	2784.8	33/2⁺		
522.6 *1*	78 *8*	1419.1	21/2⁻	896.4	17/2⁻		
524.3 *5*		3735.0	37/2⁻	3210.7	33/2⁻		
537.0 *1*	66 *7*	1999.2	27/2⁺	1462.1	23/2⁺		DCO=1.0 *2*.
541.2 *1*	51 *4*	4013.8	39/2⁻	3472.6	35/2⁻		
543.7 *1*	740 *20*	1753.0	29/2⁺	1209.2	25/2⁺	E2[c]	DCO=1.1 *1*.
544 *1*		3556.5	37/2⁻	3012.4	37/2⁺		
549.0 *1*	58 *5*	1699.8	23/2⁻	1150.8	19/2⁻		DCO=2.2 *3*.
549.1 *1*	60 *5*	2082.8	25/2⁻	1533.7	21/2⁻		DCO=1.3 *3*.
550.7 *5*	35 *6*	2012.5	25/2⁻	1462.1	23/2⁺		
552.9 *5*	35 *6*	3241.5	33/2⁻	2688.5	29/2⁻		
561.7 *5*	35 *6*	3472.6	35/2⁻	2911.0	31/2⁻		
566.1 *1*	201 *8*	3556.5	37/2⁻	2990.5	33/2⁻		DCO=1.1 *2*.
572.1 *1*	67 *5*	1991.2	25/2⁻	1419.1	21/2⁻		DCO=2.4 5.
579.4 *5*	44 *3*	4314.4	41/2⁻	3735.0	37/2⁻		
590.7 *5*	26 *3*	3832.2	37/2⁻	3241.5	33/2⁻		
592.1 *1*	65 *5*	2292.0	27/2⁻	1699.8	23/2⁻		DCO=2.4 *5*.
602.9 *1*	66 *8*	2602.1	31/2⁺	1999.2	27/2⁺		
605.0 *1*	7.0×10^2 *4*	2358.1	33/2⁺	1753.0	29/2⁺	E2[c]	DCO=1.1 *1*.
605.7 *5*	33 *4*	2688.5	29/2⁻	2082.8	25/2⁻		
607 *1*		3912.6	39/2⁻	3304.5	35/2⁻		
608.3 *1*	51 *4*	2599.6	29/2⁻	1991.2	25/2⁻		
611.2 *5*	49 *4*	3210.7	33/2⁻	2602.1	31/2⁺		

Continued on next page (footnotes at end of table)

(HI,xnγ) 1994Vl02,1996Fi08 (continued)

γ(^{155}Dy) (continued)

E_γ [†]	I_γ [&]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [b]	Comments
615.1 *1*	82 *12*	2784.8	33/2+	2169.7	29/2+		DCO=1.2 *2*.
619.0 *1*	65 *7*	2911.0	31/2−	2292.0	27/2−		DCO=2.3 *5*.
620.2 *5*		4634.0	43/2−	4013.8	39/2−		
623 *1*		1004.9	19/2+	381.9	17/2+		
623.9 *1*	224 *9*	4180.4	41/2−	3556.5	37/2−		DCO=1.3 *2*.
632.5 *5*	27 *5*	2990.5	33/2−	2358.1	33/2+		
639.5 *5*	20 *2*	4471.7	41/2−	3832.2	37/2−		
654.3 *1*	480 *20*	3012.4	37/2+	2358.1	33/2+	E2 [c]	DCO=1.2 *1*.
654.5 *5*	45 *5*	3256.4	35/2+	2602.1	31/2+		
659.2 *1*	53 *4*	4973.8	45/2−	4314.4	41/2−		
661.8 *1*	90 *6*	4574.4	43/2−	3912.6	39/2−		DCO=1.1 *2*.
685.6 *1*	194 *8*	4866.0	45/2−	4180.4	41/2−	E2	DCO=0.9 *2*. Mult.: from DCO, γ has mult=Q. RUL eliminates M2.
686 *1*		5158	45/2−	4471.7	41/2−		
695.0 *5*	41 *5*	3951.3	39/2+	3256.4	35/2+		
697.0 *1*	53 *6*	3481.8	37/2+	2784.8	33/2+		
697.0 *5*	42 *3*	5331.1	47/2−	4634.0	43/2−		
698.8 *1*	440 *20*	3711.2	41/2+	3012.4	37/2+		
715.8 *1*	81 *5*	5290.2	47/2−	4574.4	43/2−		
717.5 *5*	30 *8*	1462.1	23/2+	744.9	21/2+		
722.9 *1*	80 *25*	2475.8	29/2−	1753.0	29/2+		DCO=0.7 *2*.
732.7 *5*	39 *2*	5706.5	49/2−	4973.8	45/2−		
734.7 *5*	36 *6*	4686.0	43/2+	3951.3	39/2+		
737.8 *5*	28 *5*	892.7	17/2+	154.5	13/2+		
739.2 *5*	18 *2*	5897	49/2−	5158	45/2−		
742.8 *1*	3.5×10^2 *5*	4454.0	45/2+	3711.2	41/2+	E2	DCO=1.0 *1*. Mult.: from DCO, γ has mult=Q. RUL eliminates M2.
744.4 *1*	187 *8*	5610.4	49/2−	4866.0	45/2−	E2	DCO=1.0 *2*. Mult.: from DCO, γ has mult=Q. RUL eliminates M2.
746.7 *5*	41 *5*	4228.5	41/2+	3481.8	37/2+		
766.8 *5*	37 *3*	6097.8	51/2−	5331.1	47/2−		
772.1 *1*	75 *5*	6062.3	51/2−	5290.2	47/2−		
773.5 *5*	19 *5*	5459.5	47/2+	4686.0	43/2+		
[x]780 [‡]							
782.9 *5*	13 *3*	5011.4	45/2+	4228.5	41/2+		
784.5 *1*	190 *20*	5238.5	49/2+	4454.0	45/2+		DCO=1.0 *1* E2. Mult.: from DCO, γ has mult=Q. RUL eliminates M2.
787.7 *5*	17 *2*	6685	53/2−	5897	49/2−		
795.0 *1*	157 *8*	6405.4	53/2−	5610.4	49/2−	E2	DCO=1.2 *2*. Mult.: from DCO, γ has mult=Q. RUL eliminates M2.
799.0 *5*	40 *5*	6505.4	53/2−	5706.5	49/2−		
803.2 *5*	45 *8*	2012.5	25/2−	1209.2	25/2+		
[x]807 [‡]							
813.0 *5*		6272.5	51/2+	5459.5	47/2+		
820 *1*	14 *1*	7505	57/2−	6685	53/2−		
829.3 *1*	140 *10*	6067.8	53/2+	5238.5	49/2+		
829.9 *5*	35 *3*	6927.8	55/2−	6097.8	51/2−		
830.3 *1*	63 *7*	6892.6	55/2−	6062.3	51/2−		
[x]836 [‡]							
836.2 *1*	142 *8*	7241.6	57/2−	6405.4	53/2−	E2	DCO=1.1 *2*. Mult.: from DCO, γ has mult=Q. RUL eliminates M2.
[x]840 [‡]							
843.4 *5*	39 *6*	1225.3	21/2+	381.9	17/2+		
858.9 *5*	35 *3*	7364.2	57/2−	6505.4	53/2−		

Continued on next page (footnotes at end of table)

(HI,xnγ) 1994Vl02,1996Fi08 (continued)

γ(^{155}Dy) (continued)

E_γ[†]	I_γ[&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[b]	Comments
868.3 *1*	110 *8*	8109.9	61/2⁻	7241.6	57/2⁻	E2	DCO=1.3 *2*. Mult.: from DCO, γ has mult=Q. RUL eliminates M2.
875.4 *1*	102 *10*	6943.2	57/2⁺	6067.8	53/2⁺	E2	DCO=1.0 *2*. Mult.: from DCO, γ has mult=Q. RUL eliminates M2.
885.8 *5*	47 *6*	7778.4	59/2⁻	6892.6	55/2⁻		
887.5 *5*	28 *2*	7815.3	59/2⁻	6927.8	55/2⁻		
ˣ890[‡]							E_γ: peak represents a doublet structure (1994Vl02).
896.2 *5*	23 *4*	10521	71/2⁻	9625	67/2⁻		
898.3 *1*	97 *6*	9008.2	65/2⁻	8109.9	61/2⁻		
900.3 *5*	15 *2*	3912.6	39/2⁻	3012.4	37/2⁺		
905.3 *5*	19 *4*	1650.2	25/2⁺	744.9	21/2⁺		
909.6 *9*	0.28[a] *14*	909.6+x	J+2	x	J		
ˣ912[‡]							
914.2 *5*	24 *2*	8278.4	61/2⁻	7364.2	57/2⁻		
918.4 *5*	36 *5*	8696.8	63/2⁻	7778.4	59/2⁻		
927 *1*		7870.2	61/2⁺	6943.2	57/2⁺		
928 *1*		9625	67/2⁻	8696.8	63/2⁻		
ˣ930[‡]							
930 *1*		11451	75/2⁻	10521	71/2⁻		
940.9 *5*	21 *2*	8756.2	63/2⁻	7815.3	59/2⁻		
942.9[d] *5*	15 *5*	13344?	83/2⁻	12401	79/2⁻		E_γ: ordering of this transition within this band is uncertain. If the present placement is incorrect, the associated level energy will have to be changed accordingly.
943 *1*		1688	23/2	744.9	21/2⁺		
946.4 *5*	30 *3*	3304.5	35/2⁻	2358.1	33/2⁺		
950[d] *1*	22 *4*	12401	79/2⁻	11451	75/2⁻		DCO=0.6 *2*. E_γ: ordering of this transition within this band is uncertain. If the present placement is incorrect, the associated level energy will have to be changed accordingly.
952.5 *4*	0.52[a] *12*	1862.1+x	J+4	909.6+x	J+2		
957.3 *1*	79 *4*	9965.5	69/2⁻	9008.2	65/2⁻		
970.4 *5*	26 *4*	9248.8	65/2⁻	8278.4	61/2⁻		
974 *1*		1719	23/2⁺	744.9	21/2⁺		
979.2 *5*	33 *7*	8849.4	65/2⁺	7870.2	61/2⁺	E2	DCO=1.0 *1*. Mult.: from DCO, γ has mult=Q. RUL eliminates M2.
ˣ982[‡]							
994.9 *5*	21 *2*	9751.1	67/2⁻	8756.2	63/2⁻		
998.1 *2*	0.98[a] *12*	2860.2+x	J+6	1862.1+x	J+4		
999.6 *5*	45 *5*	11973	77/2⁻	10973	73/2⁻		
1007 *1*	60 *5*	10973	73/2⁻	9965.5	69/2⁻		
1011 *1*	37 *7*	12985	81/2⁻	11973	77/2⁻		
1023 *1*	17 *2*	10272	69/2⁻	9248.8	65/2⁻		
1033 *1*	26 *5*	9882	69/2⁺	8849.4	65/2⁺		
1045.0 *2*	0.92[a] *10*	3905.2+x	J+8	2860.2+x	J+6		
1051 *1*	12 *2*	10802	71/2⁻	9751.1	67/2⁻		
1057 *1*	31 *5*	14042	85/2⁻	12985	81/2⁻		
ˣ1064[‡]							
1077 *1*		11349	73/2⁻	10272	69/2⁻		
1087 *1*	9 *3*	10969	73/2⁺	9882	69/2⁺		

Continued on next page (footnotes at end of table)

(HI,xnγ) 1994Vl02,1996Fi08 (continued)

γ(^{155}Dy) (continued)

E_γ[†]	I_γ[&]	E_i(level)	J^π_i	E_f	J^π_f	Comments
1090.9 *2*	1.04[a] *15*	4996.1+x	J+10	3905.2+x	J+8	
1103 *1*		11905	75/2⁻	10802	71/2⁻	
1119 *1*	24 *5*	15161	89/2⁻	14042	85/2⁻	
1125[d] *1*	15 *5*	14469	87/2⁻	13344?	83/2⁻	E_γ: ordering of this transition within this band is uncertain.
1128[d] *1*		12477?	77/2⁻	11349	73/2⁻	
1137.3 *2*	0.96[a] *11*	6133.4+x	J+12	4996.1+x	J+10	
1144[d] *1*		11113?	77/2⁺	9965.5	69/2⁻	
1162[d] *1*		13067?	79/2⁻	11905	75/2⁻	
1168[d] *1*	<10	15637?	91/2⁻	14469	87/2⁻	
1183.6 *2*	1.07[a] *11*	7317.0+x	J+14	6133.4+x	J+12	
1186[d] *1*		16347?	93/2⁻	15161	89/2⁻	
1229.7 *2*	0.98[a] *11*	8546.7+x	J+16	7317.0+x	J+14	
1276.3 *2*	0.97[a] *10*	9823.0+x	J+18	8546.7+x	J+16	
[x]1320[‡]						
1322.8 *2*	0.92[a] *8*	11145.8+x	J+20	9823.0+x	J+18	
1368.6 *2*	1.00[a] *11*	12514.4+x	J+22	11145.8+x	J+20	
1415.0 *2*	0.81[a] *10*	13929.4+x	J+24	12514.4+x	J+22	
1461.1 *2*	0.56[a] *10*	15390.5+x	J+26	13929.4+x	J+24	
1507.3 *3*	0.45[a] *9*	16897.8+x	J+28	15390.5+x	J+26	
1551.8 *6*	0.16[a] *10*	18449.6+x	J+30	16897.8+x	J+28	

[†] From 1994Vl02, unless noted otherwise. The uncertainties are those proposed by the evaluator, based on a general comment from 1994Vl02 which states that the γ energies are accurate to 0.1 keV for most transitions and that, for weak or contaminated transitions, they are accurate to 0.5 or 1 keV. The evaluator has assigned uncertainties of 0.5 keV to those γ's having $I\gamma<50$ and 1 keV to those whose $E\gamma$ values are given only to the nearest 1 keV. Because of this problem, no least-squares fit to the listed γ-ray energies was made. Note that 1994Vl02 report no data for γ's below $E\gamma$=138.

[‡] γ reported by 1994Vl02 to be in coincidence with various members of the α=+1/2 component of the strongly mixed $i_{13/2}$-related band (band 6, in the notation of 1994Vl02) but not otherwise placed by them.

[#] From adopted values, rounded to the nearest 0.1 keV. From the ^{155}Dy IT decay (6 μs), this transition is known to deexcite this level. The various studies reported here provide no information on it.

[@] From 1973Kr12. 1994Vl02 do not report this γ.

[&] Unless noted otherwise, values are those of 1994Vl02, from $\gamma\gamma$-coincidence and the total-projection spectrum. 1973Kr12 report $I\gamma$ values for their γ's, which are shown unplaced here, but they are not listed here.

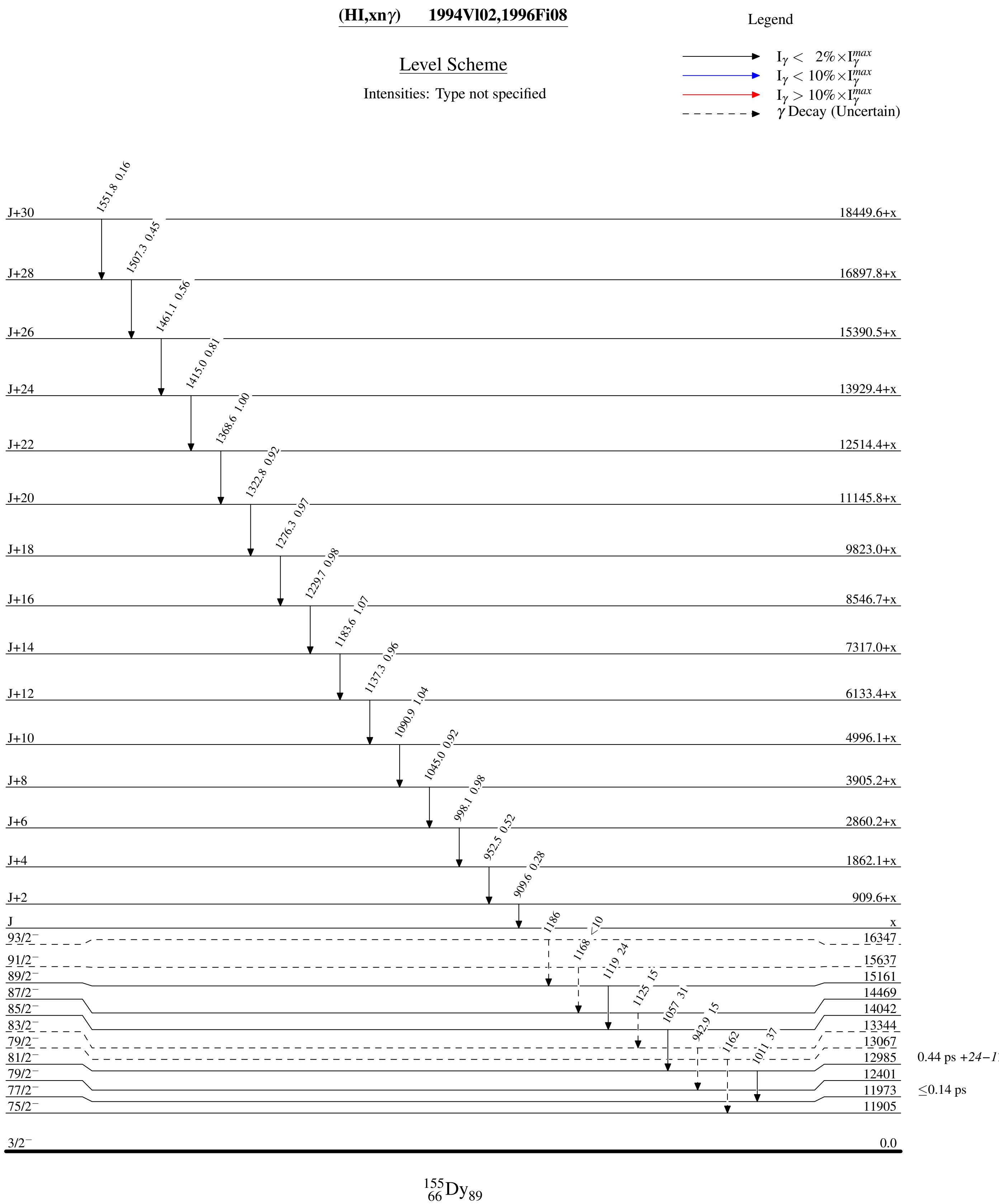
[a] From 2002Si26, who read the values from a figure (fig. 4) shown in 1996Fi08. These values are not directly comparable to those given for γ's within the states of "normal" deformation.

[b] 1994Vl02 report DCO ratios and angular-distribution coefficients. These authors state that DCO ratios are close to unity for stretched quadrupole transitions and close to 0.5 for stretched dipole transitions, but do not show their inferred mults. Except where level lifetimes are known, these mults are not listed here.

[c] From $\gamma(\theta)$ (1975Be34, 1973Kr12). From band-structure considerations, stretched quadrupole transitions are taken to be E2 rather than M2.

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

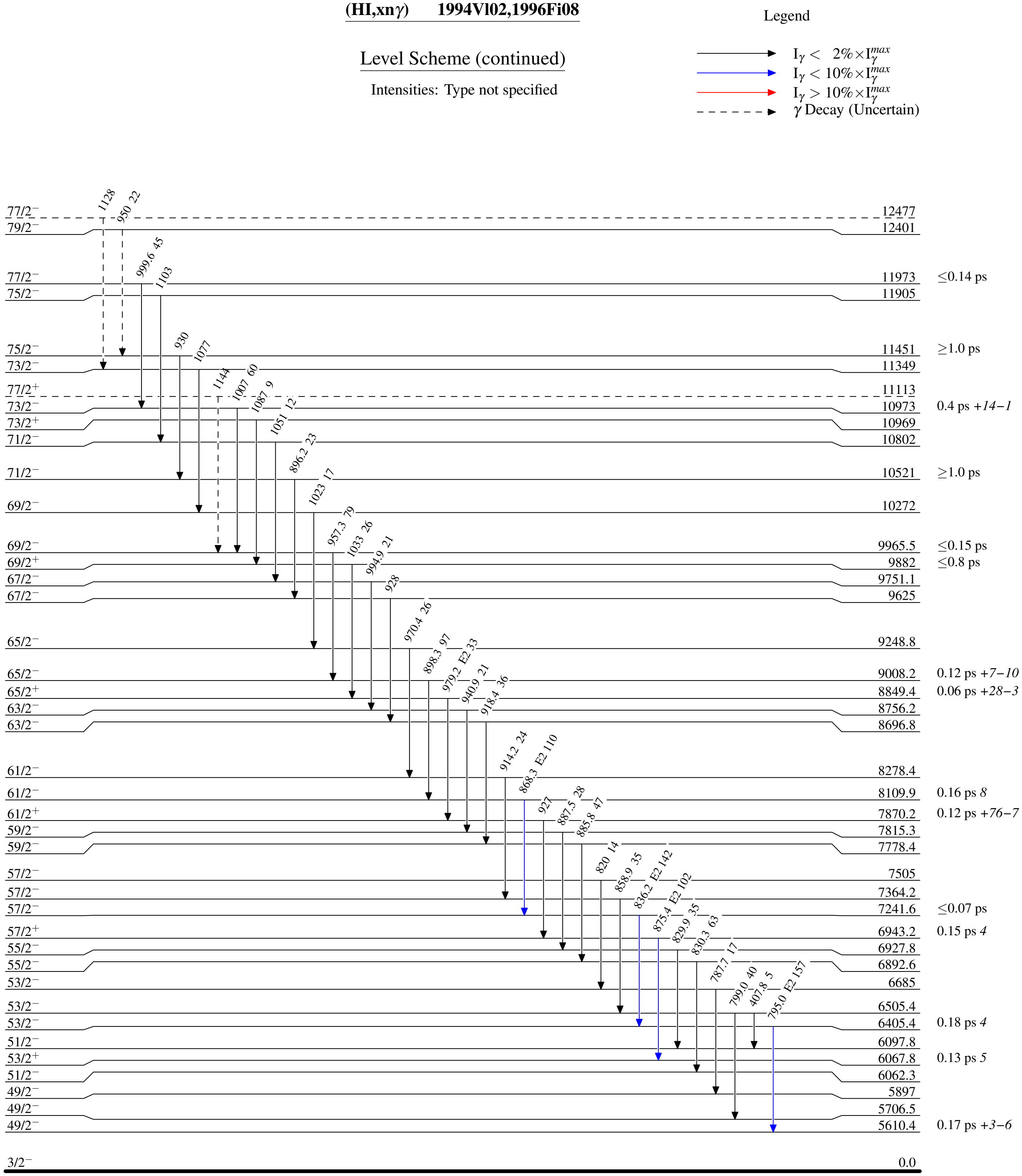
[x] γ ray not placed in level scheme.


(HI,xnγ) 1994Vl02,1996Fi08
Level Scheme
Intensities: Type not specified
Legend
Iγ < 2%×Iγmax
Iγ < 10%×Iγmax
Iγ > 10%×Iγmax
γ Decay (Uncertain)
J+30 18449.6+x
J+28 16897.8+x
J+26 15390.5+x
J+24 13929.4+x
J+22 12514.4+x
J+20 11145.8+x
J+18 9823.0+x
J+16 8546.7+x
J+14 7317.0+x
J+12 6133.4+x
J+10 4996.1+x
J+8 3905.2+x
J+6 2860.2+x
J+4 1862.1+x
J+2 909.6+x
J x
93/2− 16347
91/2− 15637
89/2− 15161
87/2− 14469
85/2− 14042
83/2− 13344
79/2− 13067
81/2− 12985 0.44 ps +24−17
79/2− 12401
77/2− 11973 ≤0.14 ps
75/2− 11905
3/2− 0.0
1551.8 0.16
1507.3 0.45
1461.1 0.56
1415.0 0.81
1368.6 1.00
1322.8 0.92
1276.3 0.97
1229.7 0.98
1183.6 1.07
1137.3 0.96
1090.9 1.04
1045.0 0.92
998.1 0.98
952.5 0.52
909.6 0.28
1186
1168 ≤10
1119 24
1125 15
1057 31
942.9 15
1162
1011 37
155 66 Dy 89

(HI,xnγ) 1994Vl02,1996Fi08

Level Scheme (continued)

Intensities: Type not specified



$^{155}_{66}Dy_{89}$

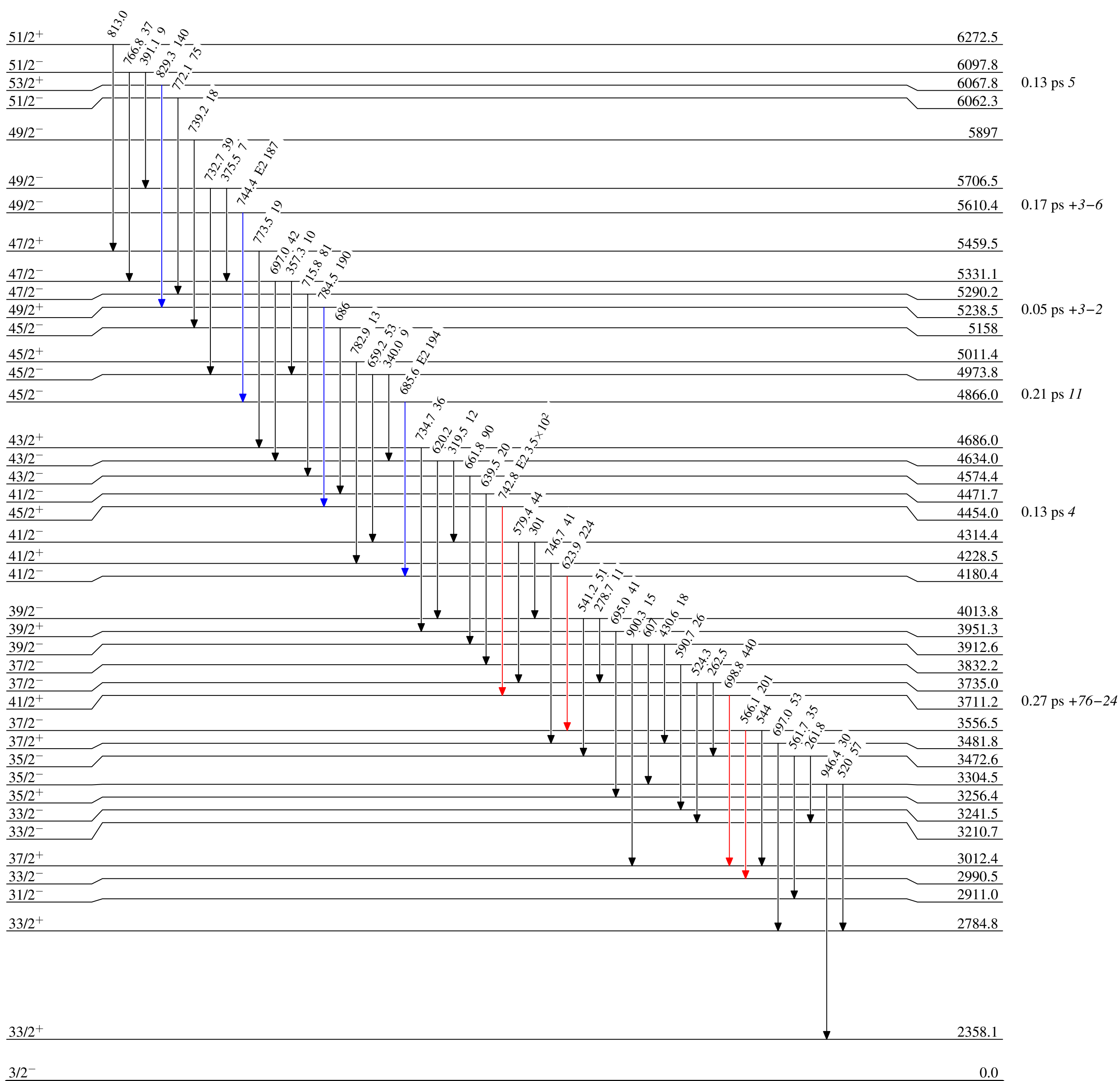
(HI,xnγ) 1994Vl02,1996Fi08

Level Scheme (continued)

Intensities: Type not specified

Legend

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



$^{155}_{66}Dy_{89}$

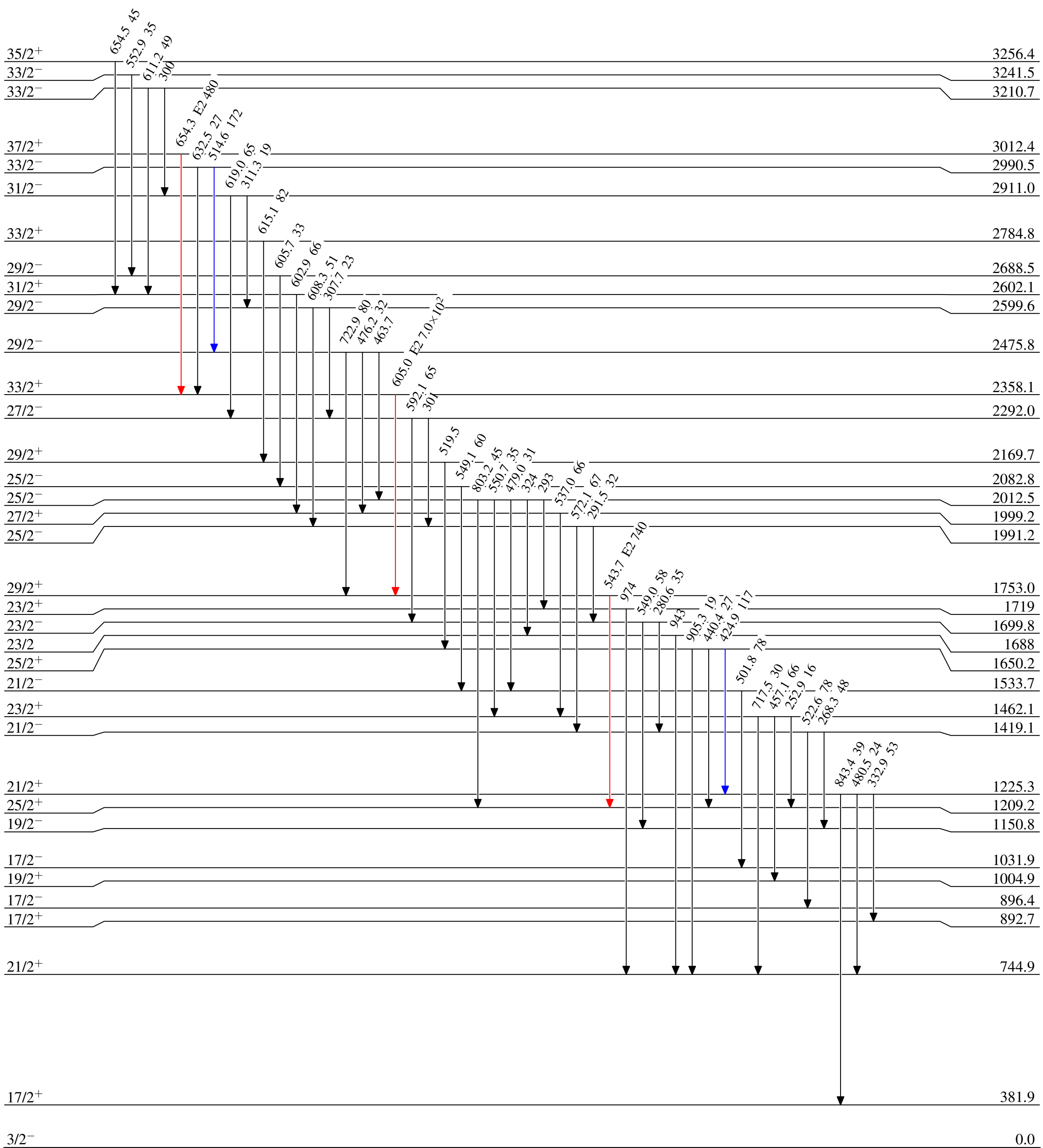
(HI,xnγ) 1994Vl02,1996Fi08

Level Scheme (continued)

Intensities: Type not specified

Legend

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

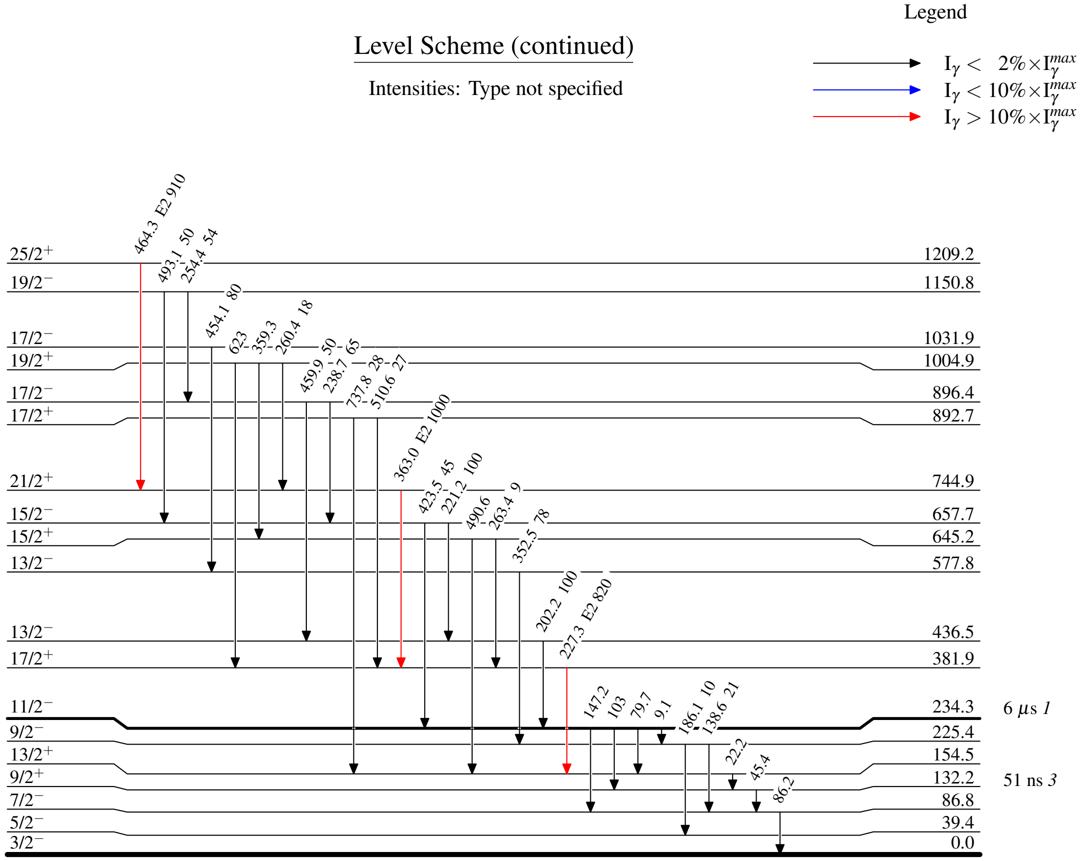


$^{155}_{66}Dy_{89}$

(HI,xnγ) 1994Vl02,1996Fi08

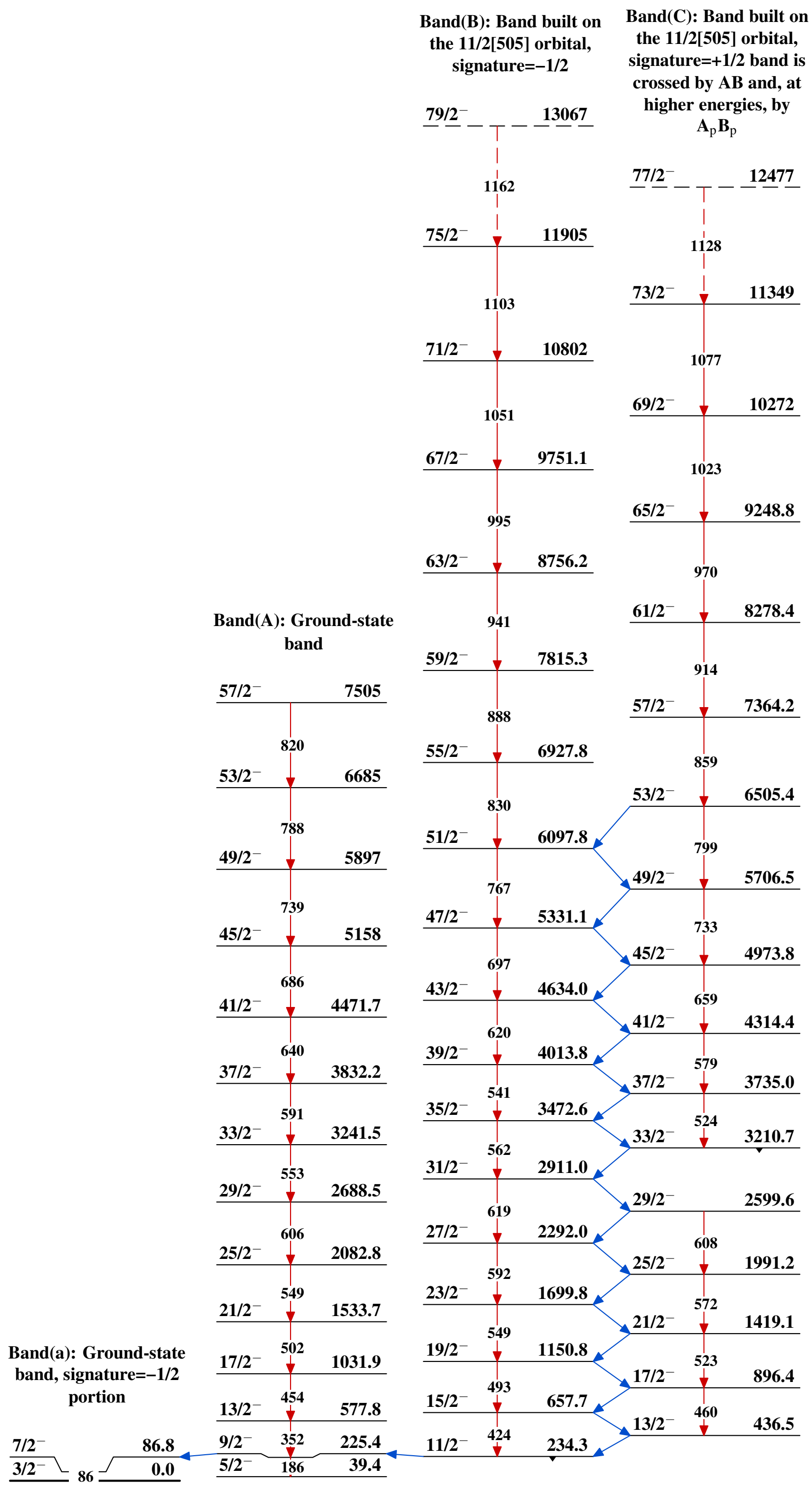
Level Scheme (continued)

Intensities: Type not specified



$^{155}_{66}Dy_{89}$

(HI,xnγ) 1994Vl02,1996Fi08



$^{155}_{66}Dy_{89}$

(HI,xnγ) 1994Vl02,1996Fi08 (continued)