(HI,xnγ)

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 195,1 (2024)	19-Sep-2023

Additional information 1.

1997Ca29: ^{139}La(^{28}Si,5n), E(^{28}Si)=160 MeV. A 1 mg/cm^2 target of ^{139}La, backed with 4 mg/cm^2 Au and covered on the front with a 30 μg/cm^2 Au layer, was used. γ radiation was detected using the 4π GASP array, consisting of 39 Compton-suppressed large-volume Ge detectors, a planar detector and an 80-element multiplicity filter of BGO detectors. Assignment of γ rays to ^{162}Lu was made based on coincidences with Lu K x rays, the BGO multiplicity distribution and previous knowledge of the neighboring Lu isotopes (^{161}Lu,^{163}Lu,^{165}Lu). Measured Eγ, Iγ, γ coincidences and DCO ratios. Authors report four bands, three of them with both signature partners (0 and 1).

1996Ca03: this work is presumably a preliminary version of the study (1997Ca29) reported by this same group. Here, the authors report Eγ and a level scheme for the (π $h_{11/2}$)(ν $i_{13/2}$) yrast band up through the (29$^-$) level.

1997Gu18: ^{148}Sm(^{19}F,5n). E(^{19}F)=112 MeV, found, through excitation functions in the 108- to 120-MeV range, to be optimum for this reaction, relative to the nearby masses. Enriched self-supporting ^{148}Sm foil, ≈850 μg/cm^2 thick. γ radiation measured using an array of six Compton-suppressed Ge detectors and a 14-element BGO-detector multiplicity filter. γ′s assigned to ^{162}Lu based on coincidences with Lu K x rays and reaction-channel elimination procedures. Measured Eγ, Iγ, γ coincidences and DCO ratios. Proposed a level scheme for ^{162}Lu consisting of three bands, each containing both signature partners (0 and 1).

1996Zh05: ^{139}La(^{28}Si,5n): E(^{28}Si)=150 MeV. The targets were foils of natural La, rolled to a thickness of 1 mg/cm^2. A target backing of 8 mg/cm^2 Au was evaporated on to the foils and a 30 μg/cm^2 Al layer was evaporated on the front side. γγ coincidences were measured using the OSIRIS γ-ray spectrometer, consisting of 12 Compton-suppressed Ge detectors and an inner ball of 48 BGO detectors to measure γ-ray multiplicity and total energy. (These data were obtained as a by-product of an experiment to study high-spin states in ^{163}Lu (see 1992Sc03). The experimental details are given there, but only briefly mentioned by 1996Zh05.).

1996Zh14: ^{147}Sm(^{19}F,4n): E(^{19}F)=85,90,95 and 100 MeV. A 7.3 mg/cm^2 self-supporting Sm target, enriched to 98% in ^{147}Sm, was used. The γ radiation was studied using one planar Ge detector and seven HpGe, BGO-shielded, detectors. The γ rays were assigned to ^{162}Lu based on (K x ray)γ coincidences and excitation functions. γγ coincidences were measured at E(^{19}F)=95 MeV, where the cross section for producing ^{161}Lu was negligible. ≈5x10^7 γγ(t) events were recorded. These authors report Eγ and a level scheme for the (π $h_{11/2}$)(ν $i_{13/2}$) yrast band up through the (22$^-$) level. For other reports on this subject from this group, see 1995Zh54,1996Zh13.

The level scheme proposed by these groups is in substantial agreement for the levels in the (π $h_{11/2}$)(ν $i_{13/2}$) yrast band having spins from (12$^-$) through (22$^-$) (where the studies overlap). The various authors report quite different pictures of the yrast band below the (12$^-$) level. The scheme adopted here for these levels is that proposed by 1997Gu18 and is not inconsistent with proposals from the other studies. Only 1997Gu18 and 1997Ca29 report band structures other than the yrast band.

All the studies report a signature inversion in the region of J=20 in the (π $h_{11/2}$)(ν $i_{13/2}$) yrast band.

For a discussion of the systematic features of signature inversion in (π $h_{11/2}$)(ν $i_{13/2}$) bands in this mass region, see, e. g., 1995Li40, 2001Ri19, 2003Ya19.

^{162}Lu Levels

The linkage of the other bands to the yrast (negative-parity) band is that reported by 1997Ca29. 1997Gu18 report only that ≈20% of the intensity of the four-quasiparticle (positive-parity) band feeds into the yrast band below J=16 via a likely γ transition of energy 600 keV.

E(level)[†]	Jπ[‡]
0.0+x	(9$^-$)
16.6+x?	
143.8+x[a]	(10$^-$)
224.5+x[&]	(11$^-$)
301.6+x[d]	J[#]

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(HI,xnγ) (continued)

^{162}Lu Levels (continued)

E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]
420.0+x[a]	(12⁻)	2205.7+x[b]	(17⁺)	3369.4+x[c]	(22⁺)	4992.3+x[e]	J+16
580.5+x[&]	(13⁻)	2339.1+x[e]	J+7	3547.4+x[a]	(22⁻)	5190.2+x[b]	(27⁺)
583.1+x		2398.6+x[c]	(18⁺)	3558.3+x[e]	J+12	5379.8+x[&]	(27⁻)
722.4+x[d]	J+2	2426.2+x[&]	(19⁻)	3687.3+x[b]	(23⁺)	5400.0+x[e]	J+17
857.1+x[a]	(14⁻)	2524.1+x[e]	J+8	3852.9+x[e]	J+13	5631.3+x[c]	(28⁺)
1085.3+x		2565.2+x[d]	J+8	3921.9+x[&]	(23⁻)	5751.2+x[a]	(28⁻)
1091.3+x[&]	(15⁻)	2594.6+x[b]	(19⁺)	4026.3+x[c]	(24⁺)	5835.4+x[e]	J+18
1258.6+x[d]	J+4	2734.6+x[e]	J+9	4226.5+x[e]	J+14	6074.2+x[b]	(29⁺)
1417.5+x[a]	(16⁻)	2800.3+x[a]	(20⁻)	4262.2+x[a]	(24⁻)	6185.4+x[&]	(29⁻)
1681.6+x		2825.7+x[c]	(20⁺)	4391.4+x[b]	(25⁺)	6290.7+x[@e]	J+19
1717.2+x[&]	(17⁻)	2991.8+x[e]	J+10	4584.5+x[e]	J+15	6554.9+x?[c]	(30⁺)
1879.8+x[d]	J+6	3086.3+x[b]	(21⁺)	4634.5+x[&]	(25⁻)	6750.9+x?[@e]	J+20
1999.6+x[c]	(16⁺)	3183.1+x[&]	(21⁻)	4787.2+x[c]	(26⁺)	7244.5+x?[@e]	J+21
2074.0+x[a]	(18⁻)	3237.8+x[e]	J+11	4982.2+x[a]	(26⁻)		

† Computed by the evaluator from a least-squares fit to the listed Eγ values. An uncertainty of 1 keV has been assigned to all the Eγ values in this calculation.

‡ For the yrast band, the values are inferred by the authors from the observed band structure and the pattern of deexciting γ's. The specific values assigned were proposed on the basis of alignment additivity and are further supported by the smooth variation in the trend of the excitation energies of the (π $h_{11/2}$)(ν $i_{13/2}$) bands in the doubly odd N=91 isotones and the neighboring doubly odd Lu isotopes. For the (positive-parity) four-quasiparticle band(s), similar considerations, together (for 1997Ca29) with the observation of connecting γ transitions to the yrast band, were used.

1997Ca29 suggest that the spin of this level lies between 9 and 12.

@ From 1997Gu18. 1997Ca29 do not report levels above the J+18 level.

& Band(A): (π $h_{11/2}$)(ν $i_{13/2}$) yrast band, signature=(1).

a Band(B): (π $h_{11/2}$)(ν $i_{13/2}$) yrast band, signature=(0).

b Band(C): Four-quasiparticle band, signature=(1). 1997Ca29 propose the configuration (π 7/2⁺[404])(ν $i_{13/2}$)(ν $i_{13/2}$)^2 for this band, while 1997Gu18 propose (π 7/2⁻[523])(ν 3/2⁻[521])(ν $i_{13/2}$)^2.

c Band(D): Four-quasiparticle band, signature=(0). 1997Ca29 propose the configuration (π 7/2⁺[404])(ν $i_{13/2}$)(ν $i_{13/2}$)^2 for this band, while 1997Gu18 propose (π 7/2⁻[523])(ν 3/2⁻[521])(ν $i_{13/2}$)^2.

d Band(E): Possible rotational band. 1997Ca29 are the only authors to propose this band.

e Band(F): probable four-quasiparticle band.

γ(^{162}Lu)

Eγ[†‡#]	Iγ[ef]	Ei(level)	Jiπ	Ef	Jfπ	Mult.[c]	Comments
80.6	15.9 *16*	224.5+x	(11⁻)	143.8+x	(10⁻)	D	Eγ: from 1996Zh14, 1997Ca29.
x97.8[b]	21[g]						
x108.2[@]	12.7 *13*					Q	
143.6	21.4 *17*	143.8+x	(10⁻)	0.0+x	(9⁻)	D	
160.5	100 *6*	580.5+x	(13⁻)	420.0+x	(12⁻)	D	
x161.0[@]	9.3 *15*						Eγ: γ reported only by 1996Zh14 and 1997Gu18.
x164.4[@]	15.1 *15*					Q	Eγ: γ not reported by 1996Zh14.
185.0	7.0[g]	2524.1+x	J+8	2339.1+x	J+7	D	
192.8	65 *5*	2398.6+x	(18⁺)	2205.7+x	(17⁺)	D	
195.6	135 *13*	420.0+x	(12⁻)	224.5+x	(11⁻)	D	
196.0	84 *9*	2594.6+x	(19⁺)	2398.6+x	(18⁺)	D	

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(HI,xnγ) (continued)

γ(^{162}Lu) (continued)

E_γ [†‡#]	I_γ [ef]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[c]	Comments
206.2	39 *4*	2205.7+x	(17$^+$)	1999.6+x	(16$^+$)		
210.4	22.8 *23*	2734.6+x	J+9	2524.1+x	J+8	D	
224.7	10.3 *12*	224.5+x	(11$^-$)	0.0+x	(9$^-$)	Q	E_γ: γ reported only by 1997Gu18.
231.0	89 *7*	2825.7+x	(20$^+$)	2594.6+x	(19$^+$)	D	
234.2	94 *7*	1091.3+x	(15$^-$)	857.1+x	(14$^-$)	D	
246.3	28.2 *20*	3237.8+x	J+11	2991.8+x	J+10	D	
257.2	29.4 *24*	2991.8+x	J+10	2734.6+x	J+9	D	
260.6	69 *6*	3086.3+x	(21$^+$)	2825.7+x	(20$^+$)	D	
x266.0[@]	28 *4*						E_γ: from 1997Gu18, 1997Ca29. 1996Zh05 report, but do not place, a 265.6γ, which is presumably the same γ as this.
x268.9[@]	23 *4*						
276.2	30 *3*	420.0+x	(12$^-$)	143.8+x	(10$^-$)		E_γ: from 1996Zh14,1997Gu18. 1997Ca29 place a 293.4γ from this level.
276.6	141 *10*	857.1+x	(14$^-$)	580.5+x	(13$^-$)	D	
x281.8[@]	20 *3*						E_γ: γ reported only by 1997Gu18.
283.0	69 *6*	3369.4+x	(22$^+$)	3086.3+x	(21$^+$)	D	
285.0[abh]		301.6+x	J	16.6+x?			
x293.4							E_γ: shown as the crossover transition deexciting the (12$^-$) level by 1997Ca29. The other authors do not report this γ. 1996Zh14 and 1997Gu18 assign the 276.2 γ as this deexciting transition.
294.5	20.4 *16*	3852.9+x	J+13	3558.3+x	J+12	D	
299.8	41 *3*	1717.2+x	(17$^-$)	1417.5+x	(16$^-$)	D	
317.8	51 *4*	3687.3+x	(23$^+$)	3369.4+x	(22$^+$)	D	
320.6	27.6 *22*	3558.3+x	J+12	3237.8+x	J+11	D	
326.3	90 *6*	1417.5+x	(16$^-$)	1091.3+x	(15$^-$)	D	
338.8	40 *5*	4026.3+x	(24$^+$)	3687.3+x	(23$^+$)	D	
340.3	21 *3*	4262.2+x	(24$^-$)	3921.9+x	(23$^-$)	D	E_γ: γ not reported by 1996Zh14.
347.6[&]	22 *4*	4982.2+x	(26$^-$)	4634.5+x	(25$^-$)	D	
352.3	25.4 *25*	2426.2+x	(19$^-$)	2074.0+x	(18$^-$)		
356.0	83 *7*	580.5+x	(13$^-$)	224.5+x	(11$^-$)	Q	
356.7	45 *4*	2074.0+x	(18$^-$)	1717.2+x	(17$^-$)	D	
358.2	10.5 *13*	4584.5+x	J+15	4226.5+x	J+14	D	
364.5	27 *3*	3547.4+x	(22$^-$)	3183.1+x	(21$^-$)	D	1996Zh14 do not report this γ.
365.0	26 *3*	4391.4+x	(25$^+$)	4026.3+x	(24$^+$)	D	
371.6	11.5 *25*	5751.2+x	(28$^-$)	5379.8+x	(27$^-$)		E_γ: from 1997Ca19. 1997Gu18 report Eγ=371, while 1996Zh05 and 1996Zh14 do not report this γ.
372.1[&]	23 *4*	4634.5+x	(25$^-$)	4262.2+x	(24$^-$)		
373.5	16.2 *16*	4226.5+x	J+14	3852.9+x	J+13	D	
374.1	29 *5*	2800.3+x	(20$^-$)	2426.2+x	(19$^-$)		I_γ: computed by the evaluator from Iγ(726γ)/Iγ(375γ)=1.6 *2* (weighted average of 1.5 *3* (1996Zh05) and 1.7 *3* (1997Ca29)) and Iγ(726γ)=46 *5* (1997Gu18). 1997Gu18 report Iγ(374γ)=42 *5* but state that some portion of this intensity is to be assigned to the 374.5γ deexciting the (23$^-$) level in this band.
374.5	14 *4*	3921.9+x	(23$^-$)	3547.4+x	(22$^-$)		E_γ: γ not reported by 1996Zh14. I_γ: computed by the evaluator from Iγ(738γ)/Iγ(374γ)=1.9 *4* (weighted average of 1.9 *5* (1997Ca29) and 1.7 *10* (1996Zh05)) and Iγ(738γ)=26 *3* (1997Gu18). 1997Gu18 do not report an Iγ value for this γ, stating simply that some

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(HI,xnγ) (continued)

γ(^{162}Lu) (continued)

E_γ[†‡#]	I_γ[ef]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[c]	Comments
							portion of the intensity of the 374.1γ deexciting the (20⁻) level in this band is to be assigned to this transition.
382.8	20 *3*	3183.1+x	(21⁻)	2800.3+x	(20⁻)	D	
388.8	51 *5*	2594.6+x	(19⁺)	2205.7+x	(17⁺)		
395.4	8.1 *9*	2734.6+x	J+9	2339.1+x	J+7	Q	
395.9	24 *4*	4787.2+x	(26⁺)	4391.4+x	(25⁺)		
397.5[&]	16 *3*	5379.8+x	(27⁻)	4982.2+x	(26⁻)	D	
398.8	32 *4*	2398.6+x	(18⁺)	1999.6+x	(16⁺)		E_γ: average of 398.3 (1997Gu18) and 399.3 (1997Ca29).
402.9	15 *3*	5190.2+x	(27⁺)	4787.2+x	(26⁺)		
407.7	5.4 *8*	5400.0+x	J+17	4992.3+x	J+16	D	Mult.: DCO ratio is for the doublet (1997Gu18).
407.8	7.8 *12*	4992.3+x	J+16	4584.5+x	J+15	D	Mult.: DCO ratio is for the doublet (1997Gu18).
420.8[a]	27.7[g]	722.4+x	J+2	301.6+x	J	Q[d]	
427.2	39 *4*	2825.7+x	(20⁺)	2398.6+x	(18⁺)	Q	
434.7[b]	18 *4*	6185.4+x	(29⁻)	5751.2+x	(28⁻)		
435.7	9.0 *18*	5835.4+x	J+18	5400.0+x	J+17		E_γ: from 1997Ca29. 1997Gu18 report Eγ=434.4.
437.1	44 *4*	857.1+x	(14⁻)	420.0+x	(12⁻)	Q	
441.0	14 *7*	5631.3+x	(28⁺)	5190.2+x	(27⁺)		I_γ: computed by the evaluator from Iγ(440.9γ+442γ)=26 *6* for the two γ′s deexciting the (28⁺) and (29⁺) levels (1997Gu18) and the Iγ value deduced for the 443.0γ deexciting the (29⁺) level in this band (see the comment for this latter γ). 1997Gu18 do not report the split in intensity for these two γ′s.
443.0	12 *4*	6074.2+x	(29⁺)	5631.3+x	(28⁺)		E_γ: from 1997Ca29. 1997Gu18 report Eγ=442. I_γ: computed by the evaluator from Iγ(883.9γ)/Iγ(443.0γ)=1.5 *4* and Iγ(882.8γ)=18 *4* (1997Gu18). 1997Gu18 report Iγ=26 *6* for the sum of the intensities of the 440.9 and 442γ′s (deexciting the (28⁺) and (29⁺) levels, respectively) but do not divide this intensity between them.
454.4	3.9 *12*	6290.7+x	J+19	5835.4+x	J+18		From 1997Gu18 only.
460.2[h]		6750.9+x?	J+20	6290.7+x	J+19		From 1997Gu18 only.
467.8	11.1 *14*	2991.8+x	J+10	2524.1+x	J+8	Q	E_γ: from 1997Ca29. 1997Gu18 report Eγ=466.8.
491.6	46 *4*	3086.3+x	(21⁺)	2594.6+x	(19⁺)	(Q)	
494[h]		7244.5+x?	J+21	6750.9+x?	J+20		From 1997Gu18 only.
502.2[ab]	20[g]	1085.3+x		583.1+x			
503.1	18.9 *24*	3237.8+x	J+11	2734.6+x	J+9	Q	
510.8	125 *8*	1091.3+x	(15⁻)	580.5+x	(13⁻)	Q	
524.1[a]	7.5 *9*	2205.7+x	(17⁺)	1681.6+x			I_γ: computed by the evaluator from Iγ(524.1γ)/Iγ(206.2γ)=0.193 (1997Ca29) and Iγ(206.2γ)=39 *4* (1997Gu18).
536.2[a]	22.9[g]	1258.6+x	J+4	722.4+x	J+2	Q[d]	
543.7	40 *4*	3369.4+x	(22⁺)	2825.7+x	(20⁺)	Q	E_γ: from 1997Ca29. 1997Gu18 report Eγ=542.6.
560.3	62 *5*	1417.5+x	(16⁻)	857.1+x	(14⁻)	Q	
566.5	15.3 *20*	3558.3+x	J+12	2991.8+x	J+10	Q	E_γ: from 1997Gu18. 1997Ca29 report Eγ=567.7.
582.8[h]	85 *12*	1999.6+x	(16⁺)	1417.5+x	(16⁻)	Q	1997Gu18 place a 582.4γ out of the (16⁺) level, but do not specifically identify the final state, other than to indicate that it is probably the same as that populated by the 788γ from the (17⁺) level. 1997Ca29 place their 788.4γ between the (17⁺) and the (16⁻) levels, which suggests to the evaluator that this is also the final state for the 582.4γ. This placement, however, is

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(HI,xnγ) (continued)

γ(^{162}Lu) (continued)

E_γ[†‡#]	I_γ[ef]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[c]	Comments
							inconsistent with mult=Q reported by 1997Gu18. 1997Ca29 report a 583.1γ, but do not place it in the level scheme other than to say that it deexcites this band. The evaluator has chosen to assume that these two γ′s are the same and has tentatively placed the transition out of the (16$^+$) level.
							E_γ: average of 582.4 (1997Gu18) and 583.1 (1997Ca29).
596.3[ab]	19[g]	1681.6+x		1085.3+x			
601.1	65 *8*	3687.3+x	(23$^+$)	3086.3+x	(21$^+$)		E_γ: from 1997Ca29. 1997Gu18 report Eγ=600.2.
615.0	21.0 *24*	3852.9+x	J+13	3237.8+x	J+11	Q	
621.6[a]	19[g]	1879.8+x	J+6	1258.6+x	J+4	Q[d]	
626.0	84 *6*	1717.2+x	(17$^-$)	1091.3+x	(15$^-$)	Q	
644.3[a]	9.0[g]	2524.1+x	J+8	1879.8+x	J+6	Q[d]	
656.5	49 *5*	2074.0+x	(18$^-$)	1417.5+x	(16$^-$)	Q	
657.1	48 *5*	4026.3+x	(24$^+$)	3369.4+x	(22$^+$)	Q	E_γ: from 1997Ca29. 1997Gu18 report Eγ=655.8.
657.5[ab]	9.2[g]	2339.1+x	J+7	1681.6+x			
668.2	11.4 *12*	4226.5+x	J+14	3558.3+x	J+12	Q	E_γ: from 1997Ca29. 1997Gu18 report Eγ=667.3.
681.8[b]	5.7 *4*	2398.6+x	(18$^+$)	1717.2+x	(17$^-$)		Iγ computed by the evaluator from Iγ(681.8γ)/Iγ(398.9γ+192.9γ)=0.059 (1997Ca29) and Iγ(398.9γ+192.9γ)=97 *7* (1997Gu18).
685.0[ab]	7.0[g]	2565.2+x	J+8	1879.8+x	J+6		
704.1	38 *5*	4391.4+x	(25$^+$)	3687.3+x	(23$^+$)	Q	E_γ: from 1997Ca29. 1997Gu18 report Eγ=703.1.
709.1	62 *6*	2426.2+x	(19$^-$)	1717.2+x	(17$^-$)	Q	
712.6[&]	28 *5*	4634.5+x	(25$^-$)	3921.9+x	(23$^-$)	Q	E_γ: 1996Zh05 show a 745.5 γ deexciting the (25$^-$) level. 1996Ca03 show this γ (for which they report Eγ=746) deexciting the (27$^-$) level.
714.8	38 *6*	4262.2+x	(24$^-$)	3547.4+x	(22$^-$)	Q	E_γ: γ not reported by 1996Zh14.
720.2	28 *4*	4982.2+x	(26$^-$)	4262.2+x	(24$^-$)	Q	E_γ: γ not reported by 1996Zh14.
726.3	46 *5*	2800.3+x	(20$^-$)	2074.0+x	(18$^-$)	Q	
731.6	14.7 *18*	4584.5+x	J+15	3852.9+x	J+13	Q	E_γ: from 1997Ca29. 1997Gu18 report Eγ=730.8.
738.7	26 *3*	3921.9+x	(23$^-$)	3183.1+x	(21$^-$)	Q	E_γ: γ not reported by 1996Zh14.
745.3[&]	22 *4*	5379.8+x	(27$^-$)	4634.5+x	(25$^-$)		
747.0	55 *7*	3547.4+x	(22$^-$)	2800.3+x	(20$^-$)	Q	
756.9	36 *4*	3183.1+x	(21$^-$)	2426.2+x	(19$^-$)	Q	
760.8	27 *4*	4787.2+x	(26$^+$)	4026.3+x	(24$^+$)	Q	E_γ: from 1997Gu18. 1997Ca29 report Eγ=761.7.
765.7	11.1 *15*	4992.3+x	J+16	4226.5+x	J+14	Q	E_γ: from 1997Gu18. 1997Ca29 report Eγ=766.6.
769.2	17 *4*	5751.2+x	(28$^-$)	4982.2+x	(26$^-$)		E_γ: from 1997Ca19. 1997Gu18 report Eγ=768, while 1996Zh05 and 1996Zh14 do not report this γ.
788.0	30 *4*	2205.7+x	(17$^+$)	1417.5+x	(16$^-$)	D	E_γ: average of 787.6 (1997Gu18) and 788.4 (1997Ca29). Mult.: from DCO ratios, the multipolarity is consistent with a stretched dipole. Arguing by analogy from the apparently similar situation in the neighboring ^{161}Lu and ^{163}Lu isotopes, 1997Ca29 assume that this transition is a stretched E1, which establishes the parity of this band relative to that (negative) of the yrast band.
798.7	29 *5*	5190.2+x	(27$^+$)	4391.4+x	(25$^+$)		E_γ: from 1997Gu18. 1997Ca29 report Eγ=800.0.
805.0[b]	26 *9*	6185.4+x	(29$^-$)	5379.8+x	(27$^-$)		I_γ: calculated from the γ branching (1.4 *5*) from this level, as reported by 1997Ca29, and Iγ(434.7γ).
815.8	10.8 *20*	5400.0+x	J+17	4584.5+x	J+15		E_γ: from 1997Ca29. 1997Gu18 report Eγ=815.
842.8	9.0 *20*	5835.4+x	J+18	4992.3+x	J+16	Q	
844.3	27 *6*	5631.3+x	(28$^+$)	4787.2+x	(26$^+$)		
883.9	18 *4*	6074.2+x	(29$^+$)	5190.2+x	(27$^+$)		E_γ: from 1997Ca29. 1997Gu18 report Eγ=882.8.
889.4	4.8 *15*	6290.7+x	J+19	5400.0+x	J+17		E_γ: from 1997Gu18 only.

Continued on next page (footnotes at end of table)

(HI,xnγ) (continued)

γ(^{162}Lu) (continued)

E_γ †‡#	I_γ ef	E_i(level)	J_i^π	E_f	J_f^π	Comments
908.2 b	8.2 *12*	1999.6+x	(16$^+$)	1091.3+x	(15$^-$)	I_γ: computed by the evaluator from Iγ(908.2γ)/Iγ(583.1γ)=0.096 (1997Ca29) and Iγ(582.4γ)=85 *12* (1997Gu18).
915.9 h		6750.9+x?	J+20	5835.4+x	J+18	From 1997Gu18 only.
922.7 h	11 g	6554.9+x?	(30$^+$)	5631.3+x	(28$^+$)	E_γ: γ reported by 1997Ca29. 1997Gu18 show a (30$^+$) level as questionable and deexciting via two questionable gammas having energies of 479 and 921 keV.
953.8 h		7244.5+x?	J+21	6290.7+x	J+19	From 1997Gu18 only.

† None of the studies included here list uncertainties for their Eγ values. 1996Zh05 state that their Eγ values are accurate to within 0.3 keV for most transitions but that, for weak or contaminated transitions, the values are accurate to within 1.0 keV. 1997Ca29 report that their uncertainties range from 0.1 to 0.3 keV. 1997Gu18 report that their uncertainties range from 0.3 keV, for strong transitions, to 0.8 keV for weaker transitions.

‡ For the gammas associated, or assumed to be associated, with the yrast (negative-parity) band, the γ-ray energies are an average of the values reported by 1996Zh05, 1996Zh14, 1997Gu18 and 1997Ca29, unless noted otherwise. Since 1996Zh05 and 1996Zh14 report data for the yrast band only, the Eγ values involving the other levels are from 1997Gu18 and 1997Ca29 and represent an average, unless otherwise indicated.

For the transitions assigned as ΔJ=1, the various reported Eγ values agree rather well (within a few tenths of a keV) among themselves. For many of the ΔJ=2 transitions, however, there are sizeable (up to 1 keV or so) differences in the reported values, with those of 1997Gu18 being systematically lower than the others.

@ γ said to be associated with the decay of the yrast band by one or more of following: 1996Zh05, 1996Zh14, 1997Gu18, 1997Ca29.

& γ not reported by 1996Zh05 and 1996Zh14.

a From 1997Ca29.

b Reported by 1997Ca29 only.

c Unless noted otherwise, the multipolarities were determined from DCO measurements (1997Gu18,1997Ca29). 1997Ca29 state that the mixing ratios of the low-lying ΔJ=1 transitions in the yrast band were estimated, from angular-correlation measurements, to be <0.27. 1997Gu18 state that some of the low-energy dipole transitions were determined to be M1 from intensity-balance considerations.

d From DCO ratio data of 1997Ca29. 1997Gu18 state that this γ is one of a sequence of E2 transitions, which they do not place in the level scheme, but they do not present the data on which these multipolarity assignments are based.

e Values with uncertainties are those reported by 1997Gu18. For convenience in listing, they are shown divided by ten.

f Unless noted otherwise, the Iγ values are those of 1997Gu18, from ^{148}Sm(^{19}F,5nγ) with E(^{19}F)=112 MeV. 1997Ca29, from the ^{139}La(^{28}Si,5nγ) reaction at E(^{28}Si)=160 MeV, report Iγ values, but do not report uncertainties, simply stating that the uncertainties range from 5% to 30%. These authors do report γ-branching ratios for the γ′s deexciting the various levels. However, in many cases these ratios do not agree with the values calculated from their listed Iγ values. (in deriving the adopted γ branching for the Adopted Gammas data set, we have included their γ-branching ratios along with the values reported by other authors.) 1996Zh05, from ^{139}La(^{28}Si,5nγ) at E(^{28}Si)=150 MeV, report Iγ values for γ′s within the yrast (negative-parity) band. 1996Ca03 and 1996Zh14 do not report Iγ values.

g Value for this γ is reported by 1997Ca29 only. The listed value has been multiplied by a factor of 0.22 in an attempt to make it consistent with the intensity scale of the other Iγ values (which are from 1997Gu18 from the ^{148}Sm(^{19}F,5n) reaction). This normalization was arrived at by requiring that the sum of the Iγ values of the 185, 210 and 395 γ′s be the same in both lists. These γ′s occur near the bottom of the four quasiparticle band of uncertain configuration and have relative Iγ values that agree relatively well in the two data sets. This normalization also agrees rather well with that inferred from other pairs of γ′s (i.e., 583.1,582.4 and 787.6,788.4) seen in the two experiments.

h Placement of transition in the level scheme is uncertain.

x γ ray not placed in level scheme.

(HI,xnγ)

Level Scheme

Intensities: Relative I_γ

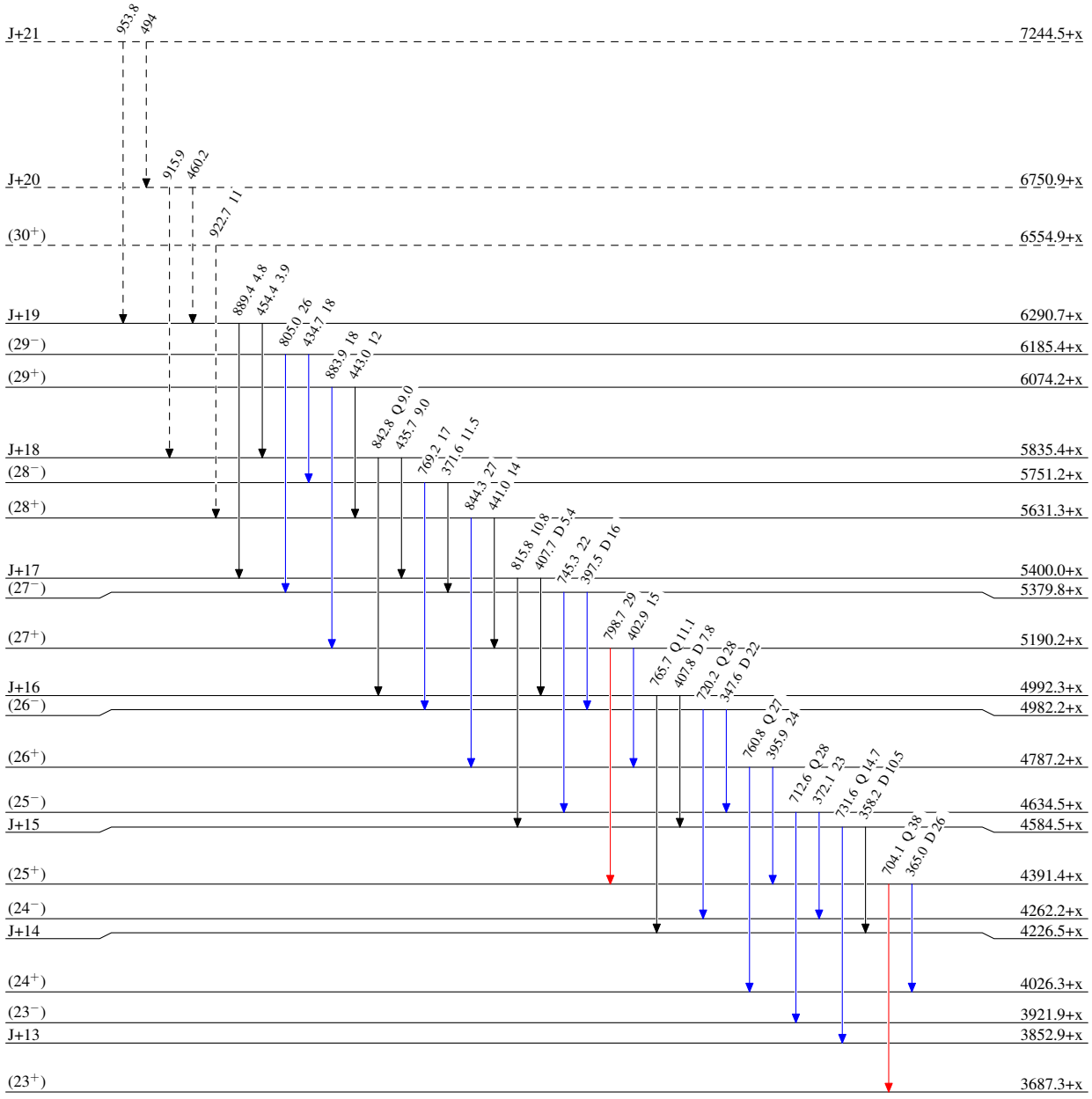
Legend

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

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

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

γ Decay (Uncertain)

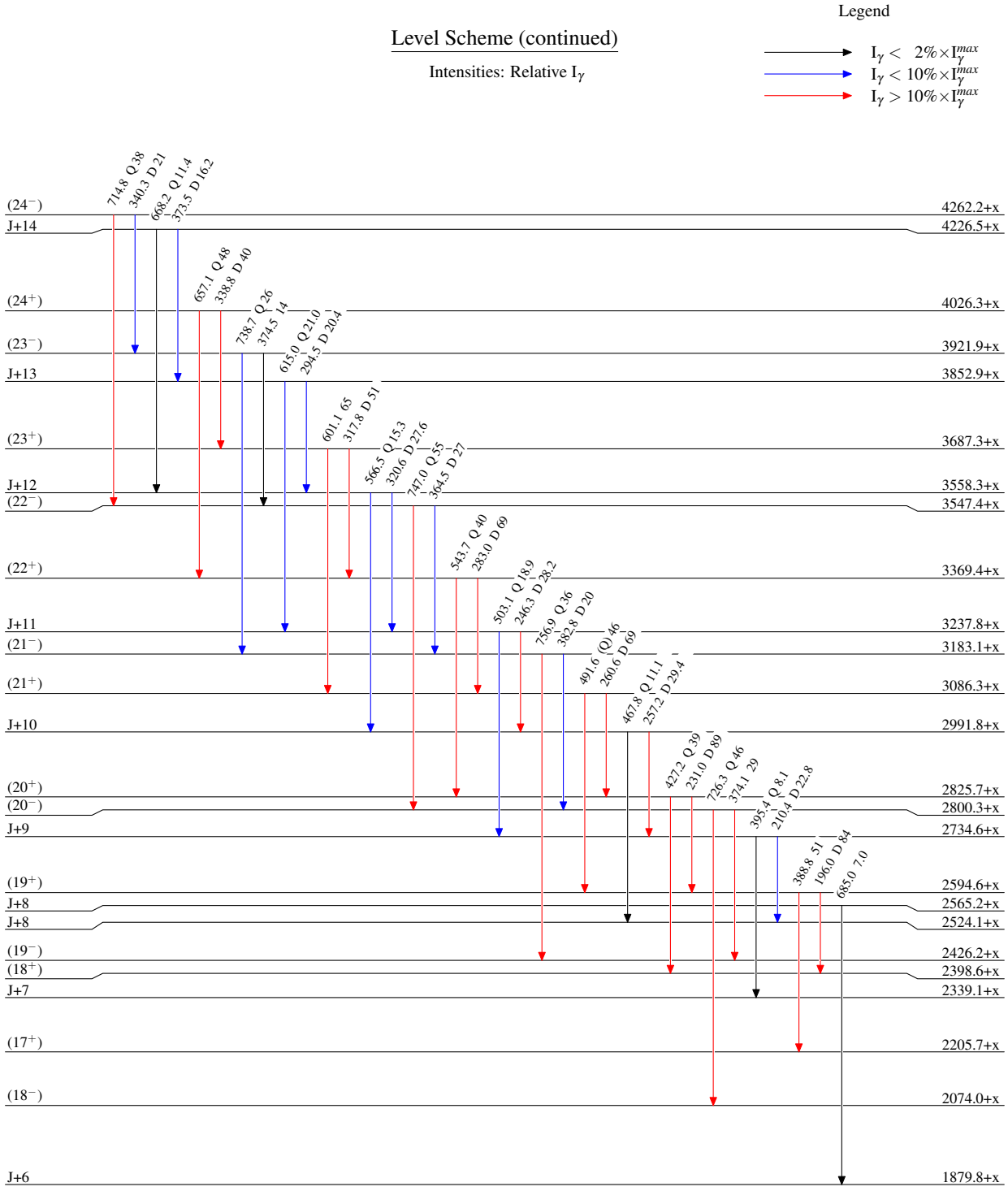


$^{162}_{71}Lu_{91}$

(HI,xnγ)

Level Scheme (continued)

Intensities: Relative I_γ



$^{162}_{71}Lu_{91}$

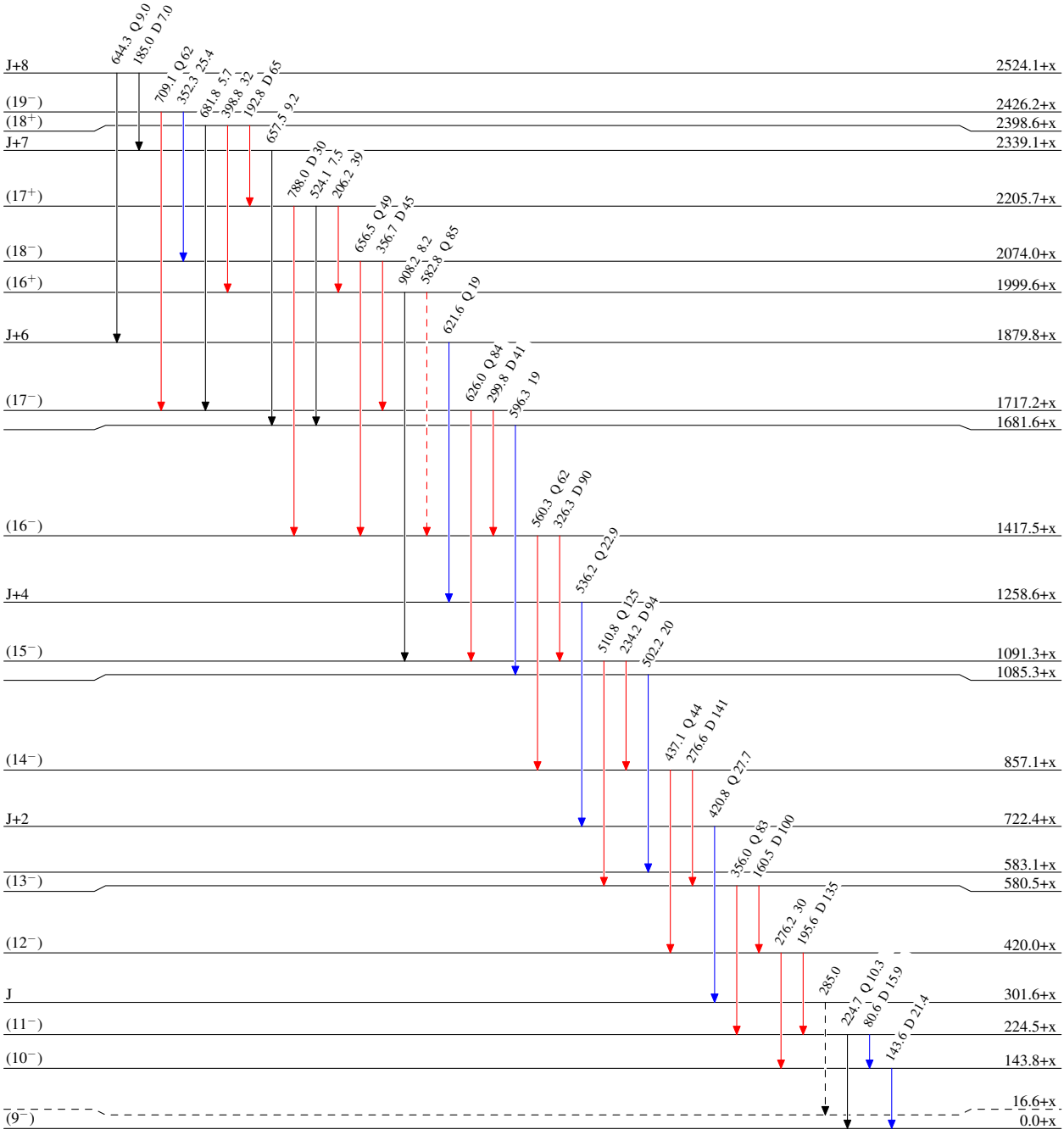
(HI,xnγ)

Level Scheme (continued)

Intensities: Relative I_γ

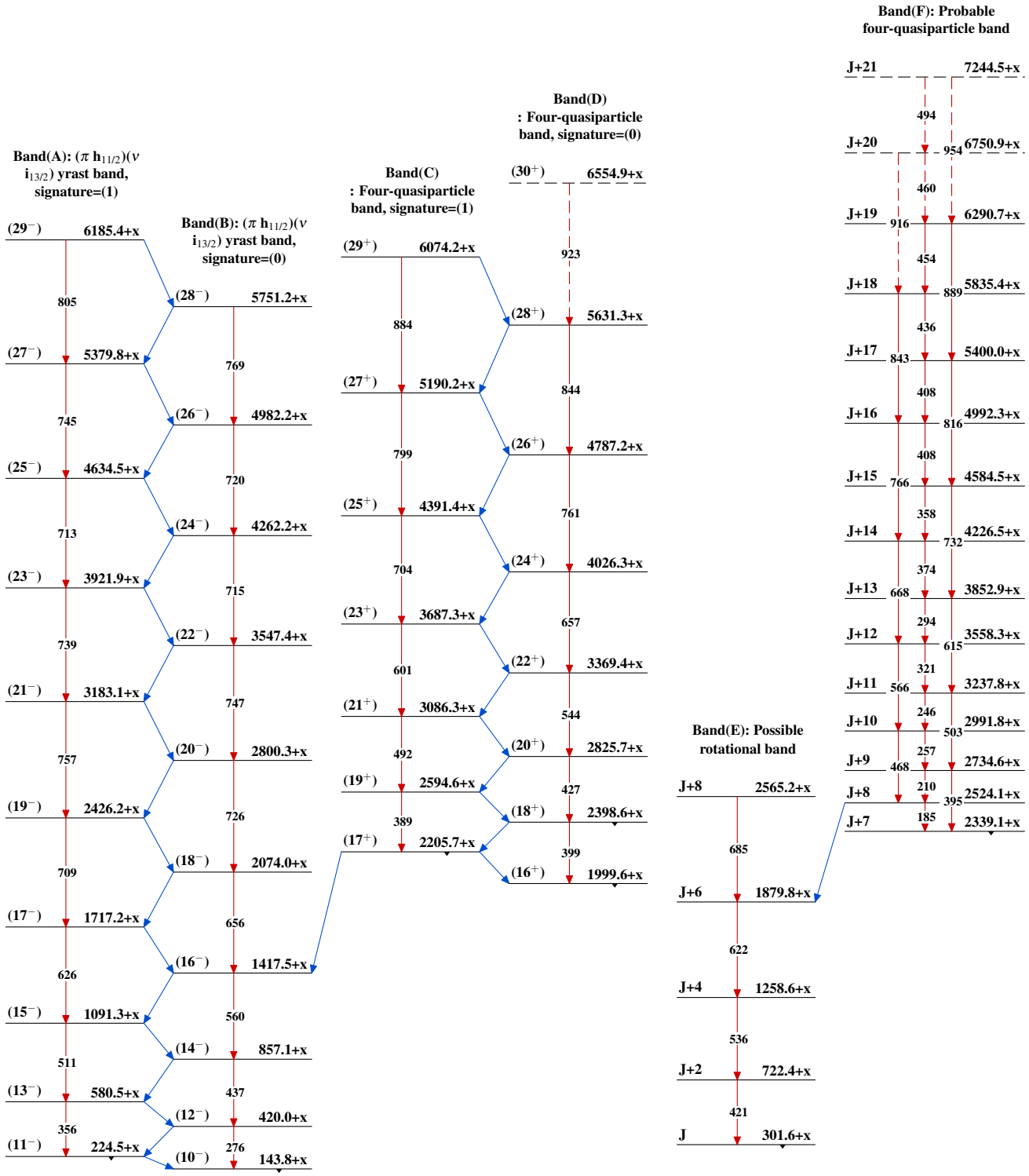
Legend

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



$^{162}_{71}Lu_{91}$

(HI,xnγ)



$^{162}_{71}Lu_{91}$