(HI,xnγ) 1982Pi01,1988Ka28,1989Gr21

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 74,63 (1995)	22-Dec-1994

1982Pi01 (also 1981Pi12,1982So09): ^{66}Zn(^{12}C,2nγ) E=39 MeV. Measured γ, γγ, γ(θ), γγ(DCO at 0° and 90°), $T_{1/2}$ by DSAM. Level structure explained by 2-quasiparticle + rotor model (1982So09).
1988Ka28: ^{63}Cu(^{16}O,n2pγ) E=69 MeV. Measured γ, γγ.
1989Gr21 (also 1988Gr23): ^{58}Ni(^{24}Mg,α2pγ) E=85, 110 MeV and ^{40}Ca(^{40}Ca,4pγ) E=155 MeV. Measured γ, γγ, particle γ coin $T_{1/2}$ by DSAM method. Intrinsic structure of bands explained by Woods-Saxon-Strutinsky cranking model.
Others:
1984Wo10: ^{63}Cu(^{16}O,p2nγ) E=49-58 MeV. Measured $T_{1/2}$ by DSA method.
1982Ke01: ^{63}Cu(^{19}F,α2nγ) E=58 MeV. Measured $T_{1/2}$ by RDDS method.
1982WiZS (also 1982DuZY): ^{74}Se(α,2nγ) E=27 MeV. Measured $T_{1/2}$ by DSA method.
1974No08 (also 1970No03): ^{62}Ni(^{16}O,2nγ) E=42 MeV. Measured $T_{1/2}$ by RDDS method.
The level scheme proposed by 1982Pi01, 1988Ka28 and 1989Gr21 is based on γγ data.

^{76}Kr Levels

Recoil-distance Doppler shift method is abbreviated as RDDS.

E(level)[†]	Jπ[‡]	$T_{1/2}$	Comments
0.0[@]	0+		
423.9[@] *2*	2+	24.7 ps *6*	$T_{1/2}$: from RDDS. Weighted average of 24.9 ps *7* (1984Wo10), 24 ps *2* (1982Ke01), 23.6 ps *14* (priv comm quoted by 1984Wo10). Other: 37 ps *5* (1974No08). Q(intrinsic)=2.90 *4*, 2.60 *11*, 2.39 *10*, 2.66 *13* 2.53 *17* (1989Gr21, deduced from transitions up to 10+). This leads to β_2=0.33 *1* for the yrast band.
769.6?[c] *6*	0+		Level shown by 1982Pi01 only.
1034.5[@] *3*	4+	3.3 ps *3*	$T_{1/2}$: weighted average of 3.4 ps *3* (RDDS,1984Wo10); 3.5 *14* (DSA,1982Pi01); 2.9 ps *7* (RDDS,1982WiZS). Others: 5.7 ps *16* (RDDS,1974No08), 4.30 ps *14* (RDDS,1982Ke01).
1221.6[&] *4*	2+	≈1 ps	$T_{1/2}$: estimated from RDDS (1982Ke01).
1687.6[c] *12*	2+		From 1982Pi01 only.
1733.4[&] *7*	(3+)	≈1 ps	$T_{1/2}$: estimated from RDDS (1982Ke01).
1859.0[@] *7*	6+	0.83 ps *7*	$T_{1/2}$: weighted average of 0.82 ps *9* (DSA,1989Gr21); 1.04 ps *14* (RDDS, 1984Wo10); 0.87 ps *8* (DSA,1982Pi01); 0.55 ps *14* (RDDS,1982WiZS).
1957.2[&] *4*	4+	0.90[#] ps *30*	$T_{1/2}$: other:≈1.0 ps (RDDS,1982Ke01).
2226.8[a] *6*	(2−)		Level from 1989Gr21 only.
2257.7[b] *7*	3−		From 1989Gr21 only.
2452.0[&] *5*	(5+)	0.76[#] ps *30*	
2622.0[a] *6*	(4−)		
2682.7[b] *8*	(5−)		
2762.9[&] *6*	(6+)		
2878.7[@] *7*	8+	0.22 ps *2*	$T_{1/2}$: weighted average of 0.23 ps *2* (DSA,1989Gr21); 0.21 ps *2* (DSA,1982Pi01); 0.22 ps *3* (RDDS,1982WiZS). Other: 0.31 ps *5* (DSA,1984Wo10,effective half-life).
3175.2[a] *8*	(6−)		
3287.5[b] *7*	(7−)	0.26 ps *4*	$T_{1/2}$: DSA method (1982Pi01).
3332.0[&] *8*	(7+)	0.71[#] ps *21*	
3571.0[&] *9*	(8+)		
3901.9[a] *13*	(8−)		
4067.9[@] *12*	10+	0.104 ps *14*	$T_{1/2}$: from DSA method. Weighted average of 0.097 ps *14* (1982Pi01); 0.12 ps *3* (1982WiZS). Others (effective half-lives): 0.56 ps *11* (1989Gr21), 0.14 ps *4* (1984Wo10).

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(HI,xnγ) 1982Pi01,1988Ka28,1989Gr21 (continued)

^{76}Kr Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$	Comments
4071.9[b] *12*	(9⁻)	0.35[#] ps *8*	$T_{1/2}$: other: 0.11 ps *4* (from DSA,$\gamma\gamma$,1982Pi01).
4403.0[&] *13*	(9⁺)	0.29[#] ps *7*	
4807.6[a] *14*	(10⁻)		
5050.4[b] *10*	(11⁻)	0.12 ps *5*	$T_{1/2}$: DSA method (1982Pi01).
5347.0[@] *15*	(12⁺)	0.17[#] ps *4*	
5874.2[a] *14*	(12⁻)		
6219.2[b] *12*	(13⁻)	0.24[#] ps *6*	
6647.0[@] *16*	(14⁺)		
7109.7[a] *15*	(14⁻)		
7577.2[b] *14*	(15⁻)		
7996.3[@] *18*	(16⁺)		
8520.9[a] *18*	(16⁻)		
9110.7[b] *15*	(17⁻)		1988Ka28 show a 1521γ deexciting a 17⁻ level, and a 1532γ deexciting a 19⁻ level of the same band, but no 1521γ is observed by 1989Gr21; instead, a 1533.5γ (probably the same as 1532γ from 1988Ka28) is suggested (1989Gr21) to deexcite 17⁻ level and a 1615γ a 19⁻ level.
9396.0[@] *19*	(18⁺)		
10056.4[a] *21*	(18⁻)		
10725.8?[b] *18*	(19⁻)		See comment for 9111, (17⁻) level.
10930[@] *3*	(20⁺)		
11650?[a] *3*	(20⁻)		
12686[@] *3*	(22⁺)		
13347?[b] *4*	(22⁻)		
14735?[@] *3*	(24⁺)		

[†] From least-squares fit to Eγ′s.
[‡] From Adopted Levels.
[#] Effective half-life from DSA method (1982Pi01).
[@] Band(A): π=+, α=0, yrast band band crossings are attributed to alignments of pairs of g9/2 protons and neutrons (1989Gr21). Q(intrinsic)=2.90 *4* (1989Gr21).
[&] Band(B): K=2⁺, γ-band.
[a] Band(C): π=−, α=0 band. proposed Configuration=((π 3/2+(431))(π 3/2−(312))) (1989Gr21).
[b] Band(D): π=−, α=1 band. proposed Configuration=((π 3/2+(431))(π 3/2−(312))) (1989Gr21).
[c] Band(E): K=0⁺, β^{-}band.

γ(^{76}Kr)

A_2 and A_4 values are from 1982Pi01.

E_{γ}[†]	I_{γ}[‡]	E_i(level)	J^{π}_i	E_f	J^{π}_f	Mult.[#]	Comments
345.7[@] *5*	1	769.6?	0⁺	423.9	2⁺		A_2=0.06 *5*, A_4=−0.06 *7*. (346γ)(424γ)(θ).
395.2[a] *6*		2622.0	(4⁻)	2226.8	(2⁻)		
423.9 *2*	100	423.9	2⁺	0.0	0⁺	E2	A_2=0.31 *1*, A_4=−0.14 *1*.
425[a] *1*		2682.7	(5⁻)	2257.7	3⁻		

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(HI,xnγ) 1982Pi01,1988Ka28,1989Gr21 (continued)

γ(^{76}Kr) (continued)

Eγ[†]	Iγ[‡]	Ei(level)	J^π_i	Ef	J^π_f	Mult.[#]	δ[#]	Comments
553.1 6		3175.2	(6⁻)	2622.0	(4⁻)			
604.9 5	5	3287.5	(7⁻)	2682.7	(5⁻)	E2		A_2=0.38 5, A_4=−0.29 7.
610.6 2	85	1034.5	4⁺	423.9	2⁺	E2		A_2=0.36 1, A_4=−0.15 1. (611γ)(424γ)(θ).
719.9 10	4	2452.0	(5⁺)	1733.4	(3⁺)			
723.5 10	5	3175.2	(6⁻)	2452.0	(5⁺)			
726.7 10	5	3901.9	(8⁻)	3175.2	(6⁻)			
736.0[&] 5	4	1957.2	4⁺	1221.6	2⁺	E2		A_2=0.28 3, A_4=−0.18 4.
784.4 4	4	4071.9	(9⁻)	3287.5	(7⁻)			
797.7[&] 5	6	1221.6	2⁺	423.9	2⁺	(M1+E2)	+0.2 1	δ: from (798γ)(424γ)(θ).
805.7[&] 5	2	2762.9	(6⁺)	1957.2	4⁺			
808 1	2	3571.0	(8⁺)	2762.9	(6⁺)			
824.4 7	50	1859.0	6⁺	1034.5	4⁺	E2		A_2=0.30 2, A_4=−0.14 2. (824γ)(611γ)(θ) and (824γ)(424γ)(θ).
879.9[&] 5	3	3332.0	(7⁺)	2452.0	(5⁺)			
887 1		2622.0	(4⁻)	1733.4	(3⁺)			From 1988Ka28 only.
905.5 5	≤2	4807.6	(10⁻)	3901.9	(8⁻)			
918[@] 1	<1	1687.6	2⁺	769.6?	0⁺			
922.6[@] 5	7	1957.2	4⁺	1034.5	4⁺	M1+E2	−0.84 5	δ: A_2=−0.19 2, A_4=−0.22 3 from γ(θ). Other: −1.0 5 from (923γ)(424γ)(θ).
978.5 6	<1	5050.4	(11⁻)	4071.9	(9⁻)			
1005[a] 1		2226.8	(2⁻)	1221.6	2⁺			
1019.7 2	18	2878.7	8⁺	1859.0	6⁺	E2		A_2=0.39 2, A_4=−0.13 2. (1020γ)(825γ)(θ) and (1020γ)(424γ)(θ).
1036[a] 1		2257.7	3⁻	1221.6	2⁺			
1066.6 4		5874.2	(12⁻)	4807.6	(10⁻)			
1071[&] 1	<1	4403.0	(9⁺)	3332.0	(7⁺)			
1168.8 6	<1	6219.2	(13⁻)	5050.4	(11⁻)			
1189.2 10	9	4067.9	10⁺	2878.7	8⁺	E2		A_2=0.30 2, A_4=−0.16 3.
1221.8[&] 5	3	1221.6	2⁺	0.0	0⁺	E2		A_2=0.52 4, A_4=−0.12 5.
1235.5 5		7109.7	(14⁻)	5874.2	(12⁻)			
1279.1 9	4	5347.0	(12⁺)	4067.9	10⁺			
1300.0 6		6647.0	(14⁺)	5347.0	(12⁺)			
1309.2 10	10	1733.4	(3⁺)	423.9	2⁺	(M1+E2)	+0.38 4	A_2=0.24 3, A_4=−0.02 2. δ from (1309γ)(424γ)(θ).
1349.2 7		7996.3	(16⁺)	6647.0	(14⁺)			
1358.0 6		7577.2	(15⁻)	6219.2	(13⁻)			
1399.7 7		9396.0	(18⁺)	7996.3	(16⁺)			
1411.2 10		8520.9	(16⁻)	7109.7	(14⁻)			
1417.2[&] 5	4	2452.0	(5⁺)	1034.5	4⁺	M1+E2	+4 2	δ: from A_2=0.34 4, A_4=0.20 5. (1417γ)(611γ)(θ).
1428.5 5	4	3287.5	(7⁻)	1859.0	6⁺	D(+Q)	0.00 4	δ: from A_2=−0.31 4, A_4=0.05 5.
1532.9[@] 5	2	1957.2	4⁺	423.9	2⁺			
1533.5 6		9110.7	(17⁻)	7577.2	(15⁻)			
1534.2 20		10930	(20⁺)	9396.0	(18⁺)			
1535.6 10		10056.4	(18⁻)	8520.9	(16⁻)			
1588.8 10		2622.0	(4⁻)	1034.5	4⁺			
1593[b] 2		11650?	(20⁻)	10056.4	(18⁻)			
1615[ab]		10725.8?	(19⁻)	9110.7	(17⁻)			
1648.4 20	7	2682.7	(5⁻)	1034.5	4⁺	D+Q	+0.04 3	δ: from A_2=−0.21 3, A_4=−0.07 5.
1697[ab] 2		13347?	(22⁻)	11650?	(20⁻)			
1712[@] 1	<1	3571.0	(8⁺)	1859.0	6⁺			
1755.5 10		12686	(22⁺)	10930	(20⁺)			

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(HI,xnγ) 1982Pi01,1988Ka28,1989Gr21 (continued)

γ(^{76}Kr) (continued)

Eγ[†]	Ei(level)	J^π_i	E_f	J^π_f
1803[a] *1*	2226.8	(2⁻)	423.9	2⁺
1834[a] *1*	2257.7	3⁻	423.9	2⁺
2049[ab]	14735?	(24⁺)	12686	(22⁺)

† From 1989Gr21 unless otherwise stated.

‡ From 1982Pi01. Detailed values are not available from any other study. ΔIγ≈5%. 1982Ke01 in ^{63}Cu(^{19}F,α2nγ) E=58 reaction give relative intensities of g.s. transitions from 424, 770, 1035, 1221, 1733 and 1957 as *100*, 3 *2*, 71 *9*, 10 *2*, 15 *4* and 4 *2*, respectively. Relative intensities of γ rays in three bands (yrast band, K=1⁻ odd J, K=1⁻ even J) are given by 1989Gr21 from γγ spectra and the ordering of the transitions in the cascades is based on such intensities.

From γ(θ) (1982Pi01) and RUL for E2 and M2 transitions.

@ From 1982Pi01. Uncertainty=0.5 or 1 (evaluator).

& Weighted average of available values. Uncertainty=0.5 or 1 assigned by the evaluator.

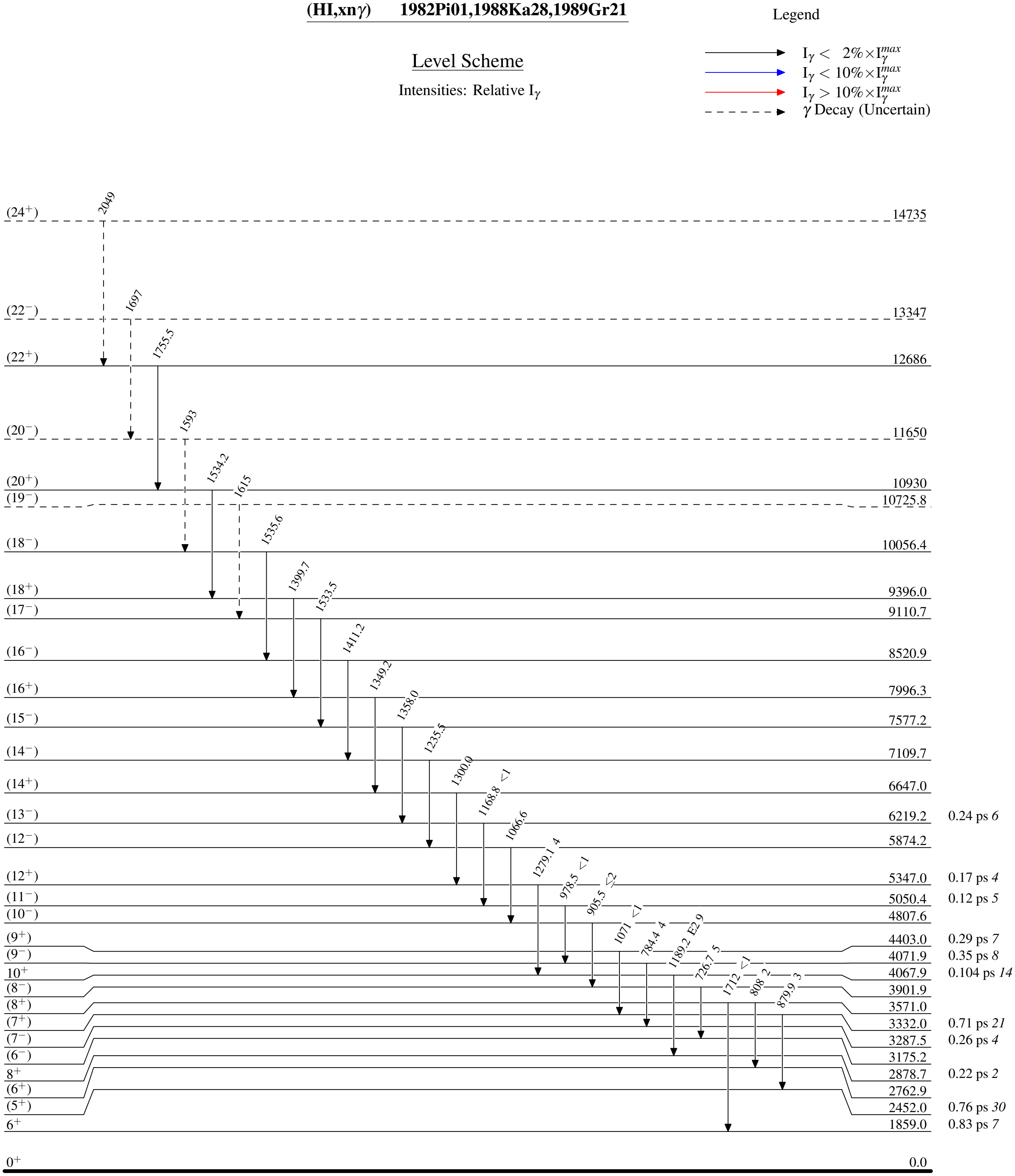
a γ reported by 1989Gr21 only.

b Placement of transition in the level scheme is uncertain.

(HI,xnγ) 1982Pi01,1988Ka28,1989Gr21

Level Scheme

Intensities: Relative I_γ



$^{76}_{36}Kr_{40}$

(HI,xnγ) 1982Pi01,1988Ka28,1989Gr21

Level Scheme (continued)

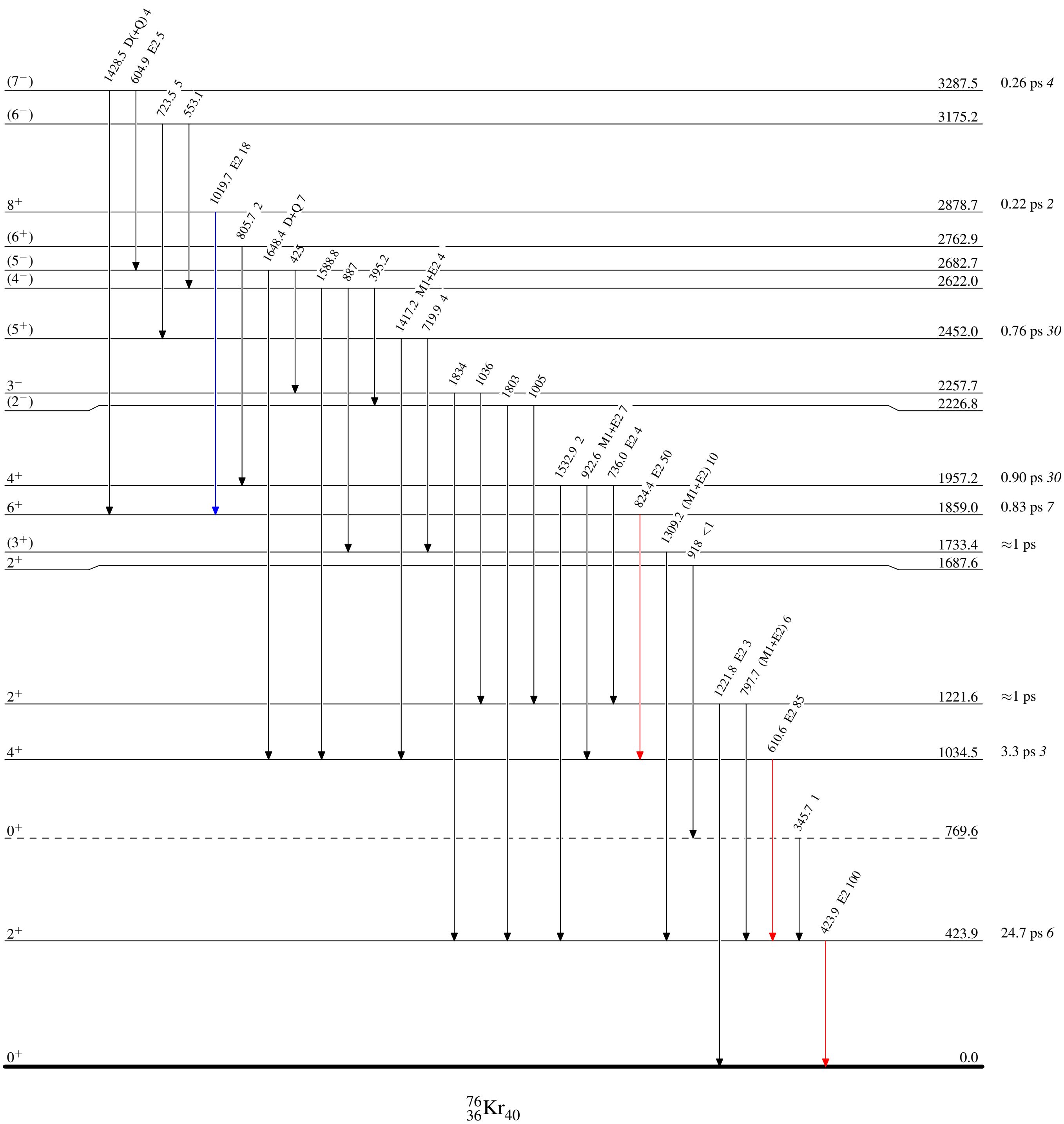
Intensities: Relative I_γ

Legend

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

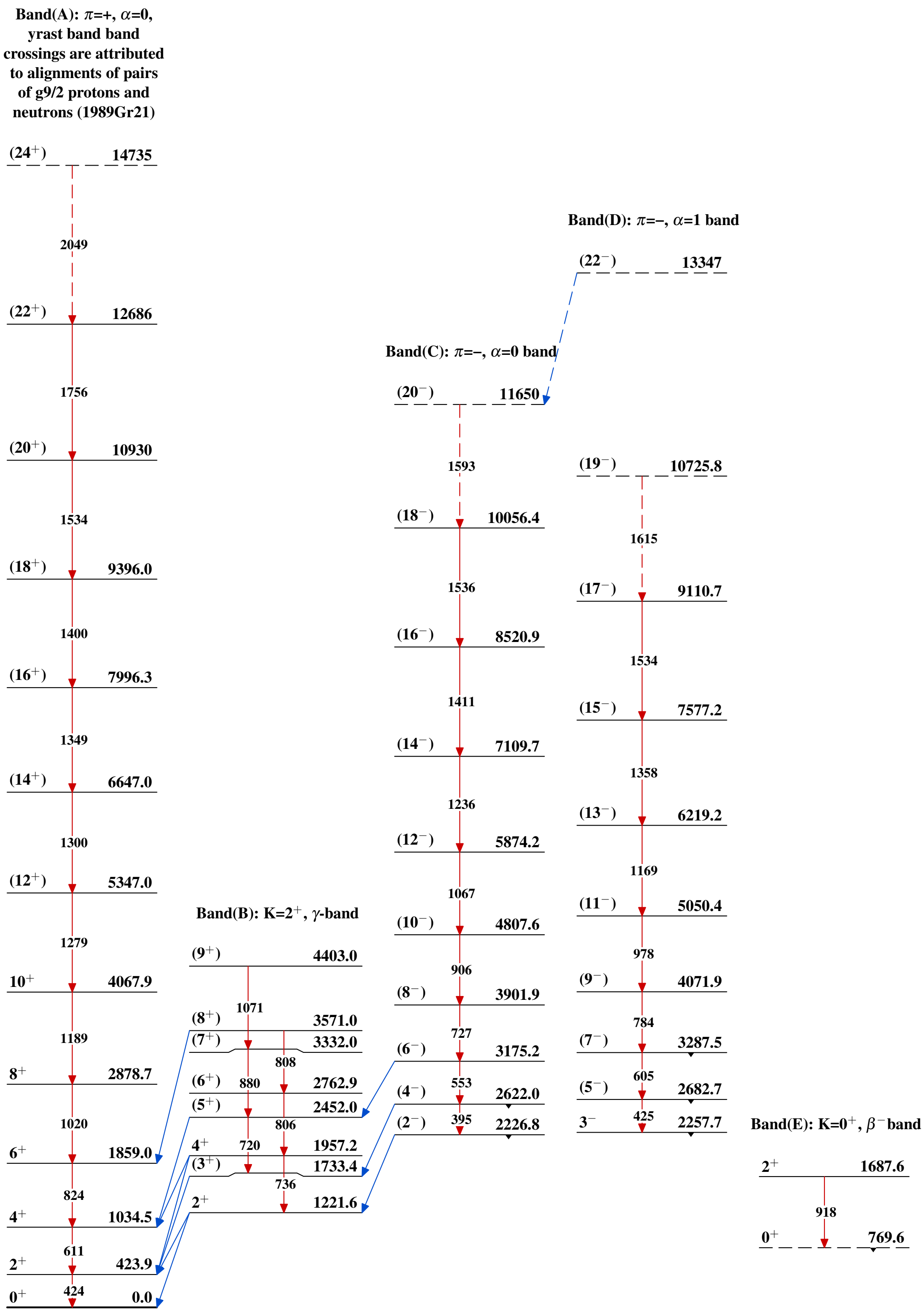
$I_\gamma < 10\% \times I_\gamma^{max}$

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



$^{76}_{36}Kr_{40}$

(HI,xnγ) 1982Pi01,1988Ka28,1989Gr21



$^{76}_{36}Kr_{40}$