^{105}Pd(^{35}Cl,α2n2pγ) 1999Ko21,1997Ha05

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov, A. A. Rodionov and S. Sakharov, Balraj Singh	NDS 104, 497 (2005)	10-Feb-2005

1999Ko21 (also 1999Ko19), 2002La09 (also 2001Ri20): E=173 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(DCO) using GAMMASPHERE spectrometer with 57 (for thin target experiment) and 97 (for backed target experiment) HPGe detectors. The charged particles were identified with the MICROBALL detector array. Transition quadrupole moments were deduced from lifetime measurements with gates above or below the level of interest (2002La09).

1997Ha05: E=180 MeV. Measured Eγ, $\gamma\gamma\gamma$, $\gamma\gamma\gamma$(particle) coin using GAMMASPHERE and MICROBALL particle detector arrays. Deduced three SD bands.

^{132}Pr Levels

E(level)[†]	J$^\pi$	Comments
0.0+x	(7$^-$)	J$^\pi$: (6$^-$) in adopted level for a level at 98.0+x.
283.8+x[#] *10*	(8$^+$)	E(level): 381.0+x in Adopted Levels decaying to 145.0+x, (7$^-$) level and 98.0+x, (6$^-$) level. J$^\pi$: (7$^+$) in Adopted Levels.
346.9+x[@] *13*	(9$^+$)	
430.6+x[‡] *11*	(7$^+$)	
476.8+x[#] *12*	(10$^+$)	
685.2+x[‡] *11*	(9$^+$)	
742.7+x[@] *13*	(11$^+$)	
983.3+x[#] *14*	(12$^+$)	
1053.5+x[‡] *12*	(11$^+$)	
1072.9+x *12*	(11$^+$)	
1366.3+x[@] *13*	(13$^+$)	
1379.0+x *14*	(12)	
1594.1+x[‡] *12*	(13$^+$)	
1803.7+x *17*	(13)	
2254.5+x[‡] *12*	(15$^+$)	
2999.1+x[‡] *12*	(17$^+$)	
3791.6+x[‡] *12*	(19$^+$)	
4629.2+x[‡] *13*	(21$^+$)	
5541.7+x[‡] *14*	(23$^+$)	
6551.1+x[‡] *15*	(25$^+$)	
7663.5+x[‡] *16*	(27$^+$)	
8877.3+x[‡] *18*	(29$^+$)	
10184.1+x[‡] *19*	(31$^+$)	
11588.4+x[‡] *20*	(33$^+$)	
y[&]	J≈(12)	J$^\pi$: from 1997Ha05, π=+ from proposed configuration.
565.3+y[&] *3*	J+2	
865.8+y[a] *6*	J+3	
1206.3+y[&] *5*	J+4	
1561.3+y[a] *6*	J+5	
1934.0+y[&] *5*	J+6	
2326.1+y[a] *6*	J+7	
2736.8+y[&] *6*	J+8	
3166.8+y[a] *7*	J+9	
3613.5+y[&] *6*	J+10	
4079.0+y[a] *7*	J+11	

Continued on next page (footnotes at end of table)

^{105}Pd(^{35}Cl,α2n2pγ) 1999Ko21,1997Ha05 (continued)

^{132}Pr Levels (continued)

E(level)[†]	J$^{\pi}$	Comments
4561.8+y[&] *7*	J+12	
5063.6+y[a] *7*	J+13	
5580.8+y[&] *7*	J+14	
6119.5+y[a] *8*	J+15	
6672.2+y[&] *8*	J+16	
7246.9+y[a] *8*	J+17	
7834.0+y[&] *9*	J+18	
8446.8+y[a] *9*	J+19	
9068.0+y[&] *9*	J+20	
9720.6+y[a] *9*	J+21	
10375.0+y[&] *10*	J+22	
11069.1+y[a] *10*	J+23	
11759.4+y[&] *10*	J+24	
12496.4+y[a] *10*	J+25	
13224.2+y[&] *10*	J+26	
14004.6+y[a] *10*	J+27	
z[b]	J1≈(14)	J$^{\pi}$: from 1997Ha05, π=− from proposed configuration.
738.3+z[b] *3*	J1+2	
1552.0+z[b] *5*	J1+4	
2450.4+z[b] *6*	J1+6	
3440.3+z[b] *6*	J1+8	
4518.9+z[b] *7*	J1+10	
5686.7+z[b] *8*	J1+12	
6942.9+z[b] *8*	J1+14	
8286.2+z[b] *9*	J1+16	

[†] From least-squares fit to Eγ's. The energy scale differs from that in Adopted Levels and in other in-beam γ-ray data sets. In order to match the energy scales and to account for differences in the low-energy section of the level scheme as compared to that in Adopted Levels (based mainly on data from 1998Pe05), add ≈122 keV to all levels, except for 0+x and 283.8+x levels, for which 98 keV should be added.

[‡] Band(A): $\pi h_{11/2}\nu(f_{7/2}+h_{9/2})$, α=1. Decoupled band. Q(intrinsic)=4.1 *3*, β_2=0.24 *1* (1999Ko21). The orbitals correspond to the following Nilsson model states: 3/2[541] for $h_{11/2}$; 1/2[541] for $f_{7/2}+h_{9/2}$.

[#] Band(B): $\pi h_{11/2}\nu g_{7/2}$, α=0.

[@] Band(b): $\pi h_{11/2}\nu g_{7/2}$, α=1.

[&] Band(C): SD-1 band (1997Ha05). Percent population=1.4 (1997Ha05). Configuration=π9/2[404]ν1/2[660] (1997Ha05). Q(transition)=7.0 *7* (2002La09,2001Ri20).

[a] Band(D): SD-2 band (1997Ha05). Percent population=1.4 (1997Ha05). Configuration=π9/2[404]ν1/2[660] (1997Ha05). SD-1 and SD-2 bands are interpreted (1997Ha05) as signature partners. Q(transition)=7.0 *7* (2002La09,2001Ri20).

[b] Band(E): SD-3 band (1997Ha05). Percent population=1.2 (1997Ha05). Configuration=π5/2[532]ν1/2[660] (1997Ha05).

^{105}Pd(^{35}Cl,α2n2pγ) 1999Ko21,1997Ha05 (continued)

$\gamma(^{132}Pr)$

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
129.8 *2*	100	476.8+x	(10^+)	346.9+x	(9^+)		
146.8 *6*	<1	430.6+x	(7^+)	283.8+x	(8^+)		
192.8		476.8+x	(10^+)	283.8+x	(8^+)		
208.7 *6*	<1	685.2+x	(9^+)	476.8+x	(10^+)		
240.5		983.3+x	(12^+)	742.7+x	(11^+)		
254.7 *6*	<1	685.2+x	(9^+)	430.6+x	(7^+)		
266.0		742.7+x	(11^+)	476.8+x	(10^+)		
283.8		283.8+x	(8^+)	0.0+x	(7^-)		
301#		865.8+y	J+3	565.3+y	J+2		
305.9		1379.0+x	(12)	1072.9+x	(11^+)		
341#		1206.3+y	J+4	865.8+y	J+3		
355#		1561.3+y	J+5	1206.3+y	J+4		
368.7 *6*	4 *1*	1053.5+x	(11^+)	685.2+x	(9^+)	E2	DCO=1.0 *1* (ΔJ=2 gated), 1.8 *3* (ΔJ=1 gated).
373#		1934.0+y	J+6	1561.3+y	J+5		
383.1		1366.3+x	(13^+)	983.3+x	(12^+)		
387.6		1072.9+x	(11^+)	685.2+x	(9^+)		
392#		2326.1+y	J+7	1934.0+y	J+6		
395.8		742.7+x	(11^+)	346.9+x	(9^+)		
401.5 *6*	2 *1*	685.2+x	(9^+)	283.8+x	(8^+)	M1+E2	DCO=1.5 *3* (ΔJ=2 gated), 0.9 *1* (ΔJ=1 gated).
410#		2736.8+y	J+8	2326.1+y	J+7		
424.7		1803.7+x	(13)	1379.0+x	(12)		
431#		3166.8+y	J+9	2736.8+y	J+8		
447#		3613.5+y	J+10	3166.8+y	J+9		
465#		4079.0+y	J+11	3613.5+y	J+10		
483#		4561.8+y	J+12	4079.0+y	J+11		
501#		5063.6+y	J+13	4561.8+y	J+12		
506.5		983.3+x	(12^+)	476.8+x	(10^+)		
517#		5580.8+y	J+14	5063.6+y	J+13		
521.3 *6*	9 *1*	1594.1+x	(13^+)	1072.9+x	(11^+)	E2	DCO=1.2 *1* (ΔJ=2 gated), 2.0 *2* (ΔJ=1 gated).
539#		6119.5+y	J+15	5580.8+y	J+14		
540.6 *2*	24 *2*	1594.1+x	(13^+)	1053.5+x	(11^+)	E2	DCO=1.1 *1* (ΔJ=2 gated), 2.3 *2* (ΔJ=1 gated).
565.3# *3*		565.3+y	J+2	y	J≈(12)		
576.6 *2*	15 *1*	1053.5+x	(11^+)	476.8+x	(10^+)	M1+E2	DCO=0.6 *1* (ΔJ=2 gated), 1.2 *2* (ΔJ=1 gated).
596.2		1072.9+x	(11^+)	476.8+x	(10^+)		
623.6		1366.3+x	(13^+)	742.7+x	(11^+)		
636.5		1379.0+x	(12)	742.7+x	(11^+)		
641.0# *3*		1206.3+y	J+4	565.3+y	J+2		
660.4 *2*	18 *3*	2254.5+x	(15^+)	1594.1+x	(13^+)	E2	DCO=1.1 *1* (ΔJ=2 gated), 2.4 *3* (ΔJ=1 gated).
695.5# *3*		1561.3+y	J+5	865.8+y	J+3		
706.5 *6*	5 *1*	1053.5+x	(11^+)	346.9+x	(9^+)	E2	DCO=1.0 *1*.
726.1		1072.9+x	(11^+)	346.9+x	(9^+)		
727.6# *3*		1934.0+y	J+6	1206.3+y	J+4		
738.3# *3*		738.3+z	J1+2	z	J1≈(14)		
744.6 *2*	15 *2*	2999.1+x	(17^+)	2254.5+x	(15^+)	E2	DCO=1.2 *1* (ΔJ=2 gated), 2.4 *4* (ΔJ=1 gated).
764.8# *3*		2326.1+y	J+7	1561.3+y	J+5		
792.5 *2*	12 *1*	3791.6+x	(19^+)	2999.1+x	(17^+)	E2	DCO=1.0 *1* (ΔJ=2 gated), 2.0 *3* (ΔJ=1 gated).
802.9# *3*		2736.8+y	J+8	1934.0+y	J+6		
813.7# *3*		1552.0+z	J1+4	738.3+z	J1+2		
837.6 *2*	10 *1*	4629.2+x	(21^+)	3791.6+x	(19^+)	E2	DCO=1.0 *1* (ΔJ=2 gated), 1.8 *2* (ΔJ=1 gated).
840.7# *3*		3166.8+y	J+9	2326.1+y	J+7		

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^{105}Pd(^{35}Cl,α2n2pγ) 1999Ko21,1997Ha05 (continued)

$\gamma(^{132}Pr)$ (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
876.5[#] *3*		3613.5+y	J+10	2736.8+y	J+8		
898.4[#] *3*		2450.4+z	J1+6	1552.0+z	J1+4		
912.3[#] *3*		4079.0+y	J+11	3166.8+y	J+9		
912.5 *6*	8 *1*	5541.7+x	(23^+)	4629.2+x	(21^+)	E2	DCO=1.0 *1* (ΔJ=2 gated), 1.8 *2* (ΔJ=1 gated).
948.3[#] *3*		4561.8+y	J+12	3613.5+y	J+10		
984.6[#] *3*		5063.6+y	J+13	4079.0+y	J+11		
989.9[#] *3*		3440.3+z	J1+8	2450.4+z	J1+6		
1009.4 *6*	5 *1*	6551.1+x	(25^+)	5541.7+x	(23^+)	(E2)	
1019.0[#] *3*		5580.8+y	J+14	4561.8+y	J+12		
1055.9[#] *3*		6119.5+y	J+15	5063.6+y	J+13		
1078.6[#] *3*		4518.9+z	J1+10	3440.3+z	J1+8		
1091.4[#] *3*		6672.2+y	J+16	5580.8+y	J+14		
1112.4 *6*	3 *1*	7663.5+x	(27^+)	6551.1+x	(25^+)	(E2)	
1127.4[#] *3*		7246.9+y	J+17	6119.5+y	J+15		
1161.8[#] *3*		7834.0+y	J+18	6672.2+y	J+16		
1167.8[#] *3*		5686.7+z	J1+12	4518.9+z	J1+10		
1199.9[#] *3*		8446.8+y	J+19	7246.9+y	J+17		
1213.8 *6*	2 *1*	8877.3+x	(29^+)	7663.5+x	(27^+)	(E2)	
1234.0[#] *3*		9068.0+y	J+20	7834.0+y	J+18		
1256.2[#] *3*		6942.9+z	J1+14	5686.7+z	J1+12		
1273.8[#] *3*		9720.6+y	J+21	8446.8+y	J+19		
1306.8 *6*	≈1	10184.1+x	(31^+)	8877.3+x	(29^+)		
1307.0[#] *3*		10375.0+y	J+22	9068.0+y	J+20		
1343.3[#] *3*		8286.2+z	J1+16	6942.9+z	J1+14		
1348.5[#] *3*		11069.1+y	J+23	9720.6+y	J+21		
1384.4[#] *3*		11759.4+y	J+24	10375.0+y	J+22		
1404.3 *6*	<1	11588.4+x	(33^+)	10184.1+x	(31^+)		
1427.3[#] *3*		12496.4+y	J+25	11069.1+y	J+23		
1464.8[#] *3*		13224.2+y	J+26	11759.4+y	J+24		
1508.1[#] *3*		14004.6+y	J+27	12496.4+y	J+25		

[†] From 1999Ko21, unless otherwise stated; $\Delta(E\gamma)$=0.2 keV for strong $I\gamma \geq 10$ and 0.6 keV for $I\gamma < 10$.
[‡] From 1999Ko21.
[#] From 1997Ha05.

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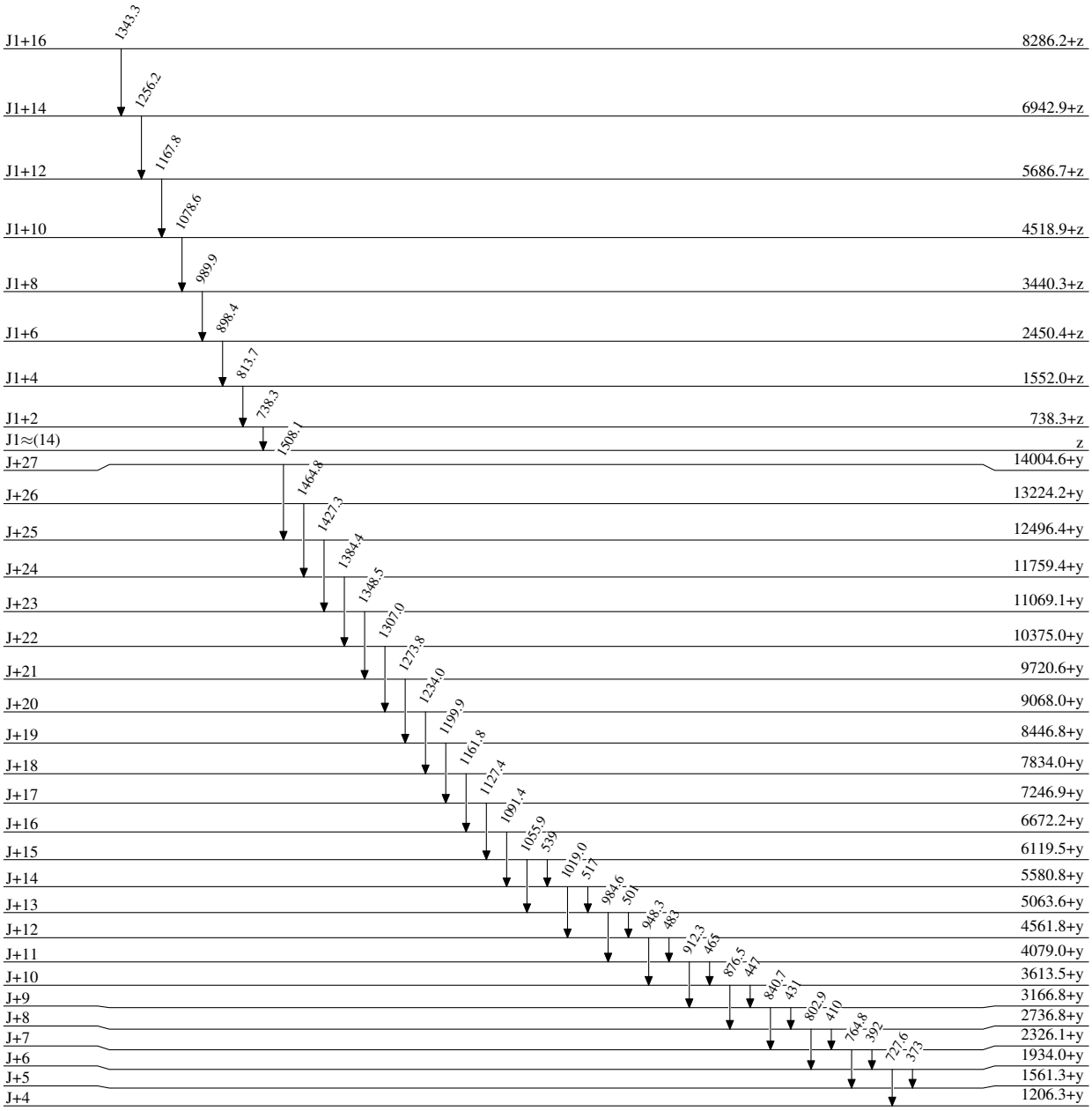
Level Scheme

Intensities: Relative I_γ



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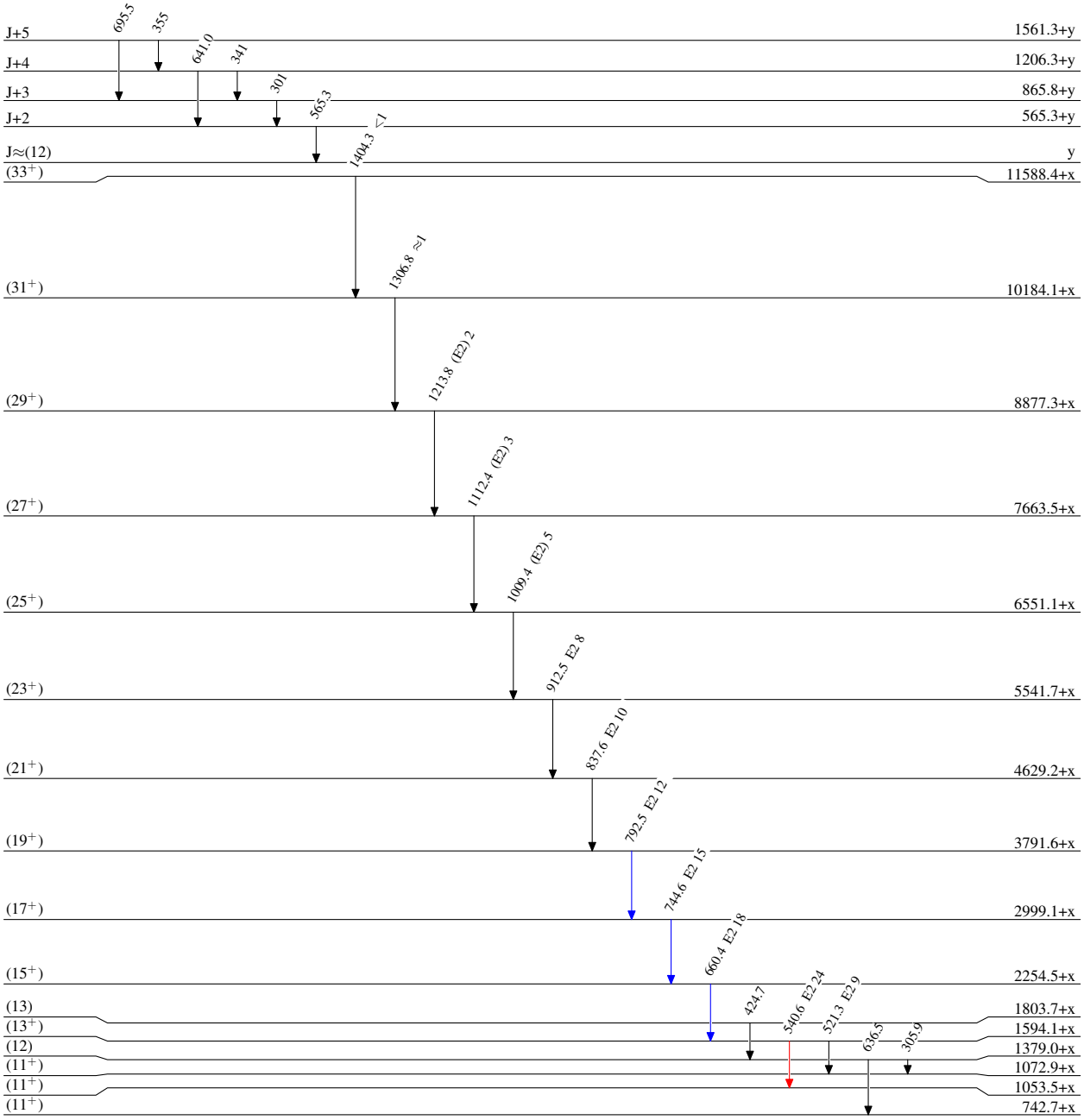
^{105}Pd(^{35}Cl,α2n2pγ) 1999Ko21,1997Ha05

Level Scheme (continued)

Intensities: Relative I_γ

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



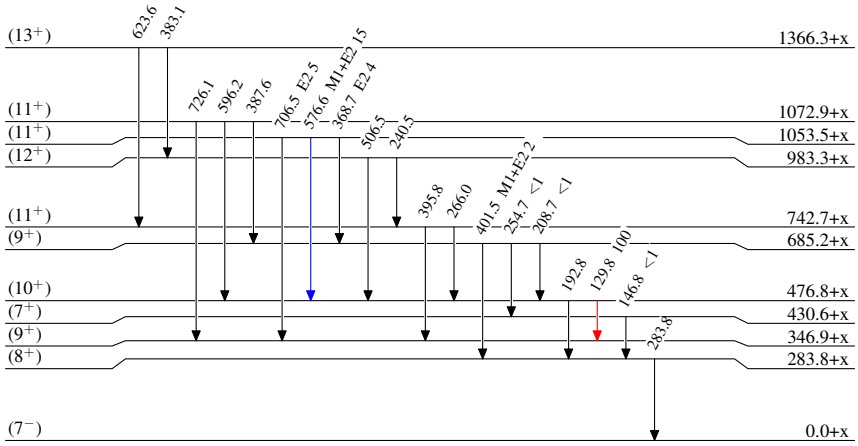
$^{132}_{59}Pr_{73}$

^{105}Pd(^{35}Cl,α2n2pγ) 1999Ko21,1997Ha05

Level Scheme (continued)

Intensities: Relative I_γ

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



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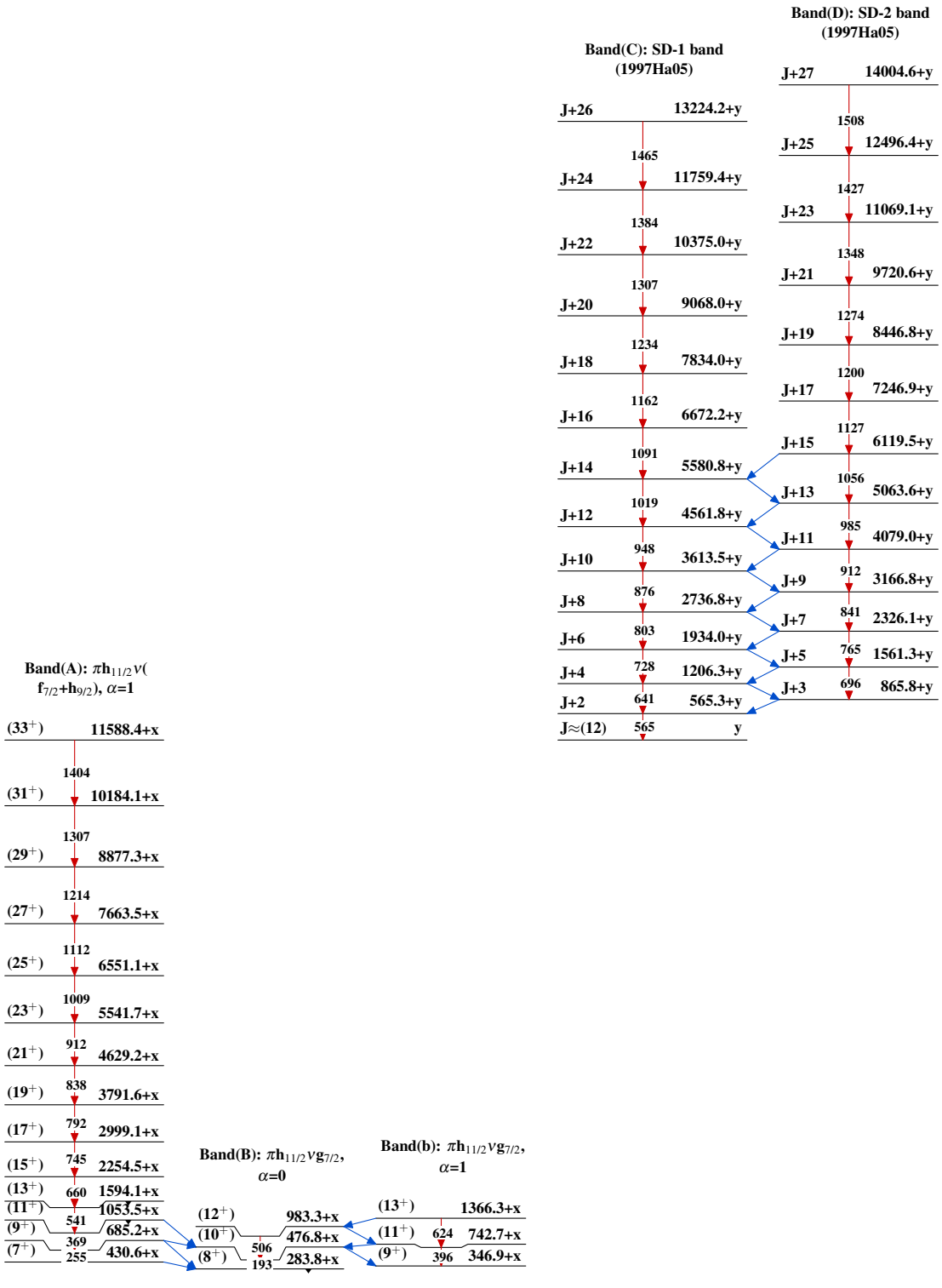
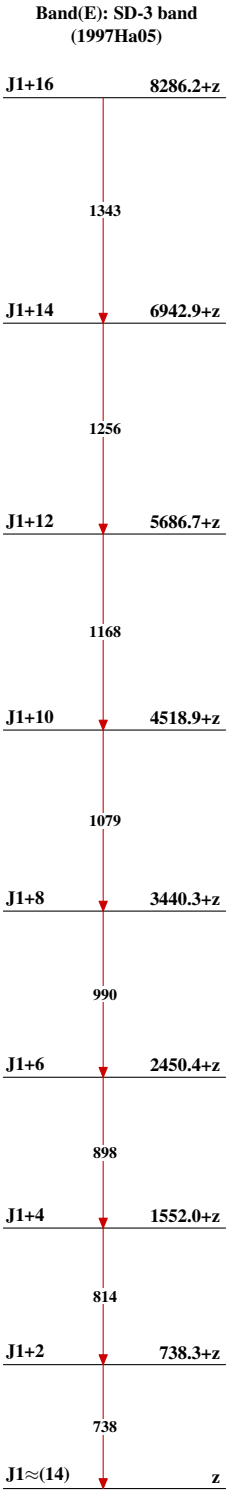


$^{132}_{59}Pr_{73}$

^{105}Pd(^{35}Cl,α2n2pγ) 1999Ko21,1997Ha05 (continued)



$^{132}_{59}Pr_{73}$