#### (HI,xnγ) 1996Pe01,2003Ro09

		History	
Туре	Author	Citation	Literature Cutoff Date
Full Evaluation	A. A. Sonzogni	NDS 103, 1 (2004)	31-Jul-2004

1996Pe01:<sup>119</sup>Sn(<sup>19</sup>F,4nγ), E=87 MeV, <sup>110</sup>Pd(<sup>28</sup>Si,3npγ), E=130 MeV; measured Eγ, Iγ, γγ-coin using GASP array of 31 Ge detectors and 80 BGO inner-ball detectors.
 2003Ro09: <sup>119</sup>Sn(<sup>19</sup>F,4nγ), E=76 MeV; measured Eγ, γγ-coin using 5 Compton-suppressed Ge and one LEP detectors coupled

2003Ro09: <sup>119</sup>Sn(<sup>19</sup>F,4n $\gamma$ ), E=76 MeV; measured E $\gamma$ ,  $\gamma\gamma$ -coin using 5 Compton-suppressed Ge and one LEP detectors coupled to a 14-element BGO array.

1998Ra21: <sup>110</sup>Pd(<sup>28</sup>Si,3np $\gamma$ ), E=130 MeV; measured E $\gamma$ , T<sub>1/2</sub> using Doppler shift method. GASP array.

1994Ha28: <sup>100</sup>Mo(<sup>37</sup>Cl,3nγ), E=155 MeV; measured Eγ, Iγ, γγ-coin using Eurogam array of 41 Compton-suppressed Ge detectors.

The level scheme is based on the recent study by 2003Ro09 on the lowest energy states; the use of LEPs allowed to identify a 39 keV transition that had been missed in earlier works. This work assigned a  $J^{\pi}$  value of (7<sup>+</sup>) to the lowest level of the  $\pi h_{11/2} \nu h_{11/2}$  band, which was given a (6<sup>+</sup>) value in earlier works. The (7<sup>+</sup>) value is adopted here, while the J values for the remaining were increased by one unit.

#### <sup>134</sup>Pr Levels

E(level) <sup>†</sup>	$\mathbf{J}^{\pi}$	T <sub>1/2</sub>	Comments
0.0+y	(6 <sup>-</sup> )	≈11 min	Additional information 1. T <sub>1/2</sub> : from Adopted Levels.
306.50+y <sup>&amp;</sup> 10	$(7^{+})$	3.18 ns 7	$T_{1/2}$ : from 2003Ro09.
345.8+y& 10	(8 <sup>+</sup> )		
440.1+y& <i>15</i>	(9 <sup>+</sup> )		
611.0+y& <i>16</i>	$(10^{+})$	3.4 ps 8	T <sub>1/2</sub> : from 1999K111.
898.1+y& 16	$(11^{+})$		
1204.3+y& 17	$(11^{+})$		
1235.3+y <sup>a</sup> 17	$(11^{+})$		
1236.7+y <i>17</i>	(11)		
1447.4+y 17	$(12^+)$		
1462.0+y 17 1518 $3+y^{a} 17$	(12) $(12^+)$		
$1620.7 \pm x^{\&} 17$	$(12^+)$		
1020.7 + y = 17 1841.8+ $y^a = 17$	$(13^{+})$		
2016.1+y& <i>17</i>	$(13^+)$		
2032.8+y <sup>@</sup> 21	$(11^{-})$		
$2092.5 + y^{\#} 18$	$(14^{+})$		
2178.8+y <sup>a</sup> 17	(14+)		
2248.8+y <sup>@</sup> 18	(12 <sup>-</sup> )		
2479.0+y <sup>@</sup> 18	(13 <sup>-</sup> )		
2511.1+y <sup>&amp;</sup> 18	$(14^{+})$		
2547.6+y <sup>a</sup> 17	$(15^{+})$		
2679.5+y <sup>@</sup> 18	(14 <sup>-</sup> )		
2859.9+y <sup>#</sup> 21	(16+)		
2884.2+y <sup>@</sup> 18	(15 <sup>-</sup> )		
2947.1+y <sup>a</sup> 18	$(16^{+})$		
2991.7+y <sup>&amp;</sup> 18	(15 <sup>+</sup> )		
3123.7+y <sup>@</sup> 19	(16 <sup>-</sup> )		
3413.6+y <sup>@</sup> 19	(17 <sup>-</sup> )		
3419.1+y <sup>a</sup> 19	$(17^{+})$		

 $^{134}_{59}$ Pr<sub>75</sub>-1

### (HI,xnγ) **1996Pe01,2003Ro09** (continued)

# <sup>134</sup>Pr Levels (continued)

E(level) <sup>†</sup>	$J^{\pi}$	T <sub>1/2</sub>	Comments
3537.9+y <sup>&amp;</sup> 19	$(16^{+})$		
3709.1+y <sup>#</sup> 23	(18 <sup>+</sup> )		
3756.6+y <sup>@</sup> 20	(18 <sup>-</sup> )		
3885.1+y <sup>a</sup> 19	$(18^{+})$		
4058.7+y& 20	$(17^{+})$		
4142.1+y <sup>@</sup> 20	(19 <sup>-</sup> )		
4553.4+y <sup>#</sup> 25	$(20^{+})$		
4580.1+y <sup>@</sup> 21	$(20^{-})$		
4597.8+y& 20	(18 <sup>+</sup> )		
4969.9+y <sup>a</sup>	$(20^{+})$		
5056.1+y <sup>w</sup> 21	(21 <sup>-</sup> )		
$5097.0+y^{\alpha} 21$	(19 <sup>+</sup> )	4	
5376+y <sup>#</sup> 3	(22+)	2964 fs 16	
5537.3+y <sup>&amp;</sup> 21	$(20^{+})$		
5573.2+y <sup>@</sup> 22	(22 <sup>-</sup> )		
6010.6+y <sup>&amp;</sup> 23	(21+)		
6123.2+y <sup>e</sup> 22	(23 <sup>-</sup> )	+	
6258+y <sup>#</sup> 3	(24 <sup>+</sup> )	205+ fs 11	
6485.3+y <sup>&amp;</sup> 24	(22+)		
6715.2+y <sup>@</sup> 23	(24 <sup>-</sup> )		
7015.0+y	(23 <sup>+</sup> )	+	
7236+y <sup>#</sup> 3	(26 <sup>+</sup> )	874 fs 10	
7327.2+y <sup>@</sup> 23	(25 <sup>-</sup> )		
7973.2+y <sup>@</sup> 24	(26 <sup>-</sup> )		
$8311 + y^{m} 4$	(28+)	71+ fs 8	
8649.7+y	$(27^{-})$		
9478+y" 4	(30 <sup>+</sup> )	$53^{+}$ fs 6	
10/30 + y'' 4	$(32^{+})$	40 <del>+</del> fs 6	
$12056 + y^{\pi} 4$	(34+)		
0.0+z <sup>0</sup>			Additional information 2. E(level) $J^{\pi_1}$ linking transitions were not clearly obtained, the Y and 871.5+z seem
			to feed the 2249+Y (12 <sup>-</sup> ), 2479+Y (13 <sup>-</sup> ), 2680+Y (14 <sup>-</sup> ) and 2884+Y (15 <sup>-</sup> ) levels
h			(1994Ha28). Parity of the band expected to be negative.
$871.51 + z^0 20$		+	
$1819.7 + z^{o} 3$		166 <sup>+</sup> fs 21	
$2829.2 + z^{o} 4$		116 <sup>+</sup> fs 15	
$3893.5 + z^{D} 4$		85 <sup>+</sup> fs 11	
$5020.0 + z^{\nu} 5$		$60^{+}$ fs 8	
$6220.8 + z^{b} 5$		44 <sup>+</sup> fs 6	
$7508.5 + z^{\nu} 6$		$33^{+}$ fs 4	
8894.3+z <sup>0</sup> 6		24+ fs 3	
$10376.3 + z^{\nu} 6$		16.6 <sup>+</sup> fs 21	
$11964.3 + z^{\nu} 7$			
$13656.3 + z^{\upsilon}$ 12			

#### $(HI,xn\gamma)$ 1996Pe01,2003Ro09 (continued)

### <sup>134</sup>Pr Levels (continued)

<sup>†</sup> From least-squares to  $E\gamma$  assuming an uncertainty of 1 keV when unknown.

- <sup>‡</sup> From 1998Ra21. <sup>#</sup> Band(A):  $\pi h_{11/2}^3 v_{1/2}[530]$ , average transition quadrupole moment= 3.9 eb 3 (1998Ra21). <sup>@</sup> Band(B):  $\pi 5/2[413]v_{9/2}[514]$ .
- <sup>&</sup> Band(C):  $\pi h_{11/2} \nu h_{11/2}$ .
- <sup>*a*</sup> Band(D):  $\pi 3/2[541]vh_{11/2}$ .
- <sup>b</sup> Band(E): Band based on z level, possibly of negative parity, transition quadrupole moment= 6.3 eb 4.

## $\gamma(^{134}\text{Pr})$

R(DCO) values are from 1996PE01, they are stretched dipole gated, unless otherwise stated.

Eγ‡	$I(\gamma + ce)^{\dagger}$	$E_i$ (level)	$\mathbf{J}_i^{\pi}$	$E_f$	$\mathbf{J}_{f}^{\pi}$	Mult.	Comments
39.3 <sup>#</sup>		345 8+v	$(8^{+})$	306 50+v	$(7^{+})$	M1	Mult : from $\alpha(\exp) = 3.6.4$ (2003Ro09)
94.3	183.7	440.1 + v	$(9^+)$	345.8+v	$(8^+)$	M1	Mult.: from $\alpha(\exp) = 1.4 \ 3 \ (2003Ro09)$ .
171.0	155.0	611.0+v	$(10^{+})$	440.1 + v	$(9^+)$		R(DCO) = 0.97.3.
200.4	9.4	2679.5+v	$(14^{-})$	2479.0+v	$(13^{-})$		R(DCO) = 0.99 3.
204.4	25.8 5	2884.2+v	$(15^{-})$	2679.5+v	$(14^{-})$		R(DCO) = 1.00 4.
210.3	3.0 1	1447.4+y	$(12^+)$	1236.7+y	(11)		
216.0	2.5	2248.8+y	$(12^{-})$	2032.8+y	$(11^{-})$		
230.2	2.0	2479.0+y	$(13^{-})$	2248.8+y	$(12^{-})$		
239.8	23.5	3123.7+y	(16 <sup>-</sup> )	2884.2+y	(15 <sup>-</sup> )		$R(DCO) = 0.94 \ 3.$
244	0.5 3	1447.4+y	$(12^{+})$	1204.3+y	$(11^{+})$		
245.0	4.0	1482.0+y	$(12^{+})$	1236.7+y	(11)		
278	1.5	1482.0+y	$(12^{+})$	1204.3+y	$(11^{+})$		
282.9	12.1	1518.3+y	$(12^{+})$	1236.7+y	(11)		$R(DCO) = 1.02 \ 4.$
287.4	100.0	898.1+y	$(11^{+})$	611.0+y	$(10^{+})$		$R(DCO) = 0.53 \ 3$ (stretched quadrupole gated).
289.7	24.6	3413.6+y	$(17^{-})$	3123.7+y	(16 <sup>-</sup> )		R(DCO) = 1.02 2.
306.3 1	58.0	1204.3+y	$(11^{+})$	898.1+y	$(11^{+})$		$E_{\gamma}$ : from 2003Ro09.
306.5 <sup>#</sup> 1		306.50+y	(7 <sup>+</sup> )	0.0+y	(6 <sup>-</sup> )	(E1)	Mult.: Proposed by 2003Ro09; the transition is dipole based on $\gamma(\theta)$ , while the level T <sub>1/2</sub> value points at change of parity between the connecting levels
323.6	24.0	1841 8±v	$(13^{+})$	1518 3±v	$(12^{+})$		$R(DCO) = 0.98 \ 4$
337.0	9.0	2178 8+v	$(13^{+})$	1310.3 + y 1841 8+y	$(12^{+})$		R(DCO) = 1.004
339.0	6.0	1236.7+y	(11)	898 1+v	$(13^{+})$		R(DCO) = 0.80 ?
342.8	17.0	3756.6+y	(11)	3413.6+v	$(17^{-})$		R(DCO) = 0.97 3.
368.8	4.5	2547.6+v	$(15^+)$	2178.8 + y	$(14^+)$		R(DCO) = 1.02.6
385.6	11.9	4142.1+v	$(10^{-})$	3756.6+v	$(18^{-})$		
395.3	25.5	2016.1+v	$(13^{+})$	1620.7 + v	$(13^{+})$		R(DCO) = 1.00 5.
399.6	2.2	2947.1+v	$(16^{+})$	2547.6+v	$(15^+)$		R(DCO) = 0.96 6.
404.5 <sup>a</sup>	< 0.5	2884.2+y	(15-)	2479.0+y	(13-)		
416.2	43.0	1620.7+y	(13+)	1204.3+y	$(11^+)$		R(DCO) = 0.50 4 (stretched quadrupole gated).
428 <sup>a</sup>	< 0.5	3419.1+y	$(17^{+})$	2991.7+y	$(15^{+})$		
436.2	2.2 1	2947.1+y	$(16^{+})$	2511.1+y	$(14^+)$		
437.9	9.1	4580.1+y	$(20^{-})$	4142.1+y	(19 <sup>-</sup> )		R(DCO) = 1.17 9.
440.4	1.6	5537.3+y	$(20^{+})$	5097.0+y	$(19^+)$		
444.0	9.0	3123.7+y	(16 <sup>-</sup> )	2679.5+y	$(14^{-})$		$R(DCO) = 2.80 \ 6.$
446.0 <sup>a</sup>	< 0.5	2479.0+y	(13 <sup>-</sup> )	2032.8+y	$(11^{-})$		
458.1	9.0	898.1+y	$(11^{+})$	440.1+y	(9 <sup>+</sup> )		
466.0	1.0 5	3885.1+y	$(18^{+})$	3419.1+y	$(17^{+})$		
472	1.3	3419.1+y	$(17^{+})$	2947.1+y	$(16^{+})$		
473 <sup>a</sup>	<1.0	6010.6+y	$(21^{+})$	5537.3+y	$(20^{+})$		

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### (HI,xnγ) **1996Pe01,2003Ro09** (continued)

# $\gamma$ <sup>(134</sup>Pr) (continued)</sup>

	E <sub>γ</sub> ‡	$I(\gamma+ce)^{\dagger}$	E <sub>i</sub> (level)	$\mathbf{J}_i^{\pi}$	$E_f$	$\mathbf{J}_{f}^{\pi}$	Comments
	475 <sup>a</sup>	< 0.5	6485.3+y	$(22^{+})$	6010.6+y	$(21^{+})$	
480.6 7.4 2991.7- $\frac{1}{7}$ (15 <sup>+</sup> ) 2511.1- $\frac{1}{7}$ (14 <sup>+</sup> ) R(DCO)= 0.91 7. 495.3 1.0 2511.1+ $\frac{1}{7}$ (14 <sup>+</sup> ) R(DCO)= 1.15 <i>II</i> . 495.3 2.9 5097.0+ $\frac{1}{7}$ (17 <sup>+</sup> ) 255.1+ $\frac{1}{7}$ (21 <sup>-</sup> ) 520.8 2.9 4058.7+ $\frac{1}{7}$ (17 <sup>+</sup> ) 255.1+ $\frac{1}{7}$ (21 <sup>-</sup> ) 529.5 2.4 <i>I</i> 3413.6+ $\frac{1}{7}$ (17 <sup>+</sup> ) 2584.2+ $\frac{1}{7}$ (17 <sup>-</sup> ) 531.3 1.6 5 2547.6+ $\frac{1}{7}$ (15 <sup>+</sup> ) 2016.1+ $\frac{1}{7}$ (13 <sup>-</sup> ) 539 2.8 4597.8+ $\frac{1}{7}$ (16 <sup>+</sup> ) 2991.7+ $\frac{1}{7}$ (25 <sup>-</sup> ) 546.1 4.7 3537.9+ $\frac{1}{7}$ (16 <sup>+</sup> ) 2991.7+ $\frac{1}{7}$ (15 <sup>-</sup> ) 550.3 2.6 (125.2+ $\frac{1}{7}$ (23 <sup>-</sup> ) 6418.3+ $\frac{1}{7}$ (27 <sup>-</sup> ) 550.3 2.6 (125.2+ $\frac{1}{7}$ (23 <sup>-</sup> ) 6418.3+ $\frac{1}{7}$ (27 <sup>-</sup> ) 552. 2.5 6115.2+ $\frac{1}{7}$ (24 <sup>-</sup> ) 1620.7+ $\frac{1}{7}$ (27 <sup>-</sup> ) 553.1 2.4 2178.8+ $\frac{1}{7}$ (16 <sup>+</sup> ) 2991.7+ $\frac{1}{7}$ (27 <sup>-</sup> ) 554.1 2.4 2178.8+ $\frac{1}{7}$ (16 <sup>+</sup> ) 2991.7+ $\frac{1}{7}$ (27 <sup>-</sup> ) 555.2 2.6 615.2+ $\frac{1}{7}$ (24 <sup>-</sup> ) 1623.2+ $\frac{1}{7}$ (27 <sup>-</sup> ) 575.6 2.0 202.5+ $\frac{1}{7}$ (14 <sup>+</sup> ) 1620.7+ $\frac{1}{7}$ (27 <sup>-</sup> ) 61.5 5.0 202.5+ $\frac{1}{7}$ (14 <sup>+</sup> ) 1620.7+ $\frac{1}{7}$ (27 <sup>-</sup> ) 61.5 5.0 202.5+ $\frac{1}{7}$ (14 <sup>+</sup> ) 1620.7+ $\frac{1}{7}$ (27 <sup>-</sup> ) 61.6 1.0 15 2178.3+ $\frac{1}{7}$ (12 <sup>+</sup> ) 888.1+ $\frac{1}{7}$ (17 <sup>-</sup> ) 61.7 12 (stretched quadrupole gated). 61.6 1.0 1 213.3+ $\frac{1}{7}$ (12 <sup>+</sup> ) 889.1+ $\frac{1}{7}$ (17 <sup>-</sup> ) 61.7 12 (stretched quadrupole gated). 61.6 1.0 1 237.3+ $\frac{1}{7}$ (12 <sup>+</sup> ) 1214.3+ $\frac{1}{7}$ (11 <sup>-</sup> ) R(DCO)= 2.40 3. 61.6 1.0 5 2178.3+ $\frac{1}{7}$ (14 <sup>+</sup> ) 2016.1+ $\frac{1}{7}$ (13 <sup>+</sup> ) 61.6 1.9 1 2884.2+ $\frac{1}{7}$ (15 <sup>+</sup> ) 2178.8+ $\frac{1}{7}$ (14 <sup>+</sup> ) 71.6 1.9 1 2884.2+ $\frac{1}{7}$ (15 <sup>+</sup> ) 2178.8+ $\frac{1}{7}$ (14 <sup>+</sup> ) 72.4 1.7 1620.7+ $\frac{1}{7}$ 137.8+ $\frac{1}{7}$ (14 <sup>+</sup> ) 2016.1+ $\frac{1}{7}$ (17 <sup>+</sup> ) 71.6 1.9 1 2884.2+ $\frac{1}{7}$ (15 <sup>+</sup> ) 2178.8+ $\frac{1}{7}$ (14 <sup>+</sup> ) 72.8 4 4.8 4142.1+ $\frac{1}{7}$ (16 <sup>+</sup> ) 2178.8+ $\frac{1}{7}$ (14 <sup>+</sup> ) 72.8 4 4.8 4142.1+ $\frac{1}{7}$ (16 <sup>+</sup> ) 2178.8+ $\frac{1}{7}$ (14 <sup>+</sup> ) 72.8 4 4.8 4142.1+ $\frac{1}{7}$ (16 <sup>+</sup> ) 2178.8+ $\frac{1}{7}$ (17 <sup>+</sup> ) 73.7 5 2.2 2679.5+ $\frac{1}{7}$ (12 <sup>+</sup> ) 21.1+ $\frac{1}{7}$ (10 <sup>+</sup> ) 73.7 5 2.2 2679.5+ $\frac{1}{7}$ (12 <sup>+</sup> ) 21.1+ $\frac{1}{7}$ (12 <sup>+</sup> ) 73.7 5 2.2 2679.5+ $\frac{1}{7}$ (12 <sup>+</sup> ) (21 <sup>+</sup> ) (21 <sup>+</sup> ) 73.7 6 <sup>+</sup> (2 <sup>+</sup> ) 3756.6+ $\frac{1}{7}$	476.0	6.3	5056.1+y	$(21^{-})$	4580.1+y	$(20^{-})$	R(DCO) = 0.99 4.
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	480.6	7.4	2991.7+y	(15+)	2511.1+y	$(14^+)$	R(DCO) = 0.91 7.
499.3 2.9 507.0- $\frac{1}{9}$ (197) 457.8- $\frac{1}{9}$ (187) 57.3 4.1 557.5.2+ $\frac{1}{9}$ (227) 556.1- $\frac{1}{9}$ (167) 539.9 clb 7 0150 + $\frac{1}{9}$ (235) 6485.3+ $\frac{1}{9}$ (227) 539.5 70150 + $\frac{1}{9}$ (235) 6485.3+ $\frac{1}{9}$ (227) 539.5 2.4 <i>I</i> 3413.6+ $\frac{1}{9}$ (177) 2884.2+ $\frac{1}{9}$ (157) 531.3 1.6 5 247.6+ $\frac{1}{9}$ (157) 2016.1+ $\frac{1}{9}$ (137) 539.2 2.8 4597.8+ $\frac{1}{9}$ (187) 4505.7+ $\frac{1}{9}$ (177) 546.1 4.7 3337.9+ $\frac{1}{9}$ (167) 2991.7+ $\frac{1}{9}$ (157) 550.3 2.6 (212.2+ $\frac{1}{9}$ (237) 5573.2+ $\frac{1}{9}$ (237) 573.6 2.1.0 1204.3+ $\frac{1}{9}$ (117) 611.0+ $\frac{1}{9}$ (107) R(DCO)= 2.27 <i>I.5.</i> 610.5 5.0 2092.5+ $\frac{1}{9}$ (147) 1620.7+ $\frac{1}{9}$ (237) 610.5 5.0 2092.5+ $\frac{1}{9}$ (147) 1620.7+ $\frac{1}{9}$ (237) 610.5 5.0 2092.5+ $\frac{1}{9}$ (147) 1610.7+ $\frac{1}{9}$ (17) R(DCO)= 0.84 4. 620.0 14.0 1518.3+ $\frac{1}{9}$ (127) 6898.1+ $\frac{1}{9}$ (117) R(DCO)= 0.44 4. 624.4 9.0 1235.3+ $\frac{1}{9}$ (117) 611.0+ $\frac{1}{9}$ (107) R(DCO)= 0.49 4. 623.0 4.0 375.66+ $\frac{1}{9}$ (187) 122.7+ $\frac{1}{9}$ (257) 633.0 4.0 375.66+ $\frac{1}{9}$ (187) 122.7+ $\frac{1}{9}$ (257) 645.0 2.8 2092.5+ $\frac{1}{9}$ (147) 121.4+ $\frac{1}{9}$ (147) R(DCO)= 0.49 3. 646.0 0.9 5 7973.2+ $\frac{1}{9}$ (267) 732.2+ $\frac{1}{9}$ (257) 661.0 1.0 5 2178.8+ $\frac{1}{9}$ (147) 2016.1+ $\frac{1}{9}$ (137) 676 4 1.8 <i>I</i> 2447.6+ $\frac{1}{9}$ (157) 1247.8+ $\frac{1}{9}$ (147) 705 4 0.5 2864.7+ $\frac{1}{9}$ (157) 1247.8+ $\frac{1}{9}$ (147) 705 4 0.5 1235.3+ $\frac{1}{9}$ (117) 460.1+ $\frac{1}{9}$ (137) 705 4 0.5 1235.3+ $\frac{1}{9}$ (117) 460.1+ $\frac{1}{9}$ (138) 706 1.9 <i>I</i> 2884.2+ $\frac{1}{9}$ (157) 1247.8+ $\frac{1}{9}$ (147) 707.5 9.2 289.9+ $\frac{1}{9}$ (167) 2178.8+ $\frac{1}{9}$ (147) 707.5 9.2 289.9+ $\frac{1}{9}$ (167) 2178.8+ $\frac{1}{9}$ (147) 707.5 9.2 289.9+ $\frac{1}{9}$ (167) 2178.8+ $\frac{1}{9}$ (147) 707.6 1.9 <i>I</i> 247.1+ $\frac{1}{9}$ (167) 2178.8+ $\frac{1}{9}$ (147) 707.6 1.9 <i>I</i> 247.1+ $\frac{1}{9}$ (167) 2178.8+ $\frac{1}{9}$ (17) 707.6 1.15 247.1+ $\frac{1}{9}$ (17) 124.3+ $\frac{1}{9}$ (17) 707.6 1.2 3.147.1+ $\frac{1}{9}$ (167) 2178.8+ $\frac{1}{9}$ (17) 707.8 2.2 6 75.75+ $\frac{1}{9}$ (27) 737.2+ $\frac{1}{9}$ (27) 737.2+ $\frac{1}{9}$ (28) 453.3+ $\frac{1}{9}$ (27) 737.2+ $\frac{1}{9}$ (27) 737.2+ $\frac{1}{9}$ (28) 453.3+ $\frac{1}{9}$ (27) 737.2+ $\frac$	495.3	13.0	2511.1+y	$(14^+)$	2016.1+y	$(13^{+})$	$R(DCO) = 1.15 \ 11.$
	499.3	2.9	5097.0+y	(19+)	4597.8+y	$(18^+)$	
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	517.3	4.1	5573.2+y	$(22^{-})$	5056.1+y	$(21^{-})$	
$\begin{array}{llllllllllllllllllllllllllllllllllll$	520.8	2.9	4058.7+y	(17+)	3537.9+y	(16+)	
$\begin{array}{llllllllllllllllllllllllllllllllllll$	529 <sup>a</sup>	< 0.5	7015.0+v	$(23^{+})$	6485.3+v	$(22^{+})$	
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	529.5	2.4 1	3413.6+y	$(17^{-})$	2884.2+y	(15-)	
$\begin{array}{llllllllllllllllllllllllllllllllllll$	531.3	1.6 5	2547.6+y	$(15^+)$	2016.1+y	$(13^{+})$	
$      546.1   4.7   35379 - y   (16^+)   2991.7 + y   (15^+)   550   3.2   6123.2 + y   (23^+)   5573.2 + y   (22^+)   5573.2 + y   (23^+)   5573.2 + y   (24^+)   1610.4 + y   (10^+)   722.4   722.4 + 1.573.2 + y   (25^-)   6715.2 + y   (24^+)   611.0 + y   (11^+)   611.0 + y   (12^+)   610.0 + 0.59   8.   633.0   4.0   3756.6 + y   (18^+)   1373.7 + y   (26^-)   7327.2 + y   (26^-)   737.2 + y   (27^-)   7973.2 + y   (26^-)   737.2 + y   (26^-)   737.2 + y   (27^-)   7973.2 + y   (26^-)   737.2 + y   (26^-)   737.2 + y   (27^-)   797.3 + y   (26^-)   737.2 + y   (26^-)   737.2 + y   (26^-)   737.2 + y   (27^-)   797.3 + y   (27^-)   797.3 + y   (27^-)   797.3 + y   (27^-)   797.3 + y   (26^-)   737.2 + y   (27^-)   797.3 +$	539	2.8	4597.8+y	(18+)	4058.7+y	$(17^{+})$	
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	546.1	4.7	3537.9+y	(16 <sup>+</sup> )	2991.7+y	$(15^+)$	
$\begin{array}{llllllllllllllllllllllllllllllllllll$	550	3.2	6123.2+y	(23-)	5573.2+y	$(22^{-})$	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	558.1	2.4	2178.8+y	$(14^+)$	1620.7+y	$(13^{+})$	
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	592	2.5	6715.2+y	$(24^{-})$	6123.2+y	$(23^{-})$	
610.5 5.0 2092.5+y (14 <sup>+</sup> ) 1482.0+y (12 <sup>+</sup> ) R(DCO)= 1.17 12 (stretched quadrupole gated). 612 1.4 5 7327.2+y (25 <sup>-</sup> ) 6715.2+y (24 <sup>-</sup> ) 610.0 1.40 1518.3+y (12 <sup>+</sup> ) 898.1+y (11 <sup>+</sup> ) R(DCO)= 0.84 4. 624.4 9.0 1235.3+y (11 <sup>+</sup> ) 611.0+y (10 <sup>+</sup> ) R(DCO)= 2.40 3. 637.5 6.4 1841.8+y (13 <sup>+</sup> ) 1204.3+y (11 <sup>+</sup> ) R(DCO)= 0.83 11 (stretched quadrupole gated). 645.0 2.8 2092.5+y (14 <sup>+</sup> ) 1447.4+y (12 <sup>+</sup> ) R(DCO)= 0.83 11 (stretched quadrupole gated). 646 0.9 5 7973.2+y (26 <sup>-</sup> ) 737.2+y (25 <sup>-</sup> ) 661.0 1.0 5 2178.8+y (14 <sup>+</sup> ) 1518.3+y (12 <sup>+</sup> ) 663 2.5 2679.5+y (14 <sup>-</sup> ) 2016.1+y (13 <sup>+</sup> ) 676 <sup>4</sup> <0.5 8649.7+y (27 <sup>-</sup> ) 7973.2+y (26 <sup>-</sup> ) 705.8 1.8 1 2547.6+y (15 <sup>+</sup> ) 1841.8+y (13 <sup>+</sup> ) 706 1.9 1 2884.2+y (15 <sup>+</sup> ) 1841.8+y (13 <sup>+</sup> ) 706 1.9 1 2884.2+y (15 <sup>+</sup> ) 1278.8+y (14 <sup>+</sup> ) 722.4 17.7 1620.7+y (13 <sup>+</sup> ) 898.1+y (11 <sup>+</sup> ) R(DCO)= 1.78 18. 728.4 4.8 4142.1+y (19 <sup>-</sup> ) 3413.6+y (17 <sup>-</sup> ) R(DCO)= 2.40 2. 767.5 9.5 2859.9+y (16 <sup>+</sup> ) 2092.5+y (14 <sup>+</sup> ) 768.4 1.1 5 2947.1+y (16 <sup>+</sup> ) 2178.8+y (14 <sup>+</sup> ) 784.4 1.1 5 2947.1+y (16 <sup>+</sup> ) 2178.8+y (14 <sup>+</sup> ) 785.4 0.5 1253.3+y (12 <sup>+</sup> ) 4533.4+y (20 <sup>+</sup> ) 811.5 27.8 2016.1+y (13 <sup>+</sup> ) 1204.3+y (11 <sup>+</sup> ) 815.5 27.8 2016.1+y (13 <sup>+</sup> ) 1204.3+y (11 <sup>+</sup> ) 825.5 9.5 3376+y (22 <sup>+</sup> ) 4553.4+y (20 <sup>+</sup> ) 837.5 2.2 2679.5+y (14 <sup>+</sup> ) 837.6+y (18 <sup>-</sup> ) 836.0 1.0 1447.4+y (12 <sup>+</sup> ) 611.0+y (10 <sup>+</sup> ) 844.3 9.5 4553.4+y (20 <sup>+</sup> ) 3709.1+y (18 <sup>+</sup> ) 844.3 9.5 4553.4+y (20 <sup>+</sup> ) 3709.1+y (18 <sup>+</sup> ) 844.3 9.5 4553.4+y (20 <sup>+</sup> ) 3709.1+y (18 <sup>+</sup> ) 844.3 9.5 4553.4+y (20 <sup>+</sup> ) 3709.1+y (18 <sup>+</sup> ) 844.3 9.5 4553.4+y (20 <sup>+</sup> ) 3709.1+y (18 <sup>+</sup> ) 844.3 9.5 4553.4+y (20 <sup>+</sup> ) 3709.1+y (18 <sup>+</sup> ) 847.2 0.0 87 <sup>*</sup> 6 871.51+z 0.0+z 871.5 2.0 6278+y (24 <sup>+</sup> ) 5376+y (25 <sup>+</sup> ) 882.5 5.0 6258+y (24 <sup>+</sup> ) 5376+y (25 <sup>+</sup> ) 882.5 5.0 6258+y (24 <sup>+</sup> ) 5376+y (25 <sup>+</sup> ) 882.5 5.0 6258+y (24 <sup>+</sup> ) 5376+y (24 <sup>+</sup> ) 872.6 4.7 1518.3+y (12 <sup>+</sup> ) 611.0+y (10 <sup>+</sup> ) 872.7 1.5 2847.6+y (15 <sup>+</sup> ) 2016.1+y (13 <sup>+</sup> ) 973.8 1.0 388.1+y (18 <sup>+</sup> ) 2047.1+y (16 <sup>+</sup> ) 974.1 2.2 573.3+y (20 <sup>+</sup> ) 4382.1+y (18 <sup>+</sup> )	593.6	21.0	1204.3+y	(11+)	611.0+y	$(10^{+})$	R(DCO)= 2.27 15.
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	610.5	5.0	2092.5+y	$(14^{+})$	1482.0+y	$(12^{+})$	$R(DCO) = 1.17 \ 12$ (stretched quadrupole gated).
	612	1.4 5	7327.2+y	$(25^{-})$	6715.2+y	$(24^{-})$	
	620.0	14.0	1518.3+y	$(12^{+})$	898.1+y	$(11^{+})$	$R(DCO) = 0.84 \ 4.$
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	624.4	9.0	1235.3+y	$(11^{+})$	611.0+y	$(10^{+})$	R(DCO) = 0.76 5.
$\begin{array}{llllllllllllllllllllllllllllllllllll$	633.0	4.0	3756.6+y	$(18^{-})$	3123.7+y	(16 <sup>-</sup> )	$R(DCO) = 2.40 \ 3.$
	637.5	6.4	1841.8+y	$(13^{+})$	1204.3+y	$(11^{+})$	$R(DCO) = 0.59 \ 8.$
$ \begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	645.0	2.8	2092.5+y	$(14^{+})$	1447.4+y	$(12^{+})$	$R(DCO) = 0.83 \ 11$ (stretched quadrupole gated).
	646	0.9 5	7973.2+y	$(26^{-})$	7327.2+y	$(25^{-})$	
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	661.0	1.0 5	2178.8+y	$(14^{+})$	1518.3+y	$(12^{+})$	
	663	2.5	2679.5+y	$(14^{-})$	2016.1+y	$(13^{+})$	
705.81.8 I2547.6+y $(15^+)$ 1841.8+y $(13^+)$ 7061.9 I2884.2+y $(15^-)$ 2178.8+y $(14^+)$ 722.417.71620.7+y $(13^+)$ 898.1+y $(11^+)$ R(DCO)= 1.78 I8.728.44.84142.1+y $(19^-)$ 3413.6+y $(17^-)$ R(DCO)= 2.40 2.767.59.52859.9+y $(16^+)$ 2092.5+y $(14^+)$ 795<0.5	676 <sup>a</sup>	< 0.5	8649.7+y	$(27^{-})$	7973.2+y	(26 <sup>-</sup> )	
7061.9 I2884.2+y(15 <sup>-</sup> )2178.8+y(14 <sup>+</sup> )R(DCO)= 1.78 I8.722.417.71620.7+y(13 <sup>+</sup> )898.1+y(11 <sup>+</sup> )R(DCO)= 1.78 I8.728.44.84142.1+y(19 <sup>-</sup> )3413.6+y(17 <sup>-</sup> )R(DCO)= 2.40 2.767.59.52859.9+y(16 <sup>+</sup> )2092.5+y(14 <sup>+</sup> )784.41.1 52947.1+y(16 <sup>+</sup> )2178.8+y(14 <sup>+</sup> )795<0.5	705.8	1.8 1	2547.6+y	$(15^{+})$	1841.8+y	$(13^{+})$	
722.417.71620.7+y(13 <sup>+</sup> )898.1+y(11 <sup>+</sup> )R(DCO)= 1.78 18.728.44.84142.1+y(19 <sup>-</sup> )3413.6+y(17 <sup>-</sup> )R(DCO)= 2.40 2.767.59.52859.9+y(16 <sup>+</sup> )2092.5+y(14 <sup>+</sup> )768.41.1 52947.1+y(16 <sup>+</sup> )2178.8+y(14 <sup>+</sup> )795<0.5	706	1.9 <i>1</i>	2884.2+y	$(15^{-})$	2178.8+y	$(14^{+})$	
728.44.84142.1+y $(19^-)$ 3413.6+y $(17^-)$ $R(DCO) = 2.40$ 2.767.59.52859.9+y $(16^+)$ $2092.5+y$ $(14^+)$ 795<0.5	722.4	17.7	1620.7+y	$(13^{+})$	898.1+y	$(11^{+})$	$R(DCO) = 1.78 \ 18.$
$\begin{array}{llllllllllllllllllllllllllllllllllll$	728.4	4.8	4142.1+y	(19 <sup>-</sup> )	3413.6+y	$(17^{-})$	R(DCO) = 2.40 2.
$\begin{array}{llllllllllllllllllllllllllllllllllll$	767.5	9.5	2859.9+y	(16 <sup>+</sup> )	2092.5+y	$(14^{+})$	
$795$ $< 0.5$ $1235.3+y$ $(11^-)$ $440.1+y$ $(9^-)$ $811.5$ $27.8$ $2016.1+y$ $(13^+)$ $1204.3+y$ $(11^+)$ $R(DCO)= 1.80$ $15.$ $822.5$ $9.5$ $5376+y$ $(22^+)$ $4553.4+y$ $(20^+)$ $823.5$ $4.5$ $4580.1+y$ $(20^-)$ $836.0$ $1.0$ $1447.4+y$ $(12^+)$ $611.0+y$ $(10^+)$ $837.5$ $2.2$ $2679.5+y$ $(14^-)$ $1841.8+y$ $(13^+)$ $844.3$ $9.5$ $4553.4+y$ $(20^+)$ $3709.1+y$ $(18^+)$ $849.1^+$ $10.0$ $3709.1+y$ $(18^+)$ $849.1$ $10.0$ $3709.1+y$ $(18^+)$ $2859.9+y$ $(16^+)$ $858.2$ $3.6$ $2479.0+y$ $(13^-)$ $1620.7+y$ $(13^+)$ $871.$ $1.05$ $1482.0+y$ $(12^+)$ $611.0+y$ $(10^+)$ $8(DCO)= 2.002.$ $871$ $1.05$ $1482.0+y$ $(12^+)$ $611.0+y$ $(10^+)$ $872^d$ $<0.4$ $3419.1+y$ $(17^+)$ $2547.6+y$ $(15^+)$ $882.5$ $5.0$ $6258+y$ $(24^+)$ $5376+y$ $(22^+)$ $907.0$ $2.7I$ $1518.3+y$ $(12^+)$ $611.0+y$ $(10^+)$ $907.8$ $2.0I$ $3419.1+y$ $(17^+)$ $2511.1+y$ $(14^+)$ $913.5$ $4.9$ $6010.6+y$ $(21^+)$ $5097.0+y$ $(19^+)$ $914.2$ $2.7$ $5056.1+y$ $(15^+)$ $1620.7+y$ $(13^+)$ $927$ $1.5$ $2547.6+y$ $(15^+)$ $1620.7+y$ <td< td=""><td>768.4</td><td>1.1 5</td><td>2947.1+y</td><td><math>(16^{+})</math></td><td>2178.8+y</td><td><math>(14^+)</math></td><td></td></td<>	768.4	1.1 5	2947.1+y	$(16^{+})$	2178.8+y	$(14^+)$	
811.5 27.8 2016.1+y (13') 1204.3+y (11') R(DCO)= 1.80 75. 822.5 9.5 $5376+y$ (22') 4553.4+y (20') 823.5 4.5 4580.1+y (20') 3756.6+y (18') 836.0 1.0 1447.4+y (12') 611.0+y (10') 837.5 2.2 2679.5+y (14') 1841.8+y (13') 844.3 9.5 4553.4+y (20') 3709.1+y (18') 849.1 10.0 3709.1+y (18') 2859.9+y (16') 858.2 3.6 2479.0+y (13') 1620.7+y (13') 871 1.0 5 1482.0+y (12') 611.0+y (10') 871.5 <sup>©</sup> 2 0.87 <sup>&amp;</sup> 6 871.51+z 0.0+z 872 <sup><i>d</i></sup> <0.4 3419.1+y (17') 2547.6+y (15') 882.5 5.0 6258+y (24') 5376+y (22') 890.3 15.3 2511.1+y (14') 1620.7+y (13') 907.0 2.7 <i>I</i> 1518.3+y (12') 611.0+y (10') 907.8 2.0 <i>I</i> 3419.1+y (17') 2511.1+y (14') 913.5 4.9 6010.6+y (21') 5097.0+y (19') 914.2 2.7 5056.1+y (21') 4142.1+y (19') 914.2 1.7 5056.1+y (21') 4142.1+y (19') 914.2 2.7 5056.1+y (21') 4142.1+y (19') 914.2 2.7 5056.1+y (21') 4142.1+y (19') 914.2 1.6 2947.1+y (16') 2016.1+y (13') 938 1.0 3885.1+y (18') 2947.1+y (16') 939.4 2.2 537.3+y (20') 4597.8+y (18')	795	<0.5	1235.3+y	(11')	440.1+y	(9')	D(DCO) 100.15
$\begin{array}{llllllllllllllllllllllllllllllllllll$	811.5	27.8	2016.1+y	$(13^{+})$	1204.3+y	(11')	$R(DCO) = 1.80 \ I5.$
823.54.54380.1+y(20)3750.6+y(18)836.01.01447.4+y(12+)611.0+y(10+)837.52.22679.5+y(14 <sup>-</sup> )1841.8+y(13+)844.39.54553.4+y(20+)3709.1+y(18+)849.110.03709.1+y(18+)2859.9+y(16+)858.23.62479.0+y(13 <sup>-</sup> )1620.7+y(13 <sup>+</sup> )8711.0.51482.0+y(12+)611.0+y(10+)871.520.87&6871.51+z0.0+z872 <sup>4</sup> <0.4	822.5	9.5	5376+y	$(22^{+})$	4553.4+y	$(20^{+})$	
$\begin{array}{llllllllllllllllllllllllllllllllllll$	823.5	4.5	4580.1+y	(20)	3/56.6+y	(18)	
$\begin{array}{llllllllllllllllllllllllllllllllllll$	830.0	1.0	1447.4+y	$(12^{+})$	011.0+y	$(10^{+})$	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	037.3 944 2	2.2	2079.3+y	(14)	1041.0+y	(13)	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	840.1	9.5	$4555.4 \pm y$ 3700 1 ± y	$(20^{-})$	$2850.0 \pm x$	$(10^{-})$	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	858 2	3.6	$3709.1 \pm y$ $2470.0 \pm y$	(10) $(13^{-})$	$2639.9 \pm y$ 1620 7 $\pm y$	$(10^{-})$	P(DCO) = 2.00.2
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	871	5.0 1.0.5	1482.0+y	$(13^{+})$	$611.0 \pm y$	$(13^{+})$	R(DCO) = 2.00 2.
$\begin{array}{llllllllllllllllllllllllllllllllllll$	071 5 <sup>@</sup> 2	0.07%	971 51 + -	(12)	0.0+-	(10)	
$\begin{array}{llllllllllllllllllllllllllllllllllll$	8/1.5 - 2	0.8/ 0	8/1.31+Z	$(17^{+})$	0.0+2	$(15^{+})$	
$882.3$ $5.0$ $0238+y$ $(24^{\circ})$ $3576+y$ $(22^{\circ})$ $890.3$ $15.3$ $2511.1+y$ $(14^{+})$ $1620.7+y$ $(13^{+})$ $907.0$ $2.7 I$ $1518.3+y$ $(12^{+})$ $611.0+y$ $(10^{+})$ $907.8$ $2.0 I$ $3419.1+y$ $(17^{+})$ $2511.1+y$ $(14^{+})$ $913.5$ $4.9$ $6010.6+y$ $(21^{+})$ $5097.0+y$ $(19^{+})$ $914.2$ $2.7$ $5056.1+y$ $(21^{-})$ $4142.1+y$ $(19^{-})$ $927$ $1.5$ $2547.6+y$ $(15^{+})$ $1620.7+y$ $(13^{+})$ $931$ $1.0$ $2947.1+y$ $(16^{+})$ $2016.1+y$ $(13^{+})$ $938$ $1.0$ $3885.1+y$ $(18^{+})$ $2947.1+y$ $(16^{+})$ $939.4$ $2.2$ $5537.3+y$ $(20^{+})$ $4597.8+y$ $(18^{+})$	8/2	<0.4	5419.1+y	$(17^{+})$	2347.0+y	$(15^{+})$	
$997.5$ $13.5$ $2511.1+y$ $(14^+)$ $1020.7+y$ $(13^+)$ $907.0$ $2.7 I$ $1518.3+y$ $(12^+)$ $611.0+y$ $(10^+)$ $907.8$ $2.0 I$ $3419.1+y$ $(17^+)$ $2511.1+y$ $(14^+)$ $913.5$ $4.9$ $6010.6+y$ $(21^+)$ $5097.0+y$ $(19^+)$ $914.2$ $2.7$ $5056.1+y$ $(21^-)$ $4142.1+y$ $(19^-)$ $R(DCO)= 3.20 9.$ $927$ $1.5$ $2547.6+y$ $(15^+)$ $1620.7+y$ $(13^+)$ $931$ $1.0$ $2947.1+y$ $(16^+)$ $2016.1+y$ $(13^+)$ $938$ $1.0$ $3885.1+y$ $(18^+)$ $2947.1+y$ $(16^+)$ $939.4$ $2.2$ $5537.3+y$ $(20^+)$ $4597.8+y$ $(18^+)$	882.3 800 2	5.0 15.2	0238+y	(24)	1620 7 J	(22)	
907.02.7 I1318.3+y(12)011.0+y(10)907.82.0 I3419.1+y $(17^+)$ 2511.1+y $(14^+)$ 913.54.96010.6+y $(21^+)$ 5097.0+y $(19^+)$ 914.22.75056.1+y $(21^-)$ 4142.1+y $(19^-)$ R(DCO)= 3.20 9.9271.52547.6+y $(15^+)$ 1620.7+y $(13^+)$ 9311.02947.1+y $(16^+)$ 2016.1+y $(13^+)$ 9381.03885.1+y $(18^+)$ 2947.1+y $(16^+)$ 939.42.25537.3+y $(20^+)$ 4597.8+y $(18^+)$	007.0	271	$2511.1 \pm y$ 1518 3 $\pm y$	$(14^{-})$	$611.0 \pm y$	$(13^{+})$	
913.54.9 $6010.6+y$ $(21^+)$ $5097.0+y$ $(19^+)$ 914.22.7 $5056.1+y$ $(21^-)$ $4142.1+y$ $(19^-)$ $R(DCO)= 3.20$ 9271.5 $2547.6+y$ $(15^+)$ $1620.7+y$ $(13^+)$ 9311.0 $2947.1+y$ $(16^+)$ $2016.1+y$ $(13^+)$ 9381.0 $3885.1+y$ $(18^+)$ $2947.1+y$ $(16^+)$ 939.42.2 $5537.3+y$ $(20^+)$ $4597.8+y$ $(18^+)$	907.8	2.71 201	$3419.1 \pm v$	(12) $(17^+)$	2511 1±v	$(10^{-})$	
914.22.75056.1+y $(21^{-})$ $4142.1+y$ $(19^{-})$ $R(DCO)= 3.20$ 9.9271.52547.6+y $(15^{+})$ $1620.7+y$ $(13^{+})$ 9311.02947.1+y $(16^{+})$ $2016.1+y$ $(13^{+})$ 9381.03885.1+y $(18^{+})$ $2947.1+y$ $(16^{+})$ 939.42.25537.3+y $(20^{+})$ $4597.8+y$ $(18^{+})$	913 5	49	6010.6+v	$(21^+)$	5097 0+v	$(19^+)$	
9271.5 $2547.6+y$ $(15^+)$ $1620.7+y$ $(13^+)$ 9311.0 $2947.1+y$ $(16^+)$ $2016.1+y$ $(13^+)$ 9381.0 $3885.1+y$ $(18^+)$ $2947.1+y$ $(16^+)$ 939.42.2 $5537.3+y$ $(20^+)$ $4597.8+y$ $(18^+)$	914.2	2.7	5056.1 + v	$(21^{-})$	4142.1+v	$(19^{-})$	R(DCO) = 3.20.9
9311.0 $2947.1+y$ $(16^+)$ $2016.1+y$ $(13^+)$ 9381.0 $3885.1+y$ $(18^+)$ $2947.1+y$ $(16^+)$ 939.42.2 $5537.3+y$ $(20^+)$ $4597.8+y$ $(18^+)$	927	1.5	2547.6+v	$(15^+)$	1620.7+v	$(13^+)$	
938 1.0 3885.1+y $(18^+)$ 2947.1+y $(16^+)$ 939.4 2.2 5537.3+y $(20^+)$ 4597.8+y $(18^+)$	931	1.0	2947.1 + v	$(16^+)$	2016.1+v	$(13^+)$	
939.4 2.2 $5537.3+y$ (20 <sup>+</sup> ) $4597.8+y$ (18 <sup>+</sup> )	938	1.0	3885.1+v	$(18^+)$	2947.1+v	$(16^+)$	
	939.4	2.2	5537.3+y	$(20^{+})$	4597.8+y	(18+)	

Continued on next page (footnotes at end of table)

#### $(HI,xn\gamma)$ 1996Pe01,2003Ro09 (continued)

#### $\gamma(^{134}\text{Pr})$ (continued)

Eγ‡	$I(\gamma+ce)^{\dagger}$	E <sub>i</sub> (level)	$\mathbf{J}_i^{\pi}$	$E_f$	$\mathrm{J}_f^\pi$		Comments	
944 <sup><i>a</i></sup>	< 0.5	1841.8+y	$(13^{+})$	898.1+y	$(11^{+})$			
948	1.0	6485.3+y	$(22^{+})$	5537.3+y	$(20^{+})$			
948.2 <sup>@</sup> 2	$1.00^{\&}$ 7	1819.7+z		871.51+z				
975 <sup>a</sup>	< 0.5	2178.8+y	$(14^{+})$	1204.3+y	$(11^{+})$			
975.6	20.4	2991.7+y	$(15^{+})$	2016.1+y	$(13^{+})$			
977.4	4.5	7236+y	$(26^{+})$	6258+y	$(24^{+})$			
993	2.9	5573.2+y	$(22^{-})$	4580.1+y	$(20^{-})$	R(DCO)= 1.80 4.		
1004 <sup><i>a</i></sup>	< 0.5	7015.0+y	$(23^{+})$	6010.6+y	$(21^{+})$			
$1009.5^{\textcircled{0}}2$	0.87 <sup>&amp;</sup> 7	2829.2+z		1819.7+z				
1026.8	9.5	3537.9+y	$(16^{+})$	2511.1+y	$(14^{+})$			
1038.5	6.7	5097.0+y	(19 <sup>+</sup> )	4058.7+y	$(17^{+})$			
1044.5	5.0	2248.8+y	$(12^{-})$	1204.3+y	$(11^{+})$	R(DCO)= 1.70 2.		
1059.8	4.7	4597.8+y	$(18^{+})$	3537.9+y	$(16^{+})$			
1064.3 <sup>@</sup> 2	0.77 <sup>&amp;</sup> 7	3893.5+z		2829.2+z				
1067.0	11.7	4058.7+y	$(17^{+})$	2991.7+y	$(15^{+})$			
1067	1.9 <i>1</i>	6123.2+y	(23 <sup>-</sup> )	5056.1+y	$(21^{-})$			
1075.5	3.4	8311+y	$(28^{+})$	7236+y	$(26^{+})$			
1084 <sup><i>a</i></sup>	<1.0	4969.9+y	$(20^{+})$	3885.1+y	$(18^{+})$			
1126.5 <sup>@</sup> 2	0.61 <sup>&amp;</sup> 5	5020.0+z		3893.5+z				
1142	1.4	6715.2+y	(24 <sup>-</sup> )	5573.2+y	$(22^{-})$			
1167.0	2.9	9478+y	$(30^{+})$	8311+y	$(28^{+})$			
1200.8 <sup>@</sup> 2	0.43 <sup>&amp;</sup> 4	6220.8+z		5020.0+z				
1204	1.4	7327.2+y	$(25^{-})$	6123.2+y	(23 <sup>-</sup> )			
1252.0	2.5	10730+y	$(32^{+})$	9478+y	$(30^{+})$			
1258	0.6 3	7973.2+y	(26 <sup>-</sup> )	6715.2+y	(24 <sup>-</sup> )			
1287.7 <sup>@</sup> 2	0.38 <sup>&amp;</sup> 4	7508.5+z		6220.8+z				
1322 <sup><i>a</i></sup>	< 0.5	8649.7+y	$(27^{-})$	7327.2+y	$(25^{-})$			
1326	0.7 5	12056+y	(34 <sup>+</sup> )	10730+y	$(32^{+})$			
1385.7 <sup>@</sup> 2	0.34 <sup>&amp;</sup> 3	8894.3+z		7508.5+z				
1482.0 <sup>@</sup> 2	0.17 <sup>&amp;</sup> 2	10376.3+z		8894.3+z				
1588.0 <sup>@</sup> 2	0.09 <mark>&amp;</mark> 2	11964.3+z		10376.3+z				
1692 <sup>@</sup> 1		13656.3+z		11964.3+z				

<sup>†</sup> From 1996Pe01, unless stated otherwise. Transition (total) intensities deduced from total projection and gated spectra. Uncertainties, when not given, are <10%.

<sup>±</sup> From 1996Pe01, unless stated otherwise.

<sup>\*</sup> From 1990Fe01, unless stated onerw.
<sup>#</sup> From 2003Ro09.
<sup>@</sup> From 1994Ha28.
<sup>&</sup> From 1994Ha28, relative to 948.2 G.

<sup>*a*</sup> Placement of transition in the level scheme is uncertain.



<sup>134</sup><sub>59</sub>Pr<sub>75</sub>







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 $^{134}_{59}\mathrm{Pr}_{75}$ 

### (HI,xnγ) 1996Pe01,2003Ro09



<sup>134</sup><sub>59</sub>Pr<sub>75</sub>

#### 1996Pe01,2003Ro09 $(HI,xn\gamma)$



**Band(A):**  $\pi h_{11/2}^3 v 1/$ 2[530], average transition quadrupole moment= 3.9 eb 3 (1998Ra21)



Band(B): *π*5/2[413]*ν*9/2[514] (27-) 8649.7+y (26-) 7973.2+y (25-) 1327.2+y 676 646 1322 6123.2+  $(24^{-})$  $\begin{array}{c} (23^{-}) \\ \hline (22^{-}) \\ \hline 1258 \end{array}$ 6123.2+ 573.2+ 1204<sup>5056.1+</sup> 580.1+ 142.1+ 1067<sup>3756.6+</sup> 413.6+ 914<sup>8123.7+</sup> 612 (21-) 592  $\begin{array}{c|c} \hline (20^{-}) \\ \hline (19^{-}) \\ \hline 550 \\ \hline \end{array}$ (18-517 476 993- $(17^{-})$ +  $(16^{-})$ 438 2884.2+ 2679.5+ 2479.0+ 824  $(15^{-})$ ×  $(14^{-})$ (13<sup>-</sup>) 2248.8+ (12-) (11-) 2032.8+

**Band**(**C**): *π***h**<sub>11/2</sub>*ν***h**<sub>11/2</sub>

·y	(23+)		7015.0+y		
·y	$(22^+)$		6485.3+y		
·y	$(21^+)$		6010.6+y		
·y	$(20^+)$	529	5537.3+y		
·y	(19+)	475	5097.0+y	Band(D): $\pi$	3/2[541]vh11/2
·y	(18+)	473 014	4597.8+y		
·y	$(17^+)$	440 440	4058.7+y	<b>(20</b> <sup>+</sup> )	4969.9+y
·y	(16 <sup>+</sup> )	499	3537.9+y	(18 <sup>+</sup> )	3885.1+y
·y	(15 <sup>+</sup> )	539	2991.7+y	$(17^+)^{1084}$	3419.1+v
·y	(14+)	521	2511.1+y		2947.1+v
.y	(13+)	546	2016.1+y	$(15^+)$ 938 $\frac{40}{47}$	2547.6+v
·y	(13+)		1620.7+y	$(14^+)$	- 872 2178.8+y
.y .v	(11+)	401 976	1204.3+y	(13+)	1841.8+v
<u> </u>	$\frac{(11^+)}{(10^+)}$	495 890	898.1+y	(12+)	1518.3+v
	$\frac{(10^+)}{(0^+)}$	812	611.0+y		
	$\frac{(9^+)}{(9^+)}$	306 722 594	440.1+y	>	
	(8)	458 287	345.8+y		
	· (/') '	<u> </u>	000.30+y		

<sup>134</sup><sub>59</sub>Pr<sub>75</sub>