

Adopted Levels, Gammas

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

$Q(\beta^-) = -3.79 \times 10^3$ 7; $S(n) = 8.98 \times 10^3$ 8; $S(p) = 2.79 \times 10^3$ 7; $Q(\alpha) = 9.9 \times 10^2$ 8 [2012Wa38](#)

Note: Current evaluation has used the following Q record -3790 60 9010 80 2790 70 990 80 [2003Au03](#).

$Q(\epsilon p) = 1270$ 60 ([2003Au03](#)).

 ^{132}Pr LevelsCross Reference (XREF) Flags

- A** ^{132}Nd ϵ decay (94 s)
B $^{104}\text{Pd}(^{32}\text{S}, 3p n \gamma)$
C $^{105}\text{Pd}(^{35}\text{Cl}, \alpha 2n 2p \gamma)$
D $^{117}\text{Sn}(^{19}\text{F}, 4n \gamma)$

E(level)	J^π	$T_{1/2}$	XREF	Comments
0.0	$(2)^+$	1.6 min 3	A	$\% \epsilon + \% \beta^+ = 100$ E(level): probably the g.s. of ^{132}Pr . J^π : M1 γ from 1^+ ; systematics of neighboring even Pr nuclides. $T_{1/2}$: from 1974Ar27 and 1987Ko24 . Others: 1974La32 , 1964PeZY .
0+x	(5^+)		B	
58.0+x 15	(6^+)		B	
87.5+x 13	(6^+)		B	
98.0+x # 10	(6^-)		BCD	
145.3+x @ 12	(7^-)		BCD	
147.72 11	1^+		A	J^π : strong $\epsilon + \beta^+$ feeding ($\log ft \approx 4.7$) from 0^+ .
261.2+x # 12	(8^-)		B D	
284.53 13	$(1, 2)^-$		A	J^π : E1 γ 's to 1^+ and $(2)^+$.
288.16 12	$(0 \text{ to } 3)^+ \ddagger$		A	J^π : M1 γ to 1^+ .
342.90 13	$(0 \text{ to } 3)^+ \ddagger$		A	J^π : M1, E2 γ to 1^+ .
381.7+x 11	(7^+)		BCD	
387.20 18	$(0 \text{ to } 3)^+ \ddagger$		A	J^π : M1 γ to $(1)^+$.
405.3+x & 13	(8^+)		BC	
405.82 16	$(0 \text{ to } 3^+)$		A	J^π : γ to $(1)^+$.
439.8+x @ 12	(9^-)		B D	
468.6+x a 14	(9^+)		BC	
501.34 16	$(0 \text{ to } 3)^+ \ddagger$		A	J^π : M1, E2 γ to $(1)^+$.
526.15 17	$(0 \text{ to } 3)^+ \ddagger$		A	J^π : M1, E2 γ to 1^+ .
552.1+x 14	(7^+)		C	
567.49 # 20	$(0 \text{ to } 3^+)$		A	J^π : γ to 1^+ .
587.44 24	$(0 \text{ to } 3)^+ \ddagger$		A	J^π : M1 γ to $(1)^+$.
598.3+x & 14	(10^+)		BCD	
630.42 24	$(0 \text{ to } 3^+)^{\ddagger}$		A	J^π : γ to 1^+ .
668.5+x # 12	(10^-)		B D	
714.94 15	1^+		A	J^π : M1 γ to 1^+ ; strong $\epsilon + \beta^+$ feeding ($\log ft \approx 4.6$) from 0^+ .
724.83 16	$(\leq 3)^{\ddagger}$		A	J^π : γ 's to $(2)^+$ and $(1, 2)^-$.
806.7+x 13	(9^+)		BC	
854.9 3	$(0 \text{ to } 3)^+ \ddagger$		A	J^π : γ to 1^+ .
861.23 22	$(0 \text{ to } 4)^- \ddagger$		A	J^π : γ to $(1, 2)^-$.

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Adopted Levels, Gammas (continued) ^{132}Pr Levels (continued)

E(level)	J^π	XREF	Comments
864.8+x ^a 14	(11 ⁺)	BCD	
946.0+x [@] 12	(11 ⁻)	B D	
981.85 17	(0 ⁺ to 3 ⁺) [‡]	A	J^π : γ 's to 1 ⁺ and (2) ⁺ .
1105.4+x ^{&} 14	(12 ⁺)	BCD	
1175.1+x ^e 14	(11 ⁺)	BCD	
1194.2+x ^d 14	(11 ⁺)	BCD	
1258.0+x [#] 12	(12 ⁻)	B D	
1330.1 3	(0 to 3 ⁺) [‡]	A	J^π : γ to 1 ⁺ .
1440.7 6	(0 to 3 ⁺)	A	J^π : γ to 1 ⁺ .
1489.2+x ^a 14	(13 ⁺)	BCD	
1500.7+x ^c 14	(12 ⁺)	BCD	
1610.7+x [@] 12	(13 ⁻)	B D	
1715.7+x ^e 14	(13 ⁺)	BCD	
1810.5+x ^{&} 14	(14 ⁺)	B D	
1925.4+x ^d 14	(13 ⁺)	BCD	
1986.4+x [#] 14	(14 ⁻)	B D	
2263.8+x ^a 15	(15 ⁺)	B	
2293.4+x ^c 17	(14 ⁺)	B	
2376.3+x ^e 14	(15 ⁺)	BC	
2393.5+x [@] 14	(15 ⁻)	B	
2658.5+x ^{&} 16	(16 ⁺)	B	
2811.5+x [#] 15	(16 ⁻)	B	
3101.4+x ^d 20	(16 ⁺)	B	J^π : 1998Pe06 assigned (18 ⁺), however, according to J^π assignments by 2001Ko30 for other members of this band, (16 ⁺) is more likely.
3121.1+x ^e 14	(17 ⁺)	BC	
3143.2+x ^a 16	(17 ⁺)	B	
3246.5+x [@] 16	(17 ⁻)	B	
3600.3+x ^{&} 17	(18 ⁺)	B	
3688.5+x [#] 16	(18 ⁻)	B	
3913.5+x ^e 14	(19 ⁺)	BC	
4074.3+x ^a 17	(19 ⁺)	B	
4116.5+x [@] 19	(19 ⁻)	B	
4563.3+x ^{&} 18	(20 ⁺)	B	
4564.5+x [#] 19	(20 ⁻)	B	
4566.3+x ^b 18	(20 ⁺)	B	
4750.8+x ^e 14	(21 ⁺)	BC	
4998.5+x [@] 21	(21 ⁻)	B	
5003.3+x ^a 18	(21 ⁺)	B	
5482.5+x [#] 22	(22 ⁻)	B	
5525.3+x ^b 21	(22 ⁺)	B	
5563.3+x ^{&} 21	(22 ⁺)	B	
5662.9+x ^e 14	(23 ⁺)	BC	
5954.5+x [@] 23	(23 ⁻)	B	
5958.3+x ^a 21	(23 ⁺)	B	
6480.5+x [#] 24	(24 ⁻)	B	
6588.3+x ^b 23	(24 ⁺)	B	

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Adopted Levels, Gammas (continued) ^{132}Pr Levels (continued)

E(level)	J^π	XREF	Comments
6625.3+x ^{&} 23	(24 ⁺)	B	
6672.0+x ^e 15	(25 ⁺)	BC	
6985.3+x ^a 23	(25 ⁺)	B	
7006+x [@] 3	(25 ⁻)	B	
7583+x [#] 3	(26 ⁻)	B	
7746.3+x ^b 25	(26 ⁺)	B	
7784.2+x ^e 16	(27 ⁺)	BC	
8086.3+x ^a 25	(27 ⁺)	B	
8994+x ^b 3	(28 ⁺)	B	
8997.8+x ^e 17	(29 ⁺)	BC	
9231+x ^a 3	(29 ⁺)	B	
10304.3+x ^e 18	(31 ⁺)	BC	
10319+x ^b 3	(30 ⁺)	B	
10404+x ^a 3	(31 ⁺)	B	
11589+x ^a 3	(33 ⁺)	B	
11708.3+x ^e 19	(33 ⁺)	BC	
y ^g	J≈(12)	BC	Additional information 1.
565.3+y ^g 3	J+2	BC	
865.8+y ^f 6	J+3	BC	
1206.3+y ^g 5	J+4	BC	
1561.3+y ^f 6	J+5	BC	
1934.0+y ^g 5	J+6	BC	
2326.1+y ^f 6	J+7	BC	
2736.8+y ^g 6	J+8	BC	
3166.8+y ^f 7	J+9	BC	
3613.4+y ^g 6	J+10	BC	
4079.0+y ^f 7	J+11	BC	
4561.8+y ^g 7	J+12	BC	
5063.6+y ^f 7	J+13	BC	
5580.8+y ^g 7	J+14	BC	
6119.5+y ^f 8	J+15	BC	
6672.2+y ^g 8	J+16	BC	
7246.9+y ^f 8	J+17	BC	
7834.0+y ^g 9	J+18	BC	
8446.8+y ^f 9	J+19	BC	
9068.0+y ^g 9	J+20	BC	
9720.6+y ^f 9	J+21	BC	
10375.0+y ^g 10	J+22	BC	
11069.1+y ^f 10	J+23	BC	
11759.4+y ^g 10	J+24	BC	
12496.5+y ^f 10	J+25	BC	
13224.2+y ^g 10	J+26	BC	
14004.6+y ^f 11	J+27	BC	
z ^h	J1≈(12)	B	Additional information 2.
709.0+z ^h 10	J1+2	BC	
1447.3+z ^h 11	J1+4	BC	
2261.0+z ^h 11	J1+6	BC	

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Adopted Levels, Gammas (continued) ^{132}Pr Levels (continued)

E(level)	$J^{\pi\dagger}$	XREF	Comments
3159.4+z ^h 12	J1+8	BC	
4149.3+z ^h 12	J1+10	BC	
5227.9+z ^h 12	J1+12	BC	
6395.7+z ^h 13	J1+14	BC	
7651.9+z ^h 13	J1+16	BC	
8995.2+z ^h 14	J1+18	BC	
10420.2+z ^h 17	J1+20	B	
11947.2+z ^h 20	J1+22	B	
u ⁱ	J2≈(16)	B	Additional information 3.
736.0+u ⁱ 10	J2+2	B	
1541.0+u ⁱ 11	J2+4	B	
2410.6+u ⁱ 11	J2+6	B	
3291.6+u ⁱ 12	J2+8	B	
4210.0+u ⁱ 13	J2+10	B	
5207.5+u ⁱ 14	J2+12	B	
6282.8+u ⁱ 15	J2+14	B	
7427.1+u ⁱ 16	J2+16	B	
8628.5+u ⁱ 19	J2+18	B	
9884.3+u ⁱ 21	J2+20	B	
11207.9+u ⁱ 23	J2+22	B	
12617+u ⁱ 3	J2+24	B	
14125+u ⁱ 3	J2+26	B	
15734+u ⁱ 3	J2+28	B	

[†] The assignments for high-spin states (J>4) are based on $\gamma\gamma(\theta)$ data for selected transitions and on band assignments.

[‡] Possible allowed $\varepsilon+\beta^+$ transition from 0^+ favors 1^+ .

Band(A): $\pi h_{11/2} \nu g_{7/2}$, $\alpha=0$.

@ Band(a): $\pi h_{11/2} \nu g_{7/2}$, $\alpha=1$.

& Band(B): $\pi h_{11/2} \nu h_{11/2}$, $\alpha=0$.

^a Band(b): $\pi h_{11/2} \nu h_{11/2}$, $\alpha=1$.

^b Band(C): Band based on 20^+ .

^c Band(D): Chiral doublet partner of $\pi h_{11/2} \nu h_{11/2}$, $\alpha=0$. (2001Ko30).

^d Band(d): Chiral doublet partner of $\pi h_{11/2} \nu h_{11/2}$, $\alpha=1$. (2001Ko30).

^e Band(E): Highly-deformed (decoupled) band, $\alpha=1$. (1999Ko21,1998Pe06,1994Ha28,1988Sh17).

Configuration= $\pi h_{11/2} \nu (f_{7/2}+h_{9/2})$ (1999Ko21), $\pi h_{11/2}^3 \nu (f_{7/2}+h_{9/2})$ (1998Pe06). The orbital $h_{11/2}$ corresponds to $3/2[541]$, and $f_{7/2}+h_{9/2}$ to $1/2[541]$. $Q(\text{intrinsic})=4.1 \text{ } 3$, $\beta_2=0.24 \text{ } 1$ (1999Ko21). Percent population ≈ 9 (1998Pe06). 1998Pe06 proposed that this band and SD-3 band are signature partners, but this conclusion is not confirmed by 1999Ko21.

^f Band(F): SD-1 band (1998Pe06,1997Ha05). Band is built on $\pi 9/2[404] \nu 1/2[660]$ configuration. $Q(\text{transition})=7.0 \text{ } 7$ (2002La09,2001Ri20). Percent population ≈ 1.4 (1998Pe06,1997Ha05).

^g Band(G): SD-2 band (1998Pe06,1997Ha05). Band is built on $\pi 9/2[404] \nu 1/2[660]$ configuration. $Q(\text{transition})=7.0 \text{ } 7$ (2002La09,2001Ri20). Percent population ≈ 1.4 (1998Pe06,1997Ha05).

^h Band(H): SD-3 band (1998Pe06,1997Ha05). Configuration= $\pi h_{11/2}^3 \nu (f_{7/2}+h_{9/2})$, $\alpha=0$ as signature partner of decoupled band starting at 1174.8+x is not confirmed by 1999Ko21. Percent population ≈ 1.4 (1998Pe06), ≈ 1.2 (1997Ha05).

ⁱ Band(I): SD-4 band (1998Pe06). Percent population ≈ 2.4 .

Adopted Levels, Gammas (continued)

E _i (level)	J ^π _i	E _γ	I _γ	E _f	J ^π _f	Mult.	γ(¹³² Pr)		Comments
							α [‡]		
98.0+x	(6 ⁻)	40		58.0+x (6 ⁺)					
		98		0+x (5 ⁺)					
145.3+x	(7 ⁻)	47		98.0+x (6 ⁻)					
		58		87.5+x (6 ⁺)					
147.72	1 ⁺	147.7 2	100	0.0 (2) ⁺		M1	0.436		α(K)=0.372; α(L)=0.0509; α(M)=0.0107; α(N+..)=0.00292
261.2+x	(8 ⁻)	116.1 2	100	145.3+x (7 ⁻)		D			
		163		98.0+x (6 ⁻)					
284.53	(1,2) ⁻	136.9 2	100 4	147.72 1 ⁺		E1	0.106		α(K)=0.091; α(L)=0.0124; α(M)=0.00259; α(N+..)=0.00068
		284.5 2	65 4	0.0 (2) ⁺		E1	0.0149		α(K)=0.0128; α(L)=0.00169; α(M)=0.00035
288.16	(0 to 3) ⁺	140.6 2	100 8	147.72 1 ⁺		M1	0.501		α(K)=0.427; α(L)=0.0585; α(M)=0.0123; α(N+..)=0.00336
		288.2 2	55 7	0.0 (2) ⁺		M1,E2	0.064 7		α(K)=0.053 8; α(L)=0.0087 6; α(M)=0.00186 16; α(N+..)=0.00050 4
342.90	(0 to 3) ⁺	195.2 1	100 13	147.72 1 ⁺		M1,E2	0.204		α(K)=0.163 9; α(L)=0.032 9; α(M)=0.0070 21; α(N+..)=0.0019 6
		342.8 3	14 7	0.0 (2) ⁺					
381.7+x	(7 ⁺)	236		145.3+x (7 ⁻)					
		283.7 2	100	98.0+x (6 ⁻)		D			
		294		87.5+x (6 ⁺)					
387.20	(0 to 3) ⁺	99.1 2	62 8	288.16 (0 to 3) ⁺		M1	1.35		α(K)=1.15; α(L)=0.158; α(M)=0.0332; α(N+..)=0.0091
									α(L)exp≤0.15.
		102.4 3	31 8	284.53 (1,2) ⁻		[E1]	0.237		α(K)=0.201; α(L)=0.0283; α(M)=0.00588; α(N+..)=0.00153
		239.6 3	100 15	147.72 1 ⁺		(M1,E2)	0.110 6		α(K)=0.090 9; α(L)=0.016 3; α(M)=0.0034 7; α(N+..)=0.00092 16
									α(K)exp=0.096 24 for 239.6+237.8.
405.3+x	(8 ⁺)	24 [#]		381.7+x (7 ⁺)					
		307		98.0+x (6 ⁻)					
405.82	(0 to 3) ⁺	117.9 2	100	288.16 (0 to 3) ⁺					
		122.0 4	†	284.53 (1,2) ⁻					
439.8+x	(9 ⁻)	178.5 2	100 10	261.2+x (8 ⁻)		D			
		294.2 2	22 2	145.3+x (7 ⁻)		Q			
468.6+x	(9 ⁺)	63		405.3+x (8 ⁺)					
501.34	(0 to 3) ⁺	96.0 3	†	405.82 (0 to 3) ⁺					
		213.3 2	100.0 24	288.16 (0 to 3) ⁺		M1,E2	0.156		α(K)=0.126 10; α(L)=0.024 6; α(M)=0.0051 13; α(N+..)=0.0014 4
		352.8 3	100 7	147.72 1 ⁺					
		501.4 3	33 9	0.0 (2) ⁺					
526.15	(0 to 3) ⁺	121.0 5	†	405.82 (0 to 3) ⁺					
		183.2 4	†	342.90 (0 to 3) ⁺					
		237.8 3	26.0 20	288.16 (0 to 3) ⁺		(M1,E2)	0.113 6		α(K)=0.092 9; α(L)=0.016 3; α(M)=0.0035 7; α(N+..)=0.00094 16
									α(K)exp=0.096 24 for 239.6+237.8.
		378.6 2	100 4	147.72 1 ⁺		M1,E2	0.030 5		α(K)=0.025 5; α(L)=0.00379 17; α(M)=0.00080 3; α(N+..)=0.00022 1
552.1+x	(7 ⁺)	146.8 6	100	405.3+x (8 ⁺)					

Adopted Levels, Gammas (continued)

$\gamma(^{132}\text{Pr})$ (continued)								
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	$\alpha^\ddagger$	Comments
567.49	(0 to 3 ⁺)	419.7 2	100	147.72	1 ⁺			
587.44	(0 to 3) ⁺	299.0 3	100	288.16	(0 to 3) ⁺	M1	0.0642	$\alpha(\text{K})=0.0549$; $\alpha(\text{L})=0.00738$; $\alpha(\text{M})=0.00155$; $\alpha(\text{N}+...)=0.00042$
598.3+x	(10 ⁺)	130.0 2	100	468.6+x	(9 ⁺)	D		
		192.8		405.3+x	(8 ⁺)			
630.42	(0 to 3 ⁺)	224.6 3	100 15	405.82	(0 to 3 ⁺)			
		482.7 3	<215	147.72	1 ⁺			
668.5+x	(10 ⁻)	228.6 2	100 10	439.8+x	(9 ⁻)	D		
		407.6 2	93 9	261.2+x	(8 ⁻)	Q		
714.94	1 ⁺	310.0 4	$\uparrow$	405.82	(0 to 3 ⁺)			
		372.0 4	3.2 9	342.90	(0 to 3) ⁺			
		426.8 2	12.0 9	288.16	(0 to 3) ⁺			
		430.4 2	61 4	284.53	(1,2) ⁻	E1	0.00533	$\alpha(\text{K})=0.00458$; $\alpha(\text{L})=0.00059$; $\alpha(\text{M})=0.00012$
		567.0 2	100.0 18	147.72	1 ⁺	M1	0.0126	$\alpha(\text{K})=0.0107$; $\alpha(\text{L})=0.00141$
724.83	(≤ 3)	137.1 3	$\uparrow$	587.44	(0 to 3) ⁺			
		199.1 3	35 8	526.15	(0 to 3) ⁺			
		319.0 4	$\uparrow$	405.82	(0 to 3 ⁺)			
		382.2 4	73 12	342.90	(0 to 3) ⁺			
		440.0 3	88 23	284.53	(1,2) ⁻			
		725.2 3	100 42	0.0	(2) ⁺			
806.7+x	(9 ⁺)	208.7 6	<50	598.3+x	(10 ⁺)			
		254.7 6	<50	552.1+x	(7 ⁺)			
		401.5 6	100 50	405.3+x	(8 ⁺)	D+Q		
854.9	(0 to 3 ⁺)	449.0 4	$\uparrow$	405.82	(0 to 3 ⁺)			
		707.2 3	100	147.72	1 ⁺			
861.23	(0 to 4 ⁻)	455.0 4	$\uparrow$	405.82	(0 to 3 ⁺)			
		576.8 2	100	284.53	(1,2) ⁻			
864.8+x	(11 ⁺)	266.7 2	100 10	598.3+x	(10 ⁺)	D		
		396.0 2	11.3 11	468.6+x	(9 ⁺)			
946.0+x	(11 ⁻)	277.3 2	68 7	668.5+x	(10 ⁻)	D		
		506.1 2	100 10	439.8+x	(9 ⁻)	Q		
981.85	(0 ⁺ to 3 ⁺)	257.4 3	10 3	724.83	(≤ 3)			
		414.2 3	28 3	567.49	(0 to 3 ⁺)			
		693.7 3	31 13	288.16	(0 to 3) ⁺			
		834.2 3	44 3	147.72	1 ⁺			
		981.3 4	100 7	0.0	(2) ⁺			
1105.4+x	(12 ⁺)	240.5 2	100 10	864.8+x	(11 ⁺)	D		
		507.1 2	54 5	598.3+x	(10 ⁺)	Q		
1175.1+x	(11 ⁺)	368.7 6	27 7	806.7+x	(9 ⁺)	Q		
		576.6 2	100 7	598.3+x	(10 ⁺)	D+Q		
		706.5 6	33 7	468.6+x	(9 ⁺)	Q		

Adopted Levels, Gammas (continued)

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

<u>E_i(level)</u>	<u>J_i^{π}</u>	<u>E_{γ}</u>	<u>I_{γ}</u>	<u>E_f</u>	<u>J_f^{π}</u>	<u>Mult.</u>	<u>Comments</u>
1194.2+x	(11 ⁺)	387.6		806.7+x	(9 ⁺)		
		595.8 2	100	598.3+x	(10 ⁺)	D	
		726.1		468.6+x	(9 ⁺)		
1258.0+x	(12 ⁻)	311.3 2	37 4	946.0+x	(11 ⁻)	D	
		589.8 2	100 10	668.5+x	(10 ⁻)	Q	A 192.7 γ with I γ =3.5 12 was reported from this level by 1988Sh17 , but not confirmed by 1998Pe05 .
1330.1	(0 to 3 ⁺)	1041.7 4	71 12	288.16	(0 to 3) ⁺		
		1045.7 4	100 12	284.53	(1,2) ⁻		
		1182.5 4	59 9	147.72	1 ⁺		
1440.7	(0 to 3 ⁺)	1293.0 5	100	147.72	1 ⁺		
1489.2+x	(13 ⁺)	383.7 2	100 10	1105.4+x	(12 ⁺)	D	
		624.3 2	40 3	864.8+x	(11 ⁺)	Q	
1500.7+x	(12 ⁺)	305.9		1194.2+x	(11 ⁺)		
		635.9 2	100	864.8+x	(11 ⁺)		
1610.7+x	(13 ⁻)	352.3 2	27 3	1258.0+x	(12 ⁻)	D	
		665.1 2	100 10	946.0+x	(11 ⁻)	Q	
1715.7+x	(13 ⁺)	521.6 2	35 4	1194.2+x	(11 ⁺)	Q	I γ : other: 15.2 15 (1994Ha28).
		540.6 2	100 8	1175.1+x	(11 ⁺)	Q	
1810.5+x	(14 ⁺)	321.2 2	85 8	1489.2+x	(13 ⁺)	D	
		705.2 2	100 10	1105.4+x	(12 ⁺)	Q	
1925.4+x	(13 ⁺)	424.7 2	100	1500.7+x	(12 ⁺)	Q	
1986.4+x	(14 ⁻)	376		1610.7+x	(13 ⁻)		
		728		1258.0+x	(12 ⁻)		
2263.8+x	(15 ⁺)	453		1810.5+x	(14 ⁺)		
		775		1489.2+x	(13 ⁺)		
2293.4+x	(14 ⁺)	368		1925.4+x	(13 ⁺)		
2376.3+x	(15 ⁺)	660.6 2	100	1715.7+x	(13 ⁺)	Q	
2393.5+x	(15 ⁻)	407		1986.4+x	(14 ⁻)		
		783		1610.7+x	(13 ⁻)		
2658.5+x	(16 ⁺)	395		2263.8+x	(15 ⁺)		
		848		1810.5+x	(14 ⁺)		
2811.5+x	(16 ⁻)	418		2393.5+x	(15 ⁻)		
		825		1986.4+x	(14 ⁻)		
3101.4+x	(16 ⁺)	808		2293.4+x	(14 ⁺)		
3121.1+x	(17 ⁺)	744.8 2	100	2376.3+x	(15 ⁺)	Q	
3143.2+x	(17 ⁺)	485		2658.5+x	(16 ⁺)		
		879		2263.8+x	(15 ⁺)		
3246.5+x	(17 ⁻)	435		2811.5+x	(16 ⁻)		
		853		2393.5+x	(15 ⁻)		
3600.3+x	(18 ⁺)	457		3143.2+x	(17 ⁺)		
		942		2658.5+x	(16 ⁺)		
3688.5+x	(18 ⁻)	442		3246.5+x	(17 ⁻)		

Adopted Levels, Gammas (continued)

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

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	Comments
3688.5+x	(18 ⁻)	877		2811.5+x	(16 ⁻)		
3913.5+x	(19 ⁺)	792.4 2	100	3121.1+x	(17 ⁺)	Q	
4074.3+x	(19 ⁺)	474		3600.3+x	(18 ⁺)		
		931		3143.2+x	(17 ⁺)		
4116.5+x	(19 ⁻)	870		3246.5+x	(17 ⁻)		
4563.3+x	(20 ⁺)	489		4074.3+x	(19 ⁺)		
		963		3600.3+x	(18 ⁺)		
4564.5+x	(20 ⁻)	876		3688.5+x	(18 ⁻)		
4566.3+x	(20 ⁺)	492		4074.3+x	(19 ⁺)		
		966		3600.3+x	(18 ⁺)		
4750.8+x	(21 ⁺)	837.3 2	100	3913.5+x	(19 ⁺)	Q	
4998.5+x	(21 ⁻)	882		4116.5+x	(19 ⁻)		
5003.3+x	(21 ⁺)	437		4566.3+x	(20 ⁺)		
		440		4563.3+x	(20 ⁺)		
		929		4074.3+x	(19 ⁺)		
5482.5+x	(22 ⁻)	918		4564.5+x	(20 ⁻)		
5525.3+x	(22 ⁺)	959		4566.3+x	(20 ⁺)		
5563.3+x	(22 ⁺)	1000		4563.3+x	(20 ⁺)		
5662.9+x	(23 ⁺)	912.1 2	100	4750.8+x	(21 ⁺)	Q	
5954.5+x	(23 ⁻)	956		4998.5+x	(21 ⁻)		
5958.3+x	(23 ⁺)	955		5003.3+x	(21 ⁺)		
6480.5+x	(24 ⁻)	998		5482.5+x	(22 ⁻)		
6588.3+x	(24 ⁺)	1063		5525.3+x	(22 ⁺)		
6625.3+x	(24 ⁺)	1062		5563.3+x	(22 ⁺)		
6672.0+x	(25 ⁺)	1009.1 5	100	5662.9+x	(23 ⁺)		
6985.3+x	(25 ⁺)	1027		5958.3+x	(23 ⁺)		
7006+x	(25 ⁻)	1051		5954.5+x	(23 ⁻)		
7583+x	(26 ⁻)	1102		6480.5+x	(24 ⁻)		
7746.3+x	(26 ⁺)	1158		6588.3+x	(24 ⁺)		
7784.2+x	(27 ⁺)	1112.2 5	100	6672.0+x	(25 ⁺)		
8086.3+x	(27 ⁺)	1101		6985.3+x	(25 ⁺)		
8994+x	(28 ⁺)	1248		7746.3+x	(26 ⁺)		
8997.8+x	(29 ⁺)	1213.6 5	100	7784.2+x	(27 ⁺)		
9231+x	(29 ⁺)	1145		8086.3+x	(27 ⁺)		
10304.3+x	(31 ⁺)	1306.5 6	100	8997.8+x	(29 ⁺)		
10319+x	(30 ⁺)	1325		8994+x	(28 ⁺)		
10404+x	(31 ⁺)	1173		9231+x	(29 ⁺)		
11589+x	(33 ⁺)	1185		10404+x	(31 ⁺)		
11708.3+x	(33 ⁺)	1404.0 6	100	10304.3+x	(31 ⁺)		
565.3+y	J+2	565.3 3		y	J≈(12)		Additional information 4.
865.8+y	J+3	301		565.3+y	J+2		
1206.3+y	J+4	341		865.8+y	J+3		

Adopted Levels, Gammas (continued)

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

$E_i(\text{level})$	J_i^π	E_γ	E_f	J_f^π	Comments
1206.3+y	J+4	641.0 3	565.3+y	J+2	Additional information 5.
1561.3+y	J+5	355	1206.3+y	J+4	
		695.5 3	865.8+y	J+3	Additional information 6.
1934.0+y	J+6	373	1561.3+y	J+5	
		727.6 3	1206.3+y	J+4	Additional information 7.
2326.1+y	J+7	392	1934.0+y	J+6	
		764.8 3	1561.3+y	J+5	Additional information 8.
2736.8+y	J+8	410	2326.1+y	J+7	
		802.9 3	1934.0+y	J+6	Additional information 9.
3166.8+y	J+9	431	2736.8+y	J+8	
		840.7 3	2326.1+y	J+7	Additional information 10.
3613.4+y	J+10	447	3166.8+y	J+9	
		876.5 3	2736.8+y	J+8	Additional information 11.
4079.0+y	J+11	465	3613.4+y	J+10	
		912.3 3	3166.8+y	J+9	Additional information 12.
4561.8+y	J+12	483	4079.0+y	J+11	
		948.3 3	3613.4+y	J+10	Additional information 13.
5063.6+y	J+13	501	4561.8+y	J+12	
		984.6 3	4079.0+y	J+11	Additional information 14.
5580.8+y	J+14	517	5063.6+y	J+13	
		1019.0 3	4561.8+y	J+12	Additional information 15.
6119.5+y	J+15	539	5580.8+y	J+14	
		1055.9 3	5063.6+y	J+13	Additional information 16.
6672.2+y	J+16	1091.4 3	5580.8+y	J+14	Additional information 17.
7246.9+y	J+17	1127.4 3	6119.5+y	J+15	Additional information 18.
7834.0+y	J+18	1161.8 3	6672.2+y	J+16	Additional information 19.
8446.8+y	J+19	1199.9 3	7246.9+y	J+17	Additional information 20.
9068.0+y	J+20	1234.0 3	7834.0+y	J+18	Additional information 21.
9720.6+y	J+21	1273.8 3	8446.8+y	J+19	Additional information 22.
10375.0+y	J+22	1307.0 3	9068.0+y	J+20	Additional information 23.
11069.1+y	J+23	1348.5 3	9720.6+y	J+21	Additional information 24.
11759.4+y	J+24	1384.4 3	10375.0+y	J+22	Additional information 25.
12496.5+y	J+25	1427.3 3	11069.1+y	J+23	Additional information 26.
13224.2+y	J+26	1464.8 3	11759.4+y	J+24	Additional information 27.
14004.6+y	J+27	1508.1 3	12496.5+y	J+25	Additional information 28.
709.0+z	J1+2	709 1	z	J1 $\approx$ (12)	
1447.3+z	J1+4	738.3 3	709.0+z	J1+2	Additional information 29.
2261.0+z	J1+6	813.7 3	1447.3+z	J1+4	Additional information 30.
3159.4+z	J1+8	898.4 3	2261.0+z	J1+6	Additional information 31.
4149.3+z	J1+10	989.9 3	3159.4+z	J1+8	Additional information 32.
5227.9+z	J1+12	1078.6 3	4149.3+z	J1+10	Additional information 33.
6395.7+z	J1+14	1167.8 3	5227.9+z	J1+12	Additional information 34.
7651.9+z	J1+16	1256.2 3	6395.7+z	J1+14	Additional information 35.

Adopted Levels, Gammas (continued)

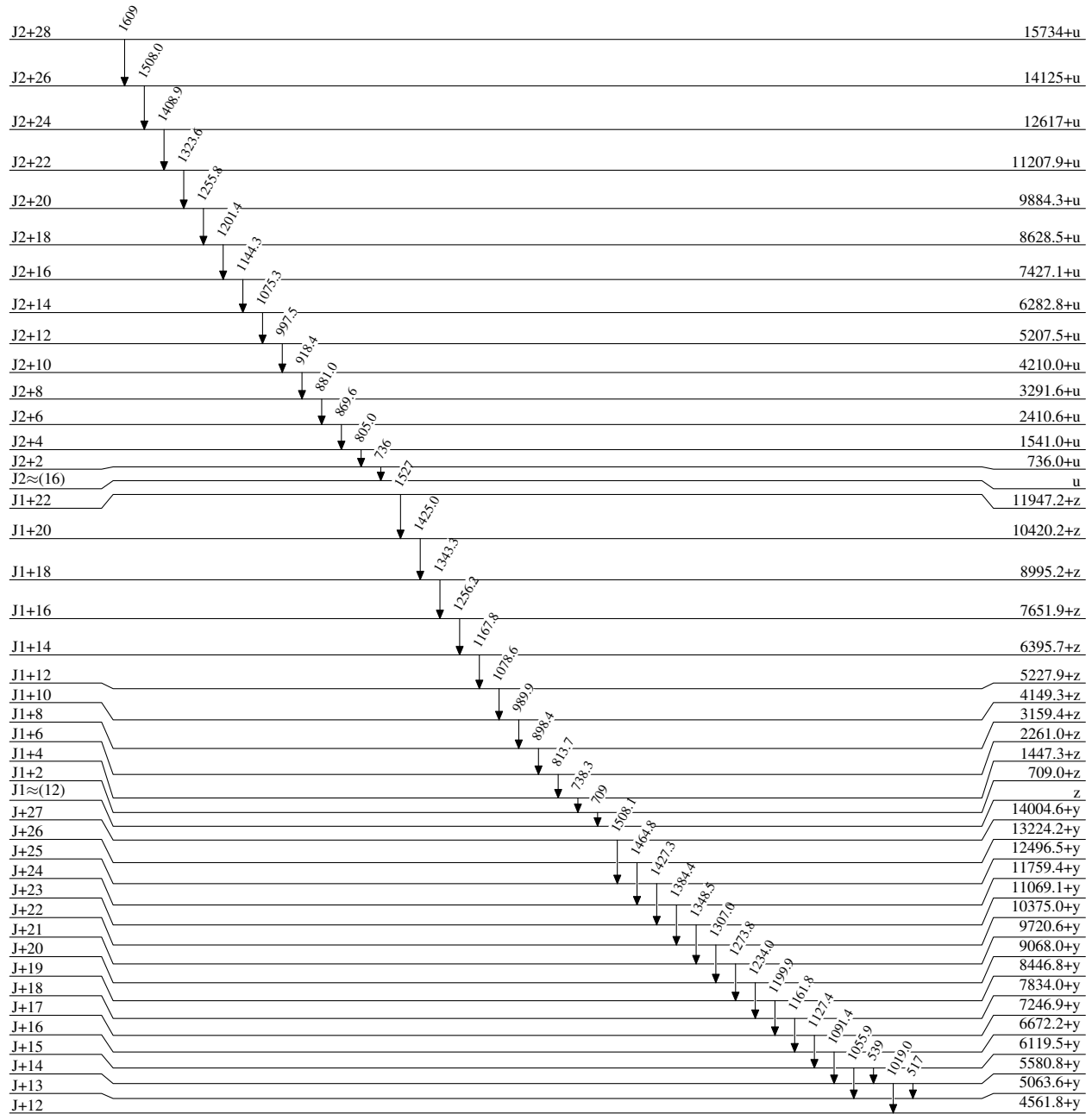
$\gamma(^{132}\text{Pr})$ (continued)

<u>E_i(level)</u>	<u>J^{π}_i</u>	<u>E_{γ}</u>	<u>E_f</u>	<u>J^{π}_f</u>	<u>Comments</u>
8995.2+z	J1+18	1343.3 3	7651.9+z	J1+16	Additional information 36.
10420.2+z	J1+20	1425.0 10	8995.2+z	J1+18	
11947.2+z	J1+22	1527 1	10420.2+z	J1+20	
736.0+u	J2+2	736 1	u	J2 $\approx$ (16)	
1541.0+u	J2+4	805.0 2	736.0+u	J2+2	
2410.6+u	J2+6	869.6 2	1541.0+u	J2+4	
3291.6+u	J2+8	881.0 5	2410.6+u	J2+6	
4210.0+u	J2+10	918.4 5	3291.6+u	J2+8	
5207.5+u	J2+12	997.5 5	4210.0+u	J2+10	
6282.8+u	J2+14	1075.3 5	5207.5+u	J2+12	
7427.1+u	J2+16	1144.3 5	6282.8+u	J2+14	
8628.5+u	J2+18	1201.4 10	7427.1+u	J2+16	
9884.3+u	J2+20	1255.8 10	8628.5+u	J2+18	
11207.9+u	J2+22	1323.6 10	9884.3+u	J2+20	
12617+u	J2+24	1408.9 10	11207.9+u	J2+22	
14125+u	J2+26	1508.0 10	12617+u	J2+24	
15734+u	J2+28	1609 1	14125+u	J2+26	

† Weak transition.
‡ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
Placement of transition in the level scheme is uncertain.

Adopted Levels, GammasLevel Scheme

Intensities: Relative photon branching from each level

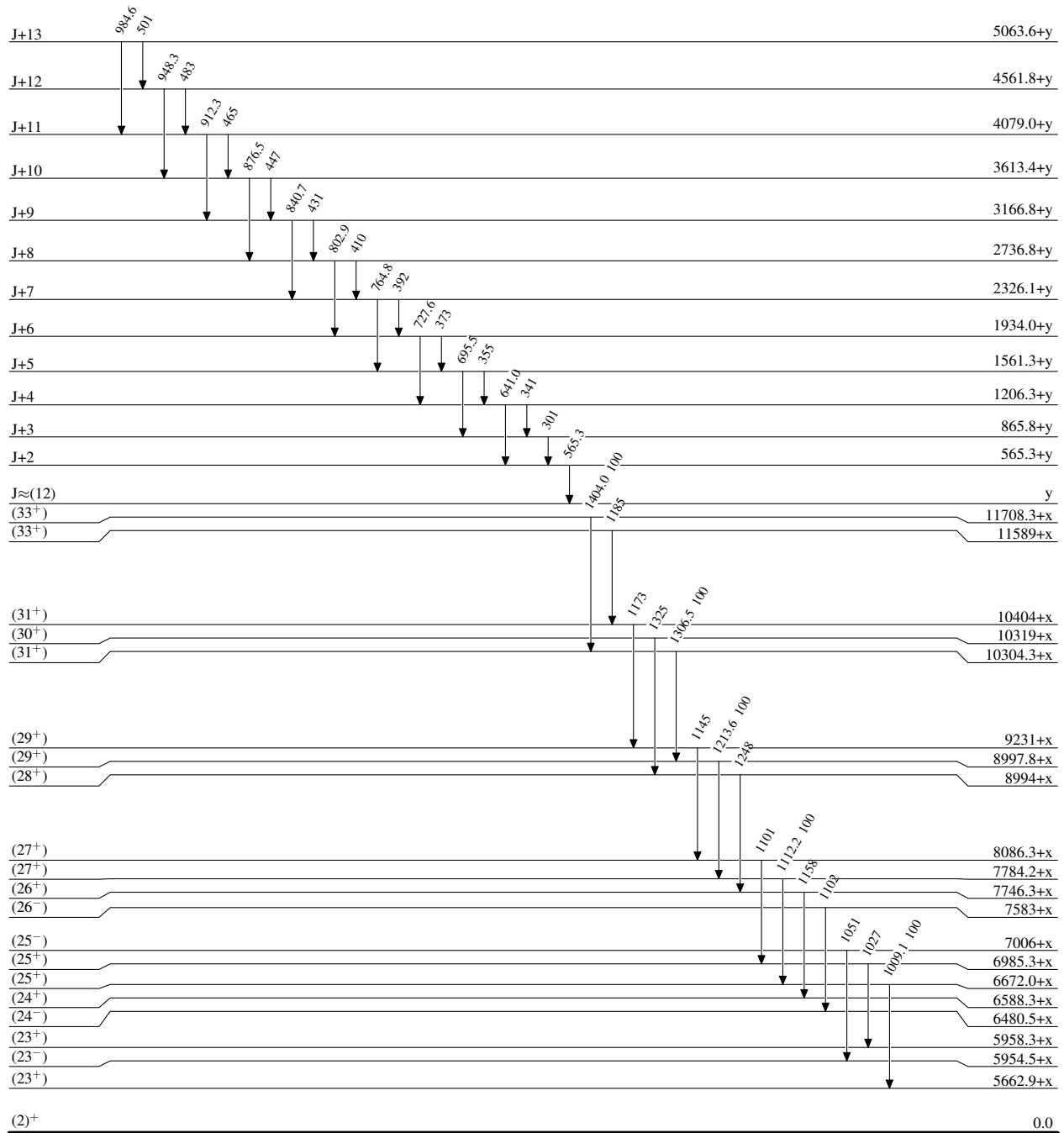
(2)⁺

0.0

1.6 min 3

Adopted Levels, Gammas**Level Scheme (continued)**

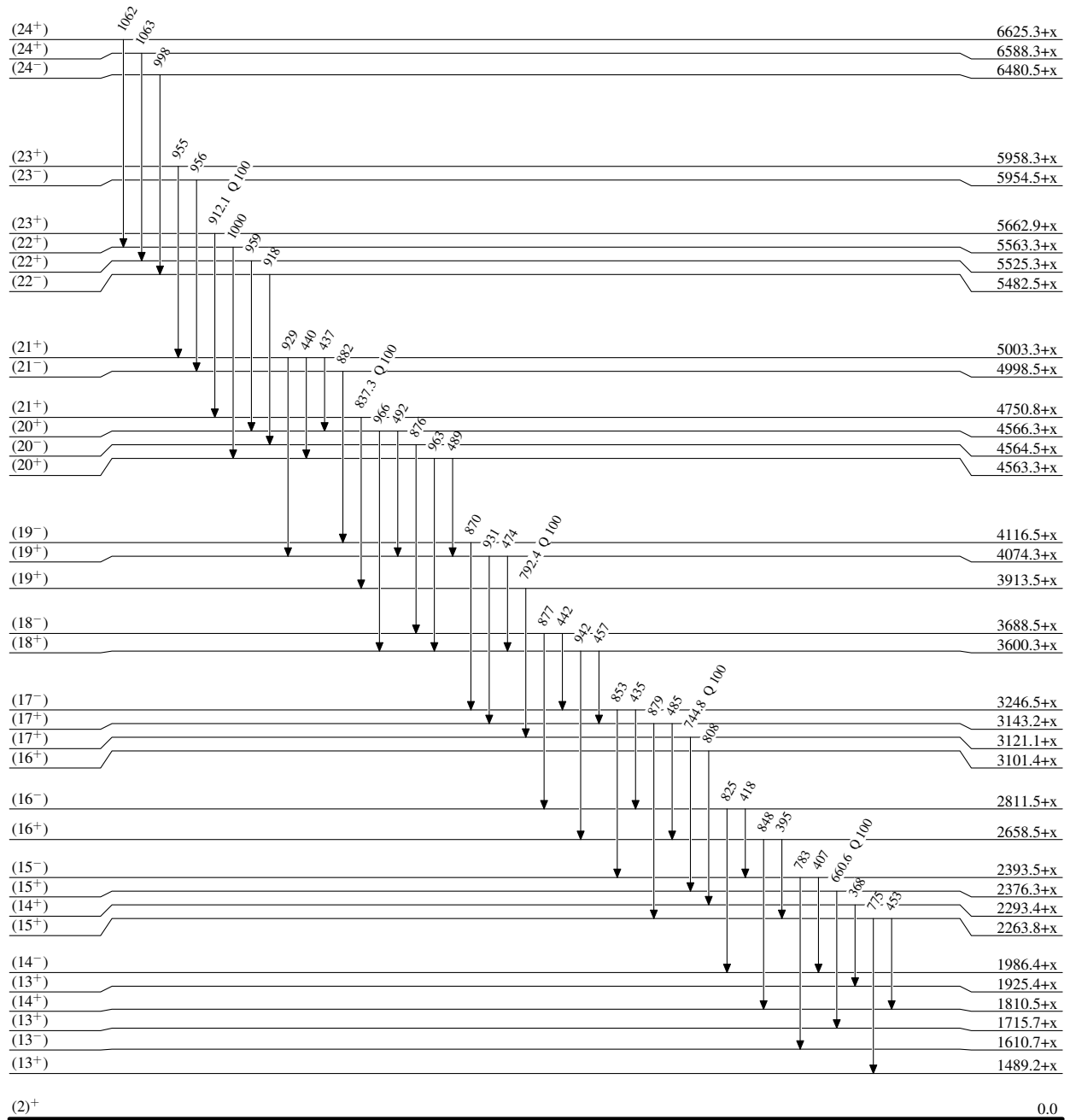
Intensities: Relative photon branching from each level



1.6 min 3

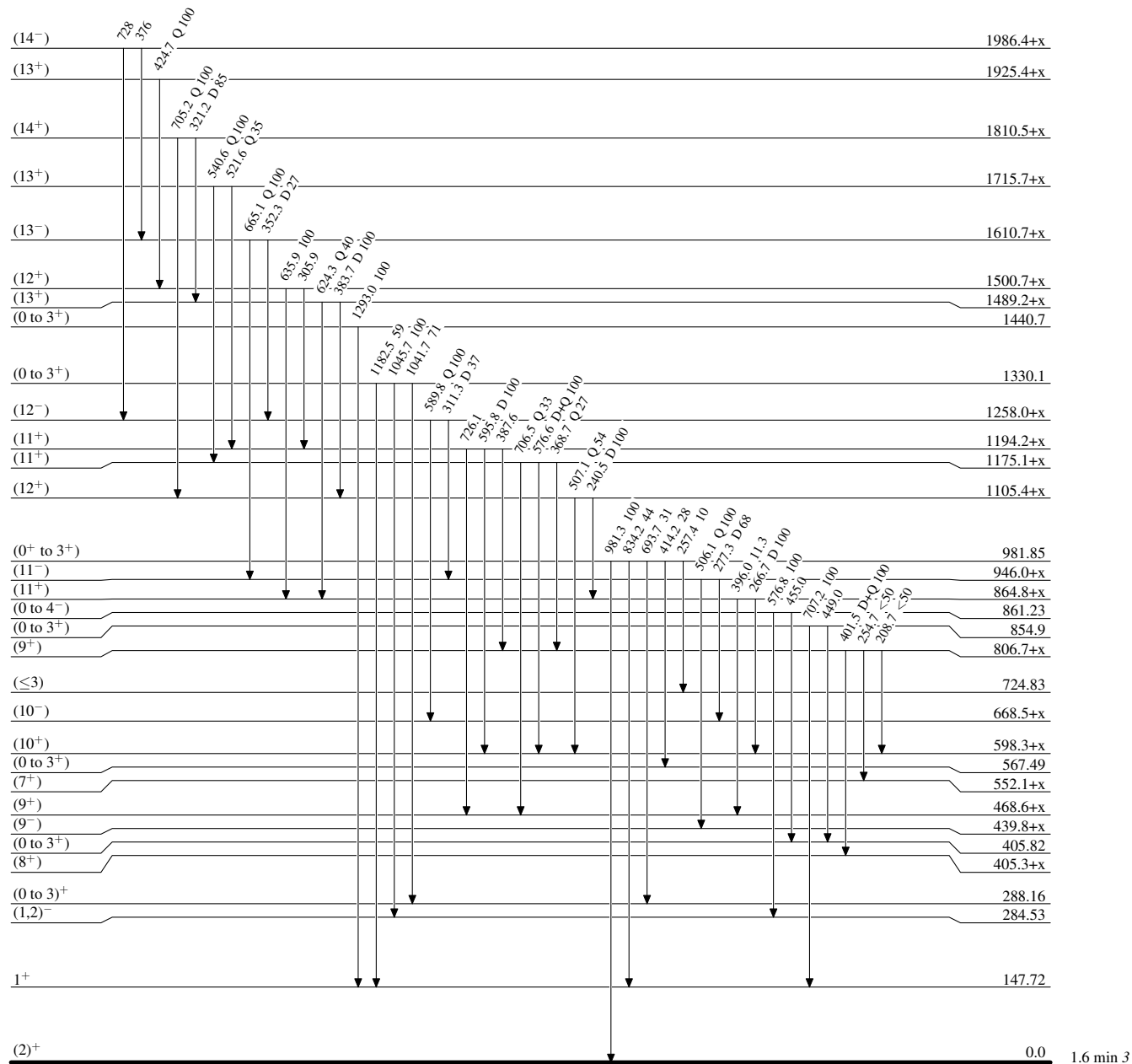
Adopted Levels, GammasLevel Scheme (continued)

Intensities: Relative photon branching from each level



Adopted Levels, GammasLevel Scheme (continued)

Intensities: Relative photon branching from each level

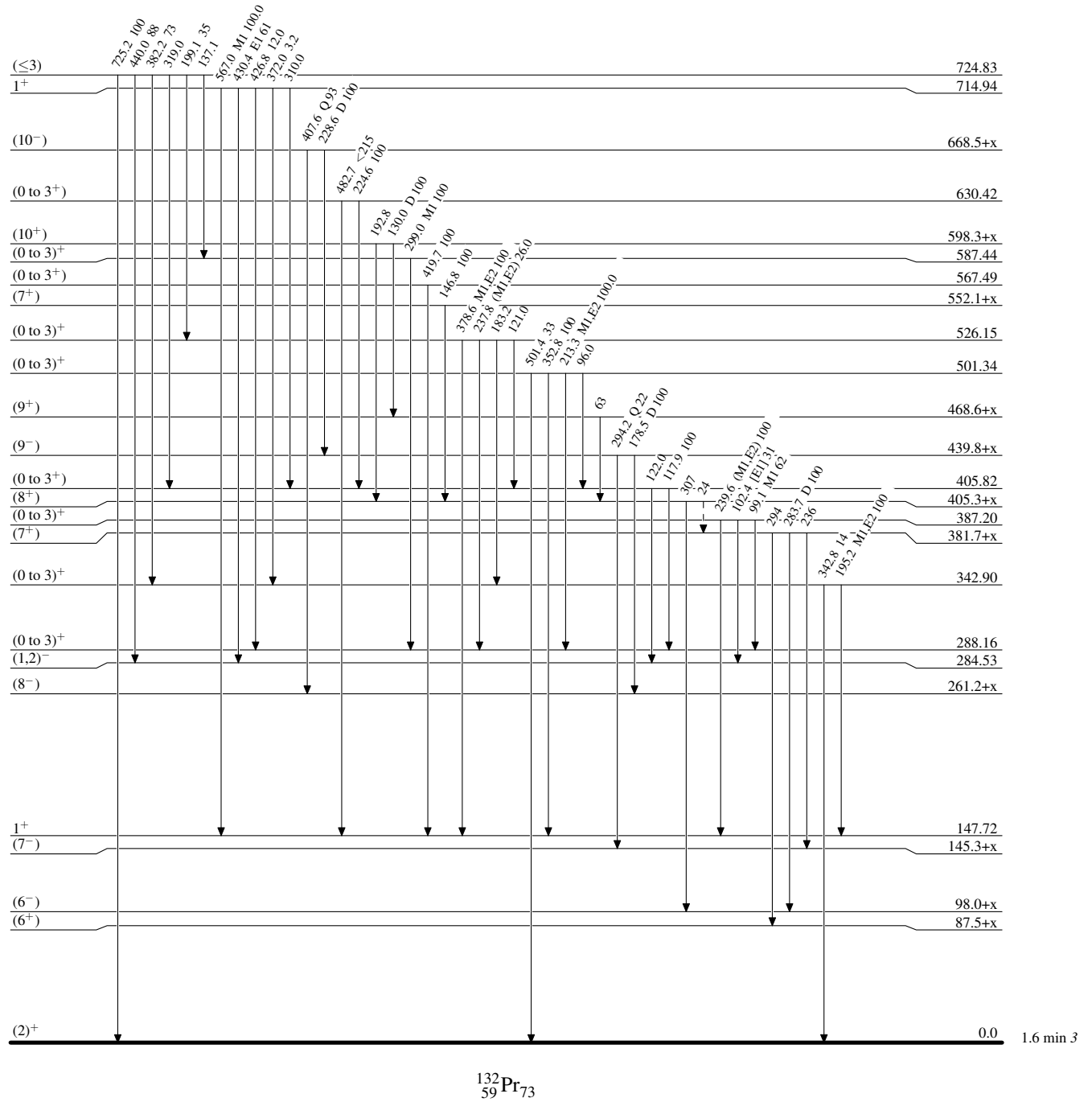


Adopted Levels, Gammas

Legend

Level Scheme (continued)

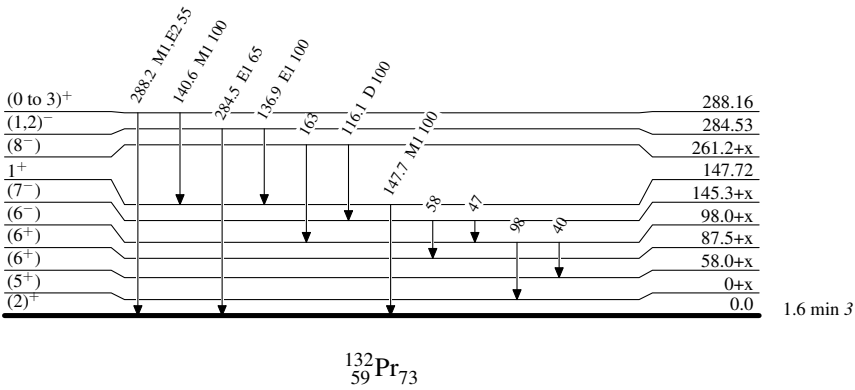
Intensities: Relative photon branching from each level

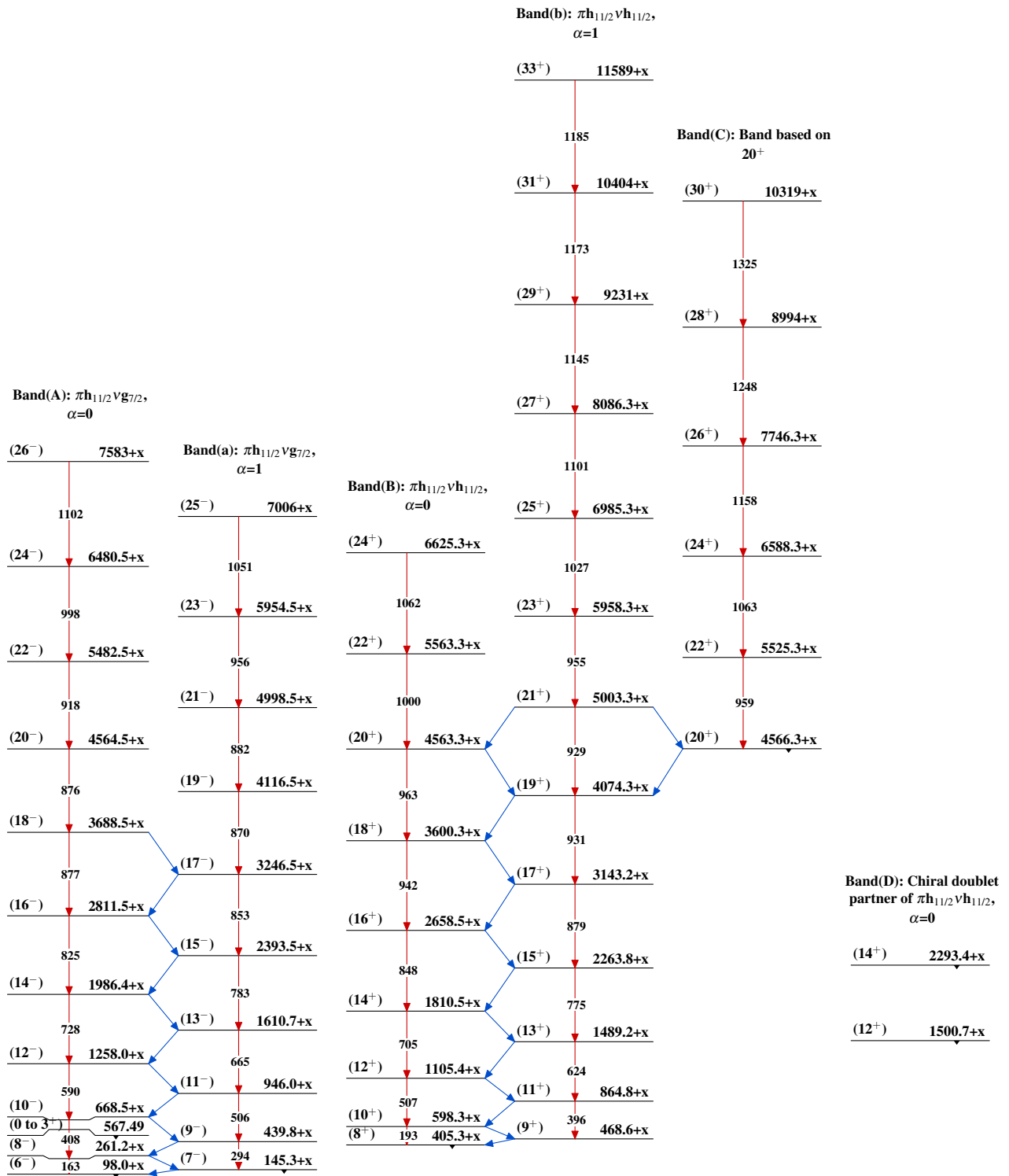
-----► γ Decay (Uncertain)

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Adopted Levels, Gammas (continued)

			Band(H): SD-3 band (1998Pe06, 1997Ha05)		
			J1+22	11947.2+z	
			J1+20	1527	10420.2+z
			J1+18	1425	8995.2+z
			J1+16	1343	7651.9+z
			J1+14	1256	6395.7+z
			J1+12	1168	5227.9+z
			J1+10	1079	4149.3+z
			J1+8	990	3159.4+z
			J1+6	898	2261.0+z
			J1+4	814	1447.3+z
			J1+2	738	709.0+z
			J1≈(12)	709	z
			Band(F): SD-1 band (1998Pe06,1997Ha05)		
			J+27	14004.6+y	
			J+25	1508	12496.5+y
			J+23	1427	11069.1+y
			J+21	1348	9720.6+y
			J+19	1274	8446.8+y
			J+17	1200	7246.9+y
			J+15	1127	6119.5+y
			J+13	1056	5063.6+y
			J+11	985	4079.0+y
			J+9	912	3166.8+y
			J+7	841	2326.1+y
			J+5	765	1561.3+y
			J+3	696	865.8+y
			Band(G): SD-2 band (1998Pe06,1997Ha05)		
			J+26	13224.2+y	
			J+24	1465	11759.4+y
			J+22	1384	10375.0+y
			J+20	1307	9068.0+y
			J+18	1234	7834.0+y
			J+16	1162	6672.2+y
			J+14	1091	5580.8+y
			J+12	1019	4561.8+y
			J+10	948	3613.4+y
			J+8	876	2736.8+y
			J+6	803	1934.0+y
			J+4	728	1206.3+y
			J+2	641	565.3+y
			J≈(12)	565	y
			Band(E): Highly-deformed (decoupled) band, α=1		
			(33 ⁺)	11708.3+x	
			(31 ⁺)	1404	10304.3+x
			(29 ⁺)	1306	8997.8+x
			(27 ⁺)	1214	7784.2+x
			(25 ⁺)	1112	6672.0+x
			(23 ⁺)	1009	5662.9+x
			(21 ⁺)	912	4750.8+x
			(19 ⁺)	837	3913.5+x
			(17 ⁺)	792	3121.1+x
			(15 ⁺)	745	2376.3+x
			(13 ⁺)	661	1715.7+x
			(11 ⁺)	541	1175.1+x
			Band(d): Chiral doublet partner of $\pi h_{11/2} \nu h_{11/2}$, α=1		
			(16 ⁺)	3101.4+x	
			(13 ⁺)	1925.4+x	
			(11 ⁺)	1194.2+x	

Adopted Levels, Gammas (continued)

Band(I): SD-4 band (1998Pe06)

<u>J2+28</u>		<u>15734+u</u>
	1609	
<u>J2+26</u>	▼	<u>14125+u</u>
	1508	
<u>J2+24</u>	▼	<u>12617+u</u>
	1409	
<u>J2+22</u>	▼	<u>11207.9+u</u>
	1324	
<u>J2+20</u>	▼	<u>9884.3+u</u>
	1256	
<u>J2+18</u>	▼	<u>8628.5+u</u>
	1201	
<u>J2+16</u>	▼	<u>7427.1+u</u>
	1144	
<u>J2+14</u>	▼	<u>6282.8+u</u>
	1075	
<u>J2+12</u>	▼	<u>5207.5+u</u>
	998	
<u>J2+10</u>	▼	<u>4210.0+u</u>
	918	
<u>J2+8</u>	▼	<u>3291.6+u</u>
	881	
<u>J2+6</u>	▼	<u>2410.6+u</u>
	870	
<u>J2+4</u>	▼	<u>1541.0+u</u>
	805	
<u>J2+2</u>	▼	<u>736.0+u</u>
<u>J2≈(16)</u>	▼	<u>u</u>

 $^{132}_{59}\text{Pr}_{73}$