Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 187,1 (2023)	12-Oct-2022

Q(β^-)=−1823.0 *28*; S(n)=9400 *6*; S(p)=5229.3 *12*; Q(α)=−1298.6 *22* 2021Wa16
S(2n)=17329 *4*, S(2p)=13370.1 *15* (2021Wa16).
Additional information 1.

^{141}Pr Levels

^{141}Pr has 59 protons and 82 neutrons which gives no valence neutrons above N=82 closed shell but 9 valence protons above Z=50 closed shell whose excitations are responsible for high-spin states J^π values.
Possible configurations ((^{7}Li,4nγ), 2015Li21): $\pi(g_{7/2}d_{5/2})^9$ up to $23/2^+$ and $\pi(g_{7/2}d_{5/2})^7h^2_{11/2}$ up to $45/2^+$ for positive-parity states; $\pi(g_{7/2}d_{5/2})^8h^1_{11/2}$ for negative-parity states.

Cross Reference (XREF) Flags

A	^{141}Ce β^- decay	H	^{140}Ce(p,p),(pol p,p) IAR	O	^{141}Pr(n,n′γ)
B	^{141}Nd ε decay (2.49 h)	I	^{140}Ce(d,n)	P	^{141}Pr(d,d′),(α,α′)
C	^{141}Nd ε decay (62.0 s)	J	^{140}Ce(^{3}He,d)	Q	Coulomb excitation
D	^{145}Pm α decay	K	^{140}Ce(^{7}Li,^{6}He)	R	^{142}Ce(p,2nγ)
E	^{138}Ba(^{7}Li,4nγ)	L	^{140}Ce(^{16}O,^{15}N)	S	^{142}Nd(d,^{3}He)
F	^{139}La(^{3}He,n)	M	^{141}Pr(γ,γ′)	T	^{144}Nd(p,α)
G	^{139}La(α,2nγ)	N	^{141}Pr(γ,n),(γ,p),(e,e′)	U	^{142}Nd(e,e′p)

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	XREF	Comments
0.0	$5/2^+$	stable	ABCDE GHIJKLMNOPQRSTU	μ=+4.2754 *5* (1982Ma31,2014StZZ) Q=−0.077 *6* (1994Ii01,2016St14) μ: by optical double resonance method. Q: by collinear fast-beam laser spectroscopy; others: −0.0589 *42* (atomic beam) and −0.024 (1978LeZA). J$^\pi$: L=2 in (^{3}He,d), atomic beam (1976Fu06). <r^2>$^{1/2}$: 4.8919 fm *50* (2013An02, compilation); 5.19 fm *22* in (e,e′p) (1993La16).
145.4434 *14*	$7/2^+$	1.85 ns *3*	ABC EFG IJK M OPQRSTU	μ=+2.95 *9* (2014StZZ) μ: by Mossbauer effect method (re-evaluated by 2014StZZ); others: 2.8 *2* (1971Ka08), +3.1 *2* (1973Gr15), +2.78 *+12−6* (1971Be11). $T_{1/2}$: ^{141}Ce β^- decay (1966Bl08). Others from ^{141}Ce β^- decay: 1.82 ns *4* (1972Ga39), 1.91 ns *6* (1968Ra02), 1.83 ns *4* (1967Ba27); from (n,n′γ): >1.23 ps (2008Sc17). J$^\pi$: L=4 in (^{3}He,d), γ to $5/2^+$ is M1+E2. Radius(rms)=5.21 fm *20* in (e,e′p) (1993La16).
1117.67 *6*	$11/2^-$	4.8 ns *1*	C E G IJK M OP RSTU	μ=+6.2 *4* (1984Go12,2014StZZ) μ: from $\gamma(\theta$,H,t) in (α,2nγ) (1984Go12); other: +7.2 *4* (1974Ej01). $T_{1/2}$: from (α,2nγ) (1981Pr09). Others: 4.8 ns *3* (p,2nγ) (1981Ko16), 5.1 ns *3* (α,2nγ) (1975Fr18), 4.80 ns *25* (α,2nγ) (1973Ej02), 4.6 ns *1* (α,2nγ) (1984Go12), >0.76 ps (n,nγ) (2008Sc17). J$^\pi$: L=5 in (^{3}He,d), γ to $5/2^+$ is E3, γ to $7/2^+$ is M2. Radius(rms)=5.64 fm *22* in (e,e′p) (1993La16).
1126.83 *10*	$3/2^+$	>188[@] fs	B G M O QR	J$^\pi$: γ to $5/2^+$ is ΔJ=1 M1+E2, log *ft*=6.4 via $3/2^+$ parent.

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Adopted Levels, Gammas (continued)

^{141}Pr Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
1292.69 *9*	(5/2)$^+$	0.33[@] ps *+10–7*	B G M O QR	Jπ: γ to 5/2$^+$ is M1+E2, log *ft*=6.2 via 3/2$^+$ parent, γγ(θ) for 1147γ in Coul. ex. (1980An22).
1298.71 *14*	1/2$^+$	0.34[@] ps *+22–10*	B G IJKL OP RSTU	Jπ: γ to 5/2$^+$ is E2, L=0 in (^{3}He,d); contradicts with A_2=−0.10 *5* in (p,2nγ) for γ to 5/2$^+$. Radius(rms)=4.93 fm *24* in (e,e′p) (1993La16).
1436.12 *12*	3/2$^+$	0.23[@] ps *+8–5*	B G M OP R	Jπ: γ(θ) for γ from 5/2$^+$ 7632 resonance in (γ,γ′), γ to 7/2$^+$.
1452.36 *9*	(7/2)$^+$	0.31[@] ps *+11–7*	BC G M OP R	Jπ: γ(θ) for γ from 5/2$^+$ 7632 resonance in (γ,γ′), γ to 7/2$^+$ is M1+E2 and is much stronger than γ to 5/2$^+$. This eliminates the possibility of J=3/2 allowed by γ(θ) in (γ,γ′).
1455.5 *3*	$^+$		G	Jπ: L=2 in (α,α′). Suggested (7/2$^+$).
1457.36 *10*	9/2$^+$	0.26[@] ps *+7–5*	E G M OP R	Jπ: γ to 7/2$^+$ is ΔJ=1, M1+E2. γ to 11/2$^-$. γ from 13/2$^+$.
1491.9			M	
1493.98 *12*	11/2$^+$	0.46[@] ps *+36–15*	EFG OPQR	Jπ: γ to 7/2$^+$ is ΔJ=2 E2, yield in (p,2nγ).
1510.3? *11*			M	
1520.89 *10*	9/2$^+$	150[@] fs *+19–16*	C E G M OP R	Jπ: γ to 5/2$^+$ is ΔJ=2 E2, γ to 11/2$^-$. $T_{1/2}$: other: 179 fs *22* (from B(E2)↑=0.057 *7*, 2007Sc18, (γ,γ′)).
1559.0 *10*			M	
1580.05 *10*	5/2$^-$	0.22[@] ps *+6–4*	B G M OPQR	Jπ: γ to 7/2$^+$ is E1, ε feeding from 3/2$^+$; π contradicts direct excitation observed in Coul. ex. (1980An22).
1596.6? *12*			M	
1608.26 *18*	(3/2)$^+$	11.8[@] fs *7*	B G IJKLM OPQRST	Jπ: L=2 in (^{3}He,d) and (M1+E2) γ to 5/2$^+$ g.s.
1650.85 *11*	(9/2$^+$)	132[@] fs *+21–17*	G M OP R	Jπ: γ to 5/2$^+$ is (E2) and γ to 7/2$^+$ is (M1+E2). $T_{1/2}$: other: 159 fs *13* (from B(E2)↑=0.040 *4*, 2007Sc18, (γ,γ′)).
1657.07 *16*	1/2$^+$	>0.67[@] ps	B IJ M O R T	Jπ: L=0 in (^{3}He,d),(d,n).
1666?			M	
1767.36 *13*	13/2$^+$	>0.37[@] ps	E G OP R	Jπ: γ to 11/2$^-$ is ΔJ=1 E1, γ to 11/2$^+$ is ΔJ=1 M1+E2; no γ to <11/2. 1994De56 suggest 11/2$^+$.
1786.47 *14*	(5/2$^+$)	0.19[@] ps *+5–4*	M O QR	Jπ: γ′s to 3/2$^+$ and 7/2$^+$ are (M1+E2).
1796.21 *16*	15/2$^+$	1.0 ns *1*	E G OP R	μ=+8.0 *17* (1984Go12,2014StZZ) μ: from γ(θ,H,t) in (α,2nγ) (1984Go12). Jπ: γ to 11/2$^+$ is ΔJ=2 E2; no γ′s to J<11/2. $T_{1/2}$: from (α,2nγ); other: >10.4 fs (n,n′γ).
1812.37 *14*	(9/2$^+$)	0.8[@] ps *+12–3*	OP R	Jπ: γ to 5/2$^+$ is (E2) and γ to 7/2$^+$ is (M1+E2).
1816			M	
1842.14 *14*	(7/2$^+$)	0.70[@] ps *+59–22*	G M OP R	Jπ: (M1+E2) γ′s to 5/2$^+$, 7/2$^+$, and 9/2$^+$.
1849.0 *10*			M	
1853.79 *12*	(11/2$^+$)	0.8[@] ps *+16–3*	G O R	Jπ: γ to 7/2$^+$ is (E2) and γ to 9/2$^+$ is (M1+E2).
1910.49? *20*			O	
1912.9 *8*			G M	
1943.3 *11*			M	
1975.26 *15*	(3/2$^+$)	0.39[@] ps *+19–10*	M O R	XREF: M(1981). Jπ: γ to 5/2$^-$ is (E1) and γ to 7/2$^+$ is (E2).
1986.08 *16*	(13/2$^+$)	>0.42[@] ps	E G O R	Jπ: γ to 9/2$^+$ is (E2) and γ to 11/2$^-$ is (E1) with mult in (p,2nγ).
2000.27 *22*	(13/2$^-$)	0.13[@] ps *+11–5*	O	Jπ: γ to 11/2$^-$ is (M1+E2).

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Adopted Levels, Gammas (continued)

^{141}Pr Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	S	XREF	Comments
2000.47# *15*	$(9/2)^-$	0.22@ ps *+12−6*		C OP R	Jπ: γ to $7/2^+$ is (E1), γ to $9/2^+$ is (E1), and γ to $11/2^-$; π=− from L=3 in (α,α′).
2003.84 *23*	$(11/2^+)$	0.7@ ps *+10−3*		OP R	Jπ: γ to $7/2^+$ is (E2) and γ to $9/2^+$ is (M1+E2).
2006.9 *11*				M	
2018.12 *15*	$(3/2^+)$	0.40@ ps *+26−12*		M O	XREF: M(2016). Jπ: γ′s to $5/2^+$ and $1/2^+$ are (M1+E2).
2045.11 *16*	$9/2^+$	0.68@ ps *+86−25*		O	Jπ: γ to $7/2^+$ is M1+E2 and γ from $11/2^+$ is M1+E2.
2068.84 *15*	$17/2^+$			E G R	Jπ: γ to $15/2^+$ is ΔJ=1 M1+E2, no γ to $<13/2^+$.
2075.50 *12*	$(5/2^+)$	0.22@ ps *+9−6*		O	Jπ: γ′s to $3/2^+$ and $7/2^+$ are (M1+E2).
2100.91 *25*	$(3/2^+,5/2^+)$	0.17@ ps *+7−4*		O	Jπ: γ′s to $3/2^+$ and $5/2^+$ are (M1+E2).
2105.02# *18*	$(5/2^-)$	87@ fs *+15−11*		M OP R	Jπ: L=3 in (α,α′) and γ′s to $5/2^+$ and $7/2^+$ are (E1).
2105.5 *3*	$(7/2^-,15/2^-)$	0.15@ ps *+49−8*		O	Jπ: γ to $11/2^-$ is (E2).
2106.2 *7*	$(5/2^-)$		1.0 *3*	M	
2108.20 *23*	$15/2^{(+)}$	>28@ fs		E G O R	Jπ: γ to $13/2^+$ is ΔJ=1 (M1), γ to $15/2^+$ is ΔJ=0 (M1).
2126.10 *15*	$(11/2^+)$	>114@ fs		O R	Jπ: γ to $7/2^+$ is (E2) and γ to $9/2^+$ is (M1+E2).
2135.51 *21*	$(7/2^-)$	0.27@ ps *+11−7*		M O	Jπ: γ′s to $5/2^+$, $7/2^+$, and $9/2^+$ are (E1).
2154.5 *4*	$(1/2^+,3/2,5/2^+)$			O	Jπ: γ′s to $1/2^+$ and $(5/2)^+$ in (n,n′γ).
2171.86 *25*	$(5/2^-,7/2^-,9/2^-)$	101@ fs *+18−15*		O R	Jπ: γ to $7/2^+$ is (E1).
2178 *10*	$(5/2^-)$			P	Jπ: L=3 in (α,α′), γ′s to $7/2^+$ and $3/2^+$.
2188.15 *20*	$(3/2^+)$	0.26@ ps *+24−9*		O	Jπ: γ to $7/2^+$ is (E2) and γ to $5/2^+$ is (M1+E2).
2190.36 *20*	$(1/2^-)$	>215@ fs		O	Jπ: γ to $5/2^+$ is (M2) and γ to $(7/2^+)$ is (E3).
2205.96 *21*	$(11/2^+)$	171@ fs *+40−28*		O R	Jπ: γ to $7/2^+$ is (E2) and γ to $11/2^+$ is (M1+E2).
2228.84 *14*	$(5/2^+,7/2^+)$	0.7@ ps *+61−4*		O	Jπ: γ′s to $5/2^+$ and $7/2^+$ are (M1+E2).
2230.3 *4*				O	Jπ: suggested $13/2^+$,$15/2^+$ in (n,n′γ) (1994De56).
2234 *5*	3/2			M	Jπ: from γ(θ) for γ from $5/2^+$ resonance 7632 in (γ,γ′).
2243.15 *16*				G O R	Jπ: suggested $13/2^+$ in (n,n′γ) (1994De56).
2247.7 *4*	$(3/2^-,5/2^-)$	147@ fs *+35−25*		M O	Jπ: γ′s to $3/2^+$ and $5/2^+$ are (E1).
2254.0 *18*	$^+$			OP	Jπ: L=2 in (α,α′). Suggested $1/2^+$,$3/2^+$ in (n,n′γ) (1994De56).
2264.49 *17*	$(3/2^+)$	0.18@ ps *+10−7*		O	Jπ: γ to $7/2^+$ is (E2) and γ to $1/2^+$ is (M1+E2).

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Adopted Levels, Gammas (continued)

^{141}Pr Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
2267.20 *18*	(1/2+)	>184@ fs	F M O	XREF: F(2280)M(2272). Jπ: γ to 5/2+ is (E2) and γ to 3/2+ is (M1+E2).
2270.1 *10*			M	
2296.0 *10*			M	
2302.6 *4*	(5/2+,7/2+,9/2+)	0.25@ ps *+15−7*	O	Jπ: γ to 7/2+ is (M1+E2) and γ to (5/2)+.
2310.0 *11*			M	
2315.65 *20*	(5/2,7/2)	130@ fs *+35−24*	OP	Jπ: L=3 in (α,α′); suggested 3/2−,5/2−,7/2− in (n,n′γ) (1994De56), but 5/2+,7/2+ in (n,n′γ) (2008Sc17).
2336.54# *21*	(15/2−)	>28@ fs	O	Jπ: γ to 11/2− is (E2) and γ to 9/2+ is (E3).
2341.0 *11*			M	
2345.87 *15*	(9/2+)	0.21@ ps *+26−8*	O	Jπ: γ to 11/2− is (E1) and γ to 5/2+ is (E2).
2353.7 *19*			M O	Jπ: suggested 1/2− in (n,n′γ) (1994De56).
2362.85 *20*	(5/2−)	39@ fs *+10−8*	O	Jπ: γ′s to 3/2+ and 7/2+ are (E1).
2364.8? *8*			O	Jπ: suggested as 7/2+ in (n,n′γ).
2382.2# *3*	(9/2−,11/2−)	0.24@ ps *+28−9*	C OP R	Jπ: γ to 9/2+ is (E1) and γ to 11/2− is (M1+E2).
2399.28? *22*			O	Jπ: suggested 11/2+,13/2+ in (n,n′γ) (1994De56).
2403.13 *24*	(9/2+)	0.49@ ps *+85−20*	O	Jπ: γ to 5/2+ is (E2) and γ to 7/2+ is (M1+E2).
2419.9 *3*	(9/2+)	0.5@ ps *+17−2*	O	Jπ: γ to 5/2+ is (E2) and γ to 11/2+ is (M1+E2).
2453.1 *3*	(3/2−,5/2−)	18.7@ fs *+35−28*	M O	Jπ: γ′s to 3/2+ and 5/2+ are (E1).
2454.20 *22*	(15/2+)	>94@ fs	O	Jπ: γ to 11/2+ is (E2) and γ to 13/2+ is (M1+E2).
2461.79 *21*	(5/2+)	136@ fs *+57−33*	O	Jπ: γ′s to 3/2+ and 7/2+ are (M1+E2).
2473.2? *3*	(1/2−,9/2−)	>14@ fs	O	Jπ: γ to 5/2− is (E2).
2480			M	
2499.08? *22*			O	Jπ: suggested 13/2+ in (n,n′γ) (1994De56).
2499.76 *25*	(5/2+,7/2+,9/2+)	102@ fs *+28−19*	M O	Jπ: γ to 7/2+ is (M1+E2).
2520.15 *21*	(3/2+)	0.2@ ps *+18−1*	M O	Jπ: γ to 7/2+ is (E2) and γ to 5/2+ is (M1+E2).
2563.9 *6*	(5/2−,7/2−)	55@ fs *+10−8*	M OP	Jπ: γ to 7/2+ is (E1) and γ from 5/2+.
2580.71 *16*	(11/2+)	>13@ fs	O	Jπ: γ to 7/2+ is (E2) and γ to 9/2+ is (M1+E2).
2583.0 *6*	(5/2−,7/2−,9/2−)	24@ fs *+7−6*	M OP	Jπ: γ to 7/2+ is (E1).
2586.1 *10*			M	
2601.2 *6*	(5/2−,7/2−)	59@ fs *+37−20*	M O	Jπ: γ′s to 7/2+ and 5/2+ are (E1).
2603.7 *6*	(5/2−,7/2−)	28@ fs *+12−9*	O	E(level): Possible doublet with 2601.2 level. Jπ: γ′s to 7/2+ and 5/2+ are (E1).
2607.1 *8*	(1/2+)	0.12@ ps *+11−5*	O	Jπ: γ to 5/2+ is (E2) and excitation function in (n,n′γ).
2609 *10*	+		P	Jπ: L=2 in (α,α′).
2611.7 *5*	(9/2+)	29@ fs *+5−4*	O	Jπ: γ to 5/2+ is (E2) and excitation

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Adopted Levels, Gammas (continued)

^{141}Pr Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
				function in (n,n′γ).
2623.2 *4*	(5/2+,7/2+)	72[@] fs *+19−14*	M O	Jπ: γ′s to 5/2+ and 7/2+ are (M1+E2).
2626.7? *3*	(15/2−)		E G R	Jπ: from comparison with isotone ^{143}Pm.
2646.4 *6*	(9/2+)	90[@] fs *+25−17*	M O	Jπ: γ to 5/2+ is (E2) and γ to 7/2+ is (M1+E2).
2659.6 *8*	(11/2+)	>156[@] fs	O	Jπ: γ′s to 7/2+ are (E2).
2669.02[#] *22*	(9/2−,11/2−,13/2−)	42[@] fs *+23−14*	O	Jπ: γ to 11/2+ is (E1). 2008Sc17 in (n,n′γ) adopted (13/2−) from (E3) γ to 7/2+ but this greatly exeeds RUL limits, reason for which (13/2−) is not adopted here.
2682.99 *24*	(5/2+)	0.22[@] ps *+22−8*	O	Jπ: γ′s to 3/2+ and 7/2+ are (M1+E2).
2692.0 *10*	−		M P	XREF: P(2984). Jπ: L=3 in (α,α′).
2699? *5*			M	
2707.9[#] *4*	(15/2−)	0.04[@] ps *+12−3*	O	Jπ: γ to 11/2− is (E2).
2710.1 *3*	(3/2+)	0.16[@] ps *+46−8*	O	Jπ: γ′s to 3/2+ and 1/2+ are (M1+E2) and excitation function in (n,n′γ).
2718.5[#] *4*	(9/2,11/2)	>159[@] fs	O	Jπ: γ′s to 9/2+ and 11/2−.
2722.4 *4*	(3/2+)	44[@] fs *+16−11*	M O	Jπ: γ′s to 1/2+ and 5/2+ are (M1+E2).
2731.4 *3*	(9/2+)	55[@] fs *+23−15*	O P	Jπ: γ to 5/2+ is (E2) and γ to 11/2+ is (M1+E2).
2739.7 *4*	(1/2−,9/2−)	>87[@] fs	O	Jπ: γ to 5/2− is (E2).
2749.58 *17*			R	
2777.5 *4*	(9/2)	44[@] fs *+12−9*	O	Jπ: γ to 7/2+ is D+Q and γ to 11/2+.
2782.4 *6*	(5/2+,7/2+)	0.15[@] ps *+10−5*	O	Jπ: γ′s to 5/2+ and 7/2+ are (M1+E2).
2782.7 *3*	(13/2+)	>51[@] fs	O	Jπ: γ to 9/2+ is (E2) and γ to 11/2+ is (M1+E2).
2786.2 *10*			M	
2801.77 *22*	(9/2+)	0.12[@] ps *+16−5*	O	Jπ: γ to 5/2+ is (E2) and γ to 7/2+ is (M1+E2).
2807.18 *18*	(3/2+,5/2,7/2+)	51[@] fs *+25−15*	M O	Jπ: γ′s to 5/2+ and 7/2+.
2810.70 *22*	(1/2+)	>76[@] fs	O	Jπ: γ to 5/2+ is (E2) and γ to 3/2+ is (M1+E2).
2814.0 *3*	(1/2−)	24[@] fs *+26−14*	O	Jπ: γ to 5/2− is (E2) and γ to 3/2+ is (E1).
2820 *10*			P	
2837.5 *7*	(5/2−,7/2−)	24[@] fs *+13−9*	M O	Jπ: γ′s to 5/2+ and 7/2+ are (E1).
2839.7 *4*	(9/2−)	56[@] fs *+48−23*	O	Jπ: (5/2−,7/2−,9/2−) from (E1) γ to 7/2+; (3/2,9/2,11/2) from excitation function in (n,n′γ).
2844.7 *4*	(3/2−)	45[@] fs *+90−28*	M O P	Jπ: γ to 5/2+ is (E1) and γ to 1/2+ is (E1). $T_{1/2}$: other: 0.01 eV (γ,γ′).
2847.5 *3*	(9/2+)	>97[@] fs	O	Jπ: γ to 5/2+ is (E2) and γ to 11/2+ is (M1+E2).
2863.4 *6*		0.06[@] ps *+150−4*	O	
2876 *10*			P	
2881.6 *4*	(7/2+)	>55[@] fs	O	Jπ: γ′s to 5/2+ and 9/2+ are (M1+E2).
2887.47[#] *25*	(7/2+,9/2,11/2+)	>24[@] fs	O	Jπ: γ′s to 7/2+ and 11/2+.

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Adopted Levels, Gammas (continued)

^{141}Pr Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
2896.8 *7*	(11/2$^+$)		O	Jπ: (5/2$^+$,7/2,9/2,11/2$^+$) from γ's to 7/2$^+$ and 9/2$^+$ and (11/2,13/2) from excitation function in (n,n′γ).
2927.25 *20*	19/2$^-$		E G P R	Jπ: γ to 17/2$^+$ is ΔJ=1 E1, no γ to levels with J<17/2.
2929.2 *5*	(5/2$^+$,7/2$^+$)	0.08@ ps *+14−4*	O	Jπ: γ's to 5/2$^+$ and 7/2$^+$ are (M1+E2).
2941.4 *6*			OP	
2950.5 *6*	(1/2$^+$)		M O	Jπ: (1/2$^+$,3/2,5/2,7/2$^+$) from γ's to 3/2$^+$ and 5/2$^+$ and (1/2) from excitation function in (n,n′γ).
2954.0 *10*			M	
2962.65 *24*	19/2$^+$		E G	Jπ: γ to 17/2$^+$ is ΔJ=1 M1+E2, no γ to levels with J<15/2.
2983.5 *4*	(5/2$^-$,7/2$^-$)		M O	Jπ: (3/2$^+$,5/2,7/2,9/2$^+$) from γ's to 5/2$^+$ and 7/2$^+$; (5/2$^-$,7/2$^-$) more probable in (n,n′γ) (2008Sc17) based on excitation function and decay behavior.
2986 *10*	$^+$		P	Jπ: L=2 in (α,α′).
3000.75 *23*	(11/2$^+$)		O	Jπ: (5/2$^+$,7/2,9/2,11/2$^+$) from γ's to 7/2$^+$ and 9/2$^+$; (11/2$^+$) more probable in (n,n′γ) (2008Sc17) based on excitation function and decay behavior.
3016.3 *5*	(5/2$^-$)		M O	Jπ: (3/2$^+$,5/2,7/2$^+$) from γ's to 3/2$^+$ and 7/2$^+$; (5/2$^-$) more probable in (n,n′γ) (2008Sc17) based on excitation function and decay behavior.
3016.88 *25*	21/2$^+$		E G	Jπ: γ to 17/2$^+$ is ΔJ=2 E2, no γ to levels with J<17/2.
3018.95 *22*	21/2$^-$	0.2 ns *1*	E G	$T_{1/2}$: from (α,2nγ) (1981Pr09). Jπ: γ to 19/2$^-$ is ΔJ=1 M1+E2 and based on syst that favours 21/2$^-$ adopted in (^{7}Li,4nγ) and not 17/2$^-$ adopted in (α,2nγ).
3034.3 *6*	(1/2$^+$)		O	Jπ: (1/2$^+$,3/2,5/2$^+$) from γ's to 1/2$^+$ and 5/2$^+$; (1/2$^+$) more probable in (n,n′γ) (2008Sc17) based on excitation function and decay behavior.
3045.5 *6*	(11/2$^+$,9/2)		O	Jπ: (5/2$^+$,7/2,9/2,11/2$^+$) from γ's to 7/2$^+$ and 9/2$^+$; (11/2$^+$,9/2) more probable in (n,n′γ) (2008Sc17) based on excitation function and decay behavior.
3057.0 *10*			M	
3064.5 *5*	(7/2$^+$,9/2$^-$)		O	Jπ: γ's to 5/2$^-$ and 11/2$^+$.
3075.5 *9*	(3/2$^+$)		M O	Jπ: (3/2$^+$,5/2,7/2,9/2$^+$) from γ's to 5/2$^+$ and 7/2$^+$; (3/2$^+$) more probable in (n,n′γ) (2008Sc17) based on excitation function and decay behavior.
3080.0 *5*			O	
3083.5 *9*	(5/2)	0.02 eV	M O	Jπ,$T_{1/2}$: from (γ,γ′).
3114.8 *12*			O	
3128.6 *5*			M OP	
3155.5 *6*			M O	
3203.3 *7*	$^-$		F M P	Jπ: L(^{3}He,n)=3.
3206.0 *10*			M	
3255.0 *10*			M	
3272.3 *7*			M	
3294.0 *10*			M	
3324.3 *7*			M	
3338.0 *10*			M	
3346.0 *10*			M	
3348.8 *7*	(7/2)	0.05 eV	M P	Jπ,$T_{1/2}$: from (γ,γ′).
3370.0 *10*			M	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{141}Pr Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
3376.0 *10*			M	
3396.7 *3*	21/2$^-$		E G	Jπ: γ to 19/2$^+$ is ΔJ=1 E1, no γ to levels with J<19/2.
3417.3 *7*			M	
3427.3 *7*			M P	
3449.0 *10*			M	
3470.9 *3*	23/2$^-$		E G	Jπ: γ to 21/2$^+$ is ΔJ=1 E1, no γ to levels with J<21/2$^+$.
3494.8 *7*			M	
3508.0 *10*			M	
3526.6 *3*	23/2$^-$		E G	Jπ: γ to 21/2$^-$ is M1+E2 and γ from 27/2$^-$ is Q.
3581.0 *10*			M	
3585.5 *4*	23/2$^+$	0.2 ns *1*	E G	$T_{1/2}$: from (α,2nγ) (1981Pr09). Jπ: γ to 21/2$^+$ is ΔJ=1 M1, no γ to levels with J<21/2; maximum alignment of $\pi(g_{7/2}d_{5/2})^9$ configuration.
3590 *20*			P	
3643.1 *10*			M	
3643.3 *4*			G	
3659.1 *10*			M	
3706.1 *10*			M	
3761.1 *10*			M	
3773.1 *10*			M	
3791.1 *10*			M	
3812.1 *10*			M	
3829.1 *10*			M	
3879.3 *7*			M	
3913.1 *10*			M	
4187.8 *6*	(23/2$^+$)		E	Jπ: γ to 21/2$^+$ is D+Q and possible configuration. Possible configuration=$\pi(g_{7/2}d_{5/2})^9 \otimes \nu(f_{7/2}h^{-1}_{11/2})$ in (^{7}Li,4nγ) (2015Li21).
4296.7 *5*	25/2$^{(-)}$		E	Jπ: γ to 21/2$^-$ is Q and γ to 23/2$^+$ is D+Q; π=− more likely.
4370.5 *3*	27/2$^-$		E G	Jπ: γ to 23/2$^-$ is E2.
4381.7 *5*	25/2$^{(-)}$		E	Jπ: γ to 21/2$^-$ is Q; π=− more likely.
4430.3 *5*	25/2$^{(-)}$		E	Jπ: γ to 23/2$^-$ is D+Q; tentative π=− based on $\pi(g_{7/2}d_{5/2})^8h^1_{11/2}$ configuration.
4546.9 *7*			E	
4592.0 *6*	(25/2$^-$)		E	Jπ: γ to 21/2$^-$ is (Q); π=− more likely.
4740.6 *4*	27/2$^{(-)}$		E G	Jπ: γ to 23/2$^-$ is Q; π=− more likely.
4826.8 *5*	25/2$^{(+)}$		E	Jπ: γ to 23/2$^+$ is D+Q; tentative π=+ based on $\pi(g_{7/2}d_{5/2})^7h^2_{11/2}$ configuration.
4907.0 *8*			E	
4988.5 *5*	29/2$^{(-)}$		E	Jπ: γ to 27/2$^-$ is D+Q; π=− more likely from γ to 25/2$^{(-)}$.
5039.9 *5*	29/2		E	Jπ: γ to 27/2$^-$ is D+Q.
5103.6 *6*	31/2$^{(-)}$		E	Jπ: γ to 27/2$^-$ is Q; π=− more likely.
5142.5 *6*	27/2$^{(+)}$		E	Jπ: γ to 25/2$^{(+)}$ is D+Q; tentative π=+ based on $\pi(g_{7/2}d_{5/2})^7h^2_{11/2}$ configuration.
5747.4 *9*	29/2$^{(+)}$		E	Jπ: γ to 27/2$^{(+)}$ is D+Q; tentative π=+ based on $\pi(g_{7/2}d_{5/2})^7h^2_{11/2}$ configuration.
6116.0 *5*	7/2$^{(+)}$	0.052 eV *10*	M	Jπ: γ(θ) for γ's to 5/2$^+$ and 7/2$^+$, γ to 3/2$^+$ in (γ,γ′). $T_{1/2}$: Γ from 1979Mo19, 1972Wo21.
6239.6 *9*	(35/2$^-$)		E	Jπ: based on possible configuration=$\pi(g_{7/2}d_{5/2})^8h^1_{11/2}$ with maximum angular momentum of 35/2$^-$.
6878.6 *4*	7/2$^+$	0.085 eV *10*	M	Jπ: γ(θ) and polarization of 6877γ M1 in (γ,γ′) (1972Wo21). $T_{1/2}$: Γ from (1979Mo19).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{141}Pr Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
7186.5 *6*	5/2		M	Jπ: γ(θ) in (γ,γ′) (1971Pa01).
7255.8 *5*	$5/2^-$	0.29 eV *3*	M	Jπ: γ(θ) and polarization of 7256γ E1 in (γ,γ′) (1972Wo21). $T_{1/2}$: Γ from (1979Mo19,1974Wo05).
7630.7 *10*	$5/2^+$	0.090 eV *+40−10*	M	$T_{1/2}$: Γ from 1979Mo19. Other: 0.133 eV *23* (1969Mo11). Jπ: γ(θ) and polarization of 7632γ M1 in (γ,γ′) (1972Wo21).
7915.2 *10*	$5/2^+$	0.007 eV *3*	M	Jπ: γ(θ) and polarization of 7915γ M1 in (γ,γ′) (1972Wo21). $T_{1/2}$: Γ from (1974Wo05,1979Mo19).
8880.5 *5*	(5/2,7/2)		M	Jπ: γ′s to $7/2^+$ and $3/2^+$.
9751	$7/2^-$&	60 keV	H	$T_{1/2}$: resonance Γ from 1965Vo03.
10405	$3/2^-$&	84 keV	H	$T_{1/2}$: resonance Γ from 1965Vo03.
10882	$1/2^-$&	91 keV	H	Jπ: from polarization in (p,p) (1968Ve07), L=1 in (p,p′). $T_{1/2}$: resonance Γ from 1965Vo03.
11100?	$(9/2^-)$&		H	
11251	$(5/2)^-$&	77 keV	H	$T_{1/2}$: resonance Γ from 1965Vo03.
11493?	$(5/2^-)$&	100 keV	H	$T_{1/2}$: resonance Γ from 1965Vo03.

† From least-squares fit to Eγ. χ^2 norm =1.63 greater than χ^2 critical=1.20.

‡ Based on specific arguments as given in comments. Most J^π values were adopted from the (n,n′γ) dataset based on measured γ-ray multipolarities and $T_{1/2}$′s, and calculations. For levels from (α,2nγ) monotonic increase of J>9/2 with increasing E was supported by observation or non observation of crossover γ′s and excitation functions. For levels from (^{7}Li,4nγ) deduced configurations were used in J^π assignments.

Possible member of $h_{11/2}\otimes 2^+$ multiplet (n,n′γ).

@ From (n,n′γ) (2008Sc17, DSAM).

& L in (p,p), analogs to the lowest states in ^{141}Ce.

Adopted Levels, Gammas (continued)

$\gamma(^{141}Pr)$

Additional information 2.

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	δ[#]	α[@]	Comments
145.4434	$7/2^+$	145.4433 *14*	100	0.0	$5/2^+$	M1+E2	+0.069 *7*	0.449 *6*	B(M1)(W.u.)=2.658×10^{-3} *44*; B(E2)(W.u.)=0.35 *+8−7* α(K)=0.383 *5*; α(L)=0.0529 *7*; α(M)=0.01115 *16* α(N)=0.002493 *35*; α(O)=0.000401 *6*; α(P)=2.93×10^{-5} *4* E_γ,I_γ,Mult.,δ: from β^- decay.
1117.67	$11/2^-$	972.14 *10*	100.0 *3*	145.4434	$7/2^+$	M2(+E3)	+0.17 *+9−8*	0.00832 *17*	B(M2)(W.u.)=0.238 *+7−10*; B(E3)(W.u.)=7 *+8−5* α(K)=0.00708 *15*; α(L)=0.000976 *18*; α(M)=0.000206 *4* α(N)=4.61×10^{-5} *9*; α(O)=7.44×10^{-6} *14*; α(P)=5.52×10^{-7} *12* E_γ: from (α,2nγ). δ: +0.17 *+9−8* or >+6 (n,n′γ) (second value excluded by RUL).
		1117.60 *11*	11.4 *3*	0.0	$5/2^+$	E3		0.00345 *5*	B(E3)(W.u.)=9.99 *32* α(N)=2.057×10^{-5} *29*; α(O)=3.26×10^{-6} *5*; α(P)=2.163×10^{-7} *30*; α(IPF)=1.217×10^{-7} *18* α(K)=0.00290 *4*; α(L)=0.000434 *6*; α(M)=9.24×10^{-5} *13* E_γ: from (α,2nγ). I_γ: from (n,n′γ). Other: 10.5 *12* (α,2nγ) (1975Fr18).
1126.83	$3/2^+$	981.1 *3*	2.77 *10*	145.4434	$7/2^+$	(E2)		2.22×10^{-3} *3*	α(K)=0.001890 *26*; α(L)=0.000257 *4*; α(M)=5.42×10^{-5} *8* α(N)=1.208×10^{-5} *17*; α(O)=1.928×10^{-6} *27*; α(P)=1.357×10^{-7} *19* B(E2)(W.u.)<2.12 I_γ: from (n,n′γ). Other: 2.7 *3* (ε decay (2.49 h)).
		1126.50 *21*	100.00 *10*	0.0	$5/2^+$	M1+E2	+0.47 *6*	0.00225 *4*	α(K)=0.00193 *4*; α(L)=0.000250 *5*; α(M)=5.24×10^{-5} *9* α(N)=1.172×10^{-5} *21*; α(O)=1.895×10^{-6} *35*; α(P)=1.431×10^{-7} *28*; α(IPF)=9.18×10^{-7} *14* B(M1)(W.u.)<0.068; B(E2)(W.u.)<8.12
1292.69	$(5/2)^+$	1146.90 *22*	66.7 *8*	145.4434	$7/2^+$	E2		1.60×10^{-3} *2*	B(E2)(W.u.)=7.9 *+22−18* α(K)=0.001366 *19*; α(L)=0.0001819 *25*; α(M)=3.82×10^{-5} *5*

$^{141}_{59}Pr_{82}$-9

Adopted Levels, Gammas (continued)

$\gamma(^{141}Pr)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
								B(E2)(W.u.)=7.9 *+22−18* α(K)=0.001366 *19*; α(L)=0.0001819 *25*; α(M)=3.82×10^{-5} *5* α(N)=8.52×10^{-6} *12*; α(O)=1.366×10^{-6} *19*; α(P)=9.83×10^{-8} *14*; α(IPF)=1.715×10^{-6} *26*
1292.69	(5/2)$^+$	1292.53 *22*	100.0 *8*	0.0	5/2$^+$	E2+M1	0.00151 *24*	α(K)=0.00128 *21*; α(L)=0.000166 *25*; α(M)=3.5×10^{-5} *5* α(N)=7.8×10^{-6} *12*; α(O)=1.26×10^{-6} *20*; α(P)=9.4×10^{-8} *17*; α(IPF)=1.987×10^{-5} *32*
1298.71	1/2$^+$	1298.44 *22*	100	0.0	5/2$^+$	E2	1.26×10^{-3} *2*	B(E2)(W.u.)=10.3 *+44−39* α(K)=0.001064 *15*; α(L)=0.0001398 *20*; α(M)=2.93×10^{-5} *4* α(N)=6.54×10^{-6} *9*; α(O)=1.051×10^{-6} *15*; α(P)=7.67×10^{-8} *11*; α(IPF)=2.081×10^{-5} *29*
1436.12	3/2$^+$	309.36 *21*	2.9 *15*	1126.83	3/2$^+$	(E2+M1)	0.052 *6*	α(K)=0.043 *6*; α(L)=0.00693 *30*; α(M)=0.00148 *9* α(N)=0.000328 *16*; α(O)=5.12×10^{-5} *10*; α(P)=3.1×10^{-6} *7*
		1290.67 *24*	100.0 *15*	145.4434	7/2$^+$	(E2)	1.28×10^{-3} *2*	B(E2)(W.u.)=8.2 *+23−22* α(K)=0.001077 *15*; α(L)=0.0001415 *20*; α(M)=2.97×10^{-5} *4* α(N)=6.62×10^{-6} *9*; α(O)=1.064×10^{-6} *15*; α(P)=7.76×10^{-8} *11*; α(IPF)=1.938×10^{-5} *27*
		1436.1 *3*	88.0 *15*	0.0	5/2$^+$	(E2+M1)	0.00125 *18*	α(K)=0.00103 *15*; α(L)=0.000132 *19*; α(M)=2.8×10^{-5} *4* α(N)=6.2×10^{-6} *9*; α(O)=1.00×10^{-6} *14*; α(P)=7.5×10^{-8} *12*; α(IPF)=5.69×10^{-5} *12*
1452.36	(7/2)$^+$	1306.63 *21*	100.0 *5*	145.4434	7/2$^+$	M1+E2	0.00148 *23*	α(K)=0.00125 *20*; α(L)=0.000162 *25*; α(M)=3.4×10^{-5} *5* α(N)=7.6×10^{-6} *12*; α(O)=1.23×10^{-6} *19*; α(P)=9.2×10^{-8} *16*; α(IPF)=2.26×10^{-5} *4* δ: +0.90 *+31−20* or −29 *+7−6* (n,n′γ).
		1452.20 *24*	22.6 *5*	0.0	5/2$^+$	(M1+E2)	0.00123 *17*	α(N)=6.0×10^{-6} *8*; α(O)=9.7×10^{-7} *14*; α(P)=7.3×10^{-8} *12*; α(IPF)=6.21×10^{-5} *13* α(K)=0.00100 *15*; α(L)=0.000129 *18*; α(M)=2.7×10^{-5} *4* δ: −5 *+2−6* or −0.48 *+12−26* (n,n′γ).
1455.5	$^+$	1455.5 *3*	100	0.0	5/2$^+$			E_γ: from (α,2nγ).
1457.36	9/2$^+$	339.15 *24*	1.23 *14*	1117.67	11/2$^-$	(E1)	0.00953 *13*	B(E1)(W.u.)=2.2×10^{-4} *+6−5* α(K)=0.00818 *12*; α(L)=0.001072 *15*; α(M)=0.0002244 *32* α(N)=4.99×10^{-5} *7*; α(O)=7.94×10^{-6} *11*; α(P)=5.53×10^{-7} *8*
		1311.83 *22*	100.0 *6*	145.4434	7/2$^+$	M1+E2	0.00147 *23*	α(K)=0.00124 *20*; α(L)=0.000161 *24*; α(M)=3.4×10^{-5} *5* α(N)=7.5×10^{-6} *11*; α(O)=1.22×10^{-6} *19*; α(P)=9.1×10^{-8} *16*; α(IPF)=2.36×10^{-5} *4* δ: −0.053 *+22−26* or +8.9 *+17−19* (n,n′γ).
		1457.42 *23*	35.0 *6*	0.0	5/2$^+$	(E2)	1.05×10^{-3} *2*	B(E2)(W.u.)=1.95 *+47−42*

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Adopted Levels, Gammas (continued)

$\gamma(^{141}Pr)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
								α(K)=0.000850 *12*; α(L)=0.0001103 *15*; α(M)=2.309×10^{-5} *32* α(N)=5.16×10^{-6} *7*; α(O)=8.30×10^{-7} *12*; α(P)=6.12×10^{-8} *9*; α(IPF)=6.27×10^{-5} *9*
1493.98	11/2$^+$	1348.51 *22*	100	145.4434	7/2$^+$	E2	1.18×10^{-3} *2*	B(E2)(W.u.)=6.3 *+31−26* α(N)=6.04×10^{-6} *8*; α(O)=9.72×10^{-7} *14*; α(P)=7.12×10^{-8} *10*; α(IPF)=3.16×10^{-5} *4* α(K)=0.000988 *14*; α(L)=0.0001292 *18*; α(M)=2.71×10^{-5} *4* E_γ: placed at 1494 level in Coul. ex. data.
1520.89	9/2$^+$	402.87 *23*	2.05 *11*	1117.67	11/2$^-$	(E1)	0.00624 *9*	B(E1)(W.u.)=4.6×10^{-4} *6* α(N)=3.25×10^{-5} *5*; α(O)=5.19×10^{-6} *7*; α(P)=3.66×10^{-7} *5* α(K)=0.00536 *8*; α(L)=0.000698 *10*; α(M)=0.0001461 *21*
		1375.56 *25*	11.7 *3*	145.4434	7/2$^+$	(E2+M1)	0.00135 *20*	α(K)=0.00112 *17*; α(L)=0.000145 *21*; α(M)=3.0×10^{-5} *4* α(N)=6.8×10^{-6} *10*; α(O)=1.10×10^{-6} *16*; α(P)=8.2×10^{-8} *14*; α(IPF)=3.90×10^{-5} *7*
		1520.98 *22*	100.0 *3*	0.0	5/2$^+$	E2	9.95×10^{-4} *14*	B(E2)(W.u.)=9.3 *11* α(K)=0.000783 *11*; α(L)=0.0001012 *14*; α(M)=2.119×10^{-5} *30* α(N)=4.73×10^{-6} *7*; α(O)=7.62×10^{-7} *11*; α(P)=5.64×10^{-8} *8*; α(IPF)=8.41×10^{-5} *12*
1559.0		1559	100	0.0	5/2$^+$			E_γ: from (γ,γ,).
1580.05	5/2$^-$	287.06 *22*	3.06 *14*	1292.69	(5/2)$^+$	(E1)	0.01455 *21*	B(E1)(W.u.)=0.00106 *24* α(K)=0.01247 *18*; α(L)=0.001647 *23*; α(M)=0.000345 *5* α(N)=7.66×10^{-5} *11*; α(O)=1.215×10^{-5} *17*; α(P)=8.33×10^{-7} *12*
		1434.54 *25*	100.0 *7*	145.4434	7/2$^+$	E1	6.31×10^{-4} *9*	B(E1)(W.u.)=2.8×10^{-4} *6* α(N)=2.323×10^{-6} *33*; α(O)=3.75×10^{-7} *5*; α(P)=2.84×10^{-8} *4*; α(IPF)=0.0001661 *23* α(K)=0.000402 *6*; α(L)=4.99×10^{-5} *7*; α(M)=1.040×10^{-5} *15*
		1580.06 *25*	35.8 *7*	0.0	5/2$^+$	(E1)	6.69×10^{-4} *9*	B(E1)(W.u.)=7.4×10^{-5} *16* α(K)=0.000342 *5*; α(L)=4.23×10^{-5} *6*; α(M)=8.81×10^{-6} *12* α(N)=1.969×10^{-6} *28*; α(O)=3.18×10^{-7} *4*; α(P)=2.414×10^{-8} *34*; α(IPF)=0.000274 *4*
1608.26	(3/2)$^+$	1608.20 *23*	100	0.0	5/2$^+$	(E2+M1)	0.00106 *12*	α(K)=0.00081 *11*; α(L)=0.000104 *13*; α(M)=2.17×10^{-5} *27* α(N)=4.8×10^{-6} *6*; α(O)=7.8×10^{-7} *10*; α(P)=5.9×10^{-8} *8*; α(IPF)=0.0001196 *32*
1650.85	(9/2$^+$)	532.6 *2*	12	1117.67	11/2$^-$	[E1]	0.00326 *5*	B(E1)(W.u.)=0.00125 *29* α(N)=1.680×10^{-5} *24*; α(O)=2.69×10^{-6} *4*; α(P)=1.939×10^{-7} *27* α(K)=0.00280 *4*; α(L)=0.000361 *5*; α(M)=7.54×10^{-5} *11* I_γ: from (γ,γ,).
		1506.1 *3*	8.58 *22*	145.4434	7/2$^+$	(E2+M1)	0.00116 *15*	α(K)=0.00093 *13*; α(L)=0.000119 *16*; α(M)=2.49×10^{-5} *33*

$^{141}_{59}Pr_{82}$-11

Adopted Levels, Gammas (continued)

$\gamma(^{141}Pr)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	δ[#]	α[@]	Comments
									α(N)=5.6×10^{-6} *8*; α(O)=9.0×10^{-7} *12*; α(P)=6.8×10^{-8} *10*; α(IPF)=8.04×10^{-5} *19*
									δ: −0.23 *6* or <−7.9 (n,n′γ).
1650.85	(9/2$^+$)	1651.39 *23*	100.00 *22*	0.0	5/2$^+$	(E2)		9.13×10^{-4} *13*	B(E2)(W.u.)=6.6 *+10−9*
									α(K)=0.000670 *9*; α(L)=8.60×10^{-5} *12*; α(M)=1.799×10^{-5} *25*
									α(N)=4.02×10^{-6} *6*; α(O)=6.48×10^{-7} *9*; α(P)=4.83×10^{-8} *7*; α(IPF)=0.0001343 *19*
1657.07	1/2$^+$	358.17 *23*	16.6 *8*	1298.71	1/2$^+$				
		530.03 *21*	100.0 *17*	1126.83	3/2$^+$	E2		0.00964 *14*	α(K)=0.00804 *11*; α(L)=0.001262 *18*; α(M)=0.000269 *4*
									α(N)=5.97×10^{-5} *8*; α(O)=9.30×10^{-6} *13*; α(P)=5.62×10^{-7} *8*
									B(E2)(W.u.)<223.96
		1657.5 *3*	93.9 *17*	0.0	5/2$^+$	(E2)		9.10×10^{-4} *13*	α(K)=0.000665 *9*; α(L)=8.54×10^{-5} *12*; α(M)=1.786×10^{-5} *25*
									α(N)=3.99×10^{-6} *6*; α(O)=6.43×10^{-7} *9*; α(P)=4.79×10^{-8} *7*; α(IPF)=0.0001368 *19*
									B(E2)(W.u.)<0.7
1767.36	13/2$^+$	273.38 *21*	23.1 *9*	1493.98	11/2$^+$	M1+E2	+0.08 *6*	0.0802 *11*	α(K)=0.0684 *10*; α(L)=0.00926 *13*; α(M)=0.001950 *28*
									α(N)=0.000436 *6*; α(O)=7.03×10^{-5} *10*; α(P)=5.21×10^{-6} *8*
									B(M1)(W.u.)<0.54; B(E2)(W.u.)<82.72
									Mult.,δ: from (α,2nγ).
									δ: −0.07 *+8−7* (n,n′γ).
		310.3 *3*	3.4 *1*	1457.36	9/2$^+$	(E2)		0.0455 *7*	α(K)=0.0364 *5*; α(L)=0.00714 *10*; α(M)=0.001547 *22*
									α(N)=0.000340 *5*; α(O)=5.13×10^{-5} *7*; α(P)=2.388×10^{-6} *34*
									E_γ,I_γ,Mult.: from (α,2nγ) (not seen in (n,n′γ)).
									B(E2)(W.u.)<338 upper limit exceeds RUL=300.
		649.62 *21*	100.0 *9*	1117.67	11/2$^-$	E1		2.11×10^{-3} *3*	α(K)=0.001816 *25*; α(L)=0.0002319 *33*; α(M)=4.84×10^{-5} *7*
									α(N)=1.080×10^{-5} *15*; α(O)=1.733×10^{-6} *24*; α(P)=1.266×10^{-7} *18*
									B(E1)(W.u.)<0.0019
									Mult.: from (α,2nγ).
1786.47	(5/2$^+$)	494.6 *3*		1292.69	(5/2)$^+$				
		658.8 *3*	4.9 *3*	1126.83	3/2$^+$	(E2+M1)		0.0070 *15*	α(K)=0.0060 *13*; α(L)=0.00082 *14*; α(M)=0.000173 *28*
									α(N)=3.9×10^{-5} *6*; α(O)=6.2×10^{-6} *11*; α(P)=4.4×10^{-7} *11*

$^{141}_{59}Pr_{82}$-12

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
								α(P)=4.4×10^{-7} *11*
1786.47	(5/2$^+$)	1640.9 *3*	46.7 *11*	145.4434	7/2$^+$	(E2+M1)	0.00103 *12*	α(K)=0.00078 *10*; α(L)=9.9×10^{-5} *12*; α(M)=2.08×10^{-5} *25* α(N)=4.6×10^{-6} *6*; α(O)=7.5×10^{-7} *9*; α(P)=5.7×10^{-8} *8*; α(IPF)=0.000133 *4*
		1786.40 *25*	100.0 *11*	0.0	5/2$^+$	(E2+M1)	0.00095 *9*	α(K)=0.00065 *7*; α(L)=8.3×10^{-5} *9*; α(M)=1.73×10^{-5} *19* α(N)=3.9×10^{-6} *4*; α(O)=6.3×10^{-7} *7*; α(P)=4.8×10^{-8} *6*; α(IPF)=0.000198 *6*
1796.21	15/2$^+$	28.9 *2*	57 *2*	1767.36	13/2$^+$	(M1)	7.30 *18*	B(M1)(W.u.)=0.090 *+10−9* α(L)=5.76 *14*; α(M)=1.216 *30* α(N)=0.272 *7*; α(O)=0.0436 *11*; α(P)=0.00317 *8* E_γ,I_γ: from (α,2nγ).
		302.6 *3*	100 *3*	1493.98	11/2$^+$	E2	0.0492 *7*	B(E2)(W.u.)=0.89 *+11−9* α(K)=0.0392 *6*; α(L)=0.00780 *11*; α(M)=0.001693 *24* α(N)=0.000372 *5*; α(O)=5.61×10^{-5} *8*; α(P)=2.57×10^{-6} *4* E_γ,I_γ: from (α,2nγ).
1812.37	(9/2$^+$)	359.74 *22*	15.3 *7*	1452.36	(7/2)$^+$	(E2+M1)	0.034 *5*	α(K)=0.028 *5*; α(L)=0.00437 *11*; α(M)=0.000931 *15* α(N)=0.000207 *4*; α(O)=3.25×10^{-5} *15*; α(P)=2.1×10^{-6} *5* δ: +0.11 *13* or +3.5 *+28−12* (n,n′γ).
		1667.13 *24*	100.0 *13*	145.4434	7/2$^+$	(E2+M1)	0.00102 *11*	α(K)=0.00075 *9*; α(L)=9.6×10^{-5} *12*; α(M)=2.01×10^{-5} *24* α(N)=4.5×10^{-6} *5*; α(O)=7.3×10^{-7} *9*; α(P)=5.5×10^{-8} *8*; α(IPF)=0.000145 *4* δ: +0.25 *4* or +2.3 *+4−3* (n,n′γ).
		1812.7 *3*	52.8 *12*	0.0	5/2$^+$	(E2)	8.58×10^{-4} *12*	B(E2)(W.u.)=0.26 *+16−12* α(N)=3.35×10^{-6} *5*; α(O)=5.41×10^{-7} *8*; α(P)=4.05×10^{-8} *6*; α(IPF)=0.0002046 *29* α(K)=0.000563 *8*; α(L)=7.18×10^{-5} *10*; α(M)=1.500×10^{-5} *21*
1842.14	(7/2$^+$)	384.8 *3*	1.9 *3*	1457.36	9/2$^+$	(E2+M1)	0.028 *5*	α(K)=0.024 *4*; α(L)=0.00358 *17*; α(M)=0.000762 *28* α(N)=0.000169 *7*; α(O)=2.66×10^{-5} *18*; α(P)=1.7×10^{-6} *4*
		389.8 *3*	1.4 *3*	1452.36	(7/2)$^+$	(E2+M1)	0.027 *5*	α(K)=0.023 *4*; α(L)=0.00345 *18*; α(M)=0.000733 *30* α(N)=0.000163 *8*; α(O)=2.57×10^{-5} *19*; α(P)=1.7×10^{-6} *4*
		1696.6 *3*	54.6 *11*	145.4434	7/2$^+$	(E2+M1)	0.00100 *11*	α(N)=4.3×10^{-6} *5*; α(O)=7.0×10^{-7} *8*; α(P)=5.3×10^{-8} *7*; α(IPF)=0.000158 *5* α(K)=0.00072 *9*; α(L)=9.2×10^{-5} *11*; α(M)=1.93×10^{-5} *23* δ: +0.52 *+28−21* or −2.8 *+1−4* (n,n′γ).
		1842.1 *3*	100.0 *11*	0.0	5/2$^+$	(E2+M1)	0.00094 *8*	α(K)=0.00061 *7*; α(L)=7.8×10^{-5} *8*; α(M)=1.63×10^{-5} *17* α(N)=3.6×10^{-6} *4*; α(O)=5.9×10^{-7} *6*; α(P)=4.5×10^{-8} *5*; α(IPF)=0.000225 *7* δ: −0.57 *+16−23* or −4.6 *+17−44* (n,n′γ).
1849.0		1849	100	0.0	5/2$^+$			E_γ: from (γ,γ,).

$^{141}_{59}Pr_{82}$-13

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
1853.79	(11/2$^+$)	332.66 *22*	1.1 *11*	1520.89	9/2$^+$	(E2+M1)	0.042 *6*	α(K)=0.035 *6*; α(L)=0.00554 *9*; α(M)=0.001182 *32* α(N)=0.000262 *6*; α(O)=4.10×10^{-5} *9*; α(P)=2.5×10^{-6} *6*
		396.51 *25*	6.3 *4*	1457.36	9/2$^+$	(E2+M1)	0.026 *4*	α(K)=0.022 *4*; α(L)=0.00328 *19*; α(M)=0.000697 *33* α(N)=0.000155 *8*; α(O)=2.44×10^{-5} *19*; α(P)=1.6×10^{-6} *4* δ: −0.31 *+14−16* or −5 *+2−11* (n,n′γ).
		1708.7 *3*	100.0 *4*	145.4434	7/2$^+$	(E2)	8.88×10^{-4} *12*	B(E2)(W.u.)=0.8 *+5−4* α(K)=0.000628 *9*; α(L)=8.05×10^{-5} *11*; α(M)=1.683×10^{-5} *24* α(N)=3.76×10^{-6} *5*; α(O)=6.06×10^{-7} *8*; α(P)=4.53×10^{-8} *6*; α(IPF)=0.0001584 *22*
		1853.8 *8*	32 *6*	0.0	5/2$^+$			
1910.49?		1764.5[&] *2*	72[‡]	145.4434	7/2$^+$			
		1910.5[&] *2*	100[‡]	0.0	5/2$^+$			
1912.9		145.7		1767.36	13/2$^+$			E_γ: from (α,2nγ).
		795.1		1117.67	11/2$^-$			E_γ: from (α,2nγ).
1975.26	(3/2$^+$)	394.52 *25*	3.7 *12*	1580.05	5/2$^-$	(E1)	0.00657 *9*	B(E1)(W.u.)=1.6×10^{-4} *+8−7* α(K)=0.00564 *8*; α(L)=0.000735 *10*; α(M)=0.0001538 *22* α(N)=3.42×10^{-5} *5*; α(O)=5.46×10^{-6} *8*; α(P)=3.85×10^{-7} *5*
		523.0 *3*	17 *1*	1452.36	(7/2)$^+$	(E2)	0.00999 *14*	B(E2)(W.u.)=59 *+21−19* α(N)=6.20×10^{-5} *9*; α(O)=9.67×10^{-6} *14*; α(P)=5.81×10^{-7} *8* α(K)=0.00832 *12*; α(L)=0.001313 *19*; α(M)=0.000280 *4*
		848.6 *3*	65.9 *17*	1126.83	3/2$^+$	(E2+M1)	0.0038 *8*	α(K)=0.0033 *7*; α(L)=0.00044 *8*; α(M)=9.2×10^{-5} *16* α(N)=2.1×10^{-5} *4*; α(O)=3.3×10^{-6} *6*; α(P)=2.4×10^{-7} *6*
		1830.0 *6*	57.6 *15*	145.4434	7/2$^+$	(E2)	8.54×10^{-4} *12*	B(E2)(W.u.)=0.38 *+13−12* α(N)=3.29×10^{-6} *5*; α(O)=5.31×10^{-7} *7*; α(P)=3.98×10^{-8} *6*; α(IPF)=0.0002125 *30* α(K)=0.000553 *8*; α(L)=7.05×10^{-5} *10*; α(M)=1.473×10^{-5} *21*
		1976.0 *5*	100 *2*	0.0	5/2$^+$	(E2+M1)	0.00091 *7*	α(K)=0.00053 *5*; α(L)=6.7×10^{-5} *6*; α(M)=1.41×10^{-5} *14* α(N)=3.15×10^{-6} *31*; α(O)=5.1×10^{-7} *5*; α(P)=3.9×10^{-8} *4*; α(IPF)=0.000290 *10*
1986.08	(13/2$^+$)	218.67 *22*	7.5 *10*	1767.36	13/2$^+$	(E2+M1)	0.1435 *33*	α(N)=0.00103 *23*; α(O)=0.000157 *29*; α(P)=8.1×10^{-6} *15* α(K)=0.116 *9*; α(L)=0.022 *5*; α(M)=0.0047 *11* B(M1)(W.u.): LT 0.35 (if pure M1).
		465.41 *25*	14.9 *10*	1520.89	9/2$^+$	(E2)	0.01372 *19*	α(K)=0.01136 *16*; α(L)=0.001864 *26*; α(M)=0.000399 *6* α(N)=8.82×10^{-5} *12*; α(O)=1.366×10^{-5} *19*; α(P)=7.85×10^{-7} *11* B(E2)(W.u.)<184.46
		868.4 *3*	100.0 *13*	1117.67	11/2$^-$	(E1)	1.17×10^{-3} *2*	α(N)=5.91×10^{-6} *8*; α(O)=9.51×10^{-7} *13*; α(P)=7.05×10^{-8} *10* α(K)=0.001006 *14*; α(L)=0.0001269 *18*; α(M)=2.65×10^{-5} *4* B(E1)(W.u.)<7.49×10^{-4}
2000.27	(13/2$^-$)	882.59 *21*	100	1117.67	11/2$^-$	(E2+M1)	0.0035 *7*	α(K)=0.0030 *6*; α(L)=0.00040 *7*; α(M)=8.4×10^{-5} *15*

$^{141}_{59}Pr_{82}$-14

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
								α(N)=1.87×10^{-5} *33*; α(O)=3.0×10^{-6} *6*; α(P)=2.2×10^{-7} *5* δ: +0.01 *+62−4* or +10 *+11−4* (n,n′γ).
2000.47	(9/2)$^-$	349.58 *25*	3.1 *3*	1650.85	(9/2$^+$)	(E1)	0.00884 *12*	B(E1)(W.u.)=0.00062 *+25−21* α(K)=0.00758 *11*; α(L)=0.000993 *14*; α(M)=0.0002078 *29* α(N)=4.62×10^{-5} *7*; α(O)=7.36×10^{-6} *10*; α(P)=5.14×10^{-7} *7*
		542.8 *3*	4.5 *3*	1457.36	9/2$^+$	(E1)	0.00312 *4*	B(E1)(W.u.)=2.4×10^{-4} *+10−8* α(K)=0.00269 *4*; α(L)=0.000345 *5*; α(M)=7.22×10^{-5} *10* α(N)=1.609×10^{-5} *23*; α(O)=2.58×10^{-6} *4*; α(P)=1.860×10^{-7} *26*
		548.1 *3*	25.7 *21*	1452.36	(7/2)$^+$	(E1)	0.00306 *4*	B(E1)(W.u.)=0.0013 *5* α(N)=1.574×10^{-5} *22*; α(O)=2.521×10^{-6} *35*; α(P)=1.821×10^{-7} *26* α(K)=0.00263 *4*; α(L)=0.000338 *5*; α(M)=7.06×10^{-5} *10*
		883.1 *3*		1117.67	11/2$^-$			
		1855.2 *6*	100.0 *3*	145.4434	7/2$^+$	(E1)	7.84×10^{-4} *11*	B(E1)(W.u.)=1.3×10^{-4} *5* α(K)=0.000263 *4*; α(L)=3.24×10^{-5} *5*; α(M)=6.74×10^{-6} *9* α(N)=1.507×10^{-6} *21*; α(O)=2.438×10^{-7} *34*; α(P)=1.856×10^{-8} *26*; α(IPF)=0.000480 *7*
2003.84	(11/2$^+$)	545.7 *3*	3 *3*	1457.36	9/2$^+$	(E2+M1)	0.0112 *23*	α(N)=6.3×10^{-5} *9*; α(O)=1.01×10^{-5} *15*; α(P)=7.0×10^{-7} *18* α(K)=0.0095 *21*; α(L)=0.00135 *19*; α(M)=0.00028 *4* δ: −0.40 *+19−21* or −4 *+2−9* (n,n′γ).
		1858.2 *7*	100.0 *3*	145.4434	7/2$^+$	(E2)	8.49×10^{-4} *12*	B(E2)(W.u.)=0.8 *+7−4* α(N)=3.20×10^{-6} *4*; α(O)=5.16×10^{-7} *7*; α(P)=3.87×10^{-8} *5*; α(IPF)=0.0002255 *32* α(K)=0.000537 *8*; α(L)=6.85×10^{-5} *10*; α(M)=1.430×10^{-5} *20*
2018.12	(3/2$^+$)	438.27 *25*	8.7 *7*	1580.05	5/2$^-$	E1	0.00511 *7*	B(E1)(W.u.)=0.00036 *+16−13* α(K)=0.00439 *6*; α(L)=0.000569 *8*; α(M)=0.0001191 *17* α(N)=2.65×10^{-5} *4*; α(O)=4.23×10^{-6} *6*; α(P)=3.01×10^{-7} *4*
		565.1[&] *2*		1452.36	(7/2)$^+$			
		719.5 *3*	15.9 *11*	1298.71	1/2$^+$	(E2+M1)	0.0057 *12*	α(K)=0.0048 *11*; α(L)=0.00066 *11*; α(M)=0.000139 *23* α(N)=3.1×10^{-5} *5*; α(O)=5.0×10^{-6} *9*; α(P)=3.6×10^{-7} *9*
		725.2 *3*	5.1 *9*	1292.69	(5/2)$^+$	(E2+M1)	0.0056 *12*	α(K)=0.0047 *10*; α(L)=0.00065 *11*; α(M)=0.000136 *23* α(N)=3.0×10^{-5} *5*; α(O)=4.9×10^{-6} *9*; α(P)=3.5×10^{-7} *9*
		1872.1 *4*	51.5 *15*	145.4434	7/2$^+$	(E2)	8.47×10^{-4} *12*	B(E2)(W.u.)=0.40 *+18−14* α(K)=0.000530 *7*; α(L)=6.75×10^{-5} *9*; α(M)=1.410×10^{-5} *20* α(N)=3.15×10^{-6} *4*; α(O)=5.09×10^{-7} *7*; α(P)=3.82×10^{-8} *5*; α(IPF)=0.0002319 *33*
		2017.5 *4*	100.0 *16*	0.0	5/2$^+$	(E2+M1)	0.00090 *7*	α(N)=3.01×10^{-6} *28*; α(O)=4.9×10^{-7} *5*; α(P)=3.7×10^{-8} *4*; α(IPF)=0.000311 *11* α(K)=0.00051 *5*; α(L)=6.5×10^{-5} *6*; α(M)=1.35×10^{-5} *13*

$^{141}_{59}Pr_{82}$-15

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.	δ #	α @	Comments
2045.11	9/2+	524.1 *4*		1520.89	9/2+				
		1900.01 *22*	100	145.4434	7/2+	E2+M1		0.00092 *8*	α(K)=0.00057 *6*; α(L)=7.3×10^{-5} *7*; α(M)=1.53×10^{-5} *16* α(N)=3.41×10^{-6} *35*; α(O)=5.5×10^{-7} *6*; α(P)=4.2×10^{-8} *5*; α(IPF)=0.000253 *9* δ: −0.49 *+6−8* or −3.4 *+6−8* (n,n′γ).
2068.84	17/2+	272.7 *1*	100 *2*	1796.21	15/2+	M1+E2	+0.10 *8*	0.0807 *12*	α(K)=0.0688 *10*; α(L)=0.00933 *14*; α(M)=0.001965 *30* α(N)=0.000439 *7*; α(O)=7.08×10^{-5} *10*; α(P)=5.23×10^{-6} *8*
		301.4 *1*	2.8 *2*	1767.36	13/2+				Eγ,Iγ: from (α,2nγ).
2075.50	(5/2+)	425.19 *22*	7.1 *10*	1650.85	(9/2+)	(E2)		0.01770 *25*	Eγ,Iγ: from (α,2nγ). B(E2)(W.u.)=115 *+48−37* α(K)=0.01456 *20*; α(L)=0.002473 *35*; α(M)=0.000531 *7* α(N)=0.0001173 *17*; α(O)=1.806×10^{-5} *25*; α(P)=9.97×10^{-7} *14*
		495.27 *22*	11.8 *10*	1580.05	5/2−	(E1)		0.00384 *5*	B(E1)(W.u.)=0.00042 *+16−13* α(N)=1.986×10^{-5} *28*; α(O)=3.18×10^{-6} *4*; α(P)=2.279×10^{-7} *32* α(K)=0.00330 *5*; α(L)=0.000426 *6*; α(M)=8.92×10^{-5} *13*
		623.02 *22*	17.0 *13*	1452.36	(7/2)+	(E2+M1)		0.0081 *17*	α(K)=0.0069 *15*; α(L)=0.00095 *15*; α(M)=0.000200 *31* α(N)=4.5×10^{-5} *7*; α(O)=7.1×10^{-6} *12*; α(P)=5.0×10^{-7} *13*
		782.8 *3*	32.1 *16*	1292.69	(5/2)+	(E2+M1)		0.0046 *10*	α(K)=0.0040 *9*; α(L)=0.00053 *9*; α(M)=0.000112 *19* α(N)=2.5×10^{-5} *4*; α(O)=4.0×10^{-6} *7*; α(P)=2.9×10^{-7} *7*
		948.6 *3*	100.0 *21*	1126.83	3/2+	(E2+M1)		0.0030 *6*	α(K)=0.0025 *5*; α(L)=0.00034 *6*; α(M)=7.1×10^{-5} *12* α(N)=1.58×10^{-5} *28*; α(O)=2.5×10^{-6} *5*; α(P)=1.9×10^{-7} *4*
		1929.7 *4*	56.4 *18*	145.4434	7/2+	(E2+M1)		0.00091 *7*	α(N)=3.30×10^{-6} *33*; α(O)=5.3×10^{-7} *5*; α(P)=4.1×10^{-8} *5*; α(IPF)=0.000267 *9* α(K)=0.00056 *6*; α(L)=7.1×10^{-5} *7*; α(M)=1.48×10^{-5} *15*
		2075.1 *5*	36.8 *16*	0.0	5/2+	(E2+M1)		0.00090 *6*	α(K)=0.00048 *4*; α(L)=6.1×10^{-5} *5*; α(M)=1.27×10^{-5} *11* α(N)=2.85×10^{-6} *26*; α(O)=4.6×10^{-7} *4*; α(P)=3.51×10^{-8} *35*; α(IPF)=0.000340 *13*
2100.91	(3/2+,5/2+)	664.4 *3*	13.7 *8*	1436.12	3/2+	(E2+M1)		0.0069 *15*	α(K)=0.0059 *13*; α(L)=0.00081 *13*; α(M)=0.000170 *27* α(N)=3.8×10^{-5} *6*; α(O)=6.1×10^{-6} *11*; α(P)=4.3×10^{-7} *11*
		974.4 *5*	100.0 *14*	1126.83	3/2+	(E2+M1)		0.0028 *5*	α(K)=0.0024 *5*; α(L)=0.00032 *5*; α(M)=6.6×10^{-5} *11* α(N)=1.48×10^{-5} *26*; α(O)=2.4×10^{-6} *4*; α(P)=1.8×10^{-7} *4*
		2102.0 *6*	13.5 *13*	0.0	5/2+	(E2+M1)		0.00090 *6*	α(K)=0.00047 *4*; α(L)=5.9×10^{-5} *5*; α(M)=1.24×10^{-5} *11*

$^{141}_{59}Pr_{82}$-16

Adopted Levels, Gammas (continued)

$\gamma(^{141}Pr)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
								α(N)=2.77×10^{-6} *24*; α(O)=4.5×10^{-7} *4*; α(P)=3.42×10^{-8} *33*; α(IPF)=0.000353 *13*
2105.02	(5/2$^-$)	525.3 *3*	8.2 *10*	1580.05	5/2$^-$	(E2+M1)	0.0124 *25*	α(N)=7.0×10^{-5} *9*; α(O)=1.12×10^{-5} *16*; α(P)=7.7×10^{-7} *19* α(K)=0.0105 *23*; α(L)=0.00149 *20*; α(M)=0.00032 *4*
		652.7 *3*	24.9 *10*	1452.36	(7/2)$^+$	(E1)	2.09×10^{-3} *3*	B(E1)(W.u.)=0.00128 *19* α(K)=0.001798 *25*; α(L)=0.0002295 *32*; α(M)=4.79×10^{-5} *7* α(N)=1.069×10^{-5} *15*; α(O)=1.716×10^{-6} *24*; α(P)=1.253×10^{-7} *18*
		1959.4 *4*	100.0 *18*	145.4434	7/2$^+$	(E1)	8.35×10^{-4} *12*	B(E1)(W.u.)=1.89×10^{-4} *28* α(K)=0.0002409 *34*; α(L)=2.97×10^{-5} *4*; α(M)=6.17×10^{-6} *9* α(N)=1.379×10^{-6} *19*; α(O)=2.232×10^{-7} *31*; α(P)=1.701×10^{-8} *24*; α(IPF)=0.000557 *8*
		2104.9 *5*	67.5 *18*	0.0	5/2$^+$	(E1)	9.08×10^{-4} *13*	B(E1)(W.u.)=1.03×10^{-4} *15* α(K)=0.0002152 *30*; α(L)=2.64×10^{-5} *4*; α(M)=5.50×10^{-6} *8* α(N)=1.230×10^{-6} *17*; α(O)=1.991×10^{-7} *28*; α(P)=1.520×10^{-8} *21*; α(IPF)=0.000660 *9*
2105.5	(7/2$^-$,15/2$^-$)	987.8 *3*	100	1117.67	11/2$^-$	(E2)	2.18×10^{-3} *3*	B(E2)(W.u.)=9×10^{1} *+11−5* α(K)=0.001863 *26*; α(L)=0.000253 *4*; α(M)=5.33×10^{-5} *7* α(N)=1.189×10^{-5} *17*; α(O)=1.899×10^{-6} *27*; α(P)=1.338×10^{-7} *19*
2106.2	(5/2$^-$)	1961	100 *15*	145.4434	7/2$^+$			E_γ: from (γ,γ,).
		2106	347 *15*	0.0	5/2$^+$			E_γ: from (γ,γ,).
2108.20	15/2$^{(+)}$	122.3 *3*	18.4 *20*	1986.08	(13/2$^+$)			E_γ,I_γ: from (α,2nγ).
		311.9 *4*	100 *4*	1796.21	15/2$^+$	(E2+M1)	0.051 *6*	α(K)=0.042 *6*; α(L)=0.00676 *27*; α(M)=0.00144 *8* α(N)=0.000320 *15*; α(O)=4.99×10^{-5} *9*; α(P)=3.0×10^{-6} *7* Mult.: from (n,n′γ). E_γ,I_γ: from (α,2nγ).
		340.9 *5*	42.9 *20*	1767.36	13/2$^+$	(E2+M1)	0.039 *6*	E_γ,I_γ: from (α,2nγ). Mult.: from (n,n′γ).
2126.10	(11/2$^+$)	272.28 *22*	68 *9*	1853.79	(11/2$^+$)	(E2+M1)	0.075 *6*	α(K)=0.062 *8*; α(L)=0.0104 *11*; α(M)=0.00223 *26* α(N)=0.00049 *5*; α(O)=7.6×10^{-5} *5*; α(P)=4.4×10^{-6} *9*
		604.9 *3*	41 *5*	1520.89	9/2$^+$	(E2+M1)	0.0087 *18*	α(K)=0.0074 *16*; α(L)=0.00103 *16*; α(M)=0.000216 *32* α(N)=4.8×10^{-5} *7*; α(O)=7.7×10^{-6} *13*; α(P)=5.4×10^{-7} *14*
		631.8 *3*	43 *4*	1493.98	11/2$^+$	(E2+M1)	0.0078 *17*	α(K)=0.0066 *15*; α(L)=0.00092 *15*; α(M)=0.000193 *30* α(N)=4.3×10^{-5} *7*; α(O)=6.9×10^{-6} *12*; α(P)=4.9×10^{-7} *12*
		669	92	1457.36	9/2$^+$	(E2+M1)	0.0068 *14*	α(K)=0.0058 *13*; α(L)=0.00079 *13*; α(M)=0.000167 *27* α(N)=3.7×10^{-5} *6*; α(O)=5.9×10^{-6} *11*; α(P)=4.2×10^{-7} *10* I_γ: this γ ray is not resolved by 2008Sc17 in (n,n′γ) due to a background line and the branching ratio relative to 632γ was taken by the authors from 1994De56.

$^{141}_{59}Pr_{82}$-17

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
2126.10	(11/2$^+$)	1008.8 *3*	100 *6*	1117.67	11/2$^-$	(E1)	8.75×10^{-4} *12*	α(K)=0.000755 *11*; α(L)=9.47×10^{-5} *13*; α(M)=1.975×10^{-5} *28* α(N)=4.41×10^{-6} *6*; α(O)=7.11×10^{-7} *10*; α(P)=5.31×10^{-8} *7* B(E1)(W.u.)<6.53×10^{-4}
		1981.4 *5*	32 *4*	145.4434	7/2$^+$	(E2)	8.37×10^{-4} *12*	α(K)=0.000478 *7*; α(L)=6.06×10^{-5} *8*; α(M)=1.266×10^{-5} *18* α(N)=2.83×10^{-6} *4*; α(O)=4.57×10^{-7} *6*; α(P)=3.44×10^{-8} *5*; α(IPF)=0.000283 *4* B(E2)(W.u.)<0.39
2135.51	(7/2$^-$)	678.3 *3*	27.2 *10*	1457.36	9/2$^+$	(E1)	1.93×10^{-3} *3*	B(E1)(W.u.)=0.00048 *+17−14* α(K)=0.001658 *23*; α(L)=0.0002113 *30*; α(M)=4.41×10^{-5} *6* α(N)=9.84×10^{-6} *14*; α(O)=1.580×10^{-6} *22*; α(P)=1.157×10^{-7} *16*
		682.9 *4*	5.0 *10*	1452.36	(7/2)$^+$	(E1)	1.90×10^{-3} *3*	B(E1)(W.u.)=8.6×10^{-5} *+35−30* α(K)=0.001635 *23*; α(L)=0.0002083 *29*; α(M)=4.35×10^{-5} *6* α(N)=9.70×10^{-6} *14*; α(O)=1.558×10^{-6} *22*; α(P)=1.141×10^{-7} *16*
		1990.0 *5*	35.6 *13*	145.4434	7/2$^+$	(E1)	8.51×10^{-4} *12*	B(E1)(W.u.)=2.5×10^{-5} *+9−7* α(K)=0.0002351 *33*; α(L)=2.89×10^{-5} *4*; α(M)=6.02×10^{-6} *8* α(N)=1.345×10^{-6} *19*; α(O)=2.177×10^{-7} *30*; α(P)=1.660×10^{-8} *23*; α(IPF)=0.000579 *8*
		2135.5 *5*	100.0 *17*	0.0	5/2$^+$	(E1)	9.24×10^{-4} *13*	B(E1)(W.u.)=5.7×10^{-5} *+20−16* α(K)=0.0002104 *29*; α(L)=2.59×10^{-5} *4*; α(M)=5.38×10^{-6} *8* α(N)=1.202×10^{-6} *17*; α(O)=1.946×10^{-7} *27*; α(P)=1.486×10^{-8} *21*; α(IPF)=0.000681 *10*
2154.5	(1/2$^+$,3/2,5/2$^+$)	855.2[&] *2*		1298.71	1/2$^+$			
		861.8 *3*		1292.69	(5/2)$^+$			
2171.86	(5/2$^-$,7/2$^-$,9/2$^-$)	520.9 *3*	8.7 *7*	1650.85	(9/2$^+$)	(E1)	0.00343 *5*	B(E1)(W.u.)=0.00140 *+27−23* α(K)=0.00295 *4*; α(L)=0.000379 *5*; α(M)=7.93×10^{-5} *11* α(N)=1.768×10^{-5} *25*; α(O)=2.83×10^{-6} *4*; α(P)=2.037×10^{-7} *29*
		2026.6 *4*	100.0 *7*	145.4434	7/2$^+$	(E1)	8.69×10^{-4} *12*	B(E1)(W.u.)=2.73×10^{-4} *+47−41* α(K)=0.0002284 *32*; α(L)=2.81×10^{-5} *4*; α(M)=5.85×10^{-6} *8* α(N)=1.307×10^{-6} *18*; α(O)=2.114×10^{-7} *30*; α(P)=1.613×10^{-8} *23*; α(IPF)=0.000605 *8*
2188.15	(3/2$^+$)	736.0 *3*	61 *3*	1452.36	(7/2)$^+$	(E2)	0.00423 *6*	B(E2)(W.u.)=58 *+32−25* α(K)=0.00358 *5*; α(L)=0.000515 *7*; α(M)=0.0001089 *15* α(N)=2.423×10^{-5} *34*; α(O)=3.83×10^{-6} *5*; α(P)=2.55×10^{-7} *4*

$^{141}_{59}Pr_{82}$-18

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.	α @	Comments
2188.15	(3/2$^+$)	751.9 *3*	47.9 *22*	1436.12	3/2$^+$	(E2+M1)	0.0051 *11*	α(K)=0.0044 *10*; α(L)=0.00059 *10*; α(M)=0.000124 *21* α(N)=2.8×10^{-5} *5*; α(O)=4.4×10^{-6} *8*; α(P)=3.2×10^{-7} *8*
		2042.5 *5*	100 *3*	145.4434	7/2$^+$	(E2)	8.37×10^{-4} *12*	B(E2)(W.u.)=0.58 *+31−25* α(K)=0.000452 *6*; α(L)=5.72×10^{-5} *8*; α(M)=1.195×10^{-5} *17* α(N)=2.67×10^{-6} *4*; α(O)=4.32×10^{-7} *6*; α(P)=3.26×10^{-8} *5*; α(IPF)=0.000312 *4*
		2188.0 *6*	33 *3*	0.0	5/2$^+$	(E2+M1)	0.00090 *6*	α(K)=0.000433 *35*; α(L)=5.5×10^{-5} *4*; α(M)=1.14×10^{-5} *9* α(N)=2.55×10^{-6} *21*; α(O)=4.14×10^{-7} *34*; α(P)=3.16×10^{-8} *29*; α(IPF)=0.000396 *15*
2190.36	(1/2$^-$)	897.6 *2*		1292.69	(5/2)$^+$			
		2044.7 *7*	7 *3*	145.4434	7/2$^+$	(E3)	1.10×10^{-3} *2*	α(K)=0.000790 *11*; α(L)=0.0001046 *15*; α(M)=2.197×10^{-5} *31* α(N)=4.91×10^{-6} *7*; α(O)=7.90×10^{-7} *11*; α(P)=5.82×10^{-8} *8*; α(IPF)=0.0001803 *25* Additional information 3.
		2190.8 *5*	100 *3*	0.0	5/2$^+$	(M2)	1.36×10^{-3} *2*	α(N)=5.92×10^{-6} *8*; α(O)=9.59×10^{-7} *13*; α(P)=7.32×10^{-8} *10*; α(IPF)=0.0002269 *32* α(K)=0.000974 *14*; α(L)=0.0001262 *18*; α(M)=2.64×10^{-5} *4* Additional information 4.
2205.96	(11/2$^+$)	352.7 *3*	3.5 *7*	1853.79	(11/2$^+$)	(E2+M1)	0.036 *5*	α(K)=0.030 *5*; α(L)=0.00464 *9*; α(M)=0.000988 *14* α(N)=0.000219 *4*; α(O)=3.44×10^{-5} *14*; α(P)=2.2×10^{-6} *5*
		752.7 *5*		1452.36	(7/2)$^+$			
		2060.6 *4*	100.0 *7*	145.4434	7/2$^+$	(E2)	8.37×10^{-4} *12*	B(E2)(W.u.)=1.97 *+40−37* α(K)=0.000445 *6*; α(L)=5.63×10^{-5} *8*; α(M)=1.175×10^{-5} *16* α(N)=2.63×10^{-6} *4*; α(O)=4.25×10^{-7} *6*; α(P)=3.20×10^{-8} *4*; α(IPF)=0.000321 *4*
2228.84	(5/2$^+$,7/2$^+$)	386.95 *25*	8.9 *18*	1842.14	(7/2$^+$)	(E2+M1)	0.028 *5*	α(K)=0.023 *4*; α(L)=0.00352 *18*; α(M)=0.000749 *29* α(N)=0.000166 *8*; α(O)=2.62×10^{-5} *19*; α(P)=1.7×10^{-6} *4*
		649.0 *3*	100 *36*	1580.05	5/2$^-$	(E1)	2.11×10^{-3} *3*	B(E1)(W.u.)=0.0006 *+9−4* α(K)=0.001820 *26*; α(L)=0.0002323 *33*; α(M)=4.85×10^{-5} *7* α(N)=1.082×10^{-5} *15*; α(O)=1.737×10^{-6} *24*; α(P)=1.268×10^{-7} *18*
		776.62 *25*	8.0 *16*	1452.36	(7/2)$^+$	(E2+M1)	0.0047 *10*	α(N)=2.6×10^{-5} *4*; α(O)=4.1×10^{-6} *8*; α(P)=3.0×10^{-7} *7* α(K)=0.0040 *9*; α(L)=0.00054 *10*; α(M)=0.000115 *20*
		935.8 *3*	8.0 *18*	1292.69	(5/2)$^+$	(E2+M1)	0.0031 *6*	α(K)=0.0026 *5*; α(L)=0.00035 *6*; α(M)=7.3×10^{-5} *13* α(N)=1.63×10^{-5} *28*; α(O)=2.6×10^{-6} *5*; α(P)=1.9×10^{-7} *4*
		2082.8 *5*	52 *3*	145.4434	7/2$^+$	(E2+M1)	0.00090 *6*	α(K)=0.00048 *4*; α(L)=6.0×10^{-5} *5*; α(M)=1.26×10^{-5} *11* α(N)=2.82×10^{-6} *25*; α(O)=4.6×10^{-7} *4*; α(P)=3.48×10^{-8} *34*; α(IPF)=0.000343 *13* δ: −0.37 *+11−12* or −5 *+2−5*.

$^{141}_{59}Pr_{82}$-19

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.	α @	Comments
2228.84	(5/2$^+$,7/2$^+$)	2228.2 *5*	38.0 *25*	0.0	5/2$^+$	(E2+M1)	0.00090 *5*	α(K)=0.000418 *32*; α(L)=5.3×10^{-5} *4*; α(M)=1.10×10^{-5} *9* α(N)=2.46×10^{-6} *19*; α(O)=3.99×10^{-7} *32*; α(P)=3.04×10^{-8} *27*; α(IPF)=0.000417 *16*
2230.3		736.3 *3*	100	1493.98	11/2$^+$			
2243.15		749.17 *10*	100	1493.98	11/2$^+$	D+(Q)		E_γ,Mult.: from (p,2nγ).
2247.7	(3/2$^-$,5/2$^-$)	1120.9 *4*	12.5 *18*	1126.83	3/2$^+$	(E1)	7.24×10^{-4} *10*	B(E1)(W.u.)=1.35×10^{-4} *32* α(N)=3.62×10^{-6} *5*; α(O)=5.83×10^{-7} *8*; α(P)=4.38×10^{-8} *6*; α(IPF)=4.66×10^{-6} *9* α(K)=0.000621 *9*; α(L)=7.77×10^{-5} *11*; α(M)=1.620×10^{-5} *23*
		2247.6 *5*	100.0 *18*	0.0	5/2$^+$	(E1)	9.80×10^{-4} *14*	B(E1)(W.u.)=1.34×10^{-4} *27* α(K)=0.0001944 *27*; α(L)=2.386×10^{-5} *33*; α(M)=4.96×10^{-6} *7* α(N)=1.109×10^{-6} *16*; α(O)=1.796×10^{-7} *25*; α(P)=1.373×10^{-8} *19*; α(IPF)=0.000756 *11*
2254.0	+	2254.0 *18*	100	0.0	5/2$^+$			
2264.49	(3/2$^+$)	684.8 *3*	12.0 *22*	1580.05	5/2$^-$	(E1)	1.89×10^{-3} *3*	B(E1)(W.u.)=0.00025 *+17−10* α(K)=0.001625 *23*; α(L)=0.0002070 *29*; α(M)=4.32×10^{-5} *6* α(N)=9.64×10^{-6} *14*; α(O)=1.549×10^{-6} *22*; α(P)=1.134×10^{-7} *16*
		812.4 *4*	10 *3*	1452.36	(7/2)$^+$	(E2)	0.00337 *5*	B(E2)(W.u.)=10 *+7−5* α(N)=1.891×10^{-5} *27*; α(O)=3.00×10^{-6} *4*; α(P)=2.042×10^{-7} *29* α(K)=0.00286 *4*; α(L)=0.000402 *6*; α(M)=8.49×10^{-5} *12*
		828.1 *3*	18 *4*	1436.12	3/2$^+$	(E2+M1)	0.0041 *8*	α(K)=0.0035 *7*; α(L)=0.00047 *8*; α(M)=9.8×10^{-5} *17* α(N)=2.2×10^{-5} *4*; α(O)=3.5×10^{-6} *6*; α(P)=2.6×10^{-7} *6*
		965.9 *4*	17 *3*	1298.71	1/2$^+$	(E2+M1)	0.0028 *6*	α(N)=1.51×10^{-5} *26*; α(O)=2.4×10^{-6} *4*; α(P)=1.8×10^{-7} *4* α(K)=0.0024 *5*; α(L)=0.00032 *6*; α(M)=6.8×10^{-5} *12*
		2118.6 *5*	100 *4*	145.4434	7/2$^+$	(E2)	8.39×10^{-4} *12*	B(E2)(W.u.)=0.8 *+5−3* α(K)=0.000423 *6*; α(L)=5.34×10^{-5} *7*; α(M)=1.116×10^{-5} *16* α(N)=2.494×10^{-6} *35*; α(O)=4.03×10^{-7} *6*; α(P)=3.05×10^{-8} *4*; α(IPF)=0.000349 *5*
		2264.0 *5*	49 *3*	0.0	5/2$^+$	(E2+M1)	0.00090 *5*	α(K)=0.000405 *30*; α(L)=5.1×10^{-5} *4*; α(M)=1.07×10^{-5} *8* α(N)=2.38×10^{-6} *18*; α(O)=3.86×10^{-7} *30*; α(P)=2.95×10^{-8} *25*; α(IPF)=0.000435 *17*
2267.20	(1/2$^+$)	291.65 *25*	6 *5*	1975.26	(3/2$^+$)	(E2+M1)	0.061 *6*	α(K)=0.051 *7*; α(L)=0.0083 *6*; α(M)=0.00179 *15* α(N)=0.000396 *30*; α(O)=6.15×10^{-5} *26*; α(P)=3.6×10^{-6} *8*
		975.0 *3*		1292.69	(5/2)$^+$			
		2267.1 *3*	100 *5*	0.0	5/2$^+$	(E2)	8.54×10^{-4} *12*	α(K)=0.000374 *5*; α(L)=4.71×10^{-5} *7*; α(M)=9.84×10^{-6} *14*

$^{141}_{59}Pr_{82}$-20

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
								α(N)=2.200×10^{-6} *31*; α(O)=3.56×10^{-7} *5*; α(P)=2.70×10^{-8} *4*; α(IPF)=0.000420 *6* B(E2)(W.u.)<1.17
2270.1		2270	100	0.0	5/2$^+$			
2296.0		2296	100	0.0	5/2$^+$			
2302.6	(5/2$^+$,7/2$^+$,9/2$^+$)	1009.2 *4*		1292.69	(5/2)$^+$			
		2158.3 *5*	100	145.4434	7/2$^+$	(E2+M1)	0.00090 *6*	α(N)=2.63×10^{-6} *22*; α(O)=4.3×10^{-7} *4*; α(P)=3.24×10^{-8} *30*; α(IPF)=0.000381 *14* α(K)=0.00045 *4*; α(L)=5.6×10^{-5} *5*; α(M)=1.17×10^{-5} *10* δ: −0.16 *+31−23* or <−7.9 (n,n′γ).
2315.65	(5/2,7/2)	1022.9 *3*	96 *3*	1292.69	(5/2)$^+$	Q+D		Mult.: (E2+M1) (n,n′γ) (2008Sc17).
		2169.9 *5*	39.0 *19*	145.4434	7/2$^+$	Q+D		Mult.: (E2+M1) (n,n′γ) (2008Sc17).
		2315.7 *5*	100 *3*	0.0	5/2$^+$			
2336.54	(15/2$^-$)	816.03 *25*	80 *11*	1520.89	9/2$^+$	(E3)	0.00759 *11*	α(K)=0.00625 *9*; α(L)=0.001058 *15*; α(M)=0.0002274 *32* α(N)=5.04×10^{-5} *7*; α(O)=7.86×10^{-6} *11*; α(P)=4.65×10^{-7} *7*
		1218.3 *3*	100 *11*	1117.67	11/2$^-$	(E2)	1.42×10^{-3} *2*	α(K)=0.001209 *17*; α(L)=0.0001598 *22*; α(M)=3.35×10^{-5} *5* α(N)=7.48×10^{-6} *10*; α(O)=1.201×10^{-6} *17*; α(P)=8.70×10^{-8} *12*; α(IPF)=8.22×10^{-6} *12* B(E2)(W.u.)<106.26
2345.87	(9/2$^+$)	559.0 *3*	51 *4*	1786.47	(5/2$^+$)	[E2]	0.00838 *12*	B(E2)(W.u.)=1.4×10^2 *+9−7* α(K)=0.00701 *10*; α(L)=0.001082 *15*; α(M)=0.0002305 *32* α(N)=5.11×10^{-5} *7*; α(O)=7.99×10^{-6} *11*; α(P)=4.92×10^{-7} *7* Mult.: (E2+M1) in (n,n′γ) 2008Sc17 but based on assigned spins it is rather ΔJ=2 γ.
		851.76 *23*	66 *4*	1493.98	11/2$^+$	(E2+M1)	0.0038 *8*	α(K)=0.0033 *7*; α(L)=0.00044 *8*; α(M)=9.1×10^{-5} *16* α(N)=2.0×10^{-5} *4*; α(O)=3.3×10^{-6} *6*; α(P)=2.4×10^{-7} *6*
		1052.6 *3*	90 *5*	1292.69	(5/2)$^+$	(E2)	1.91×10^{-3} *3*	B(E2)(W.u.)=11 *+7−5* α(K)=0.001630 *23*; α(L)=0.0002197 *31*; α(M)=4.62×10^{-5} *6* α(N)=1.030×10^{-5} *14*; α(O)=1.647×10^{-6} *23*; α(P)=1.172×10^{-7} *16*
		1229.8 *3*	37 *7*	1117.67	11/2$^-$	(E1)	6.51×10^{-4} *9*	B(E1)(W.u.)=5.9×10^{-5} *+39−29* α(K)=0.000526 *7*; α(L)=6.56×10^{-5} *9*;

$^{141}_{59}Pr_{82}$-21

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
								α(M)=1.366×10^{-5} *19* α(N)=3.05×10^{-6} *4*; α(O)=4.93×10^{-7} *7*; α(P)=3.71×10^{-8} *5*; α(IPF)=4.19×10^{-5} *6*
2345.87	(9/2$^+$)	2199.5 *6*	55 *5*	145.4434	7/2$^+$	(E2+M1)	0.00090 *5*	α(K)=0.000429 *34*; α(L)=5.4×10^{-5} *4*; α(M)=1.13×10^{-5} *9* α(N)=2.53×10^{-6} *20*; α(O)=4.09×10^{-7} *34*; α(P)=3.12×10^{-8} *28*; α(IPF)=0.000402 *15*
		2345.1 *6*	100 *6*	0.0	5/2$^+$	(E2)	8.66×10^{-4} *12*	B(E2)(W.u.)=0.22 *+14−10* α(K)=0.000352 *5*; α(L)=4.43×10^{-5} *6*; α(M)=9.24×10^{-6} *13* α(N)=2.067×10^{-6} *29*; α(O)=3.34×10^{-7} *5*; α(P)=2.54×10^{-8} *4*; α(IPF)=0.000457 *6*
2353.7		2353.7 *19*	100	0.0	5/2$^+$			
2362.85	(5/2$^-$)	754.64 *24*	16.4 *14*	1608.26	(3/2)$^+$	(E1)	1.54×10^{-3}	B(E1)(W.u.)=0.00133 *+37−29* α(K)=0.001330 *19*; α(L)=0.0001688 *24*; α(M)=3.52×10^{-5} *5* α(N)=7.86×10^{-6} *11*; α(O)=1.264×10^{-6} *18*; α(P)=9.31×10^{-8} *13*
		1064.4[&] *4*	15 *3*	1298.71	1/2$^+$			Mult.: M2 γ based on $\Delta J^\pi_{(\text{levels})}$ gives B(M2)(W.u.)=1.8E3 *+10−7* exceeding RUL=1.
		1235.7 *3*	100 *3*	1126.83	3/2$^+$	(E1)	6.48×10^{-4} *9*	B(E1)(W.u.)=0.00185 *+48−38* α(K)=0.000522 *7*; α(L)=6.50×10^{-5} *9*; α(M)=1.355×10^{-5} *19* α(N)=3.03×10^{-6} *4*; α(O)=4.88×10^{-7} *7*; α(P)=3.68×10^{-8} *5*; α(IPF)=4.48×10^{-5} *6*
		2217.0 *6*	12.4 *14*	145.4434	7/2$^+$	(E1)	9.65×10^{-4} *14*	B(E1)(W.u.)=4.0×10^{-5} *+11−9* α(K)=0.0001985 *28*; α(L)=2.437×10^{-5} *34*; α(M)=5.07×10^{-6} *7* α(N)=1.133×10^{-6} *16*; α(O)=1.835×10^{-7} *26*; α(P)=1.402×10^{-8} *20*; α(IPF)=0.000736 *10*
		2362.5 *6*	39.6 *19*	0.0	5/2$^+$	(E1)	1.04×10^{-3} *2*	B(E1)(W.u.)=1.05×10^{-4} *+28−22* α(K)=0.0001801 *25*; α(L)=2.208×10^{-5} *31*; α(M)=4.59×10^{-6} *6* α(N)=1.027×10^{-6} *14*; α(O)=1.662×10^{-7} *23*; α(P)=1.272×10^{-8} *18*; α(IPF)=0.000831 *12*
2364.8?		1237.9[&] *2*		1126.83	3/2$^+$			
		1246.7[&] *2*		1117.67	11/2$^-$			
2382.2	(9/2$^-$,11/2$^-$)	861.3 *3*	100.0 *17*	1520.89	9/2$^+$	(E1)	1.18×10^{-3} *2*	B(E1)(W.u.)=0.0012 *+7−5* α(K)=0.001022 *14*; α(L)=0.0001290 *18*; α(M)=2.69×10^{-5} *4* α(N)=6.01×10^{-6} *8*; α(O)=9.67×10^{-7} *14*; α(P)=7.17×10^{-8} *10*

$^{141}_{59}Pr_{82}$-22

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	δ[#]	α[@]	Comments
2382.2	(9/2⁻,11/2⁻)	1264.5 *4*	38.1 *17*	1117.67	11/2⁻	(E2+M1)		0.00158 *26*	α(K)=0.00135 *22*; α(L)=0.000175 *27*; α(M)=3.7×10^{-5} *6* α(N)=8.2×10^{-6} *13*; α(O)=1.32×10^{-6} *21*; α(P)=9.9×10^{-8} *18*; α(IPF)=1.505×10^{-5} *24*
2399.28?		1281.3[&] *2*	100	1117.67	11/2⁻				
2403.13	(9/2⁺)	945.8 *3*	43.2 *19*	1457.36	9/2⁺	(E2+M1)		0.0030 *6*	α(K)=0.0026 *5*; α(L)=0.00034 *6*; α(M)=7.1×10^{-5} *12* α(N)=1.59×10^{-5} *28*; α(O)=2.6×10^{-6} *5*; α(P)=1.9×10^{-7} *4*
		2257.5 *5*	24.7 *17*	145.4434	7/2⁺	(E2+M1)		0.00090 *5*	α(K)=0.000407 *30*; α(L)=5.1×10^{-5} *4*; α(M)=1.07×10^{-5} *8* α(N)=2.40×10^{-6} *18*; α(O)=3.88×10^{-7} *30*; α(P)=2.97×10^{-8} *25*; α(IPF)=0.000431 *17* δ: −0.40 *+22−41* or <−1.8 (n,n′γ).
		2403.2 *5*	100.0 *24*	0.0	5/2⁺	(E2)		8.76×10^{-4} *12*	B(E2)(W.u.)=0.20 *+14−10* α(K)=0.000337 *5*; α(L)=4.24×10^{-5} *6*; α(M)=8.84×10^{-6} *12* α(N)=1.976×10^{-6} *28*; α(O)=3.20×10^{-7} *4*; α(P)=2.429×10^{-8} *34*; α(IPF)=0.000485 *7*
2419.9	(9/2⁺)	925.9 *3*	39 *4*	1493.98	11/2⁺	(E2+M1)		0.0031 *6*	α(K)=0.0027 *5*; α(L)=0.00036 *6*; α(M)=7.5×10^{-5} *13* α(N)=1.67×10^{-5} *29*; α(O)=2.7×10^{-6} *5*; α(P)=2.0×10^{-7} *4*
		2274.2 *6*	100 *8*	145.4434	7/2⁺	(E2+M1)		0.00090 *5*	α(K)=0.000401 *30*; α(L)=5.1×10^{-5} *4*; α(M)=1.06×10^{-5} *8* α(N)=2.36×10^{-6} *18*; α(O)=3.83×10^{-7} *30*; α(P)=2.92×10^{-8} *24*; α(IPF)=0.000440 *17* δ: +0.4 *+20−2* or +1.6 *+8−13* (n,n′γ).
		2419.9 *6*	69 *13*	0.0	5/2⁺	(E2)		8.79×10^{-4} *12*	B(E2)(W.u.)=0.10 *+7−5* α(K)=0.000333 *5*; α(L)=4.18×10^{-5} *6*; α(M)=8.73×10^{-6} *12* α(N)=1.952×10^{-6} *27*; α(O)=3.16×10^{-7} *4*; α(P)=2.399×10^{-8} *34*; α(IPF)=0.000493 *7*
2453.1	(3/2⁻,5/2⁻)	1326.4 *3*	9 *8*	1126.83	3/2⁺	(E1)		6.26×10^{-4} *9*	B(E1)(W.u.)=0.00047 *+41−25* α(K)=0.000460 *6*; α(L)=5.73×10^{-5} *8*; α(M)=1.193×10^{-5} *17* α(N)=2.67×10^{-6} *4*; α(O)=4.30×10^{-7} *6*; α(P)=3.25×10^{-8} *5*; α(IPF)=9.30×10^{-5} *13*
		2452.7 *6*	100 *8*	0.0	5/2⁺	(E1)		1.08×10^{-3} *2*	B(E1)(W.u.)=0.00083 *+14−15* α(K)=0.0001701 *24*; α(L)=2.084×10^{-5} *29*;

$^{141}_{59}Pr_{82}$-23

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	δ[#]	α[@]	Comments
									α(M)=4.33×10^{-6} *6* α(N)=9.69×10^{-7} *14*; α(O)=1.569×10^{-7} *22*; α(P)=1.201×10^{-8} *17*; α(IPF)=0.000886 *12*
2454.20	(15/2$^+$)	449.91 *22*	64 *5*	2003.84	(11/2$^+$)	(E2)		0.01508 *21*	α(K)=0.01246 *18*; α(L)=0.002070 *29*; α(M)=0.000443 *6* α(N)=9.81×10^{-5} *14*; α(O)=1.515×10^{-5} *21*; α(P)=8.58×10^{-7} *12*
		687.32 *23*	100 *5*	1767.36	13/2$^+$	(E2+M1)	−0.26 *+14−15*	0.00751 *24*	α(K)=0.00644 *21*; α(L)=0.000847 *23*; α(M)=0.000178 *5* α(N)=3.98×10^{-5} *11*; α(O)=6.42×10^{-6} *18*; α(P)=4.82×10^{-7} *17*
2461.79	(5/2$^+$)	810.5 *3*	23.1 *22*	1650.85	(9/2$^+$)	(E2)		0.00338 *5*	B(M1)(W.u.)<0.45; B(E2)(W.u.)<82.27 B(E2)(W.u.)=37 *+13−11* α(N)=1.902×10^{-5} *27*; α(O)=3.02×10^{-6} *4*; α(P)=2.052×10^{-7} *29* α(K)=0.00287 *4*; α(L)=0.000405 *6*; α(M)=8.54×10^{-5} *12*
		1026.2 *4*	21.3 *20*	1436.12	3/2$^+$	(E2+M1)		0.0025 *5*	α(K)=0.0021 *4*; α(L)=0.00028 *5*; α(M)=5.9×10^{-5} *10* α(N)=1.31×10^{-5} *22*; α(O)=2.1×10^{-6} *4*; α(P)=1.56×10^{-7} *33*
		1335.0 *4*	24.7 *20*	1126.83	3/2$^+$	(E2+M1)		0.00142 *22*	α(N)=7.2×10^{-6} *11*; α(O)=1.17×10^{-6} *18*; α(P)=8.8×10^{-8} *15*; α(IPF)=2.87×10^{-5} *5* α(K)=0.00120 *19*; α(L)=0.000155 *23*; α(M)=3.2×10^{-5} *5*
		2462.2 *6*	100 *3*	0.0	5/2$^+$	(E2+M1)		0.00093 *5*	α(K)=0.000343 *21*; α(L)=4.32×10^{-5} *27*; α(M)=9.0×10^{-6} *6* α(N)=2.02×10^{-6} *13*; α(O)=3.27×10^{-7} *21*; α(P)=2.50×10^{-8} *18*; α(IPF)=0.000534 *22*
2473.2?	(1/2$^-$,9/2$^-$)	368.16 *21*	100	2105.02	(5/2$^-$)	(E2)		0.0270 *4*	α(K)=0.02194 *31*; α(L)=0.00396 *6*; α(M)=0.000853 *12* α(N)=0.0001882 *27*; α(O)=2.87×10^{-5} *4*; α(P)=1.476×10^{-6} *21*
2499.08?		1381.1[&] *2*	100	1117.67	11/2$^-$				
2499.76	(5/2$^+$,7/2$^+$,9/2$^+$)	1046.5 *4*	19.6 *14*	1452.36	(7/2)$^+$	(E2+M1)		0.0024 *4*	α(K)=0.0020 *4*; α(L)=0.00027 *5*; α(M)=5.6×10^{-5} *9* α(N)=1.26×10^{-5} *21*; α(O)=2.0×10^{-6} *4*; α(P)=1.50×10^{-7} *31* δ: +0.22 *+47−22* or +2.4 *+29−13* (n,n′γ).

$^{141}_{59}Pr_{82}$-24

Adopted Levels, Gammas (continued)

$\gamma(^{141}Pr)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
2499.76	(5/2$^+$,7/2$^+$,9/2$^+$)	2354.8 *3*	100.0 *14*	145.4434	7/2$^+$	(E2+M1)	0.00091 *5*	α(K)=0.000375 *25*; α(L)=4.72×10^{-5} *33*; α(M)=9.9×10^{-6} *7* α(N)=2.20×10^{-6} *16*; α(O)=3.57×10^{-7} *26*; α(P)=2.73×10^{-8} *21*; α(IPF)=0.000480 *19* δ: +0.06 *8* or +4.1 *+16−11* (n,n′γ).
2520.15	(3/2$^+$)	501.5 *3*	62 *9*	2018.12	(3/2$^+$)	(E2+M1)	0.0140 *28*	α(K)=0.0118 *25*; α(L)=0.00169 *21*; α(M)=0.00036 *4* α(N)=8.0×10^{-5} *9*; α(O)=1.27×10^{-5} *17*; α(P)=8.6×10^{-7} *22*
		1085.0 *4*	73 *11*	1436.12	3/2$^+$	(E2+M1)	0.0022 *4*	α(K)=0.00188 *35*; α(L)=0.00025 *4*; α(M)=5.2×10^{-5} *9* α(N)=1.16×10^{-5} *19*; α(O)=1.86×10^{-6} *32*; α(P)=1.38×10^{-7} *28*
		1227.3 *4*	77 *10*	1292.69	(5/2)$^+$	(E2+M1)	0.00168 *28*	α(K)=0.00144 *25*; α(L)=0.000187 *29*; α(M)=3.9×10^{-5} *6* α(N)=8.7×10^{-6} *14*; α(O)=1.41×10^{-6} *23*; α(P)=1.05×10^{-7} *20*; α(IPF)=9.47×10^{-6} *15*
		2374.6 *7*	100 *10*	145.4434	7/2$^+$	(E2)	8.71×10^{-4} *12*	B(E2)(W.u.)=0.22 *+24−12* α(N)=2.020×10^{-6} *28*; α(O)=3.27×10^{-7} *5*; α(P)=2.481×10^{-8} *35*; α(IPF)=0.000471 *7* α(K)=0.000345 *5*; α(L)=4.33×10^{-5} *6*; α(M)=9.03×10^{-6} *13*
		2520.7 *9*	76 *10*	0.0	5/2$^+$	(E2+M1)	0.00094 *5*	α(K)=0.000328 *19*; α(L)=4.12×10^{-5} *24*; α(M)=8.6×10^{-6} *5* α(N)=1.92×10^{-6} *12*; α(O)=3.12×10^{-7} *19*; α(P)=2.39×10^{-8} *16*; α(IPF)=0.000563 *24*
2563.9	(5/2$^-$,7/2$^-$)	2418.0 *9*	49 *7*	145.4434	7/2$^+$	(E1)	1.07×10^{-3} *2*	B(E1)(W.u.)=1.06×10^{-4} *+22−20* α(K)=0.0001738 *24*; α(L)=2.130×10^{-5} *30*; α(M)=4.43×10^{-6} *6* α(N)=9.90×10^{-7} *14*; α(O)=1.604×10^{-7} *22*; α(P)=1.228×10^{-8} *17*; α(IPF)=0.000865 *12*
		2564.1 *7*	100 *7*	0.0	5/2$^+$	(E1)	1.14×10^{-3} *2*	B(E1)(W.u.)=1.81×10^{-4} *+32−29* α(K)=0.0001591 *22*; α(L)=1.947×10^{-5} *27*; α(M)=4.05×10^{-6} *6* α(N)=9.05×10^{-7} *13*; α(O)=1.466×10^{-7} *21*; α(P)=1.123×10^{-8} *16*; α(IPF)=0.000953 *13*
2580.71	(11/2$^+$)	536.0 *3*	50 *8*	2045.11	9/2$^+$	(E2+M1)	0.0118 *24*	α(K)=0.0100 *22*; α(L)=0.00141 *19*; α(M)=0.00030 *4* α(N)=6.7×10^{-5} *9*; α(O)=1.06×10^{-5} *16*; α(P)=7.3×10^{-7} *18*
		726.7 *3*	33 *8*	1853.79	(11/2$^+$)	(E2+M1)	0.0055 *12*	α(K)=0.0047 *10*; α(L)=0.00064 *11*; α(M)=0.000135 *23* α(N)=3.0×10^{-5} *5*; α(O)=4.8×10^{-6} *9*; α(P)=3.5×10^{-7} *8*

$^{141}_{59}Pr_{82}$-25

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.	δ #	α @	Comments
2580.71	(11/2$^+$)	1122.9 *4*	94 *17*	1457.36	9/2$^+$	(E2+M1)		0.0020 *4*	α(K)=0.00174 *32*; α(L)=0.00023 *4*; α(M)=4.8×10^{-5} *8* α(N)=1.07×10^{-5} *18*; α(O)=1.72×10^{-6} *29*; α(P)=1.28×10^{-7} *25*; α(IPF)=8.12×10^{-7} *16*
		2435.30 *25*	100 *19*	145.4434	7/2$^+$	(E2)		8.82×10^{-4} *12*	α(N)=1.929×10^{-6} *27*; α(O)=3.12×10^{-7} *4*; α(P)=2.372×10^{-8} *33*; α(IPF)=0.000500 *7* α(K)=0.000330 *5*; α(L)=4.14×10^{-5} *6*; α(M)=8.63×10^{-6} *12* B(E2)(W.u.)<5.26
2583.0	(5/2$^-$,7/2$^-$,9/2$^-$)	2437.2 *8*	50.4 *6*	145.4434	7/2$^+$	(E1)		1.08×10^{-3} *2*	B(E1)(W.u.)=2.4×10^{-4} *+8–6* α(K)=0.0001718 *24*; α(L)=2.104×10^{-5} *29*; α(M)=4.38×10^{-6} *6* α(N)=9.78×10^{-7} *14*; α(O)=1.584×10^{-7} *22*; α(P)=1.213×10^{-8} *17*; α(IPF)=0.000877 *12*
		2583.3 *7*	100.0 *6*	0.0	5/2$^+$	(E1)		1.15×10^{-3} *2*	B(E1)(W.u.)=0.00040 *+13–9* α(K)=0.0001573 *22*; α(L)=1.925×10^{-5} *27*; α(M)=4.00×10^{-6} *6* α(N)=8.95×10^{-7} *13*; α(O)=1.450×10^{-7} *20*; α(P)=1.111×10^{-8} *16*; α(IPF)=0.000965 *14*
2586.1		2586	100	0.0	5/2$^+$				
2601.2	(5/2$^-$,7/2$^-$)	2455.7 *7*	41 *7*	145.4434	7/2$^+$	(E1)		1.08×10^{-3} *2*	B(E1)(W.u.)=8.3×10^{-5} *+44–33* α(K)=0.0001698 *24*; α(L)=2.080×10^{-5} *29*; α(M)=4.33×10^{-6} *6* α(N)=9.67×10^{-7} *14*; α(O)=1.566×10^{-7} *22*; α(P)=1.199×10^{-8} *17*; α(IPF)=0.000888 *12*
		2601.3 *8*	100 *7*	0.0	5/2$^+$	(E1)		1.16×10^{-3} *2*	B(E1)(W.u.)=1.7×10^{-4} *+9–6* α(K)=0.0001557 *22*; α(L)=1.905×10^{-5} *27*; α(M)=3.96×10^{-6} *6* α(N)=8.86×10^{-7} *12*; α(O)=1.434×10^{-7} *20*; α(P)=1.099×10^{-8} *15*; α(IPF)=0.000976 *14*
2603.7	(5/2$^-$,7/2$^-$)	2458.7 *7*	25 *3*	145.4434	7/2$^+$	(E1)		1.09×10^{-3} *2*	B(E1)(W.u.)=1.2×10^{-4} *+6–4* α(K)=0.0001695 *24*; α(L)=2.076×10^{-5} *29*; α(M)=4.32×10^{-6} *6* α(N)=9.65×10^{-7} *14*; α(O)=1.563×10^{-7} *22*; α(P)=1.197×10^{-8} *17*; α(IPF)=0.000890 *12*
		2603.1 *8*	100 *3*	0.0	5/2$^+$	(E1)		1.16×10^{-3} *2*	B(E1)(W.u.)=0.00040 *+20–12* α(K)=0.0001555 *22*; α(L)=1.903×10^{-5} *27*; α(M)=3.96×10^{-6} *6*

$^{141}_{59}Pr_{82}$-26

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
								B(E1)(W.u.)=0.00040 *+20−12* α(K)=0.0001555 *22*; α(L)=1.903×10^{-5} *27*; α(M)=3.96×10^{-6} *6* α(N)=8.85×10^{-7} *12*; α(O)=1.433×10^{-7} *20*; α(P)=1.098×10^{-8} *15*; α(IPF)=0.000977 *14*
2607.1	(1/2$^+$)	2607.1 *8*	100	0.0	5/2$^+$	(E2)	9.19×10^{-4} *13*	B(E2)(W.u.)=0.9 *+7−4* α(K)=0.000292 *4*; α(L)=3.66×10^{-5} *5*; α(M)=7.62×10^{-6} *11* α(N)=1.705×10^{-6} *24*; α(O)=2.76×10^{-7} *4*; α(P)=2.102×10^{-8} *29*; α(IPF)=0.000580 *8*
2611.7	(9/2$^+$)	1318.6 *5*	14.3 *17*	1292.69	(5/2)$^+$	(E2)	1.23×10^{-3} *2*	B(E2)(W.u.)=14.1 *26* α(K)=0.001033 *14*; α(L)=0.0001353 *19*; α(M)=2.84×10^{-5} *4* α(N)=6.33×10^{-6} *9*; α(O)=1.018×10^{-6} *14*; α(P)=7.44×10^{-8} *10*; α(IPF)=2.48×10^{-5} *4*
		2612.4 *7*	100.0 *17*	0.0	5/2$^+$	(E2)	9.20×10^{-4} *13*	B(E2)(W.u.)=3.2 *5* α(K)=0.000291 *4*; α(L)=3.64×10^{-5} *5*; α(M)=7.60×10^{-6} *11* α(N)=1.699×10^{-6} *24*; α(O)=2.75×10^{-7} *4*; α(P)=2.095×10^{-8} *29*; α(IPF)=0.000583 *8*
2623.2	(5/2$^+$,7/2$^+$)	1330.3 *5*	39 *6*	1292.69	(5/2)$^+$	(E2+M1)	0.00143 *22*	α(K)=0.00121 *19*; α(L)=0.000156 *23*; α(M)=3.3×10^{-5} *5* α(N)=7.3×10^{-6} *11*; α(O)=1.18×10^{-6} *18*; α(P)=8.8×10^{-8} *15*; α(IPF)=2.76×10^{-5} *5*
		2477.7 *7*	93 *6*	145.4434	7/2$^+$	(E2+M1)	0.00093 *5*	α(K)=0.000339 *20*; α(L)=4.27×10^{-5} *26*; α(M)=8.9×10^{-6} *6* α(N)=1.99×10^{-6} *13*; α(O)=3.23×10^{-7} *21*; α(P)=2.47×10^{-8} *17*; α(IPF)=0.000541 *23*
		2623.8 *8*	100 *7*	0.0	5/2$^+$	(E2+M1)	0.00096 *4*	α(K)=0.000304 *15*; α(L)=3.81×10^{-5} *20*; α(M)=7.9×10^{-6} *4* α(N)=1.78×10^{-6} *10*; α(O)=2.88×10^{-7} *16*; α(P)=2.21×10^{-8} *13*; α(IPF)=0.000613 *26*
2626.7?	(15/2$^-$)	1509.1 *3*	100	1117.67	11/2$^-$			E_γ: from (α,2nγ).
2646.4	(9/2$^+$)	2500.6 *7*	85 *6*	145.4434	7/2$^+$	E2+M1	0.00094 *5*	α(K)=0.000333 *19*; α(L)=4.19×10^{-5} *25*; α(M)=8.7×10^{-6} *5* α(N)=1.96×10^{-6} *12*; α(O)=3.17×10^{-7} *20*; α(P)=2.42×10^{-8} *16*; α(IPF)=0.000553 *23*
		2646.9 *8*	100 *6*	0.0	5/2$^+$	E2	9.28×10^{-4} *13*	B(E2)(W.u.)=0.60 *+15−13* α(K)=0.000284 *4*; α(L)=3.56×10^{-5} *5*; α(M)=7.42×10^{-6} *10* α(N)=1.659×10^{-6} *23*; α(O)=2.69×10^{-7} *4*; α(P)=2.047×10^{-8} *29*; α(IPF)=0.000599 *8*
2659.6	(11/2$^+$)	2514.1 *8*	100	145.4434	7/2$^+$	(E2)	8.98×10^{-4} *13*	α(K)=0.000311 *4*; α(L)=3.90×10^{-5} *5*; α(M)=8.14×10^{-6} *11* α(N)=1.821×10^{-6} *26*; α(O)=2.95×10^{-7} *4*; α(P)=2.242×10^{-8} *31*; α(IPF)=0.000537 *8* B(E2)(W.u.)<0.83

$^{141}_{59}Pr_{82}$-27

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
2669.02	(9/2$^-$,11/2$^-$,13/2$^-$)	1175.2 *3*	20 *3*	1493.98	11/2$^+$	(E1)	6.78×10^{-4} *9*	B(E1)(W.u.)=0.00048 *+26−17* α(N)=3.32×10^{-6} *5*; α(O)=5.35×10^{-7} *7*; α(P)=4.02×10^{-8} *6*; α(IPF)=1.797×10^{-5} *27* α(K)=0.000570 *8*; α(L)=7.12×10^{-5} *10*; α(M)=1.484×10^{-5} *21*
		1216.4 *4*	34 *5*	1452.36	(7/2)$^+$			Mult.: (E3) from 2008Sc17 in (n,n′γ) greatly exeeds RUL limits and is not adopted here.
		1551.3 *4*	100 *5*	1117.67	11/2$^-$	(E2+M1)	0.00111 *14*	α(K)=0.00087 *12*; α(L)=0.000112 *15*; α(M)=2.34×10^{-5} *30* α(N)=5.2×10^{-6} *7*; α(O)=8.5×10^{-7} *11*; α(P)=6.4×10^{-8} *10*; α(IPF)=9.71×10^{-5} *24* δ: −0.18 *8* or <−4.9 (n,n′γ).
2682.99	(5/2$^+$)	870.9 *4*	25 *3*	1812.37	(9/2$^+$)			Mult.: (E2+M1) from (n,n′γ) but (E2) based on ΔJ from level scheme.
		1246.1 *5*	13.7 *24*	1436.12	3/2$^+$	(E2+M1)	0.00163 *27*	α(K)=0.00139 *23*; α(L)=0.000180 *28*; α(M)=3.8×10^{-5} *6* α(N)=8.4×10^{-6} *13*; α(O)=1.36×10^{-6} *22*; α(P)=1.02×10^{-7} *19*; α(IPF)=1.217×10^{-5} *20*
		1556.3 *4*	100 *4*	1126.83	3/2$^+$	(E2+M1)	0.00111 *14*	α(K)=0.00087 *12*; α(L)=0.000111 *14*; α(M)=2.32×10^{-5} *30* α(N)=5.2×10^{-6} *7*; α(O)=8.4×10^{-7} *11*; α(P)=6.3×10^{-8} *9*; α(IPF)=9.90×10^{-5} *25*
		2537.5 *11*	10.0 *22*	145.4434	7/2$^+$	(E2+M1)	0.00095 *5*	α(K)=0.000324 *18*; α(L)=4.07×10^{-5} *24*; α(M)=8.5×10^{-6} *5* α(N)=1.90×10^{-6} *11*; α(O)=3.08×10^{-7} *19*; α(P)=2.36×10^{-8} *15*; α(IPF)=0.000571 *24*
		2683.2 *8*	55 *5*	0.0	5/2$^+$	(E2+M1)	0.00098 *4*	α(K)=0.000291 *14*; α(L)=3.65×10^{-5} *18*; α(M)=7.6×10^{-6} *4* α(N)=1.70×10^{-6} *9*; α(O)=2.76×10^{-7} *14*; α(P)=2.11×10^{-8} *12*; α(IPF)=0.000642 *28*
2692.0	−	2692	100	0.0	5/2$^+$			
2707.9	(15/2$^-$)	1590.2 *4*	100	1117.67	11/2$^-$	(E2)	9.46×10^{-4} *13*	B(E2)(W.u.)=32 *+73−21* α(K)=0.000719 *10*; α(L)=9.27×10^{-5} *13*; α(M)=1.939×10^{-5} *27* α(N)=4.33×10^{-6} *6*; α(O)=6.98×10^{-7} *10*; α(P)=5.18×10^{-8} *7*; α(IPF)=0.0001099 *15*
2710.1	(3/2$^+$)	1411.3 *3*	82 *16*	1298.71	1/2$^+$	(E2+M1)	0.00129 *19*	α(N)=6.4×10^{-6} *9*; α(O)=1.04×10^{-6} *15*; α(P)=7.8×10^{-8} *13*; α(IPF)=4.92×10^{-5} *10*

$^{141}_{59}Pr_{82}$-28

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
								α(K)=0.00106 *16*; α(L)=0.000137 *20*; α(M)=2.9×10^{-5} *4*
2710.1	(3/2$^+$)	1583.3 *4*	100 *16*	1126.83	3/2$^+$	(E2+M1)	0.00108 *13*	α(K)=0.00084 *11*; α(L)=0.000107 *14*; α(M)=2.24×10^{-5} *29* α(N)=5.0×10^{-6} *6*; α(O)=8.1×10^{-7} *11*; α(P)=6.1×10^{-8} *9*; α(IPF)=0.0001096 *28*
2718.5	(9/2,11/2)	1197.5 *4*	100 *5*	1520.89	9/2$^+$			
		1601.1 *5*	47 *4*	1117.67	11/2$^-$			
2722.4	(3/2$^+$)	1271.6 *5*	30 *20*	1452.36	(7/2)$^+$	(E2)	1.31×10^{-3} *2*	B(E2)(W.u.)=13 *+10−7* α(K)=0.001109 *16*; α(L)=0.0001460 *20*; α(M)=3.06×10^{-5} *4* α(N)=6.83×10^{-6} *10*; α(O)=1.097×10^{-6} *15*; α(P)=7.99×10^{-8} *11*; α(IPF)=1.610×10^{-5} *24*
		1422.4 *6*	20 *20*	1298.71	1/2$^+$	(E2+M1)	0.00127 *19*	α(K)=0.00105 *16*; α(L)=0.000135 *19*; α(M)=2.8×10^{-5} *4* α(N)=6.3×10^{-6} *9*; α(O)=1.02×10^{-6} *15*; α(P)=7.7×10^{-8} *13*; α(IPF)=5.26×10^{-5} *11*
		2576.0 *9*	50 *20*	145.4434	7/2$^+$	(E2)	9.12×10^{-4} *13*	B(E2)(W.u.)=0.65 *+31−29* α(K)=0.000298 *4*; α(L)=3.74×10^{-5} *5*; α(M)=7.79×10^{-6} *11* α(N)=1.742×10^{-6} *24*; α(O)=2.82×10^{-7} *4*; α(P)=2.147×10^{-8} *30*; α(IPF)=0.000566 *8*
		2721.5 *8*	100 *20*	0.0	5/2$^+$	(E2+M1)	0.00099 *4*	α(N)=1.66×10^{-6} *8*; α(O)=2.68×10^{-7} *13*; α(P)=2.06×10^{-8} *11*; α(IPF)=0.000660 *29* α(K)=0.000283 *13*; α(L)=3.55×10^{-5} *17*; α(M)=7.4×10^{-6} *4*
2731.4	(9/2$^+$)	877.5 *4*	6 *6*	1853.79	(11/2$^+$)	E2+M1	0.0036 *7*	α(K)=0.0030 *6*; α(L)=0.00041 *7*; α(M)=8.5×10^{-5} *15* α(N)=1.90×10^{-5} *33*; α(O)=3.1×10^{-6} *6*; α(P)=2.2×10^{-7} *5*
		1278.7 *5*	44 *20*	1452.36	(7/2)$^+$	E2+M1	0.00155 *25*	α(K)=0.00131 *22*; α(L)=0.000170 *26*; α(M)=3.6×10^{-5} *5* α(N)=8.0×10^{-6} *12*; α(O)=1.29×10^{-6} *20*; α(P)=9.6×10^{-8} *17*; α(IPF)=1.741×10^{-5} *29*
		2586.6 *8*	100 *20*	145.4434	7/2$^+$	E2+M1	0.00096 *4*	α(K)=0.000312 *16*; α(L)=3.92×10^{-5} *22*; α(M)=8.2×10^{-6} *5* α(N)=1.83×10^{-6} *10*; α(O)=2.96×10^{-7} *17*; α(P)=2.27×10^{-8} *14*; α(IPF)=0.000595 *25* δ: −0.04 *+16−14* or +7 *+57−4* (n,n′γ).
		2732.1 *8*	50 *20*	0.0	5/2$^+$	E2	9.49×10^{-4} *13*	B(E2)(W.u.)=0.39 *+20−17* α(N)=1.567×10^{-6} *22*; α(O)=2.54×10^{-7} *4*; α(P)=1.936×10^{-8} *27*; α(IPF)=0.000638 *9* α(K)=0.000269 *4*; α(L)=3.36×10^{-5} *5*; α(M)=7.01×10^{-6} *10*
2739.7	(1/2$^-$,9/2$^-$)	1159.6 *3*	100	1580.05	5/2$^-$	E2	1.56×10^{-3} *2*	α(K)=0.001335 *19*; α(L)=0.0001777 *25*; α(M)=3.73×10^{-5} *5* α(N)=8.32×10^{-6} *12*; α(O)=1.334×10^{-6} *19*; α(P)=9.61×10^{-8} *13*; α(IPF)=2.43×10^{-6} *4*
2749.58		963.1 *1*	100	1786.47	(5/2$^+$)			B(E2)(W.u.)<71.15
2777.5	(9/2)	923.8 *4*	20 *3*	1853.79	(11/2$^+$)			E_γ: from (p,2nγ).

$^{141}_{59}Pr_{82}$-29

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
2777.5	(9/2)	2631.9 *8*	100 *3*	145.4434	7/2$^+$	D+Q		δ: +0.06 *+10−9* or +4.1 *+29−12* (n,n′γ).
2782.4	(5/2$^+$,7/2$^+$)	2637.4 *8*	100 *5*	145.4434	7/2$^+$	(E2+M1)	0.00097 *4*	α(K)=0.000301 *15*; α(L)=3.77×10^{-5} *20*; α(M)=7.9×10^{-6} *4* α(N)=1.76×10^{-6} *9*; α(O)=2.85×10^{-7} *16*; α(P)=2.19×10^{-8} *13*; α(IPF)=0.000620 *27*
		2781.8 *9*	52 *5*	0.0	5/2$^+$	(E2+M1)	0.00100 *4*	α(K)=0.000271 *11*; α(L)=3.40×10^{-5} *15*; α(M)=7.09×10^{-6} *32* α(N)=1.59×10^{-6} *7*; α(O)=2.57×10^{-7} *12*; α(P)=1.97×10^{-8} *10*; α(IPF)=0.000689 *30*
2782.7	(13/2$^+$)	576.93 *25*	49 *22*	2205.96	(11/2$^+$)	(E2+M1)	0.0098 *20*	α(K)=0.0083 *18*; α(L)=0.00116 *17*; α(M)=0.000245 *35* α(N)=5.5×10^{-5} *8*; α(O)=8.7×10^{-6} *14*; α(P)=6.1×10^{-7} *15*
		1261.1 *5*	100 *22*	1520.89	9/2$^+$	(E2)	1.33×10^{-3} *2*	α(K)=0.001128 *16*; α(L)=0.0001486 *21*; α(M)=3.12×10^{-5} *4* α(N)=6.95×10^{-6} *10*; α(O)=1.117×10^{-6} *16*; α(P)=8.12×10^{-8} *11*; α(IPF)=1.441×10^{-5} *22* B(E2)(W.u.)<65.31
2786.2		2786	100	0.0	5/2$^+$			
2801.77	(9/2$^+$)	1151.2 *5*	100 *8*	1650.85	(9/2$^+$)	(E2+M1)	0.00193 *34*	α(K)=0.00165 *30*; α(L)=0.000216 *35*; α(M)=4.5×10^{-5} *7* α(N)=1.01×10^{-5} *16*; α(O)=1.63×10^{-6} *27*; α(P)=1.21×10^{-7} *24*; α(IPF)=1.94×10^{-6} *4*
		2656.0 *4*	92 *8*	145.4434	7/2$^+$	(E2+M1)	0.00097 *4*	α(K)=0.000297 *14*; α(L)=3.72×10^{-5} *19*; α(M)=7.8×10^{-6} *4* α(N)=1.74×10^{-6} *9*; α(O)=2.81×10^{-7} *15*; α(P)=2.16×10^{-8} *12*; α(IPF)=0.000629 *27*
		2801.8 *3*	78 *8*	0.0	5/2$^+$	(E2)	9.67×10^{-4} *14*	B(E2)(W.u.)=0.18 *+14−9* α(K)=0.000258 *4*; α(L)=3.21×10^{-5} *5*; α(M)=6.70×10^{-6} *9* α(N)=1.498×10^{-6} *21*; α(O)=2.426×10^{-7} *34*; α(P)=1.853×10^{-8} *26*; α(IPF)=0.000669 *9*
2807.18	(3/2$^+$,5/2,7/2$^+$)	491.4 *3*	17 *17*	2315.65	(5/2,7/2)			
		2662.0 *4*	96 *21*	145.4434	7/2$^+$			
		2807.13 *22*	100 *21*	0.0	5/2$^+$			
2810.70	(1/2$^+$)	1201.1 *5*	85 *13*	1608.26	(3/2)$^+$	(E2+M1)	0.00176 *30*	α(K)=0.00150 *26*; α(L)=0.000196 *31*; α(M)=4.1×10^{-5} *6* α(N)=9.2×10^{-6} *15*; α(O)=1.48×10^{-6} *24*; α(P)=1.10×10^{-7} *21*; α(IPF)=6.16×10^{-6} *11*
		2810.95 *23*	100 *13*	0.0	5/2$^+$	(E2)	9.70×10^{-4} *14*	α(K)=0.000256 *4*; α(L)=3.20×10^{-5} *4*; α(M)=6.66×10^{-6} *9* α(N)=1.490×10^{-6} *21*; α(O)=2.412×10^{-7} *34*;

$^{141}_{59}Pr_{82}$-30

Adopted Levels, Gammas (continued)

$\gamma(^{141}Pr)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
								α(P)=1.842×10^{-8} *26*; α(IPF)=0.000673 *9* B(E2)(W.u.)<0.59
2814.0	(1/2$^-$)	1233.1 *4*	85 *13*	1580.05	5/2$^-$	(E2)	1.39×10^{-3} *2*	B(E2)(W.u.)=9×10^{1} *+12−5* α(N)=7.29×10^{-6} *10*; α(O)=1.170×10^{-6} *16*; α(P)=8.49×10^{-8} *12*; α(IPF)=1.022×10^{-5} *15* α(K)=0.001180 *17*; α(L)=0.0001558 *22*; α(M)=3.27×10^{-5} *5*
		1687.7 *3*	100 *13*	1126.83	3/2$^+$	(E1)	7.09×10^{-4} *10*	B(E1)(W.u.)=0.0012 *+15−6* α(K)=0.000307 *4*; α(L)=3.79×10^{-5} *5*; α(M)=7.89×10^{-6} *11* α(N)=1.762×10^{-6} *25*; α(O)=2.85×10^{-7} *4*; α(P)=2.165×10^{-8} *30*; α(IPF)=0.000355 *5*
2837.5	(5/2$^-$,7/2$^-$)	2692.0 *9*	100 *5*	145.4434	7/2$^+$	(E1)	1.20×10^{-3} *2*	B(E1)(W.u.)=0.00040 *+24−14* α(K)=0.0001479 *21*; α(L)=1.809×10^{-5} *25*; α(M)=3.76×10^{-6} *5* α(N)=8.41×10^{-7} *12*; α(O)=1.362×10^{-7} *19*; α(P)=1.045×10^{-8} *15*; α(IPF)=0.001030 *14*
		2837.5 *11*	33 *5*	0.0	5/2$^+$	(E1)	1.27×10^{-3} *2*	B(E1)(W.u.)=1.1×10^{-4} *+7−4* α(K)=0.0001369 *19*; α(L)=1.672×10^{-5} *23*; α(M)=3.48×10^{-6} *5* α(N)=7.77×10^{-7} *11*; α(O)=1.259×10^{-7} *18*; α(P)=9.66×10^{-9} *14*; α(IPF)=0.001111 *16*
2839.7	(9/2$^-$)	2694.2 *4*	100	145.4434	7/2$^+$	(E1)	1.20×10^{-3} *2*	B(E1)(W.u.)=0.00023 *+16−10* α(K)=0.0001478 *21*; α(L)=1.807×10^{-5} *25*; α(M)=3.76×10^{-6} *5* α(N)=8.40×10^{-7} *12*; α(O)=1.361×10^{-7} *19*; α(P)=1.043×10^{-8} *15*; α(IPF)=0.001032 *14*
2844.7	(3/2$^-$)	1186.8 *5*	50 *30*	1657.07	1/2$^+$	(E1)	6.71×10^{-4} *9*	B(E1)(W.u.)=0.0008 *+15−6* α(K)=0.000561 *8*; α(L)=7.00×10^{-5} *10*; α(M)=1.458×10^{-5} *20* α(N)=3.26×10^{-6} *5*; α(O)=5.25×10^{-7} *7*; α(P)=3.95×10^{-8} *6*; α(IPF)=2.24×10^{-5} *4*
		1546.6 *6*	50 *30*	1298.71	1/2$^+$	(E1)	6.59×10^{-4} *9*	B(E1)(W.u.)=0.0004 *+7−3* α(K)=0.000354 *5*; α(L)=4.39×10^{-5} *6*; α(M)=9.14×10^{-6} *13* α(N)=2.042×10^{-6} *29*; α(O)=3.30×10^{-7} *5*; α(P)=2.501×10^{-8} *35*; α(IPF)=0.0002488 *35*
		2846.2 *11*	100 *40*	0.0	5/2$^+$	(E1)	1.27×10^{-3} *2*	B(E1)(W.u.)=0.00012 *+19−8* α(K)=0.0001362 *19*; α(L)=1.665×10^{-5} *23*; α(M)=3.46×10^{-6} *5* α(N)=7.74×10^{-7} *11*; α(O)=1.253×10^{-7} *18*; α(P)=9.62×10^{-9} *13*; α(IPF)=0.001116 *16*
2847.5	(9/2$^+$)	1005.0 *4*	100 *11*	1842.14	(7/2$^+$)	(E2+M1)	0.0026 *5*	α(K)=0.0022 *4*; α(L)=0.00029 *5*; α(M)=6.2×10^{-5} *11* α(N)=1.38×10^{-5} *24*; α(O)=2.2×10^{-6} *4*; α(P)=1.64×10^{-7} *35* δ: +0.20 *+43−23* or +2.5 *+45−15* (n,n′γ).
		1354.0 *5*	50 *8*	1493.98	11/2$^+$	(E2+M1)	0.00139 *21*	α(K)=0.00116 *18*; α(L)=0.000150 *22*; α(M)=3.1×10^{-5} *5*

$^{141}_{59}Pr_{82}$-31

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
								α(N)=7.0×10^{-6} *10*; α(O)=1.13×10^{-6} *17*; α(P)=8.5×10^{-8} *15*; α(IPF)=3.33×10^{-5} *6*
2847.5	(9/2$^+$)	1389.9 *6*	42 *8*	1457.36	9/2$^+$	(E2+M1)	0.00132 *19*	α(K)=0.00110 *17*; α(L)=0.000142 *20*; α(M)=3.0×10^{-5} *4* α(N)=6.6×10^{-6} *10*; α(O)=1.07×10^{-6} *16*; α(P)=8.0×10^{-8} *13*; α(IPF)=4.30×10^{-5} *8*
		2702.8 *12*	33 *6*	145.4434	7/2$^+$	(E2+M1)	0.00098 *4*	α(K)=0.000287 *13*; α(L)=3.60×10^{-5} *18*; α(M)=7.5×10^{-6} *4* α(N)=1.68×10^{-6} *8*; α(O)=2.72×10^{-7} *14*; α(P)=2.08×10^{-8} *11*; α(IPF)=0.000651 *28*
		2848.4 *11*	53 *17*	0.0	5/2$^+$	(E2)	9.80×10^{-4} *14*	α(K)=0.0002503 *35*; α(L)=3.12×10^{-5} *4*; α(M)=6.51×10^{-6} *9* α(N)=1.455×10^{-6} *20*; α(O)=2.356×10^{-7} *33*; α(P)=1.800×10^{-8} *25*; α(IPF)=0.000690 *10* B(E2)(W.u.)<0.19
2863.4		1570.9 *6*	100 *30*	1292.69	(5/2)$^+$			
		2716.8 *15*	49 *30*	145.4434	7/2$^+$			
2881.6	(7/2$^+$)	1028.0 *5*	92 *42*	1853.79	(11/2$^+$)			Mult.: (E2+M1) from (n,n′γ) but (E2) based on ΔJ from level scheme.
		1424.5 *8*	100 *50*	1457.36	9/2$^+$	(E2+M1)	0.00127 *18*	α(N)=6.3×10^{-6} *9*; α(O)=1.02×10^{-6} *15*; α(P)=7.6×10^{-8} *12*; α(IPF)=5.33×10^{-5} *11* α(K)=0.00104 *16*; α(L)=0.000134 *19*; α(M)=2.8×10^{-5} *4*
		1428.5 *6*	81 *19*	1452.36	(7/2)$^+$	(E2+M1)	0.00126 *18*	α(K)=0.00104 *15*; α(L)=0.000134 *19*; α(M)=2.8×10^{-5} *4* α(N)=6.3×10^{-6} *9*; α(O)=1.01×10^{-6} *15*; α(P)=7.6×10^{-8} *12*; α(IPF)=5.45×10^{-5} *11*
		2737.0 *16*	31 *15*	145.4434	7/2$^+$	(E2+M1)	0.00099 *4*	α(K)=0.000280 *12*; α(L)=3.51×10^{-5} *17*; α(M)=7.32×10^{-6} *35* α(N)=1.64×10^{-6} *8*; α(O)=2.65×10^{-7} *13*; α(P)=2.03×10^{-8} *11*; α(IPF)=0.000667 *29*
		2882.3 *11*	81 *15*	0.0	5/2$^+$	(E2+M1)	0.00103 *4*	α(K)=0.000254 *9*; α(L)=3.17×10^{-5} *13*; α(M)=6.62×10^{-6} *27* α(N)=1.48×10^{-6} *6*; α(O)=2.40×10^{-7} *10*; α(P)=1.84×10^{-8} *8*; α(IPF)=0.000736 *33*
2887.47	(7/2$^+$,9/2,11/2$^+$)	1075.2 *5*	86 *21*	1812.37	(9/2$^+$)			
		1367.0 *4*	100 *21*	1520.89	9/2$^+$			
		1392.8 *5*	82 *21*	1493.98	11/2$^+$			
		1769.6 *6*	61 *36*	1117.67	11/2$^-$			
		2742.5 *17*	32 *11*	145.4434	7/2$^+$			
2896.8	(11/2$^+$)	1439.0 *8*	41 *14*	1457.36	9/2$^+$			
		2752.0 *10*	100 *14*	145.4434	7/2$^+$			

$^{141}_{59}Pr_{82}$-32

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.	α @	Comments
2927.25	19/2$^-$	858.42 *15*	100	2068.84	17/2$^+$	E1	1.19×10^{-3} *2*	α(K)=0.001029 *14*; α(L)=0.0001298 *18*; α(M)=2.71×10^{-5} *4* α(N)=6.05×10^{-6} *8*; α(O)=9.73×10^{-7} *14*; α(P)=7.21×10^{-8} *10* E_γ: from (p,2nγ).
2929.2	(5/2$^+$,7/2$^+$)	1636.0 *5*	100 *10*	1292.69	(5/2)$^+$	(E2+M1)	0.00104 *12*	α(K)=0.00078 *10*; α(L)=0.000100 *12*; α(M)=2.09×10^{-5} *26* α(N)=4.7×10^{-6} *6*; α(O)=7.6×10^{-7} *10*; α(P)=5.7×10^{-8} *8*; α(IPF)=0.000131 *4*
		2785.2 *11*	85 *10*	145.4434	7/2$^+$	(E2+M1)	0.00100 *4*	α(K)=0.000271 *11*; α(L)=3.39×10^{-5} *15*; α(M)=7.07×10^{-6} *32* α(N)=1.58×10^{-6} *7*; α(O)=2.57×10^{-7} *12*; α(P)=1.97×10^{-8} *10*; α(IPF)=0.000690 *30*
		2930.3 *12*	23 *6*	0.0	5/2$^+$	(E2+M1)	0.00104 *4*	α(K)=0.000246 *8*; α(L)=3.07×10^{-5} *11*; α(M)=6.41×10^{-6} *24* α(N)=1.43×10^{-6} *5*; α(O)=2.33×10^{-7} *9*; α(P)=1.78×10^{-8} *8*; α(IPF)=0.000758 *34*
2941.4		1484.2 *10*	66 *41*	1457.36	9/2$^+$			
		1488.6 *8*	66 *41*	1452.36	(7/2)$^+$			
		2796.4 *14*	81 *25*	145.4434	7/2$^+$			
		2941.7 *14*	100 *25*	0.0	5/2$^+$			
2950.5	(1/2$^+$)	1514.4 *6*	100 *22*	1436.12	3/2$^+$			
		2950.1 *17*	49 *22*	0.0	5/2$^+$			
2954.0		2954		0.0	5/2$^+$			E_γ: from (γ,γ,).
2962.65	19/2$^+$	854.6 *3*	77 *4*	2108.20	15/2$^{(+)}$	(E2)	0.00300 *4*	α(N)=1.671×10^{-5} *23*; α(O)=2.66×10^{-6} *4*; α(P)=1.826×10^{-7} *26* α(K)=0.00255 *4*; α(L)=0.000356 *5*; α(M)=7.50×10^{-5} *11* E_γ,I_γ,Mult.: from (α,2nγ).
		893.7 *3*	100 *4*	2068.84	17/2$^+$	M1+E2	0.0034 *7*	α(K)=0.0029 *6*; α(L)=0.00039 *7*; α(M)=8.1×10^{-5} *14* α(N)=1.82×10^{-5} *32*; α(O)=2.9×10^{-6} *5*; α(P)=2.1×10^{-7} *5* E_γ,I_γ,Mult.: from (α,2nγ).
		1166.1 *7*	43 *6*	1796.21	15/2$^+$	Q		E_γ,I_γ,Mult.: from (^{7}Li,4nγ).
2983.5	(5/2$^-$,7/2$^-$)	2839.0 *7*	22 *13*	145.4434	7/2$^+$			
		2983.0 *5*	100 *13*	0.0	5/2$^+$			
3000.75	(11/2$^+$)	956.0 *4*	60 *22*	2045.11	9/2$^+$			
		1479.5 *5*	40 *22*	1520.89	9/2$^+$			
		2855.2 *3*	100 *18*	145.4434	7/2$^+$			
3016.3	(5/2$^-$)	941.0 *5*	97 *24*	2075.50	(5/2$^+$)			
		1887.9 *13*	50 *18*	1126.83	3/2$^+$			
		2871.0 *19*	38 *15*	145.4434	7/2$^+$			
		3015.9 *15*	100 *18*	0.0	5/2$^+$			
3016.88	21/2$^+$	89.7 *7*	<4	2927.25	19/2$^-$	E1	0.338 *9*	α(K)=0.287 *7*; α(L)=0.0410 *11*; α(M)=0.00859 *23* α(N)=0.00189 *5*; α(O)=0.000290 *8*; α(P)=1.68×10^{-5} *4* E_γ,I_γ: from (^{7}Li,4nγ)). E_γ,I_γ,Mult.: from (^{7}Li,4nγ).

$^{141}_{59}Pr_{82}$-33

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.	δ #	α @	Comments
3016.88	21/2$^+$	948.0 *3*	100.0 *20*	2068.84	17/2$^+$	E2		2.39×10^{-3} *3*	α(K)=0.002034 *29*; α(L)=0.000279 *4*; α(M)=5.87×10^{-5} *8*; α(N)=1.307×10^{-5} *18*; α(O)=2.085×10^{-6} *29*; α(P)=1.460×10^{-7} *20* E_γ,I_γ: from (^{7}Li,4nγ).
3018.95	21/2$^-$	91.7 *1*	100	2927.25	19/2$^-$	M1+E2	1.7 *6*	2.58 *24*	B(M1)(W.u.)=0.010 *+15−5* α(K)=1.516 *35*; α(L)=0.83 *17*; α(M)=0.19 *4*; α(N)=0.040 *8*; α(O)=0.0057 *11*; α(P)=8.7×10^{-5} *6* E_γ,Mult.,δ: from α(exp) (^{7}Li,4nγ). B(E2)(W.u.)=2.1×10^3 *+17−9* exceeds RUL=300.
3034.3	(1/2$^+$)	1734.9 *7*	100 *33*	1298.71	1/2$^+$				
		1742.5 *8*	67 *33*	1292.69	(5/2)$^+$				
3045.5	(11/2$^+$,9/2)	1524.6 *7*	100 *19*	1520.89	9/2$^+$				
		2900.2 *12*	85 *19*	145.4434	7/2$^+$				
3057.0		3057	100	0.0	5/2$^+$				
3064.5	(7/2$^+$,9/2$^-$)	960.5 *6*	84 *55*	2105.02	(5/2$^-$)				
		1209.9 *6*	79 *32*	1853.79	(11/2$^+$)				
		2918.4 *12*	100 *21*	145.4434	7/2$^+$				
3075.5	(3/2$^+$)	1623.1 *11*	100 *38*	1452.36	(7/2)$^+$				
		3075.4 *15*	92 *38*	0.0	5/2$^+$				
3080.0		1094.0 *5*	100 *43*	1986.08	(13/2$^+$)				
		2934.1 *17*	89 *43*	145.4434	7/2$^+$				
3083.5	(5/2)	2938	56	145.4434	7/2$^+$				
		3083.4 *14*	100	0.0	5/2$^+$				
3114.8		2969.2 *19*	100 *25*	145.4434	7/2$^+$				
		3114.8 *15*	49 *25*	0.0	5/2$^+$				
3128.6		764.6 *5*	53 *33*	2362.85	(5/2$^-$)				
		1838.1 *7*	98 *25*	1292.69	(5/2)$^+$				
		3128.7 *16*	100 *25*	0.0	5/2$^+$				
3155.5		1180.3 *7*	88 *30*	1975.26	(3/2$^+$)				
		1497.7 *14*	42 *30*	1657.07	1/2$^+$				
		1574.7 *13*	73 *37*	1580.05	5/2$^-$				
		3011.2 *12*	100 *21*	145.4434	7/2$^+$				
		3155 *14*		0.0	5/2$^+$				
3203.3	$^-$	3058	16	145.4434	7/2$^+$				
		3203	100 *26*	0.0	5/2$^+$				
3206.0		3206	100	0.0	5/2$^+$				
3255.0		3255	100	0.0	5/2$^+$				
3272.3		3127	100	145.4434	7/2$^+$				
		3272	43 *7*	0.0	5/2$^+$				
3294.0		3294	100	0.0	5/2$^+$				
3324.3		3179	100	145.4434	7/2$^+$				

$^{141}_{59}Pr_{82}$-34

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
3324.3		3324	58 *11*	0.0	$5/2^+$			
3338.0		3338	100	0.0	$5/2^+$			
3346.0		3346	100	0.0	$5/2^+$			
3348.8	(7/2)	3203	100	145.4434	$7/2^+$			
		3349	37 *8*	0.0	$5/2^+$			
3370.0		3370	100	0.0	$5/2^+$			
3376.0		3376	100	0.0	$5/2^+$			
3396.7	$21/2^-$	434.1 *3*	100	2962.65	$19/2^+$	E1	0.00522 *7*	α(K)=0.00449 *6*; α(L)=0.000583 *8*; α(M)=0.0001218 *17* α(N)=2.71×10^{-5} *4*; α(O)=4.33×10^{-6} *6*; α(P)=3.08×10^{-7} *4* E_γ,Mult.: from (α,2nγ).
3417.3		3272	100	145.4434	$7/2^+$			
		3417	35 *7*	0.0	$5/2^+$			
3427.3		3282	41	145.4434	$7/2^+$			
		3427	100 *23*	0.0	$5/2^+$			
3449.0		3449	100	0.0	$5/2^+$			
3470.9	$23/2^-$	74.2 *1*	8.3 *14*	3396.7	$21/2^-$			E_γ,I_γ: from (α,2nγ).
		454.0 *3*	100.0 *7*	3016.88	$21/2^+$	E1	0.00470 *7*	α(K)=0.00404 *6*; α(L)=0.000523 *7*; α(M)=0.0001094 *15* α(N)=2.437×10^{-5} *34*; α(O)=3.89×10^{-6} *5*; α(P)=2.78×10^{-7} *4* E_γ,I_γ,Mult.: from (α,2nγ).
3494.8		3349	100	145.4434	$7/2^+$			
		3495	85 *22*	0.0	$5/2^+$			
3508.0		3508	100	0.0	$5/2^+$			
3526.6	$23/2^-$	507.6 *3*	73 *8*	3018.95	$21/2^-$	M1+E2	0.0135 *27*	α(K)=0.0115 *25*; α(L)=0.00164 *20*; α(M)=0.00035 *4* α(N)=7.7×10^{-5} *9*; α(O)=1.23×10^{-5} *17*; α(P)=8.4×10^{-7} *21* E_γ,I_γ: from (α,2nγ). Mult.: D+Q, ΔJ=1 γ in (^{7}Li,4nγ) (ADO ratio, 2015Li21); E2, ΔJ=2 γ in (α,2nγ) (α(K)exp, α(L)exp, angular correlations). ΔJ=1 γ sustained by D+Q, ΔJ=1 509.7γ decaying this level and ultimately by (α,2nγ) data with very mixed M1+E2 γ, which is adopted here.
		509.7 *3*	100 *50*	3016.88	$21/2^+$	D+Q		E_γ,I_γ: from (α,2nγ). Mult.: D+Q, ΔJ=1 γ in (^{7}Li,4nγ).
3581.0		3581	100	0.0	$5/2^+$			
3585.5	$23/2^+$	568.6 *3*	100 *11*	3016.88	$21/2^+$	M1	0.01224 *17*	B(M1)(W.u.)=0.00046 *+38−16* α(K)=0.01049 *15*; α(L)=0.001382 *19*; α(M)=0.000290 *4* α(N)=6.49×10^{-5} *9*; α(O)=1.048×10^{-5} *15*; α(P)=7.89×10^{-7} *11* E_γ,I_γ: from (^{7}Li,4nγ). Mult.: from (α,2nγ).
		622.7 *7*	30 *4*	2962.65	$19/2^+$	[E2]	0.00636 *9*	α(K)=0.00534 *8*; α(L)=0.000801 *11*; α(M)=0.0001700 *24* α(N)=3.77×10^{-5} *5*; α(O)=5.93×10^{-6} *8*; α(P)=3.78×10^{-7} *5* B(E2)(W.u.)=0.16 *+14−6* E_γ,I_γ,Mult.: Q from (^{7}Li,4nγ).

$^{141}_{59}Pr_{82}$-35

Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.	α @	Comments
3643.1		3643	100	0.0	5/2$^+$			E_γ: from (γ,γ,).
3643.3		116.7 *3*	100	3526.6	23/2$^-$			E_γ,I_γ: from (α,2nγ).
3659.1		3659	100	0.0	5/2$^+$			
3706.1		3706	100	0.0	5/2$^+$			
3761.1		3761	100	0.0	5/2$^+$			
3773.1		3773	100	0.0	5/2$^+$			
3791.1		3791	100	0.0	5/2$^+$			
3812.1		3812	100	0.0	5/2$^+$			
3829.1		3829	100	0.0	5/2$^+$			
3879.3		3734	82	145.4434	7/2$^+$			
		3879	100 *40*	0.0	5/2$^+$			
3913.1		3913	100	0.0	5/2$^+$			
4187.8	(23/2$^+$)	1170.9 *5*	100	3016.88	21/2$^+$	D+Q		E_γ,I_γ,Mult.: from (^{7}Li,4nγ).
4296.7	25/2$^{(-)}$	711.2 *7*	100 *12*	3585.5	23/2$^+$	D(+Q)		E_γ,I_γ,Mult.: from (^{7}Li,4nγ).
		825.7 *7*	50.0 *95*	3470.9	23/2$^-$			E_γ,I_γ: from (^{7}Li,4nγ).
		1277.8 *7*	88 *14*	3018.95	21/2$^-$	Q		E_γ,I_γ,Mult.: from (^{7}Li,4nγ).
4370.5	27/2$^-$	843.9 *3*	27.3 *18*	3526.6	23/2$^-$	Q		Mult.: from (^{7}Li,4nγ).
		899.6 *3*	100.0 *36*	3470.9	23/2$^-$	E2	0.00268 *4*	α(K)=0.002278 *32*; α(L)=0.000315 *4*; α(M)=6.63×10^{-5} *9* α(N)=1.478×10^{-5} *21*; α(O)=2.354×10^{-6} *33*; α(P)=1.633×10^{-7} *23*
4381.7	25/2$^{(-)}$	796.2 *7*	64 *13*	3585.5	23/2$^+$			E_γ,I_γ: from (^{7}Li,4nγ).
		910.7 *7*	54 *10*	3470.9	23/2$^-$			E_γ,I_γ: from (^{7}Li,4nγ).
		1362.8 *7*	100 *18*	3018.95	21/2$^-$	Q		E_γ,I_γ,Mult.: from (^{7}Li,4nγ).
4430.3	25/2$^{(-)}$	903.8 *5*	100 *13*	3526.6	23/2$^-$	(D+Q)		E_γ,I_γ,Mult.: from (^{7}Li,4nγ).
		959.3 *7*	58 *8*	3470.9	23/2$^-$	D+Q		E_γ,I_γ,Mult.: from (^{7}Li,4nγ).
4546.9		116.6 *5*	100	4430.3	25/2$^{(-)}$			E_γ,I_γ: from (^{7}Li,4nγ). Transition replaced from 3643.5 in (α,2nγ).
4592.0	(25/2$^-$)	1121.0 *7*	100 *14*	3470.9	23/2$^-$			E_γ,I_γ: from (^{7}Li,4nγ).
		1573.1 *7*	86 *17*	3018.95	21/2$^-$	(Q)		E_γ,I_γ,Mult.: from (^{7}Li,4nγ).
4740.6	27/2$^{(-)}$	370.2 *3*	17.4 *48*	4370.5	27/2$^-$			
		1269.6 *3*	100 *10*	3470.9	23/2$^-$	Q		Mult.: from (^{7}Li,4nγ).
4826.8	25/2$^{(+)}$	1241.3 *5*	100 *15*	3585.5	23/2$^+$	D+Q		E_γ,I_γ,Mult.: from (^{7}Li,4nγ).
		1355.8 *7*	51 *9*	3470.9	23/2$^-$			E_γ,I_γ: from (^{7}Li,4nγ).
4907.0		1380.4 *7*	100	3526.6	23/2$^-$			E_γ,I_γ: from (^{7}Li,4nγ).
4988.5	29/2$^{(-)}$	247.8 *7*	88 *16*	4740.6	27/2$^{(-)}$			E_γ,I_γ: from (^{7}Li,4nγ).
		606.9 *7*	84 *12*	4381.7	25/2$^{(-)}$			E_γ,I_γ: from (^{7}Li,4nγ).
		618.1 *7*	100 *14*	4370.5	27/2$^-$	D+Q		E_γ,I_γ,Mult.: from (^{7}Li,4nγ).
		691.9 *7*	61 *9*	4296.7	25/2$^{(-)}$			E_γ,I_γ: from (^{7}Li,4nγ).
5039.9	29/2	299.2 *5*	100 *16*	4740.6	27/2$^{(-)}$	D+Q		E_γ,I_γ,Mult.: from (^{7}Li,4nγ).
		669.5 *5*	100 *12*	4370.5	27/2$^-$	D+Q		E_γ,I_γ,Mult.: from (^{7}Li,4nγ).

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Adopted Levels, Gammas (continued)

γ(^{141}Pr) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.	Comments
5103.6	31/2$^{(-)}$	362.9 *7*	90 *13*	4740.6	27/2$^{(-)}$	Q	E_γ,I_γ,Mult.: from (^{7}Li,4nγ).
		733.2 *7*	100 *13*	4370.5	27/2$^-$	Q	E_γ,I_γ,Mult.: from (^{7}Li,4nγ).
5142.5	27/2$^{(+)}$	315.7 *5*	100 *16*	4826.8	25/2$^{(+)}$	D+Q	E_γ,I_γ,Mult.: from (^{7}Li,4nγ).
		772.0 *7*	51 *9*	4370.5	27/2$^-$		E_γ,I_γ: from (^{7}Li,4nγ).
5747.4	29/2$^{(+)}$	604.9 *7*	100	5142.5	27/2$^{(+)}$	D+Q	E_γ,I_γ,Mult.: from (^{7}Li,4nγ).
6116.0	7/2$^{(+)}$	3490	4.5 *6*	2623.2	(5/2$^+$,7/2$^+$)		
		3775	2.7 *7*	2341.0			
		3806	2.5 *5*	2310.0			
		4109	2.0 *10*	2006.9			
		4511	2.4 *8*	1608.26	(3/2)$^+$		
		4657	15.7 *19*	1457.36	9/2$^+$		
		4822	2.4 *8*	1292.69	(5/2)$^+$		
		5970	47.3 *7*	145.4434	7/2$^+$		
		6115	100.0 *9*	0.0	5/2$^+$		
6239.6	(35/2$^-$)	1136.0 *7*	100	5103.6	31/2$^{(-)}$		
6878.6	7/2$^+$	5066		1816			
		5094		1786.47	(5/2$^+$)		
		5227		1650.85	(9/2$^+$)		
		5299		1580.05	5/2$^-$		
		5357		1520.89	9/2$^+$		
		5422		1457.36	9/2$^+$		
		6732		145.4434	7/2$^+$		
		6877		0.0	5/2$^+$	M1	α(IPF)=0.002116 *30* $\Gamma(\gamma_0)$=0.017 eV *9* (1972Wo21,1979Mo19).
7186.5	5/2	6066	4.3 *22*	1117.67	11/2$^-$		
		7042	14.1 *23*	145.4434	7/2$^+$		
		7188	100.0 *32*	0.0	5/2$^+$		
7255.8	5/2$^-$	5590&	10.2 *40*	1666?			
		5659	6.6 *40*	1596.6?			
		5823	<8.7	1436.12	3/2$^+$		
		6124	10.1 *51*	1126.83	3/2$^+$		
		7111	64.9 *57*	145.4434	7/2$^+$		
		7256	100.0 *79*	0.0	5/2$^+$	E1	α(IPF)=0.00259 *4* $\Gamma(\gamma_0)$=0.110 eV *10* (1972Wo21).
7630.7	5/2$^+$	4841 *4*	3.1 *4*	2786.2			
		4932 *4*		2699?			
		5043 *4*	1	2586.1			
		5066 *4*	1	2563.9	(5/2$^-$,7/2$^-$)		
		5108 *4*	3.1 *4*	2520.15	(3/2$^+$)		
		5158 *4*		2480			
		5284 *4*	3.1 *4*	2345.87	(9/2$^+$)		

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Adopted Levels, Gammas (continued)

$\gamma(^{141}Pr)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	Comments
7630.7	$5/2^+$	5360 *4*	2	2270.1			
		5397 *4*	16.7	2234	$3/2$		
		5616 *4*	1	2018.12	$(3/2^+)$		
		5785 *4*	5.2 *6*	1842.14	$(7/2^+)$		
		5982 *4*		1650.85	$(9/2^+)$		
		6050 *4*	3.1 *4*	1580.05	$5/2^-$		
		6120 *4*		1510.3?			
		6181 *4*	18.8 *2*	1452.36	$(7/2)^+$		
		6195 *4*	15.6 *2*	1436.12	$3/2^+$		
		6339 *4*	1	1292.69	$(5/2)^+$		
		6502 *4*	17.7 *2*	1126.83	$3/2^+$		
		7487 *4*	15.6 *2*	145.4434	$7/2^+$		
		7632 *4*	100 *10*	0.0	$5/2^+$	M1	α(IPF)=0.002282 *32* $\Gamma(\gamma_0)$=0.036 eV *8* in (γ,γ') (1979Mo19,1972Wo21).
7915.2	$5/2^+$	7915	100	0.0	$5/2^+$	M1	B(M1)(W.u.)=0.0007 *3* α(IPF)=0.002339 *33* $\Gamma(\gamma_0)$=0.002 eV *1* in (γ,γ') (1979Mo19,1972Wo21).
8880.5	(5/2,7/2)	6937	24.2 *63*	1943.3			
		7036	9.5 *56*	1842.14	$(7/2^+)$		
		7228	18.0 *57*	1650.85	$(9/2^+)$		
		7370	12.3 *54*	1510.3?			
		7588	4 *3*	1292.69	$(5/2)^+$		
		8735	14.9 *44*	145.4434	$7/2^+$		
		8883	100.0 *75*	0.0	$5/2^+$		

[†] From (n,n′γ) unless noted otherwise. From either (^{7}Li,4nγ)) or $(\gamma,\gamma,)$ for each level in the interval 4742-6240 of excitation energies, and from $(\gamma,\gamma,)$ only up to 8883.
[‡] Iγ(1910γ)/Iγ(1765γ)=42/58 (n,n′γ) (1994De56).
[#] Additional information 5.
[@] Additional information 6.
[&] Placement of transition in the level scheme is uncertain.

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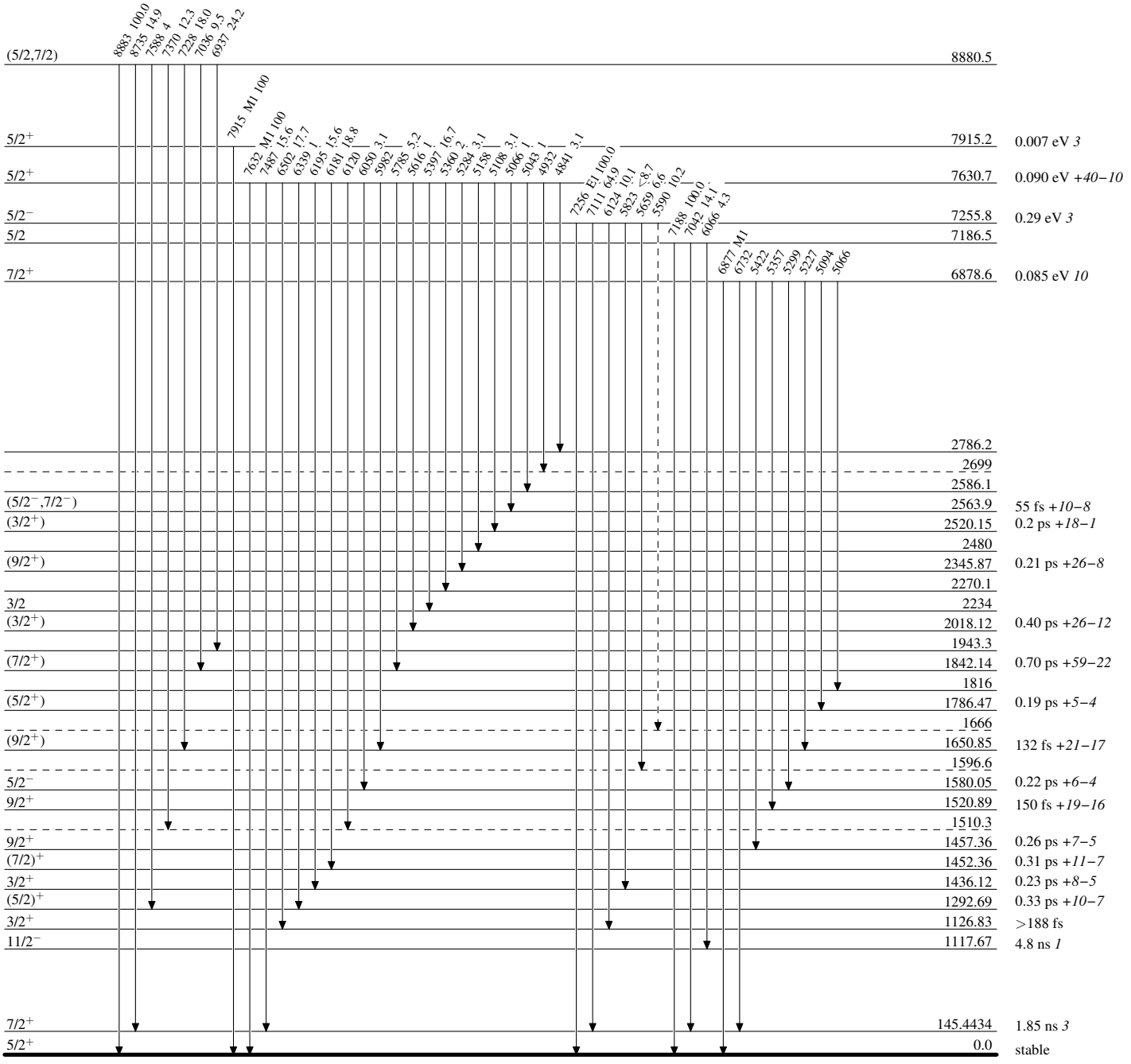
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

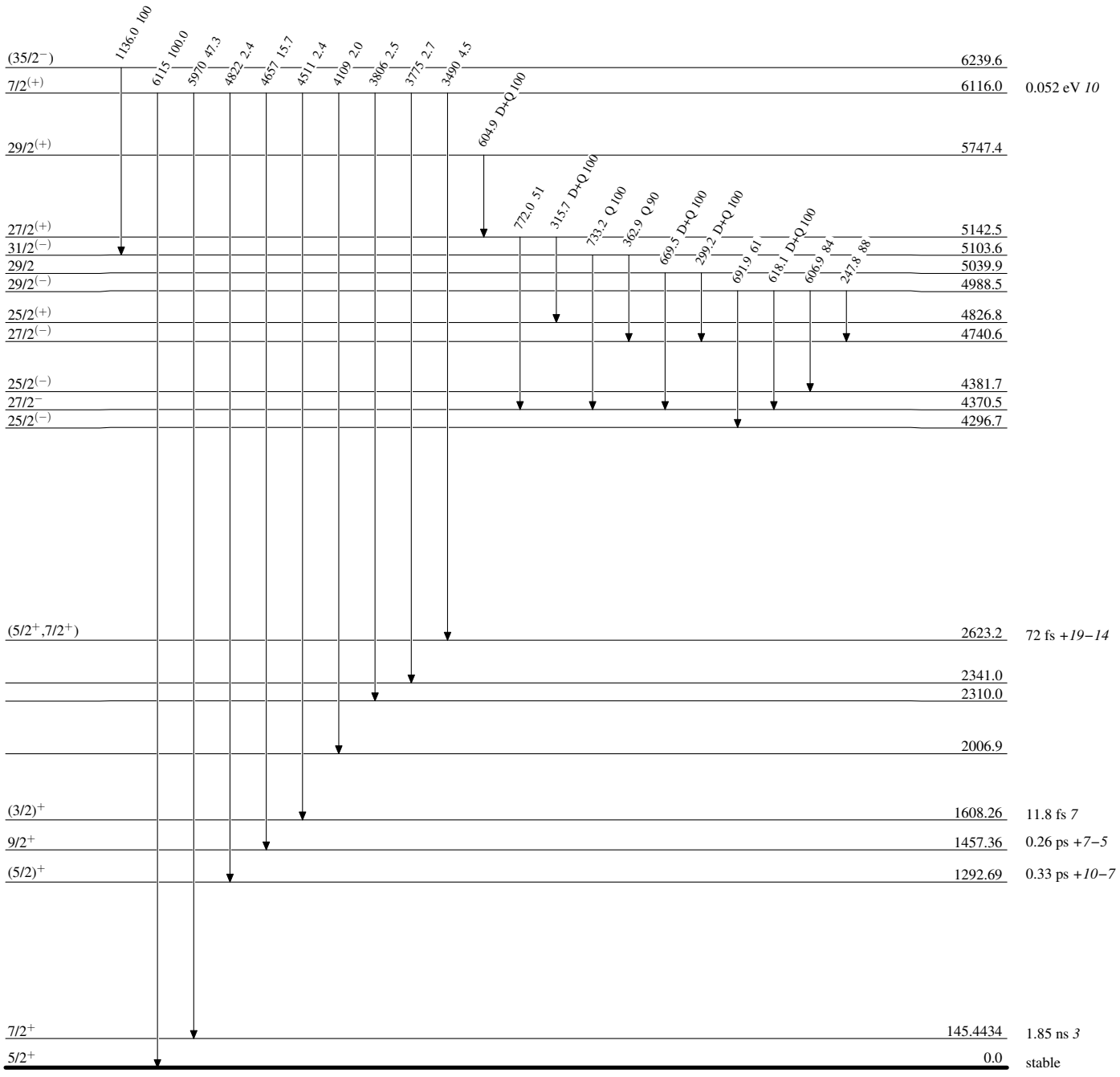


$^{141}_{59}Pr_{82}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

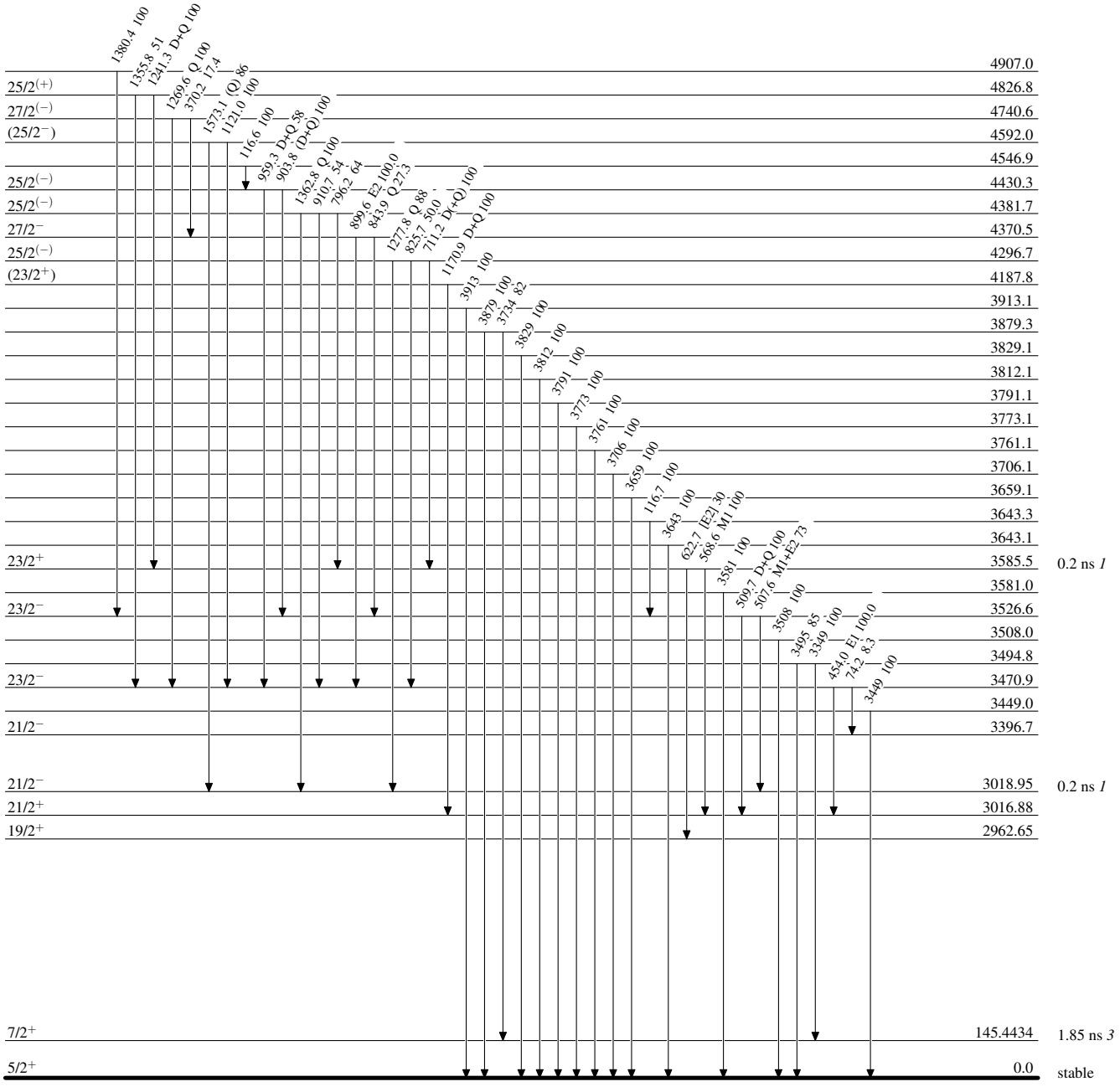


$^{141}_{59}Pr_{82}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

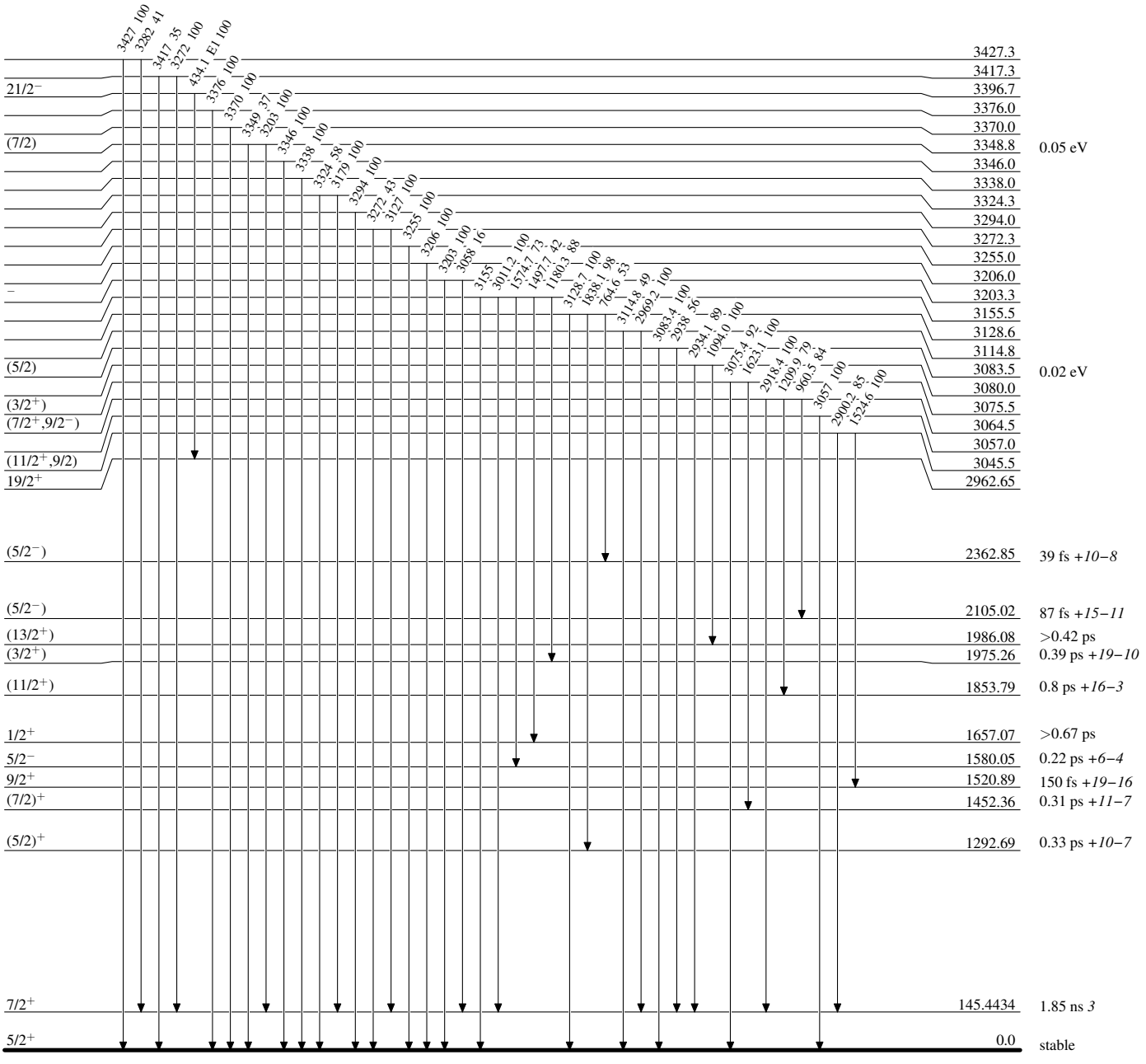


$^{141}_{59}Pr_{82}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

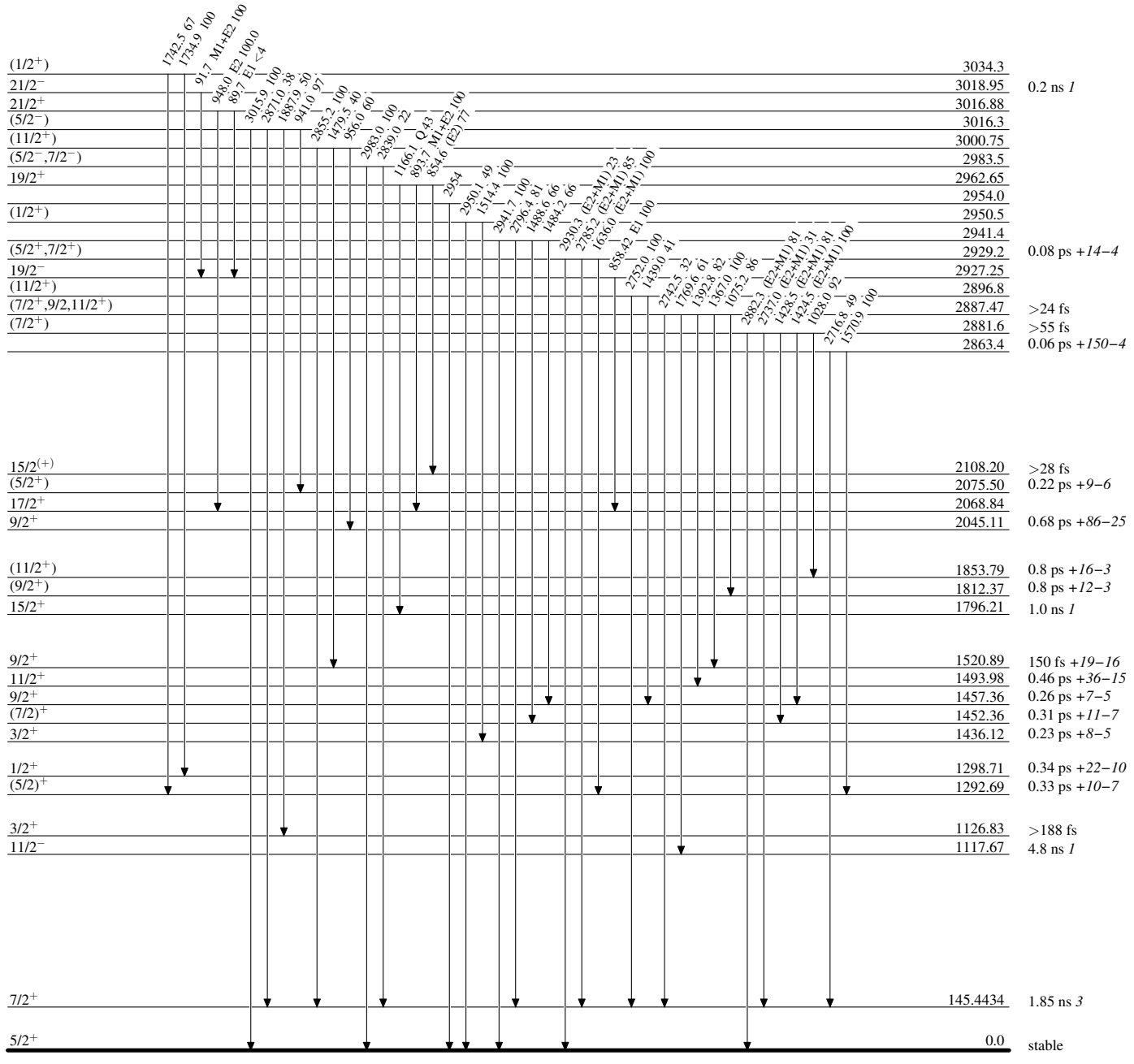


$^{141}_{59}Pr_{82}$

Adopted Levels, Gammas

Level Scheme (continued)

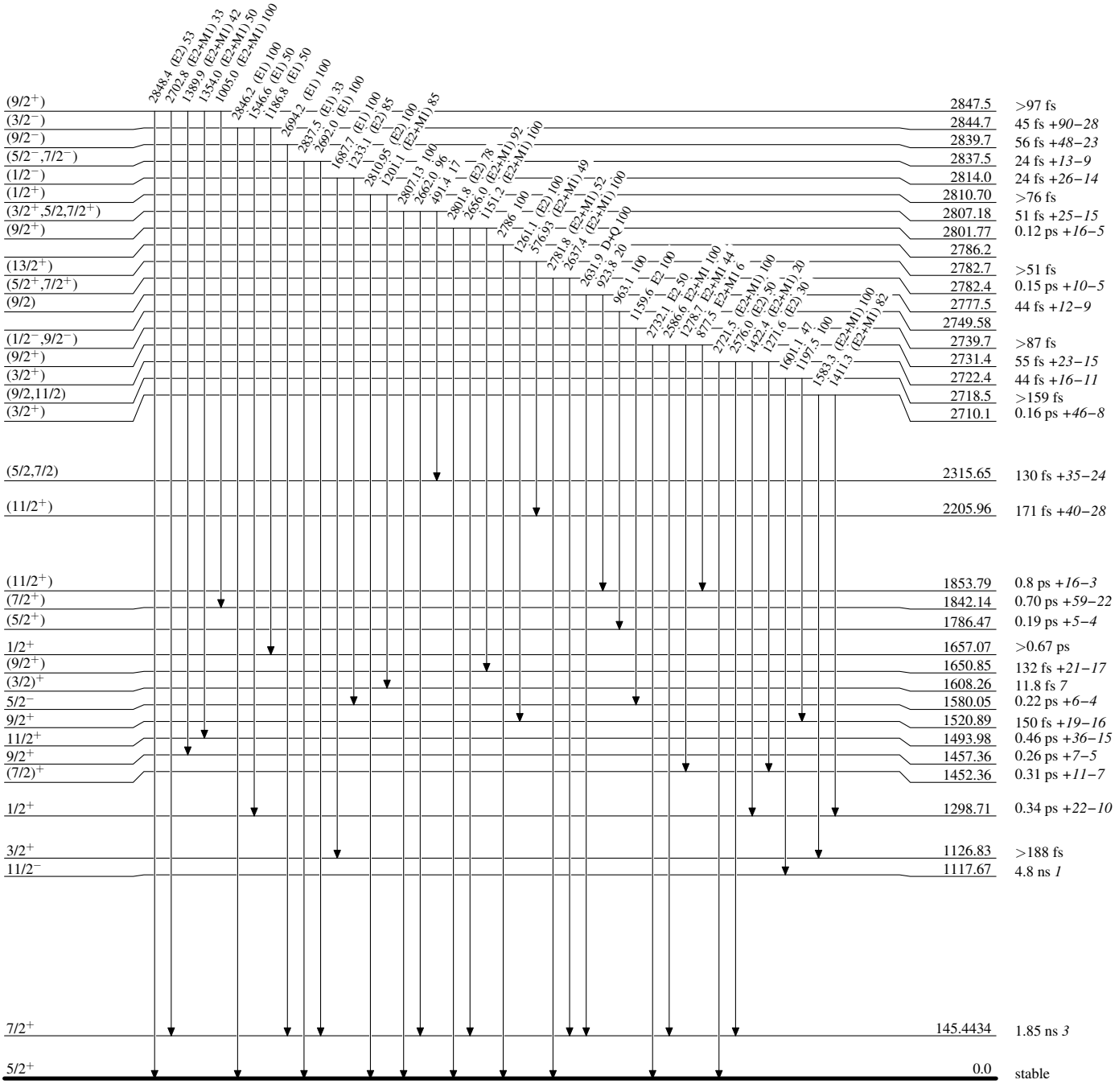
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{141}_{59}Pr_{82}$

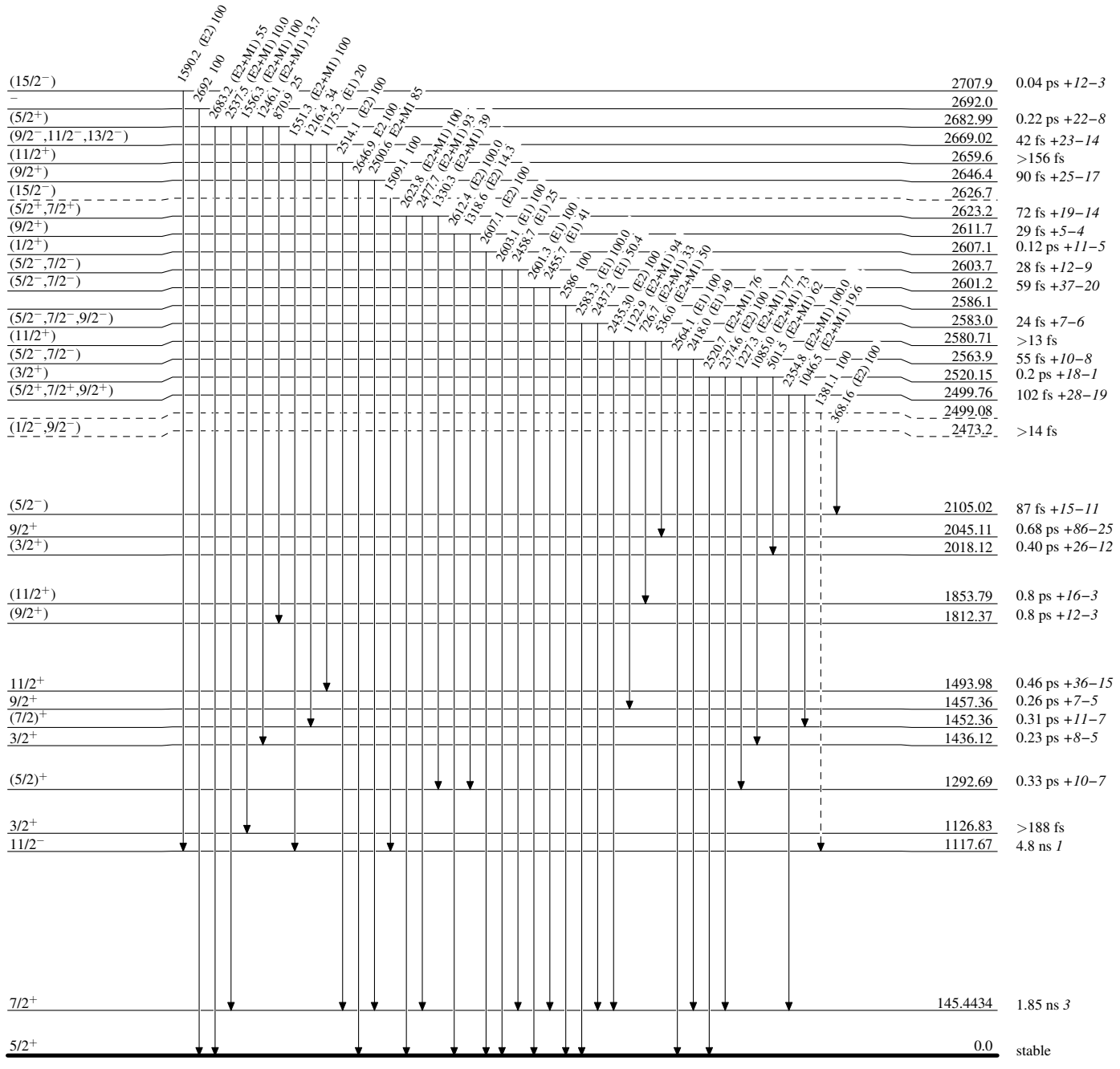
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{141}_{59}Pr_{82}$

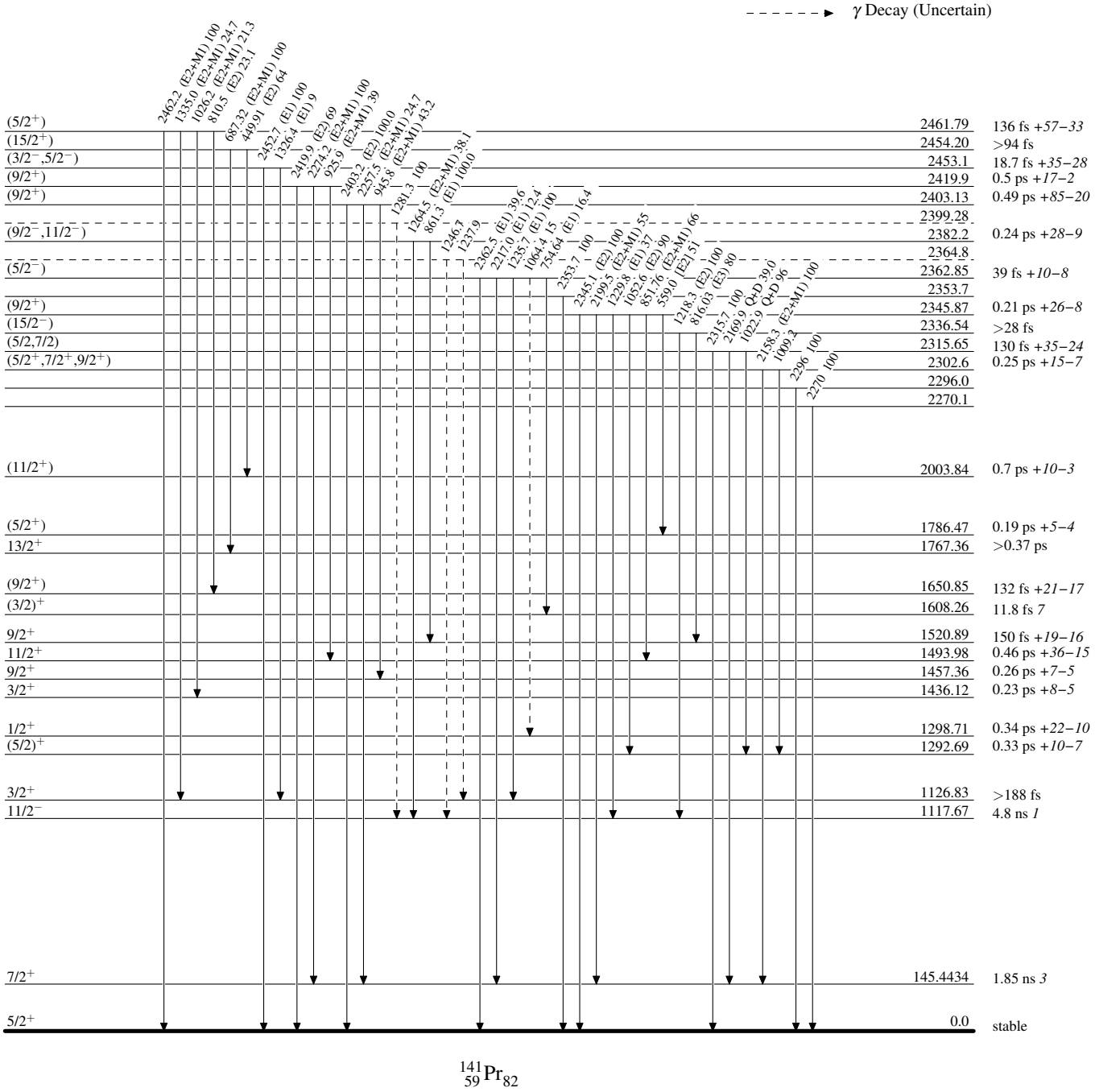
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{141}_{59}Pr_{82}$

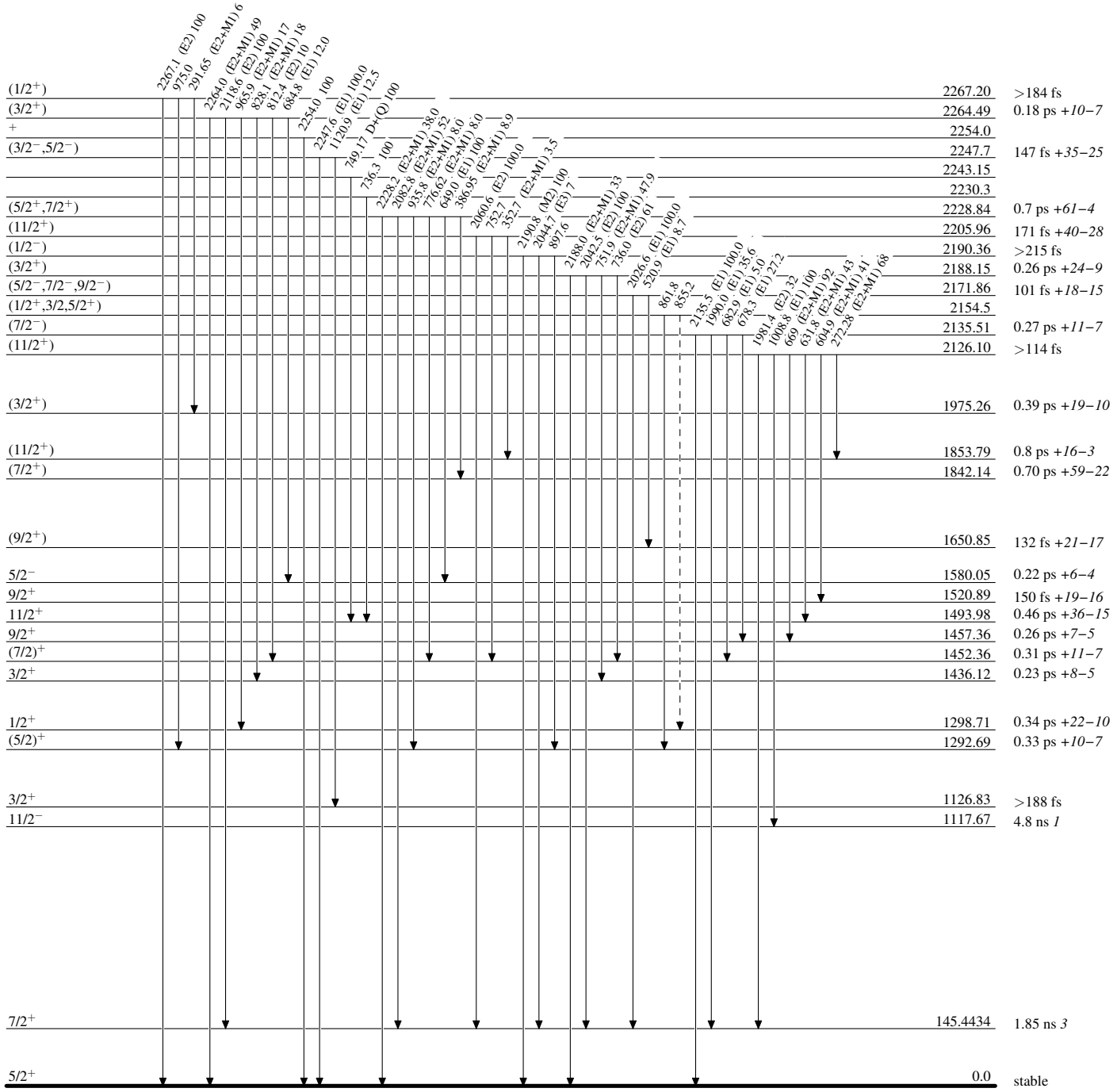
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



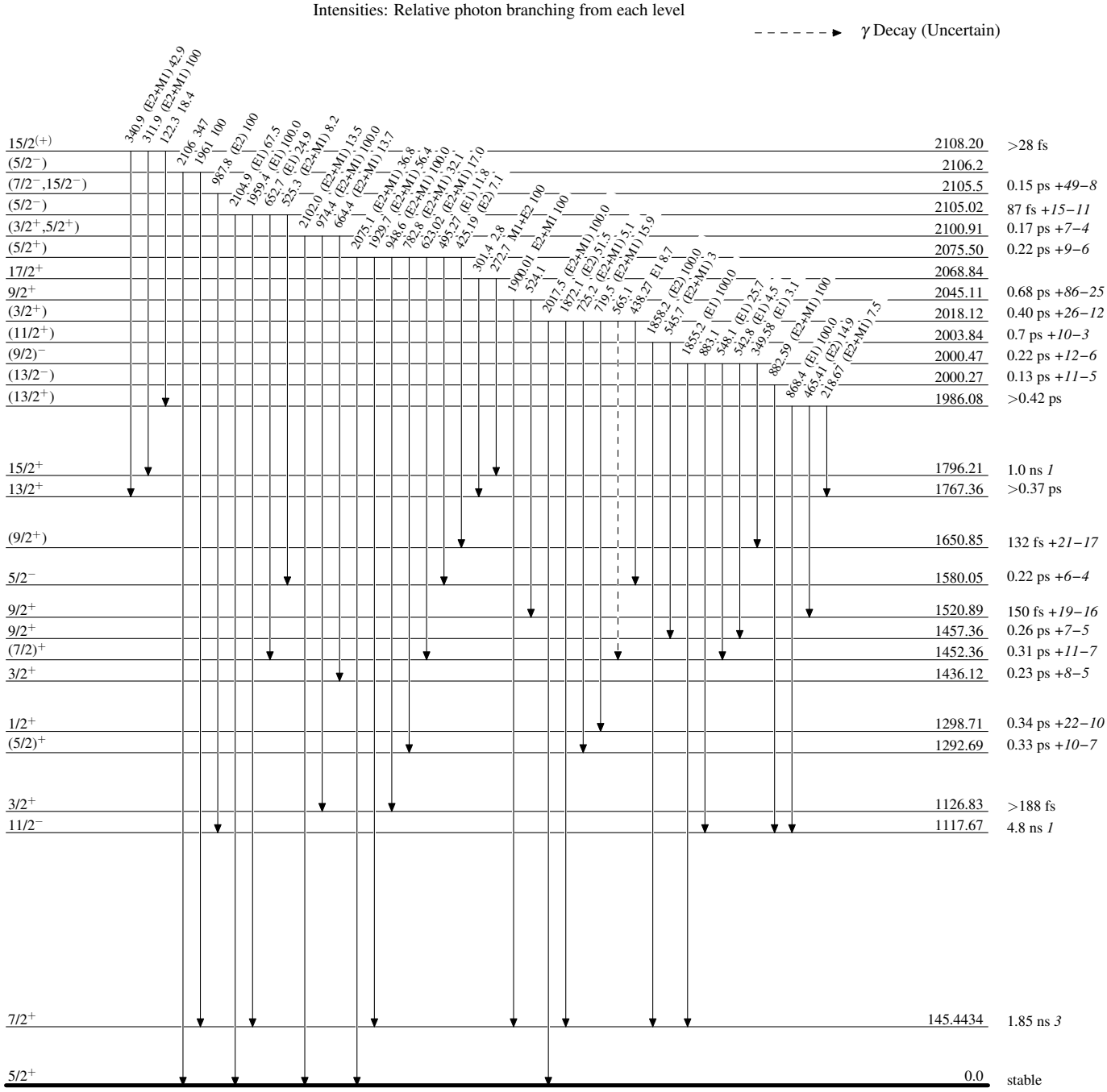
$^{141}_{59}Pr_{82}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{141}_{59}Pr_{82}$

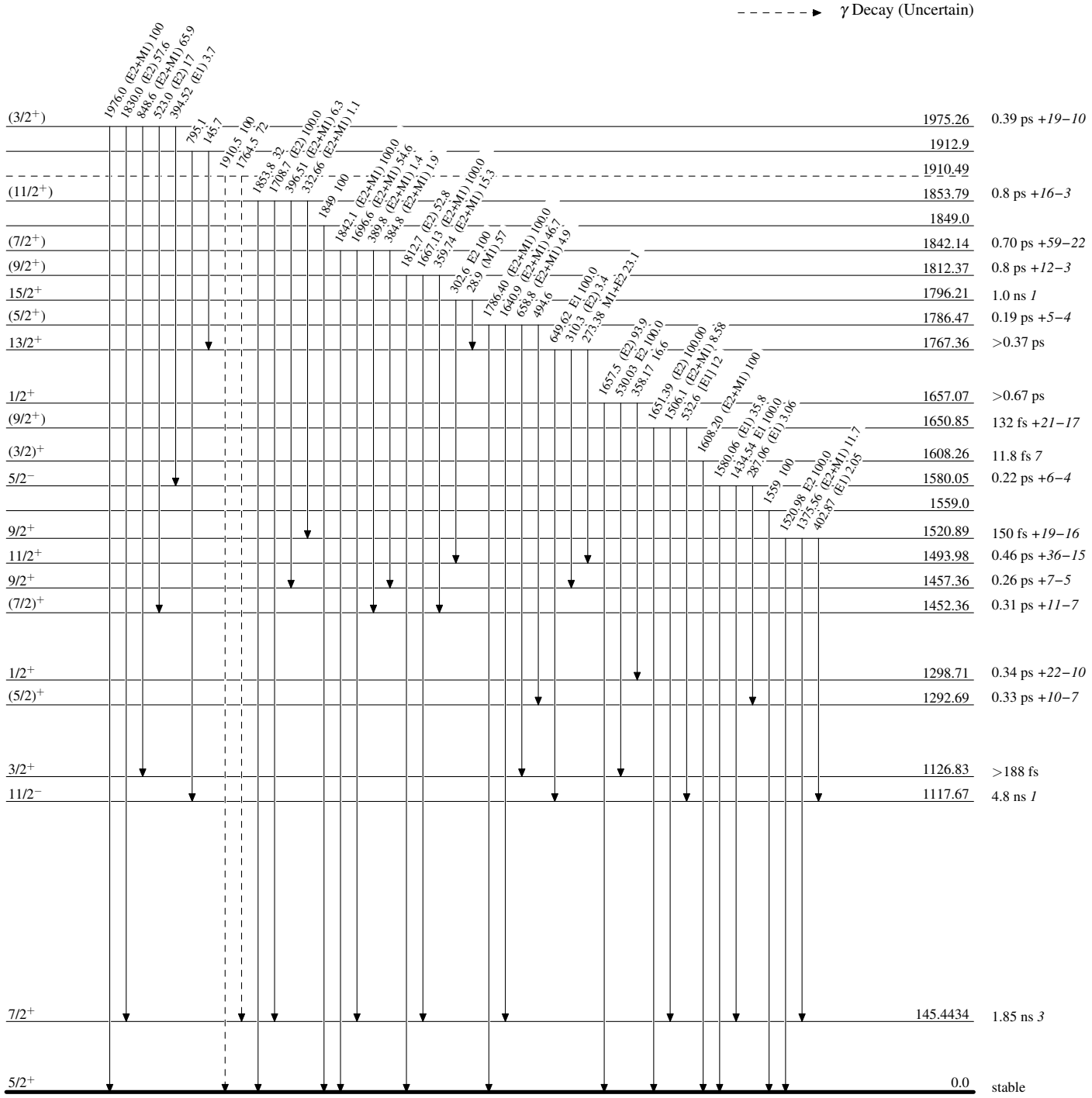
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

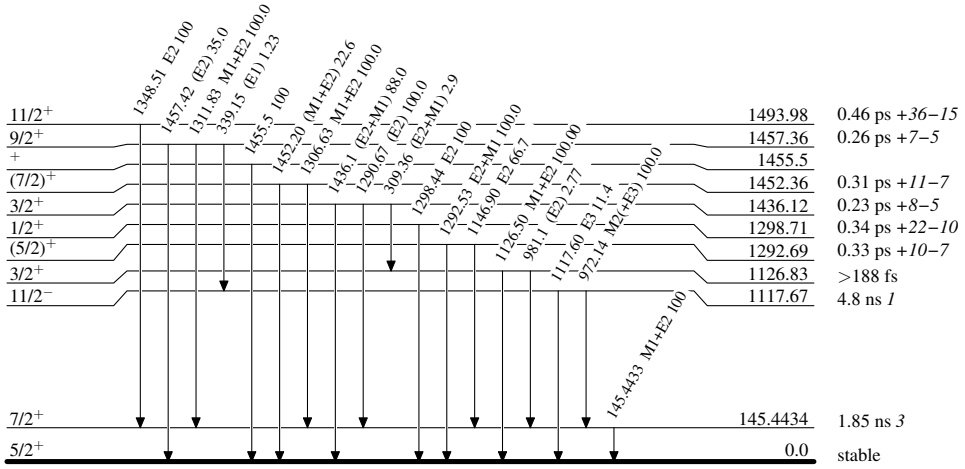


$^{141}_{59}Pr_{82}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{141}_{59}Pr_{82}$