

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	E. Browne	NDS 93,846 (2001)	1-May-2001

Q(β^-)=1149.2 9; S(n)=6037 22; S(p)=5279.0 23; Q(α)=5562 3 [2012Wa38](#)Note: Current evaluation has used the following Q record 1149.1 9 6034 215276.7 245430 80 [1995Au04](#). ^{223}Fr LevelsCross Reference (XREF) Flags

A ^{223}Rn β^- decay
 B ^{227}Ac α decay

E(level) [†]	J π^d	T _{1/2}	XREF	Comments
0.0 [‡]	3/2 ⁽⁻⁾	22.00 min 7	AB	$\% \beta^- = 99.994$; $\% \alpha = 0.006$ $\mu = +1.17$ 2; Q = +1.17 1 T _{1/2} : weighted average of 22.00 min 7 (1993Ab01) and 21.8 min 4 (1967Li17). Other value: 22 min 1 (1955Ad10,1956Pe27). Other: 1939Pe01 . J π : J=3/2, atomic beam (laser optical pumping) (1985Co24). Low α hindrance factor (HF=6.8) from ^{227}Ac α decay suggests same spin and parity (J π =3/2 ⁻). Single particle configuration has not been established. However, the similarity between the magnetic and quadrupole moments of ^{227}Ac and ^{223}Fr , respectively, suggest that the g.s. of ^{223}Fr has a significant component of 3/2[532], the single particle configuration of ^{227}Ac g.s. (1988Le13). See also 1986Ek02 . μ, Q : atomic beam (laser optical pumping) (1989Ra17,1985Co24). measured isotope shift (1987Co19). $\% \alpha$: from 1955Ad10, 1956Pe27 . Other value: $\% \alpha \approx 0.004$ (1953Hy83).
12.882 [‡] 22	(5/2 ⁻)		AB	J π : 12.9 γ (E2) to 3/2 ⁽⁻⁾ .
54.98 [@] 4	1/2 ⁽⁻⁾		AB	J π : 55.0 γ M1+E2 to 3/2 ⁽⁻⁾ .
82.129 [‡] 21	(7/2 ⁻)		AB	J π : 69.2 γ M1+E2 to (5/2 ⁻).
99.53 [@] 3	(3/2 ⁻)		AB	J π : 99.5 γ M1 to 3/2 ⁽⁻⁾ .
100.999 [@] 24	(5/2 ⁻)		AB	J π : 101.0 γ M1 to 3/2 ⁽⁻⁾ .
134.48 ^{&} 4	(3/2 ⁺)		AB	J π : 79.5 γ E1 to 1/2 ⁽⁻⁾ , 121.6 γ E1 to (5/2 ⁻).
160.43 [#] 3	(3/2 ⁺)		AB	J π : 147.5 γ E1 to (5/2 ⁻), 160.5 γ E1 to 3/2 ⁽⁻⁾ .
171.963 [#] 25	(5/2 ⁺)		AB	J π : 172.0 γ E1 to 3/2 ⁽⁻⁾ , 89.9 γ to (7/2 ⁻).
187.07 ^c 3	(5/2 ⁻)		AB	J π : 104.9 γ M1 to (7/2 ⁻), 52.3 γ to (3/2 ⁺).
188.92 [@] 3	(7/2 ⁻)		AB	J π : 106.8 γ M1 to (7/2 ⁻), 176.1 γ M1,E2 to (5/2 ⁻).
219.53 ^{&} 3	(7/2 ⁺)		AB	J π : 206.6 γ E1 to (5/2 ⁻), 85.0 γ to (3/2 ⁺).
222.98 [#] 4	(7/2 ⁺)		AB	J π : 140.9 γ E1 to (7/2 ⁻), 88.5 γ to (3/2 ⁺).
242.45 4	(5/2)		AB	J π : 242.4 γ to 3/2 ⁽⁻⁾ , 53.3 γ to (7/2 ⁻), 108.0 γ to (3/2 ⁺).
243.57 4	(5/2)		AB	J π : interpreted as J π =5/2 ⁺ member of K π =1/2 ⁺ parity doublet band (1995Sh03). J π : 243.7 γ to 3/2 ⁽⁻⁾ , 161.4 γ to (7/2 ⁻), 83.0 γ to (3/2 ⁺).
244.674 ^c 25	(7/2 ⁻)		AB	J π : interpreted as J π =5/2 ⁺ member of K π =1/2 ⁺ parity doublet band (1992Ku03). J π : 143.6 γ M1 to (5/2 ⁻), 231.8 γ M1,E2 to (7/2 ⁻).
298.7 ^c 3	(9/2 ⁻)		B	J π : 216.6 γ to (7/2 ⁻).
365.65 5			AB	
371 4			B	
379 7			B	
449 5			B	Tentatively assigned as J π =3/2 ⁺ bandhead of a K π =3/2 ⁺ parity doublet band (1992Ku03).
503 7			B	

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Adopted Levels, Gammas (continued) ^{223}Fr Levels (continued)

E(level) [†]	J^π ^d	XREF	Comments
515.20 ^b 22	3/2 ⁻	A	J^π : favored α decay (HF=2.1) from $^{227}\text{Ac}(J^\pi=3/2^-)$.
540.53 ^a 3	(5/2 ⁺)	AB	J^π : 540. γ to 3/2 ⁽⁻⁾ , 351.8 γ to (7/2 ⁻).
605.40 ^b 3	(5/2 ⁻)	AB	J^π : 416.5 γ M1 to (7/2 ⁻), 592.6 γ M1+E2 to (5/2 ⁻).
647.58 3	(5/2 ⁻ , 7/2 ⁻)	A	J^π : 546.5 γ M1 to (5/2 ⁻), 565.5 γ M1+E2 to (7/2 ⁻).
649.66 3	(5/2 ⁻)	A	J^π : 649.7 γ M1 to 3/2 ⁽⁻⁾ , 567.6 γ M1+E2 to (7/2 ⁻).
684.80 ^a 6	(7/2 ⁺)	A	J^π : 461.8 γ M1 to (7/2 ⁺).
698.62 7		A	
736.88 ^b 4	(7/2 ⁻)	A	J^π : 635.8 γ M1(+E2) to (5/2 ⁻), 492.2 γ M1 to (7/2 ⁻), 736.8 γ to 3/2 ⁽⁻⁾ .
763.21 4		A	
782.66 4	(3/2 ⁺ , 5/2 ⁺)	A	J^π : 622.2 γ M1(+E2) to (3/2 ⁺), 563.1 γ to (7/2 ⁺).
834.54 5		A	
839.30 5		A	
892.68 4		A	
921.63 11		A	
987.73 11		A	
995.61 7		A	
999.12 6		A	
1001.94 7		A	
1035.28 6		A	
1042.28 10		A	
1070.11 5		A	
1102.81 5		A	
1120.24 6		A	
1221.10 7		A	
1322.17 5		A	
1359.12 5		A	
1398.29 9		A	
1399.17 6		A	
1512.40 10		A	
1540.74 6		A	
1552.11 6		A	
1566.56 18		A	
1573.78 10		A	
1590.49 10		A	
1595.05 8		A	
1629.30 10		A	
1695.43 21		A	

[†] From ^{223}Rn β^- decay, unless otherwise specified.

[‡] Band(A): $K^\pi=3/2^-$ parity doublet band – 3/2[523].

Band(a): $K^\pi=3/2^+$ parity doublet band – 3/2[402].

@ Band(B): $K^\pi=1/2^-$ parity doublet band – 1/2[541].

& Band(b): $K^\pi=1/2^+$ parity doublet band – 1/2[411].

^a Band(C): $K^\pi=3/2^+$ parity doublet band – 3/2[651].

^b Band(c): $K^\pi=3/2^-$ parity doublet band – 3/2[521].

^c Band(D): $K^\pi=5/2^-$ parity doublet band – 5/2[523].

^d J^π assignments are based on γ -ray multipolarities and decay patterns. These assignments have been complemented with rotational band arguments for those levels that belong to parity doublet bands.

Adopted Levels, Gammas (continued)

$\gamma(^{223}\text{Fr})$								
$E_i(\text{level})$	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult. †	δ †	α #
12.882	(5/2 ⁻)	12.90	100.0	0.0	3/2 ⁽⁻⁾	(E2)		5.11×10 ⁴
Mult.: from ce(M1)+ce(M2):ce(M3):ce(N) exp=130:130:180 in ²²⁷ Ac α decay.								
54.98	1/2 ⁽⁻⁾	55.00 5	100.0	0.0	3/2 ⁽⁻⁾	M1+E2	0.05 4	17.4 8
82.129	(7/2 ⁻)	69.21 5	100 6	12.882	(5/2 ⁻)	M1+E2	0.42 8	15.0 22
		82.10 5	23.5 12	0.0	3/2 ⁽⁻⁾	E2		22.6
99.53	(3/2 ⁻)	44.7 ‡ 1	2.2 ‡ 5	54.98	1/2 ⁽⁻⁾			
		86.7 3	≈48	12.882	(5/2 ⁻)			
		99.55 5	100 20	0.0	3/2 ⁽⁻⁾	M1		3.02
100.999	(5/2 ⁻)	45.95	≈0.55	54.98	1/2 ⁽⁻⁾			
		88.0 @ 1	≈66 @	12.882	(5/2 ⁻)			
		100.95 5	100 6	0.0	3/2 ⁽⁻⁾	M1		2.90
134.48	(3/2 ⁺)	33.5 ‡ 1	10 ‡ 3	100.999	(5/2 ⁻)			
		35.0 ‡ 2	2.5 ‡ 13	99.53	(3/2 ⁻)			
		79.50 10	100 17	54.98	1/2 ⁽⁻⁾	E1		
		121.58 5	83 4	12.882	(5/2 ⁻)	E1		0.299
		134.50 5	39 4	0.0	3/2 ⁽⁻⁾	E1		0.233
160.43	(3/2 ⁺)	25.95	≈0.012	134.48	(3/2 ⁺)			
		59.4 ‡ 2	0.9 ‡ 3	100.999	(5/2 ⁻)			
		60.6 ‡ 3	0.9 ‡ 3	99.53	(3/2 ⁻)			
		147.52 5	49.7 20	12.882	(5/2 ⁻)	E1		
		160.45 5	100 4	0.0	3/2 ⁽⁻⁾	E1		0.152
171.963	(5/2 ⁺)	37.47	≈0.28	134.48	(3/2 ⁺)			
		72.4 2	6.7 13	99.53	(3/2 ⁻)			
		89.90 5	17.4 15	82.129	(7/2 ⁻)			
		159.08 5	57.0 21	12.882	(5/2 ⁻)			
		171.95 5	100.0	0.0	3/2 ⁽⁻⁾	E1		0.128
187.07	(5/2 ⁻)	52.32	≈31	134.48	(3/2 ⁺)			
		86.1 1	100 11	100.999	(5/2 ⁻)			
		104.87 5	73 5	82.129	(7/2 ⁻)	M1		13.3
		174.15 5	52.1 21	12.882	(5/2 ⁻)			
188.92	(7/2 ⁻)	88.0 @ 1	22 @ 3	100.999	(5/2 ⁻)			
		106.80 5	100 6	82.129	(7/2 ⁻)	M1		12.6
		176.10 5	32.0 12	12.882	(5/2 ⁻)	M1,E2		2.0 11
219.53	(7/2 ⁺)	85.0 5	≈1.2	134.48	(3/2 ⁺)			
		118.58 10	3.3 8	100.999	(5/2 ⁻)			
		137.35 5	43.6 18	82.129	(7/2 ⁻)			
		206.65 5	100 4	12.882	(5/2 ⁻)	E1		0.0822
222.98	(7/2 ⁺)	51.06	≈0.14	171.963	(5/2 ⁺)			

Adopted Levels, Gammas (continued)

$\gamma(^{223}\text{Fr})$ (continued)								
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult. [†]	$\delta^\dagger$	$\alpha^\#$
222.98	(7/2 ⁺)	88.5 5	≈ 0.47	134.48	(3/2 ⁺)	E1		0.208
		140.93 5	100 4	82.129	(7/2 ⁻)			
242.45	(5/2)	53.3 3	≈ 35	188.92	(7/2 ⁻)			
		70.60 10	43 6	171.963	(5/2 ⁺)			
		108.0 [‡] 3	10 [‡] 3	134.48	(3/2 ⁺)			
		229.60 5	100 5	12.882	(5/2 ⁻)	M1		14.9
242.41 5		77 5		0.0	3/2 ⁽⁻⁾			
243.57	(5/2)	83.0 1	≈ 6	160.43	(3/2 ⁺)			
		161.38 5	60.6 24	82.129	(7/2 ⁻)			
		243.69 5	100 5	0.0	3/2 ⁽⁻⁾			
244.674	(7/2 ⁻)	55.80 5	6.9 8	188.92	(7/2 ⁻)	M1		5.38
		57.56 5	5.7 8	187.07	(5/2 ⁻)			
		143.65 5	47.1 19	100.999	(5/2 ⁻)			
		162.50 5	100 4	82.129	(7/2 ⁻)			
		231.79 5	13.1 8	12.882	(5/2 ⁻)			
298.7	(9/2 ⁻)	216.6 3	100	82.129	(7/2 ⁻)	M1,E2		2.5 13
365.65		142.74 5	85 4	222.98	(7/2 ⁺)			
		146.0 2	16 6	219.53	(7/2 ⁺)			
		283.45 5	100 5	82.129	(7/2 ⁻)			
515.20	3/2 ⁻	415.6 [‡] 3	100 [‡] 25	99.53	(3/2 ⁻)			
		460.2 [‡] 3	100 [‡] 25	54.98	1/2 ⁽⁻⁾	M1		0.414
540.53	(5/2 ⁺)	351.8 5	22 9	188.92	(7/2 ⁻)			
		439.60 5	49 3	100.999	(5/2 ⁻)			
		441.08 5	78 4	99.53	(3/2 ⁻)			
		527.60 10	40.0 23	12.882	(5/2 ⁻)			
605.40	(5/2 ⁻)	540.40 @ 5	1.0×10 ² @ 4	0.0	3/2 ⁽⁻⁾	M1		0.281
		360.73 5	5.87 24	244.674	(7/2 ⁻)			
		382.0 5	0.36 11	222.98	(7/2 ⁺)			
		416.52 5	64 3	188.92	(7/2 ⁻)			
		504.35 10	0.47 4	100.999	(5/2 ⁻)			
		505.85 5	4.56 24	99.53	(3/2 ⁻)	M1		0.153
		523.26 5	13.1 6	82.129	(7/2 ⁻)			
		592.55 5	100 5	12.882	(5/2 ⁻)			
		605.40 10	1.66 9	0.0	3/2 ⁽⁻⁾			
647.58	(5/2 ⁻ , 7/2 ⁻)	402.80 5	23.5 11	244.674	(7/2 ⁻)			
		424.76 10	3.5 5	222.98	(7/2 ⁺)	M1		0.217
		458.65 5	49.7 19	188.92	(7/2 ⁻)			
		546.53 5	100 4	100.999	(5/2 ⁻)			
		565.52 5	68 3	82.129	(7/2 ⁻)			
		634.65 10	55 6	12.882	(5/2 ⁻)			
						M1(+E2)	1.1 6	0.07 4

Adopted Levels, Gammas (continued)

$\gamma(^{223}\text{Fr})$ (continued)								
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult. [†]	$\delta^\dagger$	$\alpha^\#$
647.58	(5/2 ⁻ , 7/2 ⁻)	647.75 10	7.9 5	0.0	3/2 ⁽⁻⁾			
649.66	(5/2 ⁻)	404.7 5	2.2 8	244.674	(7/2 ⁻)			
		460.85 10	8.0 4	188.92	(7/2 ⁻)	M1		0.214
		477.8 3	2.4 5	171.963	(5/2 ⁺)			
		548.55 5	19.3 16	100.999	(5/2 ⁻)			
		550.10 5	10.6 6	99.53	(3/2 ⁻)			
		567.60 5	14.0 8	82.129	(7/2 ⁻)	M1+E2	0.9 5	0.08 3
		636.75 10	40.9 22	12.882	(5/2 ⁻)			
		649.73 5	100 4	0.0	3/2 ⁽⁻⁾	M1		0.086
684.80	(7/2 ⁺)	319.5 5	≈13	365.65				
		461.81 5	100 4	222.98	(7/2 ⁺)	M1		0.213
698.62		509.75 10	100 5	188.92	(7/2 ⁻)			
		526.52 10	60 4	171.963	(5/2 ⁺)			
		698.90 20	14.9 17	0.0	3/2 ⁽⁻⁾			
736.88	(7/2 ⁻)	492.21 5	35.0 10	244.674	(7/2 ⁻)	M1		0.180
		493.3 3	≈3	243.57	(5/2)			
		514.3 5	0.9 4	222.98	(7/2 ⁺)			
		517.8 5	1.3 4	219.53	(7/2 ⁺)			
		548.0 3	3.8 10	188.92	(7/2 ⁻)			
		635.80 10	100 4	100.999	(5/2 ⁻)	M1(+E2)		
		654.78 5	79 4	82.129	(7/2 ⁻)	M1		0.084
		724.00 5	44.1 19	12.882	(5/2 ⁻)	M1+E2	0.75 25	0.047 8
		736.75 10	6.13 25	0.0	3/2 ⁽⁻⁾			
763.21		397.8 5	≈16	365.65				
		520.75 5	34.6 21	242.45	(5/2)			
		540.4 @ 5	31 @ 11	222.98	(7/2 ⁺)			
		543.70 10	14.7 11	219.53	(7/2 ⁺)			
		576.10 5	100 6	187.07	(5/2 ⁻)			
		591.3 5	26 11	171.963	(5/2 ⁺)			
		750.80 20	7.3 11	12.882	(5/2 ⁻)			
782.66	(3/2 ⁺ , 5/2 ⁺)	540.4 @ 5	6.9 @ 23	242.45	(5/2)			
		563.10 10	6.2 4	219.53	(7/2 ⁺)			
		610.65 5	22.4 10	171.963	(5/2 ⁺)			
		622.25 5	100 4	160.43	(3/2 ⁺)	M1(+E2)	0.5 3	0.082 14
		648.1 5	4.3 12	134.48	(3/2 ⁺)			
		782.60 10	4.5 5	0.0	3/2 ⁽⁻⁾			
834.54		590.1 3	32 8	244.674	(7/2 ⁻)			
		590.9 3	≈40	243.57	(5/2)			
		674.25 20	11.6 16	160.43	(3/2 ⁺)			
		752.40 5	100 10	82.129	(7/2 ⁻)			
		821.65 20	10.8 8	12.882	(5/2 ⁻)			

Adopted Levels, Gammas (continued)

 $\gamma(^{223}\text{Fr})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π
839.30		595.80 10	64 7	243.57 (5/2)		1120.24		948.45 10	100 5	171.963 (5/2 ⁺)	
		619.65 10	78 5	219.53 (7/2 ⁺)				959.85 10	25.3 11	160.43 (3/2 ⁺)	
		667.35 5	100 6	171.963 (5/2 ⁺)				1037.90 10	16.3 11	82.129 (7/2 ⁻)	
892.68		669.70 5	58.7 23	222.98 (7/2 ⁺)				1107.30 20	6.3 7	12.882 (5/2 ⁻)	
		673.20 5	100 5	219.53 (7/2 ⁺)		1221.10		977.40 20	25 4	243.57 (5/2)	
		705.44 10	16.1 14	187.07 (5/2 ⁻)				998.15 10	100 6	222.98 (7/2 ⁺)	
		791.30 20	7.6 9	100.999 (5/2 ⁻)				1208.20 10	70 6	12.882 (5/2 ⁻)	
		810.60 20	5.4 9	82.129 (7/2 ⁻)		1322.17		781.70 10	41 3	540.53 (5/2 ⁺)	
		892.80 20	9.0 9	0.0 3/2 ⁽⁻⁾				1077.40 10	25.3 21	244.674 (7/2 ⁻)	
921.63		734.55 10	100.0	187.07 (5/2 ⁻)				1099.30 10	28.1 21	222.98 (7/2 ⁺)	
987.73		744.15 10	100.0	243.57 (5/2)				1221.10 10	16.4 21	100.999 (5/2 ⁻)	
995.61		835.20 20	33 3	160.43 (3/2 ⁺)				1239.95 10	100 6	82.129 (7/2 ⁻)	
		894.60 10	100 4	100.999 (5/2 ⁻)				1309.50 20	12.3 21	12.882 (5/2 ⁻)	
		982.70 10	24 3	12.882 (5/2 ⁻)		1359.12		753.75 10	44.7 22	605.40 (5/2 ⁻)	
		995.70 20	14 3	0.0 3/2 ⁽⁻⁾				818.60 10	100 4	540.53 (5/2 ⁺)	
999.12		216.40 5	100 5	782.66 (3/2 ⁺ , 5/2 ⁺)				1139.50 10	9.8 11	219.53 (7/2 ⁺)	
		827.40 20	12.1 16	171.963 (5/2 ⁺)				1170.15 10	10.9 11	188.92 (7/2 ⁻)	
		944.30 10	38.9 21	54.98 1/2 ⁽⁻⁾				1187.10 10	18.9 11	171.963 (5/2 ⁺)	
1001.94		830.00 10	46 4	171.963 (5/2 ⁺)				1258.20 10	11.6 11	100.999 (5/2 ⁻)	
		841.50 10	100 5	160.43 (3/2 ⁺)				1277.30 20	9.5 11	82.129 (7/2 ⁻)	
		867.45 10	61 6	134.48 (3/2 ⁺)				1358.90 20	5.5 8	0.0 3/2 ⁽⁻⁾	
1035.28		812.50 20	25 5	222.98 (7/2 ⁺)		1398.29		1175.30 10	100 9	222.98 (7/2 ⁺)	
		815.55 10	100 7	219.53 (7/2 ⁺)				1315.90 20	69 9	82.129 (7/2 ⁻)	
		863.45 10	69 7	171.963 (5/2 ⁺)				1385.70 20	72 9	12.882 (5/2 ⁻)	
		900.80 10	73 7	134.48 (3/2 ⁺)		1399.17		793.80 20	22.6 22	605.40 (5/2 ⁻)	
1042.28		800.00 20	46 6	242.45 (5/2)				1154.50 10	57 4	244.674 (7/2 ⁻)	
		881.80 10	100 7	160.43 (3/2 ⁺)				1156.70 10	47 4	242.45 (5/2)	
1070.11		385.32 10	35.2 17	684.80 (7/2 ⁺)				1210.20 10	46 4	188.92 (7/2 ⁻)	
		847.05 10	100 4	222.98 (7/2 ⁺)				1298.20 10	100 6	100.999 (5/2 ⁻)	
		850.65 10	36.9 25	219.53 (7/2 ⁺)		1512.40		1268.85 10	100 5	243.57 (5/2)	
		883.05 10	98 17	187.07 (5/2 ⁻)		1540.74		1296.20 10	81 5	244.674 (7/2 ⁻)	
		898.10 10	86 4	171.963 (5/2 ⁺)				1317.60 10	100 6	222.98 (7/2 ⁺)	
1102.81		858.50 & 10	29 3	244.674 (7/2 ⁻)				1368.7 5	17 6	171.963 (5/2 ⁺)	
		883.0 5	25 9	219.53 (7/2 ⁺)				1439.80 10	34 3	100.999 (5/2 ⁻)	
		913.75 10	50 3	188.92 (7/2 ⁻)				1540.50 20	27.3 21	0.0 3/2 ⁽⁻⁾	
		915.75 10	48 3	187.07 (5/2 ⁻)		1552.11		1307.50 10	98 6	244.674 (7/2 ⁻)	
		942.40 10	100 5	160.43 (3/2 ⁺)				1329.10 10	89 5	222.98 (7/2 ⁺)	
		1001.85 10	63 4	100.999 (5/2 ⁻)				1332.60 10	100 5	219.53 (7/2 ⁺)	
		1090.00 10	41 3	12.882 (5/2 ⁻)				1379.70 20	28 4	171.963 (5/2 ⁺)	
		1102.80 20	13.4 17	0.0 3/2 ⁽⁻⁾				1451.30 20	33 4	100.999 (5/2 ⁻)	
1120.24		931.30 10	16.3 14	188.92 (7/2 ⁻)		1566.56		1394.8 5	22 7	171.963 (5/2 ⁺)	

Adopted Levels, Gammas (continued)

$\gamma(^{223}\text{Fr})$ (continued)

<u>E_i(level)</u>	<u>J_i^{π}</u>	<u>E_{γ}[†]</u>	<u>I_{γ}[†]</u>	<u>E_f</u>	<u>J_f^{π}</u>	<u>E_i(level)</u>	<u>J_i^{π}</u>	<u>E_{γ}[†]</u>	<u>I_{γ}[†]</u>	<u>E_f</u>	<u>J_f^{π}</u>
1566.56		1406.20 20	100 7	160.43	(3/2 ⁺)	1595.05		1371.40 20	39 5	222.98	(7/2 ⁺)
		1565.9 5	15 3	0.0	3/2 ⁽⁻⁾			1375.40 20	57 6	219.53	(7/2 ⁺)
1573.78		1350.80 10	100 9	222.98	(7/2 ⁺)			1423.25 10	100 8	171.963	(5/2 ⁺)
		1472.8 5	40 9	100.999	(5/2 ⁻)			1513.00 20	24 3	82.129	(7/2 ⁻)
		1491.60 20	83 9	82.129	(7/2 ⁻)	1629.30		1409.70 10	100 6	219.53	(7/2 ⁺)
1590.49		1367.4 5	27 9	222.98	(7/2 ⁺)			1547.40 20	18.8 18	82.129	(7/2 ⁻)
		1402.0 5	28 5	188.92	(7/2 ⁻)	1695.43		1535.00 20	100.0	160.43	(3/2 ⁺)
		1403.40 10	100 6	187.07	(5/2 ⁻)						

† From ²²³Rn β^- decay, unless otherwise specified.

‡ From ²²⁷Ac α decay.

Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

@ Multiply placed with intensity suitably divided.

& Placement of transition in the level scheme is uncertain.

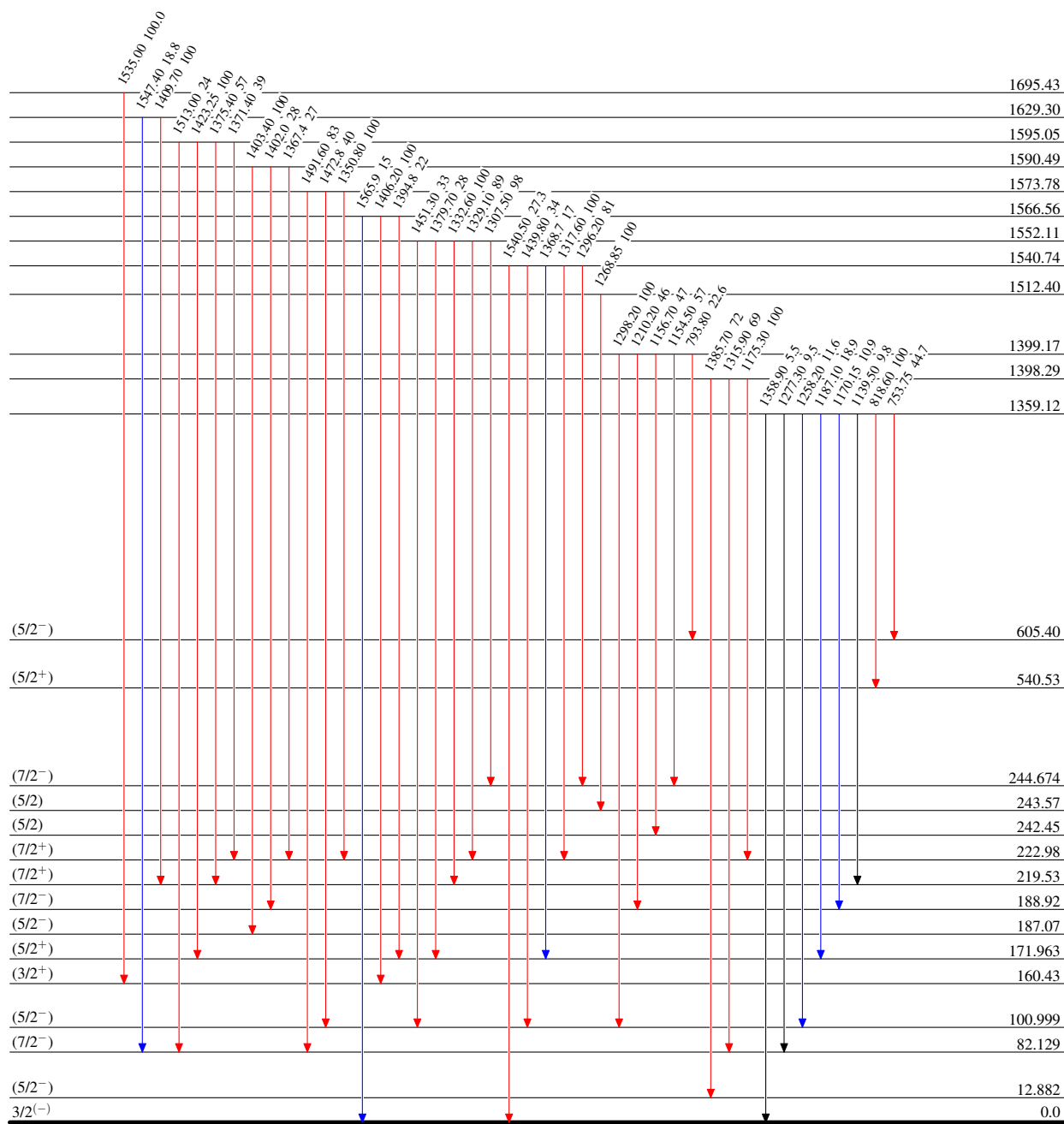
Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified

Legend

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



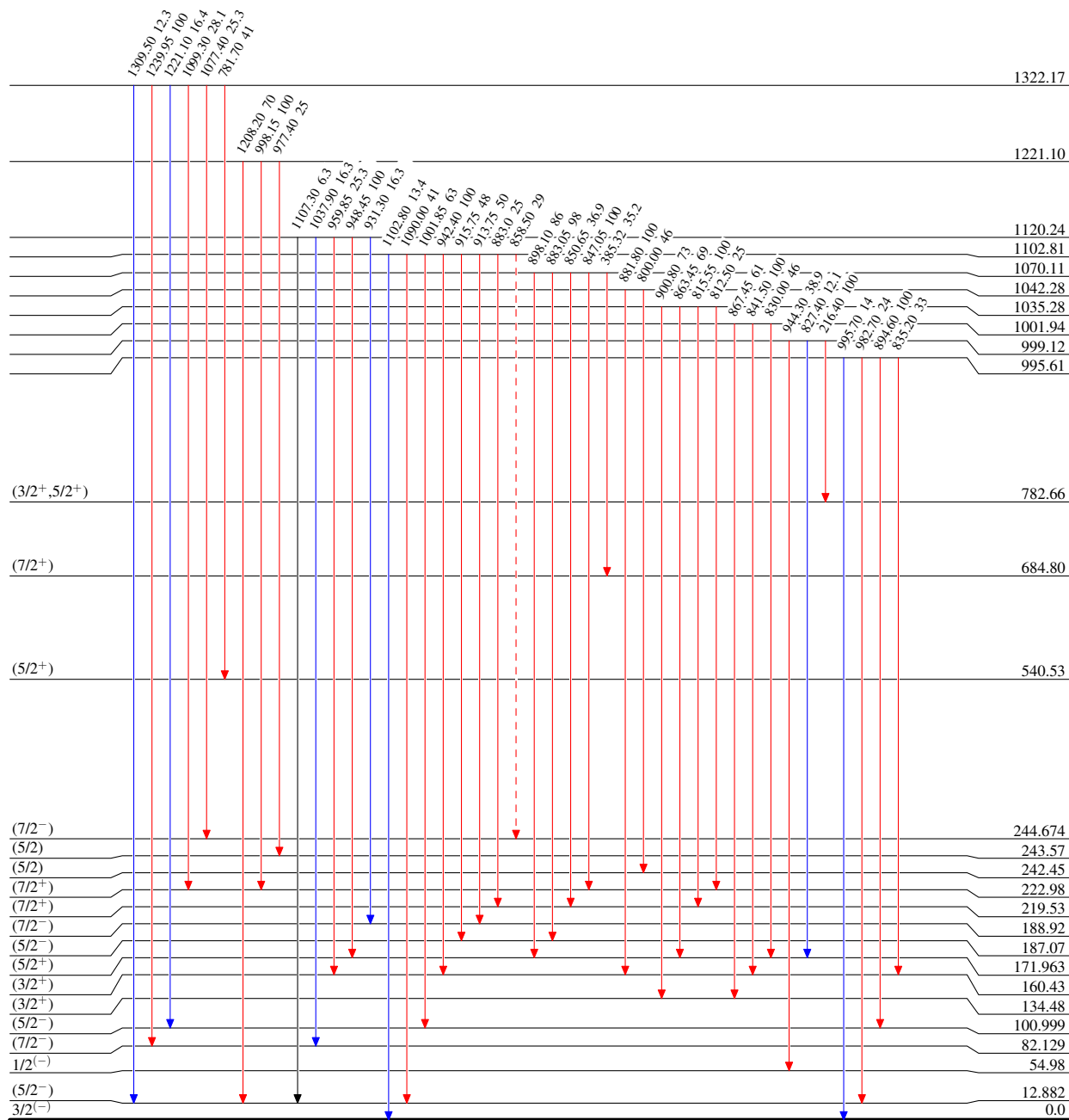
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Type not specified

- $I_\gamma < 2\% \times I_\gamma^{\max}$
 —→ $I_\gamma < 10\% \times I_\gamma^{\max}$
 —→ $I_\gamma > 10\% \times I_\gamma^{\max}$
 - - - - -→ γ Decay (Uncertain)

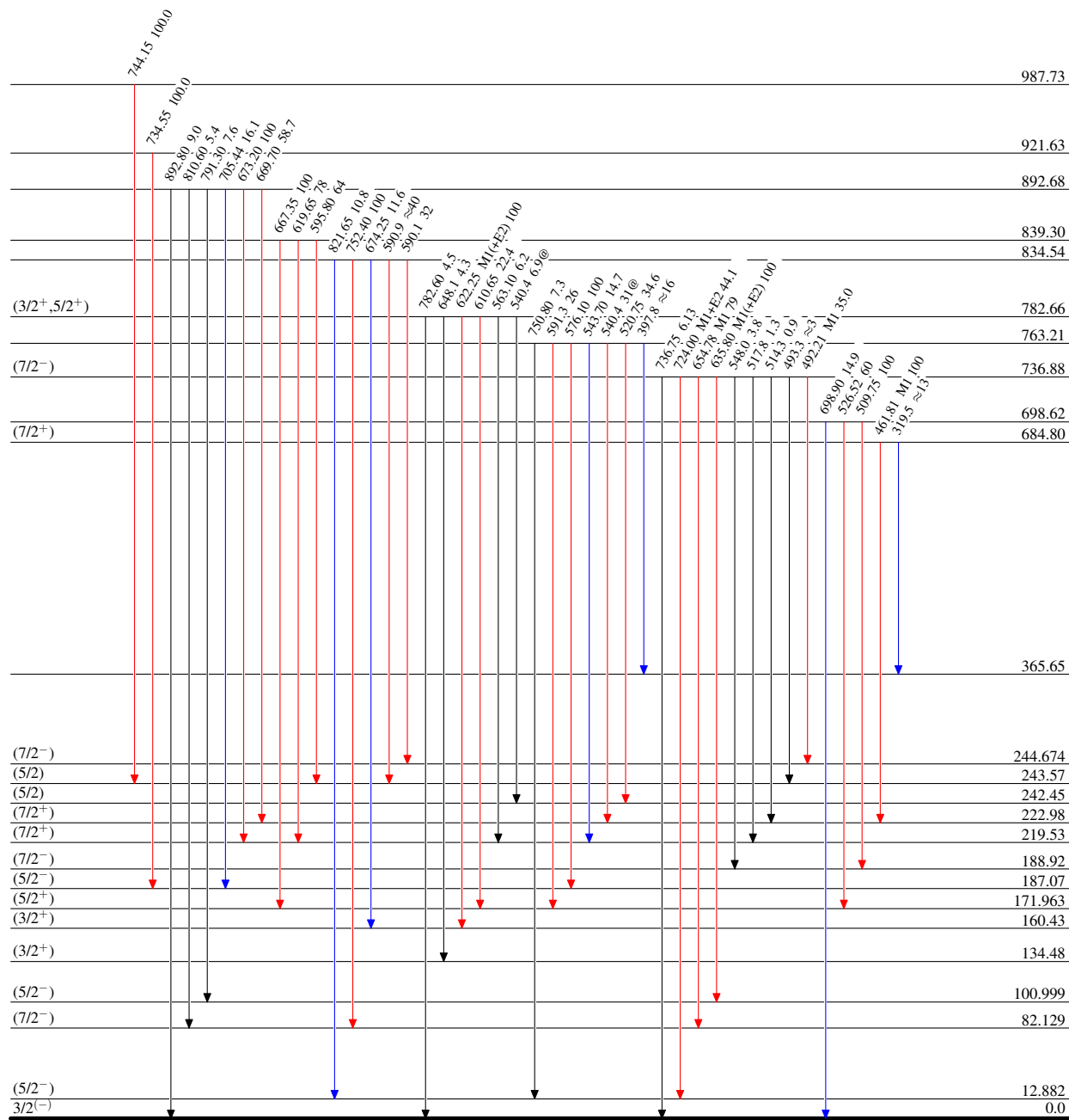


22.00 min 7

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

Intensities: Type not specified
 @ Multiply placed: intensity suitably divided

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

 $^{223}_{87}\text{Fr}_{136}$

22.00 min 7

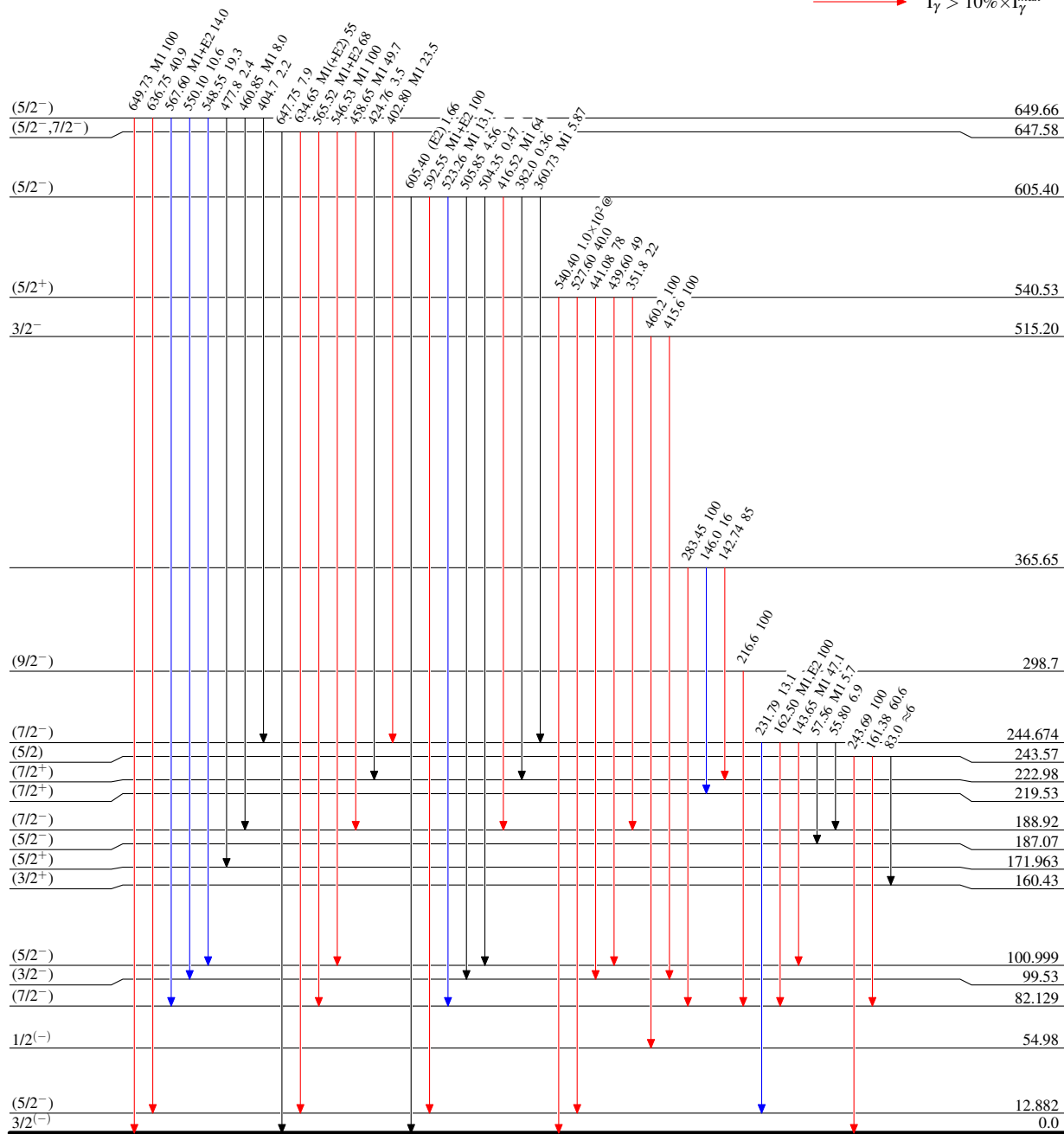
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
 @ Multiply placed: intensity suitably divided

Legend

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



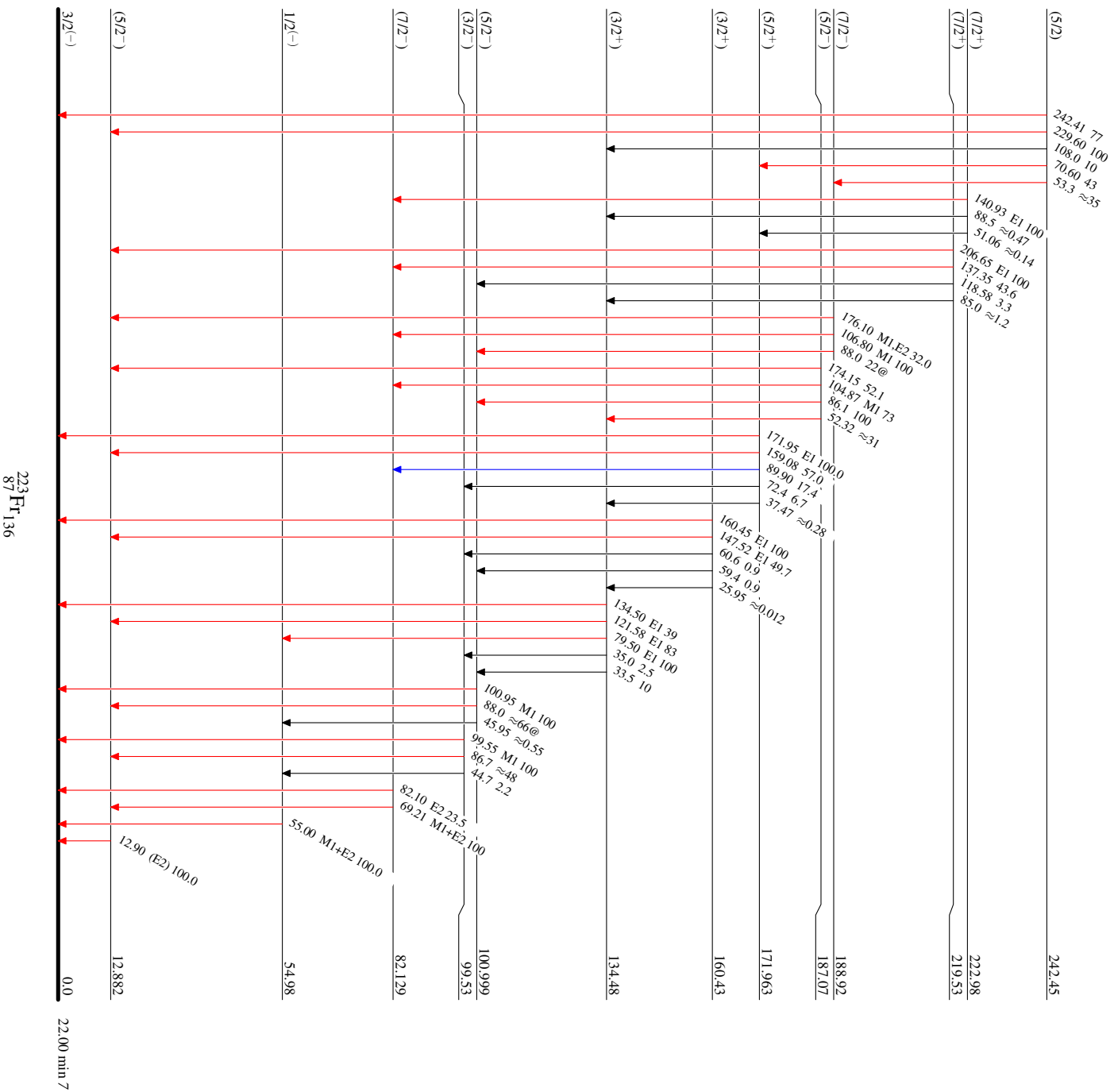
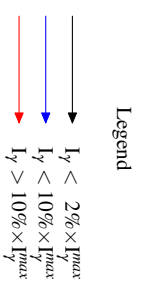
22.00 min 7

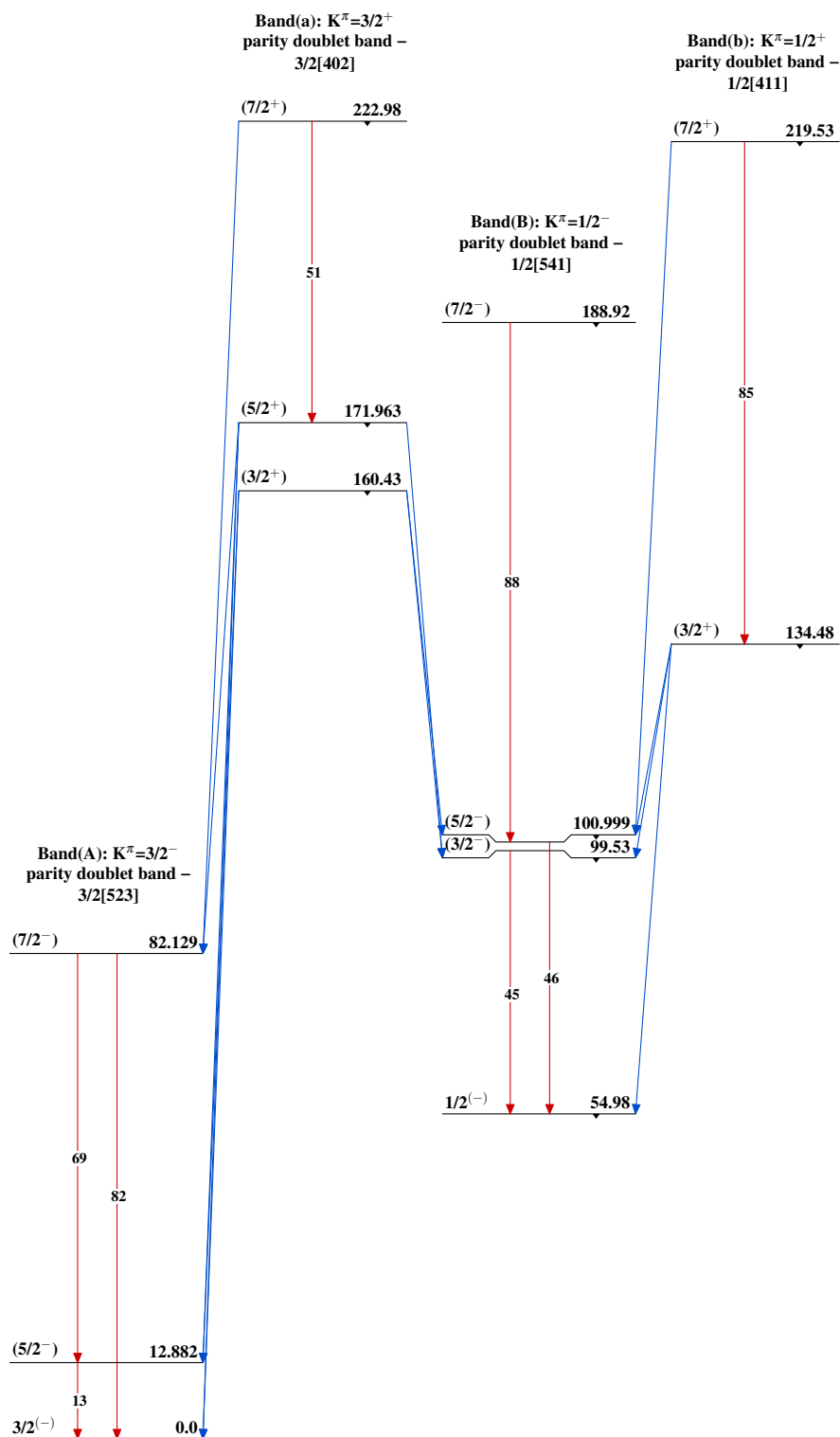
 $^{223}_{87}\text{Fr}_{136}$

Adopted Levels, Gammas

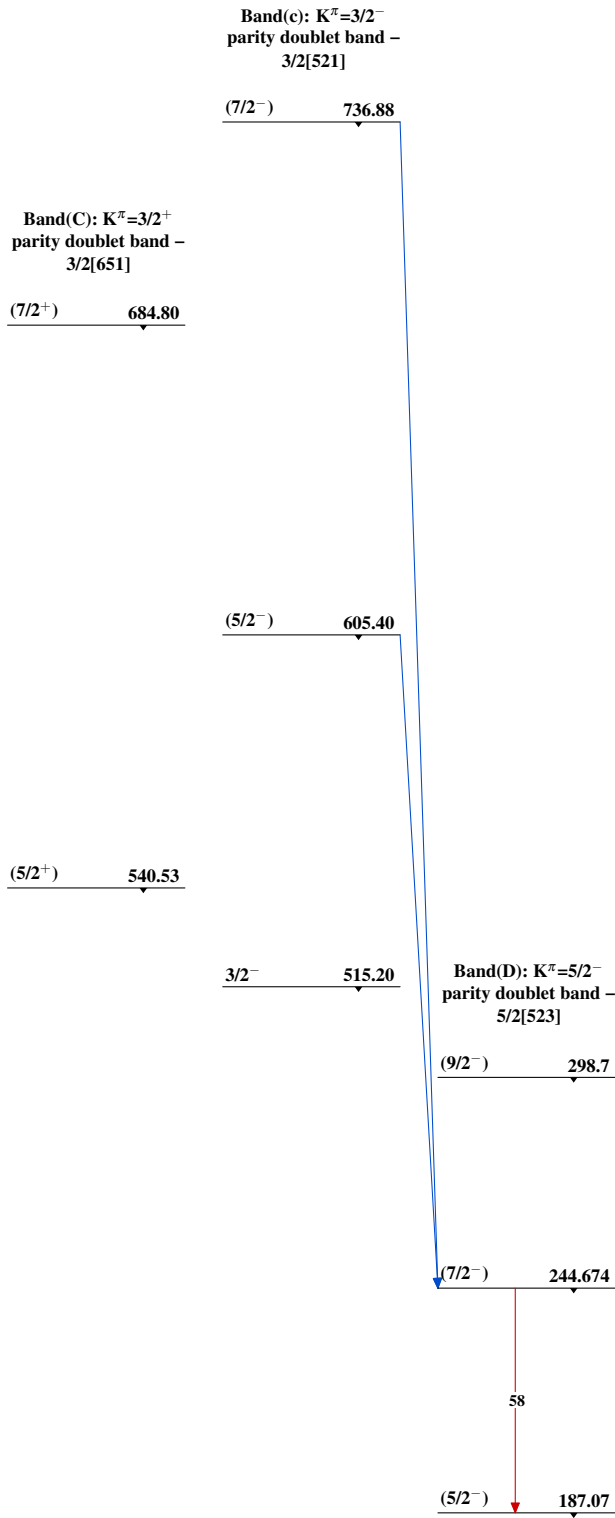
Level Scheme (continued)

Intensities: Type not specified
@ Multiply placed: intensity suitably divided



Adopted Levels, Gammas

Adopted Levels, Gammas (continued)



²²³Fr₁₃₆