

**Adopted Levels, Gammas**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 107,791 (2006)	15-Sep-2005

Q(β<sup>-</sup>)=-2.96×10<sup>3</sup> 4; S(n)=7.85×10<sup>3</sup> 4; S(p)=2.72×10<sup>3</sup> 4; Q(α)=3.84×10<sup>3</sup> 4 [2012Wa38](#)

Note: Current evaluation has used the following Q record -2960 407850 402720 403840 40 [2003Au03](#).

<sup>176</sup>Re Levels

Cross Reference (XREF) Flags

- A <sup>176</sup>Os ε decay
- B <sup>165</sup>Ho(<sup>16</sup>O,5nγ)
- C <sup>169</sup>Tm(<sup>12</sup>C,5nγ)
- D <sup>159</sup>Tb(<sup>22</sup>Ne,5nγ)

E(level) <sup>†</sup>	J <sup>π</sup> <sup>‡</sup>	T <sub>1/2</sub>	XREF	Comments
0.0 <sup>a</sup>	(3 <sup>+</sup> )	5.3 min 3	BCD	%ε+%β <sup>+</sup> =100 J <sup>π</sup> : log ft=6.7 to 109.1 (J <sup>π</sup> =2 <sup>+</sup> ) level, log ft=6.2 to 349.3 (J <sup>π</sup> =4 <sup>+</sup> ) level in <sup>176</sup> Re ε decay. configuration: π(1/2[541])⊗ν1/2[521] with a band head at (3 <sup>+</sup> ). T <sub>1/2</sub> : weighted average of 5 min 1 (1967Na17), 5.7 min 8 (1970Go20), 5.6 min 10 (1972Be89), and 5.2 min 4 (1977Ha24).
0.0+x <sup>@</sup>	(5 <sup>-</sup> )		B	J <sup>π</sup> : configuration: π(1/2[541])⊗ν(7/2[633]). Measured B(M1)/B(E2) value and calculation result are consistent with the configuration ( <sup>16</sup> O,5nγ).
0.0+y <sup>b</sup>	J		BC	J <sup>π</sup> : J=4 <sup>+</sup> or 5 <sup>+</sup> , from similarities with the bands in <sup>174</sup> Lu and <sup>176</sup> Ta.
14.8+x <sup>c</sup>	(7 <sup>+</sup> )		B	J <sup>π</sup> : Possible configuration: π9/2[514]⊗ν5/2[512]. 99.5γ E1 from (8 <sup>-</sup> ) state.
37.5+x <sup>@</sup>	(6 <sup>-</sup> )		B	
44.1+y <sup>b</sup>	J+1		B	
76.2 <sup>a</sup>	(5 <sup>+</sup> )		BCD	J <sup>π</sup> : Inband 76.2γ E2 to (3 <sup>+</sup> ) g.s.
93.7+x <sup>@</sup>	(7 <sup>-</sup> )		B	
114.1+y <sup>b</sup>	J+2		BC	
114.8+x <sup>#</sup>	(8 <sup>-</sup> )	30 ns 3	B	J <sup>π</sup> : 99.5γ E1 to (7 <sup>+</sup> ) state. T <sub>1/2</sub> : From 99.5γ δ(t) in ( <sup>16</sup> O,5nγ) (1999Ca08).
141.3 <sup>a</sup>	(4 <sup>+</sup> )		B	J <sup>π</sup> : 65.0γ M1+E2 to (5 <sup>+</sup> ) state.
156.4+x <sup>@</sup>	(8 <sup>-</sup> )		B	
184.8+x <sup>#</sup>	(9 <sup>-</sup> )		B	J <sup>π</sup> : 70.5γ M1+E2 to (8 <sup>-</sup> ) state.
194.5+x <sup>c</sup>	(8 <sup>+</sup> )		B	
208.7+x <sup>d</sup>	(7 <sup>+</sup> )		B	
211.5+y <sup>b</sup>	J+3		BC	
247.5 <sup>a</sup>	(7 <sup>+</sup> )		BCD	
263.6+x <sup>@</sup>	(9 <sup>-</sup> )		B	
300.6+x <sup>d</sup>	(8 <sup>+</sup> )		B	
303.7 <sup>a</sup>	(6 <sup>+</sup> )		B	J <sup>π</sup> : 56.0γ M1+E2 to (7 <sup>+</sup> ) state. 227.3γ M1+E2 to (5 <sup>+</sup> ) state.
307.2+x <sup>#</sup>	(10 <sup>-</sup> )		B	
333.5+y <sup>b</sup>	J+4		BC	
356.9+x <sup>@</sup>	(10 <sup>-</sup> )		B	
394.5+x <sup>c</sup>	(9 <sup>+</sup> )		B	
439.7+x <sup>d</sup>	(9 <sup>+</sup> )		B	
468.1+x <sup>#</sup>	(11 <sup>-</sup> )		B	
482.6+y <sup>b</sup>	J+5		BC	

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**Adopted Levels, Gammas (continued)**

$^{176}\text{Re}$  Levels (continued)

E(level) <sup>†</sup>	J <sup>π</sup> <sup>‡</sup>	XREF	E(level) <sup>†</sup>	J <sup>π</sup> <sup>‡</sup>	XREF	E(level) <sup>†</sup>	J <sup>π</sup> <sup>‡</sup>	XREF
515.3 <sup>a</sup>	(9 <sup>+</sup> )	BCD	1577.3+x <sup>@</sup>	(16 <sup>-</sup> )	B	2944.5 <sup>a</sup>	(19 <sup>+</sup> )	B
533.1+x <sup>@</sup>	(11 <sup>-</sup> )	B	1630.0+x <sup>c</sup>	(14 <sup>+</sup> )	B	2987.7+x <sup>&amp;</sup>	(17,19)	B
562.0 <sup>a</sup>	(8 <sup>+</sup> )	B	1691.3+x <sup>&amp;</sup>	(12,14)	B	2996.2+x <sup>d</sup>	(19 <sup>+</sup> )	B
602.3+x <sup>d</sup>	(10 <sup>+</sup> )	B	1709.0+x <sup>#</sup>	(16 <sup>-</sup> )	B	3037.5+x <sup>#</sup>	(20 <sup>-</sup> )	B
621.4+x <sup>c</sup>	(10 <sup>+</sup> )	B	1801.7+x <sup>d</sup>	(15 <sup>+</sup> )	B	3277.5+x <sup>@</sup>	(21 <sup>-</sup> )	B
654.3+y <sup>b</sup>	J+6	BC	1825.7 <sup>a</sup>	(15 <sup>+</sup> )	BCD	3315.5+x <sup>&amp;</sup>	(18,20)	B
657.4+x <sup>@</sup>	(12 <sup>-</sup> )	B	1841.3+y <sup>b</sup>	J+11	B	3318.1+x <sup>d</sup>	(20 <sup>+</sup> )	B
665.3+x <sup>#</sup>	(12 <sup>-</sup> )	B	1842.8 <sup>a</sup>	(14 <sup>+</sup> )	B	3401.0+x <sup>#</sup>	(21 <sup>-</sup> )	B
803.6+x <sup>d</sup>	(11 <sup>+</sup> )	B	1892.6+x <sup>&amp;</sup>	(13,15)	B	3545.3 <sup>a</sup>	(21 <sup>+</sup> )	B
851.5+y <sup>b</sup>	J+7	B	1907.3+x <sup>c</sup>	(15 <sup>+</sup> )	B	3629.2+x <sup>@</sup>	(22 <sup>-</sup> )	B
852.9+x <sup>c</sup>	(11 <sup>+</sup> )	B	1936.8+x <sup>@</sup>	(17 <sup>-</sup> )	B	3654.3+x <sup>d</sup>	(21 <sup>+</sup> )	B
874.6 <sup>a</sup>	(11 <sup>+</sup> )	BCD	2022.4+x <sup>#</sup>	(17 <sup>-</sup> )	B	3655.3+x <sup>&amp;</sup>	(19,21)	B
887.9+x <sup>#</sup>	(13 <sup>-</sup> )	BC	2087.7+x <sup>d</sup>	(16 <sup>+</sup> )	B	3765.0+x <sup>#</sup>	(22 <sup>-</sup> )	B
907.5+x <sup>@</sup>	(13 <sup>-</sup> )	B	2127.5+x <sup>&amp;</sup>	(14,16)	B	4025.6+x <sup>&amp;</sup>	(20,22)	B
911.3 <sup>a</sup>	(10 <sup>+</sup> )	B	2132.3+y <sup>b</sup>	J+12	B	4040.8+x <sup>@</sup>	(23 <sup>-</sup> )	B
1027.8+x <sup>d</sup>	(12 <sup>+</sup> )	B	2181.5+x <sup>@</sup>	(18 <sup>-</sup> )	B	4146.0+x <sup>#</sup>	(23 <sup>-</sup> )	B
1066.3+x <sup>@</sup>	(14 <sup>-</sup> )	B	2190.8+x <sup>c</sup>	(16 <sup>+</sup> )	B	4206.9 <sup>a</sup>	(23 <sup>+</sup> )	B
1068.8+y <sup>b</sup>	J+8	B	2347.9+x <sup>#</sup>	(18 <sup>-</sup> )	B	4452.2+x <sup>@</sup>	(24 <sup>-</sup> )	B
1100.8+x <sup>c</sup>	(12 <sup>+</sup> )	B	2376.0 <sup>a</sup>	(16 <sup>+</sup> )	B	4533.5+x <sup>#</sup>	(24 <sup>-</sup> )	B
1140.5+x <sup>#</sup>	(14 <sup>-</sup> )	B	2378.6 <sup>a</sup>	(17 <sup>+</sup> )	B	4861.3+x <sup>@</sup>	(25 <sup>-</sup> )	B
1253.9+x <sup>&amp;</sup>	(10,12)	B	2378.7+x <sup>d</sup>	(17 <sup>+</sup> )	B	4932.1 <sup>a</sup>	(25 <sup>+</sup> )	B
1268.4+x <sup>d</sup>	(13 <sup>+</sup> )	B	2390.6+x <sup>&amp;</sup>	(15,17)	B	5321.3+x <sup>#</sup>	(25 <sup>-</sup> )	B
1309.0+y <sup>b</sup>	J+9	B	2423.3+y <sup>b</sup>	J+13	B	5322.6+x <sup>@</sup>	(26 <sup>-</sup> )	B
1315.9 <sup>a</sup>	(13 <sup>+</sup> )	BCD	2511.3+x <sup>c</sup>	(17 <sup>+</sup> )	B	5715.8 <sup>a</sup>	(27 <sup>+</sup> )	B
1342.3 <sup>a</sup>	(12 <sup>+</sup> )	B	2572.8+x <sup>@</sup>	(19 <sup>-</sup> )	B	5729.3+x <sup>@</sup>	(27 <sup>-</sup> )	B
1360.2+x <sup>c</sup>	(13 <sup>+</sup> )	B	2678.4+x <sup>&amp;</sup>	(16,18)	B	6127.7+x <sup>#</sup>	(26 <sup>-</sup> )	B
1377.3+x <sup>@</sup>	(15 <sup>-</sup> )	B	2686.9+x <sup>d</sup>	(18 <sup>+</sup> )	B	6221.6+x <sup>@</sup>	(28 <sup>-</sup> )	B
1414.8+x <sup>#</sup>	(15 <sup>-</sup> )	B	2690.7+x <sup>#</sup>	(19 <sup>-</sup> )	B	6555.9 <sup>a</sup>	(29 <sup>+</sup> )	B
1531.1+x <sup>d</sup>	(14 <sup>+</sup> )	B	2762.4+x <sup>c</sup>	(18 <sup>+</sup> )	B	6959.7+x <sup>#</sup>	(27 <sup>-</sup> )	B
1566.3+y <sup>b</sup>	J+10	B	2869.7+x <sup>@</sup>	(20 <sup>-</sup> )	B	7822.7+x <sup>#</sup>	(28 <sup>-</sup> )	B

<sup>†</sup> Energy levels from 1998Ca08,  $^{165}\text{Ho}(^{16}\text{O},5n\gamma)$ . Energy levels of bands A, B, C, F, G; band E; were built from depopulating  $\gamma$ -energies on the 0.0+x; and 0.0+y levels, respectively, by the evaluator.  $\gamma$  rays from  $^{176}\text{Os}$   $\varepsilon$  decay are uncertain, and levels, tentative.

<sup>‡</sup> J<sup>π</sup> assignment from rotational band structure and measured DCO ratios in  $^{165}\text{Ho}(^{16}\text{O},5n\gamma)$  (1999Ca08), unless otherwise specified.

# Band(A): band A: configuration:  $\pi 9/2[514] \otimes \nu 7/2[633]$ .

@ Band(B): band B: configuration:  $\pi(1/2[541]) \otimes \nu(7/2[633])$ .

& Band(C): band C.

<sup>a</sup> Band(D): Band D: configuration:  $\pi(1/2[541]) \otimes \nu 1/2[521]$  doubly decoupled band.

<sup>b</sup> Band(E): band E.

<sup>c</sup> Band(F): band F: Possible configuration:  $\pi 9/2[514] \otimes \nu 5/2[512]$ .

<sup>d</sup> Band(G): band G: Possible configuration:  $\pi 5/2[402] \otimes \nu 7/2[633]$ .

**Adopted Levels, Gammas (continued)**

$\gamma(^{176}\text{Re})$								
$E_i(\text{level})$	$J_i^\pi$	$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_f$	$J_f^\pi$	Mult. <sup>c</sup>	$\delta^e$	Comments
37.5+x	(6 <sup>-</sup> )	37.5	100	0.0+x	(5 <sup>-</sup> )			
44.1+y	J+1	44.1	100	0.0+y	J			$E_\gamma$ : Not seen in ( $^{12}\text{C},5\text{n}\gamma$ ).
76.2	(5 <sup>+</sup> )	76.2 <sup>@</sup>	100	0.0	(3 <sup>+</sup> )	E2		Mult.: from $\alpha(\text{exp})=13\ 1$ (from intensity balance in 1999Ca08).
93.7+x	(7 <sup>-</sup> )	56.2	100	37.5+x	(6 <sup>-</sup> )			
114.1+y	J+2	70.0	100	44.1+y	J+1			
114.8+x	(8 <sup>-</sup> )	114.3	5 <sup>b</sup> 2	0.0+y	J			
		99.5 <sup>a</sup>	100	14.8+x	(7 <sup>+</sup> )	E1		Mult.: From $\alpha(\text{exp})=0.36\ 9$ (from intensity balance in 1999Ca08).
141.3	(4 <sup>+</sup> )	65.0 <sup>‡</sup>	100	76.2	(5 <sup>+</sup> )	M1+E2 <sup>d</sup>		Mult.: from $\alpha(\text{exp})=6.0\ 5$ (from intensity balance in 1999Ca08).
		141.3 <sup>‡</sup>	76	0.0	(3 <sup>+</sup> )			
156.4+x	(8 <sup>-</sup> )	62.7	100	93.7+x	(7 <sup>-</sup> )			
		118.9	17 <sup>b</sup> 3	37.5+x	(6 <sup>-</sup> )			
184.8+x	(9 <sup>-</sup> )	70.5	100	114.8+x	(8 <sup>-</sup> )	M1+E2 <sup>d</sup>	0.16 8	Mult.: from $\alpha(\text{exp})=3.0\ 4$ (from intensity balance in 1999Ca08).
194.5+x	(8 <sup>+</sup> )	179.7	100	14.8+x	(7 <sup>+</sup> )	M1+E2		
208.7+x	(7 <sup>+</sup> )	193.9	100	14.8+x	(7 <sup>+</sup> )	M1+E2		
211.5+y	J+3	97.4	100	114.1+y	J+2	M1+E2		
		167.6	19 <sup>b</sup> 5	44.1+y	J+1			
247.5	(7 <sup>+</sup> )	171.3 <sup>@</sup>	100	76.2	(5 <sup>+</sup> )	E2		
263.6+x	(9 <sup>-</sup> )	107.2	100	156.4+x	(8 <sup>-</sup> )	M1+E2		
		169.7	32 <sup>b</sup> 5	93.7+x	(7 <sup>-</sup> )	E2		
300.6+x	(8 <sup>+</sup> )	91.9	100	208.7+x	(7 <sup>+</sup> )			
303.7	(6 <sup>+</sup> )	56.0 <sup>‡</sup>		247.5	(7 <sup>+</sup> )	M1+E2 <sup>d</sup>		$I_\gamma$ : Not available. Mult.: from $\alpha(\text{exp})=6\ 3$ (from intensity balance in 1999Ca08).
		162.4 <sup>#</sup>	100	141.3	(4 <sup>+</sup> )	E2		
		227.3 <sup>‡</sup>	19	76.2	(5 <sup>+</sup> )	M1+E2 <sup>d</sup>	0.20 12	
307.2+x	(10 <sup>-</sup> )	122.4	100	184.8+x	(9 <sup>-</sup> )	M1+E2		
333.5+y	J+4	122.0	100	211.5+y	J+3	M1+E2		
		219.3	66 <sup>b</sup> 13	114.1+y	J+2	E2		
356.9+x	(10 <sup>-</sup> )	93.3	100	263.6+x	(9 <sup>-</sup> )	M1+E2		
		200.2	89 <sup>b</sup> 6	156.4+x	(8 <sup>-</sup> )	E2		
394.5+x	(9 <sup>+</sup> )	200.0	100	194.5+x	(8 <sup>+</sup> )	E2		
		379.7	41 <sup>b</sup> 4	14.8+x	(7 <sup>+</sup> )	E2		
439.7+x	(9 <sup>+</sup> )	139.1	100	300.6+x	(8 <sup>+</sup> )	M1+E2		
		231.9	41 <sup>b</sup> 6	208.7+x	(7 <sup>+</sup> )			
468.1+x	(11 <sup>-</sup> )	160.9	100	307.2+x	(10 <sup>-</sup> )	M1+E2	0.31 3	$\delta$ : 0.31 3 (estimated).
		282.7	14 <sup>b</sup> 3	184.8+x	(9 <sup>-</sup> )			
482.6+y	J+5	149.1	100	333.5+y	J+4	M1+E2	-0.10 7	$E_\gamma$ : 161.1 in $^{169}\text{Tm} (^{12}\text{C},5\text{n}\gamma)$ .
		270.7	83 <sup>b</sup> 12	211.5+y	J+3	E2		
515.3	(9 <sup>+</sup> )	267.8 <sup>@</sup>	100	247.5	(7 <sup>+</sup> )	E2		
533.1+x	(11 <sup>-</sup> )	176.2	100	356.9+x	(10 <sup>-</sup> )	M1+E2		
		269.4	71 <sup>b</sup> 5	263.6+x	(9 <sup>-</sup> )	E2		
562.0	(8 <sup>+</sup> )	46.5		515.3	(9 <sup>+</sup> )			
		258.3 <sup>#</sup>	100	303.7	(6 <sup>+</sup> )	E2		
		314.3 <sup>‡</sup>	6	247.5	(7 <sup>+</sup> )			

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**Adopted Levels, Gammas (continued)**

$\gamma(^{176}\text{Re})$ (continued)								
$E_i(\text{level})$	$J_i^\pi$	$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_f$	$J_f^\pi$	Mult. <sup>c</sup>	$\delta^e$	Comments
602.3+x	(10 <sup>+</sup> )	162.6	36.6	439.7+x	(9 <sup>+</sup> )	M1		$I_\gamma$ : $I_\gamma(162.6):I_\gamma(301.5)=100:82(7)$ from Branching ratio in ( $^{16}\text{O},5n\gamma$ ).
		207.9	100	394.5+x	(9 <sup>+</sup> )	M1+E2		
		301.5	41.5	300.6+x	(8 <sup>+</sup> )	E2		
		407.6	60.4	194.5+x	(8 <sup>+</sup> )	E2		
621.4+x	(10 <sup>+</sup> )	181.7 <sup>&amp;</sup>		439.7+x	(9 <sup>+</sup> )			$I_\gamma$ : Not available.
		226.9	100	394.5+x	(9 <sup>+</sup> )	M1+E2		
		427.1	85 <sup>b</sup> 7	194.5+x	(8 <sup>+</sup> )	E2		
654.3+y	J+6	171.7	77 <sup>b</sup>	482.6+y	J+5	M1		$E_\gamma$ : 197.4 in $^{169}\text{Tm}(^{12}\text{C},5n\gamma)$ .
		320.3	100 23	333.5+y	J+4	E2		
657.4+x	(12 <sup>-</sup> )	124.3	34 <sup>b</sup>	533.1+x	(11 <sup>-</sup> )	M1		
		300.4	100 14	356.9+x	(10 <sup>-</sup> )	E2		
665.3+x	(12 <sup>-</sup> )	197.2	100	468.1+x	(11 <sup>-</sup> )	M1+E2		
		358.0	28 <sup>b</sup> 5	307.2+x	(10 <sup>-</sup> )	E2		
803.6+x	(11 <sup>+</sup> )	201.3	100	602.3+x	(10 <sup>+</sup> )			
		363.5	50 <sup>b</sup> 7	439.7+x	(9 <sup>+</sup> )	E2		
		409.1	14	394.5+x	(9 <sup>+</sup> )			
851.5+y	J+7	197.2	56 <sup>b</sup>	654.3+y	J+6	M1+E2		
		368.7	100 17	482.6+y	J+5	E2		
852.9+x	(11 <sup>+</sup> )	231.5	91 <sup>b</sup>	621.4+x	(10 <sup>+</sup> )			$I_\gamma$ : Not available.
		250.9 <sup>&amp;</sup>		602.3+x	(10 <sup>+</sup> )			
		458.8	100 9	394.5+x	(9 <sup>+</sup> )	E2		
874.6	(11 <sup>+</sup> )	359.3 <sup>@</sup>	100	515.3	(9 <sup>+</sup> )	E2		
887.9+x	(13 <sup>-</sup> )	222.6	100	665.3+x	(12 <sup>-</sup> )	M1+E2		
		419.7	56 <sup>b</sup> 8	468.1+x	(11 <sup>-</sup> )	E2		
907.5+x	(13 <sup>-</sup> )	250.1	76.9 <sup>b</sup>	657.4+x	(12 <sup>-</sup> )	M1+E2		
		374.2	100 15	533.1+x	(11 <sup>-</sup> )	E2		
911.3	(10 <sup>+</sup> )	349.3 <sup>#</sup>	100	562.0	(8 <sup>+</sup> )	E2		
		396.0 <sup>‡</sup>	0.04	515.3	(9 <sup>+</sup> )			
1027.8+x	(12 <sup>+</sup> )	224.2	76.9 <sup>b</sup>	803.6+x	(11 <sup>+</sup> )	M1+E2		
		425.6	100 15	602.3+x	(10 <sup>+</sup> )	E2		
1066.3+x	(14 <sup>-</sup> )	158.8	20 <sup>b</sup>	907.5+x	(13 <sup>-</sup> )	M1+E2	-0.17 10	
		408.8	100 14	657.4+x	(12 <sup>-</sup> )	E2		
1068.8+y	J+8	217.3	34 <sup>b</sup>	851.5+y	J+7	M1+E2		
		414.3	100 21	654.3+y	J+6	E2		
1100.8+x	(12 <sup>+</sup> )	247.9	100 <sup>b</sup>	852.9+x	(11 <sup>+</sup> )	M1+E2		
		479.9	100 10	621.4+x	(10 <sup>+</sup> )	E2		
1140.5+x	(14 <sup>-</sup> )	252.6	100	887.9+x	(13 <sup>-</sup> )	M1+E2		
		475.2	64 <sup>b</sup> 9	665.3+x	(12 <sup>-</sup> )	E2		
1253.9+x	(10,12)	786.2	100	468.1+x	(11 <sup>-</sup> )	(M1+E2)		
		946.7	92.8	307.2+x	(10 <sup>-</sup> )	(E2)		
1268.4+x	(13 <sup>+</sup> )	240.6	33 <sup>b</sup>	1027.8+x	(12 <sup>+</sup> )	M1+E2		
		465.7	100 20	803.6+x	(11 <sup>+</sup> )	E2		
1309.0+y	J+9	240.2	40 <sup>b</sup>	1068.8+y	J+8	M1		
		457.2	100 20	851.5+y	J+7	E2		
1315.9	(13 <sup>+</sup> )	441.3 <sup>@</sup>	100	874.6	(11 <sup>+</sup> )	E2		
1342.3	(12 <sup>+</sup> )	431.0 <sup>#</sup>	100	911.3	(10 <sup>+</sup> )	E2		
		467.6 <sup>‡</sup>	0.05	874.6	(11 <sup>+</sup> )			
1360.2+x	(13 <sup>+</sup> )	259.4	63 <sup>b</sup>	1100.8+x	(12 <sup>+</sup> )	M1+E2		

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) $\gamma(^{176}\text{Re})$  (continued)

$E_i(\text{level})$	$J_i^\pi$	$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_f$	$J_f^\pi$	Mult. <sup>c</sup>	Comments
1360.2+x	(13 <sup>+</sup> )	507.7	100 13	852.9+x	(11 <sup>+</sup> )	E2	
1377.3+x	(15 <sup>-</sup> )	311.0	53 <sup>b</sup>	1066.3+x	(14 <sup>-</sup> )	M1+E2	
		469.8	100 16	907.5+x	(13 <sup>-</sup> )	E2	
1414.8+x	(15 <sup>-</sup> )	274.3	93 <sup>b</sup> 13	1140.5+x	(14 <sup>-</sup> )	M1+E2	
		526.7	100	887.9+x	(13 <sup>-</sup> )	E2	
1531.1+x	(14 <sup>+</sup> )	262.7	37 <sup>b</sup>	1268.4+x	(13 <sup>+</sup> )	M1+E2	
		504.1	100 19	1027.8+x	(12 <sup>+</sup> )	E2	
1566.3+y	J+10	257.3	23 <sup>b</sup>	1309.0+y	J+9	M1	
		497.3	100 25	1068.8+y	J+8	E2	
1577.3+x	(16 <sup>-</sup> )	200.8	13 <sup>b</sup>	1377.3+x	(15 <sup>-</sup> )		
		510.1	100 13	1066.3+x	(14 <sup>-</sup> )	E2	
1630.0+x	(14 <sup>+</sup> )	269.8	67 <sup>b</sup>	1360.2+x	(13 <sup>+</sup> )		
		529.6	100 13	1100.8+x	(12 <sup>+</sup> )	E2	
1691.3+x	(12,14)	437.4	100	1253.9+x	(10,12)		
		803.8	80	887.9+x	(13 <sup>-</sup> )	(M1+E2)	
		1026.4		665.3+x	(12 <sup>-</sup> )	(E2)	I <sub>γ</sub> : Not available.
1709.0+x	(16 <sup>-</sup> )	294.2	83 <sup>b</sup>	1414.8+x	(15 <sup>-</sup> )	M1+E2	
		568.0	100 17	1140.5+x	(14 <sup>-</sup> )	E2	
1801.7+x	(15 <sup>+</sup> )	270.6	12.6 <sup>b</sup>	1531.1+x	(14 <sup>+</sup> )	M1+E2	
		533.2	100 29	1268.4+x	(13 <sup>+</sup> )	E2	
1825.7	(15 <sup>+</sup> )	509.8 <sup>@</sup>	100	1315.9	(13 <sup>+</sup> )	E2	
1841.3+y	J+11	275.0	16.4 <sup>b</sup>	1566.3+y	J+10	M1	
		532.4	100 25	1309.0+y	J+9	E2	
1842.8	(14 <sup>+</sup> )	500.5 <sup>#</sup>	100	1342.3	(12 <sup>+</sup> )	E2	
1892.6+x	(13,15)	201.3	100	1691.3+x	(12,14)		
1907.3+x	(15 <sup>+</sup> )	277.3	52.6 <sup>b</sup>	1630.0+x	(14 <sup>+</sup> )		
		547.5	100 16	1360.2+x	(13 <sup>+</sup> )	E2	
1936.8+x	(17 <sup>-</sup> )	359.5	43.5 <sup>b</sup>	1577.3+x	(16 <sup>-</sup> )	M1+E2	
		558.4	100 13	1377.3+x	(15 <sup>-</sup> )	E2	
2022.4+x	(17 <sup>-</sup> )	313.4	52.6 <sup>b</sup>	1709.0+x	(16 <sup>-</sup> )	M1+E2	
		607.5	100 16	1414.8+x	(15 <sup>-</sup> )	E2	
2087.7+x	(16 <sup>+</sup> )	286.0	11.1 <sup>b</sup>	1801.7+x	(15 <sup>+</sup> )		
		556.2	100 11	1531.1+x	(14 <sup>+</sup> )	E2	
2127.5+x	(14,16)	234.9	100	1892.6+x	(13,15)	(M1+E2)	
		437.1	26 <sup>b</sup> 6	1691.3+x	(12,14)		
2132.3+y	J+12	291.0 <sup>f</sup>	20.8 <sup>fb</sup>	1841.3+y	J+11		
		566.0	100 23	1566.3+y	J+10	E2	
2181.5+x	(18 <sup>-</sup> )	244.7	12.5 <sup>b</sup>	1936.8+x	(17 <sup>-</sup> )	M1+E2	
		603.7	100 25	1577.3+x	(16 <sup>-</sup> )	E2	
2190.8+x	(16 <sup>+</sup> )	560.8	100	1630.0+x	(14 <sup>+</sup> )		
2347.9+x	(18 <sup>-</sup> )	325.5	33.3 <sup>b</sup>	2022.4+x	(17 <sup>-</sup> )	M1+E2	
		638.7	100 17	1709.0+x	(16 <sup>-</sup> )	E2	
2376.0	(16 <sup>+</sup> )	533.2 <sup>#</sup>	100	1842.8	(14 <sup>+</sup> )	E2	
2378.6	(17 <sup>+</sup> )	553.0 <sup>#</sup>	100	1825.7	(15 <sup>+</sup> )	E2	
2378.7+x	(17 <sup>+</sup> )	291.0 <sup>f</sup>	16.7 <sup>fb</sup>	2087.7+x	(16 <sup>+</sup> )		
		577.3	100 50	1801.7+x	(15 <sup>+</sup> )	E2	
2390.6+x	(15,17)	263.1	100	2127.5+x	(14,16)		
		498.3	41 <sup>b</sup> 10	1892.6+x	(13,15)		
2423.3+y	J+13	291.0 <sup>f</sup>	15.2 <sup>fb</sup>	2132.3+y	J+12		

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Adopted Levels, Gammas (continued) $\gamma(^{176}\text{Re})$  (continued)

$E_i(\text{level})$	$J_i^\pi$	$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_f$	$J_f^\pi$	Mult. <sup>c</sup>	Comments
2423.3+y	J+13	582.2	100 20	1841.3+y	J+11	E2	
2511.3+x	(17 <sup>+</sup> )	604.0 <sup>g</sup>	100	1907.3+x	(15 <sup>+</sup> )		
2572.8+x	(19 <sup>-</sup> )	391.3	35.7 <sup>b</sup>	2181.5+x	(18 <sup>-</sup> )		
		635.3	100 14	1936.8+x	(17 <sup>-</sup> )	E2	
2678.4+x	(16,18)	287.8	100	2390.6+x	(15,17)		
		551.8	80 <sup>b</sup> 20	2127.5+x	(14,16)		
2686.9+x	(18 <sup>+</sup> )	599.2	100	2087.7+x	(16 <sup>+</sup> )		
2690.7+x	(19 <sup>-</sup> )	342.8	31.3 <sup>b</sup>	2347.9+x	(18 <sup>-</sup> )	M1+E2	
		668.3	100 16	2022.4+x	(17 <sup>-</sup> )	E2	
2762.4+x	(18 <sup>+</sup> )	571.6 <sup>g</sup>	100	2190.8+x	(16 <sup>+</sup> )		
2869.7+x	(20 <sup>-</sup> )	296.9	10 <sup>b</sup>	2572.8+x	(19 <sup>-</sup> )		
		687.3	100 20	2181.5+x	(18 <sup>-</sup> )	E2	
2944.5	(19 <sup>+</sup> )	565.8 <sup>@</sup>	100	2378.6	(17 <sup>+</sup> )	E2	
2987.7+x	(17,19)	309.3	50 <sup>b</sup>	2678.4+x	(16,18)		
		597.2	100	2390.6+x	(15,17)		
2996.2+x	(19 <sup>+</sup> )	617.5	100	2378.7+x	(17 <sup>+</sup> )		
3037.5+x	(20 <sup>-</sup> )	346.8	38.5 <sup>b</sup>	2690.7+x	(19 <sup>-</sup> )	M1	
		689.7	100 15	2347.9+x	(18 <sup>-</sup> )	E2	
3277.5+x	(21 <sup>-</sup> )	407.8		2869.7+x	(20 <sup>-</sup> )		I <sub>γ</sub> : Not reported.
		703.7	100	2572.8+x	(19 <sup>-</sup> )	E2	
3315.5+x	(18,20)	327.8	100	2987.7+x	(17,19)		
		636.7	80 <sup>b</sup> 20	2678.4+x	(16,18)		
3318.1+x	(20 <sup>+</sup> )	631.2	100	2686.9+x	(18 <sup>+</sup> )		
3401.0+x	(21 <sup>-</sup> )	363.5	20 <sup>b</sup>	3037.5+x	(20 <sup>-</sup> )	M1+E2	
		710.2	100 40	2690.7+x	(19 <sup>-</sup> )	E2	
3545.3	(21 <sup>+</sup> )	600.8 <sup>@</sup>	100	2944.5	(19 <sup>+</sup> )	E2	
3629.2+x	(22 <sup>-</sup> )	350.3	35.8	3277.5+x	(21 <sup>-</sup> )		
		760.9	100	2869.7+x	(20 <sup>-</sup> )	E2	
3654.3+x	(21 <sup>+</sup> )	658.1	100	2869.7+x	(20 <sup>-</sup> )		
3655.3+x	(19,21)	339.8	83.3 <sup>b</sup>	3315.5+x	(18,20)		
		667.4	100 25	2987.7+x	(17,19)		
3765.0+x	(22 <sup>-</sup> )	364.0	12.5 <sup>b</sup>	3401.0+x	(21 <sup>-</sup> )		
		727.5	100 38	3037.5+x	(20 <sup>-</sup> )	E2	
4025.6+x	(20,22)	370.3	90.9 <sup>b</sup>	3655.3+x	(19,21)		
		710.4	100 27	3315.5+x	(18,20)		
4040.8+x	(23 <sup>-</sup> )	763.3	100	3277.5+x	(21 <sup>-</sup> )	E2	
4146.0+x	(23 <sup>-</sup> )	381.0	27 <sup>b</sup>	3765.0+x	(22 <sup>-</sup> )		
		745.8	100 22	3401.0+x	(21 <sup>-</sup> )		
4206.9	(23 <sup>+</sup> )	661.6 <sup>@</sup>	100	3545.3	(21 <sup>+</sup> )	E2	
4452.2+x	(24 <sup>-</sup> )	823.0	100	3629.2+x	(22 <sup>-</sup> )		
4533.5+x	(24 <sup>-</sup> )	387.5	34.5 <sup>b</sup>	4146.0+x	(23 <sup>-</sup> )		
		768.0	100 31	3765.0+x	(22 <sup>-</sup> )		
4861.3+x	(25 <sup>-</sup> )	820.5	100	4040.8+x	(23 <sup>-</sup> )		
4932.1	(25 <sup>+</sup> )	725.2 <sup>@</sup>	100	4206.9	(23 <sup>+</sup> )	E2	
5321.3+x	(25 <sup>-</sup> )	787.8	100	4533.5+x	(24 <sup>-</sup> )		
5322.6+x	(26 <sup>-</sup> )	870.4	100	4452.2+x	(24 <sup>-</sup> )		
5715.8	(27 <sup>+</sup> )	783.7 <sup>@</sup>	100	4932.1	(25 <sup>+</sup> )		
5729.3+x	(27 <sup>-</sup> )	868.0	100	4861.3+x	(25 <sup>-</sup> )		
6127.7+x	(26 <sup>-</sup> )	806.4	100	5321.3+x	(25 <sup>-</sup> )		
6221.6+x	(28 <sup>-</sup> )	899.0	100	5322.6+x	(26 <sup>-</sup> )		

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**Adopted Levels, Gammas (continued)** $\gamma(^{176}\text{Re})$  (continued)

<u><math>E_i(\text{level})</math></u>	<u><math>J_i^\pi</math></u>	<u><math>E_\gamma^\dagger</math></u>	<u><math>I_\gamma^\dagger</math></u>	<u><math>E_f</math></u>	<u><math>J_f^\pi</math></u>
6555.9	(29 <sup>+</sup> )	840.1 <sup>@</sup>	100	5715.8	(27 <sup>+</sup> )
6959.7+x	(27 <sup>-</sup> )	832.0 <sup>g</sup>	100	6127.7+x	(26 <sup>-</sup> )
7822.7+x	(28 <sup>-</sup> )	863.0 <sup>g</sup>	100	6959.7+x	(27 <sup>-</sup> )

<sup>†</sup> From  $^{165}\text{Ho}(^{16}\text{O},5n\gamma)$  (1999Ca08), unless otherwise specified.

<sup>‡</sup> Transition from the unfavored, ( $\alpha=0$ ), into the favored, ( $\alpha=1$ ), sequence in band D, configuration:  $\pi(1/2[541])\otimes\nu 1/2[521]$ .

<sup>#</sup> Transitions in unfavored, ( $\alpha=0$ ), sequence in band D, configuration:  $\pi(1/2[541])\otimes\nu 1/2[521]$ .

<sup>@</sup> Transitions in favored, ( $\alpha=1$ ), sequence in band D, configuration:  $\pi(1/2[541])\otimes\nu 1/2[521]$ .

<sup>&</sup> Shown in the decay scheme, but not in the table (1999Ca08).

<sup>a</sup> Transition depopulating band A, configuration:  $\pi 9/2[514]\otimes\nu 7/2[633]$ .

<sup>b</sup> From Branching ratio in ( $^{16}\text{O},5n\gamma$ ).

<sup>c</sup> Assigned by evaluator based on DCO ratio in  $^{165}\text{Ho}(^{16}\text{O},5n\gamma)$ , except otherwise noted.

<sup>d</sup> In  $^{165}\text{Ho}(^{16}\text{O},5n\gamma)$  (1999Ca08) presented as M1(E2).

<sup>e</sup> From ( $^{16}\text{O},5n\gamma$ ).

<sup>f</sup> Multiply placed with intensity suitably divided.

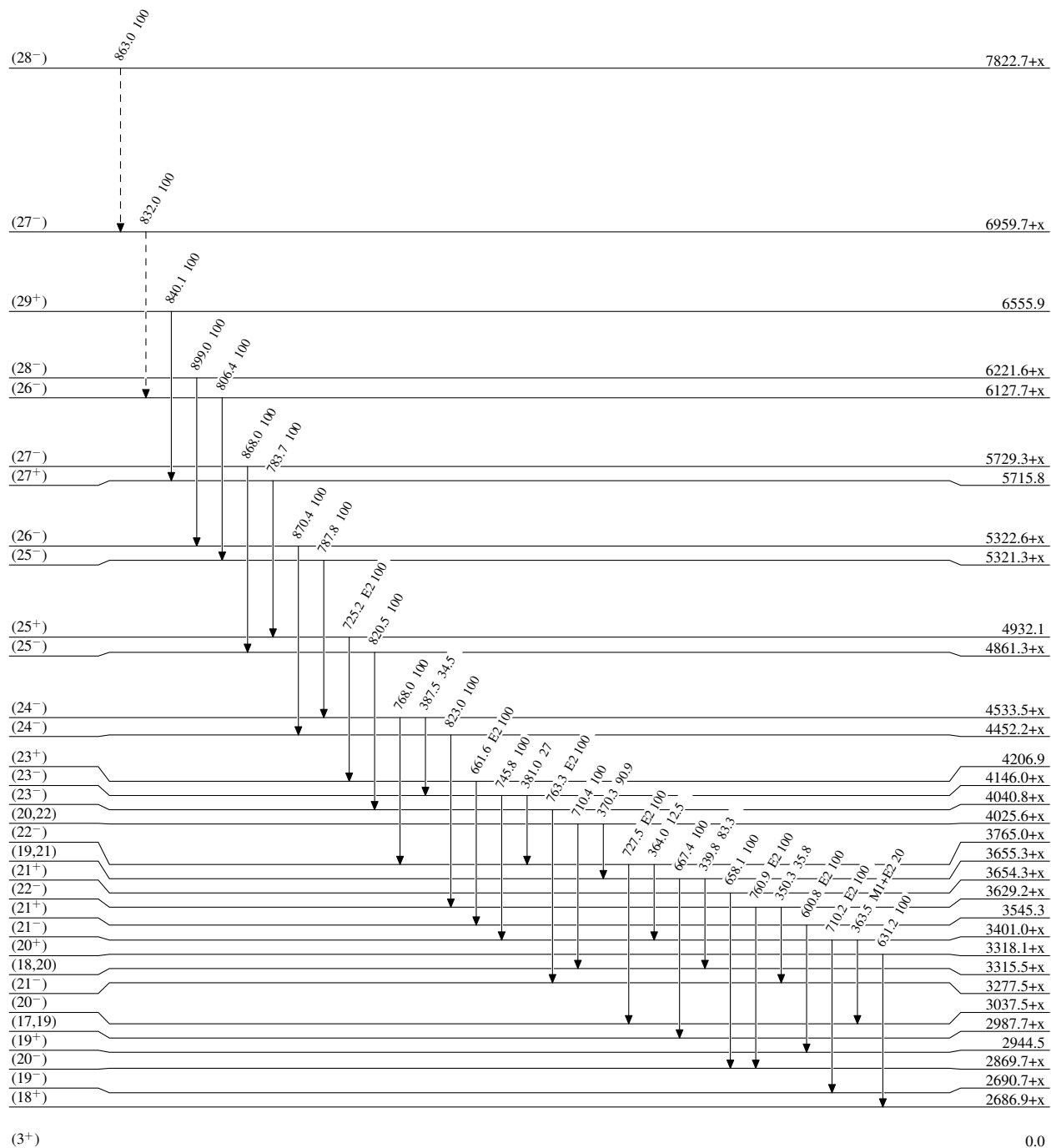
<sup>g</sup> Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----▶  $\gamma$  Decay (Uncertain)

5.3 min 3



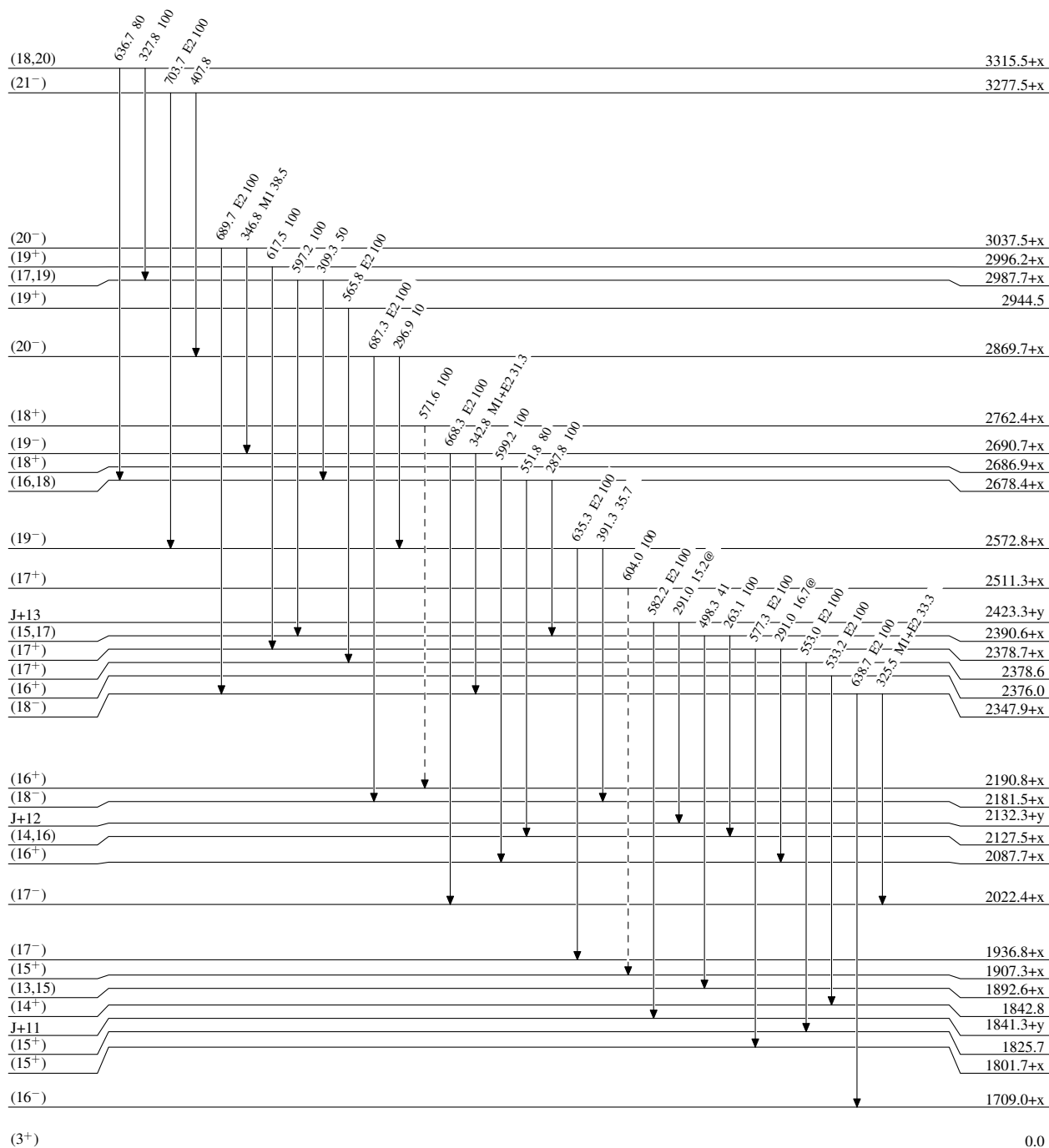
**Adopted Levels, Gammas**

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level  
 @ Multiply placed: intensity suitably divided

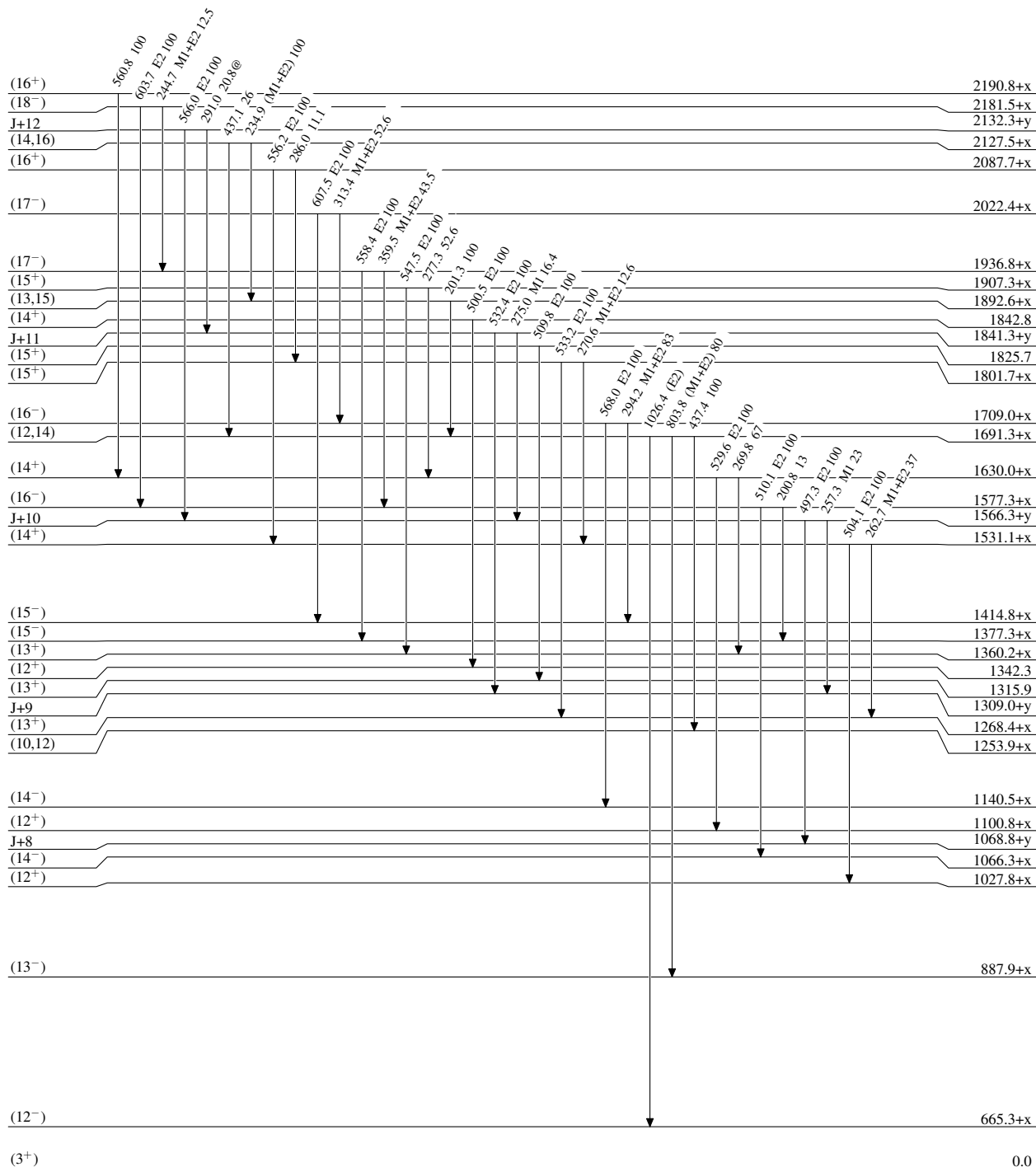
-----▶  $\gamma$  Decay (Uncertain)



**Adopted Levels, Gammas**

**Level Scheme (continued)**

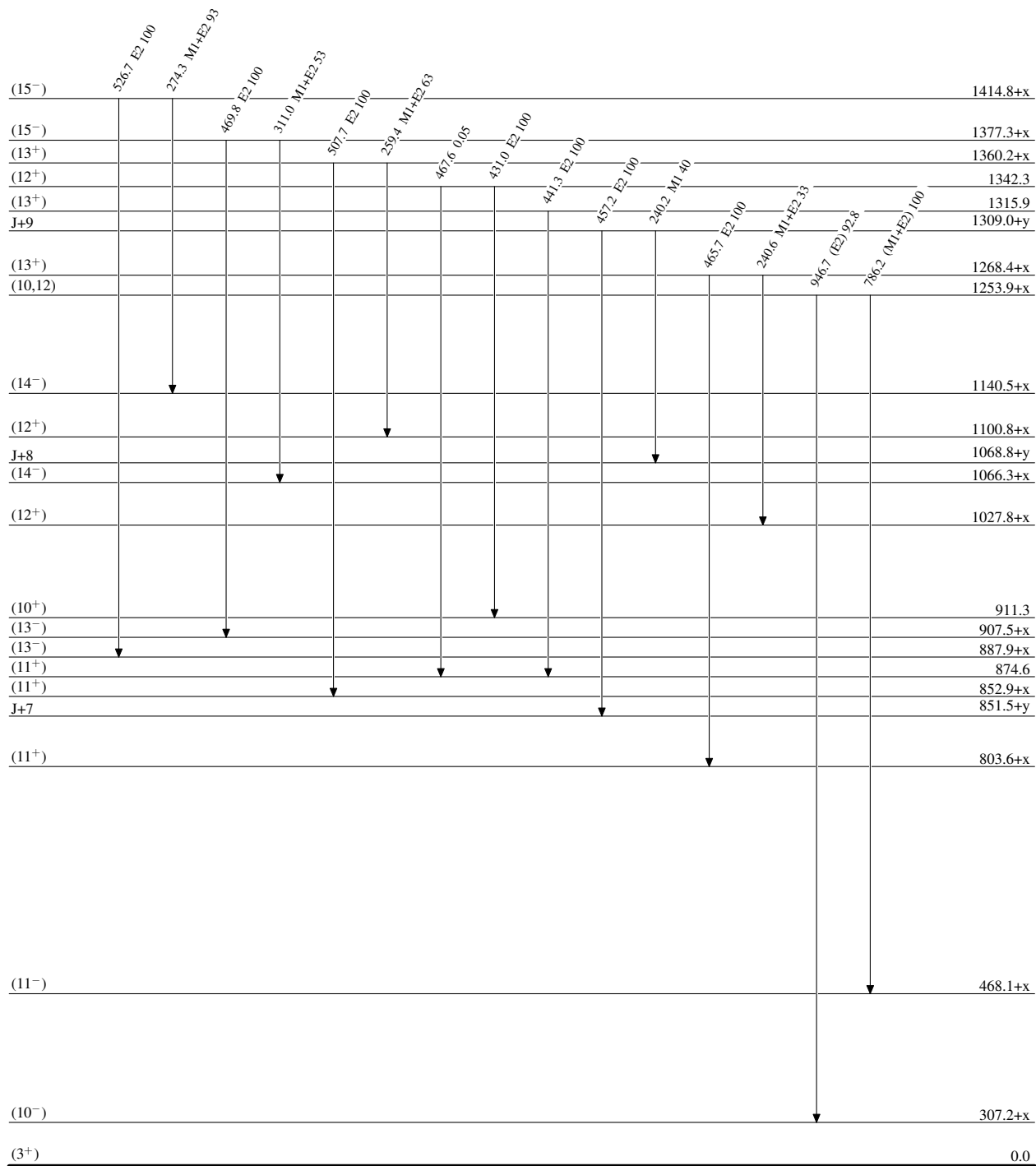
Intensities: Relative photon branching from each level  
@ Multiplied: intensity suitably divided



**Adopted Levels, Gammas**

Level Scheme (continued)

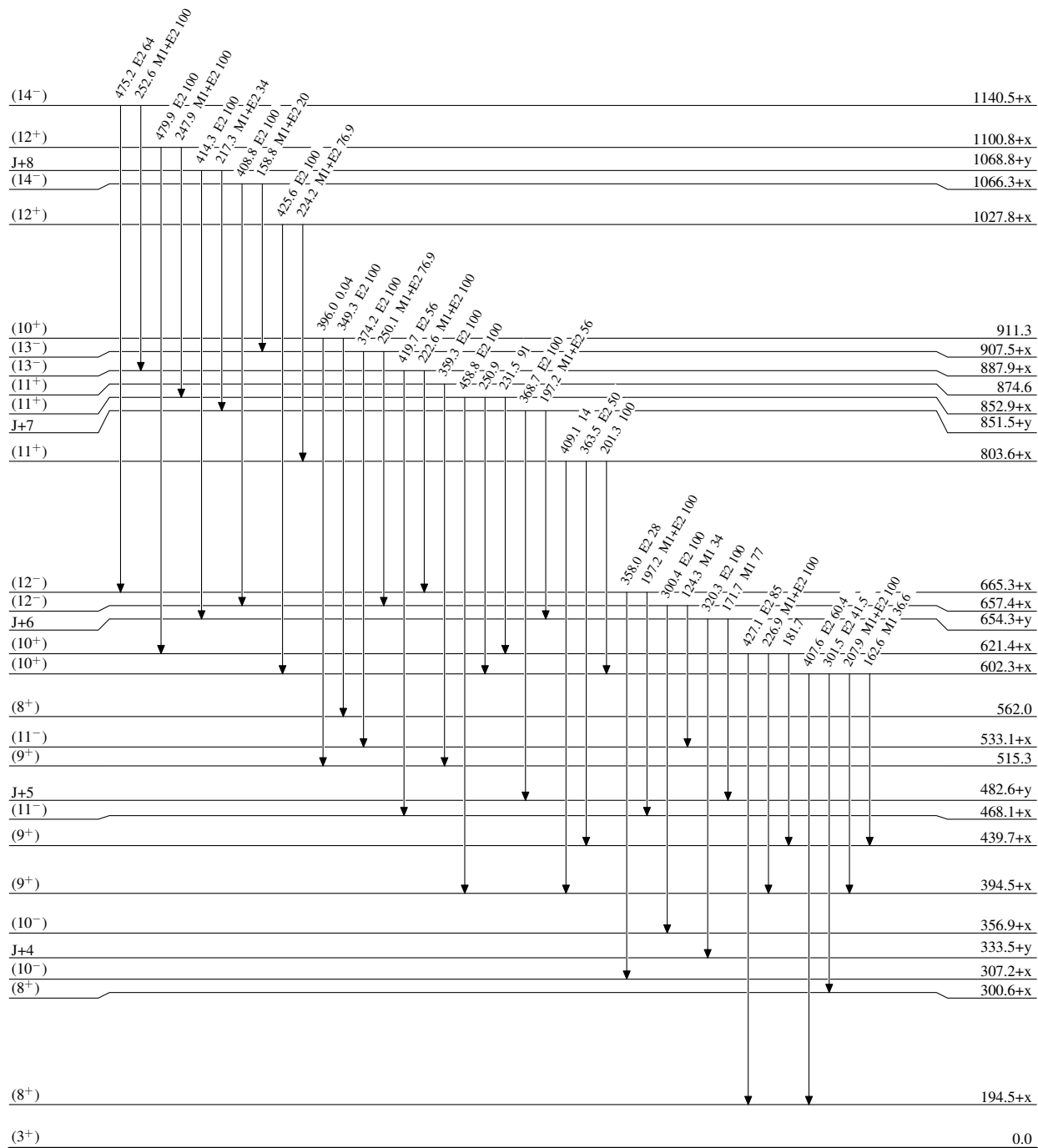
Intensities: Relative photon branching from each level  
 @ Multiply placed: intensity suitably divided



**Adopted Levels, Gammas**

**Level Scheme (continued)**

Intensities: Relative photon branching from each level  
 @ Multiplied: intensity suitably divided

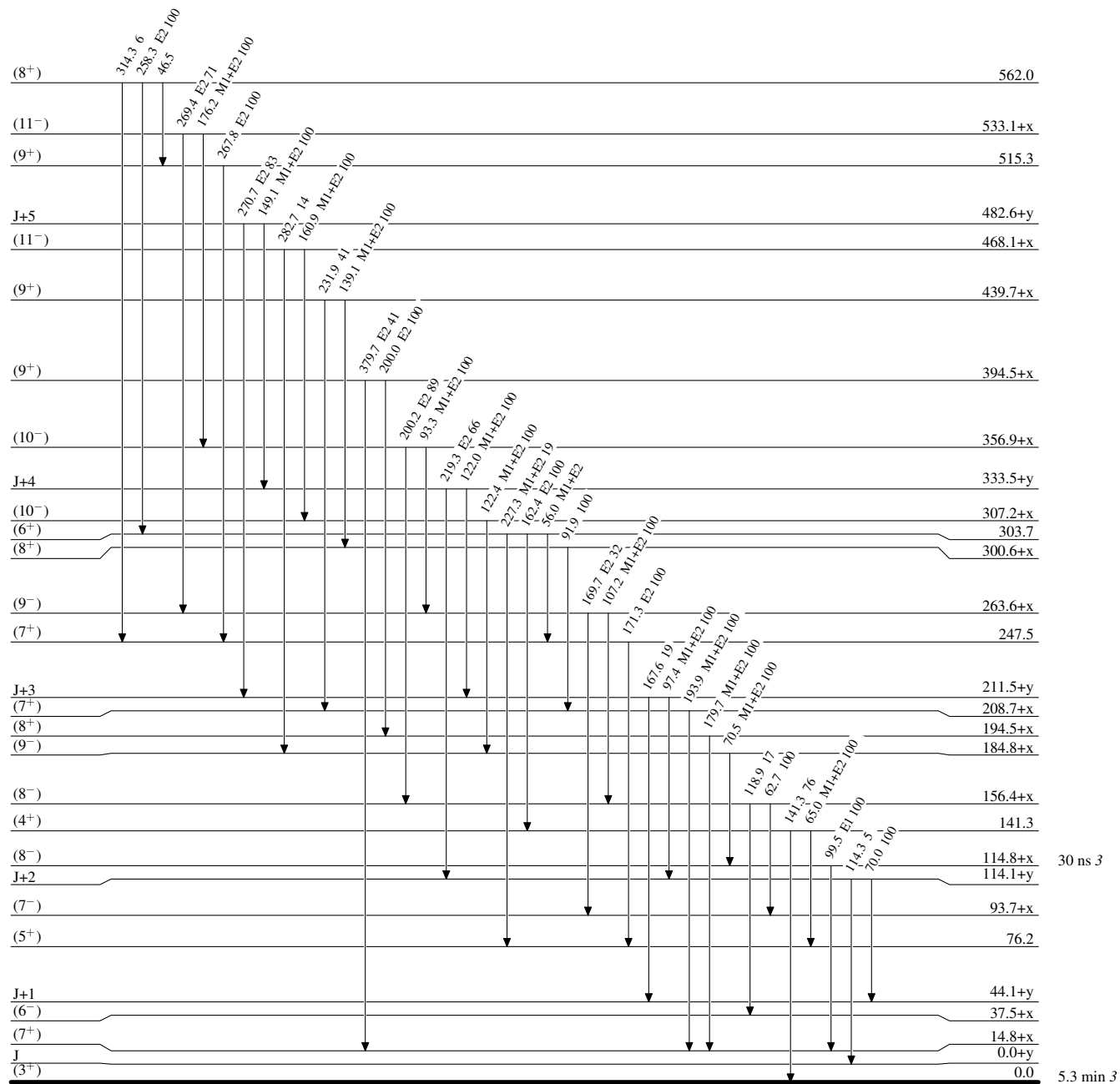


5.3 min 3

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

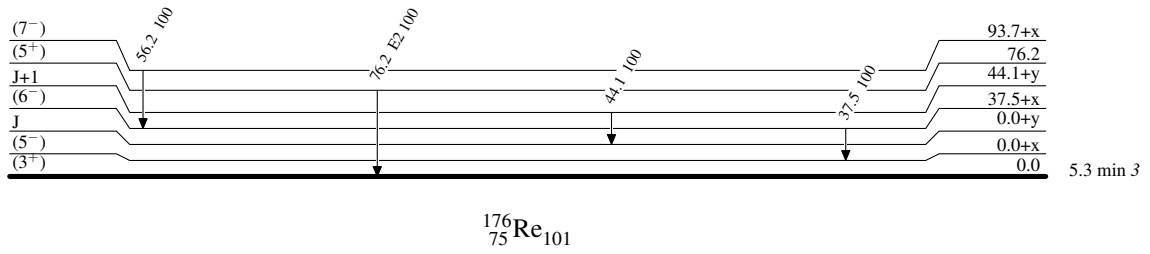
Intensities: Relative photon branching from each level

@ Multiply placed: intensity suitably divided

 $^{176}_{75}\text{Re}_{101}$

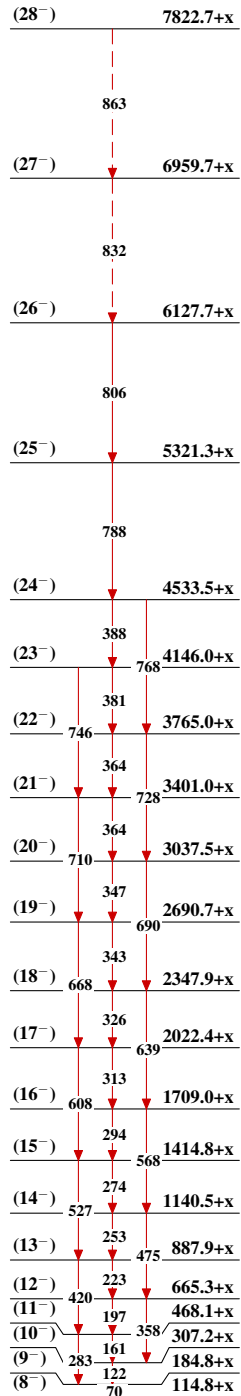
**Adopted Levels, Gammas****Level Scheme (continued)**

Intensities: Relative photon branching from each level  
@ Multiply placed: intensity suitably divided

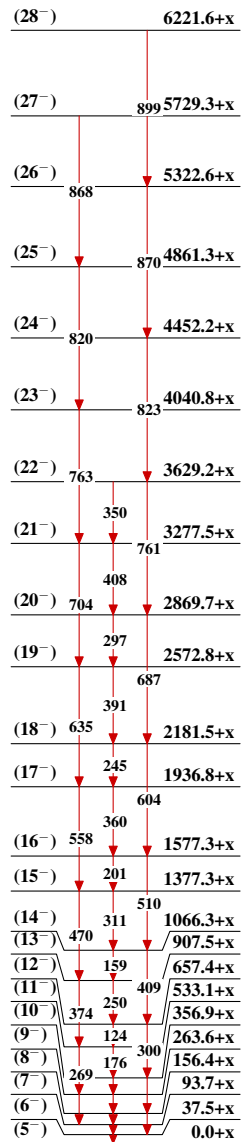


## Adopted Levels, Gammas

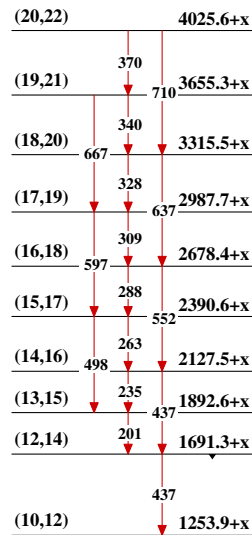
Band(A): Band A: configuration:  
 $\pi 9/2[514] \otimes \nu 7/2[633]$



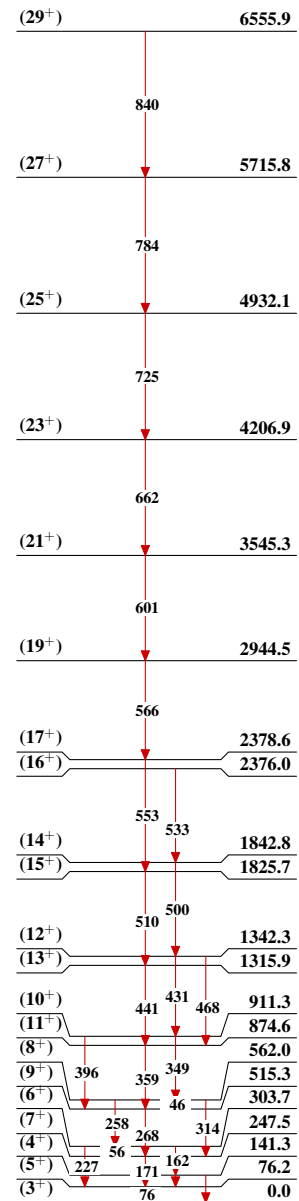
Band(B): Band B: configuration:  
 $\pi(1/2[541]) \otimes \nu(7/2[633])$



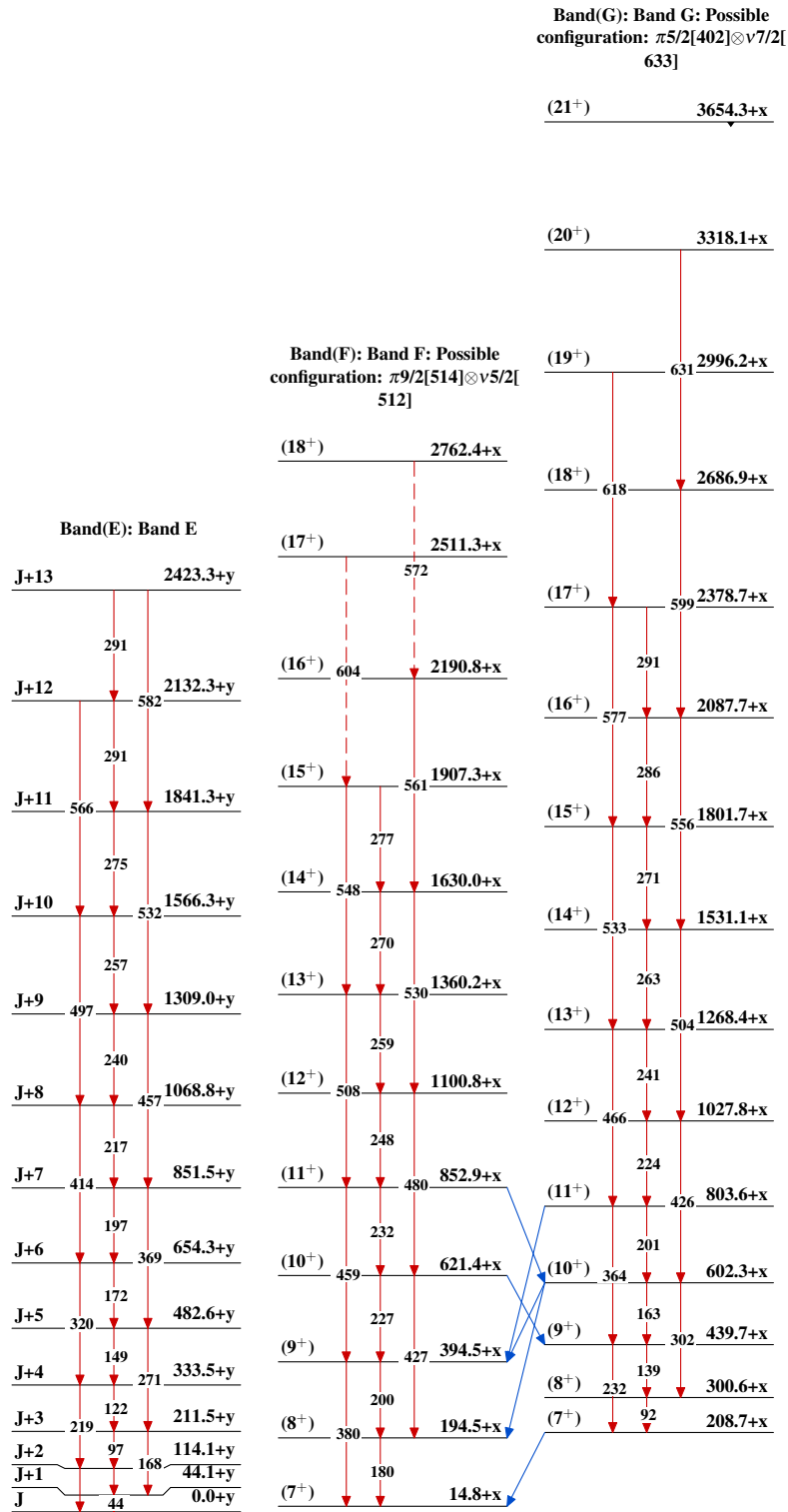
Band(C): Band C



Band(D): Band D: configuration:  
 $\pi(1/2[541]) \otimes \nu 1/2[521]$  doubly decoupled band



**Adopted Levels, Gammas (continued)**



$^{176}_{75}\text{Re}_{101}$