

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	V. S. Shirley	NDS 75,377 (1995)	1-Oct-1993

$Q(\beta^-) = -6.12 \times 10^3$ 4; $S(n) = 1.010 \times 10^4$ 5; $S(p) = 1.75 \times 10^3$ 4; $Q(\alpha) = 4.31 \times 10^3$ 4 [2012Wa38](#)

Note: Current evaluation has used the following Q record -6270 SY10140 SY2040 SY4230 syst [1993Au05](#).

Identification: excitation functions for $^{165}\text{Ho}(^{16}\text{O}, \text{xn})$, presence of 457.7γ from ^{173}W ε decay ([1986Sz05](#)); $\text{Ti}(p, \text{X})$ reactions ([1973BeWB](#)).

 ^{173}Re LevelsCross Reference (XREF) Flags

A ^{177}Ir α decay
B (HI, xn γ)

E(level) [†]	J^π [‡]	$T_{1/2}$	XREF	Comments
0.0 [#]	(5/2 ⁻)	1.98 min 26	AB	$\% \varepsilon + \% \beta^+ = 100$ $\% \alpha \approx 2.5 \times 10^{-5}$ from extrapolation of $Q(\alpha)$ vs. $T_{1/2}(\alpha)$ for $^{163,165}\text{Re}$. J^π : favored α decay from ^{177}Ir ($J^\pi = (5/2^-)$). 5/2 ⁻ 1/2[541] Nilsson state assigned, as for ^{175}Re and ^{177}Re . $T_{1/2}$: from 1986Sz05 . Other value: 2 min (1973BeWB).
87.1 [#] 3	(9/2 ⁻)		B	
118.1 [@] 12	(5/2 ⁺)		B	
231.5 [@] 11	(7/2 ⁺)		B	
284.2 ^{&} 6			B	
293.8 [#] 4	(13/2 ⁻)		B	
364.4 [@] 11	(9/2 ⁺)		B	
476.9 ^{&} 5			B	
514.7 [@] 11	(11/2 ⁺)		B	
614.7 [#] 5	(17/2 ⁻)		B	
655.1 ^a 6			B	
676.6 [@] 11	(13/2 ⁺)		B	
746.0 ^{&} 6			B	
853.2 [@] 11	(15/2 ⁺)		B	
951.1 ^a 7			B	
1030.4 [#] 6	(21/2 ⁻)		B	
1040.1 [@] 11	(17/2 ⁺)		B	
1067.0 ^{&} 9			B	
1242.9 [@] 11	(19/2 ⁺)		B	
1255.2 ^a 7	(17/2 ⁺)		B	
1441.2 ^{&} 12			B	
1454.2 [@] 11	(21/2 ⁺)		B	
1518.2 [#] 7	(25/2 ⁻)		B	
1540.7 ^a 10	(21/2 ⁺)		B	
1685.0 [@] 11	(23/2 ⁺)		B	
1869.7 ^{&} 13			B	
1884.8 ^a 11	(25/2 ⁺)		B	
1932.1 [@] 11	(25/2 ⁺)		B	

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Adopted Levels, Gammas (continued) ^{173}Re Levels (continued)

E(level) [†]	J ^π [‡]	XREF	E(level) [†]	J ^π [‡]	XREF	E(level) [†]	J ^π [‡]	XREF
2055.9 [#] 7	(29/2 ⁻)	B	4524.8 [#] 13	(45/2 ⁻)	B	1554.8+x ^b 4	(23/2 ⁻)	B
2179.0 [@] 11	(27/2 ⁺)	B	4530.5 ^a 13	(45/2 ⁺)	B	1815.2+x ^b 4	(25/2 ⁻)	B
2308.2 ^a 11	(29/2 ⁺)	B	5212 ^a 2	(49/2 ⁺)	B	2077.2+x ^b 5	(27/2 ⁻)	B
2353 ^{&} 2		B	5261 [#] 2	(49/2 ⁻)	B	2349.6+x ^b 5	(29/2 ⁻)	B
2446.9 [@] 11	(29/2 ⁺)	B	5946 ^a 2	(53/2 ⁺)	B	2624.6+x ^b 5	(31/2 ⁻)	B
2624.1 [#] 8	(33/2 ⁻)	B	6055 [#] 2	(53/2 ⁻)	B	2891.1+x ^b 5	(33/2 ⁻)	B
2722.4 [@] 12	(31/2 ⁺)	B	6730 ^a 2	(57/2 ⁺)	B	3131.9+x ^b 6	(35/2 ⁻)	B
2786.7 ^a 12	(33/2 ⁺)	B	6905 [#] 2	(57/2 ⁻)	B	3381.5+x ^b 7	(37/2 ⁻)	B
3011.6 [@] 12	(33/2 ⁺)	B	7566 ^a 2	(61/2 ⁺)	B	3659.5+x ^b 8	(39/2 ⁻)	B
3216.7 [#] 8	(37/2 ⁻)	B	0.0+x ^b	(9/2 ⁻)	B	3958.0+x ^b 8	(41/2 ⁻)	B
3309.8 [@] 13	(35/2 ⁺)	B	160.3+x ^b 3	(11/2 ⁻)	B	4285.0+x ^b 9	(43/2 ⁻)	B
3317.4 ^a 12	(37/2 ⁺)	B	360.3+x ^b 3	(13/2 ⁻)	B	4628.0+x ^b 9	(45/2 ⁻)	B
3614 [@] 2	(37/2 ⁺)	B	575.4+x ^b 3	(15/2 ⁻)	B	4995+x ^b 1	(47/2 ⁻)	B
3845.4 [#] 11	(41/2 ⁻)	B	813.2+x ^b 3	(17/2 ⁻)	B	5375+x ^b 1	(49/2 ⁻)	B
3898.6 ^a 12	(41/2 ⁺)	B	1052.3+x ^b 4	(19/2 ⁻)	B	5772+x ^b 1	(51/2 ⁻)	B
3928 [@] 2	(39/2 ⁺)	B	1304.9+x ^b 4	(21/2 ⁻)	B			

[†] From least-squares fit of levels and gammas in (HI,xny).[‡] From γ -ray multiplicities, coincidence data, and analysis of rotational structure in (HI,xny).[#] Band(A): Proton h_{9/2} 1/2[541] band.[@] Band(B): 5/2(402) band; $\alpha=16.9$, $\beta=-68.4$ (J=5/2, 7/2, 9/2, 11/2 levels).[&] Band(C): Decoupled h_{9/2} band, unfavored signature partner (tentative assignment).^a Band(D): Mixed i_{13/2} 1/2[660] band.^b Band(E): h_{11/2} proton 9/2[514] band; x $\leq$ 118 keV expected from position of this band in ^{171}Re and ^{175}Re . $\gamma(^{173}\text{Re})$ All γ -ray properties are from (HI,xny).

E _i (level)	J ^π _i	E _γ	I _γ [†]	E _f	J ^π _f	Mult.	α [‡]
87.1	(9/2 ⁻)	87.0 3	100	0.0	(5/2 ⁻)		
231.5	(7/2 ⁺)	113.3 3	100	118.1	(5/2 ⁺)	(M1+E2)	3.1 6
284.2		284.5 7	100	0.0	(5/2 ⁻)		
293.8	(13/2 ⁻)	206.7 3	100	87.1	(9/2 ⁻)	E2	0.290
364.4	(9/2 ⁺)	132.7 3	100 12	231.5	(7/2 ⁺)	M1+E2	1.9 5
		247.0 [#] 7	24 12	118.1	(5/2 ⁺)	E2	0.162
476.9		193.0 7		284.2			
		389.6 7		87.1	(9/2 ⁻)		
514.7	(11/2 ⁺)	150.3 3	100 11	364.4	(9/2 ⁺)	M1+E2	1.3 4
		283.5 7	25 9	231.5	(7/2 ⁺)	(E2)	0.105
614.7	(17/2 ⁻)	320.9 3	100	293.8	(13/2 ⁻)	E2	0.0729
655.1		178.2 3	100	476.9			
676.6	(13/2 ⁺)	161.7 3	100 13	514.7	(11/2 ⁺)	M1+E2	1.0 3
		312.1 3	71 13	364.4	(9/2 ⁺)	(E2)	0.079
746.0		269.2 7		476.9			
		452.2 7		293.8	(13/2 ⁻)		
853.2	(15/2 ⁺)	176.5 3	100 13	676.6	(13/2 ⁺)	M1+E2	0.8 3

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Adopted Levels, Gammas (continued)

$\gamma(^{173}\text{Re})$ (continued)							
$E_i(\text{level})$	J_i^π	E_γ	$I_\gamma^\dagger$	E_f	J_f^π	Mult.	$\alpha^\ddagger$
853.2	(15/2 ⁺)	338.7 3	73 15	514.7	(11/2 ⁺)		
951.1		205.0 7		746.0			
		296.0 7		655.1			
1030.4	(21/2 ⁻)	415.7 3	100	614.7	(17/2 ⁻)	E2	0.0354
1040.1	(17/2 ⁺)	186.7 3	98 13	853.2	(15/2 ⁺)		
		363.6 3	100 21	676.6	(13/2 ⁺)		
1067.0		321.0 7	100	746.0			
1242.9	(19/2 ⁺)	202.6 3	72 12	1040.1	(17/2 ⁺)	M1+E2	0.52 21
		389.8 3	100 20	853.2	(15/2 ⁺)		
1255.2	(17/2 ⁺)	304.1 7		951.1			
		640.5 7		614.7	(17/2 ⁻)		
1441.2		374.2 7	100	1067.0			
1454.2	(21/2 ⁺)	211.1 3	66 14	1242.9	(19/2 ⁺)	M1+E2	0.46 19
		414.1 3	100 20	1040.1	(17/2 ⁺)		
1518.2	(25/2 ⁻)	487.8 3	100	1030.4	(21/2 ⁻)	E2	0.0234
1540.7	(21/2 ⁺)	285.5 7		1255.2	(17/2 ⁺)		
		298.0 [#] 7		1242.9	(19/2 ⁺)		
		500.4 7		1040.1	(17/2 ⁺)		
1685.0	(23/2 ⁺)	230.7 3	54 12	1454.2	(21/2 ⁺)	M1+E2	0.35 15
		442.3 3	100 20	1242.9	(19/2 ⁺)		
1869.7		428.5 7	100	1441.2			
1884.8	(25/2 ⁺)	199.6 7	23 8	1685.0	(23/2 ⁺)		
		344.2 7	65 38	1540.7	(21/2 ⁺)		
		430.6 3	100 19	1454.2	(21/2 ⁺)	E2	0.0322
1932.1	(25/2 ⁺)	247.0 [#] 7		1685.0	(23/2 ⁺)		
		477.4 7		1454.2	(21/2 ⁺)		
2055.9	(29/2 ⁻)	537.7 3	100	1518.2	(25/2 ⁻)	E2	0.0185
2179.0	(27/2 ⁺)	247.0 [#] 7		1932.1	(25/2 ⁺)		
		494.1 3		1685.0	(23/2 ⁺)		
2308.2	(29/2 ⁺)	423.4 3	100	1884.8	(25/2 ⁺)	E2	0.0337
2353		483.0 7	100	1869.7			
2446.9	(29/2 ⁺)	268.0 3	100 23	2179.0	(27/2 ⁺)		
		514.7 3	91 23	1932.1	(25/2 ⁺)		
2624.1	(33/2 ⁻)	568.2 3	100	2055.9	(29/2 ⁻)	E2	0.0162
2722.4	(31/2 ⁺)	275.4 7	68 21	2446.9	(29/2 ⁺)		
		543.4 7	100 26	2179.0	(27/2 ⁺)		
2786.7	(33/2 ⁺)	478.5 3	100	2308.2	(29/2 ⁺)		
3011.6	(33/2 ⁺)	289.0 7	39 17	2722.4	(31/2 ⁺)		
		564.7 7	100 28	2446.9	(29/2 ⁺)		
3216.7	(37/2 ⁻)	592.6 3	100	2624.1	(33/2 ⁻)	E2	0.0147
3309.8	(35/2 ⁺)	298.0 [#] 7		3011.6	(33/2 ⁺)		
		587.6 7		2722.4	(31/2 ⁺)		
3317.4	(37/2 ⁺)	530.7 3	100	2786.7	(33/2 ⁺)	(E2)	0.0191
3614	(37/2 ⁺)	602.0 7	100	3011.6	(33/2 ⁺)		
3845.4	(41/2 ⁻)	628.7 7	100	3216.7	(37/2 ⁻)	E2	0.0128
3898.6	(41/2 ⁺)	581.2 3	100	3317.4	(37/2 ⁺)	E2	0.0154
3928	(39/2 ⁺)	618.0 7	100	3309.8	(35/2 ⁺)		
4524.8	(45/2 ⁻)	679.4 7	100	3845.4	(41/2 ⁻)		
4530.5	(45/2 ⁺)	631.9 3	100	3898.6	(41/2 ⁺)	E2	0.0127
5212	(49/2 ⁺)	681.6 7	100	4530.5	(45/2 ⁺)		
5261	(49/2 ⁻)	736.4 7	100	4524.8	(45/2 ⁻)		
5946	(53/2 ⁺)	733.4 7	100	5212	(49/2 ⁺)		
6055	(53/2 ⁻)	793.4 7	100	5261	(49/2 ⁻)		
6730	(57/2 ⁺)	785.0 7	100	5946	(53/2 ⁺)		

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Adopted Levels, Gammas (continued) $\gamma(^{173}\text{Re})$ (continued)

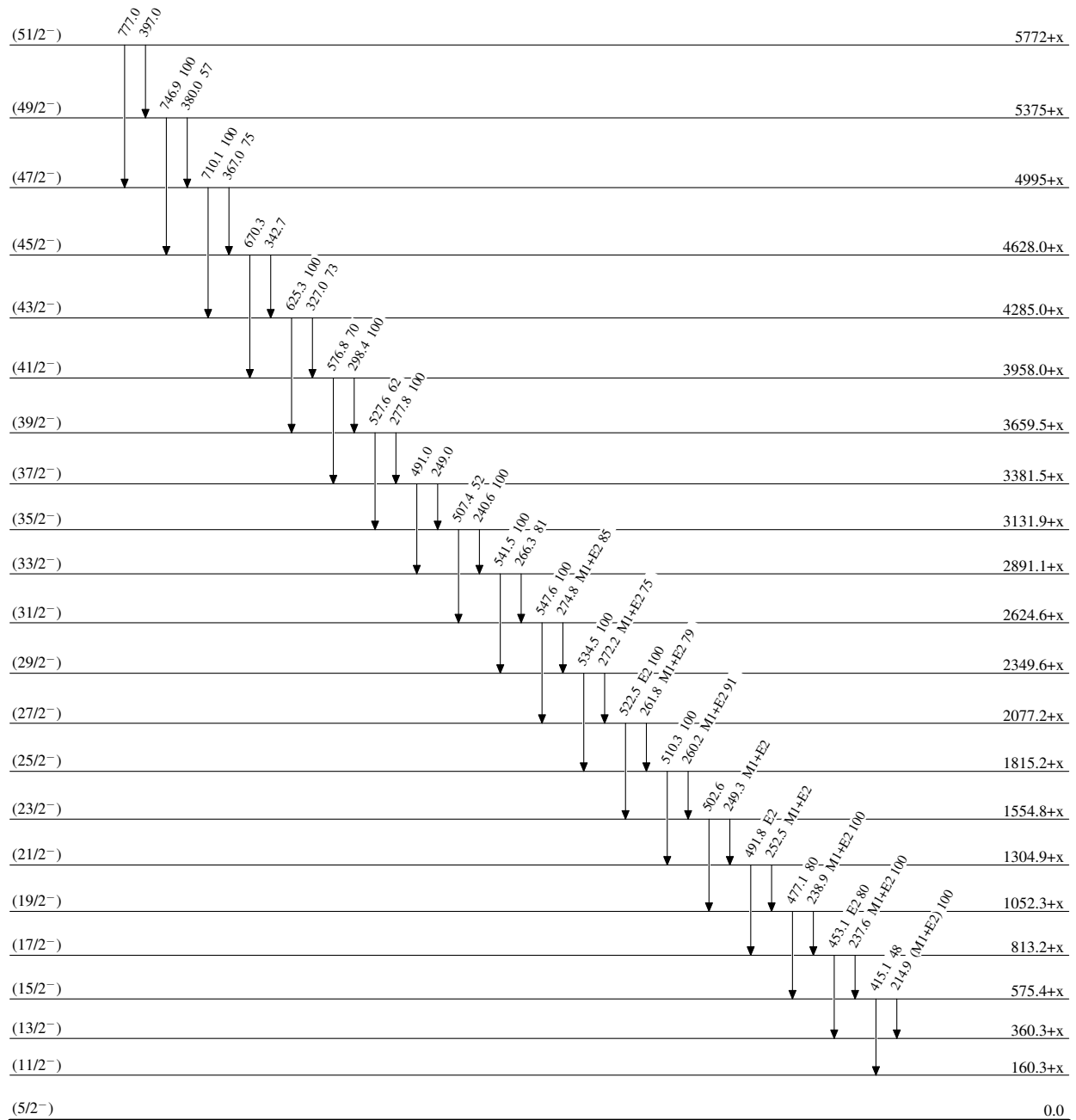
$E_i(\text{level})$	J_i^π	E_γ	$I_\gamma^\dagger$	E_f	J_f^π	Mult.	$\alpha^\ddagger$
6905	(57/2 ⁻)	850.0 7	100	6055	(53/2 ⁻)		
7566	(61/2 ⁺)	835.0 7	100	6730	(57/2 ⁺)		
160.3+x	(11/2 ⁻)	160.2 3	100	0.0+x	(9/2 ⁻)	M1+E2	1.0 3
360.3+x	(13/2 ⁻)	199.7 3	100 14	160.3+x	(11/2 ⁻)	M1+E2	0.54 21
		360.4 3	34 7	0.0+x	(9/2 ⁻)		
575.4+x	(15/2 ⁻)	214.9 3	100 12	360.3+x	(13/2 ⁻)	(M1+E2)	0.43 18
		415.1 3	48 10	160.3+x	(11/2 ⁻)		
813.2+x	(17/2 ⁻)	237.6 3	100 11	575.4+x	(15/2 ⁻)	M1+E2	0.32 14
		453.1 3	80 18	360.3+x	(13/2 ⁻)	E2	0.0282
1052.3+x	(19/2 ⁻)	238.9 3	100 12	813.2+x	(17/2 ⁻)	M1+E2	0.32 14
		477.1 3	80 24	575.4+x	(15/2 ⁻)		
1304.9+x	(21/2 ⁻)	252.5 3		1052.3+x	(19/2 ⁻)	M1+E2	0.27 12
		491.8 7		813.2+x	(17/2 ⁻)	E2	0.0229
1554.8+x	(23/2 ⁻)	249.3 7		1304.9+x	(21/2 ⁻)	M1+E2	0.28 12
		502.6 3		1052.3+x	(19/2 ⁻)		
1815.2+x	(25/2 ⁻)	260.2 3	91 18	1554.8+x	(23/2 ⁻)	M1+E2	0.25 11
		510.3 3	100 12	1304.9+x	(21/2 ⁻)		
2077.2+x	(27/2 ⁻)	261.8 3	79 18	1815.2+x	(25/2 ⁻)	M1+E2	0.25 11
		522.5 3	100 12	1554.8+x	(23/2 ⁻)	E2	0.0198
2349.6+x	(29/2 ⁻)	272.2 3	75 9	2077.2+x	(27/2 ⁻)	M1+E2	0.22 10
		534.5 3	100 13	1815.2+x	(25/2 ⁻)		
2624.6+x	(31/2 ⁻)	274.8 3	85 12	2349.6+x	(29/2 ⁻)	M1+E2	0.21 10
		547.6 3	100 15	2077.2+x	(27/2 ⁻)		
2891.1+x	(33/2 ⁻)	266.3 7	81 29	2624.6+x	(31/2 ⁻)		
		541.5 3	100 14	2349.6+x	(29/2 ⁻)		
3131.9+x	(35/2 ⁻)	240.6 3	100 14	2891.1+x	(33/2 ⁻)		
		507.4 7	52 10	2624.6+x	(31/2 ⁻)		
3381.5+x	(37/2 ⁻)	249.0 7		3131.9+x	(35/2 ⁻)		
		491.0 7		2891.1+x	(33/2 ⁻)		
3659.5+x	(39/2 ⁻)	277.8 7	100 15	3381.5+x	(37/2 ⁻)		
		527.6 7	62 15	3131.9+x	(35/2 ⁻)		
3958.0+x	(41/2 ⁻)	298.4 7	100 20	3659.5+x	(39/2 ⁻)		
		576.8 7	70 20	3381.5+x	(37/2 ⁻)		
4285.0+x	(43/2 ⁻)	327.0 7	73 18	3958.0+x	(41/2 ⁻)		
		625.3 7	100 27	3659.5+x	(39/2 ⁻)		
4628.0+x	(45/2 ⁻)	342.7 7		4285.0+x	(43/2 ⁻)		
		670.3 7		3958.0+x	(41/2 ⁻)		
4995+x	(47/2 ⁻)	367.0 7	75 25	4628.0+x	(45/2 ⁻)		
		710.1 7	100 25	4285.0+x	(43/2 ⁻)		
5375+x	(49/2 ⁻)	380.0 7	57 14	4995+x	(47/2 ⁻)		
		746.9 7	100 29	4628.0+x	(45/2 ⁻)		
5772+x	(51/2 ⁻)	397.0 7		5375+x	(49/2 ⁻)		
		777.0 7		4995+x	(47/2 ⁻)		

[†] Relative photon branching from each level.[‡] For M1+E2 γ 's, α brackets combined range for M1 and E2.

Multiply placed.

Adopted Levels, Gammas**Level Scheme**

Intensities: Relative photon branching from each level

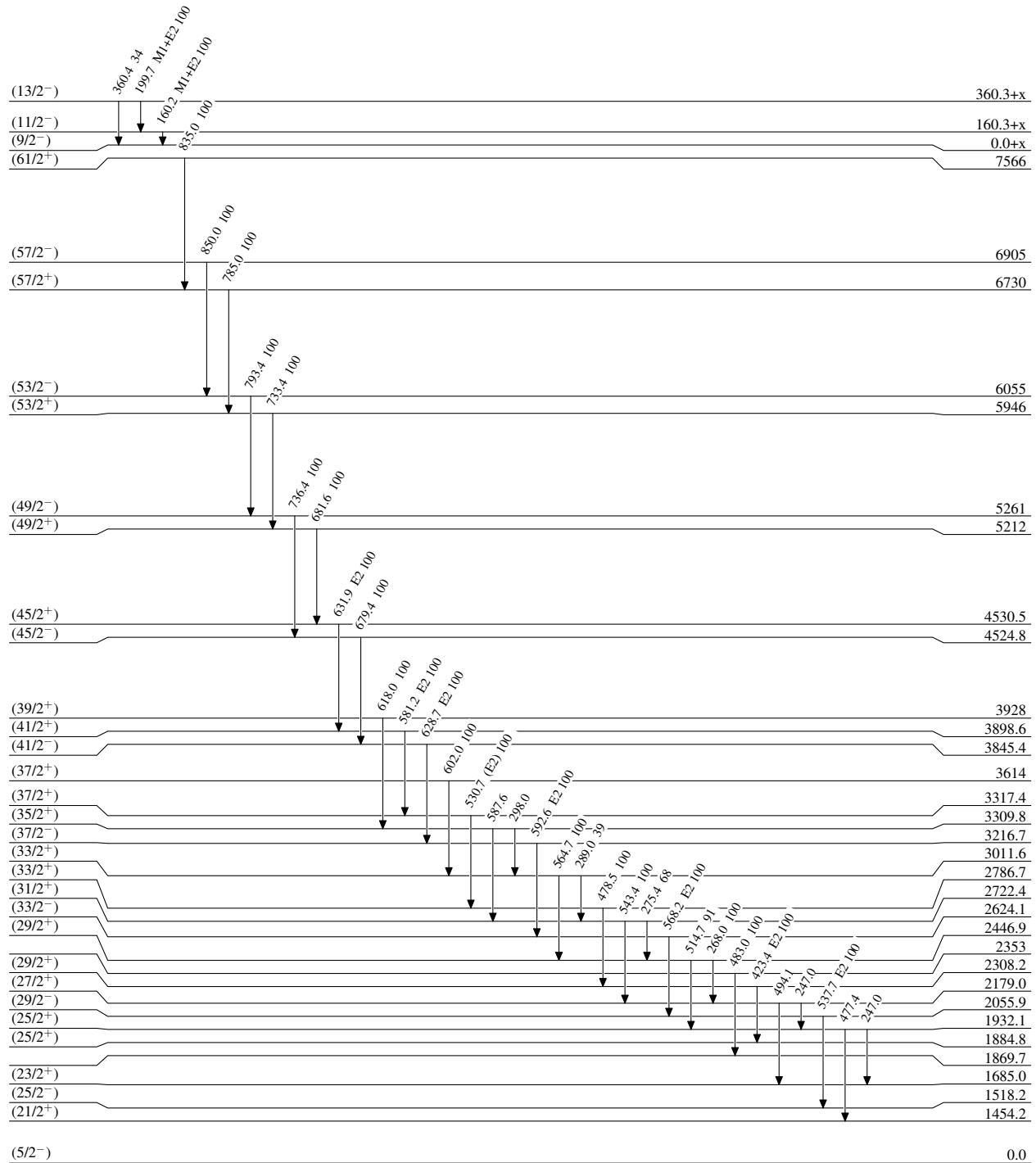


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Adopted Levels, Gammas

Level Scheme (continued)

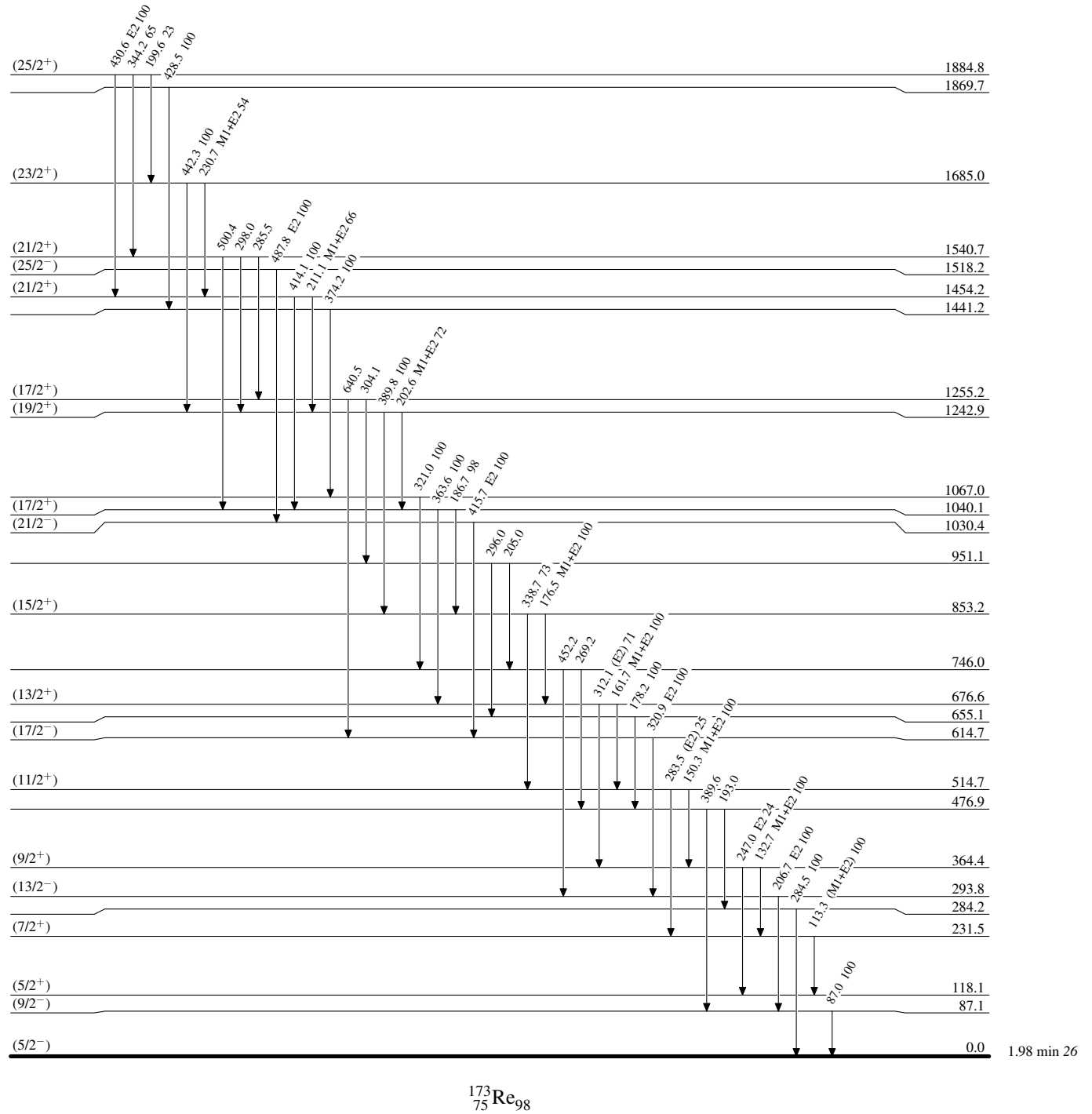
Intensities: Relative photon branching from each level

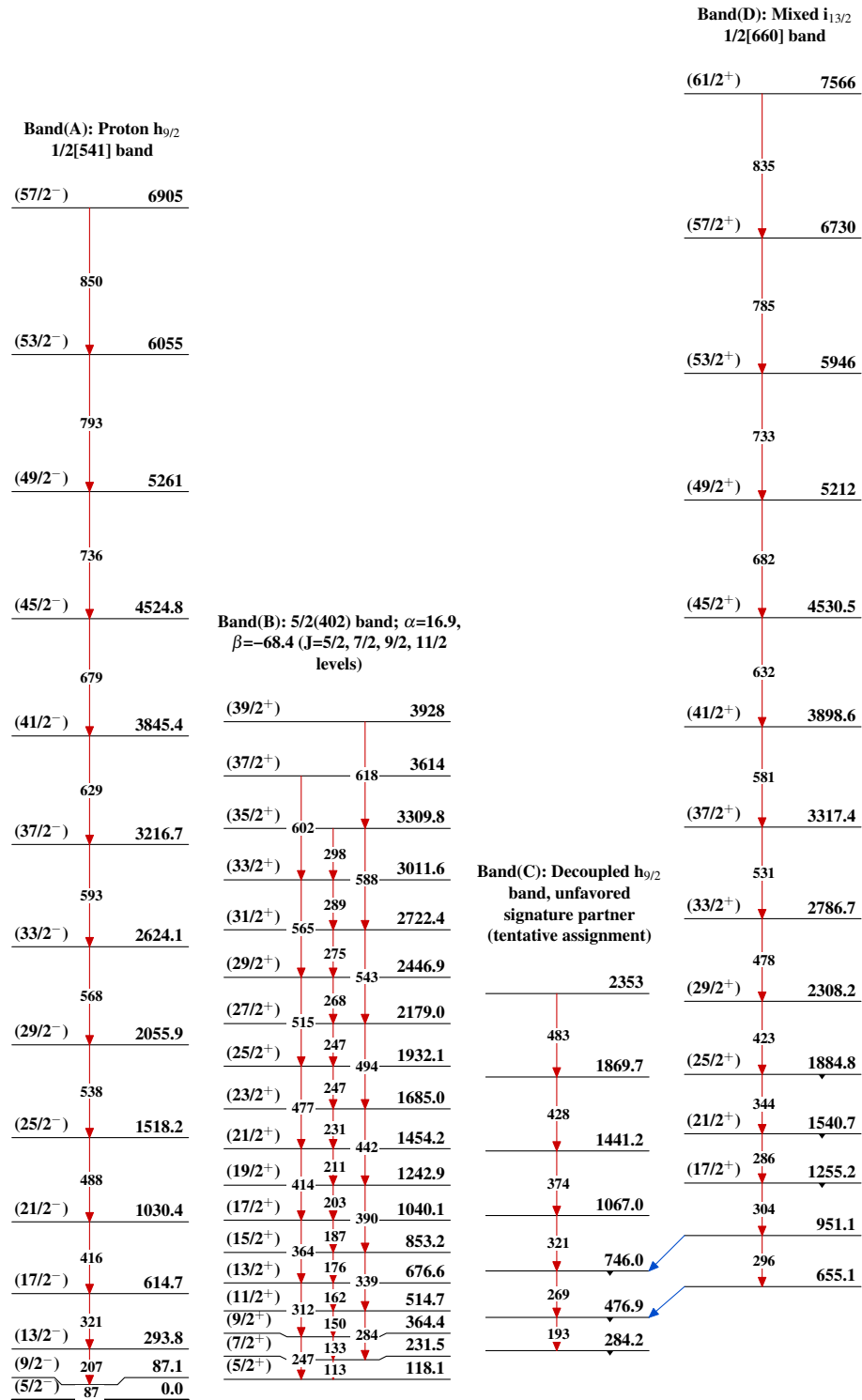


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Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Adopted Levels, Gammas (continued)

Band(E): $h_{11/2}$ proton 9/2[514]
 band; $x \leq 118$ keV expected from
 position of this band in ^{171}Re
 and ^{175}Re

(51/2 ⁻)		5772+x
	397	
(49/2 ⁻)	777	5375+x
	380	
(47/2 ⁻)	747	4995+x
	367	
(45/2 ⁻)	710	4628.0+x
	343	
(43/2 ⁻)	670	4285.0+x
	327	
(41/2 ⁻)	625	3958.0+x
	298	
(39/2 ⁻)	577	3659.5+x
	278	
(37/2 ⁻)	528	3381.5+x
	249	
(35/2 ⁻)	491	3131.9+x
	241	
(33/2 ⁻)	507	2891.1+x
	266	
(31/2 ⁻)	542	2624.6+x
	275	
(29/2 ⁻)	548	2349.6+x
	272	
(27/2 ⁻)	534	2077.2+x
	262	
(25/2 ⁻)	522	1815.2+x
	260	
(23/2 ⁻)	510	1554.8+x
	249	
(21/2 ⁻)	503	1304.9+x
	252	
(19/2 ⁻)	492	1052.3+x
	239	
(17/2 ⁻)	477	813.2+x
	238	
(15/2 ⁻)	453	575.4+x
	215	
(13/2 ⁻)	415	360.3+x
	200	
(11/2 ⁻)	360	160.3+x
(9/2 ⁻)	160	0.0+x