

$^{182}\text{W}(\text{n},\text{n}'\gamma)$ 1975De01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 130, 21 (2015)	15-Jul-2015

1975De01: E=fast reactor spectrum (energy range not specified). The level scheme was derived by the authors by comparison with other experiments. Measured $E\gamma$, $I\gamma$ with a Ge(Li) detector.

1998Be62 (also 2000De59): measured $\gamma(\theta)$, deduced mixing ratios. This work is from the same laboratory as 1975De01.

 ^{182}W Levels

E(level) [†]	J ^π [‡]	Relative population intensity	Comments
0.0 [#]	0 ⁺		
100.09 [#] 9	2 ⁺	72×10 ¹ 23	
329.44 [#] 13	4 ⁺	81 25	
680.49 [#] 16	6 ⁺	15 4	
1135.70 [@] 15	0 ⁺	13.4 15	
1144.4 [#] 4	8 ⁺	1.4 4	
1221.43 ^{&} 9	2 ⁺	30 8	
1257.48 [@] 11	2 ⁺	34.0 15	
1289.16 ^a 13	2 ⁻	44 7	
1331.14 ^{&} 12	3 ⁺	24 4	
1373.86 ^a 17	3 ⁻	20 5	
1442.97 ^{&} 17	4 ⁺	10 2	
1487.7 ^a 4	4 ⁻	12 6	
1510.22 [@] 19	4 ⁺	12 1	
1553.0 2	4 ⁻	9 3	
1621.2 ^a 5	5 ⁻	8 3	
1623.3 ^{&} 3	(5) ⁺	7.3 10	
1660.2 3	5 ⁻	0.9 5	
1756.3 4	6 ⁺	2.5 7	
1765.44 24		4.8 10	J ^π : 3 ⁻ (1975De01).
1768.3 5	(6) ⁻	1.5 5	
1813.4 3			
1833.1 6			
1856.2 3	(2 ⁺)	5.3 13	J ^π : (1,2,3) ⁺ (1975De01).
1856.9 4	1	5.8 14	
1871.2 3	1 ⁻	5.5 10	
1887.87 23		3.7 5	J ^π : (3 ⁻) (1975De01).
1918.6 4		4.7 7	J ^π : (2 ⁻) (1975De01).
1959.31 21	(2 ⁺)	10.5 20	J ^π : 3 ⁺ , (2 ⁺) (1975De01).
1960.6 4	6 ⁻		
1981.8 3		4.5 9	J ^π : (3 ⁺) (1975De01).
2016.6? 10		0.9 3	
2023.2 5	(3 ⁻)	2.0 7	
2057.4 10	1	≤1.8	J ^π : 1 ⁺ (1975De01).
2110.3 8	(2 ⁻ , 3 ⁻)	≤2.0	J ^π : 1 ⁺ (1975De01).
2116.1 6		2.3 5	J ^π : 2 ⁺ (1975De01).
2143.1? 4			
2148.1 6	(3 ⁻)	2.1 4	J ^π : 2 ⁺ (1975De01).
2173.9 5		1.8 4	J ^π : 2 ⁺ , 3 ⁻ (1975De01).
2183.6 5	(2 ⁻ , 3 ⁻)	3.0 15	J ^π : 2 ⁻ (1975De01).
2207.0 8	(3 ⁻)		
2209.2 3	3 ⁻	3.6 7	J ^π : (2 ⁺) (1975De01).
2239.5 10	(3 ⁺)	1.1 3	J ^π : 0 ⁺ (1975De01).

Continued on next page (footnotes at end of table)

 $^{182}\text{W}(\mathbf{n},\mathbf{n}'\gamma)$ **1975De01 (continued)**

 ^{182}W Levels (continued)

<u>E(level)[†]</u>	<u>J^π[‡]</u>	<u>Relative population intensity</u>	<u>Comments</u>
2274.3 7	(3) ⁻	2.3 6	
2283.5 5	1	1.4 5	J ^π : 1 ⁺ (1975De01).

[†] From least-squares fit to E γ data.

[‡] From Adopted Levels.

Band(A): g.s. band.

@ Band(B): K^π=0⁺ β band.

& Band(C): K^π=2⁺ γ band.

^a Band(D): K^π=2⁻ octupole band.

¹⁸²W(n,n'γ) 1975De01 (continued)γ(¹⁸²W)A₂ and A₄ values are from 1998Be62.

E _γ	I _γ [†]	E _i (level)	J _i ^π	E _f	J _f ^π	Mult. [‡]	δ [#]	Comments
67.8 5		1289.16	2 ⁻	1221.43	2 ⁺			
100.0 3	1.04×10 ³ 20	100.09	2 ⁺	0.0	0 ⁺	(Q)		A ₂ =+0.21 6; A ₄ =+0.06 5 Sign of A ₄ should be negative for ΔJ=2, Q transition.
152.4 2	23 5	1373.86	3 ⁻	1221.43	2 ⁺	D(+Q)	-0.03 +4-6	A ₂ =-0.203 9; A ₄ =+0.075 11
156.5 4	10 3	1487.7	4 ⁻	1331.14	3 ⁺	D(+Q)	-0.01 +3-4	A ₂ =-0.203 24; A ₄ =+0.03 3
^x 170.6 8	1.4 4							
178.2 ^d 5	6.4 ^d 20	1553.0	4 ⁻	1373.86	3 ⁻			
178.2 ^d 5	6.4 ^d 20	1621.2	5 ⁻	1442.97	4 ⁺			
221.7 3	4.5 15	1553.0	4 ⁻	1331.14	3 ⁺	D		A ₂ =-0.201 11; A ₄ =-0.030 15
229.20 15	166 16	329.44	4 ⁺	100.09	2 ⁺	Q		A ₂ =+0.288 10; A ₄ =-0.027 9
^x 256.2 3	2.7 8							
264.0 2	1.7 3	1553.0	4 ⁻	1289.16	2 ⁻	Q		A ₂ =+0.28 6; A ₄ =-0.20 10
280.6 3	1.1 4	1768.3	(6) ⁻	1487.7	4 ⁻			
286.3 2	0.70 20	1660.2	5 ⁻	1373.86	3 ⁻			
300.4 3	0.55 20	1960.6	6 ⁻	1660.2	5 ⁻			
351.04 [@] 10	21 3	680.49	6 ⁺	329.44	4 ⁺	Q		A ₂ =+0.328 16; A ₄ =-0.053 16
^x 365.6 2	1.6 4							
434.3 2	1.6 4	1765.44		1331.14	3 ⁺			
449.8 3	0.9 4	1959.31	(2 ⁺)	1510.22	4 ⁺	(Q)		A ₂ =+0.06 3; A ₄ =-0.053 16 Additional information 2.
463.9 4	1.4 4	1144.4	8 ⁺	680.49	6 ⁺	Q		A ₂ =+0.29 4; A ₄ =-0.11 4
470.4 5	1.5 5	2023.2	(3 ⁻)	1553.0	4 ⁻			
524.2 3	1.6 3	1813.4		1289.16	2 ⁻			
544.20 15	3.3 5	1765.44		1221.43	2 ⁺			
556.7 ^d 3	1.0 ^d 3	1887.87		1331.14	3 ⁺			
556.7 ^d 3	1.0 ^d 3	2110.3	(2 ⁻ ,3 ⁻)	1553.0	4 ⁻	D+Q		A ₂ =-0.076 17; A ₄ =-0.030 24 δ: for J(2110)=3, δ=-0.64 +4-7 or +12 +18-3. Assignment from 1998Be62.
^x 564.0 8	2.1 5							
^x 573.8 8	0.70 25							
^x 586.0 8	0.40 15							
598 ^a	<3 ^{&}	1856.2	(2 ⁺)	1257.48	2 ⁺			
^x 622.8 8	0.60 20							placement: 1871.1 to 1257.4 (1975De01) is incorrect.
627.5 4	2.1 6	1959.31	(2 ⁺)	1331.14	3 ⁺			
650.7 3	1.0 3	1981.8		1331.14	3 ⁺			
666.4 4	0.55 20	1887.87		1221.43	2 ⁺			
^x 678.2 6	0.88 25							
723.8 7	0.44 15	1981.8		1257.48	2 ⁺			

182W(n,n'γ) 1975De01 (continued)γ(182W) (continued)

E _γ	I _γ [†]	E _i (level)	J _i ^π	E _f	J _f ^π	Mult. [‡]	δ [#]	Comments
733.5 8	0.40 20	2023.2	(3 ⁻)	1289.16	2 ⁻	D+Q		A ₂ =-0.27 6; A ₄ =+0.6 6 δ: -0.10 +6-10 or -2.8 +6-7.
^x 738.1 10	0.40 20							
^x 744.6 8	1.1 3							
^x 777.6 10	0.44 20							
786.5 10	0.30 15	2274.3	(3) ⁻	1487.7	4 ⁻			
^x 798.2 4	1.8 4							
809.5 8	0.40 20	2183.6	(2 ⁻ ,3 ⁻)	1373.86	3 ⁻			
817.0 10	0.55 20	2148.1	(3 ⁻)	1331.14	3 ⁺			
831.0 10	1.6 4	1510.22	4 ⁺	680.49	6 ⁺			
835.9 ^{da} 6	0.60 ^d 20	2057.4	1	1221.43	2 ⁺			
835.9 ^d 6	0.60 ^d 20	2209.2	3 ⁻	1373.86	3 ⁻			
^x 867.6 3	0.55 10							
^x 888.8 5	1.3 3							
894.3 8	2.4 12	2183.6	(2 ⁻ ,3 ⁻)	1289.16	2 ⁻			
900.5 8	2.0 4	2274.3	(3) ⁻	1373.86	3 ⁻			
909.7 6	0.9 4	2283.5	1	1373.86	3 ⁻			
927.9 2	8.9 9	1257.48	2 ⁺	329.44	4 ⁺	(Q)		A ₂ =+0.082 10; A ₄ =-0.006 11
942.5 5	2.3 3	1623.3	(5) ⁺	680.49	6 ⁺	D+Q	-2.9 3	A ₂ =+0.16 3; A ₄ =+0.02 4
952.3 6	0.55 15	2173.9		1221.43	2 ⁺			
^x 959.6 3	1.3 3							
^x 979.1 4	0.90 25							
1001.6 2	7.1 7	1331.14	3 ⁺	329.44	4 ⁺	Q+D	-25 +6-10	A ₂ =-0.134 15; A ₄ =+0.001 19 δ: from 2000De59. Other: -30 +20-30 (1998Be62).
1035.60 12	15.5 12	1135.70	0 ⁺	100.09	2 ⁺			
^x 1066.0 10	0.30 15							
1075.8 5	1.3 3	1756.3	6 ⁺	680.49	6 ⁺	D+Q	+2.50 +20-17	A ₂ =-0.026 17; A ₄ =-0.155 24
^x 1088.6 4	0.50 15							
^x 1101.1 3	1.0 2							
1113.5 3	9.7 10	1442.97	4 ⁺	329.44	4 ⁺	D+Q	+4.1 3	placement: 1331.1 to 329.4 (1975De01) is incorrect. A ₂ =-0.042 9; A ₄ =-0.080 9
1121.32 [@] 8	56 3	1221.43	2 ⁺	100.09	2 ⁺	D+Q	+25 +10-8	A ₂ =-0.031 10; A ₄ =-0.014 15
1157.42 12	10.7 8	1257.48	2 ⁺	100.09	2 ⁺	D+Q	-7.9 +12-17	A ₂ =-0.106 9; A ₄ =+0.004 10 I _γ : for 1157 doublet, ≈2 units of intensity should be assigned to the decay of the 1487 level (evaluators).
1180.7 2	7.5 5	1510.22	4 ⁺	329.44	4 ⁺	D+Q	-1.11 +7-10	A ₂ =-0.160 9; A ₄ =-0.065 10
1189.08 10	14.7 10	1289.16	2 ⁻	100.09	2 ⁺			A ₂ =+0.356 10; A ₄ =+0.030 8
1221.45 10	44.0 20	1221.43	2 ⁺	0.0	0 ⁺	(Q)		A ₂ =+0.204 9; A ₄ =-0.001 9
1231.03 10	33.1 15	1331.14	3 ⁺	100.09	2 ⁺	Q+D		A ₂ =+0.064 8; A ₄ =+0.120 8 1/δ=+0.006 +8-5 (2000De59).
1257.45 15	16.9 8	1257.48	2 ⁺	0.0	0 ⁺	Q		A ₂ =+0.233 9; A ₄ =-0.060 9
1273.8 3	1.3 2	1373.86	3 ⁻	100.09	2 ⁺	D+Q	+0.35 +5-3	A ₂ =+0.15 3; A ₄ =+0.01 4
1289.5 8	1.5 4	1289.16	2 ⁻	0.0	0 ⁺	(Q)		A ₂ =+0.218 20; A ₄ =+0.01 4
1294.0 3	6.6 7	1623.3	(5) ⁺	329.44	4 ⁺			

$\gamma(^{182}\text{W})$ (continued)

E_γ	$I_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. ‡	$\delta^\#$	Comments
1342.8 2	5.0 5	1442.97	4 ⁺	100.09	2 ⁺	Q		$A_2=+0.269$ 11; $A_4=-0.047$ 12 Additional information 1.
1410.4 3	3.7 4	1510.22	4 ⁺	100.09	2 ⁺	Q		$A_2=+0.254$ 20; $A_4=-0.06$ 3
1426.9 5	1.2 3	1756.3	6 ⁺	329.44	4 ⁺	Q		$A_2=+0.32$ 4; $A_4=-0.09$ 5
^x 1438.1 4	1.5 3							
^x 1446.1 8	1.1 3							
^x 1468.0 10	1.0 3							
^x 1503.8 10	0.6 3							
^x 1510.4 10	0.6 3							
^x 1521.0 10	0.6 2							
1527.0 10	0.30 15	1856.2	(2 ⁺)	329.44	4 ⁺			
^x 1538	<0.15							
^x 1544.8 8	0.70 20							
1558.5 4	1.2 3	1887.87		329.44	4 ⁺			
^x 1588.7 10	0.7 3							
^x 1614.0 10	0.9 3							
1629.8 2	4.2 6	1959.31	(2 ⁺)	329.44	4 ⁺			$A_2=-0.077$ 15; $A_4=-0.006$ 17 δ : for J(1959)=3, $\delta=+0.01$ +3-2 or -9 +2-4. Negative A_2 is inconsistent with $\Delta J=2$ transition.
^x 1649.7 10	0.6 2							
1653.1 8	1.4 4	1981.8		329.44	4 ⁺			
^x 1662.2 5	1.8 4							
^x 1672.6 10	0.9 3							
1688.3 ^{be} 10	0.9 3	2016.6?		329.44	4 ⁺			
^x 1714.0 10	0.5 2							
1733.0 ^e 6	1.3 3	1833.1		100.09	2 ⁺			
^x 1745.6 4	2.6 5							
1756.1 3	5.0 12	1856.2	(2 ⁺)	100.09	2 ⁺			
1757.0 6	1.5 5	1856.9	1	100.09	2 ⁺			
1771.1 4	2.0 4	1871.2	1 ⁻	100.09	2 ⁺			$A_2=+0.02$ 3; $A_4=0$
1813.6 ^e 10	1.5 5	2143.1?		329.44	4 ⁺			$A_2=+0.15$ 5; $A_4=-0.06$ 6
1818.5 ^d 4	4.7 ^d 7	1918.6		100.09	2 ⁺			$A_2=+0.18$ 2; $A_4=+0.1$ 2 δ : for J(1919)=2, $\delta=+0.06$ +11-6 or +2.0 4.
1818.5 ^{da} 4	4.7 ^d 7	2148.1	(3 ⁻)	329.44	4 ⁺			
^x 1833.0 20	0.30 20							
^x 1843.0 20	0.40 15							
1856.7 6	4.3 10	1856.9	1	0.0	0 ⁺	D		$A_2=-0.03$ 9; $A_4=+0.01$ 11
1859.1 8	3.0 10	1959.31	(2 ⁺)	100.09	2 ⁺			$A_2=-0.13$ 7; $A_4=-0.02$ 9 δ : for J(1959)=3, $\delta=+0.05$ +7-8 or -5.0 +14-28.
1871.1 5	2.1 4	1871.2	1 ⁻	0.0	0 ⁺	D		$A_2=-0.052$ 16; $A_4=0.00$ 2
1877.5 8	0.8 3	2207.0	(3 ⁻)	329.44	4 ⁺	D+Q	-0.28 6	$A_2=+0.16$ 4; $A_4=+0.03$ 6
1879.6 ^e 10	0.6 6	2209.2	3 ⁻	329.44	4 ⁺	D+Q		$A_2=+0.14$ 6; $A_4=+0.03$ 9 δ : -0.24 8 or -2.6 +10-5.

¹⁸²W(n,n'γ) 1975De01 (continued)

γ(¹⁸²W) (continued)

E _γ	I _γ [†]	E _i (level)	J _i ^π	E _f	J _f ^π	Mult. [‡]	α ^c	Comments
1881.8 8	1.7 3	1981.8		100.09	2 ⁺			A ₂ =+0.08 3; A ₄ =-0.01 4
1915.3 ^{be} 12	0.9 3	2016.6?		100.09	2 ⁺			
^x 1944.6 8	0.6 3							
1956.4 ^{ae} 8	1.8 5	2057.4	1	100.09	2 ⁺			
1960.2 ^e 10	0.58 20	1959.31	(2 ⁺)	0.0	0 ⁺			
^x 1990.7 8	0.9 3							
2010.2 8	0.36 20	2110.3	(2 ⁻ ,3 ⁻)	100.09	2 ⁺			
2016.0 6	2.3 5	2116.1		100.09	2 ⁺			
^x 2039.9 10	0.35 20							
2048.0 8	2.1 4	2148.1	(3 ⁻)	100.09	2 ⁺			
2057.4 10	0.8 3	2057.4	1	0.0	0 ⁺	D		A ₂ =-0.09 3; A ₄ =-0.01 4
^x 2067.0 10	1.1 4							
2074.0 8	1.3 3	2173.9		100.09	2 ⁺			
2084.2 10	0.20 10	2183.6	(2 ⁻ ,3 ⁻)	100.09	2 ⁺			
2109.1 4	1.8 3	2209.2	3 ⁻	100.09	2 ⁺			
2139.4 10	1.1 3	2239.5	(3 ⁺)	100.09	2 ⁺			
^x 2145.4 12	0.8 3							
2148 ^{ae}	<0.20	2148.1	(3 ⁻)	0.0	0 ⁺	[E3]	0.00218	α(K)=0.001633 23; α(L)=0.000259 4; α(M)=5.90×10 ⁻⁵ 9 α(N)=1.419×10 ⁻⁵ 20; α(O)=2.30×10 ⁻⁶ 4; α(P)=1.573×10 ⁻⁷ 22; α(IPF)=0.000209 3
2174 ^{dae}	<0.3 ^d	2173.9		0.0	0 ⁺			
2174 ^{dae}	<0.3 ^d	2274.3	(3) ⁻	100.09	2 ⁺			
^x 2185.4 10	1.2 3							
2208.8 6	1.4 3	2209.2	3 ⁻	0.0	0 ⁺	[E3]	0.00209	α(K)=0.001546 22; α(L)=0.000244 4; α(M)=5.55×10 ⁻⁵ 8 α(N)=1.335×10 ⁻⁵ 19; α(O)=2.16×10 ⁻⁶ 3; α(P)=1.487×10 ⁻⁷ 21; α(IPF)=0.000230 4
^x 2231.7 12	0.65 25							
2283.5 10	1.4 4	2283.5	1	0.0	0 ⁺	D		A ₂ =-0.13 3; A ₄ =0.00 4
^x 2294.7 12	0.9 3							
^x 2312.0 20	0.7 3							
^x 2428.6 10	1.2 4							
^x 2474.0 20	0.7 3							
^x 2635.0 15	0.4 2							
^x 2644.5 15	0.6 2							
^x 3093.0 20	0.5 2							
^x 3284.0 20	0.7 3							

[†] Relative intensities normalized to 100 for γs (1121γ and 1221γ) from 1221 level.

[‡] 1998Be62 list mult=E2 and E1 or M1 for Q and D, respectively, listed here. The evaluators prefer the latter terminology since since γ(θ) data are parity-insensitive.

$\gamma(^{182}\text{W})$ (continued)

From $\gamma(\theta)$ data of [1998Be62](#).

@ [1975De01](#) take value from [1970Wh03](#) and use it as a calibration standard.

& The quoted limit is lower than expected from branchings in in Adopted Gammas. The spectrum near 598 is dominated by impurity lines in (n,n' γ).

^a Placement from table 2 of [1975De01](#), not shown in authors' table 1, both tables list $E\gamma$, $I\gamma$ data.

^b Placement from the text of [1975De01](#), not shown in authors' $E\gamma$, $I\gamma$ table 1.

^c From BrIcc v2.3b (16-Dec-2014) [2008Ki07](#), "Frozen Orbitals" appr.

^d Multiply placed with undivided intensity.

^e Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

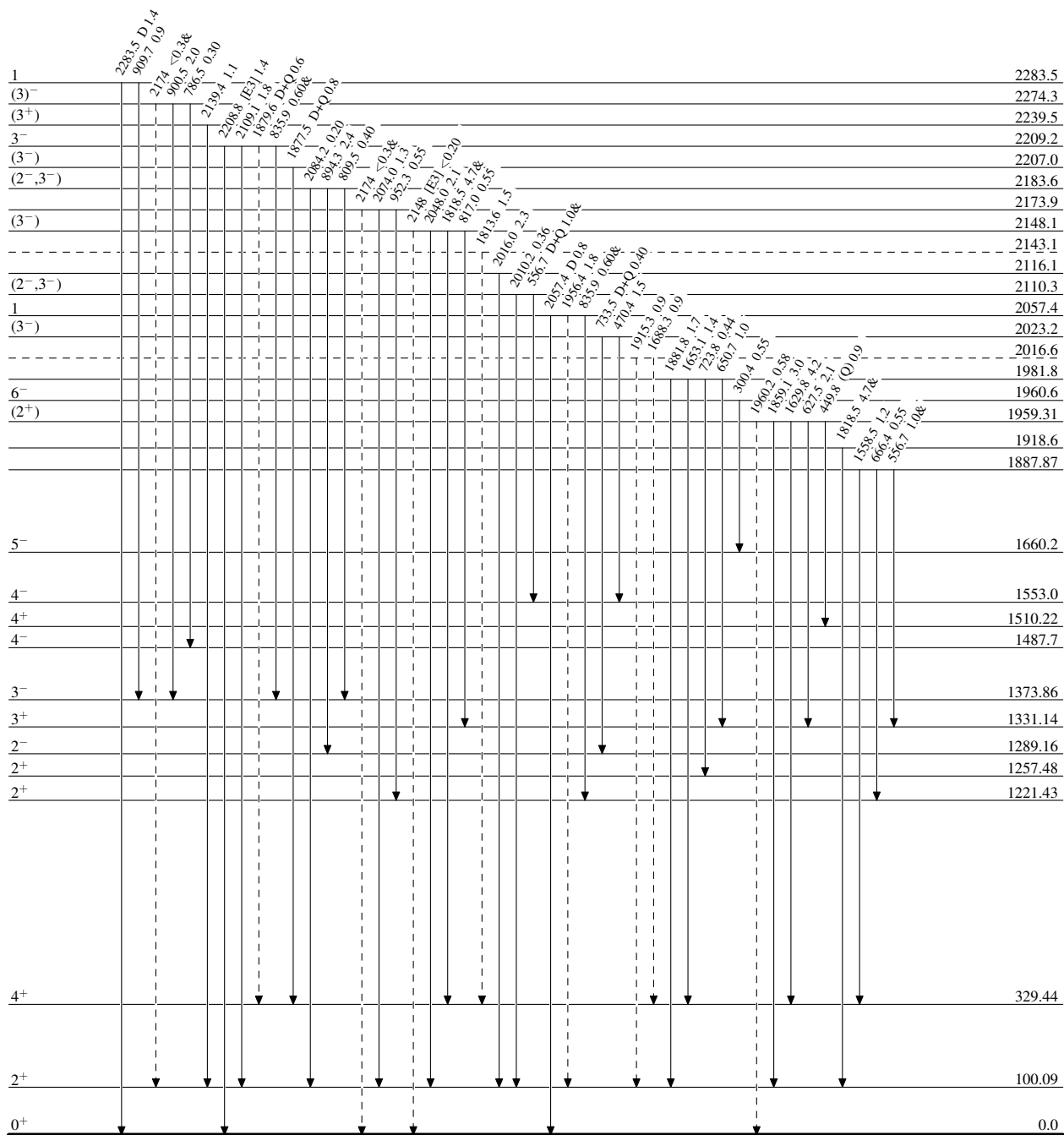
$^{182}\text{W}(\text{n},\text{n}'\gamma)$ 1975De01

Level Scheme

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend

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



¹⁸²W(n,n'γ) ¹⁹⁷⁵De01

Level Scheme (continued)

Intensities: Relative I_γ

& Multiply placed: undivided intensity given

