^{185}Re(n,γ) E=2-110 eV   1983Be27,1980BeYB

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. C. Batchelder and A. M. Hurst, M. S. Basunia	NDS 183, 1 (2022)	1-Mar-2022

Measured isolated resonances in ^{185}Re(n,γ)^{186}Re reaction with E=2-110 eV neutrons. Levels and J^π in ^{186}Re deduced from measured primary Eγ and Iγ. Few changes since earlier evaluation (2003Ba44).

^{186}Re Levels

No primary transitions were observed to the known 418, 646, 736 levels, as expected for J>4 states.

E(level)[†]	J^{π}[‡]	Comments
0.0	1^-	
58.9	$2^-,3^-$	
99.1	$2^-,3^-$	
145.8	$2^-,3^-$	
173.7	4^-	
210.6	$2^-,3^-$	
268.6	4^{-}[@]	
273.8	4^-	
314.009		E(level): from Adopted Levels.
		J^π: (3^+) from Adopted Levels.
315.5	1^-	
317.846		E(level): from Adopted Levels.
		J^π: not 2^- or 3^- or 4^-.
322.1	$2^-,3^-$	
350.8	$1^+,2^+,3^{+}$[#]	
378.1	$2^-,3^-$	
424.7	$2^+,3^+,4^{+}$[#]	
462.969		E(level): from Adopted Levels.
		J^π: not 2^- or 3^- or 4^-.
469.794		E(level): from Adopted Levels.
		J^π: data are compatible with a doublet with $J^\pi=3^-$ and 4^- near 470 keV (1983Be27); 4^- from Adopted Levels levels.
470.509		E(level): from Adopted Levels.
		J^π: data are compatible with a doublet with $J^\pi=3^-$ and 4^- near 470 keV (1983Be27); (3^-) from Adopted Levels levels.
499.6	$2^+,3^+,4^{+}$[#]	
534.3	4^{-}[#]	
577.6	$2^-,3^-$	
588.7	4^{-}[@]	
624.1	1^{-}[#]	
680.1	$2^-,3^{-}$[#]	
686.1	$2^-,3^-,4^-$	
689.3	1^{-}[#]	
753.7	$2^-,3^{-}$[#]	
761.2	$^{-}$[#]	E(level): doublet.
791.5	1^{-}[#@]	
796.3	$^{-}$[#]	E(level): doublet.
812.2	1^{-}[#]	
819.1	$2^-,3^{-}$[#]	
826.2	4^{-}[@]	

^{185}Re(n,γ) E=2-110 eV　　　**1983Be27,1980BeYB (continued)**

^{186}Re Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	Comments
857.9	2$^{(-)}$,3$^{(-)}$[#]	J$^{\pi}$: 1$^{(-)}$ excluded (1980BeYB).
862.5	2^{-},3^{-}[#]	J$^{\pi}$: 4^{-} excluded (1980BeYB).
871.3	$^{-}$[#]	E(level): doublet.
879.3	2^{-},3^{-}[#]	
888.4	4^{-}[#@]	
889.8	1^{-},2^{-},3^{-}[#]	
895.0	2^{-},3^{-},4^{-}[#]	
901.8	2^{-},3^{-}[#]	
913.6	2^{-},3^{-}[#]	
923.7	2^{-},3^{-}[#]	
930.0	$^{-}$[#]	E(level): doublet.
935.5	2^{-},3^{-}[#]	
938.3	1^{-}[#]	
946.4	2^{-},3^{-}[#]	
975.0	$^{-}$[#]	E(level): doublet.
988.8	2^{-},3^{-}[#]	
999.3	2^{-},3^{-},4^{-}[#]	
1004.8	2^{-},3^{-},4^{-}[#]	
1015.0	2^{-},3^{-},4^{-}[#]	
1019.4	1^{-},2^{-},3^{-}[#]	
1039.9	2^{-},3^{-},4^{-}[#]	
1042.9	1^{-}[#]	
1046.9	2^{-},3^{-},4^{-}[#]	
1053.4	1^{-},2^{-},3^{-}[#]	
1057.1	2^{-},3^{-}[#]	
1069.8	2^{-},3^{-}[#]	
1073.3	2^{-},3^{-}[#]	
1097.1	4^{-}[#]	
1102.9	2^{-},3^{-}[#]	
1123.9	2^{-},3^{-}[#]	
1141.9	2^{-},3^{-}[#]	
1151.3	4^{-}[#]	
1157.6	2^{-},3^{-},4^{-}[#]	
1163.0	1$^{(-)}$[#@]	
1173.6	$^{-}$[#]	E(level): doublet.
1185.0	2^{-},3^{-}[#]	
1194.3	2$^{(-)}$,3$^{(-)}$,4$^{(-)}$[#]	
1197.9	2^{-},3^{-}[#]	
1219.1	1^{-}[#]	
1225.8	1^{-},2^{-},3^{-}[#]	
1232.0	2^{-},3^{-}[#]	J$^{\pi}$: 4^{-} excluded (1980BeYB).
1242.1	2^{-},3^{-}[#]	
1248.5	$^{-}$[#]	E(level): doublet.
1261.3	1$^{(-)}$[#@]	
1271.8	2^{-},3^{-},4^{-}[#]	

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^{185}Re(n,γ) E=2-110 eV　　**1983Be27,1980BeYB (continued)**

^{186}Re Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	Comments
1275.3	$1^{(-)},2^{(-)},3^{(-)}$#	
1285.4	$2^-,3^-$#	J$^{\pi}$: 1^- excluded (1980BeYB).
1297.5	$1^-,2^-,3^-$#	
1307.5	$-$#	E(level): doublet.
1317.9	$2^-,3^-,4^-$#	
1322.0	$2^-,3^-$#	
1351.7	$4^{(-)}$#	
1355.2	$2^-,3^-$#	
1359.5	$2^-,3^-,4^-$#	
1375.1	$1^{(-)},2^{(-)},3^{(-)}$#	
1385.3	$2^-,3^-$#	J$^{\pi}$: 4^- excluded (1980BeYB).
1392.7	$2^-,3^-$#	J$^{\pi}$: 4^- excluded (1980BeYB).
1398.8	$1^-,2^-,3^-$#	
1403.2	1^-#@	
1405.8	$2^-,3^-,4^-$#	
1419.4	$2^-,3^-$#	
1424.5	$2^-,3^-$#	
1431.0	$4^{(-)}$#@	
1450.1	$1^-,2^-,3^-$#	
1458.1	$2^-,3^-$#	J$^{\pi}$: 4^- excluded (1980BeYB).
1462.8	$2^-,3^-$#	J$^{\pi}$: 1^- excluded (1980BeYB).
1476.0	$-$#	E(level): doublet.
1525.7	4^-#@	
1531.4	$2^-,3^-$#	
1538.8	$1^-,2^-,3^-$#	
1545.0	$-$#	E(level): doublet.
1550.9	$1^-,2^-,3^-$#	
1566.6	$2^{(-)},3^{(-)},4^{(-)}$#	
1572.1	$1^-,2^-,3^-$#	
1575.8	$2^-,3^-,4^-$#	
1591.6	$2^-,3^-$#	J$^{\pi}$: 4^- excluded (1980BeYB).
1627.3	$2^-,3^-,4^-$#	
1643.9	$1^-,2^-,3^-$#	
1648.1	$2^{(-)},3^{(-)},4^{(-)}$#	
1662.1	$-$#	E(level): doublet.
1667.8	$2^-,3^-,4^-$#	
1672.8	$1^-,2^-,3^-$#	
1684.2	$2^-,3^-,4^-$#	
1696.5	$2^-,3^-$#	J$^{\pi}$: 1^- excluded (1980BeYB).
1711.1	$2^-,3^-$#	J$^{\pi}$: 4^- excluded (1980BeYB).
1719.1	$2^-,3^-,4^-$#	
1758.0	$2^-,3^-$#	
1794.0	$-$#	E(level): doublet.
1818.1	$2^-,3^-,4^-$#	
1828.1	$2^-,3^-,4^-$#	

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^{185}**Re(n,γ) E=2-110 eV   1983Be27,1980BeYB (continued)**

^{186}Re Levels (continued)

E(level)[†]	J$^\pi$[‡]	Comments
1839.9	1$^-$,2$^-$,3$^-$[#]	
1847.3	2$^-$,3$^-$[#]	J$^\pi$: 4$^-$ excluded (1980BeYB).

[†] From 1980BeYB; uncertainty not stated by authors.

[‡] Based on authors' analysis of primary γ intensities to final level from each of 26 J$^\pi$=2$^+$ or 3$^+$ neutron resonances, and on average primary γ intensity from all resonances with a given J$^\pi$; fluctuation properties of the intensities were taken into account, but specific Iγ data are not reported. Excluded J$^\pi$ values are ruled out at the 99.9% confidence level, except where noted otherwise. The resonance J$^\pi$ values had been determined as 2$^+$ or 3$^+$ on the assumption of s-wave capture, and based on the systematics of the Iγ(316)/Iγ(215) ratio and/or the observation of strong primary γ transitions to low-lying levels with established J$^\pi$=1$^-$ (E=0, 316) or J$^\pi$=4$^-$ (E=174, 274) (1983Be27).
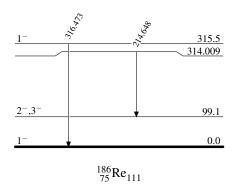
[#] From 1980BeYB.

[@] 2$^-$ and 3$^-$ are ruled out at the 99% confidence level.

γ(^{186}Re)

E$_\gamma$[†]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$
214.648 8	314.009		99.1	2$^-$,3$^-$
316.473 20	315.5	1$^-$	0.0	1$^-$

[†] From adopted gammas.

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Level Scheme

$^{186}_{75}$Re$_{111}$