Evidence of the 9B(1/2+) state in the 12C(p,a)9B reaction

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Following the elucidation of the six-decade-long ^{9}B(1/2+) state mystery using the R-matrix formalism, the low-lying excitation region in ^{9}B has been studied experimentally with the ^{12}C(p,α)^{9}B reaction at the Birmingham MC40 Cyclotron. Data collected at two distinct α-particle recoil angles, over a period of 105 hours at an average current of 1.37 nA, allowed for signatures of the elusive ^{9}B(1/2+) state to be observed. R-matrix analysis of the obtained excitation spectra, alongside statistical analysis to verify observation significance, indicates the state appears at an excitation energy of 1.83±0.05 MeV, in agreement with previous measurements over the last 25 years. Additionally, no evidence of a low-lying state around ~1.0 MeV is found, confirming that mirror symmetry remains unbroken in 1p-1n mirror systems and suggesting a resolution to the ^{9}B(1/2+) state problem.