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Structure of 9C via proton elastic scattering

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The structure of ^{9}C was studied using ^{8}B+p resonance scattering with the newly commissioned Texas Active Target (TexAT) detector system. Recent theoretical developments allow for robust predictions of level structure of light nuclei, including continuum effects, starting from nucleon-nucleon and three-nucleon interactions [1, 2, 3]. High quality experimental data are necessary to benchmark these predictions. Experimental data on ^{9}C is limited - only two excited states in ^{9}C have been observed. The goal of this work was two-fold. First, the ^{8}B+p resonance scattering was used as the first commissioning experiment for the active target detector system TexAT. This reaction was chosen because the experimental data on ^{8}B+p elastic scattering excitation function at low energy are available [4]. The second goal was to search for positive parity states in ^{9}C (non are known). For that we extended the ^{8}B+p elastic scattering excitation function to higher excitation energy, improved statistics and quality of the existing low energy data, measured angular distribution, and also searched for the ^{8}B(p,2p) reaction channel. Preliminary results of this run will be discussed. [1] N. Mihel, W. Nazarewiz, M. Ploszajzak, and J. Okolowiz, PRC 67, 054311 (2003). [2] A. Volya and V. Zelevinsky, PRL 94, 052501 (2005). [3] S. Baroni, P. Navratil, S. Quaglioni, PRC 87, 034326 (2013). [4] G. Rogachev, et al., PRC 75, 014603 (2007).

Summary

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