

Abstract Submitted
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Tracking Low-Momentum Protons in a Radial Time Projection Chamber DAVID PAYETTE, Old Dominion University, BONUS12 COLLABORATION — A Radial Time Projection Chamber (RTPC) has been designed and built for installation in Jefferson Labs Hall B as part of the BONuS12 (Barely Off-shell Nucleon Structure) experiment. The goal of BONuS12 is to accurately measure the structure function of the neutron by scattering the 11 GeV electrons from the upgraded CEBAF and detecting them with the CLAS12 spectrometer. Deuterium gas is used as an effective neutron target, and the new RTPC is used to detect low-momentum spectator protons. Protons follow a curved path in the 5 Tesla solenoid that is part of CLAS12, ionizing the He-CO₂ gas in an annular drift region surrounding the target. These ionization electrons are radially drifted outwards, amplified using cylindrical GEM (Gaseous Electron Multiplication) foils and recorded using readout pads located along the entire outer face of the cylindrical detector. Tracking software uses the signals from these pads to build tracks, which are reconstructed into the drift region using the arrival times of the signals and the positions of the pads. The proton momentum is measured from the tracks curvature and thus used to extract information about the struck neutron. We will present the status and performance of the tracking hardware and software.

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