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Calibration and Simulation of the Proton Polarimeter 2nd-FPP and Track Calibration using Cosmic Rays

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Nucleon–nucleon (NN) interactions inside nuclei are expected to be modified by nuclear medium effects. To investigate these effects, we are developing the focal-plane proton polarimeter (2nd-FPP), designed to measure proton polarization via the left–right asymmetry in elastic p–^{12}C scattering, with particle tracking provided by multi-wire drift chambers (MWDCs).
A calibration experiment at RCNP successfully separated p–^{12}C events from p–p events; however the effective analyzing power in the forward angular range was lower than reference values. GEANT4 simulations incorporating polarization effects reproduced this result, indicating that the discrepancy is likely due to overestimated scattering angles caused by bulging of the MWDC window films. To address this issue, we are calibrating the drift-time–to-distance relationship using cosmic rays. T The progress of this calibration will be reported.

Research field of your presentation

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