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Integration of a Resistive Plate Chamber for Precise Measurement of High-Momentum Protons in Short Range Correlations

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The first short-range correlation (SRC) experiment with an exotic nucleus (16C) will be performed in the Spring 2022 within the R3B collaboration as part of the FAIR Phase-0 experimental program. The study of SRC pairs at high relative momentum and low center-of-mass momentum relative to the Fermi momentum (kF) gives insight into the nucleon-nucleon interactions of cold, dense matter similar to the conditions found in neutron stars. The forward-emitted protons from the high-momentum correlated pairs will be detected using the newly implemented Resistive Plate Chamber (RPC). The time-of-flight method will be applied, taking advantage of the excellent time resolution properties of the RPC (about 50 ps). In this work, the RPC detector will be introduced, the integration of the detector in the R3B setup will be presented, and some preliminary results will be shown.

Topic

Experiment

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