Contribution ID: **79** Type: **Oral**

Resistive Plate Chambers for Precise Measurement of High-Momentum Protons in Short Range Correlations

Monday, 26 September 2022 14:20 (20 minutes)

The Reactions with Relativistic Radioactive Beams (R3B) collaboration of the FAIR facility in Darmstadt, Germany, has constructed an experimental setup to perform fundamental studies at the extremes of nuclear matter, using as a probe reactions with exotic nuclei at relativistic energies.
Among the various detection systems, one of the most recent upgrades consisted on the installation of a large area (˜2 m²) multi-gap RPC (mRPC), equipped with twelve 0.3 mm gaps and readout by 30 mm pitch strips, exhibiting a timing precision down to 50 ps and efficiencies above 98 % for MIPs [1].
The mRPC was part of the setup of the FAIR Phase-0 experiment focusing on the measurement, for the first time, of nucleon-nucleon short-range correlations (SRC) inside an exotic nucleus (16C) that occurred in Spring 2022.
The excellent timing precision of this detector will allow the measurement of the forward emitted proton momentum with a resolution of around 1%.
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.

References

[1] Blanco, Alberto, et al. "The SHiP timing detector based on MRPC." Journal of Instrumentation 15.10 (2020): C10017.

Primary author: XAREPE, Manuel

Co-authors: BLANCO, Alberto (LIP Coimbra); CORSI, Anna (CEA Saclay); LÖHER, Bastian (GSI); GALAVIZ REDONDO, Daniel (LIP - Laboratorio de Instrumentação e Física Experimental de Partículas (PT)); ROSSI, Dominic (TU Darmstadt, GSI); TORNQVIST, Hans Toshihide (Chalmers University of Technology (SE)); JOHANSSON, Håkan (Chalmers); MICHEL, Jan (Goethe University Frankfurt); SARAIVA, João (LIP-Coimbra); LOPES, Luís (LIP Coimbra); TRAXLER, Michael (GSI Helmholtzzentrum für Schwerionenforschung GmbH); AUMANN, Thomas (T)

Presenter: XAREPE, Manuel

Session Classification: New experiments