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TRICK: a Tracking Ring Imaging Cherenkov Detector

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TRICK is a project funded by the INFN CSNV Young grant 2021. It will deploy an innovative 5D technique to provide incoming particles' 3D position, time, and ID information. The proposed idea is based on the well-known technology of GEM-based TPC together with conventional Aerogel proximity focussing RICH in one single box. Both TPC and RICH parts will be readout simultaneously and instrumented by the same TIGER ASIC, developed for the BESIII CGEM-IT detector. By combining information from both systems, the TRICK technique will improve the single instrumentation performance: precise time information will help the extraction of the TPC position, while the tracking will help the rings identification, by measuring the expected center, also in a magnetic field.

The TRICK-box prototype, instrumented with triple-GEM and Hamamatsu H12700 MA-PMT, aims to reach a spatial resolution of 100 microns, time resolution below 1 ns, and 3 sigma separation for pi/K up to 4 GeV.

In this poster, a presentation of the project will be presented, with a focus on the initial studies with the prototype, the preparation of the first cosmic stand, and the next steps.

Collaboration

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