

13th Beam Telescopes and Test Beams Workshop



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Status and beam test results of the ePIC-dRICH detector at EIC

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The dual-radiator Ring Imaging Cherenkov (dRICH) detector is a crucial component of the ePIC experiment at the Electron-Ion Collider (EIC), designed for charged hadron identification in the forward region across a momentum range of ~ 3 to ~ 50 GeV/c. It will utilize aerogel and gas (C_2F_6) radiators to produce Cherenkov light, detected by a total of ~ 3 m² of Silicon Photomultipliers (SiPMs) with 3×3 mm² pixels.

A prototype dRICH detector, featuring a readout plane consisting in 2048 sensors was tested at CERN-PS beam facilities in October 2023 and May 2024. The SiPMs sensors are arranged in so-called Photo Detection Units (PDUs). The PDU represents a novelty and integrates up to 256 3×3 mm² sensors, along with cooling and front-end electronics based on the ALCOR ASIC chip. The modular design demonstrated successful detection of Cherenkov photon rings at different beam momenta, validating the detector's performance and its readiness for integration into the ePIC experiment. Results from the beam tests will be showed in this talk.

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