

A large-area prototype SiPM readout plane for the ePIC-dRICH detector at the EIC

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We present the current status of the R&D performed for the ePIC dual-radiator RICH (dRICH) detector at the future Electron-Ion Collider (EIC). The dRICH will be equipped with silicon photomultipliers (SiPM), the first large-scale application of SiPM for single-photon detection in HEP. Special focus will be given to the beam test performed with the prototype SiPM optical readout, consisting of a total of 1280 3x3 mm² SiPM sensors and related electronics tested at CERN-PS in October 2023. The photodetector surface is modular and based on a novel prototype photodetection unit (PDU) which integrates 256 SiPM pixel sensors, cooling and TDC electronics in a volume of $\sim 5 \times 5 \times 14$ cm³. The data have been collected with a complete chain of front-end and readout electronics based on the ALCOR chip. This presentation will highlight the features and details of the PDU and the performance of the full dRICH SiPM prototype system that successfully recorded Cherenkov photon rings.

Alternate track

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