



ID de Contribution: 95

Type: Poster

The High-Performance DIRC Detector for the Future Electron Ion Collider Experiment

lundi 22 juillet 2019 18:00 (15 minutes)

Excellent particle identification (PID) is an essential requirement for a future Electron-Ion Collider (EIC) detector. Identification of the hadrons in the final state is critical to study how different quark flavors contribute to nucleon properties. A detector based on the Detection of Internally Reflected Cherenkov light (DIRC) principle, with a radial size of only a few cm, is a great solution for those requirements. The R&D process performed by the EIC PID consortium (eRD14) is focused on designing a High-Performance DIRC that would extend the momentum coverage well beyond the state-of-the-art. A key component to reach such a performance is a special 3-layer compound lens. The status of the High-Performance DIRC R&D for the EIC detector will be presented, with a focus on the detailed Monte Carlo simulation results and performance tests of two 3-layer lens prototypes.

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Classification de Session: Poster session

Classification de thématique: Detector R&D