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Particle Identification with the ATHENA detector at the EIC

ATHENA is a general-purpose detector designed to deliver the full physics program of the Electron-Ion Collider (EIC). Particle identification (PID) at the EIC is an essential asset as well as a challenge: the PID systems have to provide excellent separation of pions, kaons, and protons over a large phase space with significant pion/electron suppression. ATHENA addresses the physics requirements by utilising multiple state-of-the-art particle identification technologies.

This talk presents the ATHENA detector PID subsystems, which comprise of central-barrel LGAD time-of-flight and DIRC detectors, proximity-focus RICH and dual-radiator focusing RICH detectors. R&D activities are under way to evaluate the use of SiPMs as photosensors for the RICH detectors, to explore the capabilities of the novel LAPPD detectors and to to evaluate the compatibility of commercial MCP-PMT with the magnetic field conditions of the experiment. The projected performance of the ATHENA PID detector system studied via detailed Geant4 simulations will also be discussed as well as possible future upgrades.

Submitted on behalf of a Collaboration?

Yes

Authors: GEURTS, Frank (Rice University (US)); PREGHENELLA, Roberto (INFN, Bologna (IT)); HEMMICK, Thomas (Stony Brook University)

Presenters: GEURTS, Frank (Rice University (US)); PREGHENELLA, Roberto (INFN, Bologna (IT)); HEMMICK, Thomas (Stony Brook University)

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