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Particle Identification with the ePIC detector at the EIC

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The ePIC detector is being designed as a general-purpose detector for the Electron-Ion Collider (EIC) to deliver the full physics program. One of the key challenges at the EIC is particle identification (PID), which requires excellent separation of pions, kaons, and protons over a wide phase space with significant pion/electron suppression. To address this challenge, ePIC utilises multiple advanced particle identification technologies.

The talk will cover the PID subsystems of the ePIC detector, with a specific emphasis on high-momentum particle-identification systems that use DIRC and RICH techniques to exploit Cherenkov light emission from charged particles. R&D activities are under way to evaluate the use of SiPMs as photosensors for RICH detectors, explore the capabilities of novel LAPPD detectors and assess the compatibility of commercial MCP-PMT with the experiment's magnetic field conditions. The presentation will also include a discussion of the projected performance of the PID detector system, which has been studied in detail using Geant4 simulations, as well as potential future upgrades.

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