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Developing the high-performance DIRC detector for the future Electron-Ion Collider GREG KALICY, NILANGA WICKRAMAARACHCHI, The Catholic University of America, ERD14 EIC PID COLLABORATION — The next frontier project of nuclear physics in the United States will be the Electron-Ion Collider (EIC), planned to be built in the Brookhaven National Laboratory (BNL). Excellent particle identification (PID) is one of the key requirement for the EIC central detector. Identification of the hadrons in the final state is critical to study how different quark flavors contribute to nucleon properties. A detector using the Detection of Internally Reflected Cherenkov light (DIRC) principle, with a radial size of only 7-8 cm, is a very attractive solution for those requirements. The R&D program performed by the EIC PID collaboration (eRD14) is focused on designing a high-performance DIRC (hpDIRC) detector that would extend the momentum coverage well beyond the state-of-the-art 3 standard deviations or more separation of π/K up to 6 GeV/c, p/K up to 10 GeV/c, and low energy e/π. Key components of the hpDIRC detector are a 3-layer compound lens and small pixel-size photo-sensors. This contribution will present major developments in the DIRC RD program, with a focus on developing and validating the radiation hard 3-layer lens, and preparing the hpDIRC prototype for a beam test at Fermilab.

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