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Compact, Projective and Modular Ring Imaging Cherenkov Detector for Particle Identification in EIC Experiments

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The recent announcement of the construction of an Electron Ion Collider (EIC) at Brookhaven National Lab by the U.S. Department of Energy makes the reality of a long-sought experimental effort to explore the structure and properties of proton and nuclei. Particle identification (PID) of the final state hadrons is a key requirement for EIC. A compact, projective, and modular ring imaging Cherenkov (mRICH) detector has been developed for K/π separation from 3 up to 10 GeV/c and for e/π around 2 GeV/c. The mRICH detector consists of an aerogel radiator block, a Fresnel lens, a mirror-wall and a photosensor plane. The first prototype of this detector design was successfully tested at Fermilab in 2016 followed with the second beam test in 2018 with much improved optical designs. Two more beams tests are planned in 2021 for quantifying the mRICH PID performance and new photosensor technology. This talk presents the state of the art of the mRICH development and test results.

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No, this is an entirely new submission.

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