Particle Identification Performance Studies with pfRICH Simulations

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The proximity-focusing Ring Imaging CHerenkov (pfRICH) detector is crucial for particle identification (PID) in the electron-going direction in $-3.5 < \eta < -1.5$ in ePIC. As a high-energy charged particle passes through a medium, it emits Cherenkov radiation at an angle related to the speed at which it is traveling. A separation of particle species among e, π, K and p is thus possible together with the measurement of particle momentum and knowledge of the medium's refractive index. We simulate single-particle events with pfRICH standalone simulation software, and examine PID capabilities by calculating the probabilities of a given charged particle reconstructed as e, π, K or p, as a function of the particle kinematics. These simulation results are summarized as look-up tables and are regularly updated to EIC reconstruction software. In this talk, we present recent progress on studies of pfRICH PID performance, including an investigation of detector efficiency granular in the azimuthal angle.