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Simulation studies of the pair spectrometer luminosity detector for the ePIC experiment at the EIC

Tuesday 5 September 2023 17:30 (2h 10m)

A crucial component to the Electron Ion Collider (EIC) program is the collider luminosity, with a target absolute (relative) uncertainty of less than 1% (exceeding 10^{-4} in precision). The luminosity determination will be achieved employing two complementary approaches, one by direct detection of bremsstrahlung photons and another using a Pair Spectrometer (PS) which utilizes e+e- conversions of the bremsstrahlung photons. The anticipated higher luminosity at the EIC than HERA, which achieved a precision of ≈ 2%, presents several new challenges that necessitate major improvements to the PS baseline design. More specifically, the novel design now includes a thin converter foil, sweeper and analyzer magnet, a helium/vacuum chamber, tracking layers, and modern EM calorimeters. We resent estimates to the luminosity uncertainties for the electron Proton-Ion Collider (ePIC) experiment at the EIC through dedicated simulations using the PS.

Category

Experiment

Collaboration (if applicable)

ePIC Collaboration

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