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Electron Polarimetry at JLEIC

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Polarized beams will play a crucial role in the physics program planned for future electron-ion colliders. The large luminosities available at these facilities imply excellent statistical precision; hence it is important to have comparable precision in the experimental systematic uncertainties. Knowledge of the polarization of the electron and ion beams is one such key systematic uncertainty.

This presentation will focus on the design of a Compton polarimeter to measure the electron beam polarization at the Electron Ion Collider at Jefferson Lab (JLEIC). The JLEIC Compton polarimeter builds on techniques developed at Jefferson Lab, which have resulted in measurements of electron beam polarization to better than 1% (dP/P). The JLEIC polarimeter makes use of a dipole chicane which will also be used as part of a low-Q² electron tagger. This chicane facilitates the detection of both the Compton scattered electron and the backscattered photon. The initial design has emphasized electron detection. A Compton polarimeter emphasizing detection of the backscattered photon is also under consideration for a possible second interaction region.

Options for the Compton polarimeter laser system, the polarimeter design and layout, and initial background simulations will be discussed.

Primary author: Dr GASKELL, Dave (Jefferson Lab)

Presenter: Dr GASKELL, Dave (Jefferson Lab)

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