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Abstract Title: Physics of Lambda Baryon Detection at the ePIC ZDC

Presentation Type: Oral

Sorting Category: 11. Hadronic Physics

Category Type: Experimental

Abstract Body: The Electron Ion Collider (EIC) and ePIC (enhanced Particle Identification and Calorimetry) experiment will offer an opportunity to visualize the internal structure of nucleons and nuclei and study the role of gluons within matter through collisions between high energy electrons, protons and ions. The Zero Degree Calorimeter (ZDC) is located along the proton beamline in the far forward region of the ePIC detector. The ZDC aims to offer excellent energy and position resolution for photons and neutrons produced as a result of Deep Inelastic Scattering (DIS) and the generalized Sullivan process. Using simulated data for Lambda baryons produced at the interaction point of ePIC, the detection efficiency and characteristics of events detectable by the ZDC were studied. This presentation will introduce the ZDC along with the generalized Sullivan process to motivate the need for Lambda baryon detection. It will then cover what event characteristics (momentum, angle and decay distance of the Lambda baryon) are needed in order for reconstruction to be possible as well as what actual hits in the ZDC look like.

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