



2021 Fall Meeting of the Division of Nuclear Physics

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Presentation Type: Oral Abstract

Sorting Category: 11. Hadronic Physics

Two-Photon Exchange Effects in Semi-Inclusive Deep-Inelastic Scattering on a Nucleon

Abstract Title:

Deep-inelastic scattering of electrons on a nucleon is a primary source of information about parton distribution functions (PDF) and transverse momentum distributions (TMD). The calculation of the QED corrections to SIDIS with any predetermined accuracy is crucial for studies of the 3D structure of the nucleon at JLab and future Electron Ion Collider (EIC).

A majority of approved physics experiments that will be running with 12-GeV electron beams at JLab to study the nucleon structure require per-cent level accuracies in the measurements of differential cross sections and polarization asymmetries. Neglecting

Abstract Body: electromagnetic corrections may lead to significant mis-interpretation of data. Analysis of T-odd single spin asymmetries (SSA) in SIDIS, $p(e, e'h)X$, is based on an assumption that purely electromagnetic T-odd effects are negligible. In this talk we will present evaluation of two-photon exchange on azimuthal asymmetries and generation of electromagnetic T-odd spin asymmetries in SIDIS.

Funding Acknowledgement: This work was supported by the National Science Foundation under Grant No. PHY-1812343.

Category Type: Theoretical

Newsworthy Research? Yes, I would like to consider highlighting my abstract in its outreach to journalists.

Media Summary: The electrons used to probe the nuclear structure are charged particles, and while scattering off nuclear targets they inevitably exchange extra virtual photons beyond first Born approximation in QED, presenting a challenge in interpretation in terms of hadronic structure. This work aims to disentangle high-order electromagnetic effects from the dynamics of quarks in theory description of electron scattering on nucleons.

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