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Deeply Virtual Compton Scattering on the Neutron with CLAS12 at Jefferson Lab

Wednesday 1 December 2021 17:20 (30 minutes)

A key step to improve our understanding of nucleon structure in terms of Generalized Parton Distributions (GPDs) is the measurement of Deeply Virtual Compton Scattering on the neutron (nDVCS; $ed \rightarrow e'n(p)$). This process provides mainly, in the kinematic range covered at Jefferson Lab, an access to the GPD E of the neutron, which is the least known and constrained GPD as of today. The measurement of E , together with H , yields information on the quark total angular momentum –via the Ji’s sum rule –the missing ingredient to understand the nucleon spin composition. The GPD E is accessed in nDVCS by measuring the Beam Spin Asymmetry (BSA). The measurement of the BSA of nDVCS, combined with other nDVCS observables and from those obtained in pDVCS measurements, will allow to perform the quark-flavor separation of the GPDs. This talk will report on the experiment recently carried out at Jefferson Lab with a 10.5-GeV polarized electron beam, the Hall-B CLAS12 detector, and a liquid deuterium target. Details on the data analysis along with preliminary beam-spin asymmetries for nDVCS will be presented. An overview of the imminent experiment on nDVCS with CLAS12 and a longitudinally polarized target will also be provided.

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