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NPS Experiments in Hall C at Jefferson Lab

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Deeply Virtual Compton Scattering (DVCS) and exclusive π^0 electroproduction provide experimental access to Generalized Parton Distributions (GPDs). In these channels, the measured cross sections are expressed in terms of Compton Form Factors (CFFs), which correspond to the first moments of the underlying GPDs. From September 2023 to May 2024, Jefferson Lab Hall C conducted experiment E12-13-010 with a polarized electron beam, utilizing the High Momentum Spectrometer together with the newly commissioned Neutral Particle Spectrometer (NPS) to measure DVCS and exclusive π^0 cross sections. Data analysis is currently in progress. The full 11 GeV dataset of E12-13-010 covers wide kinematics on an unpolarized proton target and is expected to enable the separation of interference and pure DVCS^2 contributions to each Fourier moment through azimuthal, energy, and beam-helicity dependences, along with a systematic Q^2 scan of all terms. In parallel, exclusive π^0 electroproduction cross sections will be extracted and subjected to a longitudinal/transverse separation. This presentation will provide a brief overview of previous related experiments at Jefferson Lab, introduce the E12-13-010 experiment in Hall C, and present some preliminary results.

Primary author: Mr ZHANG, Yaopeng (Tsinghua University)

Presenter: Mr ZHANG, Yaopeng (Tsinghua University)

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