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New results On Proton Tomography from Jefferson Lab

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Exclusive processes at high momentum transfer, such as Deeply Virtual Compton Scattering (DVCS) access the Generalized Parton Distributions (GPDs) of the nucleon. GPDs offer the exciting possibility of mapping the 3-D internal structure of protons and neutrons by providing a transverse image of the constituents as a function of their longitudinal momentum.

A vigorous experimental program is currently pursued at Jefferson Lab (JLab) to study GPDs through DVCS and meson production. New results from Hall A will be shown and discussed. Special attention will be devoted to the applicability of the GPD formalism at the moderate values of momentum transfer. In addition, we will report on results for L/T separated π^0 electroproduction cross sections off the proton, the neutron and the deuteron. A large transverse response for both the proton and neutron cases is found, pointing to a possible dominance of higher-twist transversity GPD contributions. For the first time, a flavor decomposition of the u and d quark contributions to the cross section will be shown.

We will conclude with a brief overview of additional DVCS experiments under analysis and planned with the future Upgrade of JLab to 12 GeV.

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