Contribution ID: **11** Type: **Talk in workshop 2: "AI & ML in nuclear science: starting with design, optimization, and operation of the machine and detectors, to data analysis"**

Constraining the GPD E: Deeply Virtual Compton Scattering off the neutron with CLAS12 at Jefferson Lab

Wednesday 29 October 2025 15:25 (25 minutes)

A key step toward a better understanding of the nucleon structure is the study of Generalized Parton Distributions (GPDs). GPDs are nowadays the object of an intense effort of research since they convey an image of the nucleon structure where the longitudinal momentum and the transverse spatial position of the partons inside the nucleon are correlated. Moreover, GPDs give access, via Ji's sum rule, to the contribution of the orbital angular momentum of the quarks to the nucleon spin. Deeply Virtual Compton scattering (DVCS), the electroproduction of a real photon off the nucleon at the quark level, is the golden process directly interpretable in terms of GPDs of the nucleon. The GPDs are accessed in DVCS mainly through the measurements of spin-dependent asymmetries. Combining measurements of asymmetries from DVCS experiments on both the neutron and the proton will allow performing the flavor separation of relevant quark GPDs via linear combinations of proton and neutron GPDs. This talk will give an overview of experiments aiming to constrain the GPD E, one of the least know GPDs. Focus will be directed towards the recently published neutron-DVCS measurements from the CLAS12 experiment at Jefferson Lab with the upgraded ~11 GeV CEBAF polarized electron beam. In particular, details on the measurement of Beam Spin Asymmetries from neutron-DVCS will be presented. The impact of the measurement on the extraction of the Compton form factor (CFF) E related to the GPD E of the neutron will be discussed. Further discussion will motivate the foreseen measurements with the CLAS12 experiment on a transversly polarized proton target aiming to extract the CFF E of the proton.

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Session Classification: Parallel Workshop 1