3D Partonic Structure of Nucleons and Light Nuclei

The generalized parton distributions (GPDs) framework opens a new avenue to explore the nature of the medium modifications at the partonic level, i.e., generalizing the EMC effect in terms of the GPDs. The first step in this direction has been performed by the CLAS collaboration during the 6 GeV era, where the bound proton deeply-virtual Compton scattering (DVCS) off ^{4}He is compared to the free proton. The results have indeed shown significant modification of the proton beam-spin asymmetry in ^{4}He. A new groundbreaking measurement of exclusive DVCS from the ^{4}He nucleus is a critical step towards providing similar 3D pictures of the partonic structure of nuclei, and provides a new approach to understanding the modifications of protons and neutrons within the dense environment of a nucleus. The ^{4}He nucleus is particularly important, as its partonic structure is encoded within a single chirally-even GPD, simplifying the extraction and the interpretation. These results have proven the experimental feasibility of measuring such nuclear exclusive reactions and led the way to the approval of a next generation nuclear physics program to be carried out using the upgraded CEBAF electron beam. In my talk I will be presenting the recent results and the future planned measurements using the upgraded setup of the CLAS12 spectrometer at Jefferson Lab.

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