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Accessing the Generalized Parton Distributions in the Valence Region at Jefferson Laboratory

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The generalized parton distributions (GPDs) describe the correlations between the transverse position and the longitudinal momentum of a parton inside the nucleon. They represent the next step toward a complete description of the nucleon in terms of quarks and gluons. They are accessible through deep exclusive processes among which we find the deeply virtual Compton scattering (DVCS) and the deep virtual meson production (DVMP). With its longitudinally polarized electron beam sent to fixed targets inside three experimental Halls, Jefferson Laboratory is a unique facility to probe the quarks and gluons in the valence region of the nucleon. The first experimental evidence of GPD sensitivity at Jefferson Laboratory was provided by measuring a non-zero beam spin asymmetry for photon electroproduction, arising from the interference between Bethe-Heitler and DVCS, in 1999 in the Hall B of Jefferson Laboratory. Then followed a complete experimental program dedicated to DVMP and DVCS in the different experimental Halls.
In this talk, we are going to introduce the GPDs and the information they encode about the inner structure of the nucleon. Then we are going to give an overview of the main deep exclusive processes results collected at Jefferson Laboratory and the information they have provided about the GPDs. Finally we will discuss the answers we can expect from the ongoing/future experimental program with the recently upgraded experimental Halls and the 12 GeV electron beam.

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