

Exclusive processes, factorization and parton distributions

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For a long time, it was believed that the fundamental constituents of atoms were electrons and nucleons until experiments conducted in the 1960s at Stanford Linear Accelerator Center (SLAC) proved the existence of internal degrees of freedom in the nucleons. These ones are called quarks and gluons, or collectively partons. With QCD as the fundamental theory for strong interactions, we can describe hadronic structure via correlators of partons giving rise to the so-called parton distribution functions (PDFs) and generalized parton distributions (GPDs). The non-elementary nature of hadrons makes these correlators perturbatively unsolvable so we can only measure or model them. On top of this, PDFs and GPDs appear when studying two different types of QCD processes: inclusive and exclusive. Among all known processes of these two types, there is an exclusive scattering named double deeply virtual Compton scattering (DDVCS) that allows to measure GPDs in their whole domain.

In this seminar, I review the differences between inclusive and exclusive processes with special attention to DDVCS for which my group and I have obtained a new analytical formulae useful to study its feasibility in JLab and EIC experiments.

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