

Probing the proton's correlated spatial structure through UPCs

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Generalized parton distributions (GPDs), probed through exclusive processes like deeply virtual Compton scattering, serve as indispensable tools in filling in the gaps of the angular momentum sum rules as well as mapping the partonic spatial structure of hadrons. In this work, we extend the utility of GPDs in mapping the proton's spatial structure beyond the typical one-body partonic picture, obtainable through Fourier transformations of GPDs to impact parameter space. Connecting two-body densities with the correlation functions that define double GPDs, we find that exclusive processes give access to relative distances and overlaps between partons. UPCs are an avenue for extracting such two-body densities from experiment.

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