

Nikola Crnković: Probing hadron structure through exclusive photon-meson photoproduction

Hadron structure is investigated through the study of hard exclusive processes, in particular the exclusive photoproduction of mesons on a nucleon. At high energies, these processes can be described within a perturbative framework, allowing for the factorization of short- and long-distance dynamics. This, in turn, enables access to hadron structure in terms of distribution amplitudes (DAs) and generalized parton distributions (GPDs). Unlike parton distribution functions encountered in deeply inelastic scattering, which provide a one-dimensional view of partons, GPDs offer the possibility of a three-dimensional (3D) picture of hadrons. Photon-meson (γM) photoproduction ($\gamma N \rightarrow \gamma M N'$) is studied as a promising channel for GPD analyses and is potentially measurable at current and future facilities. The present work focuses on the production of pseudoscalar mesons, with particular attention to gluon contributions in the description of flavour-singlet mesons (η').