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Generalized Parton Distributions Describing Partonic Orbital Angular Momentum¹ SIMONETTA LIUTI, University of Virginia, MICHAEL ENGELHARDT, New Mexico State University, ABHA RAJAN, University of Virginia, AURORE COURTOY, IFPA, AGO Department, Universite de Liege, Belgium — We discuss orbital angular momentum in QCD, in particular, its observability, and its partonic interpretation. Orbital momentum can be defined in QCD using two different decomposition schemes that yield a kinetic and a canonical definition, respectively. We argue that kinetic orbital angular momentum is intrinsically associated with twist three Generalized Parton Distributions (GPDs), and it is therefore readily observable in Deeply Virtual Compton Scattering experiments. On the other hand, canonical angular momentum is defined in terms of a Generalized Transverse Momentum Distribution (GTMD) and it can be therefore observed in scattering processes involving an additional hadronic reaction plane. A comparison between the two definitions can be performed by extending to GTMDs the techniques previously developed for lattice calculations of Transverse Momentum Distributions (TMDs) evaluating the matrix elements of quark bilocal operators containing a staple-shaped Wilson connection.

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