

Studies of Generalized Transverse Momentum Dependent gluon distributions at EIC and LHC

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Generalized Transverse Momentum Dependent parton distributions (GTMDs) encode information about both the transverse momentum and the coordinate dependence of quarks and gluons inside hadrons. GTMDs are hard to probe in experiments, but a few possibilities have been suggested. Gluon GTMDs are accessible via diffractive dijet production which can be explored at the Electron-Ion Collider (EIC), a future accelerator for high precision hadron tomography to be constructed in the U.S. Gluon GTMDs can also be accessed in Ultra-Peripheral Collisions (UPCs) at LHC. To facilitate the experimental study of GTMDs, we consider a model for gluon GTMDs based on an impact parameter dependent McLerran-Venugopalan model within the color glass condensate (CGC) framework. By introducing two free parameters, we fit the model to HERA's H1 data of diffractive dijet production in electron-proton collisions. We find that the model is consistent with the data with a small error band, allowing us to predict diffractive dijet in lepton production and photoproduction processes at the EIC. Conditions for UPC studies at the LHC will also be discussed.

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