Yoshikazu Hagiwara: A Unified Framework for Gluon GTMDs in the Small-x Regime

Understanding the high-energy structure of the nucleon requires a detailed multidimensional description of its constituent partons. Generalized Transverse Momentum Dependent parton distributions (GTMDs) offer the most comprehensive framework for characterizing single- parton dynamics. In the small-x regime, where gluon saturation becomes a defining feature of dense nuclear matter, this phenomenon is set to be explored at next-generation facilities such as the EIC and EicC. In this talk, we employ the Color Glass Condensate(CGC) formalism to describe gluon saturation and derive a unified treatment of gluon GTMDs directly from the dipole scattering amplitude. From this research, we can directly access GTMDs from the dipole scattering amplitude, thereby making them more accessible and providing a means to test the validity of the CGC formalism by verifying the equality among the GTMDs in the small-x limit.