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Studies of 3D Structure of the Nucleon

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The quark-gluon dynamics manifests itself in a set of non-perturbative functions describing all possible spin-spin and spin-orbit correlations. The Transverse Momentum Dependent parton distributions (TMDs) and Generalized Parton Distributions (GPDs) carry information not only on the longitudinal but also on the transverse momentum and position of partons, providing rich and direct information on the orbital motion of quarks. Single and Dihadron semi-inclusive and hard exclusive production, both in current and target fragmentation regions, provide a variety of spin and azimuthal angle dependent observables, sensitive to the dynamics of quark-gluon interactions. Studies of the 3D PDFs are currently driving the upgrades of several existing facilities (JLab, COMPASS and RHIC), and the design and construction of new facilities worldwide (EIC, FAIR, and JPARC).

In this talk, we present an overview of the current status and some future measurements of the orbital structure of nucleons at Jefferson Lab.

Preferred track

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