

Partonic Angular Momentum and Spin Orbit Correlations

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Abstract

We present a framework to study the quark Orbital Angular Momentum OAM component of the proton spin, including the spin orbit interaction term. As shown recently in [1], quark OAM can be described in terms of either a Generalized Transverse Momentum Distribution (GTMD), or a twist three GPD, the two distributions being connected through a Lorentz Invariance Relation. A similar relation exists for the spin orbit component. We will discuss how the proposed framework allows one to connect experimental measurements of orbital angular momentum with lattice QCD calculations and theoretical models. Our presentation will also include a discussion of the gauge link structure in both the Jaffe Manohar and Ji definitions of OAM.

[1] A. Rajan, A. Courtoy, M. Engelhardt and S. Liuti, arXiv:1601.06117 [hep-ph].