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Understanding the large transverse momenta in SIDIS

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In recent years the measurements of spin and azimuthal asymmetries (SSAs) in final state hadronic distributions in semi-inclusive processes have been widely used to access the underlying Transverse Momentum Dependent (TMD) parton distributions. The detailed understanding of the orbital structure of partonic distributions, encoded in TMD PDFs has been widely recognized as one of the key objectives of the JLab 12 GeV upgrade, and a driving force behind the construction of the Electron Ion Collider.
Although the interest to TMD PDFs has grown enormously, we are still in need of fresh theoretical and phenomenological ideas, and one of the most challenging items remains the transverse momentum dependence of various observables at relatively large transverse momenta, where the non-perturbative contributions still dominate.
In this talk, we present an overview of the latest studies of hadronic multiplicities and SSAs in SIDIS, and discuss the possible sources of disagreement of experimental data with predictions based on the current TMD formalism.

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