

Nucleon Tomography with 0-jettiness

We propose a novel strategy to systematically isolate the nucleon's intrinsic non-perturbative three-dimensional structure by employing 0-jettiness to suppress initial-state radiation in transverse momentum-dependent (TMD) observables. Applying this method to transverse single spin asymmetries (SSAs) in W^\pm and Z^0 boson production at RHIC, we demonstrate a substantial enhancement of the asymmetry signal, enabling a more definitive test of the predicted sign change of the Sivers function—a key prediction of TMD factorization. We further explore its applicability to spin-dependent measurements at the Electron-Ion Collider. Our analysis is formulated within a joint resummation framework that systematically resums large logarithms associated with both the veto scale and the gauge boson's transverse momentum.

Primary authors: 方, 申 (复旦大学); LIN, shuo (Shandong University); SHAO, Dingyu (Fudan University); ZHOU, jian (Shandong University)

Presenter: LIN, shuo (Shandong University)

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