

A Better Angle on Hadron Transverse Momentum Distributions at the EIC

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We propose an observable q_* sensitive to transverse momentum dependence (TMD) in $eN \rightarrow ehX$, with q_*/E_N defined purely by lab-frame angles. In 3D measurements of confinement and hadronization this resolves the crippling issue of accurately reconstructing small transverse momentum P_{hT} . We prove factorization for $d\sigma_h/dq_*$ for $q_* \ll Q$ with standard TMD functions, enabling q_* to substitute for P_{hT} . A double-angle reconstruction method is given which is exact to all orders in QCD for $q_* \ll Q$. q_* enables an order-of-magnitude improvement in the expected experimental resolution at the EIC.

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