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Determination of unpolarized TMD distributions from the fit of Drell-Yan and SIDIS data at N4LL

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Abstract

We present a fit of the transverse momentum spectrum for Drell-Yan and semi-inclusive deep inelastic scattering (SIDIS) data based on transverse momentum dependent (TMD) factorization at N^4LL accuracy. Our analysis shows good agreement with the data and confirms the findings of previous studies. Based on this, we extract the unpolarized TMD parton distribution functions, TMD fragmentation functions, and the Collins-Soper kernel. Compared to earlier works, our study incorporates several improvements, including large- x resummation, flavor and fragmentation function dependence, among others. Additionally, we supplement our extraction with an analysis of the transverse momentum moments of the extracted distributions.

