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Flavor dependence of TMDs

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In global extractions of Transverse momentum dependent (TMD) distributions, the limit of small transverse distances is constrained using the matching to collinear parton density functions (PDF). Naturally, the TMD-PDFs depend on the baseline PDF set used certain features of the former might be due to the latter, rather than genuinely due to TMD behaviour f the partons. To shed light on the issue, we study the influence of the PDF choice on the determination of unpolarized TMDPDFs and the description of TMD Drell-Yan-pair and Z-boson production data. We find that the selection of a PDF essentially biases the extraction of TMDPDFs, impacting the quality and shape of the distributions. This bias is alleviated once the PDF uncertainty is taken into account, making the non-perturbative TMD profile is flavor-dependent. This drives an improvement of the agreement between theory and experiment, substantially increase the uncertainty in extracted TMD distributions, and should be taken into account in future global analyses.

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