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One-loop matching for leading-twist generalised transverse-momentum- dependent distributions

by V. Bertone, M. G. Echevarria, Ó. del Río and S. Rodini

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Plaza de las Ciencias, 1 28040 Madrid, Spain

www.ucm.es/iparcos/



UNIVERSIDAD
COMPLUTENSE
MADRID



Abstract

We present the one-loop matching coefficients necessary to match all of the leading-twist generalised transverse-momentum-dependent distributions (GTMDs) onto generalised parton distributions (GPDs). Matching functions are extracted by computing the first radiative corrections to partonic bi-local correlators with staple-like Wilson lines, as appropriate for high-energy collisions. These correlators are characterized by transverse displacement and skewed kinematics. Using the proton helicity basis, the corresponding hadronic correlators are parameterised in terms of GTMDs, which are subsequently related to leading-twist GPDs. Our results provide new insights into the complex dynamics of GTMDs generated by radiative corrections. In particular, we show that parity-even and parity-odd contributions to GTMDs, in the so-called ERBL region, mix both under matching and evolution. Finally, we present numerical results by implementing our results to reconstruct realistic GTMDs from GPDs.

