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# TMD factorisation for diffractive jets in photon-nucleus interactions

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Using the colour dipole picture and the colour glass condensate (CGC) framework, we systematically study the diffractive production of two (quark-antiquark) and three (quark, antiquark, and gluon) jets via coherent photon-nucleus interactions at high energy. We focus on the hard scattering regime where at least one of the transverse momentum scales in the problem (the photon virtuality and/or the relative transverse momentum of two of the produced jets) is much larger than the saturation momentum $Q_s$ of the nuclear target. We argue that, despite this hardness, the cross-sections for all these processes are controlled by large dipole configurations, with transverse size $R \sim 1/Q_s$, which undergo strong scattering. We demonstrate that these dominant contributions admit factorisations in terms of the quark or gluon diffractive transverse-momentum dependent distributions (TMDs) of the Pomeron. These diffractive TMDs have support at transverse momenta $k_\perp \leq Q_s$ and vanish as a power of $1 - x$ when the parton splitting fraction $x$ approaches to unity. Their dependence upon the longitudinal momentum fraction of the Pomeron $x_{\mathbb{P}}$ is controlled by the BK/JIMWLK equations of the CGC. By integrating over $k_\perp$ up to the hard scale, we deduce explicit results for the respective diffractive PDFs and structure functions.

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