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Small-x behavior of TMD gluon distributions in the Color Glass Condensate

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We study the operator structure of the unpolarized transverse-momentum-dependent (TMD) gluon distributions in the cross section for forward dijet production in dilute-dense collisions. At finite N_c , there are total of eight TMD gluon distributions for this process, including the dipole distribution and the Weizsacker-Williams gluon distribution. For each of these functions we derive their operator definitions at small-x as correlators of Wilson lines. We demonstrate their equivalence to the operator structure of the Color Glass Condensate (CGC) cross section in the nearly back-to-back limit, and we show that the correlation limit of the CGC cross section is equivalent to the small-x limit of the TMD factorization formula, at finite N_c . We obtain an analytical result for the gluon distributions in the Golec-Biernat-Wusthoff model, their perturbative behavior at large transverse momentum in the McLerran-Venugopalan model, and, numerically, their JIMWLK evolution towards small x. We observe geometric scaling regime for all the TMDs after some evolution.

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