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Heavy quark production in unpolarized eA and pA scattering: the role of gluon polarization

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Expanding the work done in Marquet, Petreska and Roiesnel (2016), we use the Color Glass Condensate (CGC) to study the production of forward heavy di-jets both in DIS on a nucleus and in pA collisions in the small-x regime. In the correlation limit, in which the jets are nearly back-to-back in the transverse plane, the CGC result coincides with the one in the transverse-momentum dependent (TMD) factorization approach. This allows us to extract the small-x limit of the well-known Weizsäcker-Williams gluon distribution (in both the eA and the pA case) as well as two extra gluon TMDs (for pA collisions). Interestingly, in the case of heavy quarks, each of these three different gluon TMDs is accompanied by a partner that describes the linearly polarized gluon content of the hadron. We end up with six different gluon TMDs, that we can calculate in the McLerran-Venugopalan model and evolve towards smaller Bjorken-x with a numerical implementation of the JIMWLK evolution equations.

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