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Sudakov suppression and gluon saturation at NLO

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We study inclusive dijet production in deep inelastic scattering at NLO within the Color Glass Condensate effective field theory. We begin by studying this process in general small- x kinematics. We first show that the differential cross-section is infrared and collinear safe. We demonstrate the factorization of large rapidity logarithms that can then be resummed via JIMWLK renormalization, and we extract the NLO impact factor for which we provide explicit expressions.

We then specialize in the transverse back-to-back kinematics where this process is sensitive to unpolarized and linearly polarized parts of the Weizsäcker-Williams (WW) gluon distribution. We isolate in the impact factor the large Sudakov double and single logarithms at finite N_c . We show that small- x and Sudakov resummation can be performed simultaneously provided that the small- x evolution of the WW distribution, formulated in terms of the projectile rapidity, is amended by a kinematic constraint that imposes lifetime ordering of successive gluon emissions. We also comment on non-logarithmically enhanced terms in the impact factor that can break TMD factorization at NLO in the saturation regime.

Refs:

- [1] P. Caucal, F. Salazar and R. Venugopalan, JHEP 2021 (11), 1-108 18,2021
- [2] P. Caucal, F. Salazar, B. Schenke and R. Venugopalan, arXiv:2208.13872

Declaration

I certify that I have checked that I am authorised to submit the abstract with the listed co-authors with their current affiliations

Change of Speaker

I understand that change of speaker is allowed provided that no participant gives more than one talk. Otherwise, we will ask the speaker to choose between one or the other abstract to be presented.

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