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Forward dijet production and improved TMD factorization in dilute-dense hadronic collisions

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We study inclusive dijet production at small x in hadronic collisions. We show that the commonly used High Energy Factorization approach can be motivated in this context in a specific window where the transverse momentum imbalance of the dijet system is much smaller than the transverse momenta of the individual jets, but still much larger than the saturation scale. Then we extend the framework outside this kinematic window to the case of arbitrarily small transverse momentum imbalance. That involves generalizing the Transverse Momentum Dependent (TMD) factorization formula for dijet production to the case of finite Nc and with one of the incoming gluons being off-shell. We discuss the features of this new improved TMD factorization and relate it to the colour-ordered amplitude formalism.

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