

A unified derivation of JIMWLK, DGLAP, and CSS evolution from one-loop corrections to the Weizsäcker–Williams gluon distribution

Monday, 27 April 2026 16:00 (60)

Azimuthal correlations in inclusive dijet production in electron–nucleus collisions provide a powerful and direct probe of the Weizsäcker–Williams (WW) gluon transverse-momentum dependent (TMD) distribution in nuclei. In particular, at small Bjorken x , this observable is a key tool to investigate gluon saturation at the future Electron–Ion Collider (EIC). To reliably extract the WW gluon TMD and the associated saturation scale from future measurements, high theoretical precision is essential, including a consistent treatment of quantum evolution effects across different kinematic regimes.

In this talk, I revisit the calculation of next-to-leading order (NLO) corrections to dijet production at small x . Focusing on the back-to-back limit, I present a complete result for real NLO corrections associated with gluon radiation outside the jet cones. The result preserves TMD factorisation, with the same hard factor as at leading order, multiplying the one-loop correction to the WW gluon TMD at small x . By exploring different kinematic regimes, I show how the calculation naturally incorporates the relevant quantum evolution effects, unifying small- x , Collins-Soper-Sterman, and collinear dynamics. In the dilute limit, the result also connects to the unintegrated gluon distribution of the target and provides access to transverse-momentum dependent gluon splitting function.

Presenter(s) : CAUCAL, Paul (SUBATECH, Universite de Nantes, France)