



Contribution ID: 30

Type: **not specified**

TMD factorization: Bridging large x and small x

Tuesday, 28 May 2024 11:00 (30 minutes)

QCD factorization takes on different forms in the large- x and the small- x regimes. In the large- x motivated collinear factorization, one gets the DGLAP evolution equation, whereas, in the small- x motivated rapidity factorization, the BFKL equation is the major player. To unify different regimes, a new TMD factorization based on the background field method is proposed, which not only reduces to CSS and DGLAP in the large- x limit and BFKL in the small- x limit, but also defines a general evolution away from these regimes. Such a factorization has the potential to significantly advance our comprehension of high-energy processes and the three-dimensional structure of hadrons.

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Session Classification: Tuesday