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TMD factorization: Bridging large x and small x

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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.

Primary authors: Dr TARASOV, Andrey (North Carolina State University); TIWARI, Shaswat (North Carolina State University); MUKHERJEE, Swagato (Assistant Physicist); Dr SKOKOV, Vladimir (North Carolina State University)

Presenter: TIWARI, Shaswat (North Carolina State University)

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