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Diffractive single and di-hadron production at NLO in a saturation framework

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The center-of-mass energies available at modern accelerators, such as the Large Hadron Collider (LHC), and at future generation accelerators, such as the Electron-Ion Collider (EIC) and Future Circular Collider (FCC), offer us a unique opportunity to investigate hadronic matter under the most extreme conditions ever reached. One of the most intriguing phenomena of strong interaction is the so-called gluon *saturation* in nucleons and nuclei. In the saturation regime, the density of partons, per unit transverse area, in hadronic wavefunctions becomes very large leading to non-linear effects, that are described by the Balitsky-JIMWLK hierarchy of equations.

Pursuing the goal of obtaining accurate theoretical predictions to test the physics of saturation, we compute the cross-sections of diffractive single and double hadron photo- or electroproduction with large p_T, on a nucleon or a nucleus at next-to-leading logarithmic accuracy. We employ a hybrid formalism mixing collinear factorization and high energy small-x factorization. This new class of processes provides an access to precision physics of gluon saturation dynamics, with very promising future phenomenological studies at the EIC, or, at the LHC in pA and AA scattering, using Ultra Peripheral Collisions (UPC).

Collaboration / Activity

None

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