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## Ultra-forward particle production from CGC+Lund fragmentation

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We present an analysis of LHC data on ultra-forward inclusive hadron production in proton-proton and proton-nucleus collisions. The probed kinematical regime features the onset of gluon saturation effects controlled by a perturbative momentum scale  $Q_s$ . The assumption of a partonic spectrum dominated by gluon saturation of the target, which we describe with a BK-evolved unintegrated gluon distribution, allows us to use a Monte-Carlo event generator combining a perturbative approach to parton production based on the Color Glass Condensate (CGC) formalism with an implementation of hadronization in the framework of the Lund string fragmentation model. Through this approach we achieve a good description on transverse momentum spectra of charged particles as well as neutral pions at RHIC and LHC energies, and nuclear modification factors for proton-lead collisions at LHC. Being forward particle production of key importance in the development of air showers, we stress that this approach allows for a theoretically controlled extrapolation of our results to the scale of ultra-high energy cosmic rays, thus serving as startpoint for future works on this topic.

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