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Particle multiplicities in the central region of high-energy collisions from k_T-factorization with running coupling corrections

Horowitz and Kovchegov have derived a k_T-factorization formula for particle production at small x which includes running coupling corrections. We perform a first numerical analysis to confront the theory with data on the energy and centrality dependence of particle multiplicities at midrapidity in high-energy p+A (and A+A) collisions. Moreover, we point out a strikingly different dependence of the multiplicity per participant on $N_{\rm part}$ in p+Pb vs. Pb+Pb collisions at LHC energies, and argue that the observed behavior follows rather naturally from the convolution of the gluon distributions of an asymmetric vs.symmetric projectile and target.

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