

Gluon saturation and particle production at LHC

In high density QCD the hadron production stems from decay of mini-jets that have the transverse momenta of the order of the saturation scale. I will show that this idea is able to describe in a unique fashion the first data from the LHC for the inclusive charged-hadron production in pp collisions, the deep inelastic scattering at HERA at small Bjorken-x, and the hadron multiplicities in AA collisions at RHIC. Recently reported data from ALICE, CMS and ATLAS including inclusive charged-hadron transverse-momentum and multiplicity distribution in pp collisions are well described in our approach. We provide quantitative predictions for the rapidity, centrality and energy dependencies of inclusive charged-hadron productions for the LHC in AA collisions based on the idea of gluon saturation in the color-glass condensate framework. I will also discuss the importance of saturation/shadowing effects in pA collisions at LHC.

My talk is partly based on the following papers:

E. Levin and A. H. Rezaeian, arXiv:1007.2430(submitted to PRD);

E. Levin and A. H. Rezaeian, arXiv:1005.0631 (PRD 82, 014022,2010);

A. H. Rezaeian and A. Schaefer, arXiv:0908.3695 (PRD 81,114032,2010).

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Track Classification: Saturation