

Color Glass Condensate signatures at RHIC and LHC

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Deeply inelastic scattering (DIS) experiments at HERA demonstrated a rapid growth of gluon density inside a proton at small momentum fraction (x). In the framework of parton model this growth is interpreted in terms of linear gluon bremsstrahlung and predicted to saturate due non-linear processes such as gluon recombination or screening. Due to these two competing processes hadron becomes maximally occupied with gluon modes of momentum scale called the saturation scale. For small enough x , this dynamically generated scale is so large that a weak coupling effective theory called the “Color Glass condensate (CGC)” can be formulated assuming a classical description of the high occupancy states. The CGC description is universal to both hadrons and nuclei at high energies which corresponds to the small x limit (Regge-Gribov) of QCD. The framework of CGC provides an ab initio description of the multi-particle production in both DIS and hadronic/heavy ion collisions. Significant progress has been made in this framework to provide a state-of-the-art modelling of the early dynamics of heavy ion collisions. In this talk a brief review of the framework will be followed by some recent phenomenological developments.

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