Inclusive Gluon Production in DIS at High Parton Density

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Abstract

We calculate the cross section of a single inclusive gluon production in deep inelastic scattering at very high energies in the saturation regime, where the parton densities inside hadrons and nuclei are large and the evolution of structure functions with energy is nonlinear. The expression we obtain for the inclusive gluon production cross section is generated by this nonlinear evolution. We analyze the rapidity distribution of the produced gluons as well as their transverse momentum spectrum given by the derived expression for the inclusive cross section. We propose an ansatz for the multiplicity distribution of gluons produced in nuclear collisions which includes the effects of nonlinear evolution in both colliding nuclei.