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Photon from the Color Glass Condensate in the pA collision

Saturday, 24 September 2016 15:00 (20 minutes)

In this contribution I will talk about our recent results on photon production from the Color Glass Condensate (CGC) in the high energy pA collision. The nucleus is considered as a dense source of soft gluons while the proton is more dilute. This allows a systematic expansion of the amplitude in the powers of the gluon density of the proton.

The zeroth order approximation comes from bremsstrahlung of valence quarks in the proton and was originally calculated by Gelis and Jalilian-Marian (PRD D66 (2002) 014021). The first order corrections has two processes with the soft gluons in the proton emitting a quark-antiquark pair. In the first process the pair subsequently annihilates to a photon, while the second is of a bremsstrahlung type with the quark-antiquark pair and the photon in the final state.

The main results I will report on are:

1. The full analytic formula for the photon rate, that is, taking into account the annihilation as well as the bremsstrahlung process.
2. The numerical evaluation of the photon rate for the annihilation process by using the McLerran-Venugopalan model for the color average through which the rate becomes characterized by the saturation scale.

These results are partially contained in arXiv:1602.01989.

Summary

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Presentation type

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