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Inclusive photon production in high energy pA collisions from the Color Glass Condensate

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We compute a formula for the inclusive photon production cross section for high energy p+A collisions in the the $q \rightarrow q \gamma$ and $g \rightarrow q \bar{q} \gamma$ channels (in the background field of the nucleus) using the Color Glass Condensate (CGC) formalism. We successfully demonstrate that the cross section has only factorizable final-state collinear divergences. The latter are isolated thus contributing to the photon fragmentation contribution in the \overline{MS} scheme and in both channels. Combined with the direct photon contribution, the obtained result is suitable for comparison with the data from RHIC and the LHC at mid rapidities and photon transverse momenta of a few GeV.

Author: PERKOV, Anton (University of Zagreb, Faculty of Science)

Presenter: PERKOV, Anton (University of Zagreb, Faculty of Science)