

Photon jet angular correlations in p+A collisions at central rapidities

Tuesday 20 March 2018 12:00 (30 minutes)

We report on a recent computation [1] of the semi-inclusive photon-jet angular correlations in high energy $p + A$ collisions at the next-to-leading order (NLO) in the Color Glass Condensate framework. The NLO result considers the $p + A \rightarrow q\bar{q}\gamma$ channel appropriate at central rapidities. We focus on the nearly back-to-back photon-jet configurations and find the leading-order $p + A \rightarrow q\gamma$ contribution to be suppressed relative to the NLO. Integrating over the quark phase space at NLO we obtain an analytic expression for the $p + A \rightarrow q\gamma + X$ cross section and identify the corresponding transverse momentum gluon distributions. We find explicit expressions for the angular harmonics $\langle \cos n\phi \rangle$ with ϕ as the angle between the net and the average photon-jet transverse momentum and provide numerical estimates on their transverse momentum dependence and sensitivity to the saturation scale.

[1] S. Benic, A. Dumitru, Phys.Rev. D97 (2018) no.1, 014012.

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