Contribution ID: **135** Type: **oral**

Particle production beyond eikonal accuracy in dilute-dense CGC framework

Tuesday 12 January 2021 17:40 (20 minutes)

Within the Color Glass Condensate effective theory, most observables are computed by adopting the eikonal approximation. At asymptotic energies, this corresponds to treating the dense target as an infinitely thin shockwave. However, finite longitudinal width corrections to the shockwave approximation might be important at realistic energies. In such a case, the propagation of a parton through the medium is defined by a background propagator that follows a Brownian trajectory. In previous works [1,2] we used the two gluon exchange approximation - called glasma graphs -on the propagators to compute particle production and correlations in pp collisions. In order to extend the calculation to dense targets, thus in proton-nucleus collisions, here we propose a new way to compute correlators of two background propagators by discretizing the path integrals and using a localized version of the GBW model at each discretized step. We compare our result with the multiple soft scattering approximation applied in jet quenching calculations and apply them to single inclusive gluon production.

[1] P. Agostini, T. Altinoluk and N. Armesto, Eur.Phys.J.C 79 (2019) 7, 600, e-Print: 1902.04483 [hep-ph].

[2] P. Agostini, T. Altinoluk and N. Armesto, Eur.Phys.J.C 79 (2019) 9, 790, e-Print: 1907.03668 [hep-ph].

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Session Classification: CGC

Track Classification: Physics at low-x and gluon saturation