

Color Class Condensate from electron-proton DIS to proton-nucleus collisions

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The Color Class Condensate offers a consistent framework to describe high-energy (small- x) data from various experiments. The non-perturbative input for these calculations, the dipole-target amplitude at initial Bjorken- x , is obtainable from electron-proton deep inelastic scattering processes. Once that is known, one can compute, for example, single and double inclusive particle production in proton-proton and proton-nucleus collisions. Proton-nucleus collisions are especially interesting as the saturation scale is expected to scale as $A^{1/3}$, making saturation phenomena easier to observe in pA than pp collisions.

We discuss how tightly the electron-proton DIS data constrains the initial condition for the dipole amplitude and how the LHC single inclusive spectra can be used to further test the CGC picture. Then using only information from DIS experiments we generalize the dipole amplitude to nuclear targets and compute particle production in proton-nucleus collisions [1]. We present predictions for the nuclear suppression factor R_{pA} at forward rapidities and compare with pQCD calculations. We also discuss how the back-to-back structure of the forward dihadron production cross section is modified when moving from proton-proton to proton(deuteron)-nucleus collisions, as naturally understood in the CGC [2].

References:

- [1] T. Lappi, H. Mäntysaari, in progress
- [2] T. Lappi, H. Mäntysaari, Nucl. Phys. A908 (2013) 51-72

Keywords

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