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DIS structure functions at low x in the dipole factorization: including massive quarks at NLO

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Deep Inelastic Scattering (DIS) is the cleanest tool available to probe the content of a fast proton or nucleus. In the regime of low Bjorken x, one enters in the nonlinear regime of gluon saturation, where the gluons are better described within the framework of Color Glass Condensate (CGC) and the dipole factorization. This framework allows to resum coherent multiple scattering on the target, and also to resum the high-energy leading logarithms (LL).

So far, phenomenological studies have been performed successfully at LO + LL resummation in the dipole factorization using HERA data for proton DIS. However, in order to reach precision, NLO corrections with massive quarks (which is known to be sizable in DIS at NLO) should be included as well as high-energy NLL resummations. This is important not only to extract as much knowledge as possible out of the HERA data, but also in prevision of future electron-proton and/or electron-nucleus colliders.

In this talk, we will discuss the calculation of the massive quark contribution to the NLO corrections to DIS structure functions on a dense target in the dipole factorization picture. In particular, we will present the complete result for the longitudinal structure function at NLO including massive quarks in that setup.

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