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Quarkonium production with soft gluon radiation in the CGC framework

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We study initial soft gluon radiation effect on quarkonium production at low transverse momentum in the color glass condensate (CGC) framework.

In high energy pp (pA) collisions, the quarkonium production at forward rapidity can be described by adopting usual collinear pdf for dilute proton and the dipole gluon distribution function for dense proton (nucleus) [1].

The small- x quantum correction is embedded in the dipole amplitude which follows the BK equation with running coupling effect (rcBK).

In the CGC framework, the parton saturation is expected to characterize the low- $P_{\perp}$ spectrum.

Meanwhile, the initial soft gluon radiation also can affect the low- $P_{\perp}$ spectrum [2].

Therefore, in order to study the parton saturation quantitatively, both the small- x resummation and the low- $P_{\perp}$ resummation have to be considered simultaneously.

In this talk, we consider the Sudakov factor associated with the initial soft gluon resummation by following the Collins-Soper-Sterman (CSS) formalism [3].

We will present some numerical results of quarkonium production at the LHC including both the small- x resummation and the low- $P_{\perp}$ resummation.

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