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## b-CGC versus IP-Sat and combined HERA data

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We confront the Impact-Parameter dependent Color Glass Condensate dipole (b-CGC) model to the recently released high precision combined HERA data and obtain its parameters. The b-CGC results are then compared to data at small- $x$  for the structure function, the longitudinal structure function, the charm structure function, exclusive vector meson ( $J/\psi$ ,  $\phi$ ,  $\rho$ ) production and Deeply Virtual Compton Scattering (DVCS). We also compare our results with the Impact-Parameter dependent Saturation model (IP-Sat) which has also been recently updated with the combined HERA data. The b-CGC and the IP-Sat models have also been applied to proton-proton and proton-nucleus collisions and provide the basis for modeling initial conditions in heavy ion collisions.

We show that most features of inclusive DIS and exclusive diffractive data, including the  $Q^2$ ,  $W$ ,  $|t|$  and  $x$  dependence are correctly reproduced in both models. Nevertheless, the b-CGC and the IP-Sat models give different predictions beyond the current HERA kinematics, namely for the structure functions at very low  $x$  and high virtualities  $Q^2$ , and for the exclusive diffractive vector meson and DVCS production at high  $t$ . We show that both models give approximately similar saturation scale  $Q_{S < 1} \text{ GeV}$  for the proton in HERA kinematics, and also both models lead to the same conclusion that the typical impact-parameter probed in the total  $\gamma^*p$  cross-section is about  $\approx 2 \div 3 \text{ GeV}^{-1}$ . We provide some predictions for future electron-proton colliders.

This talk is mainly based on: A. H. Rezaeian and I. Schmidt, Phys. Rev. D88, 074016 (2013) [arXiv:1307.0825].

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