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Holographic approach to gluon densities of hadrons at small x

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We present our recent analysis on the nucleon and pion gluon distribution functions in the framework of holographic QCD, focusing on the small Bjorken x region. Based on an approximate relation, the gluon distributions are extracted from structure functions of the unpolarized deep inelastic scattering which can be calculated with a holographic QCD model, assuming the Pomeron exchange in the five-dimensional AdS space. All the adjustable parameters included in the model are determined with the HERA data of the proton structure functions. We show that the extracted proton gluon distribution is consistent with results of the known global QCD analysis. The structure functions of the pion can be computed without any additional parameter, which enables us to predict its gluon distribution also. We find that the resulting pion gluon density is smaller than the proton's, and agrees with the recent global QCD analysis result within the uncertainties.

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