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Type: **Theory**

Production of hadrons in proton-nucleus collisions: from RHIC to LHC

We study nuclear effects in production of large- $p_{\{T\}}$ hadrons on nuclear targets at different energies corresponding to RHIC and LHC experiments.

For calculations we employ the QCD improved parton model including the intrinsic parton transverse momenta and nuclear broadening. This model is firstly tested reproducing well the data on $p_{\{T\}}$ spectra of hadrons produced in proton-proton and proton-nucleus collisions at different energies.

Besides nuclear modification of parton distribution functions we observe that the complementary effect of initial state interaction causes rather strong nuclear suppression at large $p_{\{T\}}$ and forward rapidities violating so the QCD factorization.

Numerical results for nucleus-to-nucleon ratios are compared with available data from experiments at RHIC and LHC.

We perform also predictions for nuclear effects in production of high- $p_{\{T\}}$ hadrons at forward rapidities which are expected to be measured in the future at LHC.

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