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Low-mass Drell-Yan measurements with the upgraded ALICE detector

The measurement of the Drell-Yan (DY) production at forward rapidity in proton-proton (pp) collisions at the LHC with the upgraded ALICE detector in Run 3 provides a unique tool for probing the PDFs and partonic structure of hadrons and nuclei. There is a lack of a hard and clear probe of nuclear matter at relatively small Bjorken- x (down to 10^{-5}), which could provide information about initial stages in collisions involving heavy ions. In principle, the nuclear PDFs (nPDFs) are not well known for $x < 10^{-4}$. The low-mass DY dimuon ($M_{\mu^+\mu^-} > 4 \text{ GeV}/c^2$) measurements at forward rapidity with the upgraded ALICE detector will allow us to gain knowledge about small- x physics at the LHC. These measurements in pp collisions will serve as a reference for the future proton-lead (p-Pb) data. Moreover, in p-Pb collisions, at very small x , the ratio of the nuclear modification factors (R_{pPb}) of DY and J/ψ can provide important constraints on gluon densities. In this contribution, the comparison of the ALICE pp experimental data with Monte Carlo simulations based on the POWHEG box combined with Pythia8 will be presented. The mass and transverse momentum distributions of the $\mu^+\mu^-$ pair will be shown along with other background contributions.

Category

Experiment

Collaboration (if applicable)

The ALICE Collaboration

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