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Measurements of inclusive charmonium production at midrapidity in pp collisions at $\sqrt{s}$ = 13.6 TeV with ALICE

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Charmonium is a bound state of a charm and an anti-charm quark and its production process can be factorized into two stages: the heavy quark production and the formation of the bound state. The former happens within initial hard parton-parton scatterings with large momentum transfers, and can be well described by perturbative quantum chromodynamics (QCD). The second one, which involves long distances and soft momentum scales, is a typical non-perturbative process. Measurements of J/ψ and ψ(2S) cross section in pp collisions are crucial for studying charmonium production mechanisms and testing different QCD-based model calculations. They can also provide a reference for investigating the quark-gluon plasma formed in nucleus-nucleus collisions and the cold nuclear matter effects in proton-nucleus collisions.

In this poster, the results of inclusive J/ψ production cross section as well as the ψ(2S)-to-J/ψ ratios as functions of p_{T} and rapidity at midrapidity ($|y| < 0.9$) in pp collisions at the center-of-mass energy of $\sqrt{s}$ = 13.6 TeV will be shown. The analysis is based on the data collected by the upgraded ALICE detector during LHC Run 3, which offers a significantly larger data sample compared to Run 1 and 2.

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