

Measurements of charmonia production in p+p collision at $\sqrt{s} = 510$ and 500 GeV at the STAR experiment

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Abstract

Quarkonium states produced in heavy-ion collisions serve as essential probes in studying the Quark-Gluon Plasma. It requires a good understanding of quarkonium production mechanism when interpreting the observed quarkonium suppression in heavy-ion collisions. There are several popular models on the market for describing quarkonium production, such as the Color Singlet Model, the Color Evaporation Model, the nonrelativistic QCD (NRQCD) formalism including also the Color Octet Mechanism, and the Color Glass Condensate + NRQCD formalism. Precise measurements of quarkonium spectrum from low to high transverse momentum can provide important tests of the models and deepen our understanding of the quarkonium production mechanism in p+p collisions.

STAR is one of the running heavy-ion experiments in the world and provides a large acceptance coverage to study quarkonium production at mid-rapidity. In this presentation, we will present the latest results and progress of measuring production cross sections of J/ψ and $\psi(2S)$ from the STAR experiment in $\sqrt{s} = 510$ and 500 GeV p+p collisions.