

# **J/ $\psi$ production measurements in p+p and p+A collisions at $\sqrt{s_{NN}} = 200$ GeV through the di-muon channel at STAR**

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Quarkonium production is an important tool to study the properties of the Quark-Gluon Plasma (QGP) formed in relativistic heavy-ion collisions. In particular, suppression of the J/ $\psi$  meson production due to the color-screening effect was proposed as a direct evidence of the QGP formation. However, interpretation of the J/ $\psi$  suppression in heavy-ion collisions requires knowledge of cold nuclear matter effects and will benefit from a better understanding of the J/ $\psi$  production mechanism. By comparing J/ $\psi$  production cross-section and polarization in p+p and p+Au collisions, the cold nuclear matter effects can be studied in detail. Moreover, J/ $\psi$  polarization is sensitive to the J/ $\psi$  production mechanism, and its measurement can help distinguish among different models.

The STAR experiment at RHIC recorded large samples of p+p and p+Au collisions at  $\sqrt{s_{NN}} = 200$  GeV for charmonium studies utilizing the trigger provided by the Muon Telescope Detector. In this talk, we will present the recent measurements of the J/ $\psi$  production in p+p collisions. The results will be compared to model calculations. Furthermore, we will present measurements of the nuclear modification factor for J/ $\psi$  over a broad kinematic range in p+Au collisions, to quantify the cold nuclear matter effects.

## **Abstract Type**

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