

Measurement of J/ψ Meson Polarization at Forward Rapidity in $p + p$ Collisions at $\sqrt{s} = 510\text{GeV}$ by the PHENIX Experiment at RHIC

While the study of charmonium production provides a unique opportunity to access basic QCD dynamics, the exact production mechanisms are not yet fully understood. Many different models can adequately describe the cross-section and transverse momentum (p_T) distribution of charmonium produced in proton-proton collisions, but predict different polarization. Thus, charmonium polarization measurement can provide a stringent test for various theoretical models of charmonium production.

The PHENIX experiment at RHIC has measured polarization of J/ψ mesons produced in $p + p$ collisions at $\sqrt{s} = 510\text{GeV}$ at forward rapidity ($1.2 < y < 2.2$). The measurement was performed in several reference frames (Helicity, Collins-Soper, and Gottfried-Jackson), and includes the results for polar, azimuthal and frame-independent polarization coefficients as a function of transverse momentum. The results will be compared to the theoretical predictions provided by non-relativistic QCD models and to results from other experiments.

Preferred Track

Quarkonia

Collaboration

PHENIX

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