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## PHENIX measurement of $J/\psi$ polarization via decay di-electron pairs produced in p+p collisions at $\sqrt{s} = 510$ GeV at mid-rapidity

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Heavy quarkonia in high-energy collisions is a sensitive probe of Quantum Chromo Dynamics (QCD) due to its large scale provided by the heavy quark mass relative to the hadronization scale. The angular distribution of decay leptons from heavy quark bound state is a key observable to test heavy quarkonia production mechanisms and bound state formation. Charmonium, in particular, is an essential tool as it decays into di-leptons with a large branching ratio. PHENIX and STAR have observed  $J/\psi$  polarization consistent to zero within uncertainties with limited statistics via measurements of polar angular distribution in decay di-electron pairs at  $\sqrt{s} = 200$  GeV at midrapidity. Recently, measurement of full (polar and azimuthal) angular distribution from  $J/\psi$  decay to di-muon pairs at  $\sqrt{s}=510$  GeV in the forward rapidity region has shown good agreement with predictions made by non-relativistic QCD at high  $p_T$  and disagreement at low  $p_T$ , posing a challenge to this theoretical approach. This poster will present the status of data analysis underway on the data taken from p+p collisions at  $\sqrt{s}=510$  GeV in 2013 at RHIC. This new measurement of  $J/\psi$  polarization via full angular distribution from  $J/\psi$  decays to di-electrons at mid-rapidity  $|y| < 0.35$  at this higher energy will bring new insights into charmonium production and hadronization process.

### Content type

Experiment

### Collaboration

PHENIX

### Centralised submission by Collaboration

Presenter name already specified

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