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Measurements of Quarkonium Polarization and Production versus Charged-Particle Multiplicity in p+p Collisions at $\sqrt{s} = 500$ GeV in the STAR experiment

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Good knowledge of quarkonium production mechanism in p+p collisions is crucial for interpretation of the heavy-ion results. However, it is still not well understood after decades of effort. Simultaneous measurement of quarkonium spectrum and polarization in a wide kinematic range, notably at high transverse momentum, is suggested as a necessary step towards determination of quarkonium production mechanism. Moreover, an intriguing trend of a sharp increase of the quarkonium yields as a function of charged-particle multiplicity was observed in p+p collisions at $\sqrt{s} = 7$ TeV at the LHC. Such a behavior could be qualitatively explained in the framework of multiparton interactions, hydrodynamic evolution, or the percolation model and the latter two assume the formation of a high density medium. Therefore it is very interesting and important to study if such effects are also present at much lower energies in order to discriminate among these theoretical interpretations.

In this talk, we will present new J/ψ and Υ measurements in p+p collisions at $\sqrt{s} = 500$ GeV with the STAR experiment. The J/ψ polarization is extracted in both helicity and Collins-Soper reference frames and compared with results from other experiments at other energies. Both J/ψ and Υ production as a function of transverse momentum and charged-particle multiplicity are also measured and compared with model calculations.

On behalf of collaboration:

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