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Production of J/ψ and ψ(2S) in p+p collisions at $\sqrt{s}$ = 510 GeV from the STAR experiment

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Measurements of the production cross sections of heavy quarkonia, namely J/ψ and ψ(2S), in hadron-hadron collisions provide valuable information about yet unsolved questions of Quantum Chromodynamics. The Solenoid Tracker At RHIC (STAR) is a major high-energy nuclear physics experiment at the Relativistic Heavy Ion Collider. Its Muon Telescope Detector, which provides trigger and identification capability for muons, enables to study quarkonia in the $\mu^+\mu^-$ decay channel which is less affected by bremsstrahlung energy losses in detector materials.

In this poster, we will present the measurements of the production cross sections of the J/ψ and ψ(2S) mesons, as well as the ψ(2S) to J/ψ yield ratio as a function of p_T via the $\mu^+\mu^-$ decay channel in p+p collisions at $\sqrt{s}$ = 510 GeV from data recorded in 2017 by the STAR experiment. It is the first measurement of ψ(2S) as a function of p_T from STAR experiment. The results will be compared with various theoretical models including Next-to-Leading Order NRQCD, Improved Color Evaporation Model, and Color Glass Condensate effective theory with the NRQCD formalism.

Primary author: FENG, ChanJui (National Cheng Kung University)

Presenter: FENG, ChanJui (National Cheng Kung University)

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