

Measurement of J/ψ azimuthal anisotropy in U+U collisions at $\sqrt{s_{NN}} = 193$ GeV by the STAR experiment

The existence of Quark-Gluon Plasma (QGP) is predicted by lattice QCD at high temperatures or large nuclear densities.

Various probes were proposed to study this phase of matter, among which J/ψ suppression due to color screening of the quark potential in the QGP is of special interest since this mechanism implies the formation of the defined matter.

However, contribution from the recombination of charm and anti-charm quarks in the medium complicates the interpretation of the observed modification to the J/ψ production in heavy-ion collisions.

Measurements of the second-order harmonic coefficient (v_2) of J/ψ azimuthal anisotropy can help disentangle different contributions. For primordial J/ψ produced at the beginning of the collisions in hard scatterings, v_2 is expected to be close to zero, whereas regenerated J/ψ should inherit the anisotropy of the constituent charm quarks.

J/ψ v_2 has been measured by the STAR experiment to be consistent with zero for J/ψ $p_T > 2$ GeV/c in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV. Since U+U collisions are expected to create medium of higher energy density compared to Au+Au collisions, the relative contribution of primordial and regenerated J/ψ could be different. Therefore, U+U collisions provide a unique opportunity to test the current understanding of J/ψ production mechanisms. First results on J/ψ v_2 measured via the di-electron channel in U+U collisions at $\sqrt{s_{NN}} = 193$ GeV will be presented in this poster, and the implications on the J/ψ production mechanism will be discussed.

Preferred Track

Quarkonia

Collaboration

STAR

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Session Classification: Poster Session