Contribution ID: **305** Type: **Poster**

Collision Energy and Centrality Dependence of ϕ-Meson Spin Alignment

Chirality is the only fundamental symmetry in the nuclear matter. The study of the vorticity and possible chiral vortical effect allows us to access this fundamental property of the hot and dense nuclear matter created in high-energy nuclear collisions, especially at the high baryon density region. Global polarization parameters of identified particles can be extracted from the azimuthal distribution of particles relative to the event plane. Recently, STAR has reported global polarization measurement of Λ-baryons ($J = 1/2$).

The spin alignment of ϕ-meson ($J = 1$) could be sensitive to hadronization scenarios and possible vorticity of the colliding system. In this talk, a systematic measurement of ϕ-meson spin alignment parameters from RHIC-STAR detector will be presented in Au+Au collisions at $\sqrt{s_{\mathrm{NN}}}$ =19.6, 27, 39, 62.4 and 200 GeV. The beam energy and collision centrality dependence of spin alignment parameters will be discussed in association with the possible vorticity of the collision system.

Preferred Track

Correlations and Fluctuations

Collaboration

STAR

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Session Classification: Poster Session