Contribution ID: **1** Type: **Oral**

Chiral phase transition and spin alignment of vector mesons with chiral imbalance in a rotating QCD medium

We study the two-flavor Nambu-Jona-Lasinio model under the rotation and chiral chemical potential μ5. First, the influence of chiral imbalance on the chiral phase transition in the Tpc – ω plane is investigated. Research manifests that, as μ5 increases, the critical point of the Tpc – ω plane chiral phase transition will move closer to the T axis. This means that the chiral chemical potential μ5 can significantly affect the Tpc – ω phase diagram and phase transition behavior. While discussing the Tpc – ω phase diagram, we also study the spin alignment of the ρ vector meson under rotation. In the study of the spin alignment of the
vector meson ρ, ρ00 is the 00 element of the spin density matrix of vector mesons. At high temperatures, ρ00 is close to 1/3, which indicates that the spin alignment of the vector meson ρ is isotropic. The study found that, under finite rotation, increasing the chiral chemical potential μ5 can significantly enhance ρ00 around the phase transition temperature. When rotational angular velocity is zero, ρ00 is close to 1/3, but as ω increases, ρ00 significantly decreases and deviates 1=3, indicating that rotation can significantly cause polarization characteristics. The ρ00 – r relationship near the phase transition temperature is studied. It is found that the farther away from the center of rotation, the lower the degree of spin polarization of the system. It is also found that the influence of chiral imbalance on the ρ00 – r relationship is also significant.

Primary author: SHENG-QIN, Feng (College of Mathematics & Physics, Three Gorges University)

Presenter: SHENG-QIN, Feng (College of Mathematics & Physics, Three Gorges University)

Session Classification: Parallel

Track Classification: Spin in heavy ion collisions