Contribution ID: **227** Type: **Oral**

Deconfinement and chiral restoration phase transition under rotation from holography in an anisotropic gravitational background

Wednesday 21 August 2024 14:30 (30 minutes)

We investigate the effects of rotation on deconfinement and chiral phase transitions in the framework of dynamical holographic QCD model. Instead of transforming to the rotating system by Lorentz boost, we construct an anisotropic gravitational background by incorporating the rotating boundary current. We firstly investigate the pure gluon system under rotation to extract deconfinement phase transition from the Polyakov loop then add 2-flavor probe for chiral restoration phase transition from the chiral condensate. It is observed that at low chemical potentials, the deconfinement phase transition of pure gluon system is of first order and the chiral phase transition of 2-flavor system is of crossover. Both the critical temperatures of deconfinement and chiral phase transitions decrease/increase with imaginary/real angular velocity (Ω_I/Ω) as $T/T_c \sim 1 - C_2\Omega_I^2$ and $T/T_c \sim 1 + C_2\Omega^2$, which is consistent with lattice QCD results. In the temperature-chemical potential $T-\mu$ phase diagram, the critical end point (CEP) moves towards regions of higher temperature and chemical potential with real angular velocity.

Primary authors: CHEN, Yidian (Hangzhou Normal University); CHEN, Yidian (Hangzhou Normal University)

Co-authors: Prof. LI, Danning (Jinan University); HUANG, Mei (University of Chinese Academy of Scineces); Prof. CHEN, Xun (University of South China)

Presenter: CHEN, Yidian (Hangzhou Normal University)

Session Classification: Nuclear and Astro-particle Physics

Track Classification: F: Nuclear and Astro-Particle Physics