19th International Conference on QCD in Extreme Conditions (XQCD 2023)

Contribution ID: **78** Type: **Talk**

Quarkonium spectral functions in a bulk-viscous quark gluon plasma

In recent years, the bulk viscosity of a quark gluon plasma is gaining
increasing attention concerning the beam energy scan program, since the bulk viscous effect is expected to be enhanced near a critical point. Here we address the question of whether heavy quarkonia, which are produced at the early stage of the heavy ion collisions, are sensitive
to the bulk viscous nature of the quark gluon plasma. If this is the case, we might be able to use heavy quarkonia as a probe of the non-equilibrium properties of the plasma. We incorporate the bulk-viscous nature of the medium by deforming the distribution functions of
thermal quarks and gluons, with which the dielectric permittivity is computed within the hard thermal loop approximation. The modified dielectric permittivity is used to calculate the in-medium heavy quark complex potential, which includes both perturbative Coulombic as well
as non-perturbative string-like terms. Based on the modified heavy quark complex potential, we compute the quarkonium spectral function, with which the physical properties such as binding energies and decay widths are computed. We estimate experimental observables such as
the ψ' to J/ψ ratio and the nuclear modification factor R_{AA} and discuss the implication of bulk viscous effect on them.

Author: THAKUR, Lata

Co-author: Prof. HIRONO, Yuji (Asia Pacific Center for Theoretical Physics (APCTP))

Presenter: THAKUR, Lata