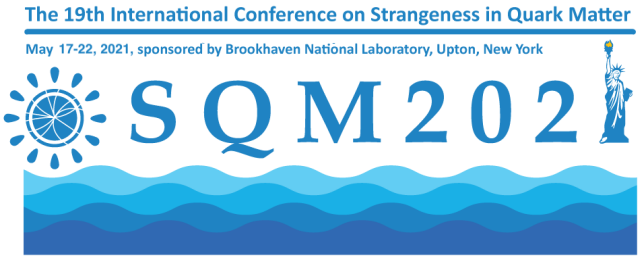

Contribution ID: **45** Type: **Theory talk**

The role of the strange quasiquarks in transport properties of the QGP

Wednesday 19 May 2021 10:50 (20 minutes)

We study the role of dynamical strange quarks in transport properties of the QGP utilizing the quasiparticle approach based on the kinetic theory. The interactions with a hot medium are encoded in the quasiparticle excitations, with the temperature dependence of the dynamical masses specified by the effective coupling extracted from the lattice QCD thermodynamics.

Evaluation of the temperature and flavor profiles of the shear (bulk) viscosity to entropy density ratio illustrates how strange quark excitations modify the transport properties of the deconfined matter [1].
Further, computing the bulk to shear viscosity ratio and parameterizing it by the sound velocity, we show that the quasiparticle model adequately captures the weak and strong coupling regimes of QCD. In the vicinity of the crossover, the bulk to shear viscosity ratio behaves consistently to the scaling with the speed of sound derived in the AdS/CFT approach, while at high temperature, it obeys the same parametric dependence as in perturbation theory.

We also find that the presence of heavy quasiquarks in the system extends the temperature region where QCD is described nonperturbatively, and significantly delays the restoration of conformal invariance at high temperature [2]. The preliminary results including the charm quark will also be presented.

[1] V. M., M. Bluhm, K. Redlich, C. Sasaki, Phys.Rev.D 100 (2019) 3, 034002

[2] V. M., C. Sasaki, Phys.Rev.D 103 (2021) 1, 014007

Collaboration

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Session Classification: Bulk (Transport)