Contribution ID: **33** Type: **not specified**

Shear and bulk viscosity for a pure glue theory using an effective matrix model

Wednesday 15 January 2025 14:46 (13 minutes)

At nonzero temperatures, the deconfining phase transition can be analyzed using an effective matrix model to characterize the change in holonomy. The model includes gluons and two-dimensional ghost fields in the adjoint representation, or "Teens". As ghosts, the teen fields are responsible for the decrease of the pressure as $T \to T_d$, with T_d the transition temperature for deconfinement. Using the solution of this matrix model for a large number of colors, the parameters of the teen fields are adjusted so that the expectation value of the Polyakov loop is close to the values from the lattice. The shear, η, and bulk, ζ, viscosities are computed in weak coupling but nonzero holonomy. In the pure glue theory, the value of the Polyakov loop is relatively large in the deconfined phase, $\approx 1/2$ at T_d. Consequently, if s the entropy density, while η/s decreases as $T \to T_d$, it is still well above the conformal bound. In contrast, ζ/s is largest at T_d, comparable to η/s, then falls off rapidly with increasing temperature and is negligible by $\sim 2T_d$.

Authors: DEBNATH, Manas (National Institute of Science Education and Research, Bhubaneswar); Dr HAQUE, Najmul (NISER Bhubaneswar); Dr GHOSH, Ritesh (Arizona State University (US)); Dr PISARSKI, Robert D. (BNL (US)); Dr HIDAKA, Yoshimasa (Kyoto University (JP))

Presenter: DEBNATH, Manas (National Institute of Science Education and Research, Bhubaneswar)

Session Classification: Parallel A

Track Classification: 8. New theoretical developments