Contribution ID: **471** Type: **Poster**

Shear viscosity and entropy of a hadron gas

Microscopic non-equilibrium dynamics are used to calculate the transport coefficients of dense hadronic matter. Specifically, the shear viscosity to entropy density ratio is investigated, and its temperature dependence between 75 MeV and 175 MeV is explored, and the effects of non-zero baryon and strange chemical potentials are probed. This is important to constrain the value of shear viscosity over entropy density used in hydrodynamic calculations of heavy ion reactions at RHIC and the LHC. Calculations are initialized using the corresponding particle densities computed from a thermal model in a hadronic box simulating infinite matter. After an appropriate equilibration delay, the shear viscosity η is computed using the Green-Kubo formalism. The entropy density s is obtained using the Gibbs formula and dN/dp spectral fitting to obtain the final (equilibrated) temperatures and chemical potentials of the system. As a check, the results for the entropy and shear viscosity of a massive and massless pion gas are compared to analytic estimates. The shear viscosity to entropy density ratio η/s is found to be significantly lower than found in previous similar calculations by [Demir & Bass][1], but in qualitative agreement with other calculations using other methods by [Romatschke & Pratt][2] and [Song, Bass & Heinz][3]. This will be the starting point for the calculation of more transport coefficients as functions of T and μ_B.
[1]: https://arxiv.org/pdf/0812.2422.pdf [2]: https://arxiv.org/pdf/1409.0010.pdf [3]: https://arxiv.org/pdf/1012.0555.pdf

Preferred Track

Collective Dynamics

Collaboration

Not applicable

Primary author: ROSE, Jean-Bernard

Presenter: ROSE, Jean-Bernard

Session Classification: Poster Session