Contribution ID: **18** Type: **not specified**

Highly-anisotropic hydrodynamics for central collisions

Friday 6 November 2015 14:40 (25 minutes)

We use leading-order anisotropic hydrodynamics to study an azimuthally-symmetric boost invariant quark-gluon plasma. We impose a realistic lattice-based equation of state and perform self-consistent anisotropic freeze-out to hadronic degrees of freedom. We then compare our results for the full spatiotemporal evolution of the quark-gluon plasma and its subsequent freeze-out to results obtained using 1+1d Israel-Stewart second-order viscous hydrodynamics. We find that for small shear viscosities, $4\pi\eta/s \sim 1$, the two methods agree well for nucleus-nucleus collisions, however, for large shear viscosity to entropy density ratios or proton-nucleus collisions we find important corrections to the Israel-Stewart results for the final particle spectra and the total number of charged particles. Finally, we demonstrate that the total number of charged particles produced is a monotonically increasing function of $4\pi\eta/s$ in Israel-Stewart viscous hydrodynamics whereas in anisotropic hydrodynamics it has a maximum at $4\pi\eta/s \sim 10$. For all $4\pi\eta/s > 0$, we find that for Pb-Pb collisions Israel-Stewart viscous hydrodynamics predicts more dissipative particle production than anisotropic hydrodynamics

Authors: BAZOW, Dennis; MARTINEZ GUERRERO, Mauricio (The Ohio State University); Dr STRICKLAND, Michael (Kent State University); Mr NOPOUSH, Mohammad (Kent State University); Dr RYBLEWSKI, Radoslaw (IFJ PAN); HEINZ, Ulrich (The Ohio State University)

Presenter: Dr RYBLEWSKI, Radoslaw (IFJ PAN)

Session Classification: Session 13