Contribution ID: **140** Type: **not specified**

Anisotropic hydrodynamics for conformal Gubser flow

Friday 5 December 2014 18:10 (20 minutes)

We derive equations of motion for a system undergoing boost-invariant longitudinal and azimuthally symmetric transverse Gubser flow using leading order anisotropic hydrodynamics. This is accomplished by assuming that the one-particle distribution function is ellipsoidally symmetric in the momenta conjugate to the de Sitter coordinates used to parametrize the Gubser flow. We then demonstrate that the $SO(3)_q$ symmetry in de Sitter space further constrains the anisotropy tensor to be of spheroidal form. The resulting system of two coupled ordinary differential equations for the de Sitter space momentum scale and anisotropy parameter are solved numerically and compared to a recently obtained exact solution of the relaxation time approximation Boltzmann equation subject to Gubser flow. We show that anisotropic hydrodynamics describes the spatio-temporal evolution of the system better than all currently known dissipative hydrodynamics approaches. In addition, we prove that anisotropic hydrodynamics gives the exact solution of the relaxation-time approximation Boltzmann equation in the ideal, $\eta/s \to 0$, and free-streaming, $\eta/s \to \infty$, limits.

In collaboration with: Radoslaw Ryblewski (H. Niewodniczan´ski Institute of Nuclear Physics), Michael Strickland (Kent State University)

Presenter: NOPOUSH, Mohammad (Kent State University)

Session Classification: Cabernet-3