Abstract Submitted
for the APR10 Meeting of
The American Physical Society

RHIC Motivated Hydrodynamics from a Schwarzschild Black Hole JAMES ALSUP, GEORGE SIOPSIS, University of Tennessee — We discuss the derivation of dissipative Bjorken hydrodynamics from a Schwarzschild black hole in asymptotically AdS spacetime in the limit of large longitudinal proper time τ. Using an appropriate slicing near the boundary, we calculate the Schwarzschild metric to next-to-next-to-leading order in the large τ expansion as well as the dual stress-energy tensor on the boundary via holographic renormalization. At next-to-next-to-leading order, it is necessary to perturb the Schwarzschild metric in order to maintain boost invariance. The perturbation has a power law time dependence and leads to the same value of the ratio of viscosity to entropy density, $1/(4\pi)$, as in the case of sinusoidal perturbations. Our results are in agreement with known time-dependent asymptotic solutions of the Einstein equations in five dimensions.

James Alsup
University of Tennessee

Date submitted: 23 Oct 2009 Electronic form version 1.4