Abstract Submitted
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Bulk Viscosity and Cavitation in Heavy Ion Collisions[1] MEGAN BYRES, University of Colorado, Boulder, SANGHOON LIM, Pusan National University, CHRIS MCGINN, JEFF OUELLETTE, JAMES NAGLE, University of Colorado, Boulder — Relativistic heavy ion collisions generate nuclear-sized droplets of quark-gluon plasma (QGP) that exhibit nearly inviscid hydrodynamic expansion. Smaller collision systems such as p+Au, d+Au, and ^{3}He+Au at the Relativistic Heavy Ion Collider, as well as p+Pb and high-multiplicity p+p at the Large Hadron Collider may create even smaller droplets of QGP. If so, the standard time evolution paradigm of heavy ion collisions may be extended to these smaller systems. These small systems present a unique opportunity to examine pre-hydrodynamic physics and extract properties of the QGP, such as the bulk viscosity, where the short lifetimes of the small droplets makes them more sensitive to these contributions. Here we focus on the influence of bulk viscosity, its temperature dependence, and the implications of negative pressure and potential cavitation effects on the dynamics in small and large systems using the publicly available hydrodynamic codes SONIC and MUSIC. We also discuss pre-hydrodynamic physics in different frameworks including AdS/CFT strong coupling, IP-GLASMA weak coupling, and free streaming.

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