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Transport Properties of a Perturbative Quark-Gluon-Plasma JOHN FUINI, University of Texas at San Antonio, NASSER DEMIR, STEFFEN BASS, Duke University — Ultrarelativistic heavy-ion collisions may create a deconfined state of QCD matter, called the Quark Gluon Plasma, which was the state of the early Universe shortly after the Big Bang. The very low shear-viscosity over entropy density ratio (eta/s) of the QGP discovered at RHIC has attracted a lot of interest, due to the use of the AdS/CFT conjecture in string theory to calculate a possible lower bound of 1/4pi for eta/s in a QCD-like theory. In this work, we use the Parton Cascade Model to calculate eta/s of a weakly interacting QGP. The PCM has been successfully applied to the study of the non-equilibrium time evolution of the QGP created in heavy ion collisions at high temperatures. Here we perform a study of QGP matter in equilibrium and, using the Kubo formalism, calculate eta/s as a function of temperature and system composition. We find values of eta/s which are too high to explain the near ideal fluid behavior observed at RHIC. By increasing the coupling constant beyond the applicability of perturbative QCD, we find eta/s values compatible with the RHIC data. Our results confirm the strongly interacting nature of the QGP at RHIC and provide a baseline for eta/s values to be expected at the LHC, where higher temperatures are thought to dominate the evolution of the system.

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