

Abstract Submitted
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Formation of Black Hole in AdS/CFT and Equilibration of QGP

SHU LIN, EDWARD SHURYAK — It is believed that the Quark Gluon Plasma matter produced in heavy ion collision is strongly coupled. The application of AdS/CFT correspondence allows for analytical study of gauge field in strong coupling regime. A gravity dual of heavy ion collision was proposed by Shuryak et al. The particles productions in the collisions are identified as creation of stringy debris in gravity. We studied the falling of different debris in AdS space. The backreaction of these debris to the AdS gravity are studied by solving linearized Einstein equation. We found the stress tensor did not adopt a hydrodynamics parameterization. We also used a simple gravitational collapsing model to study the equilibration of QGP. The model corresponds to the evolution of plasma to thermal equilibrium. We found interesting phenomenon of quasi-equilibrium: While the stress tensor of equilibrating plasma is identical to plasma in thermal equilibrium, the spectral density differs by some oscillation. The spectral density shows a universal feature as the plasma equilibrates: the oscillation damps in amplitude and grows in frequency, eventually the plasma loses all the coherence. An attempt to understand the formation of QGP in AdS/CFT context was made by Gubser et al, where entropy was estimated as a function of energy in central collision of heavy ion. We extend the work to non-central collision, where we obtain the entropy as a function of impact parameter

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