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Quark-gluon plasma from AdS/CFT Correspondence¹

YIMING ZHONG, Stony Brook University — The AdS/CFT correspondence conjectured by Maldcena in 1998 opens a door to understand behaviours of strong correlated systems such as transportation properties of quark-gluon plasmas (QGP). In one of the most intensively studied examples, namely the AdS/CFT correspondence between type IIB string theory on $AdS_5 \times S^5$ and four dimensional $N = 4$ super Yang-Mills theory, theoreticians have made tight contact between the correspondence at finite temperature and the physics of the de-confined QGP created in heavy ion collision experiments. In particular, the thermodynamical and hydrodynamical properties of QGP can be easily calculated by interpreting the gauge theory parameter into the supergravity sides like associating UV limit of the gauge theory to physics near the AdS boundary. The viscosity/ entropy ratio is shown as $1/4\pi$, which is equal to the universal value for a class of strong interacting systems whose dual description involving black holes in AdS space. On the other hand, recent experiment results extracted from the Relativistic Heavy Ion Collider (RHIC) with the hydrodynamic simulation confirmed the plasma behaves as a strongly coupled liquid and the viscosity/ entropy ratio is close to the value suggested by the AdS/CFT correspondence.

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- Prefer Oral Session
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