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Semiholography for heavy ion collisions

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Based on arXiv:1410.6448, arXiv:1512.06445 and ongoing works

Summary

Semiholography is a non-perturbative approach to describe weakly coupled perturbative degrees of freedom in the UV and strongly coupled IR degrees of freedom together in an integrated way. In case of heavy ion collisions, semiholography integrates the glasma description at the initial stage and kinetic description at later stages for the UV degrees of freedom with a holographic description of the IR. We will discuss how this approach can be applied to describe the spacetime evolution of matter formed by heavy-ion collisions. As full numerical simulations of semiholographic dynamics is not yet completed, we will present some simple examples which will be quite eloquent about various aspects of the full dynamics. In particular, pressure isotropization, hydrolyzation, thermalization and jet quenching have distinctive features in semiholography which cannot be obtained simply by extrapolating to somewhere intermediate between weak and strong coupling while ignoring the running of the coupling with the scale. We will discuss the mentioned dynamical aspects in the semiholographic framework.

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