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Recent developments in hydrodynamics and collectivity in small systems

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One of the main goals in heavy ion collision experiments at relativistic energies is to determine the properties, like viscosity, of nearly thermalized strongly interacting matter. The dynamics of the system formed in these collisions is, however, complex and the matter properties reflect into the experimental observables in a non-trivial way. Therefore, it is essential to have a good understanding of the dynamics, as well as understand how the different stages of the collisions affect the measured particle spectra.

Fluid dynamics is a natural framework to use in constraining the transport properties of the matter as the transport coefficients, like shear and bulk viscosity, are direct inputs to the models. While fluid dynamics is a convenient tool, it also has limited applicability, and for system as small as those created in heavy ion collisions it is not at all clear whether it is strictly applicable. However, the system is also strongly interacting, and the comparisons between the experimental data and the predictions of fluid dynamical models show an extremely good agreement, suggesting that we indeed create a small droplet of fluid in these collisions.

I will review the current status of describing space-time evolution of the relativistic nuclear collisions with fluid dynamics, and of determining the transport coefficients of strongly interacting matter.

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