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# Second-order multi-component reactive hydrodynamics with 14-moment formalism

Second-order viscous hydrodynamics has been successfully applied to describe the space-time evolution of the quark-gluon plasma created in heavy-ion collisions.
While hydrodynamics is a macroscopic theory, the transport coefficients and the relaxation times — controlling the evolution of the non-equilibrium corrections — depend on the microscopic processes, and can be derived using a 14-moment expansion formalism.
The quark-gluon plasma consists of multiple components (gluons and various flavors of quarks and anti-quarks), and they convert to each other through inelastic scattering.
In this talk, I will give a detailed derivation of second-order viscous hydrodynamics of multi-component reactive fluids based on the 14-moment formalism.
Compared to a single-component system, the influence of multiple particle species and chemical reactions is taken into considerations.
I will compare the transport coefficients of single-component and multi-component reactive systems using various types of cross-sections.

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