

2+1D simulations of pre-equilibrium stage with QCD kinetic theory

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The produced matter in the high energy nuclear collisions reinteracts and form a plasma which ultimately equilibrates and exhibits collective hydrodynamic flow. The connection between the early gluon production in classical field simulations and hydrodynamic expansion at later times is given by the QCD kinetic theory. In this work we construct a set of non-equilibrium Green functions calculated in QCD kinetic theory to provide a practical tool to propagate energy and momentum perturbations from the early initial state to a time when hydrodynamics becomes applicable. We demonstrate with a realistic simulation of a heavy ion collisions that such linearized kinetic propagator (called KØMPØST) provides the smooth transition from the classical fields to hydrodynamics. KØMPØST can be easily incorporated into existing hydrodynamic simulations improving the early time description of heavy ion collisions.

References:

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Summary

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