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Non-equilibrium attractors of QCD kinetic theory at zero and finite density

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The out-of-equilibrium quark-gluon plasma and how it equilibrates in the pre-equilibrium stage of ultrarelativistic heavy-ion collision is of decent interest. Based on effective kinetic QCD theory including both gluon and all light quark/antiquark degrees of freedom, we investigate the pre-equilibrium dynamics of the quark-gluon plasma and how it connects to near-equilibrium viscous hydrodynamics. Based on numerical calculations we establish the presence of a universal attractor towards viscous hydrodynamics and discuss how the evolution changes gradually for systems with non-zero net baryon density. We finally discuss phenomenological applications of our results to connect the initial energy and charge density immediately after the collision with the entropy density and chemical potential at the beginning of hydrodynamics.

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