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Collisions in Non-conformal Theories: Hydrodynamization without Equilibration

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We numerically simulate gravitational shock wave collisions in a holographic model dual to a non-conformal four-dimensional gauge theory. We find two novel effects associated to the non-zero bulk viscosity of the resulting plasma. First, the hydrodynamization time increases. Second, if the bulk viscosity is large enough then the plasma becomes well described by hydrodynamics before the equilibrium equation of state becomes applicable. We discuss implications for the quark-gluon plasma created in heavy ion collision experiments.

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