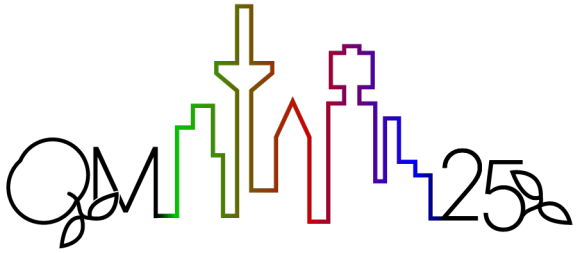

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Quenching through the chiral phase transition

We present a detailed numerical and analytical study of the out-of-equilibrium dynamics of Model G, the dynamical universality class relevant to the chiral phase transition. We quench the system from the high temperature, unbroken phase to the broken phase and study the real-time dynamics of the Goldstone modes, i.e. pions. Strikingly, the non-equilibrium evolution of the two-point functions exhibit a regime of exponential growth, a parametric enhancement, and subsequent slow relaxation to equilibrium. We analyze this response using mean-field theory and dynamical critical scaling. The same behavior persists in continuous ramps through the chiral phase transition, and the dynamics exhibit Kibble-Zurek scaling. We relate the exponential growth of the two-point functions to a parametric enhancement of soft pion yields relative to thermal equilibrium.

Category

Theory

Collaboration (if applicable)

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