

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Universal post-quench prethermalization at a quantum critical point PETER P. ORTH, PIA GAGEL, JOERG SCHMALIAN, Karlsruhe Institute of Technology (KIT) — We consider an open system near a quantum critical point that is suddenly moved towards the critical point. The bath-dominated diffusive non-equilibrium dynamics after the quench is shown to follow scaling behavior, governed by a critical exponent that emerges in addition to the known equilibrium critical exponents. We determine this exponent and show that it describes universal prethermalized coarsening dynamics of the order parameter in an intermediate time regime. Implications of this quantum critical prethermalization are a power-law rise of order and correlations after an initial collapse of the equilibrium state and a crossover to thermalization that occurs arbitrarily late for sufficiently shallow quenches. [1] P. Gagel, P. P. Orth, J. Schmalian, Phys.Rev. Lett. (in press) arXiv:1406.6387

Peter P. Orth
Karlsruhe Institute of Technology (KIT)

Date submitted: 14 Nov 2014

Electronic form version 1.4