

Quantum quenches, dynamical transitions and off-equilibrium quantum criticality

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Several mean-field computations have revealed the existence of an out of equilibrium dynamical transition induced by quantum quenching an isolated system starting from its symmetry broken phase. In this talk I shall present results obtained for the quantum $O(N)$ field theory in the large N limit by taking into account dynamical fluctuations at the Hartree-Fock level. I shall derive the critical properties of the dynamical transition beyond mean-field theory and show the existence of diverging time and length-scales, dynamic scaling and aging. Finally, I will discuss a relationship with the coarsening dynamics induced by quenching from the symmetric toward the symmetry broken phase.