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Coherence and a quench dynamics of a dissipative quantum system: renormalization group and dynamical phases[1] OLEKSIY KASHUBA, TU Dresden, Institut fuer Theoretische Physik — We study dissipation in a small quantum system coupled to an environment held in thermodynamic equilibrium. The relaxation dynamics of a system subjected to an abrupt quench in the parameters of the underlying Hamiltonian was investigated using two complementary renormalization group approaches. The methods were applied to the Ohmic spin-boson model close to the coherent-to-incoherent transition. In particular, the role of non-Markovian memory and the spin-boson coupling strength in the pre- and post-quench behavior is investigated. Additionally, we revealed several "phases" of the relaxation dynamics distinguished by the discrimination of the damping at long and intermediate time scale. Surprisingly, elevated temperature can render the system "more coherent" by inducing a transition from the partially coherent to the coherent regime.

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