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Time Evolution of a Quantum Impurity System following a Sudden Quench and General Pulse at Finite Temperatures - a td-NRG Study
HOA NGHIEM, THEODOULOS COSTI, Forschungszentrum Juelich — To study the time evolution of an observable of a quantum impurity system after a sudden quench at an arbitrary temperature, we apply the recently developed time-dependent numerical renormalization group approach (td-NRG) to the Anderson model and resonant level model.[1] In the application to the Anderson model, we quantify the results in the short and long time limits by comparing them to the thermodynamic values in the initial and final states. In the case of the resonant level model, we compare the time evolution of the local occupancy calculated by td-NRG to the exact analytic result. We also present the time evolution in response to general continuous pulses, acting in a finite time interval, and in response to periodic driving fields.[2] The study is accomplished by a generalization of the single-quench formalism to multiple quenches and by approximating smooth pulses (or periodic trains of pulses) by a sufficient number of smaller quenches.

[1]H. T. M. Nghiem and T. A. Costi, Phys. Rev. B **89**, 075118 (2014)
[2]H. T. M. Nghiem and T. A. Costi, Phys. Rev. B **90**, 035129 (2014)

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