Abstract Submitted
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Towards exact results for spectral functions of quantum impurity models in the long-time limit of the multiple-quench time-dependent numerical renormalization group approach THEO COSTI, HOA NGHIEM, Forschungszentrum Juelich, Institute for Advanced Simulation (IAS-3), 52425 Juelich, Germany — We develop a new multiple-quench time dependent numerical renormalization group (TDNRG) approach to study the time-evolution of strongly correlated quantum impurities in response to quantum quenches, pulses and periodic driving fields with potential application to a number of fields, including cold atom systems, non-equilibrium transport in nanoscale devices, and the theory of pump-probe spectroscopies of correlated materials within the non-equilibrium dynamical mean field theory. While the single-quench TDNRG suffers from sizeable errors for spectral functions and thermodynamic observables in the long-time limit, we show that our new mutiple-quench TDNRG approach systematically reduces these errors to negligible values. Precise results are presented for local observables of the Anderson model, both static (local occupation and double occupancy) and dynamic (spectral function), in the long-time limit. Significant Improvements are also demonstrated at finite times for periodic driving fields, by comparison with our previous multiple-quench TDNRG approach (H. T. M. Nghiem & T. A. Costi, Phys. Rev. B89, 075118 (2014) and Phys. Rev. B90, 035129 (2014)).

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