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A real-time impurity solver for DMFT HYUNGWON KIM, Rutgers University, CAMILLE ARON, Laboratoire de Physique Théorique, École Normale Supérieure, CNRS, Paris, France, JONG E. HAN, State University of New York at Buffalo, GABRIEL KOTLIAR, Rutgers University — Dynamical mean-field theory (DMFT) offers a non-perturbative approach to problems with strongly correlated electrons. The method heavily relies on the ability to numerically solve an auxiliary Anderson-type impurity problem. While powerful Matsubara-frequency solvers have been developed over the past two decades to tackle equilibrium situations, the status of real-time impurity solvers that could compete with Matsubara-frequency solvers and be readily generalizable to non-equilibrium situations is still premature. We present a real-time solver which is based on a quantum Master equation description of the dissipative dynamics of the impurity and its exact diagonalization. As a benchmark, we illustrate the strengths of our solver in the context of the equilibrium Mott-insulator transition of the one-band Hubbard model and compare it with iterative perturbation theory (IPT) method. Finally, we discuss its direct application to a nonequilibrium situation.

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