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Quasi-continuous-time impurity solver for the cluster dynamical mean-field theory with linear scaling in the inverse temperature DANIEL ROST, Institute of Physics, Johannes Gutenberg University, Mainz, FAKHER ASSAAD, Institute of Theoretical Physics and Astrophysics, University of Würzburg, NILS BLÜMER, Institute of Physics, Johannes Gutenberg University, Mainz — We present an extension to the dynamical cluster approximation (DCA) of an recently developed unbiased quantum Monte Carlo (QMC) impurity solver for single-site DMFT [1]. The novel algorithm is based on a multigrid version of BSS-QMC [2,3], which yields Green functions free of significant Trotter errors, and scales linearly with the inverse temperature $\beta = 1/T$ and cubically in the cluster size N. We use the superior scaling to explore ultra-low temperature regimes at moderate cluster sizes, not reachable with state-of-the-art continuous time QMC impurity solvers that scale cubically in β. Benchmark results for the the two-dimensional (2d) Hubbard model, compared with complementary methods (unbiased lattice QMC, dynamical vertex approximation (DΓA) [4]), are presented as well as a study of the 2d doped Kondo lattice model.

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