Continuous-time Monte Carlo simulation of fermionic and bosonic impurity models

Abstract

I will discuss the recently developed diagrammatic impurity solvers, their implementation on the Keldysh contour and their adaptation to bosonic impurity models. The nonequilibrium formalism will be used to study the relaxation dynamics of the Hubbard model after an interaction quench. Our results indicate the existence of sharp transitions in the relaxation dynamics with no apparent relation to an underlying phase transition in the equilibrium phase diagram. The bosonic impurity solver will be used to compute the phasediagram and correlation functions of the bose Hubbard model within the bosonic DMFT approximation. A comparison to lattice calculations shows that the single-site dynamical mean field theory provides a remarkably accurate description of the Bose Hubbard model on a 3D cubic lattice.