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*Complexity of quantum impurity models*

A quantum impurity model describes a bath of free fermions coupled to a small interacting subsystem called an impurity. Such models were famously studied in the 1960s and 1970s to investigate the physics of a magnetic impurity embedded in a metal. More recently, they have been used to study strongly correlated materials within an approximation known as dynamical mean field theory. In this work we establish a structure theorem for ground states of quantum impurity models. As a consequence we obtain a classical algorithm for approximating the ground energy and computing low energy states. The runtime of the algorithm is polynomial in the total number of fermi modes and quasipolynomial in the desired approximation error. Based on joint work with Sergey Bravyi.