



SFB/TRR 21 - Seminar

17. März 2011, Stuttgart

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Magnetic impurities in low-dimensional strongly correlated electron systems: A DMRG study

The interaction between magnetic impurities and conduction electrons in nanoscopic systems is a subject of great interest for both experimental and theoretical studies. In this talk I will present density matrix renormalization group (DMRG) results of magnetic impurities coupled to conduction electrons which present strong correlations in finite size systems. First, I will describe the behavior of Anderson impurities in the one-dimensional Hubbard model away from half filling. The appearance of the Kondo effect for the one impurity case, and its competition with the RKKY interaction when two impurities are present in the system will be addressed. Analyzing the static and dynamic properties of the model Hamiltonians, I will discuss how this competition is affected by the electron-electron repulsion in the metal. Finally, I will discuss the behavior of a magnetic impurity coupled to ferromagnetic leads and I will comment its relation with recent experiments.

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