Magnetic properties of metallic impurities with strongly correlated electrons

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We study the single impurity Anderson model in an external magnetic field. There is no exact solution for this situation and hence only approximate schemes can be employed. We demonstrate that the strong coupling regime is Kondo-like with a quasiparticle resonant peak that with magnetic field splits into two.The Kondo behavior is controlled by two Kondo scales (temperatures), one for transverse and one for longitudinal spin fluctuations. The two scales coincide at zero field, but in nonzero fields the former dominates. We show that the salient features of the spectral function in the Kondo regime can be seen already within an extended random phase approximation. To reveal the dependence of the Kondo scales on the bare electron interaction, however, one has to use a two-particle self-consistency with renormalized vertices. The Kondo temperatures in nonzero fields derived within the parquet approach are not so simply related to the density of states at the Fermi energy as in the the spin-symmetric case.

9.7 cm

13.4 cm

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