

Induced interactions, magnetic polarons, and strings with cold atoms

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We present results regarding two topics. First, we explore magnetic polarons formed by holes hopping in an anti-ferromagnetic background in a lattice. We develop a non-perturbative theory both for the equilibrium and the non-equilibrium properties and find excellent agreement with experimental results, which is remarkable for a strongly interacting non-equilibrium many-body problem. We end by discussing magnetic polarons in other lattice geometries. As a second topic, we discuss the theory behind the recent experimental observation of induced interactions between Fermi polarons. The role of the quantum statistics of the impurity and the connections to Landau's quasiparticle theory are highlighted.

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