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## Multi-orbital

Kondo physics of Co in Cu hosts ALEXANDER LICHTENSTEIN, TIM OLIVER WEHLING, ALJOSCHA WILHELM, 1st Institute for Theoretical Physics, University of Hamburg, Germany, BRIGITTE SURER, MATTHIAS TROYER, PHILIPP WERNER, Theoretische Physik, ETH Zurich, Switzerland, ANDREAS LAUCHLI, MPI fuer Physik komplexer Systeme, Dresden, Germany — We investigate the electronic structure of cobalt atoms on a copper surface and in a copper host by combining density functional calculations with a numerically exact continuous-time quantum Monte Carlo treatment of the five-orbital impurity problem. In both cases we find low energy resonances in the density of states of all five Co *d*-orbitals. The corresponding self-energies indicate the formation of a Fermi liquid state at low temperatures. Our calculations yield the characteristic energy scale – the Kondo temperature – for both systems in good agreement with experiments. We quantify the charge fluctuations in both geometries and suggest that Co in Cu must be described by an Anderson impurity model rather than by a model assuming frozen impurity valency at low energies. We show that fluctuations of the orbital degrees of freedom are crucial for explaining the Kondo temperatures obtained in our calculations and measured in experiments.

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