TT 19: CE: Quantum Impurities, Kondo Physics

Time: Monday 18:45–19:45 Location: HSZ 304

TT 19.1 Mon 18:45 HSZ 304

Phase transitions in the multichannel Anderson model with pseudogap density of states — •Imke Schneider[1], Adel Benlagra[1], Lars Fritz[2], and Matthias Vojta[1] — [1]Institut für Theoretische Physik, TU Dresden — [2]Institut für Theoretische Physik, Universität zu Köln

We consider a multichannel Anderson model with a pseudogap density of states $\rho(\omega) \propto |\omega|^r$. Using analytical and numerical renormalization group techniques we study the phase diagram and associated observables. In particular, we apply an expansion in the hybridization strength to access the quantum phase transition near $r = 1$. We relate our findings to experimental results on graphene.

TT 19.2 Mon 19:00 HSZ 304

Exact Crossover Green Function In 2-Channel Kondo Effect — •Eran Sela, Andrew Mitchell, and Lars Fritz — Universitaet zu Koeln

The non Fermi liquid critical point of the two-channel Kondo model and related multi impurity models is unstable with respect to symmetry breaking perturbations, which lead to a crossover into Fermi liquid behavior. We use an analogy between this crossover and one occurring in the boundary Ising model to calculate the crossover Green function analytically. In remarkable agreement with our numerical renormalization group calculations, the exact function applies for arbitrary mixture of the relevant perturbations of the critical point such as magnetic field or channel asymmetry, leading to rich behavior which can be observed in quantum dot or tunneling experiments.

TT 19.3 Mon 19:15 HSZ 304

RG analysis of a Spin-1 Kondo dot out of equilibrium — •Christoph Hörig, Sabine Andergassen, and Dirk Schuricht — RWTH Aachen, Germany

We study the spin-1 Kondo dot in a magnetic field and at finite bias voltage by using the real-time renormalization group in frequency space [1].

Based on a systematic expansion in the reservoir-system coupling, we integrate out the reservoir degrees of freedom and solve the resulting two-loop RG equations in the weak-coupling regime. We derive analytic expressions for the dot magnetization and for the current through the dot in the stationary state. We show that any initial spin anisotropy is strongly enhanced by renormalization effects.

Furthermore, we determine the relaxation and decoherence rates governing the time evolution into the stationary state, where an additional rate with respect to the spin-1/2 case emerges [2].

[1] H. Schoeller, Eur. Phys. J. Special Topics 168, 179 (2009).
[2] H. Schoeller and F. Reininghaus, Phys. Rev. B 80, 045117 (2009).

TT 19.4 Mon 19:30 HSZ 304

Molecular DMFT calculations of Co dimers in metal nanocontacts — •David Jacob — Max-Planck-Institut für Mikrostrukturphysik, Weinberg 2, 06108 Halle, Germany

Using our recently developed Molecular Dynamical Mean-Field Theory method [1,2] we study the electronic structure and transport properties of two Co atoms suspended between the tips of a metal nanocontact. Due to the competition between Kondo screening of the magnetic moments of the two Co atoms by the conduction electrons and the mutual antiferromagnetic coupling between the Co atoms, the spectral density and the concomitant low-bias conductance spectrum strongly changes in dependence of the distance between the two Co atoms.

[1] D. Jacob, K. Haule, and G. Kotliar, Phys. Rev. Lett. **103**, 016803 (2009).
[2] D. Jacob, K. Haule, and G. Kotliar, Phys. Rev. B **82**, 195115 (2010).