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Global phase diagram of heavy fermions and the Kondo destroyed quantum critical points of Anderson models with a transverse field

JEDEDIAH PIXLEY, Rice University, STEFAN KIRCHNER, Max Planck Institute for the physics of complex systems, QIMIAO SI, Rice University — Recent studies in quantum critical heavy fermion metals have pointed towards a global phase diagram [1]. The zero-temperature phase diagram involves a combination of phases, featuring Kondo screening/breakdown and antiferromagnetic order/disorder as the quantum fluctuations of the local moments are tuned relative to their effective interaction with the spins of the conduction electrons. In the case of Ising-anisotropic Kondo lattice systems, the fluctuations among the local moments can be generated by coupling them to a transverse magnetic field. With these effects in mind, we study the Kondo-destroyed quantum critical behavior of the Anderson impurity model in the presence of a bosonic bath or a transverse field. We extend our recent studies of the low-temperature quantum critical behavior [2,3] based on the continuous time quantum Monte Carlo, and obtain the dynamical scaling functions of the local spin susceptibility and single-electron Green's function.

[1] Q. Si and F. Steglich, *Science* 329, 1161 (2010).

[2] M. T. Glossop, S. Kirchner, J. H. Pixley and Q. Si, arXiv:0912.4521 to be published (2009).

[3] J. H. Pixley, S. Kirchner and Q. Si, arXiv:1010.3024 to be published (2010).

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