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Quantum critical Kondo destruction of the Bose-Fermi Kondo model in the presence of a local transverse field
EMILIAN NICA, Rice University, KEVIN INGERSENT, University of Florida, QIMIAO SI, Rice University — Recent studies of the global phase diagram of quantum critical heavy fermion metals [1] have motivated us to consider the interplay between the quantum fluctuations within the local-moment system and those associated with the Kondo interaction. Towards this goal, we study a Bose-Fermi Kondo model with Ising anisotropy in the presence of a local transverse field. We apply the numerical renormalization group method for the case with a sub-ohmic bosonic bath exponent and a constant conduction electron density of states [2]. Upon increasing the strength of the transverse field in the Kondo screened phase we find a crossover from a fully screened to a fully polarized impurity spin with no transition in between. Increasing the strength of the transverse coupling in the localized phase, on the other hand, we identify signatures for a continuous transition into a partially polarized Kondo phase. We discuss the implications of our results for the global phase diagram of the Kondo lattice system.

[1] Q. Si and F. Steglich, Science 329, 1161 (2010).
[2] M. T. Glossop and K. Ingersent, Phys. Rev. B 75, 104410 (2007).

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