Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Quantum Critical Behavior of the Bose-Fermi Kondo Model with Ising Anisotropy TAE-HO PARK, STEFAN KIRCHNER, QIMIAO SI, Department of Physics and Astronomy, Rice University — The existence of a continous quantum phase transition of the Bose-Fermi Kondo Model (BFKM) with a self-consistently determined bosonic bath has been demonstrated within the Extended Dynamical Mean Field Approach to the anisotropic Kondo lattice model and ω/T-scaling near the quantum critical point(QCP)was found[1,2]. We study the quantum critical properties of the anisotropic BFKM with specified bath spectral function, where the spectrum of the bosonic bath vanishes in a power-law fashion with exponent γ for small frequencies. Motivated by very recent results that the quantum to classical mapping for a related class of models fails[3,4]. We determine the critical local susceptibility using both the classical and quantum Monte Carlo approaches of Ref.5. Our results cover several values of γ below and above the upper critical dimension of the classical model for temperatures down to 1% of the bare Kondo scale. [1]D. Grempel and Q. Si, Phys. Rev. Lett. 91, 026402 (2003). [2]J.Zhu, D. Grempel, and Q. Si, Phys. Rev. Lett. 91, 156404 (2003). [3]L. Zhu, S. Kirchner, Q. Si nad A. Georges, Phys. Rev. Lett. in press (cond-mat/0406293). [4]M. Vojta, N. Tong, and R. Bulla, cond-mat/0410132. [5]D. Grempel and M. Rozenberg, Phys. Rev. B 60, 4702 (1999).

Tae-Ho Park
Department of Physics and Astronomy, Rice University

Date submitted: 07 Dec 2004 Electronic form version 1.4