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Numerical renormalization group study of the Bose-Fermi Kondo model MATTHEW T. GLOSSOP, U. of Florida, KEVIN INGERSENT, U. of Florida — The Bose-Fermi Kondo model (BFKM) is of current interest in the context of non-Fermi liquid behaviour in quantum critical heavy fermion systems [1]. We study the Ising-symmetry BFKM, employing a novel extension of Wilson's numerical renormalization group to include coupling of a quantum impurity to *both* a conduction electron band *and* a dissipative bosonic bath described by the spectral function $\eta(\omega) \propto \omega^s$ $(0 < \omega < \omega_c)$. For sub-Ohmic bath exponents $0 < s < 1$ and fixed Kondo coupling, a critical unstable fixed point describes the continuous transition—at a critical coupling $g = g_c$ to the bosonic bath—between a Kondo-screened phase $(g < g_c)$ with characteristic Kondo resonance and a "bosonic" phase $(g > g_c)$ where the effective Kondo coupling flows to zero. Various critical exponents are computed and shown to obey hyperscaling relations for $0 < s < 1$ consistent with an interacting critical fixed point; ω/T-scaling of the dynamical local susceptibility is also shown. We make comparison where relevant to recent results of the $\epsilon \equiv (1 - s)$-expansion [2] and to results for the sub-Ohmic spin-boson model [3]. Further, for the corresponding Bose-Fermi Anderson model we calculate the single-particle spectrum, in which the destruction of the Kondo resonance at the quantum critical point is directly manifest. [1] Si *et al*, Nature (London) **413** 8 04 (2001).[2] Zhu L and Si Q, Phys. Rev. B **66** 024426 (2002). [3] Bulla R *et al*, Phys. Rev. Lett. **91** 170601 (2003).

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