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Quantum phase transition in the XY-anisotropic Bose-Fermi Kondo model[1] MENGXING CHENG, KEVIN INGERSENT, University of Florida — Using the numerical renormalization group, we study the quantum phase transition induced by dissipation in the XY-anisotropic Bose-Fermi Kondo model for a spin-one-half magnetic impurity coupled both to the on-site spin of a conduction electron band and, via its x and y spin components, to a bath of vector bosons. We focus on the case of a sub-Ohmic bath characterized by a power-law spectral exponent $s < 1$. Upon increasing the coupling of the impurity to the bosonic bath (at fixed fermionic coupling), the system exhibits a continuous quantum phase transition from a Kondo-screened ground state to a state in which the impurity moment is localized by the dissipation. We probe the quantum-critical behavior in the vicinity of this transition through the calculation of critical exponents describing the static and dynamical response to a local magnetic field both at absolute zero and at finite temperatures. Critical comparisons are made with analytical renormalization-group results obtained previously through expansion around the Ohmic case $s = 1$.

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