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Quantum criticality in the pseudogap two-channel Anderson and Kondo models TATHAGATA CHOWDHURY, KEVIN INGERSENT, University of Florida, FARZANEH ZAMANI, PEDRO RIBEIRO, MPI-PKS, Dresden, Germany, STEFAN KIRCHNER, MPI-PKS, MPI-CPFS, Dresden, Germany — The two-channel Anderson and Kondo impurity models with a density of states $\rho(E) \propto |E|^r$ that vanishes at the Fermi energy ($E = 0$) is of current interest in connection with impurities in graphene and in unconventional superconductors. The phase diagram of these models has been established previously [1,2]. We study the low-temperature static and dynamical properties of the models using the numerical renormalization-group method, and compare our results against exact and perturbative analytical theories [2], and against calculations performed within the non-crossing approximation. In the vicinity of the quantum critical points separating local-moment and non-Fermi liquid phases, the static local spin susceptibility is characterized by a set of critical exponents that satisfy the hyperscaling relations expected of an interacting system below its upper critical dimension. The dynamical local susceptibility and the impurity spectral function exhibit forms consistent with frequency-over-temperature scaling, another feature associated with interacting quantum critical points. [1] C. Gonzalez-Buxton and K. Ingersent, Phys. Rev. B 57, 14254 (1998). [2] I. Schneider et al., Phys. Rev. B, 84, 125139 (2011).

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