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Phase Boundaries of the Pseudogap Anderson Impurity Model<sup>1</sup> AARON MOHAMMED, Univ of South Florida, TATHAGATA CHOWDHURY, KEVIN INGERSENT, Univ of Florida — As the temperature of metals containing dilute concentrations of magnetic impurities reach very low temperatures, a phenomenon known as the Kondo effect takes place in which the resistance increases. This is due to the domination of spin-exchange processes that occur between the electrons of the metal and the electrons of the magnetic impurity near absolute zero. The Anderson model is a quantum impurity model that was developed in the 1960s to explain this phenomenon. It involves a single magnetic impurity tunnelcoupled to the conduction band of a metal. If the conduction band of this system contains a pseudogap, or a power-law decrease in the density of states around the Fermi energy, then quantum phase transitions will occur. The phase boundaries of the pseudogap Anderson impurity model have been previously approximated using poor man's scaling analysis. Here, we focus on using the more accurate numerical renormalization group method to calculate the location of these boundaries. We then compare these numerical results with the predictions derived from the scaling approximations. The development of nanotechnology like quantum dots and STM have rekindled interest in the Kondo effect since it can now be studied within controlled settings.

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