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Magnetic Phase Transitions of Local Moments Coupled to Multiple Conduction Bands WENJIAN HU, RICHARD SCALETTAR, University of California, Davis — Interfaces between strongly and weakly correlated materials, and superlattices thereof, have been the topic of much work over the last decade. Quantum Monte Carlo (QMC) in this area has often described the strongly correlated system with a single band Hubbard model, which supports Mott insulating and magnetic ordering behaviors. Here we study, instead, using determinant quantum Monte Carlo, a bilayer system consisting of a Kondo insulator, represented by a symmetric periodic Anderson model, coupled to a metal. This introduces an additional richness to the problem by allowing consideration of the effect of the metallic band on the competition between antiferromagnetic (AF) order and singlet formation. To understand the magnetic phase transition qualitatively, we first carry out a self-consistent mean field theory (MFT). The basic conclusion is a stabilization of the AF phase to larger fd hybridization V. We then employ a QMC treatment which, in combination with finite size scaling, allows us to evaluate the critical V in an exact treatment of the interactions. This approach confirms the stabilization of AF order, which occurs through an enhancement of the Ruderman-Kittel-Kasuya-Yosida interaction by the coupling to the additional metallic band.

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