Finite $f$-Electron Bandwidth in a Heavy Fermion Model

AXEL EUVERTE, Institute non lineaire de Nice, SIMONE CHIESA, College of William and Mary, RICHARD SCALETTAR, UC Davis, GEORGE BATROUNI, Institute non lineaire de Nice — Determinant Quantum Monte Carlo is used to study the effect of non-zero hopping $t_f$ in the localized $f$-band of the periodic Anderson model in two dimensions. We show that a remnant of the band insulator to metal line at $U_f = 0$ persists in the interacting system, manifesting itself as a maximal tendency toward antiferromagnetic correlations at low temperature. In this optimal $t_f$ region, short- and long-range spin correlations develop at similar temperatures in stark contrast with the more common scenario where short range correlations are stronger and develop at higher temperature. The effect that finite $t_f$ has on Kondo screening is investigated by considering the evolution of the local density of states for selected $t_f$ as a function of $V$.

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