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Competition between pairing and magnetic interactions RAIMUNDO DOS SANTOS, PEDRO BERTUSSI, Universidade Federal do Rio de Janeiro, ANDRE MALVEZZI, Universidade Estadual Paulista, THEREZA PAIVA, Universidade Federal do Rio de Janeiro — We discuss the interplay between pairing and magnetism by considering a model system composed of both tight-binding electrons and localized moments; the conduction electrons tend to form Cooper pairs due to a local (on-site) attractive interaction, U, while they also have a Kondo-like coupling, J, with the local moments. Density matrix renormalization group diagonalization on finite one-dimensional lattices (up to 60 sites) is used to calculate magnetic and pairing correlation functions, as well as structure factors in the ground state, in the case of electron density 1/3. Similarly to what happens in the quaternary borocarbides, we find that superconductivity coexists with a variety of magnetic arrangements of the local moments, ranging from commensurate to incommensurate spin-density waves, up to a critical value $J_c(U)$; the conduction electrons show strong antiferromagnetic fluctuations in this region. Superconductivity is then suppressed by the appearance of a magnetic state with broken rotational symmetry in both the local-moment and itinerant electrons subsystems, so that for sufficiently strong J, a spiral-ferromagnetic ground state evolves to a ferromagnetic one.

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