

The Role of Kinetic Interactions and Kinetic Correlations in Coexistence of Ferromagnetism and Superconductivity

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We describe the coexistence between superconductivity (SC) and ferromagnetism (F) using the extended Hubbard-type model. The Hartree-Fock's approximation (H-F) has been used for the inter-site kinetic correlation. Using the Green's function technique we calculated the SC transition temperature T_{SC} and Curie temperature T_C . Numerical results show that the kinetic correlation is capable of creating SC. It has been also shown that the triplet SC is either enhanced or depleted by F, depending on the carrier concentration and the direction of a superconducting spin pair with respect to magnetization, which is different in A_1 and A_2 phases. We have found that even relatively weak ferromagnetic ordering created by the band shift destroys the SC while the ferromagnetism created by the decrease of kinetic energy can coexist with singlet SC.