ITINERANT FERROMAGNETISM IN DOUBLE ORBITALLY DEGENERATED BAND

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9.7 cm

In this paper the itinerant ferromagnetism in a doubly orbitally degenerate Hubbard model generalized by taking into account correlated hopping and inter-atomic exchange interaction is studied. It is found that partially polarized ferromagnetic state is stabilized by inter-atomic exchange interaction.
The intra-atomic exchange interaction and correlated hopping play the important role for the ferromagnetism stabilization. Taking into account the correlated hopping parameters allows to explain the peculiar concentration dependence of magnetic characteristics of transition metal compounds. The concentration dependence of magnetization, Curie temperature, temperature dependence of magnetization are calculated.
The obtained results qualitatively describes the experimental Slater-Pauling's curves for ferromagnetic alloys. At some values of the model parameters the experimental dependence of magnetization and Curie temperature for the systems $Fe_{1-x}Co_xS_2$ and $Co_{1-x}Ni_xS_2$ with change of electron concentration in e_g band is reproduced theoretically. The correlated hopping mechanism of ferromagnetism stabilization allows to explain ferromagnetism in the systems $Fe_{1-x}Co_xS_2$ at small concentrations $x \simeq 0.05$.

13.4 cm

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