

The study of exchange indirect interaction in the impurity bigraphene

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Recently the big attention of researchers is concentrated on calculations of electronic, magnetic, conductive changes and other properties of graphene, caused by introduction of single atomic impurity on its surface [1]. It is known, that strong updating of electronic or magnetic properties is possible at impurity introduction.

Therefore research of the collective effects connected with interaction of the impurity with a crystal lattice of graphene, i.e. RKKY (Ruderman-Kittel-Kasuya-Yosida) interaction [2-3] is very interesting.

In the given work in the framework of s-d model features of RKKY-interaction in double-layer impurity graphene have been calculated. Atomic hydrogen was considered as an impurity. Calculations have shown that on small distances antiferromagnetic ordering of the impurity spins is preferable, and with distance increasing the ordering becomes ferromagnetic.

The increase of electric field intensity leads to the strongly oscillating dependence of indirect interaction of the impurity spins on the distance between impurities that can be connected with resonant transitions of the electrons between the split levels.

The feature of the RKKY-interaction of adsorbed atoms on the surface of double-layer graphene, made in this paper is that it considered the exchange interaction on the basis of the total (including short-wave part) electron spectrum of the crystal lattice.

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