# Electron-hole pairing with finite value of Cooper pair momentum in graphene bilayer

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Electron-hole (e-h) pairing caused by Coulomb interaction in the system [1,2,3] of independently gated graphene layers is considered. We investigate influence of Fermi lines mismatch caused by density imbalance of electrons and holes and triangle distortion of their spectrum on e-h pairing.

Dependence of critical temperature and corresponding Cooper pair momentum on mismatch of Fermi lines of e and h is calculated. We predict appearance of the state with finite value of Cooper pair momentum - Larkin-Ovchinnikov-Fulde-Ferrell-like (LOFF) state [4,5] - at mismatch of the Fermi lines above the critical value.

Dependence of critical temperature and corresponding Cooper pair momentum on intensity of triangle distortion of quasiparticle spectrum is obtained. We show that triangle distortion contrary to the e-h densities mismatch does not lead to stabilization of LOFF-like state.

Internal Josephson effect in LOFF-like state caused by interlayer tunneling is considered. We suggeSt new experimental method to probe nonuniform distribution of order parameter of the system in LOFF state. We show that spatial structure of the order parameter in LOFF state can be reconstructed from the dependence of tunnel current between the layers from value and direction of magnetic field parallel to the layers.

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