A possible explanation of Fermi arcs and pseudogap

O. Ivanenko and K. Mitsen

Lebedev Physical Institute, 119991 Moscow, Russia

In the framework of the model for the electron structure of HTSC cuprates supposed by us earlier, Fermi arcs observed in ARPES appear over the parts of d-gaped Fermi surface (FS) where pair breaking due to pair hybridization (the value of $\Gamma \propto T$ of band states with negative-U centers (NUC) takes place. The transition from the superconducting to the normal state is related to the disappearance of phase coherence, and the pseudogap, which persists in the vicinity of antinodal directions, is of superconductive nature (at optimal doping). At the same time, as the doping is reduced, an insulating gap opens in the FS region from points $(\pm\pi, 0; 0, \pm\pi)$ towards the nodal directions. Other consequences of pair hybridization between the band states and NUCs are nondegenerate distribution of mobile holes and importance of the processes of hole hole scattering trough the intermediate states at NUCs, which emerge as the dominant mechanism of carrier relaxation.