

Possible nature of ground state of HTSC

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We suggest a model for the electron structure of HTSC cuprates that makes it possible to trace the evolution of their electronic structure with the doping and temperature and provides a new explanation for a number of features typical of HTSCs, including the pseudogap and the Fermi arcs. According to this model, unusual properties of these compounds result from their unique electronic structure, favorable for the formation of two-atomic negative-U centers (NUCs) and realization of a peculiar mechanism of the electron-electron interaction. One of the basic statements of the model is that charges introduced upon doping remain localized in the vicinity of the dopant ions. The key role of doping is related to the local modification of the electron structure of CuO_2 planes adjacent to the dopants (such a plane being originally a charge-transfer insulator) that results in the activation of NUCs. In turn, free hole carriers appear as a result of the transitions of electron pairs to NUCs.