Interband pairing in cuprate superconductivity

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The nonrigid electron spectrum of a cuprate superconductor is modelled by an itinerant band and nodal and antinodal defect subbands created by doping. In the case of hole doping the region near the top of the oxygen band is involved, for electron doping near the bottom of the UHB. It is supposed that the leading pair transfer channel works between itinerant and defect states. Bare gaps between these subsystems are expected to be quenched by doping and are sources of pseudogaps. Band overlap conditions determine the phase diagram special points. Illustrative mean-field calculations have been made with a plausible parameter set. Self-consistent results* demonstrate that the elaborated approach is able to reproduce the behaviour of cuprate basic superconducting characteristics as e.g. the doping dependence of Tc, superconducting gaps and pseudogaps, supercarrier density and effective mass, coherence lengths and the penetration depth, critical magnetic fields and some other properties. Interband pairing scheme is suggested to be an essential aspect of cuprate multiband superconductivity.

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