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Interface energy of multiband superconductors

Using Ginzburg-Landau theory of two band superconductors, we determine
the surface energy between coexisting normal and superconducting solutions at the thermodynamic critical field. Close to the transition temperature, Tc, the two band problem maps onto an effective single band problem. While the order parameters of the two bands may have different amplitudes in the homogeneous bulk, near the critical temperature the Josephson coupling between the bands leads to the same spatial dependence of both order parameters near an interface or a vortex. This finding puts into question the possibility of Type 1.5 superconductivity, at least near Tc.

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