

Abstract Submitted
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Three-Band Superconductivity and Time-Reversal Symmetry Breaking Order Parameter¹ VALENTIN STANEV, ZLATKO TESANOVIC, Department of Physics and Astronomy, Johns Hopkins University, Baltimore, MD 21218 — Following the discovery of iron pnictide family of materials, the multiband superconductivity has migrated to the forefront of condensed matter physics. When “multi” means “more than two”, an additional wealth of possibilities emerges, going beyond the possible sign-switched state of the two-gap models. We consider a simple model in which three bands are connected via repulsive interband pairing terms. In this case there are generically three possible superconducting states. While two of them are a straightforward generalization of the two-gap order parameter, the third one has a time-reversal symmetry breaking order parameter, even for fully isotropic interactions. This novel state appears due to the frustration between different superconducting gaps when all interactions are comparable in strength. We construct the phase diagram of the model and discuss its relevance to iron pnictides.

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