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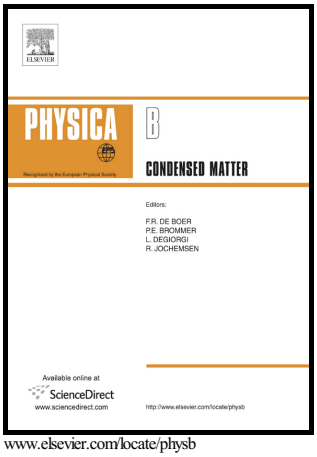

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Adaptive superconductivity on a reconstructed Fermi surface

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Abstract.

This paper discusses the adaptation of a superconducting order to a reconstructed Fermi surface (FS), in the ground state of a t-J model for a hole doped two-dimensional square lattice. It is found that while a nonmagnetic ground state always has a $d_{x^2-y^2}$ wave superconducting order, an antiferromagnetic ground state that has a FS destructed at the $d_{x^2-y^2}$ wave antinodal regions may disfavor a $d_{x^2-y^2}$ wave superconducting order. The superconductivity may adapt to the remnant FS by spontaneously reducing its symmetry, and these adapted superconducting states have fully gapped Fermi levels. Relevance with the underdoped superconducting cuprates is discussed.

Keywords: t-J model; antiferromagnetism; superconductivity; reconstructed Fermi surface; nodeless gap

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