
Fermi surface of the pseudogap state in underdoped cuprate superconductors

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Abstract

The electronic structure of the pseudogap state in the cuprates is crucial to a comprehensive understanding of high temperature superconductivity. I will present angle-resolved quantum oscillation and magnetoresistance measurements in underdoped YBCO, that resolve the electronic structure of the pseudogap as comprising a nodal twofold staggered Fermi surface in which the rotational symmetry has been transformed. This Fermi surface geometry can explain key signatures of the pseudogap such as gapless fermionic quasiparticles seen by photoemission to lie on arcs near the nodal Brillouin zone regions, a negative Hall effect and strongly enhanced interlayer transport anisotropy, and has a natural origin in a staggered biaxial charge density wave instability.

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