量子材料科学中心
International Center for Quantum Materials

Seminar

A strong coupling theory and s± pairing state of iron pnictide superconductor.

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Time: 15:00, Dec. 22. 2010 (Wednesday)

Venue: Conference Room A (607), No. 5 Science Building

Abstract

Superconductivity in iron pnictides is studied by using a two-orbital Hubbard model in the large U limit. The Coulomb repulsion induces an orbital-dependent pairing between charge carriers. The pairing is found mainly from the scattering within the same Fermi pocket. The interpocket pair scatterings determine the symmetry of the superconductivity, which is s± wave at small Hund's coupling, and d wave at large Hund's coupling and large U. By studying Josephson junctions between a FeAs-based superconductor with antiphase *s*-wave pairing and a conventional *s*-wave superconductor, we found that a planar and a point contact junction may have opposite phases in a wide doping region of the pnictide, which can be used to design a trijunction ring with π phase to probe the antiphase pairing. We also provide a possible explanation to C. C. Tsuei's phase sensitive experiment.