

凝縮系物理学ゼミナール

Condensed Matter Seminar

Location: Room 413, School of Science Bldg. 5 (理学 5 号館 413 号室)

Date: 13:30-15:00, Wednesday, 22 February 2012

Magnetic flux pattern in non-centrosymmetric interface superconductors

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Abstract:

The interface between the band insulators LaAlO_3 and SrTiO_3 is a non-centrosymmetric 2D electron system with Rashba spin-orbit coupling [1]. It has been known that the interface exhibits superconductivity [2], and recent real space imaging experiments have detected local magnetic patterns which might be interpreted as ferromagnetic patches coexistent with the superconducting (SC) phase [3]. Motivated by these experiments, we investigate magnetic properties of a 2D non-centrosymmetric superconductor in an inhomogeneous environment with an in-plane magnetic field or magnetization. In this talk, I will show that a flux pattern and vortices perpendicular to the interface appear as a result of an inhomogeneous field-induced helical SC state.

References:

- [1] S. Thiel *et al.*, *Science* 313, 1942 (2006).
- [2] N. Reyren *et al.*, *Science* 317, 1196 (2007).
- [3] J. A. Bert *et al.*, *Nature Physics* 7, 767 (2011).