

MAR13-2012-020061

Abstract for an Invited Paper
for the MAR13 Meeting of
the American Physical Society

Flux flow of iron based superconductors¹

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Flux flow measured by the microwave technique is the only one possible technique to pick up the information on the quasiparticles in the vortex core. Theoretically, novel features have been suggested to show up in the flux flow of Fe-based superconductors (SCs) as multiple gapped SCs with possible sign changes. We investigated the flux flow resistivity of various different types of Fe based SCs, such as 111, 122, and 11 systems [1]. It is found that (1) the sign change is not important for the flux flow, (2) we can discuss the gap structure based on the flux flow data, even without performing angle dependent measurement, (3) vortices of Fe-based SC dissipate more energy than expected from the properties in the Meissner state. Together with the flux flow result in many other superconductors such as cuprates, Y_2C_3 , and boron carbides, our result suggests the existence of a universal mechanism of dissipation for quasiparticles in the vortex core, probably related with the Andreev reflection at the core boundary. We also discuss the flux flow of cuprate superconductors, in terms of superconductivity fluctuation investigated by ac conductivity and diamagnetisms.

[1] K. Okada *et al.*: Phys. Rev. B86 (2012) 064516, H. Takahashi *et al.*: Phys. Rev. B86 (2012) 144525.

¹This work is partially supported by the TRIP program and also by the IRON SEA project both supported by JST.