Josephson Vortex State in Strongly Anisotropic Superconductor Bi-2212

KAZUTO HIRATA, SHUUICHI OOI, SHAN YU, EL HADI SMAIL SADKI, TAKASHI MOCHIKU, National Institute for Materials Science — We have reported that the periodic oscillations, observed in the Josephson-vortex (JV) flow resistance in Bi-2212 as a function of the parallel magnetic field, provide useful information on JV states. The 3D long-range-ordered state has been suggested from the “beats” phenomenon (Physica C412-414, 454(2004)) in the oscillations. The 3D phase ranges from the lower magnetic field boundary ($H_l$) to the higher boundary ($H_h$), which is determined from the beginning and the end of the oscillations, respectively. The boundary $H_l$ is independent of temperature and almost constant, and only depends on the anisotropy parameter $\gamma$. Crossing the boundary $H_h$, the JV flow resistance without any oscillations suggests 2D-quasi-long-range ordered state, proposed by Hu&Tachiki (PRB70, 064506(2004)).