Vortex States in Intrinsic Josephson Junctions of $\text{B}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ in High Parallel Magnetic Fields

JOVAN MIRKOVIC, Faculty of Sciences, University of Montenegro, G. Washington Str., 81000 Podgorica, Montenegro, SAIITO TAKASHI, Institute of Materials Science, University of Tsukuba, 305-8573 Tsukuba, Japan, YUIMARU KUBO, National Institute of Materials Science, 1-2-1 Sengen, Tsukuba 305-0047, Japan, ITSUHIRO KAKEYA, Electronic Science and Eng. Faculty, University of Kyoto, 615-8510 Kyoto, Japan, AHMED ORAL, Faculty of Engineering and Natural Sciences, Sabanci University, Tuzla, 34956 Istanbul, Turkey, TAKASHI YAMAMOTO, KAZUO KADOWAKI, Institute of Materials Science, University of Tsukuba, 305-8573 Tsukuba, Japan —

The $I_c$-axis resistivity measurements were performed in the vicinity of the $ab$-plane in order to investigate the interaction between Josephson vortices (JVs) and pancake vortices (PVs) in $\text{B}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ mesoscopic single crystals. It was found that the vortex lock-in transition becomes considerably broad in high magnetic fields, while the angular dependence of resistance exhibits the sharp lock-in features in low magnetic field region. The magnetic field dependence of the resistance exhibits the non-monotonic behavior probing the different vortex phases in tilted magnetic fields. Sharp dips and steps in the $c$-axis resistance were observed accompanied by penetration of quantized pancake vortices by tilting external fields from the $ab$-plane.

Jovan Mirkovic
Faculty of Sciences, University of Montenegro,
G. Washington Str. 81000 Podgorica, Montenegro

Date submitted: 18 Dec 2008

Electronic form version 1.4