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Vortex States in Intrinsic Josephson Junctions of $B_2Sr_2CaCu_2O_{8+\delta}$ in High Parallel Magnetic Fields JOVAN MIRKOVIC, Faculty of Sciences, University of Montenegro, G. Washington Str., 81000 Podgorica, Montenegro, SAITO 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 $B_2Sr_2CaCu_2O_{8+\delta}$ 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.

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