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Vortex flow characteristics of $Bi_2Sr_2CaCu_2O_{8+\delta}$ Long Intrinsic Josephson Junctions[1] KAZUO KADOWAKI, KOHEI KAWAMATA, YUIMARU KUBO, KAZUKI FUKUI, TAKASHI YAMAMOTO, ITSUHIRO KAKEYA, Institute of Materials Science, University of Tsukuba — Intrinsic Josephson junction characters in $Bi_2Sr_2CaCu_2O_{8+\delta}$, where the junction length L is much longer than the Josephson length $\lambda_J=\gamma s$, have been studied from view point of Josephson vortex dynamics, since they are expected to be released from the strong geometrical constraint, which confines Josephson vortices into a square box, and as a result they are free to move in the two dimensional channels. We fabricated such long junctions with L=20-40 μm and have measured c-axis transport characteristics. We have found that Josephson flow resistance R_f suddenly suppressed at the intermediate field region of 1-2 T, then begins to reappear gradually as field is increased. The sharp lock-in transition as a function of angle appearing below it where the periodic oscillation of R_f is seen, becomes immediately broad and a round peak above it, where the periodic oscillation of R_f is no longer observable. It seems that the transition field becomes lower as L is increased so that in short junctions it cannot be observed in a field region up to 6 T.

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