

Microwave Emission by Josephson Vortex Motion in Stacks of $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$ Intrinsic Josephson Junctions

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Collective transverse plasma modes in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$ intrinsic Josephson junctions (IJJs) can be excited by the moving Josephson vortex lattices. The c -axis standing plasma wave eigen-modes amplified by the resonance arrange the Josephson vortex lattice according to the profile of the plasma modes along c axis. This resonance phenomenon accompanies the collectively resonating multiple branches in the Josephson vortex dynamics, which may excites electromagnetic wave emission from edges of a stack of IJJs. In this presentation, we will show the experimental observation of distinct collective resonance modes in the Josephson vortex flow branches. For a dc bias on one of the resonance branches, we also obtained an evidence for the microwave emission from stacked IJJs. The emission was examined by observing the changes in the quasiparticle branches of another stack of IJJs placed in proximity to the stack.

keywords : collective transverse plasma modes, multiple Josephson vortex-flow branches, microwave emission.