

Intrinsic Josephson Junctions in Bi2212 Single Crystals: A Playground for the Quantum Physics and Electronics

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Recently, intrinsic Josephson junctions in high T_c superconductors have attracted much attention, because of a number of their interesting physical properties: a sharp lock-in behavior of the Josephson vortex flow resistance, an oscillating behavior of the flow resistance as a function of magnetic field, THz radiation due to Josephson plasma excitations, macroscopic quantum tunneling phenomena, etc. We have been working on these subjects for several years and the accumulating data show a unified view of Josephson vortex physics, which is unique in the field of superconductivity. I will give most up-to-date topics among them, especially concerning a direct observation of strong, continuous and coherent THz radiation as well as macroscopic quantum tunneling phenomena in intrinsic Josephson system Bi2212 single crystals.