Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Coherent THz radiation from multiple I-V branching structures in intrinsic Josephson junctions of Bi-2212 MANABU TSUJIMOTO, KAZUHIRO YAMAKI, TAKASHI YAMAMOTO, HIDETOSHI MINAMI, TAKANARI KASHIWAGI, KAZUO KADOWAKI, MASASHI TACHIKI, University of Tsukuba — Intense and coherent terahertz (THz) radiation was observed from the intrinsic Josephson junction (IJJ) system of the single crystalline high-T_c superconductor $Bi_2Sr_2CaCu_2O_{8+\delta}$ (Bi-2212).[1,2] In the present work, we demonstrate the importance of the THz radiation from inner branching structures of the $I-V$ characteristic curve of the IJJ system. The radiation frequency has previously been thought to be uniquely constrained to the mesa size, but it turns out in the inner branches that it varies very flexibly and widely perhaps according to the inductive and capacitive coupling strength existing in the mesa itself. Therefore, the radiation frequency does not follow the previously established cavity resonance condition. This new experimental feature may provide a unique opportunity to understand the dynamical nature of IJJ as well as the mechanism of high-T_c superconductivity in this particular Bi-2212 compound.

[1]L. Ozyuzer et al., Science **318,** (2007) 1291.
[2]K. Kadowaki et al., Physica C **468,** (2008) 634.

Manabu Tsujimoto
University of Tsukuba

Date submitted: 09 Dec 2009 Electronic form version 1.4