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Tunable THz radiation from intrinsic Josephson junctions in $Bi_2Sr_2CaCu_2O_{8+\delta}$ in a localized phase rotating mode[1] MANABU TSUJIMOTO, KAVEH DELFANAZARI, TAKEO KITAMURA, MASASHI SAWAMURA, KAZUYA ISHIDA, SHUNSUKE SEKIMOTO, CHIHARU WATANABE, University of Tsukuba, TAKASHI YAMAMOTO, Japan Science and Technology Agency, TAKANARI KASHIWAGI, HIDETOSHI MINAMI, KAZUO KADOWAKI, University of Tsukuba — After the first report of intense continuous THz electromagnetic wave radiation from high-T_c superconductor $Bi_2Sr_2CaCu_2O_{8+\delta}$ [L. Ozyuzer *et al.*, Science **318**, 1291 (2007)] with remarkably higher intensity, a great deal of interest has been drawn not only to the physical mechanism of the radiation but also to the possible variety of applications in the vast fields of THz science and technology. Recently, the authors pointed out that the contributions to the output power from the Josephson current source was found to be comparable in magnitude [K. Kadowaki *et al.*, J. Phys. Soc. Jpn. **79**, 023703 (2010); M. Tsujimoto *et al.*, Phys. Rev. Lett. **108**, 107006 (2012)]. As R. Kleiner *et al.* observed in 1992 [R. Kleiner *et al.*, Phys. Rev. Lett. **68**, 2394 (1992)], the intrinsic junctions in the phase rotating mode produce an equal number of *I-V* characteristic branches. Here we show clear evidence that the mesas can emit radiation at many frequencies in various localized phase rotating modes, and that the resulting radiation is tunable over a broad range of frequencies, allowing us to construct a powerful THz source device that could fill the THz gap.

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