THz Emission from a Triangular Mesa Structure of Bi-2212 IJJs

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Applying dc-voltage along the c-axis of $Bi_2Sr_2CaCu_2O_{8+\delta}$ (Bi2212) single crystal, which is sculptured by a focus ion beam (FIB) milling technique into a mesa structure, intense, continuous, and monochromatic terahertz (THz) electromagnetic waves are generated as previously reported.[1,2] It has been established that there are two conditions to be fulfilled in order to have THz radiation from the mesa: one is the ac-Josephson effect while another is the cavity resonance condition in order to form a standing wave inside the mesa. We fabricated the triangular mesas with various sizes and shapes; equilateral and isosceles triangular mesa structures with the various length of the sides, and observed THz emission from one of the isosceles triangles. In this THz emission, we see that the ac-Josephson relation is well obeyed and the resonance condition seems to agree with the calculated modes. We analyzed the data by simulating the mode, which will be discussed.

[1]L. Ozyuzer *et al.*, Science **318**, 1291 (2007).
[2]K. Kadowaki *et al.*, J. Phys. Soc. Jpn. **79**, 023703 (2010).