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Title:Terahertz emission from Bi2Sr2CaCu2O8+delta intrinsic Josephson junction stacks with all-superconducting electrodes
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Abstract:Terahertz (THz) emission has been recently detected from intrinsic Josephson junction (IJJ) stacks made of the high critical temperature superconductor Bi2Sr2CaCu2O8+delta (BSCCO). The most employed structure is a mesa standing on a big pedestal of a single crystal with a thin gold layer as its top electrode. In this work, a large (300 x 50 x 1.2 mu m(3)) IJJ stack with superconducting electrodes was fabricated and studied. The stack consisted of N approximate to 800 IJJs. It was prepared with a double-sided fabrication process, and significant THz emission was detected. The output power is comparable to the emission power detected from mesa structures, obviously not weakened by the superconducting upper electrode. The observation of THz emission from the double-sided structure suggests that off-chip THz emission from IJJs can be obtained not only from mesa structures and, most importantly, that the emission power can be potentially enhanced in integrated multi-stack radiation sources.
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