

Abstract Submitted  
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**Thermal Management in Large Bi2212 Mesas used for Terahertz Sources**<sup>1</sup> C. KURTER, K. E. GRAY, Q. LI, Argonne National Laboratory, L. OZYUZER, Izmir Institute of Technology, A. E. KOSHELEV, Argonne National Laboratory, T. YAMAMOTO, K. KADOWAKI, University of Tsukuba, U. WELP, Argonne National Laboratory — We report the intrinsic tunneling characteristics of  $300 \times 100 \times 1 \mu\text{m}^3$  mesas on Bi2212 single crystals that have recently shown high-power emission at terahertz frequencies due to the ac Josephson effect. Despite the large mesa volumes compared to those of others, there is an accessible range of voltages for which self-heating does not exceed  $T_c$  and significant terahertz emission can be observed. We use a model of the current-voltage curve,  $I(V)$ , based on (1) the low-current normal-state c-axis resistance of the mesa and (2) a temperature increase proportional to power,  $P=IV$ . We find that the local temperatures along the nonlinear  $I(V)$  are consistent with the observed unpolarized thermal radiation from the mesa, thus verifying the model.

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