

Abstract Submitted
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Temperature and Field Dependence of the Emission of Terahertz Waves from Intrinsic Josephson Junctions¹ ULRICH WELP, ALEXEI KOSHELEV, Argonne National Laboratory, Argonne, IL 60439, USA, LUTFI OZYUZER, Izmir Institute of Technology, TR-35430 Izmir, Turkey, CIHAN KURTER, Argonne National Laboratory, Argonne, IL 60439, USA, 2Izmir Institute of Technology, TR-35430 Izmir, Turkey, MASASHI TACHIKI, The University of Tokyo, 5-1-5 Kashiwanoha, Kashiwa 277-8568, Japan, KAZUO KADOWAKI, TAKU YAMAMOTO, University of Tsukuba, Ibaraki-ken 305-8577, Japan, KEN GRAY, WAI -K. KWOK, Argonne National Laboratory, Argonne, IL 60439, USA — We have recently succeeded in extracting coherent cw THz-radiation from intrinsic Josephson junctions in BSCCO [Science 318, 1291, (2007)]. An electromagnetic cavity resonance inside the sample generates a coherent state in which a large number of junctions are synchronized to oscillate in phase resulting in emission powers of up to 5 μ W at frequencies up to 0.85 THz. The emission displays a non-monotonic temperature dependence with a sample dependent sharp maximum in the range of 25 to 45 K which we attribute to the interplay of self-heating effects and re-trapping of intrinsic junctions. Application of magnetic fields of less than 100 Oe parallel to the CuO₂ planes as well as perpendicular leads to the rapid suppression of the emission.

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