

250. Title: Temperature Distribution in a Stack of Intrinsic Josephson Junctions with Their CuO-plane Electrodes Oriented Perpendicular to Supporting Substrate

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Abstract: We numerically study Joule heating in a THz emitter made of Bi₂Sr₂CaCu₂O_{8+δ} (Bi2212) single crystal with its CuO planes oriented perpendicular to supporting substrate. The single crystal is glued to the substrate by a layer of PMMA. The electrical current is applied in the c -axis direction across many intrinsic Josephson junctions (IJJ's) in Bi2212. The calculations show that the internal temperature increases to an acceptable 10-20 K only above the bath temperature for a Joule power density of ~105 W cm⁻³ typical for experiments on THz emission from IJJ's. This makes the suggested geometry promising for boosting the output power of the emitter..