Abstracts

High-Spatial Resolution Resistivity Mapping of Large-Area YBCO Films by a Near-Field Millimeter-Wave Microscope (Short Papers)

M. Golosovsky, A. Galkin and D. Davidov. "High-Spatial Resolution Resistivity Mapping of Large-Area YBCO Films by a Near-Field Millimeter-Wave Microscope (Short Papers)." 1996 Transactions on Microwave Theory and Techniques 44.7 (Jul. 1996, Part II [T-MTT] (Special Issue on the Microwave and Millimeter Wave Applications of High Temperature Superconductivity)): 1390-1392.

We demonstrate a new millimeter-wave technique for the resistivity mapping of large-area conducting films, namely, a near-field resistivity microscope. The microscope is based on the idea that electro-magnetic waves are transmitted through a narrow resonant slit with high efficiency. By scanning this slit at fixed height above an inhomogeneous conducting surface and measuring the intensity and phase of the reflected wave, the resistivity of this surface may be determined with a 10-100 µm spatial resolution using 80-GHz radiation. Using this technique, we map normal-sate resistivit y of 1 in x 1 in YBCO films at ambient temperature. In some films we find inhomogeneities of the normal-state sheet resistance of the order of 10%--2O%.

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