Abstracts

A New Resistance Measurement Technique Applicable to High-Temperature Superconducting Materials at Microwave Frequencies (Short Papers)

M.K. Skrehot and K. Chang. "A New Resistance Measurement Technique Applicable to High-Temperature Superconducting Materials at Microwave Frequencies (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 434-437.

A two-gap electrically floating resonant strip is used for surface resistance measurements of the high-temperature superconductor YBa/sub 2/Cu/sub 3/O/sub 7-delta/. The method used is simple, has no electrical contact, operates at various resonant frequencies, and requires only a small sample. An analysis was used that allows for the accurate design of the strip dimensions to produce a desired resonant frequency. Experimental measurements on resonant frequencies in X- and Ku-bands (8-18 GHz) agree well with the calculations. The method allows one to extract the normalized surface resistance of the sample from transmission coefficient measurements at the resonant frequency. These normalized values were found to compare favorably to the Mattis-Bardeen theory taken in the local limit. The resonant strip in waveguide should have applications in high-temperature superconductive material characterization and in the development of waveguide superconductive filters.

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