Abstracts

Current Distribution in Superconducting Strip Transmission Lines

A method for the calculation of the current distribution, resistance, and inductance for superconducting strip transmission lines is presented. These calculations allow accurate characterization of both high-T_c and low-T_c superconducting strip transmission lines. For a stripline geometry the current distribution, resistance, and inductance are calculated as a function of the penetration depth for various film thicknesses. These calculations are then used to determine the penetration depth for a $YBa_2Cu_3O_{7-X}$ superconducting thin film from the measured temperature dependence of the resonant frequency of a stripline resonator. The power dependence of the $YBa_2Cu_3O_{7-X}$ surface resistance is shown plotted against the RF magnetic field which is determined from the calculated current distribution.

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