

A Study on Inhomogeneity of YBCO Coated Conductors Using Low Temperature Scanning Laser Microscopy (LTSLM)

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Low temperature scanning laser microscopy (LTSLM) can be used for a two-dimensional display of bolometric response arising from the localized excitation of the sample by the laser beam. So we have analyzed the distribution of critical temperature (T_c) and critical current density (J_c) in YBCO coated conductor using LTSLM. For improving the temperature stability and signal to noise ratio, we have modified the system. Then we can advance the stability of temperature from ± 10 mK to ± 1 mK. For measuring the superconducting properties of YBCO coated conductors, we have prepared the sample of a narrow bridge type using the wet etching process. We have observed a spatial nonuniformity of the ac voltage response, $\delta V(x)$, which is proportional to $\partial \rho(x, J_B) / \partial T$ in the transition temperature region, and we have displayed the data in a two-dimensional image.

Keywords : LTSLM, YBCO, Coated conductor, Critical temperature (T_c)