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Peculiarities of pinning and microwave absorption hysteresis in thin superconducting films

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Abstract

The results of experimental and theoretical studies of the hysteretic microwave absorption (MWA) in the superconducting Bi₂Sr₂CaCu₂O₈ thin films are presented. It has been found experimentally that the hysteresis loop manifests some unusual features such as the non-monotone hysteresis variation and the change of a hysteresis sign. We have shown that such unusual behavior is due to the special nature of the bulk pinning in a superconducting film with a thickness comparable with the field penetration depth. The theoretical model of the MWA hysteresis has been developed taking into account the inhomogeneous distribution of centers with different symmetry of a pinning potential and their variation with the magnetic field value. © Springer Science+Business Media, LLC 2006.

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Keywords

Microwave absorption, Pinning centers, Potential wells, Thin films