Contribution ID: **175**   Type: **Oral**

GENERALIZED NONLINEAR MAGNETIC SUSCEPTIBILITY AND COLE-COLE DIAGRAM OF SUPERCONDUCTIVE DISK IN TRANSVERSE ac FIELD

Contact Phone

Abstract

Real and imaginary parts of the "generalized" (a pick-up coil size dependent) nonlinear magnetic susceptibility are calculated for an arbitrary radii's ratio $\alpha = r/R$ of the flat single-turn coil (r) and thin superconductive disk (R) (with thickness $d \ll R$) in the framework of the critical-state model at fundamental frequency. The results of the well-known Clem – Sanchez (CS) critical-state model for nonlinear magnetic susceptibility $\chi(h)$ of the superconductive disk in transverse ac field with reduced amplitude h are reproduced in the limit $\alpha \to \infty$. It is shown that for a standard experimental situation (specimen inside magnetometer pick-up coil) the relative systematic error of the critical current Jc measurements is negligible (< 2%) for $\alpha > 2$, but tends to 25% while $\alpha \to 1$. On the other hand, in the case $\alpha < 1$ the generalized susceptibility's dependence on h differs qualitatively from the CS one. The Cole – Cole diagrams for generalized susceptibility are plotted for various α values.

Type of Book of Abstracts

Primary author: Dr SEMENOV, Alexei (Institute of Physics, NAS of Ukraine, Kiev, Ukraine)

Presenter: Dr SEMENOV, Alexei (Institute of Physics, NAS of Ukraine, Kiev, Ukraine)

Session Classification: Physics of Magnetism

Track Classification: Physics of Magnetism