

Diminished Equilibrium Magnetization in Hg-1223 and Tl-2212 Superconductors with Fission-generated Columnar Defects

J.R. Thompson^a, J.G. Ossandon^b, D.K. Christen^a, K.J. Song^c, L. Krusin-Elbaum^d, and J.L. Ullmann^e

^aOak Ridge National Laboratory, Oak Ridge, TN 37831-6061 USA

^bDept of Engineering Sciences, University of Talca, Curico, Chile

^cDep't Physics, University of Tennessee, Knoxville, TN 37996-1200 USA

^dIBM Research Center, Yorktown Heights, 10598 NY

^eLos Alamos National Laboratory, Los Alamos, NM 87545 USA

When randomly oriented columnar defects (CDs) are added to Hg-1223 and Tl-2212 superconductors, their vortex state equilibrium magnetization M_{eq} decreases substantially. M_{eq} progressively deviates from the usual London $\ln(B)$ dependence and the curves become S -shaped. Vortex-defect interactions quantitatively account for this behavior. Research at ORNL and LANL was sponsored by the US DOE.

Section: Superconductivity

Keywords: equilibrium magnetization, columnar defects, cuprates, vortex pinning

LT3550