Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Suppressed mixed-state dissipation in magnesium diboride films
MILIND KUNCHUR, DANIEL ARCOS, GABRIEL SARACILA, University of South Carolina, DAVID CHRISTEN, Oak Ridge National Lab, JAMES THOMPSON, Oak Ridge National Lab/U. Tennessee — We have investigated dissipative transport in magnesium diboride films at magnetic fields approaching the upper-critical value and currents crossing the depairing limit. The depairing current and the upper-critical field behave in a reasonable manner, conforming to the conventional ideas for these phase boundaries. However the flux motion at high fields and currents experiences a drastic suppression, such that the value of applied field has little effect on the resistive transition shape or current-resistance chanracteristic, other than to cause an overall shift due to pair-breaking. We discuss these results and the possible role of the double-barreled spatial distribution of quasiparticles around a vortex in a two-band superconductor.

Milind Kunchur
University of South Carolina

Date submitted: 22 Nov 2004 Electronic form version 1.4