

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**Vortex dynamics investigated using low temperature scanning tunneling microscope: collective motion and collective pinning of vortices in NbSe<sub>2</sub>** JONGHEE LEE, WANG HUI, DAN SULLIVAN, Department of Physics, University of Maryland, College Park, MD 20740, MICHAEL DREYER, Department of Electrical & Computer Engineering, University of Maryland, College Park, MD 20740, BARRY I. BARKER, Laboratory for Physical Sciences, National Security Agency, College Park, MD 20740, PAVEL SHUK, MARK HIGGINS, EVA Y. ANDREI, Department of Physics, Rutgers University, Piscataway, NJ 08854 — We report the observation of the collective motion and the collective pinning of vortices of NbSe<sub>2</sub> under various magnetic fields and from  $\sim 6$  K to  $\sim 2$  K using scanning tunneling microscopy (STM). Scanning Tunneling Spectroscopic maps were taken continuously, providing “movies” of the vortex motion. Based on the analysis of this data, the speed of the collective motion of vortices was  $\sim 1$  pm/s. The vortices showed clear signs of weak collective flux pinning. We will quantify the collective transport behavior of vortices based on our STM measurements and compare with the pertinent theories as well as related measurements done by other groups.

Jonghee Lee  
Department of Physics, University of Maryland, College Park, MD 20740

Date submitted: 06 Dec 2005

Electronic form version 1.4