Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

The effect of magnetic field on superconductivity in ultrathin amorphous Pb films with paramagnetic impurities. ASHWANI KUMAR, H. JEFFREY GARDNER, PENG XIONG, Department of Physics and MARTECH, Florida State University — We report on a systematic study of the effect of applied magnetic fields on superconductivity in ultrathin amorphous Pb films containing various amounts of paramagnetic impurities. The Pb film, along with a 1 nm thick Sb buffer layer, was quench-condensed onto a Si substrate with pre-deposited Au contacts in a modified dilution refrigerator. Cr impurities were then deposited onto the Pb film by heating a NiCr wire at a fixed current. Both the Pb thickness (thus its T_C) and the Cr density can be varied, and electrical measurements can be performed at each step in perpendicular magnetic fields up to 8 T, all *in situ*. The reduction of the Pb T_C with increasing Cr density is well described by the Abrikosov-Gorkov theory. The application of perpendicular magnetic fields did not result in any suppression of the pair-breaking effect by the Cr impurities, i.e., field enhanced superconductivity, on several samples covering a wide range of Pb thicknesses and Cr densities. The pronounced reentrant behavior found in the magnetic field-tuned transitions in pure Pb films[1] was progressively suppressed by increasing Cr impurities. [1] J.S. Paker et al., Europhys. Lett. 75, 950 (2006).

Ashwani Kumar

Date submitted: 17 Nov 2006 Electronic form version 1.4