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High sensitivity SQUID susceptibility measurements B. KALISKY, J.R. KIRTLEY, L.C. QIAN, B.L. DWYER, K.A. MOLER, Stanford, J. NGAI, Y. SEGAL, J. REINER, F. WALKER, C. AHN, Yale, A.M. HAMILTON, B. RUTT, A.C. MATIN, Stanford, O.M. AUSLAENDER, Technion, D.A. BONN, R. LIANG, W.N. HARDY, UBC, J.G. ANALYTIS, J.-H. CHU, I.R. FISHER, Stanford — Scanning superconducting quantum interference device (SQUID) sensors have high sensitivity to magnetic flux ($10^{-6}\Phi_0/\sqrt{Hz}$) and magnetic moment (~ 100 electron spins) under reasonable scanning conditions. In addition, a single turn field coil co-centered with the SQUID sensing loop provides excitation for simultaneous measurement of low field susceptibility, with sensitivity of $\chi \sim 10^{-6}$ at a spatial resolution of a few microns. I will present our recent measurements on several systems which exhibit weak susceptometry signals: thin film paramagnetic LaNiO3 that are (hopefully) the precursors to engineered superconducting films; individual magnetotactic bacteria, which are used as MRI contrast agents; and twinned high critical temperature cuprate and pnictide superconducting samples that may experience variations in the superfluid density at the twin boundary.

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