

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Force-detected ESR from E' centers PALASH BANERJEE, YULU CHE, K.C. FONG, TIM MEWES, VIDYA BHALLAMUDI, DENIS V. PELEKHOV, P. CHRIS HAMMEL, Ohio State University — Magnetic Resonance Force Microscopy (MRFM) is a novel technique that combines magnetic resonance with scanned probe techniques. We report on low temperature force-detected electron spin resonance (ESR) signals from E' -centers in fused silica (SiO_2). By utilizing the high gradients close to a micron sized SmCo ferromagnetic tip mounted on an AFM cantilever, spin resonance was observed from a sub- micron thick “sensitive slice” whose location can be varied with respect to the sample surface. E' centers at low temperatures (< 10 K) are characterized by long spin-lattice relaxation times T_1 approaching a few seconds. The spins were adiabatically inverted at the appropriate frequency by means of microwave FM techniques and T_1 was studied as a function of field gradient. We also discuss the sensitivity of the microscope and ongoing efforts to improve it.

Palash Banerjee
Ohio State University

Date submitted: 01 Dec 2004

Electronic form version 1.4