

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Progress on Magnetic Resonance Force Microscopy Detection of Statistical Polarization of Electron Spins K.C. FONG, I.H. LEE, P. BANERJEE, YU. OBUKHOV, D. PELEKHOV, P.C. HAMMEL, Department of Physics, Ohio State University, 191 West Woodruff Ave., Columbus OH 43210 — Here we report our experimental progress on detecting statistical polarization of electron spins. In the condition of low external magnetic field and high temperature, polarization due to Boltzmann factor could be small, i.e. $\mu B/k_B T \ll 1$. The \sqrt{N} statistical polarization can dominate the Boltzmann polarization when the spins ensemble is sufficiently small. With its unprecedented force sensitivity, Magnetic Resonance Force Microscopy (MRFM) has demonstrated the capability to observe this self-polarizing nature of spins via the i-OSCAR detection protocol¹. Our efforts to use MRFM to detect this statistical polarization will be presented.

¹H.J. Mamin, R. Budakian, B.W. Chui and D. Rugar, Phys. Rev. Lett. **91**, 207604 (2003)

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Date submitted: 02 Dec 2006

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