Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Low temperature magnetic imaging of strained multiferroic $EuTiO_3$ thin films[1] YANAN GENG, WEIDA WU, Department of Physics and Astronomy, Rutgers University, Piscataway, NJ, J.W. FREELAND, P. RYAN, J.W. KIM, Advanced Photon Source, Argonne National Laboratory, Argonnne, IL, X. KE, P. SCHIFFER, Department of Physics and Materials Research Institute, J.H. LEE, D.G. SCHLOM, Department of Materials Science and Engineering, Pennsylvania State University, University Park, Pennsylvania, C.J. FENNIE, Department of Applied and Engineering Physics, Cornell University, Ithaca, New York — It has been predicted that the competition between paraelectric antiferromagnetic state and ferroelectric ferromagnetic state in perovskite $EuTiO_3$ can be tuned by epitaxial strain.[2] Tensile-strained $EuTiO_3$ thin films grown on $DyScO_3$ (110) substrate by molecular-beam epitaxy are confirmed to be ferromagnetic at low temperature by magnetometry and magneto-capacitance. Here we present magnetic imaging of $EuTiO_3/DyScO_3$ thin film using low temperature magnetic force microscopy (LT-MFM). Temperature dependence of MFM contrast confirms the ferromagnetic ground state. The magnetic field dependence of MFM images will be discussed in conjunction with magnetometry and magneto-capacitance measurements.

[1]Work at Rutgers is supported by NSF-DMR-0844807.
[2]C.J. Fennie and K.M. Rabe, Phys. Rev. Lett. 97, 267602 (2006).

Weida Wu
Department of Physics and Astronomy, Rutgers University

Date submitted: 20 Nov 2009 Electronic form version 1.4