Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Domain Wall Magnetism in Multiferroic BiFeO3 QING HE, S.-Y. YANG, C.-H. YANG, P. YU, J. WU, Z. Q. QIU, R. RAMESH, Department of Physics, UC Berkeley, M. DARAKTCHIEV, G. CATALAN, J. SCOTT, Department of Earth Science, University of Cambridge, E. ARENHOLZ, A. SCHOLL, Advanced Light Source, LBNL, A. FRAILE-RODRIGUEZ, Swiss Light Source, PSI, D. LEE, S. X. WANG, Physics Department, Stanford University, L. MARTIN, Department of Materials Science and Engineering, UIUC, Y.-H. CHU, Department of Materials Science and Engineering, National Chiao Tung University — Through a combination of theoretical calculations and experimental studies, a holistic picture of the connection between processing, structure, and properties brings to light the role of magnetism at ferroelectric domain walls in determining the magnetic properties in $BiFeO_3$. By controlling domain structures through epitaxial growth constraints and probing these domain walls with exchange bias studies, x-ray magnetic dichroism based spectromicroscopy, and high resolution transmission electron microscopy we demonstrate that the formation of certain types of ferroelectric domain walls (i.e., 109° walls) can lead to enhanced magnetic moments in $BiFeO_3$. This work is supported by the Department of Energy.

Qing He
Department of Physics, UC Berkeley

Date submitted: 01 Dec 2009 Electronic form version 1.4