

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Exchange Coupling across BiFeO₃/La_{0.7}Sr_{0.3}MnO₃ Interface PU YU, M. HUIJEN, M.B. HOLCOMB, C.H. YANG, Q. HE, Y. H. CHU, J. X. ZHANG, L. W. MARTIN, R. RAMESH, Department of Physics and Department of Materials Science and Engineering, University of California, Berkeley, PER-ANDERS GLANS, J. H. GUO, Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley — Controlling the magnetic state by using electric field is a central topic for spintronics and has piqued intense interest. The coupling of antiferromagnetic and ferroelectric order parameters of multiferroic BiFeO₃ (BFO) provides a new approach to achieve this goal by using exchange coupling effect. Our previous studies have shown negative exchange bias between epitaxial ferromagnetic La_{0.7}Sr_{0.3}MnO₃ (LSMO) and BFO heterostructures and magnetoelectric coupling at these interfaces. The coupling mechanism between these two materials is still a mystery due to the complexity of the G-type spin structure. In this work, by controlling the domain structures of BFO and studying the corresponding exchange coupling effect, the possible coupling mechanism of antiferromagnetic and ferromagnetic spin structures will be proposed. Additionally, the coupling of orbitals across the interface will also be discussed, which will give us another possible clue to understand the spin coupling mechanism, since usually orbital and spin orders are coupled together.

Pu Yu

Date submitted: 21 Nov 2008

Electronic form version 1.4