

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

**Interface-Induced Magnetic Coupling in
Multiferroic/Ferromagnetic Bilayer: An Ultrafast Pump-Probe Study¹**

ELBERT CHIA, CHAN LA-O-VORAKIAT, Y.F. TIAN, TOM WU, CHRISTOS PANAGOPOULOS, Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, JIAN-XIN ZHU, Theoretical Division and Center for Integrated Technologies, Los Alamos National Laboratory, HAIBIN SU, Division of Materials Technology, School of Materials Science and Engineering, Nanyang Technological University — By use of optical pump-probe measurement, we study the relaxation dynamics of a multiferroic-ferromagnetic $\text{TbMnO}_3/\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ bilayer. The relaxation dynamics of both layers are well separated in time allowing us to investigate the magnetic coupling across the bilayer. We observe that the relaxation dynamics of the individual layers in the bilayer sample are the result of the interplay between the intrinsic magnetic order and the induced interfacial effect. Our data suggest the existence of induced ferromagnetic order in the TbMnO_3 layer, and antiferromagnetic order in the $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ layer.

¹Singapore NRF CRP (NRF-CRP4-2008-04) and MOE AcRF Tier 1 (RG 13/12)

Elbert Chia
Division of Physics and Applied Physics, School of Physical and
Mathematical Sciences, Nanyang Technological University

Date submitted: 14 Nov 2013

Electronic form version 1.4