Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Magnetoelectric effects in oxide magnetic tunnel junctions with ferroelectric barriers JAVIER TORNOS, Universidad Complutense de Madrid, Y.H. LIU, S.G.E. TE VELTHUIS, Materials Science Division, Argonne National Laboratory, M.R. FITZSIMMONS, Los Alamos National Laboratory, A. RIVERA, Universidad Complutense de Madrid, R. LOPEZ ANTON, Universidad de Castilla La Mancha, G. SANCHEZ SANTOLINO, Universidad Complutense de Madrid, M. VARELA DEL ARCO, Condensed Matter Sciences Division, Oak Ridge National Laboratory, N.M. NEMES, Universidad Complutense de Madrid, S.J. PENNYCOOK, Condensed Matter Sciences Division, Oak Ridge National Laboratory, Z. SEFRIOUI, C. LEON YEBRA, J. SANTAMARIA, Universidad Complutense de Madrid — Functional properties of magnetic tunnel junction can be enhanced by employing a ferroelectric material as the barrier layer. We report on La0.7Sr0.3MnO3(LSMO)/BaTiO3(BTO)/LSMO magnetic tunnel junctions(MTJ) with BTO ferroelectric tunnel barrier. Switching BTO ferroelectric polarization influences the tunneling magnetoresistance (TMR) achieving two different r resistance states for each magnetic state (parallel or antiparallel) of the magnetization of the electrodes . The voltage dependence of the differential conductance obtained from IV curves displays oscillations whose period depends on the BTO electric polarization. This unusual behavior could be related to the presence of an induced magnetic moment in BTO ferroelectric barrier detected by XMCD measurements. These results reveal that spin polarization, and its tunneling conductance can be electrically tuned through reversal of the ferroelectric polarization of the barrier.

Javier Tornos
Univ Complutense

Date submitted: 19 Dec 2012 Electronic form version 1.4