

Abstract Submitted
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Giant Piezoelectricity Driven Magnetoelectric Coupling in a Multiferroic Heterostructure Membrane J. IRWIN, M. S. RZCHOWSKI, Univ of Wisconsin, W. J. MAENG, S. LINDEMANN, A. BREWER, J. FREDERICK, J. GIENKIE, T-H. KIM, C.-B. EOM, Dept of Mat. Sci. and Engr., Univ of Wisconsin — Ferromagnets coupled by strain to piezoelectrics form a promising paradigm for creating useful magnetic devices controlled by electric fields. Such control has been demonstrated in bulk materials. However, in thin films the piezoresponse of the ferroelectric is reduced by substrate clamping. Here we prepared ferromagnetic thin films on freestanding ferroelectric $Pb(Mg_{1/3}Nb_{2/3}O_3 - PbTiO_3)$ (PMN-PT) membranes. Using spatially resolved MOKE magnetometry, we demonstrated the rotation of the in-plane magnetic anisotropy of the ferromagnetic films upon the application of electric potentials less than ± 10 V. The magnetoelectric coupling coefficients of the devices were about 10^{-7} s/m at room temperature.

Julian Irwin
Univ of Wisconsin

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