Charge and Strain Control of Interface Magnetism\textsuperscript{1} M.R. FITZSIMMONS, LANL, K. DUMESNIL, Institut Jean Lamour, N. JAOUEN, Synchrotron SOLEIL, T. MAROUTIAN, G. AGNUS, Université Paris-Sud, J.-M. TONNERRE, Université Grenoble Alpes, B. KIRBY, NIST, E. FOHTUNG, NMSU, B. HOLLADAY, E.E. FULLERTON, O. SHPYRKO, S.K. SINHA, UCSD, Q. WANG, A. CHEN, Q.X. JIA, LANL — We studied the influence of an electric field applied to an La\textsubscript{0.67}Sr\textsubscript{0.33}MnO\textsubscript{3} (LSMO) layer in a LSMO/Pb(Zr\textsubscript{0.2}Ti\textsubscript{0.8})O\textsubscript{3} (PZT)/Nb-doped SrTiO\textsubscript{3} (STO) heterostructure by measuring its magnetization depth profile using resonant x-ray magnetic reflectivity. The saturation magnetization of the ferromagnetically-ordered LSMO was not affected by the direction of the polarization of the PZT. However, the ferromagnetic thickness and magnetization of the LSMO film at remanence were reduced for hole-charge accumulation at the LSMO/PZT interface. To understand the independent roles of strain and hole-doping, we performed neutron scattering experiments of La\textsubscript{0.8}Sr\textsubscript{0.2}MnO\textsubscript{3} films grown on Nb-doped STO in which bending strain (via 4-point bending jig) or electric field (via parallel plate capacitor) was applied to the films. We observed that bending strain affects the saturation magnetization of the LSMO film, whereas electric field affects the remanent magnetization of the film. These observations suggest strain may be a more effective means to control magnetism than charge.

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