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Interfacial magnetism in manganite-based synthetic multiferroics[1] S.G.E. TE VELTHUIS, Q. WANG, MSD, Argonne National Laboratory, Y. LIU, MSD, Argonne National Laboratory and QCMD, Oak Ridge National Laboratory, H. AMBAYE, V. LAUTER, T.R. CHARLTON, M.R. FITZSIMMONS, QCMD, Oak Ridge National Laboratory, M. CABERO, J. SANTAMARIA, Universidad Complutense — Ferromagnetic/ferroelectrics heterostructures, i.e. synthetic multiferroics, provide a pathway for studying the competition between these incompatible orders and the interfacial magnetoelectric coupling, which may be utilized for energy-efficient spintronics. We present polarized neutron reflectometry (PNR) results on $La_{0.7}Sr_{0.7}MnO_3$ (LSMO) and ferroelectric $BaTiO_3$ (BTO) heterostructures. We find that the magnetization and anisotropy of the LSMO layer near the interfaces is modified with respect to the central part of the layer. While a pinned magnetization is observed at the STO interface, instead a weaker anisotropy is found at the BTO interface. These results are discussed in relationship to the tunnel magnetoresistance measurements of this system, that indicate oxygen vacancies can be induced within BTO and manipulated with electric fields. Due to charge transfer, oxygen vacancies at the interface can result in modification of the interfacial magnetism of the LSMO.

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