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Investigation on valences and strains in $La_{0.7}Sr_{0.3}MnO_3/PbZr_{0.2}Ti_{0.8}$ O_3 Heterostructures JINLING ZHOU, DISHENG CHEN, West Virginia University, ANDREAS SCHOLL, Advanced Light Source, Lawrence Berkeley National Lab, YING-HAO CHU, National Chiao Tung University, MIKEL HOLCOMB, West Virgina University — Magnetoelectric (ME) coupled materials have electric and magnetic properties coexisting and coupled together, promising novel applications. Understanding the coupling mechanisms responsible for this behavior would allow a strategic approach to device design. Our group studies the interfacial properties of the known magnetoelectric system of ferromagnetic $La_{0.7}Sr_{0.3}MnO_3$ (LSMO) and ferroelectric $PbZr_{0.2}Ti_{0.8}$ O_3 (PZT). Through photoemission electron microscopy imagining, ME coupling was confirmed at the interface. X-ray absorption spectroscopy of Mn and Ti was taken across wedged samples of varying ferroelectric and ferromagnetic thicknesses. X-ray microdiffraction was analyzed at different thickness to investigate the strain effect on ME coupling. The effect of thickness and strain on Mn and Ti valences suggest an ideal model for improving interfacial coupling in these systems.

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