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Element-Specific Depth Profile of Magnetism and Stoichiometry at the $La_{0.67}Sr_{0.33}MnO_3/BiFeO_3$ Interface JOEL BERTINSHAW, SEBASTIAN BRÜCK, Univ of New South Wales, DIETER LOTT, Helmholtz Zentrum Geesthacht, HELMUT FRITZSCHE, Canadian Neutron Beam Centre, YURI KHAYDUKOV, OLAF SOLTWEDEL, THOMAS KELLER, Max Planck Institute for Solid State Research, EBERHARD GOERING, PATRICK AUDEHM, Max Planck Institute for Intelligent Systems, WAYNE HUTCHINSON, RONALD MARAN, VALANOOR NAGARAJAN, Univ of New South Wales, DAVID CORTIE, FRANK KLOSE, Australian Nuclear Science and Technology Organisation, CLEMENS ULRICH, Univ of New South Wales — Depth-sensitive magnetic, structural and chemical characterization is important in the understanding and optimization of novel physical phenomena emerging at interfaces of transition metal oxide heterostructures. In this work we have investigated an epitaxial bi-layers of ferromagnetic $La_{0.33}Sr_{0.67}MnO_3$ (LSMO) / multiferroic $BiFeO_3$. Polarised Neutron Reflectivity measurements conducted at OPAL, Australia; Chalk River, Canada; and FRM-II, Munich provided the absolute magnetic moment at the interface and X-ray Resonant Magnetic Reflectivity measurements performed at BESSY-II, Berlin provided element specific magnetic information. Our measurements indicate a region of depleted magnetization extending into the LSMO at the interface. Additional resonant X-ray reflection measurements indicate a corresponding region with an altered Mn- and O-content as origin of the reduction of the magnetic moment. This will help to systematically tune the interface stoichiometry to achieve a desired property.

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