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Asymmetric and modulated magnetic profiles in $(LaMnO_3)_{2n}/(SrMnO_3)_n$ superlattices[1] S.J. MAY, S.G.E. TE VELTHUIS, MSD, Argonne National Laboratory, M.R. FITZSIMMONS, Los Alamos National Laboratory, A.B. SHAH, J.M. ZUO, X. ZHAI, J.N. ECKSTEIN, University of Illinois, Urbana-Champaign, S.D. BADER, A. BHATTACHARYA, MSD and CNM, Argonne National Laboratory — We have determined the magnetic depth profile of MBE-grown ferromagnetic $(LaMnO_3)_{2n}/(SrMnO_3)_n$ superlattices, where n is nominally equal to 3 and 5. Polarized neutron reflectivity measurements reveal the existence of a modulated magnetic structure that repeats with the superlattice period in both samples. For n=5, a moment of $\sim$2.6 μ_B/Mn is measured in the $LaMnO_3$ (LMO) layer, while the moment in the middle of the $SrMnO_3$ (SMO) layer is negligible. The magnetization at the interfaces is found to be asymmetric with an enhanced moment residing at the LMO/SMO interfaces but not at the SMO/LMO interfaces. The origin of the magnetic asymmetry at the interfaces is elucidated from comparison with the structural properties determined by x-ray reflectivity and transmission electron microscopy.

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