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**Cross-sectional Scanning Tunneling Microscopy (XSTM) Investigation on $(SrMnO_3)_n/(LaMnO_3)_n$ Heterostructures**[1] WEI-CHENG KUO, Department of Electrophysics, National Chiao Tung University, HsinChu 30100, Taiwan, YING-HAO CHU, Department of Materials Science and Engineering, National Chiao Tung University, HsinChu 30100, Taiwan, TZENG-MING UEN, JENH-YIH JUANG, Department of Electrophysics, National Chiao Tung University, HsinChu 30100, Taiwan — Recent advances in obtaining heterostructures between dissimilar transition-metal oxides with atomically sharp interfaces have revealed emerging exotic electronic and magnetic phases in the vicinity of the interface, which are qualitatively different from the parent compounds. In this study, we have grown $(SrMnO_3)_n/(LaMnO_3)_n$ heterostrcuture superlattice, with $n$ being varied from 2 to 8, by laser MBE system with the assistance of the reflection high-energy electron diffraction (RHEED) intensity oscillations on (001) $SrTiO_3$ single-crystal substrates. The variation of the density of states across the vicinity of the $SrMnO_3$-$LaMnO_3$ interfaces were investigated by scanning tunneling microscopy (STM) to reveal the spatial modulation of the electronic properties arising from formation of the two-dimensional electron system at the interfaces. The effects of the layer number, $n$, on this electronically-induced contrast, which is generally ascribed to result from the differences in the energy band gaps, carrier concentrations, as well as electron affinities between $SrMnO_3$and $LaMnO_3$, will be discussed.

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