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Laser MBE for atomic layer by layer growth of $LaNiO_3$ films and superlattices from separate oxide targets MARYAM GOLALIKHANI, QINGYU LEI, Department of Physics, Temple University, Philadelphia, PASQUALE ORGIANI, CNR-SPIN, UOS Salerno, I-84084 Fisciano (SA), Italy, XIAOXING XI, Department of Physics, Temple University, Philadelphia — Laser MBE was used to grow Nickelate thin films and superlattices in atomic layer by layer manner from separate oxide targets. Stoichiometry and full layer coverage was controlled by in-situ monitoring of Reflection High Energy Electron Diffraction (RHEED) intensity oscillation. $LaNiO_3$ ultra-thin films were grown from La_2O_3 and NiO targets on $LaAlO_3$ and $SrTiO_3$ substrates. X-ray diffraction, x-ray reflectivity, and atomic force microscopy were used to characterize the structure, thickness, and surface morphology of the films. The origin of thickness dependent metal to insulator transition was studied using the transport properties and x-ray absorption spectroscopy measurements. Single unit cell $LaNiO_3/LaAlO_3$ superlattices were grown from La_2O_3, NiO and Al_2O_3 targets on $LaAlO_3$ substrate. By means of polarization-dependent x-ray Absorption Spectroscopy, orbital ordering in these supperlattices was studied and the results are presented herein.

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