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The MBE growth of arbitrarily thick SrTiO₃/LaAlO₃ quantum well heterostructures ELLIOTT ORTMANN, University of Texas, QIAN HE, Oak Ridge National Lab, AGHAM POSADAS, University of Texas, ALBINA BORISOVICH, Oak Ridge National Lab, ALEX DEMKOV, University of Texas — The dozens of novel electronic, magnetic, and optical phenomena discovered in oxide thin film systems in recent years suggest that these systems could eventually be used to fabricate devices that extend the functionality of traditional III-V semiconductor-based devices. Before such devices can become a reality, however, it is necessary to demonstrate the ability to fabricate high-quality oxide thin film heterostructures of arbitrary thickness. Here, we report on the structural quality of MBE-grown SrTiO₃/LaAlO₃ quantum well heterostructures at thicknesses approaching those that would be required for practical device fabrication. Through *in situ* RHEED and *ex situ* XRD and STEM measurements, we demonstrate the quality of our heterostructures does not depend on total sample thickness, indicating that it should be possible to fabricate practical devices from the STO/LAO system. Furthermore, we demonstrate an improvement in interfacial quality over previously-reported PLD-grown samples via a statistical analysis of structural variations at the STO/LAO interfaces. Notably, the well-established asymmetry between the *n*- and *p*-type STO/LAO interfaces is not present in our samples.

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