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Magnetotransport in the 2DEG at Interface Between LaAlO₃ and Thin Film SrTiO₃¹ T. HERNANDEZ, D.A. FELKER, C.W. BARK, C.B. EOM, M.S. RZCHOWSKI, University of Wisconsin-Madison — Transport properties of the 2DEG formed at the heterointerface between LaAlO₃ (LAO) and SrTiO₃ (STO) grown on Si and (LaAlO₃)_{0.3}-(Sr₂AlTaO₃)_{0.7} (LSAT) were compared to those of the LAO on single crystal STO interface. The STO layer on Si was grown by molecular beam epitaxy and on LSAT by pulsed laser deposition (PLD). In all cases, the LAO overlayers were grown using PLD. Mobility, carrier concentration, and magnetoresistance (MR) were measured over the range 3-300K and magnetic fields of 0-8T. The transport properties were similar at room temperature for the different structures. However, at low temperatures, the structures on single crystal STO showed metallic behavior and positive MR, constant in temperature in the 3-20K regime, whereas the ones on Si and LSAT substrates showed a temperature dependence consistent with Mott-type variable range hopping and negative MR with power law behavior in temperature.

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