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Effect of LaAlO_3 Stoichiometry on Magneto- Transport Properties of $\text{LaAlO}_3/\text{SrTiO}_3$ heterostructure¹ RICHARD QUI, NICHOLAS GOBLE, Department of Physics, Case Western Reserve University, RICHARD AKROBETU, ALP SEHIRLIOGLU, Department of Materials Science and Engineering, Case Western Reserve University, XUAN GAO, Department of Physics, Case Western Reserve University — The formation of 2DEG in the interface of two insulators, LaAlO_3 (LAO) and SrTiO_3 (STO), has stimulated intense research on its origin and applications. We present our low temperature magneto-transport studies on series of high quality $\text{LaAlO}_3/\text{SrTiO}_3$ hetero-structure samples with different growth and treatment conditions. Parameters that affect interface properties, such as substrate orientation, deposition oxygen partial pressure and the related oxygen vacancies, LaAlO_3 layer thickness, and LaAlO_3 stoichiometry, are controlled through processing modifications and post-processing treatments. By looking at the feature of anisotropic magnetoresistance in different samples, the critical effect of LaAlO_3 stoichiometry is identified, indicating possible candidates that give raise to the magnetism. The authors thank Air Force Office of Scientific Research (grant #FA9550-12-1-0441) for funding support.

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