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Intrinsic Electronic Confinement at Conducting Oxide Interfaces DANFENG LI, STEFANO GARIGLIO, WEI LIU, ALEXANDRE FTE, MARGHERITA BOSELLI, DQMP, University of Geneva, MARC GABAY, LPS, Universit Paris-Sud, JEAN-MARC TRISCONE, DQMP, University of Geneva, DQMP COLLABORATION, LPS COLLABORATION — The discovery of a two-dimensional electron liquid (2DEL), confined at the interface between the two band insulators $LaAlO_3$ (LAO) and $SrTiO_3$ (STO) has generated tremendous research interest [1]. The 2DEL confinement lifts the degeneracy of Ti t_{2g} orbitals and promotes exotic physical properties [2]. A previous study [3] has demonstrated that a 2DEL is also observed when LAO is alloyed with STO $(La,Al)_{1-x}(Sr,Ti)_xO_3$ (LASTO:x). The threshold thickness required for the onset of conductivity scales with x. We present here a study of magnetotransport and superconductivity at the (LASTO:0.5)/STO interface. The thickness of the 2DEL, measured using perpendicular and parallel critical fields is larger than the one at the LAO/STO interface. This change is due to a modification on the confining potential linked to a reduced charge transfer that is scaling as 1/x. This study supports an intrinsic origin to the formation of the 2DEL in the LAO/STO system. [1] A. Ohtomo, H. Y. Hwang, Nature **427**, 423 (2004). [2] P. Zubko, S. Gariglio, M. Gabay, P. Ghosez, and J.-M. Triscone, Annual Review of Condensed Matter Physics **2**, 141 (2011). [3] M.L. Reinle-Schmitt, C. Cancellieri, D. Li, D. Fontaine, M. Medarde, E. Pomjakushina, C.W. Schneider, S. Gariglio, P. Ghosez, J.-M. Triscone, and P.R. Willmott, Nature Communications **3**, 932 (2012).

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