

Abstract Submitted
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Normal state and superconducting transport at the LaAlO₃ / SrTiO₃ interface C. BELL, University of Tokyo, Japan Science and Technology Agency, S. HARASHIMA, M. KIM, Y. KOZUKA, University of Tokyo, B.G. KIM, Pusan National University, Y. HIKITA, University of Tokyo, H.Y. HWANG, University of Tokyo, Japan Science and Technology Agency — The conduction at the LaAlO₃/SrTiO₃ interface [1] provides a playground for controlling metallicity and superconductivity in a thin electron gas. This can be achieved by varying the growth of the LaAlO₃ layer, the thickness [2], and by field effect modulation [3]. A crucial question is whether the variation in conductivity is due to changes in the carrier density or mobility. Using magnetotransport studies of a gated structure, we find that the mobility variation is almost five times that of the sheet carrier density. Superconductivity can be suppressed at both positive and negative gate bias [4]. These results indicate that the relative disorder strength strongly increases across the superconductor-insulator transition.

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[2] C. Bell *et al.*, *Appl. Phys. Lett.* **94**, 222111 (2009)

[3] A. Caviglia *et al.*, *Nature* **456** 624 (2008)

[4] C. Bell *et al.*, *Phys. Rev. Lett.* (in press)

Christopher Bell
University of Tokyo, Japan Science and Technology Agency

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