Abstract Submitted
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Anisotropic superconductivity of nanowires at $LaAlO_3/SrTiO_3$(110) heterointerface[1]

JEREMY LEVY, MENGCHEN HUANG, GUANGLEI CHENG, PATRICK IRVIN, University of Pittsburgh, ANIL ANNADI, KALON GOPINADHAN, A. ARIANDO, T. VENKATESAN, National University of Singapore, Q. ZHANG, BO GU, SEIJI YUNOKI, SADAMICHI MAEKAWA, Tohuku University — A two-dimensional electron gas has recently been discovered at the interface of $LaAlO_3$ grown on the (110) surface of $SrTiO_3$.[2] The conductivty of the 2DEG at this interface is anisotropic along different crystallographic directions. Using conducting AFM lithography we write interfacial nanowires along the (001) and (1-10) directions on 3-unit cell $LaAlO_3/SrTiO_3$(110). Similar to the anisotropic conductivity found in the normal state, we observe anisotropy of the superconducting properties of the two types of wire: the upper critical magnetic field of nanowires along the (001) direction is higher than those along (1-10) direction. This observation can be related to the anisotropic orbital binding of Ti and O atoms and the differences in the spin-orbit coupling along the two different directions.

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[2]A. Annadi, *et al..Nature Commun.* **4**, 1838 (2013)

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