

Abstract Submitted
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Piezoresponse force microscopy imaging of nanostructures created by conductive AFM lithography at oxide heterointerfac¹ MENGCHEN HUANG, FENG BI, University of Pittsburgh, SANGWOO RYU, CHANG-BEOM EOM, University of Wisconsin-Madison, JEREMY LEVY, University of Pittsburgh — Nanoscale control of the metal-insulator transition in 3-unit cell (u.c.) LaAlO₃/SrTiO₃ heterostructures using conductive AFM (c-AFM) lithography allows the creation of conductive nanostructures². Piezoelectric effects have recently been observed in planar LaAlO₃/SrTiO₃ heterostructures³, and the piezoresponse differs between the conducting and insulating states of 3-u.c. samples where c-AFM modulates the transition⁴. We have employed piezoresponse force microscopy (PFM) to detect and image the piezoresponse variations of nanostructures created by c-AFM lithography. PFM imaging allows visualization of the nanostructures, expanding capabilities for characterizing and studying individual devices.

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²C. Cen, *et al. Nat. Mater.* **7**, 2136 (2008)

³C. W. Bark, *et al. Nano Letter.* 12(4), 1765 (2012)

⁴M. Huang, *et al. arXiv:* 1208.287 (2012)

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