Abstract Submitted
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Single electron manipulation and imaging by Electrostatic Force Microscopy[1] EZRA BUSSMANN, CLAYTON WILLIAMS, Department of Physics, University of Utah — A new scanning probe method capable of detecting single electron tunneling events to/from individual electronic states at the surface of an insulator has recently been demonstrated [1,2]. The approach has now been used to demonstrate the manipulation and imaging of single electrons at an oxide surface. With a positive bias voltage on the sample, single electron tunneling events are observed when the probe is brought within tunneling range. Subsequent imaging clearly shows a localized change in the surface potential each time an electron tunnels. When the polarity of the bias voltage is reversed, the electron at the surface tunnels back into the probe, with a corresponding change observed in the image of the surface. This method provides a means to characterize individual electron traps in insulator films. The details of the experiment and corresponding theory will be presented and the manipulation results will be discussed. 1. L. J. Klein and C.C. Williams, Appl. Phys. Lett. **81**, 4589 (2002). 2. E. Bussmann, D.J. Kim, and C. C. Williams, Appl. Phys. Lett. **85**, 2538 (2004).

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