

Abstract Submitted  
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**Localized Single Electron Tunneling Spectroscopy Measurements on SiO<sub>2</sub>**<sup>1</sup> 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 developed for performing local electronic spectroscopy measurements. The surface is imaged in dynamic force microscopy mode. After imaging, single electron tunneling force spectroscopy at specific locations on the surface is performed either by scanning the probe at fixed bias voltage toward the surface, or moving the tip within tunneling range and scanning the bias voltage on the probe. When this is done, single electron tunneling events are observed to occur only at specific sites on the surface, at particular gaps and voltages. A theory has been developed to extract the energy of the electronic state to/from which the single electron tunneling occurs. 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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