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Scanning Gate Microscopy of a 1D InAs/InP Nanowire Quantum Dot[1] ERIN E. BOYD, HALVAR J. TRODAHL, Dept of Physics, Harvard Univ, R.M. WESTERVELT, Dept of Physics and Sch of Eng and App Sci, Harvard Univ, KRISTIAN NILSSON, LARS SAMUELSON, Dept of Solid State Physics, Lund Univ — One-dimensional (1D) nanowire quantum dots provide ideal systems to probe the quantum behavior of electrons. We study long, thin quantum dots (length ∼300nm, diameter ∼20nm) in an InAs/InP nanowire heterostructure. They provide an interesting system - the Coulomb blockade allows one to control the electron number and measure the energy of quantum states. The nanowire diameter is less than the Bohr radius, making nanowire dots 1D for modest electron numbers. Using a liquid-He cooled scanning gate microscope (SGM) [1], we image the nanowire's conductance as a function of tip position. The conducting SGM tip creates a movable gate to probe the system. We present conductance images of long dots, which use Coulomb blockade to probe the potential profile of the nanowire system and the effects of the metal/semiconductor contacts.

[1] A. Bleszynski-Jayich *et. al* , Phys. Rev. B **77**, 245327 (2008).

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