Abstract Submitted for the MAR10 Meeting of The American Physical Society

Development of Low Temperature Scanning Gate Microscope HALVAR TRODAHL, JESSE BEREZOVSKY, R.M. WESTERVELT, Harvard University — Two-dimensional electron gas (2DEG) and semiconductor nanowire systems are of interest as they are attractive candidates for nanoelectronics, spintronics and quantum information processing. A capacitively coupled scanning probe microscope (SPM) tip can be used to study the motion of electrons in these systems by imaging electron flow through a 2DEG [1] and tuning the charge of a nanowire quantum dot [2]. In this talk we will outline the key design aspects of the third generation SPM built in the Westervelt lab to measure conductance of nanometer scale electronic devices. This microscope will have the ability to measure devices at approximately 500 mK in a 7 T magnetic field. An innovative approach to low temperature coarse positioning has been incorporated into the system.

[1] M. A. Topinka, et al., *Nature* 410, 183-186 (2001).

[2] A. C. Bleszynski, et al., Nano Letters 7, 2559-2562 (2007).

Halvar Trodahl Harvard University

Date submitted: 17 Nov 2009

Electronic form version 1.4