

Abstract Submitted
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Coulomb Blockade Imaging of Few-Electron Quantum Dots in a Magnetic Field¹ P. FALLAHI, R. WESTERVELT, M. STOPA, Harvard University, M. HANSON, A.C. GOSSARD, U.C. Santa Barbara — One-electron quantum dots are important candidates for quantum information processing. We have developed a technique to image electrons inside a quantum dot in the Coulomb blockade regime, using a scanning probe microscope (SPM) at liquid He temperatures (1). We have used this technique to image the last electron in the dot in a strong perpendicular magnetic field. Dots are formed in a two-dimensional electron gas in a GaAs/AlGaAs heterostructure by surface gates. Images are obtained by recording the dot conductance while scanning the SPM tip above the dot. SPM images show a ring of increased conductance about the center of the dot, corresponding to a Coulomb blockade peak in the dot conductance. We observe changes in the shape and the size of the conductance rings with magnetic field. This is due to a combination of energy shifts and orbital changes of the electrons in the quantum dot.

(1) P. Fallahi *et al*, Nano Letters 5, 223 (2005)

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