

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**Zero bias conductance peak in a gated quantum wire** R.W. GIANNETTA, T. OLHEISER, Loomis Laboratory of Physics, U. of Illinois at Urbana-Champaign, M. HANNAN, Maxim Integrated Products, Beaverton, Oregon, I. ADESIDA, Dept. of Electrical and Computer Engineering., U. of Illinois at Urbana-Champaign, M.R. MELLOCH, School of Electrical and Computer Engineering, Purdue University — Conductance measurements are reported for an 0.4 micron wide GaAs/AlGaAs quantum wire with 7 cross-channel gates. The device exhibited integral conductance steps, magnetoconductance plateaus in agreement with the multiprobe formula and a conductance feature at  $0.65 2e^2/h$ . Differential conductance measurements down to 50 mK revealed a zero bias conductance peak that vanished with an in-plane field of 1 Tesla. The width of this peak was comparable to that reported in high mobility quantum point contacts.[1] At low conductances this device also exhibited single electron charging characteristic of a multiple quantum dot. Work at UIUC was supported by NSF ECS02-10447, ARO grant DAAH04-95-1-0618, NSF grant ECS 92-02294 and of JSEP grant N00014-90-J-1270.[1] S.M. Cronenwett, et. al., Phys. Rev. Lett **88**, 226805 (2002)

R.W. Giannetta  
Loomis Laboratory of Physics, University of Illinois at Urbana-Champaign

Date submitted: 22 Nov 2004

Electronic form version 1.4