Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Non-Fermi liquid resonances in cleaved-edge overgrown AlAs quantum wires J. MOSER, M. GRAYSON, F. ERTL, T. ZIBOLD, D. SCHUH, M. BICHLER, G. ABSTREITER, Walter Schottky Institut, TU-Muenchen, S. RODDARO, V. PELLIGRINI, NEST - Scuola Normale Superiore, Pisa — We report conductance measurements in cleaved-edge overgrown quantum wires made of aluminum arsenide, a heavy-mass, multi- valley system. 1D conductance steps as a function of gate bias are observed. The step heights are substantially reduced from the anticipated value for a spin- and valley-degenerate 1D system, possibly as a result of disorder-induced backscattering in the wire itself. We report on a temperature T and dc bias V study of tunneling resonances in low-density AlAs quantum wires near pinchoff. Both the peak conductance and the area of resonances exhibit power laws in T and V, suggesting the existence of a non-Fermi liquid. A quantitative comparison with the sequential resonant tunneling model in a Luttinger liquid is presented, leading to the surprising result that the power law exponent shows differing values for high- and low-temperatures.

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Date submitted: 01 Dec 2004 Electronic form version 1.4