

Abstract Submitted
for the OSF08 Meeting of
The American Physical Society

Transport Properties of Nanostructures¹ AMIR MAHARJAN, H.E. JACKSON, L.M. SMITH, A. KOGAN, University of Cincinnati, J.Y. RICE, Miami University, Oxford, OH, C. JAGADISH, Australian National University, C. JAGADISH COLLABORATION — The current-voltage (I-V) properties of an InP nanowire and a CdS nanosheet are studied. Back to back metal semiconductor metal contacts are modeled based on thermionic emission theory and field emission theory. These are used to explain the I-V characteristics of these nanostructures which enables measurement of the important intrinsic properties including donor density and electrical conductivity of nanostructures. Photolithography followed by lift-off is used to fabricate the Al/Ti contact pads across these nanostructures for transport measurements. Scanning photocurrent microscopy (SPCM) is used to see the variation of photocurrent along the nanostructure. The SPCM image shows that the peak photocurrent always appears at the reverse biased metal-semiconductor contact edge indicating strong localization of electric field which is also confirmed by numerical simulation.

¹UC start-up funds, NSF Grant No 0804199, ECCS-0701703 and DMR 0806700.

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Date submitted: 08 Sep 2008

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