Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Extraordinary optoconductance in InSb-In hybrid structures[1]
K.A. WIELAND, YUN WANG, S.A. SOLIN, Washington University in St. Louis, A.M. GIRGIS, L.R. RAM-MOHAN, Worcester Polytechnic Institute — Previously reported extraordinary optoconductance (EOC)[2] in degenerate Si-doped ($n \sim 1 \times 10^{18}$ cm^{-3}) GaAs-In metal-semiconductor hybrid structures (MSHs) is compared to new experimental results on intrinsic Te-doped ($n \sim 4 \times 10^{14}$cm^{-3}) InSb-In MSHs. Using a shunted van der Pauw plate, DC and AC voltage measurements of InSb MSHs were acquired. The sample was illuminated with a focused Ar ion laser and studied as a function of wavelength ($457 - 526$nm), bias current ($\pm$100mA), lateral position (transverse to the beam), and at 300K and 10K. Whereas the optimal room temperature position sensitivity in the case of GaAs is 137 mV/mm for 100mW of 488.0 nm illumination, the corresponding sensitivity of InSb is found to be 1.2 mV/mm for 10 mW of 514.5 nm illumination. The magnitude of the InSb result is surprisingly large given the relative values of band gaps, mobility, carrier concentration, and laser illumination.[3] The origin of this large position sensitive photovoltage will be discussed.

[1]Supported by WU CMI and NSF grant ECS-0329347
[2]K.A. Wieland *et al.*, Applied Physics Letters, submitted.
[3]O. Madelung, editor, Data in Science and Technology: Semiconductors - Group IV Elements and III-V Compounds (Springer, New York, 1991).

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Date submitted: 28 Nov 2005 Electronic form version 1.4