

Abstract Submitted
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Extraordinary optoconductance in InSb-Au thin film hybrid structures¹ K.A. WIELAND, YUN WANG, S.A. SOLIN, Washington University in St. Louis — Extraordinary optoconductance (EOC)² is the third reported effect following extraordinary magnetoresistance (EMR) and extraordinary piezoconductance (EPC) that is based on the geometric enhancement of the conductivity of a metal semiconductor hybrid structure (MSH). Using a Van der Pauw plate setup, the voltage of the bare sample is compared directly to that of the MSH to determine the EOC, defined as $\{V_{MSH} - V_{bare}\}/V_{bare}$. In GaAs-In at 30K EOC $\approx 500\%$ has been observed. Bulk InSb-In structures have a room temperature EOC $\approx 50\%$. Prior research³ has shown that the one may increase the EOC by using a semiconductor with a large differential e-h mobility. Te doped *n*-type InSb thin films ($n = 2.11 \times 10^{22} \text{ m}^{-3}$ and $\mu_e = 4.02 \text{ m}^2/\text{Vs}$) are therefore prime candidates for room temperature EOC. Thin film Au shunts were chosen because of their coefficient of thermal expansion and non-magnetic properties. These MSHs were illuminated with Ar focused 488.0nm light and studied as a function of the position of the laser spot and temperature.

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²K. A. Wieland *et al.*, Appl. Phys. Lett. **88**, 52105 (2006).

³K. A. Wieland *et al.*, Phys. Rev. B., **73** 155305 (2006).

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