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Integrated Plasmonic Terahertz Detector and a Gate Controlled Schottky Barrier[1] G.C. DYER, Dept. of Physics, UCSB, E.A. SHANER, M.C. WANKE, J.L. RENO, Sandia National Laboratory, G.R. AIZIN, SUNY, New York, J.D. CROSSNO, SBCC, S.J. ALLEN, UCSB — We have successfully fabricated and tested a plasmonic terahertz detector that integrates a gate controlled lateral Schottky diode[2]. As demonstrated in prior work[3−4], a grating gated two dimensional electron gas can be the basis for a finely tuned terahertz detector. The addition of an independently biased gate adjacent to the drain yields striking Schottky-like behavior and offers increased sensitivity when biased to pinch off. We present measurements and models of the Schottky-like I-V characteristics, resonant plasmonic response (∼50 GHz width), and bias-dependent terahertz rectification. The monolithic Schottky diode plasmonic detector points the way to a plasmonic detector with increased sensitivity. [1]Supported through NSF NIRT Grant No. ECS0609146, and in collaboration with Sandia, a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. [2]V. Ryzhii, et al., Jap. J. Appl. Phys. **45**, L1118 (2006). [3]E.A. Shaner, et al., Appl. Phys. Lett. **90**, 181127 (2007). [4]G.R. Aizin, et al., Appl. Phys. Lett. **91**, 163507 (2007).

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