

Abstract Submitted  
for the MAR13 Meeting of  
The American Physical Society

**Tunable terahertz detectors on GaAs substrates** CHRISTOPHER KIM, US Naval Research Laboratory, RONGJIA TAO, Temple University, DONG HO WU, US Naval Research Laboratory — Despite considerable research activities in terahertz science and technologies, there has not been much progress in terahertz detectors. At present, the sensitivity of room temperature detector does not exceed  $10^{-9}$  W/(Hz)<sup>1/2</sup> in terms of noise equivalent power. Also most detectors are not tunable, and their response time is slow. In order to make terahertz technology practical substantial improvements should be made on the detector. Earlier, throughout research collaboration with UCSB, we have demonstrated a terahertz detector based on a Metal-Semiconductor Field Effect Transistor (MESFET) technology, which enabled us to achieve a high speed, tunable terahertz detector. The detector was tunable over the frequency range from 0.1 THz to 1.4 THz with a sensitivity of  $10^{-8}$  W/(Hz)<sup>1/2</sup>. Recently we have attempted to modify this earlier design in order to improve its sensitivity up to  $10^{-11}$  W/(Hz)<sup>1/2</sup> and the operating frequency range from 0.07 to 2.5 THz. We employed a GaAs/AlGaAs heterostructure substrate, and drastically modified the previous MESFET design. We will present our fabrication process and experimental results.

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Date submitted: 27 Nov 2012

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