

Abstract Submitted  
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**A high sensitivity terahertz detector tunable over a very large frequency range** CHRISTOPHER KIM, Temple University and US Naval Research Laboratory, DONG HO WU, US Naval Research Laboratory, RONGJIA TAO, Temple University, BENJAMIN GRABER, Temple University and US Naval Research Laboratory — A high sensitivity terahertz detector is one of the key components for a high resolution terahertz spectrometer or imager. Earlier we have demonstrated a terahertz detector that is tunable over the frequency range from 100 GHz to 1.4 THz. Based on a metal-semiconductor field-effect-transistor (MESFET) and a dipole-antenna, the detector had a sensitivity slightly poorer than  $10^{-9}$  W/(Hz)<sup>1/2</sup> in terms of noise-equivalent-power (NEP). In order to increase the sensitivity and the tuning frequency range, we have modified the MESFET structure and also replaced the dipole antenna with a spiral antenna. Our computer simulations show that the new detector can have a sensitivity much better than  $10^{-9}$  W/(Hz)<sup>1/2</sup> and its frequency tuning range can be from 100 GHz to over 3 THz. We will report details of the design parameters, computer simulations, and experimental results.

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