

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**Top Gated Graphene PN junctions for THz detection**<sup>1</sup> ANTHONY BOYD, US Naval Research Laboratory, ANINDYA NATH, George Mason University, MEHDI JADIDI, RYAN SUESS, ANDREI SUSHKOV, GREGORY JENKINS, H. DENNIS DREW, THOMAS MURPHY, University of Maryland, RACHAEL MYERS-WARD, KEVIN DANIELS, D. KURT GASKILL, US Naval Research Laboratory — The search for terahertz (THz) detectors based on graphene is encouraged by the fact that the ballistic regime in graphene occurs at room temperature over a distance of few hundred nanometers. The naturally occurring 2-DEG carriers have extremely high intrinsic mobility at room temperature. Despite being only one atomic layer thick, graphene still adsorbs several percent of incoming THz radiation well. THz detectors are fabricated on epitaxial graphene using an improved lithography process using lift off resist to achieve low contact resistance [1]. The devices are field effect transistors constructed with a thin asymmetric nichrome (NiCr) top gate that facilitates tuning the photovoltaic response. The thin NiCr gate possesses a sheet resistance of 390 ohms which enables better matching of free space and does not block the incoming Thz radiation.

[1] Nath Anindya et al Applied Physics Letters 104, 224102 (2014)

<sup>1</sup>This work was sponsored by the U.S. Office of Naval Research (award number N000141310865)

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Date submitted: 14 Nov 2014

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