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Graphene based GHz detectors.[1] ANTHONY K BOYD, ASEE Postdoctoral Fellow in-residence at U.S. Naval Research Lab, Washington DC, ABDEL EL FATIMY, PAOLA BARBARA, Georgetown University, ANINDYA NATH, George Mason University Postdoctoral fellow in-residence at U.S. Naval Research Lab, Washington DC, PAUL M CAMPBELL, RACHAEL MYERS-WARD, U.S. Naval Research Laboratory, KEVIN DANIELS, NRC Postdoctoral fellow in-residence at U.S. Naval Research Lab, Washington DC, D. KURT GASKILL, U.S. Naval Research Laboratory — Graphene demonstrates great promise as a detector over a wide spectral range especially in the GHz range. This is because absorption is enhanced due to the Drude contribution. In the GHz range there are viable detection mechanisms for graphene devices. With this in mind, two types of GHz detectors are fabricated on epitaxial graphene using a lift off resist-based clean lithography process to produce low contact resistance.[1] Both device types use asymmetry for detection, consistent with recent thoughts of the photothermoelectric effect (PTE) mechanism. The first is an antenna coupled device. It utilizes two dissimilar contact metals and the work function difference produces the asymmetry. The other device is a field effect transistor constructed with an asymmetric top gate that creates a PN junction and facilitates tuning the photovoltaic response. The response of both device types, tested from 100GHz to 170GHz, are reported. 1. Nath Anindya et al Applied Physics Letters 104, 224102 (2014)

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