

Abstract Submitted
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Graphene-BN atomic stack microwave direct and heterodyne detector JIAYUE TONG, MATTHEW CONTE, TOM GOLDSTEIN, MARTIN MUTHEE, JOSEPH BARDIN, K. SIGFRID YNGVESSON, JUN YAN, Univ of Mass - Amherst — Due to its high mobility and tunable broadband response, graphene is a promising material for high-speed optoelectronics such as microwave detectors. In this presentation, I will discuss our studies of microwave detection with graphene-BN heterostructure devices. Using a Coplanar Waveguide (CPW) that operates up to 110GHz, we demonstrate that asymmetrically-contacted graphene-BN heterostructure samples can efficiently detect microwave signal. The intrinsic detector responsivity we derived at low MW frequencies is reasonably consistent with that measured from the DC IV curve. Using the same device structure, we also performed the experiment that demonstrates a heterodyne thermoelectric detector at room temperature with very wide IF bandwidth. Our work expands the methodology for making graphene-based microwave detectors.

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