

Abstract Submitted
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Terahertz hot electron bolometric detectors based on graphene quantum dots¹ A EL FATIMY, Department of Physics, Georgetown University, Washington, DC 20057, USA, R.L. MYERS-WARD, A. K. BOYD, K. M. DANIELS, D.K. GASKILL, U.S. Naval Research Laboratory Washington, DC 20375, USA, P. BARBARA, Department of Physics, Georgetown University, Washington, DC 20057, USA — We study graphene quantum dots patterned from epitaxial graphene on SiC with a resistance strongly dependent on temperature. The combination of weak electron-phonon coupling and small electronic heat capacity in graphene makes these quantum dots ideal hot-electron bolometers. We measure and characterize the THz optical response of devices with different dot sizes, at operating temperatures from 2.5K to 80K. The high responsivity, the potential for operation above 80 K and the process scalability show great promise towards practical applications of graphene quantum dot THz detectors.

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