

Abstract Submitted
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Photovoltaic response time in dual-gated bilayer graphene M.-H. KIM, Center for Nanophysics and Advanced Materials(CNAM)-University of Maryland(UMD), J. YAN, Dept. of Physics, University of Massachusetts, Amherst, R.J. SUESS, T. MURPHY, Inst. for Research in Electronics and Applied Physics-UMD, M.S. FUHRER, H.D. DREW, CNAM-UMD — The intrinsic thermal response timescale of bilayer graphene is sub nanosecond, due to cooling of hot electrons mediated by acoustic phonon emission. We compare the response times of the photovoltaic and bolometric response as a function of temperature and dual-gate voltages in a gapped bilayer graphene device using a pulse coincidence technique at $1.5 \mu\text{m}$. We find that the photovoltaic and bolometric response time are identical and vary from 100 ps to 10 ps for temperatures from 3 K to 100 K. This result shows that the near IR photovoltaic response of bilayer graphene is thermal over this temperature range. This work was supported by IARPA, the ONR MURI program, and the NSF (grants DMR-0804976 and DMR-1105224), and in part by the NSF MRSEC (grant DMR-0520471).

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