Abstract Submitted
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Optical Third-Harmonic Microscopy of Graphene[1] JERRY I. DADAP, SUNG-YOUNG HONG, NICHOLAS W. PETRONE, PO-CHUN YEH, JAMES C. HONE, RICHARD M. OSGOOD, JR, Columbia University, New York, NY — We report strong third-harmonic (TH) generation in monolayer graphene mounted on an amorphous silica substrate using a photon energy that is three-photon resonant with the exciton-shifted van Hove singularity at the M-point of graphene. Our polarization-dependent and azimuthal rotation measurements confirm the expected isotropic symmetry properties for the TH nonlinear optical process in graphene. Since this monolayer graphene TH signal exceeds that of bulk glass by more than two orders of magnitude, the signal contrast permits background-free scanning of graphene and provides structural information that is difficult to obtain via linear optical microscopy. We also discuss the dependence of TH signals on the number of graphene layers and compare the graphene signal strength with that from crystalline Au(111) sample.

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