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Terahertz imaging and spectroscopy of large area single-layer graphene JOE TOMAINO, ANDY JAMESON, JOSH KEVEK, MICHAEL PAUL, Oregon State University, A.M. VAN DER ZANDE, R.A. BARTON, P.L. MCEUEN, Cornell University, ETHAN MINOT, YUN-SHIK LEE, Oregon State University —
We demonstrate terahertz (THz) imaging and spectroscopy of a 15x15-mm square single-layer graphene film on Si using broadband THz pulses. The THz images clearly map out the THz carrier dynamics of the graphene-on-Si sample, allowing us to measure sheet conductivity with sub-mm resolution without fabricating electrodes. The THz carrier dynamics are dominated by intraband transitions and the THz-induced electron motion is characterized by a flat spectral response. A theoretical analysis based on the Fresnel coefficients for a metallic thin film shows that the local sheet conductivity varies across the sample from 1.7e-3 to 2.4e-3 inverse ohms.

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