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Abstract:

We report an optical study of charge transport in graphene. Diffusion of hot carriers in epitaxial graphene and reduced graphene oxide samples are studied using an ultrafast pump-probe technique with a high spatial resolution. Spatiotemporal dynamics of hot carriers after a point-like excitation are monitored. Carrier diffusion coefficients of 11,000 and 5,500 squared centimeters per second are measured in epitaxial graphene and reduced graphene oxide samples, respectively, with a carrier temperature on the order of 3,600 K. The demonstrated optical techniques can be used for non-contact and non-invasive in-situ detection of transport properties of graphene.