

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**Probing Dirac electron transport in graphene by far-infrared spectroscopy** JIE SHAN, KELIANG HE, LIANG ZHAO, Case Western Reserve University, KIN FAI MAK, NICK PETRONE, JIM HONE, TONY HEINZ, Columbia University — The transport properties of Dirac fermions in graphene are a subject of intense interest. While various scattering mechanisms including impurities, graphene phonons and substrate phonons have been examined by dc transport measurements,<sup>1</sup> direct determination of the scattering rates under different experimental conditions remains challenging.<sup>2</sup> In this paper we report on the far-infrared optical conductivity spectrum of monolayer graphene samples obtained by Fourier transform infrared spectroscopy. From the frequency dependence of the optical conductivity we determine both the Drude weight and the carrier scattering rate. The dependence of these transport parameters on temperature and electrostatic doping will be presented, and the importance of many-body Coulomb interactions between Dirac electrons will be discussed.

<sup>1</sup>Das Sarma, S., Adam, S., Hwang, E. H. & Rossi, E. Rev. Mod. Phys. 83, 407-470, (2011).

<sup>2</sup>Hornig, J. et al. Phys. Rev. B 83, 165113, (2011).

Jie Shan  
Case Western Reserve University

Date submitted: 22 Nov 2011

Electronic form version 1.4