

Abstract Submitted  
for the MAR10 Meeting of  
The American Physical Society

**Electron transport in graphene at extremely high carrier doping**

DMITRI EFETOV, PHILIP KIM, Columbia University — Owing to the low dimensionality, carrier doping in graphene can be significantly changed by the electric field effect or the chemical adsorption of gaseous dopands. At extremely high doping levels, where carrier densities reach beyond  $10^{14} \text{ cm}^{-2}$  the electronic structure at the Fermi level of graphene is expected to be substantially modified, as higher band structure effects such as trigonal warping or Fermi surface renormalization due to electron-phonon coupling take place. In this presentation we will present electron transport of highly doped graphene samples. By employing a poly(ethylene oxide)- $\text{LiClO}_4$  electrolyte gate we achieve unprecedented carrier densities up to  $4 \times 10^{14} \text{ cm}^{-2}$  in graphene single and bilayers, attaining a Fermi energy change of  $\sim 2 \text{ eV}$  away from the charge neutrality point. We will present resistivity, as well as Magneto-resistance and Hall measurements in this extreme carrier doping limit.

Dmitri Efetov  
Columbia University

Date submitted: 20 Nov 2009

Electronic form version 1.4