Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Impact of physisorbed species on transport properties of graphene[1] CHAUN JANG, JIANHAO CHEN, SHUDONG XIAO, Department of Physics and Center for Nanophysics and Advanced Materials, University of Maryland, College Park, MD 20742, MASA ISHIGAMI, ELLEN WILLIAMS, Department of Physics and Materials Research Science and Engineering Center, University of Maryland, College Park, MD 20742, MICHAEL FUHRER, Department of Physics and Center for Nanophysics and Advanced Materials, University of Maryland, College Park, MD 20742 — We have measured the impact of physisorbed species, including Argon, Krypton, Nitrogen, water and Benzene, on the transport properties of mechanically-exfoliated graphene sheets on SiO_2/Si in an ultra-high vacuum environment at temperatures near 30 K. We controlled the gas dosage down to the sub-monolayer level and found species-specific effects on the field-effect mobility of graphene. We observed the influence of different molecular sizes, molecular dipole moment, and intermolecular interactions. We will discuss our results in the context of recent theoretical calculations within the Boltzmann transport framework.

[1]Suported by ONR N000140610882, NSF CCF-06-34321 (MSF), NSF-UMD-MRSEC DMR 05-20471 and the MI is supported by the DCI Postdoctoral Fellowship program.

Chaun Jang
Department of Physics and Center for Nanophysics and Advanced Materials,
University of Maryland, College Park, MD 20742

Date submitted: 03 Jan 2008 Electronic form version 1.4