

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Insulating Behavior in Graphene with Irradiation-induced Lattice Defects JIAN-HAO CHEN, ELLEN WILLIAMS, MICHAEL FUHRER, Materials Research Science and Engineering Center and Center for Nanophysics and Advanced Materials, University of Maryland, College Park, MD 20740 — We irradiated cleaned graphene on silicon dioxide in ultra-high vacuum with low energy inert gas ions to produce lattice defects [1], and investigated in detail the transition from metallic to insulating temperature dependence of the conductivity as a function of defect density. We measured the low field magnetoresistance and temperature-dependent resistivity *in situ* and find that weak localization can only account for a small correction of the resistivity increase with decreasing temperature. We will discuss possible origins of the insulating temperature dependent resistivity in defected graphene in light of our recent experiments.

[1] Jian-Hao Chen, W. G. Cullen, C. Jang, M. S. Fuhrer, E. D. Williams, *PRL* **102**, 236805 (2009)

Jian-Hao Chen
Materials Research Science and Engineering Center and Center for
Nanophysics and Advanced Materials, University of Maryland,
College Park, MD 20740

Date submitted: 10 Dec 2009

Electronic form version 1.4