Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Magnetic Oscillations in Scanning Tunneling Spectroscopy of Epitaxial Graphene on SiC KEVIN D. KUBISTA, DAVID L. MILLER, GREGORY M. RUTTER, MING RUAN, WALT A. DE HEER, PHILLIP N. FIRST, Georgia Institute of Technology, JOSEPH A. STROSCIO, Center for Nanoscale Science and Technology, NIST — Scanning tunneling microscopy (STM) and spectroscopy (STS) at a temperature of 4 K are used to study the electronic properties of epitaxial graphene on SiC in a magnetic field perpendicular to the graphene plane. While changing the magnetic field we observe Shubnikov de Haas-like magnetic oscillations in the tunneling conductance, dI/dV. The peak positions of these tunneling magnetic oscillations (TMO) vary periodically with inverse magnetic field, indicating they sample a constant cross-section of the graphene k-space. This new magnetic oscillation method can map extended parts of the electronic band structure of graphene as we vary the tunneling energy in the dI/dV measurement. This is in contrast to traditional magnetic oscillations which typically only probe the Fermi level. This work was supported in part by NSF, NRI-INDEX, and the W. M. Keck Foundation.

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Date submitted: 21 Nov 2008 Electronic form version 1.4