Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Chemical vapor deposition growth of patterned graphene on copper HUMBERTO GUTIERREZ, BEI WANG, J. ZHU, Physics Department, Penn State University — Graphene possesses unique electronic properties and application potentials. However, the synthesis of high-quality, single-layer graphene on large scale remains challenging. Mechanical exfoliation from graphite crystals yields graphene of the highest quality but in an uncontrolled and non-scalable way. Epitaxial growth on SiC has made significant advances in large-scale synthesis, although the cost is relatively high. Very recently, chemical vapor deposition (CVD) is used to grow graphene on Ni and Cu surfaces and has also produced large-area graphene of reasonably high quality. Cracks and ripples, however, present considerable challenges to the CVD growth and transfer process. We report the CVD growth of single-layer graphene on patterned, micron-size copper templates. Raman spectra of the films show low D-band and relatively narrow 2D peak, suggesting high quality. We present and discuss the transport properties of graphene films transferred onto an insulating substrate.

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Date submitted: 19 Nov 2009 Electronic form version 1.4