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Electronic properties of CVD graphene grown on copper HELIN CAO, Department of Physics, Purdue University, QINGKAI YU, Department of Electrical and Computer Engineering, University of Houston, LUIS A. JAUREGUI, School of Electrical and Computer Engineering, Purdue University, JIFA TIAN, Department of Physics, Purdue University, WEI WU, ZHIHONG LIU, Department of Electrical and Computer Engineering, University of Houston, ROMANEH JALILIAN, Department of Physics, Purdue University, DANIEL K. BENJAMIN, ZHIGANG JIANG, School of Physics, Georgia Institute of Technology, JIMING BAO, STEVEN S. PEI, Department of Electrical and Computer Engineering, University of Houston, YONG P. CHEN, Department of Physics, Purdue University
— We report the electronic properties of graphene grown by chemical vapor deposition (CVD) on copper foils at ambient pressure. Large size graphene films (4 inch*4 inch) are synthesized and transferred to SiO2/Si substrate. Raman mapping demonstrates that the films consist primarily of monolayer graphene (up to ∼90% area coverage). Low temperature transport measurements are performed on devices made from such CVD graphene. The "half-integer" quantum Hall effect, which is the hall-mark of mono-layer graphene, has been observed in these devices. We also observe the ambipolar field effect and weak localization, which allow us to extract carrier mobility ∼3000cm^2/Vs and phase coherence length ∼300nm at 1.5K.

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