

Abstract Submitted  
for the MAR09 Meeting of  
The American Physical Society

**Observation of graphene bubbles and effective mass transport under graphene films** DANIIL STOLYAROV, Brookhaven National Lab, ELENA STOLYAROVA, KIRILL BOLOTIN, LI LIU, SUNMIN RYU, KWANG RIM, Columbia University, MARK HYBERTSEN, IGOR PAVLISHIN, Brookhaven National Lab, MARTIN KLIMA, Columbia University, IGOR POGORELSKY, KARL KUSCHE, Brookhaven National Lab, JAMES HONE, PHILIP KIM, HORST STORMER, Columbia University, VITALY YAKIMENKO, Brookhaven National Lab, GEORGE FLYNN, Columbia University — Mechanically exfoliated graphene mounted on a SiO<sub>2</sub>/Si substrate was subjected to HF/H<sub>2</sub>O etching or irradiation by energetic protons. In both cases gas was released from the SiO<sub>2</sub> and accumulated at the graphene/SiO<sub>2</sub> interface resulting in the formation of “bubbles” in the graphene sheet. Formation of these “bubbles” demonstrates the robust nature of single layer graphene membranes, which are capable of containing mesoscopic volumes of gas. In addition, effective mass transport at the graphene/SiO<sub>2</sub> interface has been observed.

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Date submitted: 24 Nov 2008

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