

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Electrical and optical detection of mechanical resonance in chemical vapor deposition grown single layer graphene membranes AREND VAN DER ZANDE, ROB BARTON, CCMR, Cornell University, PHI PHAM, University of Colorado, WILLIAM WHITNEY, Cornell University, JEEVAK PARPIA, HAROLD CRAIGHEAD, PAUL MCEUEN, CCMR, Cornell University — We fabricate large arrays of electrically contacted, suspended, single layer graphene membranes and measure the mechanical resonance electrically and optically. Large area single layer graphene is grown on copper foils using chemical vapor deposition. The graphene is transferred onto a silicon oxide surface, lithographically patterned into an array of electrically contacted rectangular sheets with varying lengths and widths between 300 nm and 5 μm , and suspended using a buffered oxide etch. The graphene membranes can be actuated both electrically and optically, and the tension can be tuned electrostatically. Motion is detected using laser interferometry or electrical mixing. We examine the frequency, quality factor, and tuning of the graphene membranes as a function of their size and shape, and the temperature.

Arend van der Zande
CCMR, Cornell University

Date submitted: 20 Nov 2009

Electronic form version 1.4