

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Single-layer Graphene Motion and Mass Sensors with Electrical Readout. CHANGYAO CHEN, Columbia University, SAMI ROSENBLATT, KIRILL BOLOTIN, HORST STORMER, PHILIP KIM, TONY HEINZ, JAMES HONE — We report for the first time the implementation of graphene electromechanical resonators that can detect their own motion. Suspended single-layer graphene field-effect transistors allow for electrical detection of the resonances while functioning as heterodyne mixers in a manner analogous to the operation of a radio receiver. Mechanical resonances occur in the 10-100 MHz range, can be lithographically-tailored, are tunable by tens of MHz, and have quality factors up to 200 while operated in vacuum at room temperature. Furthermore, by analyzing the frequency response of the resonators, we succeed in weighing both the pristine single-layer graphene and with a layer of organic material deposited on.

Changyao Chen
Columbia University

Date submitted: 21 Nov 2008

Electronic form version 1.4