Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

CVD graphene growth and transfer techniques for the fabrication of micromechanical resonators DANIEL J. LOSOWYJ, ISAAC R. STORCH, THOMAS J. MCCUNE, Laboratory of Atomic and Solid State Physics, Cornell University, PAUL L. MCEUEN, Laboratory of Atomic and Solid State Physics, Kavli Institute at Cornell for Nanoscale Science, Cornell University — Graphene's superlative mechanical strength, electrical mobility, low mass, and large surface area make it a prime candidate for use in micromechanical resonators [1,2], which have potential applications in mass and force sensing [3], radio frequency signal processing, and optomechanics [4]. Our resonators use graphene grown by chemical vapor deposition (CVD) and have excellent mechanical performance, but their electrical performance is comparatively worse than that of exfoliated graphene devices. We attribute these limitations to contamination from copper oxidation during the growth and solvents used in the transfer process. To remedy this, we have performed CVD growths on copper foils with long anneal times, confirming with Raman spectroscopy and SEM that the graphene is single layer and high quality. We have also found that graphene suspended on a substrate can survive high temperature air annealing, provided that the temperature ramp is gradual. Improving the electrical performance of these novel devices will facilitate their use in a variety of new experiments and applications. [1] J. S. Bunch *et al.*, Science (2007) [2] A. M. van der Zande *et al.*, Nano Lett. (2010) [3] C. Chen *et al.*, Nature Nanotechnology (2009) [4] R. A. Barton, *et al.*, Nano Lett. (2012)

Daniel J. Losowyj
Laboratory of Atomic and Solid State Physics, Cornell University

Date submitted: 09 Nov 2012 Electronic form version 1.4