Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

**Plasmon-Enhanced Photocurrent in a Graphene Nanoconstriction** SU-FEI SHI, Cornell University, XIAODONG XU, University of Washington, P.L. MCEUEN, D.C. RALPH, Cornell University — A plasmonic nanostructure can act like an optical antenna, concentrating light into a deep sub-wavelength volume and enabling manipulation of light-electron interactions at the nanometer scale. Achieving efficient coupling from such antennas to functional electrical devices has been challenging, because the region of field enhancement is so small. We report the use of a use a self- aligned fabrication process to couple a gold break junction acting as a plasmonic antenna with a sub-10-nm graphene constriction. The nonlinear electrical characteristics of the graphene device allow it to serve as a photodetector. We observe a photocurrent that is peaked at the plasmon frequency and strongly modulated by the polarization direction of the incident light. The enhancement of the local optical-frequency electric field induced by the plasmon is a factor of 1.5-10.

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Date submitted: 30 Dec 2010 Electronic form version 1.4