Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Ultrafast photoconductive response of $LaAlO_3/SrTiO_3$ nanoscale photodetectors[1] YANJUN MA, CHENG CEN, University of Pittsburgh, CHUNG WUNG BARK, CHAD M. FOLKMAN, CHANG-BEOM EOM, University of Wisconsin-Madison, JEREMY LEVY, University of Pittsburgh — Conducting AFM lithography can be used to create nanoscale field effect transistors at the $LaAlO_3/SrTiO_3$ interface.[2,3] Such devices exhibit gatable photoconductive response, which spans from visible to near-infrared regime.[4] By implementing the pump-probe measurement with a home-built femtosecond laser, we observe an ultrafast nonlinear optical response of these nanoscale photodetectors. We explore the feasibility of these devices for molecular-scale THz spectroscopy applications.

[1]This work was supported by NSF DMR-0704022 (J.L.), DARPA W911NF-09-10258 (J.L.), the Fine Foundation (JL), NSF DMR-0906443 (C.B.E.) and David and Lucile Packard Fellowship (C.B.E.)
[2]C. Cen et al., Nature Material, 7, 2136(2008)
[3]C.Cen et al., Science, 323, 1026 (2009)
[4]P.Irvin et al., Nature Photonics advanced online publication, 14 Nov.2010 (DOI 10.1038/nphoton.2010.238)

Yanjun Ma
University of Pittsburgh

Date submitted: 27 Dec 2010 Electronic form version 1.4