Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Carbon Nanotube FET Mixers and High Frequency Applications ZHAOHUI ZHONG, Center for Nanoscale Systems, Cornell University, Ithaca, 14850, XINJIAN ZHOU, Laboratory of Atomic and Solid State Physics, Cornell University, Ithaca, 14850, PAUL MCEUEN, Center for Nanoscale Systems; Laboratory of Atomic and Solid State Physics, Cornell University, Ithaca, 14850 — We have investigated the high frequency electrical properties of single-walled carbon nanotube field effect transistors by operating the devices as microwave mixers. The mixing current amplitude depends linearly on the transconductance and quadratically on the applied AC voltage. On devices with insulating substrates, the response is approximately independent of frequency up to 40 GHz. Two applications of these high frequency-operation carbon nanotube FET mixers will be discussed: the detection of terahertz electrical pulses and nanoscale dielectric spectroscopy of liquids.

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Date submitted: 20 Nov 2006 Electronic form version 1.4