Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

**Electron heating in disordered 2DEG GaAs/AlGaAs structures by THz radiation**[1] RAHUL RAMASWAMY, KAI WANG, MATTHEW BELL, ANDREI SERGEEV, ALEKSANDR VEREVKIN, GOTTFRIED STRASSER, VLADIMIR MITIN, University at Buffalo, DAROLD WOBSCHALL, Esensors Inc.
— While numerous applications of heterostructures with two-dimensional electron gas (2DEG) in electronics require high-mobility of carriers, slow momentum relaxation creates substantial problems for employing these structures as various detectors of electromagnetic radiation. Significant kinetic inductance of carries does not allow one to use 2DEG-based sensors in combination with ordinary antennas and readouts, designed for Ohmic detectors. Keeping in mind sensor applications, we investigate the electron heating in disordered AlGaAs/GaAs structures at liquid nitrogen temperatures. In our experiments, 2DEG was overheated by DC current or THz radiation. The devices were fabricated from AlGaAs/GaAs structures and have widths of 50-150 $\mu$m and lengths varying from 3-50 $\mu$m. 2DEGs of various levels of disorder are used to change the kinetic inductance of our devices and to study effects of disorder on electron heating. Steady-state and quasi-optical THz heating measurements provide consistent data and allows us to determine basic parameters, such as electron-phonon relaxation rate, electron heat capacity of 2DEG, and radiation coupling.

[1]This research was supported by NYSTAR and NSF SBIR

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Date submitted: 07 Dec 2008 Electronic form version 1.4