Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Terahertz Photoresistance in Laterally Modulated 2D Electron Layers GREGORY AIZIN, Kingsborough College/CUNY, Brooklyn, NY, LEV MOUROKH, Stevens Institute of Technology, Hoboken, NJ — We study theoretically changes in the resistance of laterally modulated 2D electron layer induced by a terahertz electromagnetic (EM) wave at normal incidence. Electron density modulation is provided by the metal grating gate. Periodic modulation results in the coupling of an external EM wave with plasmon excitations in the layer. Corrections to the dc resistivity of 2D electron layer induced by the terahertz irradiation are found from the solution of classical kinetic equation in the lowest order on the EM wave intensity. We demonstrate that photoresistivity as a function of the frequency of EM wave has resonances at plasmon frequencies and analyze dependence of the height and position of the resonant peak on the electron density and modulation factor. It is shown that the peak height has non-monotonous dependence on the modulation factor, with the latter being determined by the gate voltage and the temperature. The implications of our results for explanation of recent experiments (X.G. Peralta *et al*, Appl. Phys. Lett., **81**, 1627 (2002)) are discussed. .

Gregory Aizin
Kingsborough College/CUNY, Brooklyn, NY

Date submitted: 01 Dec 2004 Electronic form version 1.4