Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Magnetotransport in a Modulated 2DES[1] GODFREY GUMBS, Hunter College/CUNY — We calculate the quantum magnetotransport coefficients of a two- dimensional electron gas (2DEG) in the presence of one-dimensional (1D) electrostatic modulation in the x-direction. The calculations are performed when a low-intensity, low-frequency external electric field is applied. The system is also subjected to a perpendicular magnetic field. The Kubo formula for the conductivity is employed. The eigenstates, which depend on the strengths of the magnetic field and modulation potential, are calculated and then used to determine the conductivity. We study the longitudinal resistivity and the transverse resistivity as functions of the the modulation potential and the magnetic field. We demonstrate that the effect of finite frequency is to reduce both the longitudinal and transverse resistivities. A low concentration of impurities is also included in these calculations.

[1]Supported by NSF CREST 0206162

Godfrey Gumbs
Hunter College/CUNY

Date submitted: 06 Dec 2006 Electronic form version 1.4