

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Intersubband Oscillations in GaAs Quantum Wells with Three Populated Subbands JESSE KANTER, SCOTT DIETRICH, WILLIAM MAYER, Graduate Center, City University of New York, New York 10016, USA, SERGEY VITKALOV, CUNY-CCNY, ALEXEY BYKOV, Novosibirsk State University, Novosibirsk 630090, Russia; A.V.Rzhanov Institute of Semiconductor Physics, Novosibirsk 630090, Russia — The magnetotransport of highly mobile 2D electrons is studied in GaAs quantum wells with three occupied subbands. The lower two subbands have nearly the same energy while the third subband has a much higher energy ($E_1 \approx E_2 \ll E_3$). Observed magneto-intersubband oscillations (MISO) obey the relation $\Delta_{ij} = (E_i - E_j) = k \cdot \hbar\omega_c$ for oscillations between the i^{th} and j^{th} bands where ω_c is the cyclotron frequency and k is an integer. The slight difference in the energies of the lower subbands produces noticeable interference effects in the magnetoresistance. By analyzing the amplitude of each component of the MISOs separately, the temperature dependence of the quantum lifetime $\tau_q^{(i)}$ of electrons in i^{th} subband is extracted. The studies indicates that $\tau_q^{(1)} \approx \tau_q^{(2)} = \tau_q^{(1,2)}$ while it appears that $\tau_q^{(3)} < \tau_q^{(1,2)}$ which can be related to a reduced electron density in the third subband.

This work was supported by the National Science Foundation (DMR 1104503), the Russian Foundation for Basic Research (project no.14-02-01158) and the Ministry of Education and Science of the Russian Federation.

Sergey Vitkalov
CUNY-CCNY

Date submitted: 14 Nov 2014

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