Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Inter-subband resistance oscillations in crossed electric and magnetic fields[1] SERGEY VITKALOV, SCOTT DIETRICH, SEAN BYRNES, Physics Department, City College of the City University of New York, New York 10031, USA, A.V. GORAN, A.A. BYKOV, Institute of Semiconductor Physics, 630090 Novosibirsk, Russia — Quantum oscillations of nonlinear resistance are investigated in response to electric current and magnetic field applied perpendicular to single GaAs quantum wells with two populated sub-bands. At small magnetic fields current-induced oscillations appear as Landau-Zener transitions between Landau levels inside the lowest sub-band. The period of these oscillations is proportional to the magnetic field. At high magnetic fields, a different kind of quantum oscillations emerges with a period that is independent of the magnetic field. At a fixed current the oscillations are periodic in inverse magnetic field with a period that is independent of the dc bias. The proposed model considers these oscillations as a result of spatial variations of the energy separation between two sub-bands induced by the electric current (Scott Dietrich, Sean Byrnes, Sergey Vitkalov, A. V. Goran, and A. A. Bykov Phys. Rev. B 86, 075471).

[1]Work was supported by National Science Foundation (DMR 1104503) and the Russian Foundation for Basic Research, project no. 11-02-00925.

Sergey Vitkalov
Physics Department, City College of the City University of New York,
New York 10031, USA

Date submitted: 27 Nov 2012 Electronic form version 1.4