

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Nonlinear Vertical Resonant Tunneling in Double Quantum Wells in an In-Plane Magnetic Field S.K. LYO, E. BIELEJEC, J.A. SEAMONS, J.L. RENO, M.P. LILLY, Sandia National Laboratories, YUN-PIL SHIM, U. Texas, Austin — We present a theory and data for the tunneling current between two electron-gas layers separated by a wide barrier in an in-plane magnetic field B . The electron gases are separately in equilibrium with their chemical potentials displaced by the bias energy V . The observed tunneling current and the differential conductance show interesting domain structure on the $B - V$ plane. Our theory, based on incoherent tunneling and the B -induced displacement of the energy dispersion curves, generates a similar domain structure, yielding excellent agreement with the data from GaAs/Al_xGa_{1-x}As double quantum wells. An extension of the current result to 2D-1D tunneling will be discussed. Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the U.S. DOE under contract DE-AC04-94AL85000.

S.K. Lyo
Sandia National Laboratories

Date submitted: 03 Dec 2004

Electronic form version 1.4