

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**Giant piezoresistance in AIAs 2D electron systems with antidot lattice** O. GUNAWAN, Y.P. SHKOLNIKOV, K. VAKILI, E.P.D. POORTERE, M. SHAYEGAN, Princeton University — We report a novel giant piezoresistance effect in AIAs wide quantum well 2D electron system, patterned with an antidot lattice of about  $1.0 \mu\text{m}$  period. At a low density of  $\sim 3.5 \times 10^{11}/\text{cm}^2$  and at  $T=0.3 \text{ K}$ , the piezoresistance exhibits a strain gauge factor as large as 20,000, the largest value reported so far without magnetic field. Compared to the region without the antidot pattern, this antidot region represents  $\sim 3.5 \times$  larger gauge factor and  $\sim 5 \times$  wider dynamic range in piezoresistance. Such device may find important applications for super sensitive strain detection in mechanical microstructures.

Oki Gunawan  
Princeton University

Date submitted: 04 Dec 2005

Electronic form version 1.4