

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**Intersubband electrons coupled to zone-folded coherent acoustic phonons in a GaN/AlN superlattice** CYNTHIA AKU-LEH, KLAUS REIMANN, MICHAEL WOERNER, Max-Born Institut, Max-Born Strasse 2A, 12489 Berlin, Germany, EVA MONROY, CEA Grenoble, rue des martyrs 17, 38054 Grenoble, France, DANIEL HOFSTETTER, University of Neuchâtel, 1 Rue Abraham Louis Breguet, 2000 Neuchâtel, Switzerland — We present spectrally-resolved resonant pump-probe measurements on a strongly polar GaN/AlN superlattice. The transmitted and reference probe spectra are detected at the same read out rate. Analysis of the normalized probe spectra reveals electronic contributions as well as the first three folded longitudinal acoustic phonons, matching calculated frequency values predicted by the elastic continuum model. The observed modes couple strongly to intersubband electrons and modulate the spectral width and position of the intersubband absorption. We conclude that this electron-phonon coupling takes place via piezoelectric effects and a phonon-induced modulation of the subband effective mass.

Cynthia Aku-Leh  
ISciences

Date submitted: 11 Nov 2011

Electronic form version 1.4