

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**The Magnetic-Field Dependent Phonon-Like FIR Absorption in Modulation Doped CdMnTe/CdMgTe quantum Well Structures.** LI-CHUN TUNG, National High Magnetic Field Laboratory at Florida State University, GRZEGORZ KARCZEWSKI, Institute of Physics, Polish Academy of Science, YONG-JIE WANG, National High Magnetic Field Laboratory at Florida State University — Spin-dependent phonon had been reported in several magnetic semiconductors. This unique phonon mode is resulted from an ion-position dependent spin Hamiltonian. This mode can be either infrared or Raman active. However, such modes were never observed in the diluted magnetic semiconductors. We have investigated a series of CdMnTe/CdMgTe QW samples with Mn concentration ranged from 0 to 3.9% up to 33T and found an IR absorption near  $125\text{cm}^{-1}$ . The intensity of this mode increases rapidly with increasing magnetic field, while the energy increases only several wavenumbers. This behavior resembles that of the spin-dependent phonon mode. The unique behavior of the spin-dependent phonon mode was induced by a magnetic transition with decreasing temperatures. In the current studies, however, similar behavior is induced by applying magnetic field. Besides  $125\text{cm}^{-1}$  mode, we have also observed two new IR absorptions in addition to the electron cyclotron resonance (CR). The intriguing disappearance of CR at high magnetic field and the stimulating behavior of these two new modes will be discussed.

Li-Chun Tung  
National High Magnetic Field Laboratory at Florida State University

Date submitted: 20 Nov 2006

Electronic form version 1.4