Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Polaronic effects in single doped GaAs quantum well . G. MARTINEZ, M. ORLITA, C. FAUGERAS, S. DEUTSCHLANDER, GHMFL-CNRS, Grenoble, France, P.Y. YU, University of California,Berkely, A. RIEDEL, R. HEY, Paul Drude Institute, Berlin, K. FRIEDLAND — Absolute magneto transmission experiments, for magnetic fields B up to 33 T, have been performed on a series of single GaAs quantum well with a width of 13nm, doped at a level Ns ranging from 2 to 7.5 10^{11} cm^{-2} and mobilities exceeding 10^6 $cm^2/V/sec$. The analysis of the spectra with a complete multi-dielectric model allows to extract the imaginary part of the electronic dielectric function which clearly exhibits different features for cyclotron energies higher than the phonon energies of GaAs. For the lower doped samples, the dependence on B of the damping parameter shows a pronounce increase when the energy exceeds the longitudinal optical phonon energy characteristic of polaronic effects. At higher fields this parameter increases once more resonantly showing a new interaction called "X". For Ns higher than 6 $10^{11}cm^{-2}$, only this new interaction is clearly visible though its amplitude decreases when increasing Ns. The origin of this new interaction is very likely related to mechanisms involving phonons. The different possibilities are discussed.

G. Martinez
GHMFL- CNRS

Date submitted: 21 Nov 2008 Electronic form version 1.4