

# High Field Magneto-Spectroscopy in Semiconductor devices

Keywords: Semiconductor, Magnetic field, Spectroscopy

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Atomic Structure and Physics Field / High Magnetic Field Physics

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## Background

- Semiconductor is recognized as a key material for electronic devices today. Various devices have already been realized with using the nanotechnology. In order to open a new stage of the semiconductor physics and its devices, it is indispensable to study anomalous electron properties in new materials.

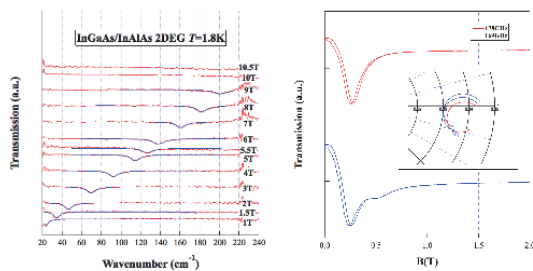
## Aim

- Magneto-optical measurements (Cyclotron resonance, Magneto-PL, Faraday rotation, Electron dipole spin resonance, Magneto Linear Dichroism) are quite powerful to study various nanostructure systems under high magnetic field.

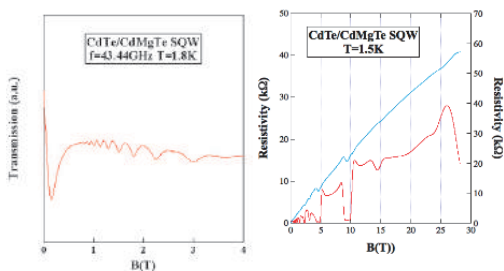
## Advanced Research Topics

Cyclotron resonance in semiconductor 2D structures

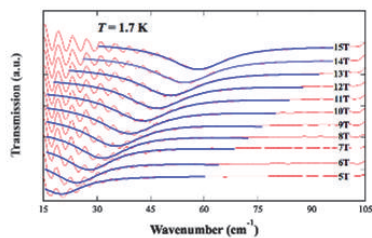
### ● InGaAs/InAlAs系



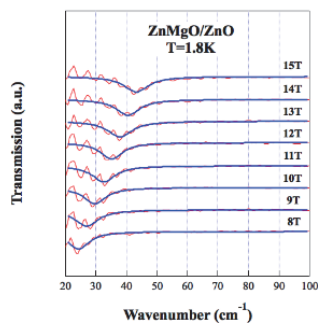
### ● CdTe/CdMgTe系



### ● AlGaN/GaN系



### ● ZnMgO/ZnO系



## Publications

- Y. IMANAKA, J. Low Temp. Phys., 170, 389 (2013).
- Y. IMANAKA et al., J. Phys., 334, 012061 (2011).

## Summary

- Cyclotron resonance in semiconductor two-dimensional electron systems
- Magneto-spectroscopy in nanostructures
- Development of high-field spectroscopy systems

## Research outcome

- Observation of anomalous properties in nanostructure systems at high magnetic fields
- Development of new spectroscopy systems in high magnetic fields
- Determination of various band parameters