

Novel Functional Devices Exploiting Electron Spins in Solids

Associate Professor Yutaka Takahashi

Semiconductor Devices

Controlling Electronic 'Charges'

- Memory
- MPU
- Laser Diodes

Logical Operations on
Information

Magnetic Devices

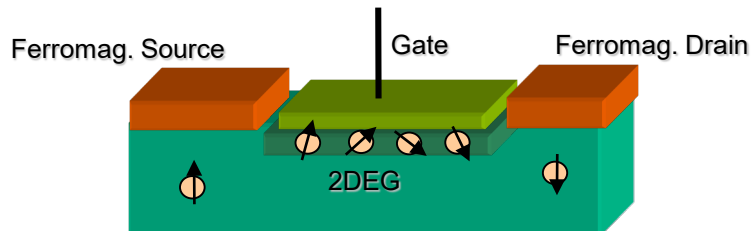
Controlling Electronic 'Spins'

- Hard Disk Drives
- MagnetoOptical Disks

Storage of Information

Integration of

Semiconductor and Magnetic materials
High-Speed, Low Power Consumption



Content:

Semiconductor devices are the basics of information technology that drives the present-day society. The current semiconductor devices function by moving or storing 'charges' of electrons. While in magnetic devices such as hard-disk drives, magnetic moments or 'spins' of electrons play a pivotal role to store information. Novel devices exploiting both electronic 'charges' and 'spins', which will be realized by integrating semiconductor and magnetic technologies, are proposed and extensively studied. This technology is expected to bring us beyond the present semiconductor technology and further promote the information-oriented society.

Appealing point:

We study the magnetic and transport properties in semiconductor-magnetic hybrid devices by exploiting our experimental expertise on crystal growth by sputtering and electrical, optical and magnetic measurements.

Yamagata University Graduate School of Science and Engineering

Research Interest : Semiconductor Materials,
Optical Electronics

E-mail : : takahasy@yz.yamagata-u.ac.jp

Tel&Fax : +81-238-26-3296, 3299

HP : <http://takahashilab.yz.yamagata-u.ac.jp/>

