

Spin Field Effect Transistor - A revolution in Semiconductor Contributed Talk

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Magnetic Random Access Memory (MRAM) has the biggest advantage of being nonvolatile, whereby the stored information in the memory is retained even when the power supply is switched off. In MRAMs, magnetic device structures like MTJ are used for data storage but the data processing is performed by MOS Field-Effect Transistor, which is made from Silicon. Shrinkage of device dimensions has led to integration of more transistors in a chip. Is there a limit for this shrinkage? Yes, because the transistor has already reached atomic dimensions. An alternative concept is semiconductor spintronics, where spin of the electron is exploited for information processing. A prominent example of spintronic device is Spin Field Effect Transistor (Spin FET). This lecture will be on different physical mechanisms, like spin injection, spin manipulation and spin detection, in the physical operation of Spin FET.

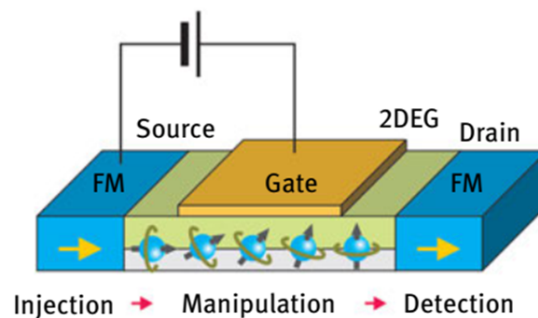


Figure 2: Source: Semiconductor Spintronics by Thomas Schapers
