平成 22 年 9 月 6 日

各　位、

東北大学 省エネルギー・スピントロニクス集積化システムセンター長、
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第 2 回 CSIS セミナー
第 47 回ナノ・スピン工学研究会
半導体スピントロニクス研究部講演会の開催について

日　時：　平成 22 年 9 月 8 日（水）15:00-17:00

場　所：　電気通信研究所　ナノ・スピン総合研究棟 4 階　カンファレンスルーム

講　師：　**Prof. Pallavi Dhagat, Oregon State University, Corvallis, U. S. A.**

講演題目：**A microfluidic immunosensor based on ferromagnetic resonance induced in magnetic bead labels**

概　要：In this presentation, I will report on our progress in the development of an inexpensive immunosensor for use in bio-medical applications. The magnetically labeled biomolecules are detected inductively using a microwave circuit patterned in a single metal layer. In comparison to magnetoresistive and Hall-effect sensors commonly used for magnetic label detection, the microwave circuit is patterned using standard CMOS (complementary metal-oxide-semiconductor) processes allowing for the immunosensor to be inexpensively realized.

講　師：　**Prof. Albrecht Jander, Oregon State University, Corvallis, U. S. A.**

講演題目：**Design and Simulation of Magnetic Logic Circuits**

概　要：With recent advances in magnetoresistive technologies, magnetic random access memories (MRAM) have become a commercial reality and magnetic logic circuits based on the same technology have become a distinct possibility. In this seminar I will discuss magnetic logic from the point of view of a circuit designer. I concentrate on architectures that can be realized with current and near-term technology, without the help of semiconductor amplifiers:

- Logic circuits using MRAM-type field switched spin valves.
- Logic circuits employing a global clock field.
- Logic circuits using three-terminal spin momentum transfer devices.

Although magnetic logic is, as yet, far from competitive with CMOS electronics, I will discuss some particular advantages, such as reconfigurability and radiation hardness, that may make it of interest in niche applications.

Designers of electronic circuits have the benefit of very efficient and accurate models in SPICE (the industry-standard circuit simulator) that are used to predict and verify the operation of circuit designs. Having access to similar models for spintronic devices will be essential for designing spintronic circuits. We have developed compact models for spintronic devices in Verilog-A, a behavioral description language that is interpreted by many SPICE simulators. This allows the simulation of the dynamic response of magnetic devices together with conventional electronic circuits. I will demonstrate the simplicity and versatility of these models in such simulations.

問い合わせ先：CSIS・山ノ内、大野研究室・佐藤（片平5554）