

第 97 回ナノ・スピン工学研究会
第 21 回 CSIS セミナー
スピントロニクス研究室講演会の開催について

日 時 : 平成 29 年 12 月 11 日 (月) 10:00-11:30

場 所 : 電気通信研究所 ナノ・スピン総合研究棟 4 階 401 号室

講 師 : **Professor Thibaut Devolder**
(Univ. Paris-Sud, France)

講演題目 : **Nanosecond-scale STT switching in perpendicularly magnetized STT-MRAM cells**

概 要 : We have studied experimentally the nanosecond-scale spin-torque-induced switching in perpendicularly magnetized tunnel junctions. The samples are improved CoFeB/MgO based systems with sizes varied between 40 and 500 nm, coming from collaborations with either IMEC Belgium or SAMSUNG E. C.. The electrical signatures of the STT-induced sub-threshold switching indicate non-uniform magnetization reversal with the presence of a domain wall in junctions of various sizes. A nucleation phase is followed by an irreversible and regular flow of a wall through the sample at an average velocity of 10-40 m/s (depending on the material parameters) with features indicating a turbulent Walker propagation regime in the largest samples. Once initiated, the duration of the switching correlates with the free layer diameter: smaller is faster. The resulting electrical signature of the reversal can be reproduced with a simple model in which the parameters α in particular the exchange stiffness A are extracted from device-level spin-wave spectroscopy.

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