17:30	Large-Scale Finite Element Micromagnetics Simulations using Open Source Software	B.P.20
17:30	Comprehensive Comparison of Switching Models for Perpendicular Spin Transfer Torque MRAM Cells	B.P.21

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Resume : The miniaturization of integrated circuits is coming to a saturation due to increased stand by power and leakages. An attractive path to avoid these issues is to introduce non-volatility: spin-transfer torque (STT) magnetoresistive random access memory (MRAM) is a viable candidate. STT-MRAM is primarily composed of two ferromagnetic layers separated by an oxide layer, where the resistance difference between the parallel and antiparallel magnetization configurations characterizes the two states of the bit. The switching between the two states can be achieved by having a current flow through the structure. Simulations of these devices is usually performed with the torque computed approximately by assuming a position-independent electric current density through the structure. For high values of the tunneling magnetoresistance (TMR), this description is not accurate anymore, and one needs to solve the spin and charge drift-diffusion equations in the whole structure self-consistently. We compute the switching time distribution obtained within the self-consistent model and compare it to the switching times from the model with the fixed current density. We show that, provided that the current is appropriately adjusted, the simplified model can mimic the correct switching time distribution even in the case of high TMR.