



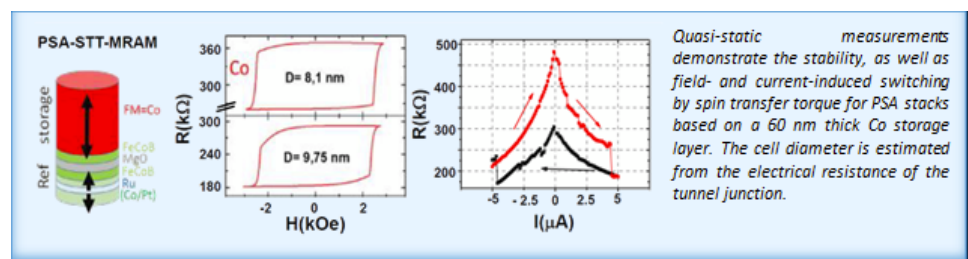
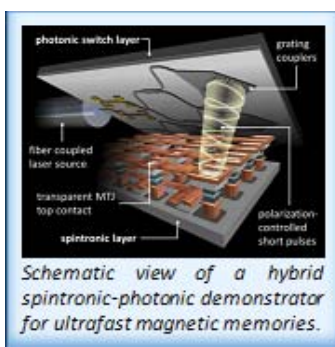
Mittwoch, 18.05.2022, um 11:15 Uhr

Dr. Lucian Prejbeanu  
(SPINTEC, Grenoble)

## MRAM concepts for sub-nanosecond switching and ultimate scalability

The development of magnetic-tunnel-junctions-based MRAM memories calls for technological breakthroughs intended to go well above the GHz operation speed, to match the speed of the processor. A very promising solution combines the spin-photon interaction, which enables the ultrafast reversal of the storage layer magnetization under the action of a laser pulse of few tens of fs duration. In the framework of the H2020 project called SPICE, SPINTEC demonstrated a conceptually new spintronic-photonic memory chip demonstrator with faster speed and lower energy consumption, as a cornerstone of a novel integration platform that combines photonic, magnetic and electronic components.

In conventional spin-transfer-torque (STT) magnetic random access memory (MRAM), lateral size reductions lead to limited storage retention. We proposed and validated a new MRAM cell concept using shape anisotropy suitable to achieve high retention at sub-10nm critical dimensions. In this concept, the thickness of the storage layer is significantly increased to values comparable to the cell diameter. A further advantage of perpendicular shape anisotropy is to be a robust source of bulk anisotropy less sensitive to temperature, while in conventional MRAM, the thermal sensitivity of the interfacial anisotropy is a limitation to MRAM applications requiring a wide range of operating temperatures.



ZOOM-Link:  
<https://us02web.zoom.us/j/82310833626>

