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Title I: Spin-torque driven magnetization dynamics

Spin transfer torque (STT) effect provides confined excitation in magnetic nano-structures and accounts as promising principle of the operation for future spintronics elements including STT-magnetoresistive random access memories (STT-MRAMs), wide-band tunable microwave signal generators and many types of high speed sensing elements. In addition, this subject opened physical media for fundamental studies of spintronics at the nano-scale such as vortex, droplet, skyrmion, and many other effects in the field of magnonics and domain wall electronics.

In this talk, after introducing the experimental basic of spin transport in nano-structures as major state of the art of media for STT observation, the STT effect will be shown in different magnetic structures. Review of pioneering works on STT effect from two decades ago until very recent achievements with focus on devices based on different types of magnetoresistance (AMR, GMR, TMR) will be presented. In addition to the STT effect on the magnetization instability, magnetization switching and spin-wave generation toward magnonics application will be reviewed.