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Spin-Torque Diode Effect in Magnetic Tunnel Junctions

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Spin-injection magnetization switching (SIMS) technique [1] made it possible to control magnetization by a direct current. A discovery of spontaneous rf oscillation from CPP-GMR nano-pillars and a real time observation of the switching process have revealed essential amplification function of a precession in the magnetic nano-pillars under a direct current [2]. Beside of those progresses, developments of giant tunneling magneto-resistive (GTMR) effect using an MgO barrier [3] made it possible to utilize a very large resistance change according to the magnetization switching. In this talk, several attempts to utilize interplay between spin-torque and giant-TMR effect will be presented referring to a "spin-torque diode effect" [4] and other properties such like rf noise control and possible signal amplification using magnetic tunnel junctions (MTJs).

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