CURRENT-INDUCED SPIN DYNAMICS IN SPIN-VALVE STRUCTURES

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9.7 cm

Spin polarized electrons traversing a ferromagnet can transfer spin-angular momentum from the system of conduction electrons to the local magnetization. This offers new possibility of manipulating magnetization without applying an external magnetic field. Recently, it has been demonstrated experimentally that the dynamical phase diagram contains several distinguishable steady-state precessional modes and static magnetic states. In this paper we use Landau-Lifshitz-Gilbert equation for magnetization dynamics, extended by including the torque due to spin-transfer. The torque is described within a macroscopic model based on the classical spin diffusion theory. Solution of the Landau-Lifshitz-Gilbert equation for spin-valve structures allows us to describe stable magnetic states, magnetization switching between different states, and also precessional modes.

13.4 cm

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