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Effects of current on the magnetization states of Permalloy nanodisks SERGEI URAZHDIN, West Virginia University, CHIA-LING CHIEN, Johns Hopkins University, KONSTANTIN GUSLIENKO, Argonne National Laboratory — We will describe expreimental evidence and theoretical model demonstrating that both the vortex and the single domain magnetic configurations of Ni80Fe20 circular nanodiscs can be achieved by the application of magnetic field or current flowing perpendicular to the disc plane. The magnetic configurations of Ni80Fe20/Cu/Ni80Fe20 trilayers have been determined by the response to a small current via the giant magnetoresistance. In addition, we report detection of the vortex state in a single magnetic layer, by exploiting a magnetoresitance arising from the suppression of spin-accumulation in the vortex state. Our analysis shows that this magnetoresistance effect becomes increasingly significant in small nanostructures.

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