

Magnetic properties of single nanowires and nanodisks

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We have investigated the magnetization reversal of single Co nanowires through magnetoresistance measurements and micromagnetic calculations. Depending on the angle between the applied magnetic field and the wire axis, the magnetization reversal process occurs by curling or uniform rotation. In the curling mode, just before the magnetization reversal a vortex is created taking the entire wire. Using the Landau-Lifshitz-Gilbert equation, we have obtained the dynamics of magnetization reversal in single Permalloy (FeNi) disks. With these dimensions the disks exhibit a magnetization structure composed by a vortex. Under application of a pulsed magnetic field (in the disk plane) the magnetization of the vortex core can be reversed through a particular dynamics involving the nucleation of a antivortex-vortex pair.