STRUCTURE DEPENDENT MAGNETIZATION REVERSAL OF NANODOTS

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Monodomain structure, stability of magnetization and switching field distribution are the properties of magnetic nanodots that are determined by the dot size and their structure depending on the fabrication methods. In this work we present the influence of the dot structure on magnetization reversal mechanism illustrated by micromagnetic simulations using object oriented micromagnetic framework (OOMMF). Two types of the dots: (i) epitaxial, with a low amount of defects (grown by molecular beam epitaxy) and (ii) defect containing (e.g. post-growth treated by ion bombardment) ones are considered. Investigated objects exhibit a single- or multi-domain stable structure, respectively upon magnetization reversal. In the epitaxial dots studied in this work the reversal magnetization is determined by a reversed domain nucleation followed by unpinned propagation of a domain wall. The simulation results are confirmed by the observations carried out by magnetic force microscopy of the dot system induced in an ultrathin Co film patterned by the structured buffer in the form of self-assembled Au islands on a Mo layer surface.

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9.7 cm

13.4 cm

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