

## Contribution submission to the conference Dresden 2009

### Model samples for magneto-impedance measurements —

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The growing interest in the magneto-impedance (MI) effect is mainly caused by the possible use of MI in high-sensitivity magnetic field detectors or magnetic recording heads. Observations of MI have been mainly confined to amorphous wires, magnetic multilayers and ribbon samples. Here, it is difficult to obtain the magnetic domain configuration. In order to find a relation between the magnetic domain structure and the size of the MI effect, we decided to perform measurements on model samples consisting of permalloy ( $\text{Ni}_{81}\text{Fe}_{19}$ , Py) nanowires prepared by means of electron beam lithography and lift-off process. Wires and other structures (rectangle, circles) were manufactured with different parameters (width, length, size, thickness, etc.). Py enables the magnetization switching process to be controlled artificially by engineering the sample geometry. Thus, there are manifold possibilities to create different domain patterns. For even smaller structures and to create pinning sites, small notches for domain pinning are manufactured using focused ion beam (FIB) milling, the optimum parameters of which (dose, ion current) were determined in a recent work [2]. Finally, the magnetic structure of our samples and MI effects are confirmed by magnetic force microscopy (MFM) observations and transport measurements.

[1] S. Getlawi et al., Superlattices and Microstructures 44, 699 (2008)

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