

## Contribution submission to the conference Dresden 2017

**Influence of dipolar coupling on microstructured multilayer giant magnetoimpedance (GMI) sensors in the high frequency regime** — ●GREGOR BÜTTEL and UWE HARTMANN — Institute of Experimental Physics, Saarland University, P. O. Box 151150, D66041, Saarbrücken, Germany

We have fabricated microstructured GMI sensors integrated into a coplanar waveguide consisting of a Cu core layer (250nm thickness) surrounded by magnetic Permalloy single and multilayers. This leads to different and complex coupling behavior of the layers and strongly influences important parameters like maximum GMI ratio, sensitivity and it creates additional peaks in the GMI curve which is in contrast to thin film devices in the mm regime about which was reported so far. To better tune and analyze such devices we have combined MOKE microscopy and micromagnetic simulations to understand the role of dipolar coupling and multi-domain switching. We discuss the complex phenomenology of domain structures for such GMI Py multilayer microstructures. This could so far not be supported by high-resolution domain-imaging techniques. Additionally we fabricated arrays of such microstructured multilayers that allow for recording of the hysteresis curve in a vibrating sample magnetometers and full magnetic characterization in order to understand the coupling behaviour in multilayers with odd and even number of magnetic layers.

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