

# Influence of edge effects on the stray field distribution of magnetic microstructures

A current issue of medical engineering research is the possibility to transport or separate different labelled chemical or biological species. A promising approach is the controlled movement of superparamagnetic microbeads attached to different molecules or cells along magnetized Permalloy or FeCoSiB microstructures. As the process is based on the stray field interactions of the magnetic microbeads and the microstructures a precise knowledge of the stray field distribution is essential [1]. A possible influence can be ascribed to the shape of the edge of a microstructure, which is defined by the used etching mechanism [2].

In this project the student will determine the shape of structure edges with microscopy methods like confocal microscopy, SEM or AFM to define the actual state. Also micro magnetic simulations of different structures with different edge shapes will be done to quantify the influence of the edge and thereby the influence of the etching method on the stray field distribution.

[1] U. Sajjad, R. Bahne Holländer, F. Klingbeil, J. McCord; Magnetomechanics of superparamagnetic beads on a magnetic merry-go-round: from micromagnetics to radial looping, *J. Phys. D. Appl. Phys.* 2017, 50, 135003.

[2] Marc Madou, Fundamentals of Microfabrication, 2002

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