Supervisor's report

In Brno, December 14th, 2020

Academic year: 2020/2021

Study programme: Advanced materials and nanosciences

Field of study: Advanced nanotechnologies and microtechnologies

Student: Meena Dhankhar

Topic: Magnetic vortex based memory device

Meena is a hard-working student very skilled in the field of nanofabrication. During her PhD, she gained a lot of knowledge in general nanofabrication with particular emphasis given to magnetic nanostructures and physics of magnetism. She achieved all goals of her PhD project, and the results are nicely summarized in the submitted thesis. Beyond her PhD studies, she is working full-time as an electron beam lithography specialist at CEITEC Nano. In addition, she is working on a joint project with Thermo Fischer Scientific dealing with magnetic contrast in SEM. She is also a very nice person, always willing to help others.

In her PhD thesis, she focused on all-electric control of magnetic vortices, which is a necessary prerequisite for the use of vortex-based multibit memory cells as a memory. She succeeded to demonstrate that selective dynamic writing of all four vortex states in magnetic nanodisks can be achieved by selecting a proper pulse sequence and that the vortex states can be detected by electric spectroscopy via the anisotropic magnetoresistance effect. The results presented in the thesis were published in two journal articles, and another manuscript is prepared for submission.

In summary, during her PhD study, Meena always performed very well, and the findings of her PhD project are nicely summarized in her thesis. Meena has proved her abilities for independent creative scientific work, and therefore I recommend her work for defence and for awarding her the PhD title.

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Michal Urbánek - supervisor

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