# Seminář odd. 26
# Tenkých vrstev a nanostruktur

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TÉMA

## Magnetic Exchange Force Microscopy and Spectroscopy


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Over that past 10 years, my coworkers and I developed a new versatile tool to study magnetic phenomena with atomic resolution, i.e., magnetic exchange force microscopy (MExFM) [1]. In contrast to magnetic force microscopy (MFM), which probes the long-range dipolar magnetostatic interaction, it is sensitive to the electron-mediated short-range magnetic exchange interaction between neighboring spins [2]. As a force microscopy based technique, it can - unlike spin-polarized scanning tunneling microscopy (SP-STM) - also be applied to nonconductive surfaces.

In my presentation, I will review MExFM results obtained on the antiferromagnetic bulk insulator NiO(001) [1], the antiferromagnetic Fe monolayer on W(001) [3] and the noncollinear skyrmionic spin texture of the Fe monolayer on Ir(111) [4]. Finally, I will show how magnetic exchange force spectroscopy (MExFS) can be performed in a very elegant fashion to obtain quantitative information about the magnetic exchange interaction [5].



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[4] J. Grenz, A. Köhler, A. Schwarz, and R. Wiesendanger “Probing the Nano-Skyrmion Lattice on Fe/Ir(111) with Magnetic Exchange Force Microscopy” Phys. Rev. Lett. 119, 047205 (2017).

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odborný garant: *Ing. Pavel Jelínek, Ph.D.*