

Seminář odd. 26

Tenkých vrstev a nanostruktur

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TÉMA

**Tabletop AFM, and, an interesting observation
when probing forces and currents**

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Ambient conditions are challenging for atomic force microscopy (AFM) because the tip dynamics change dramatically near the surface. This is due to a water layer which needs to be penetrated before the tip is close enough to the surface for high-resolution imaging. We recently achieved atomic resolution of the KBr surface. In this study, we quantified the effect of the surface water layer and laid the foundation for future work in ambient and liquids.

Scanning tunnelling microscopy (STM) also allows surfaces to be investigated at the atomic scale. This comes from the strong distance dependence of the quantum mechanical effect of tunnelling. While the total current is usually only on the order of nanoamperes, the current density can be quite high. This has strong effects on the voltage drop between tip and sample. AFM is sensitive to the total force interaction between the tip and the sample, including contributions from electrostatics, van der Waals, and chemical bonding. By simultaneously measuring force and current, we can observe changes in the electrostatic force that are due to this effective sample resistance.

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