

Influence of Free Cantilever Oscillation Amplitude on Image Contrast in the Magnetic Force Microscopy

Milan Pavúk^{a)}, Gabriel Farkas^{b)}, and Vladimír Slugen^{c)}

*Institute of Nuclear and Physical Engineering, Slovak University of Technology in Bratislava,
Ilkovičova 3, 812 19 Bratislava, Slovak Republic.*

^{a)} Corresponding author: milan.pavuk@stuba.sk

^{b)} gabriel.farkas@stuba.sk

^{c)} vladimir.slugen@stuba.sk

Abstract. The Magnetic Force Microscopy (MFM) combines the advantages of the Atomic Force Microscopy (AFM) with the ability to visualize the surface magnetic domain structure of samples. Higher contrast in the MFM imaging means better ability to see magnetic structures and distinguish them from noise. One of the parameters affecting the MFM image contrast is the free cantilever oscillation amplitude of the probe. In this study, we present MFM measurements performed on a magnetic videotape at two different levels of free cantilever oscillation amplitude. The results showed that scanning at higher amplitude can enhance the signal-to-noise ratio and thus the contrast of the MFM image. Conversely, scanning at lower amplitude increases the perception level of the noise in the image. However, it should be noted that in the scope of our experimental conditions, changes in the image were not significant. In addition, it was found that precise adjustment of the tip-to-surface distance plays a crucial role in this MFM experiment, which is not the same as the “lift height” parameter.