Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Performing spin-polarized STM experiments theoretically PETER WEINBERGER, Center for Computational Nanoscience — By introducing pathes on the hypersurface of the band energy contribution (free energy) to the magnetic anisotropy energy and of corresponding differences in the zz-like elements of the electric conductivity tensor, viewed as an implicit function of the free energy [1], experimental spin-polarized scanning tunnel microscope data, namely the recording of a differential current as a function of an externally applied field, can be analyzed and facilitate a direct comparison between theory and experiment. It is shown that along different pathes rather different flipping times of the direction of the magnetization can occur. In particular discussed are in terms of "theoretical experiments" horizontal and vertical movements of the tip, the influence of the magnetic properties of the tip as well as of typical samples. Furthermore, it is claimed that because of different time scales in a (presently still fictional) time- resolved mode for spin-polarized STM experiments even particular pathes on these hypersurfaces could be mapped out.

[1] P. Weinberger, Phys. Rev. B 80, 060403 R (2009)

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Date submitted: 06 Nov 2009 Electronic form version 1.4