



Achtung: Termin- und Raumänderung !

Ulrich Türk
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Graduiertenschule „Multiscale
Methods for Interface Coupling“

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22.11.2010

**Die Graduiertenschule MUSIC lädt ein zum Vortrag im Seminar
„Multiscale Methods for Interface Coupling“**

**Dienstag, 14. Dezember 2010, 15:00 Uhr, Appelstr. 9 A, Gebäude 3408,
Seminarraum 1611 (16. OG)**

**About modelling aspects for the simulation of magnetic force
microscopes**

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In IC failure analysis the detection of currents is often used to indicate the presence of a defective device. One possible method used for this analysis is the Magnetic Force Microscopy (MFM). During the measurement process a micro-mechanical cantilever, which holds a magnetic coated tip underneath, is moved over a magnetic field inducing sample surface. Due to the magnetic interactions attractive or repulsing forces act on the cantilever and cause a deflection, which can be detected by a reflected laser beam focused onto a photodetector. Thereby it is possible to image the magnetic domain structures and hence to draw conclusions about the sample magnetizations or currents. Unfortunately, by employing this technique measurement errors could occur as for instance due to heterogeneous magnetic tip coatings, fabrication/abrasion errors of the MFM tips and vibrations during a MFM scanning process. For that purpose, a theoretical model of the MFM based on a FEM/BEM coupled approach was developed as a first step to verify and improve the results of laboratory MFM measurements. In the presentation an overview about several modelling aspects of the magneto-mechanical coupled configuration will be given such as the calculation of the magnetic interactions between tip and sample surfaces, the occurring magnetic forces and the mechanical behaviour of the cantilever, respectively. Furthermore, a whole simulated scanning process will be shown.

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