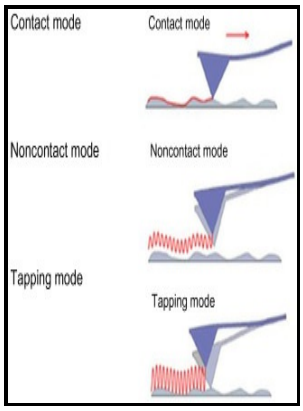
Scanning force microscopy - with applications to electric, magnetic, and atomic forces

Oxford University Press - Scanning force microscopy



Description: -
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Surfaces (Physics)
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Applications of scanning force microscopy to magnetic and electronic media

Both the tip and sample must be electrically conductive. Bag om Scanning Force Microscopy Since its invention in 1982, scanning tunneling microscopy STM has enabled users to obtain images reflecting surface electronic structure with atomic resolution. That is, the tip is brought into a close proximity of the sample to take AFM measurements.

Scanning force microscopy

There are four optical methods used in scanning force microscopy: heterodyne, homodyne, deflection and laser feedback.

Magnetic force microscope

Magnetic Imaging and Its Applications to Materials: Experimental Methods in the Physical Sciences. The Si 3N 4 cantilever-tip modules are usually more durable and have smaller restoring force constants k.

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The amount of items that will be exported is indicated in the bubble next to export format. MFM scanning often uses non-contact AFM NC-AFM mode. Academic and industrial researchers using STM, or wishing to know more about its potential, will find this book an excellent introduction to this rapidly developing field.

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Contents: Levers and Noise -- Mechanical Properties of Levers -- Stress and Strain -- Moments -- Spring Constant -- The Rayleigh Solution to a Vibrating Lever -- The Classical Solution to a Vibrating Lever -- Normal Modes -- Lumped Systems -- Resonance Enhancement -- Bimorph Driver -- Effective Spring Constant -- Bimorph-Driven Lever -- Sample-Driven Lever -- Tip-Driven Lever -- Sources of Noise -- Shot Noise -- Resistor Johnson Noise -- Laser Intensity Noise -- Laser Phase Noise -- Thermally Induced Lever Noise -- Bimorph Noise -- Lever Noise-

Limited SNR -- Experimental Characterization of Noise -- Scanning Force Microscopes -- Tunneling Detection System -- Perpendicular Arrangement -- Cross Arrangement -- Parallel Arrangement -- Serial Arrangement -- Single-Lever Arrangement -- Capacitance Detection System -- Homodyne Detection System -- Heterodyne Detection System -- Laser-Diode Feedback Detection System -- Polarization Detection System -- Deflection Detection System -- Scanning Force Microscopy -- Electric Force Microscopy -- Magnetic Force Microscopy -- Principles of Operation -- Noise Considerations -- Applications -- Performance -- Atomic Force Microscopy -- Intermolecular Microscopic Interactions -- Intermolecular Macroscopic Interactions -- Lever-Tip-Sample Contact Interactions -- Lever-Tip-Sample Noncontact Interactions -- Experimental Results for the Contact Mode. } Since the tip is magnetized along a specific direction, it will be sensitive to the component of the magnetic stray field of the sample which is aligned to the same direction. This technology has proved indispensable as a characterization tool with applications in surface physics, chemistry, materials science, bio-science, and data storage media.

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