Multi-Technique Scanning Probe Microscope for research in air, controlled gas and liquids

SOLVER

SCANNING PROBE MICROSCOPE

ALL IN ONE:

Model SOLVER P47

is supplied with universal optical detection measuring head, scanner, and microscope base with powerful HIGH-Q electronics. The ultimate vibration protection design allows obtaining an atomic resolution within proximity of noise levels up to 40 dB without an expensive anti-vibration table. ResonantMode - allows easy measurement of biological objects such as cells and DNA; other applications include biological samples, soft polymers, contaminated surfaces and any other pliable surfaces that can be easily damaged during contact AFM.

The measuring modes available in Solver P47:

Scanning Tunneling Microscopy

- **STM Imaging**
  - STM Topography (I=const)
  - STM Current Imaging (Z=const)
- **ST Spectroscopy (modulation techniques):**
  - Local Barrier Height Imaging (dI/dZ)
  - Imaging of Local Spectral Density (dI/dU)
- **STM Lithography**

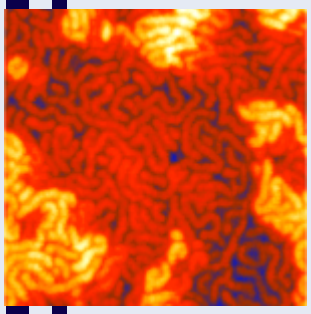
Scanning Force Microscopy (Atomic Force Microscopy)

- **Contact Mode**
  - Contact AFM (F=const)
  - Force Imaging (Z=const)
  - Lateral Force Imaging (LFM)
  - Adhesion Force Imaging (AhFM)
  - Local Viscoelastisity Imaging (force modulation technique)
  - Spreading Resistance Imaging
  - AFM in liquids
- **ResonantMode**
  - Special modulation technique for non-destructive imaging possible due to the elimination of lateral force influence.
  - Topography
    - Semicontact AFM
    - Noncontact AFM
  - Phase Imaging
  - Two-pass Techniques:
    - Magnetic Force Microscopy (MFM)
    - Electrostatic Force Microscopy (EFM)
    - Scanning Capacitance Microscopy (SCM)
    - Kelvin Probe Microscopy (SKM)
- **Lithography**
  - Mechanical Influence
    - Scratching
    - Resonant Mode
  - Electric Influence

SNOM

- **Shear Force Mode - Topography Imaging**
  - Optical input/output

HIGHLIGHTS:



Perpendicular wetting of float glass by the lamellae of a symmetric smectic liquid crystalline-isotropic diblock film. Sample courtesy of Prof. Dr. Wim H. de Jeu, FOM Institute, Netherlands.
Scan size: 879x911 nm.

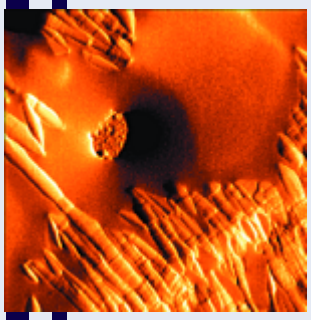
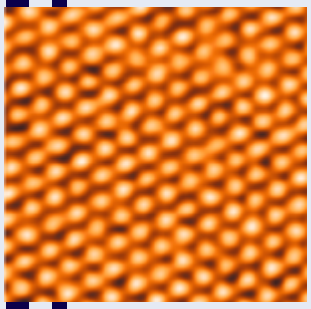


Image of Polydiethylsiloxane deposited on Si substrate by rubbing.
Scan size: 11x11 µm.



Lattice atomic resolution on Highly Oriented Pyrolytic Graphite obtained in STM mode in air.
Scan size: 5x5 nm.

- Wide range of measuring techniques on air:
  contact AFM/ LFM/ ResonantMode (semicontact + noncontact AFM)/ Phase Imaging/ Force Modulation (viscoelastisity)/ MFM/ EFM/ STM/ Adhesion Force Imaging/ Scanning Capacitance microscopy (SCM)/ Scanning Kelvin probe microscopy (SKM)/ Spreading Resistance Imaging (SRI)/ STM, RM Lithography/ AFM Lithography (Force+Voltage)/ STM Spectroscopy;
  in liquid: contact AFM/ LFM/ Adhesion Force Imaging/ Force Modulation (viscoelastisity)/ semicontact AFM (scanner-driven)/ AFM lithography (Force).
- The measuring head allows switching between imaging techniques STM/ AFM/ LFM/ ResonantMode by a mouse click in the control program.
- The topography of the same area can be shown simultaneously with LFM, MFM/EFM or STM images for comparison purposes.
- NT-MDT guarantees an atomic resolution at the customer's location within usual laboratory environment, without special anti-vibration tables.
- Advanced electronics High-Q with 22-bit resolution in XY-plane allows to set the resonance frequency with an accuracy 0.01 Hz to use probes with highest Q-factor.
- Two 16-bit ADCs allow to measure up to four differrent signals during a single scanning procedure.
- Temperature control of the sample up to 150°C degrees with accuracy 0.1°C.
- Residual nonlinearity (in XY-plane) is less than 1%.
- The symmetric design of SPM scanning-measuring system provides a low thermal drift, allowing to start measurements immediately after switching on the system.
- The piezoceramic which is used in Solver line microscopes has much better aging characteristic in comparison with analogs, used in SPM.
- Low weight (30 kg) and compact design.
- Wide range of supply voltages (80-240 V, 50-60 Hz) can be used without additional voltage stabilization.
- Low power consumption – 100 W.
- NT-MDT can customize microscopes to fit your requirements. Any system configuration can be upgraded to the TOP featured system.
- NT-MDT SPM systems have the best price – performance ratio.

To learn more about our products visit our web site http: //www.ntmdt.com

NT-MDT
Molecular Devices and Tools for NanoTechnology

NT-MDT Co., Zelenograd Research Institute of Physical Problems, 103460, Moscow, Russia
tel: +7 (095) 535-0305; fax: +7 (095) 535-6410; e-mail: spm@ntmdt.com
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