SCANNING PROBE MICROSCOPE (SPM) FACILITY

MODEL: NT-MDT Solver P47-PRO

INSTALLATION PLACE: Surface characterization Laboratory (room No18 new building), Department of Microelectronics

DESCRIPTION: The Solver P47-PRO is a universal SPM tool for studying various types of samples in ambient conditions or in a gas chamber. It uses the scanning-by-sample scheme which provides the highest possible resolution (up to atomic) in the class at the expense of small scanning area.

SPECIFICATIONS

1. Sample Size
    a. Standard configuration: 15mm by 10mm
    b. Special Holder (available only in standard AFM mode): 20mm by 20mm
2. Two available scanners
    a. 5 μm x5 μm x1.5 μm (±10%) open-loop scanner; min. scanning step of 0.0005 nm
    b. 10 μm x10 μm x2 μm (±10%) open-loop scanner; min. scanning step of 0.0011 nm
3. Three available SPM Heads
    a. Universal AFM Head
    b. STM Head (standard preamplifier): 30 pA – 50 nA, RMS noise 4 pA
    c. STM Head (low current preamplifier): 10 pA – 5 nA, RMS noise 1.5 pA
4. Available Operating Modes:
    a. Scanning Tunneling Microscopy (STM)
    b. Scanning Tunneling Spectroscopy (STS)
    c. Atomic Force Microscopy (AFM) including:
        i. Standard contact, semi-contact and non-contact AFM
        ii. Force Modulation Mode
        iii. Lateral Force Microscopy (LFM)
        iv. Spreading Resistance Imaging (SRI)
        v. Phase Imaging
        vi. Many-Pass Techniques, such as Electrostatic Force Microscopy (EFM) and Magnetic Force Microscopy (MFM)
    d. Atomic Force Spectroscopy
    e. AFM (Force) and STM (Current) Lithography

APPLICATIONS

1. Structural and Electrical Surface Characterization of Various Materials
2. Local structural and electrical characterization of electronic devices
3. Nanotribology
4. Small-Scale Nanolithography

CERTIFICATION/ACCREDITATION
The facility is not certified or accredited.

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