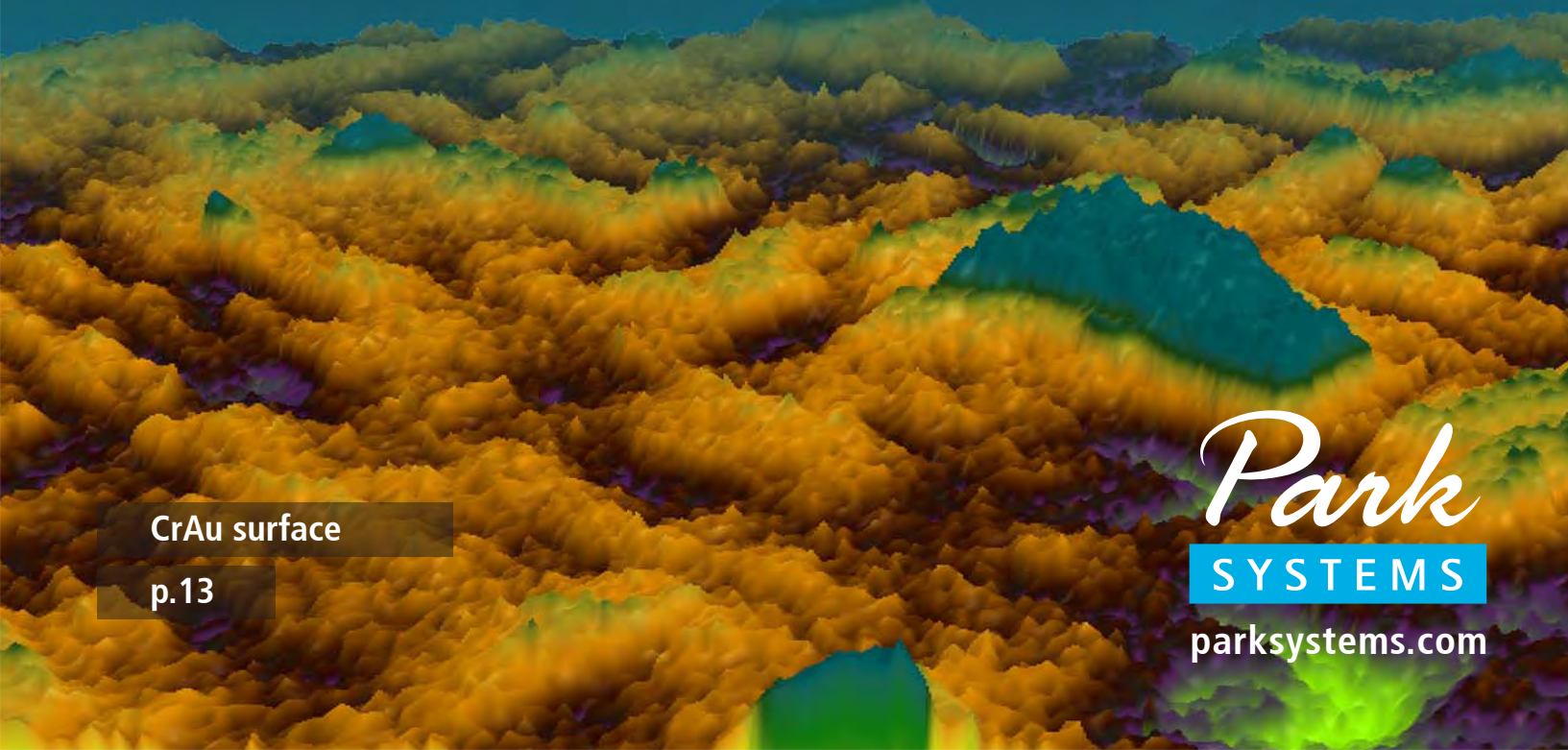
Volume 01

Park Atomic Force Microscopy

Image Gallery

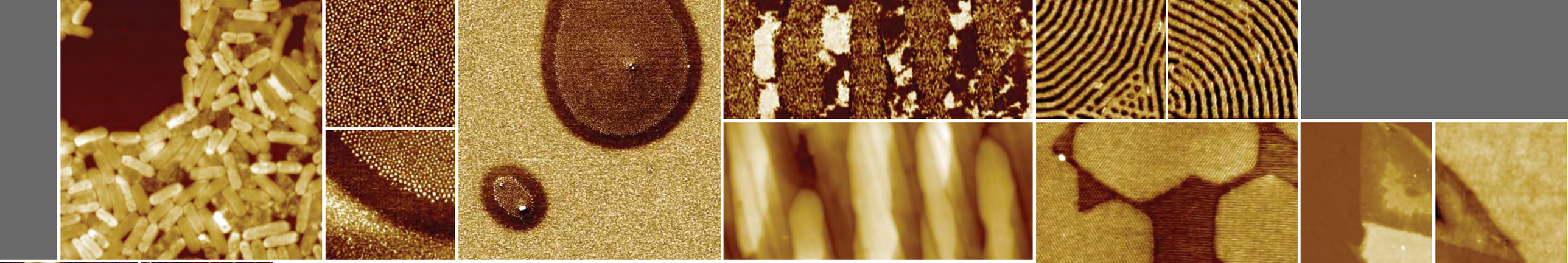


CrAu surface

p.13

Park SYSTEMS

parksystems.com



Park AFM Image Gallery

Table of Contents

Topography

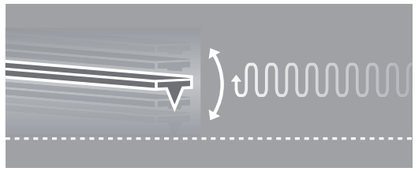
Mechanical Properties

Electrical Properties

Magnetic Property

Thermal Property

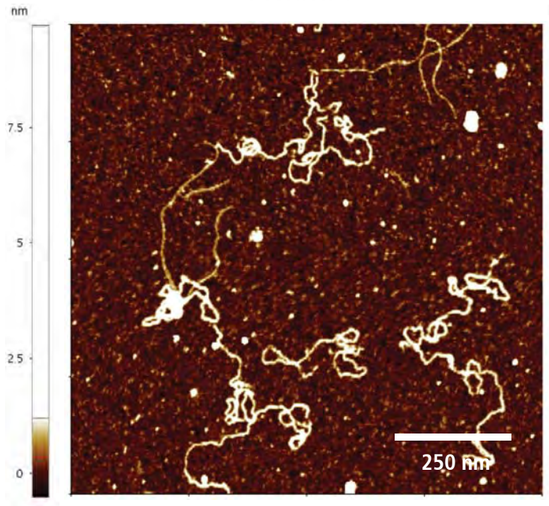
Plasmid DNA in liquid



True Non-Contact™ Mode

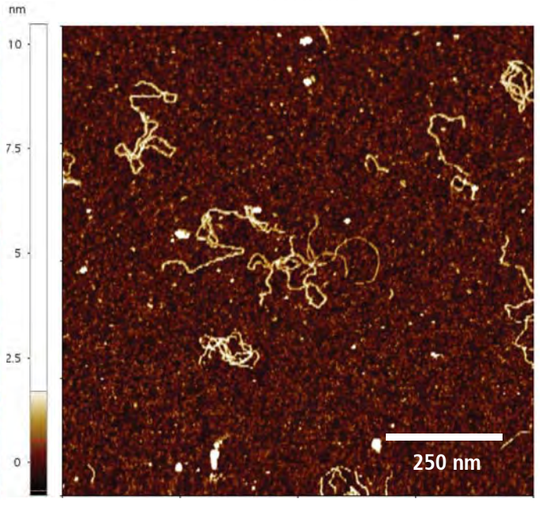
In this technique, the cantilever oscillates just above the surface as it scans. A precise, high-speed feedback loop prevents the cantilever tip from crashing into the surface, keeping the tip sharp and leaving the surface untouched. As the tip approaches the sample surface, the oscillation amplitude of the cantilever decreases. By using the feedback loop to correct for these amplitude deviations, one can generate an image of the surface topography.

Position 1



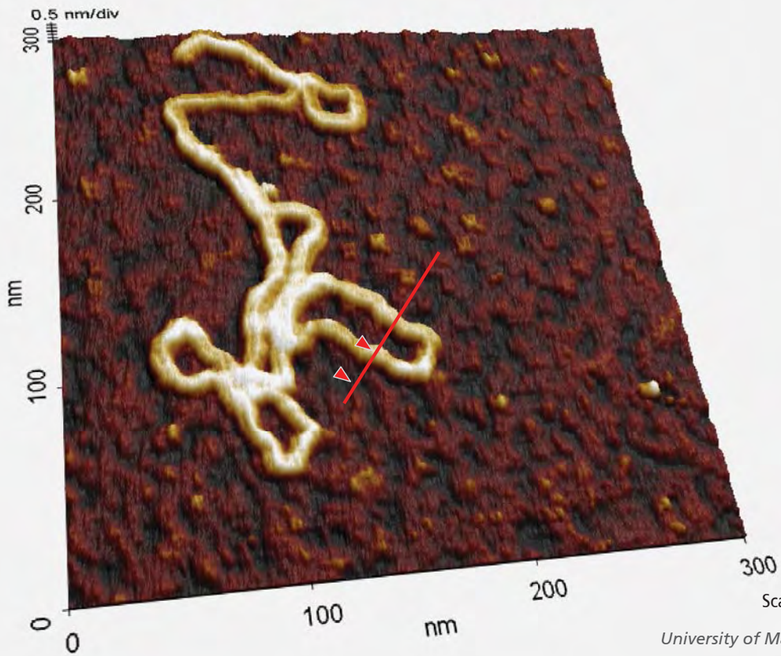
Peak to valley: 10 nm

Position 2



Peak to valley: 11 nm

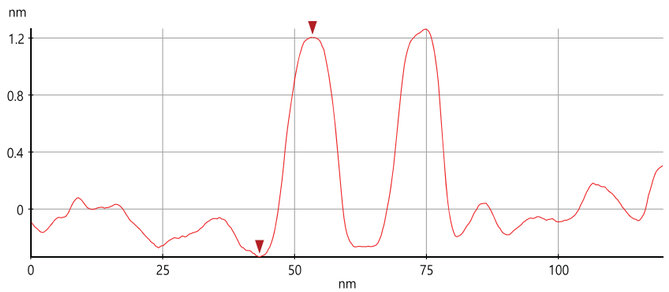
System: Park NX10
Scan Mode: Non-contact
Option: Shield liquid probe hand
Scan Size: 1 μm x 1 μm, 0.3 μm x 0.3 μm
Image Resolution: 1024 px x 512 px, 512 px x 256 px



Scale (X : Y : Z) = 1 : 1 : 5

University of Maryland, College Park
United States of America

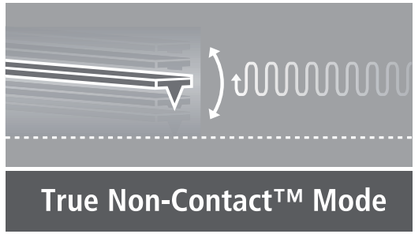
Line profile



DNA height

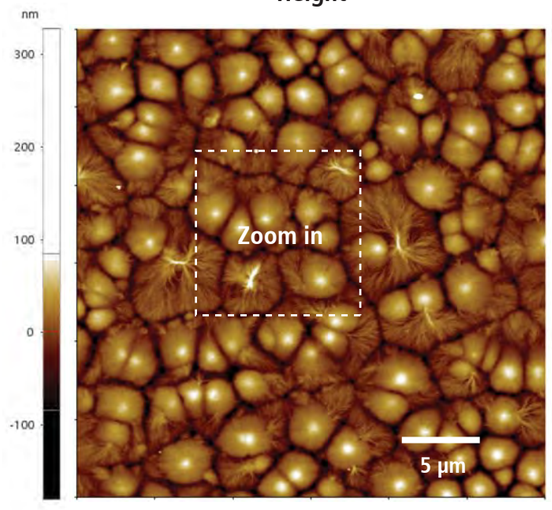
Cursor	ΔY(nm)
Red	1.536

Polyvinylidene fluoride beads



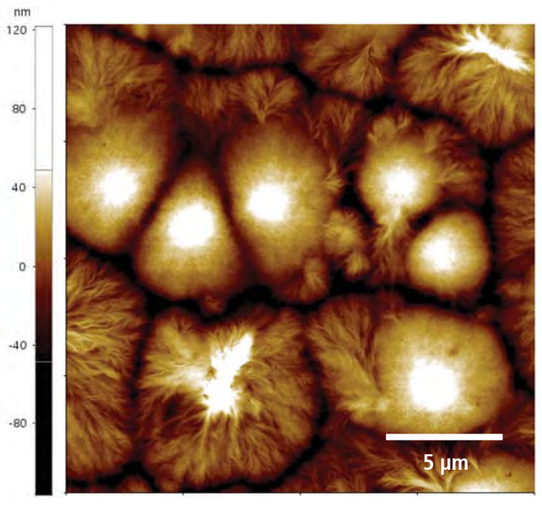
In this technique, the cantilever oscillates just above the surface as it scans. A precise, high-speed feedback loop prevents the cantilever tip from crashing into the surface, keeping the tip sharp and leaving the surface untouched. As the tip approaches the sample surface, the oscillation amplitude of the cantilever decreases. By using the feedback loop to correct for these amplitude deviations, one can generate an image of the surface topography.

Height



Peak to valley: 509 nm

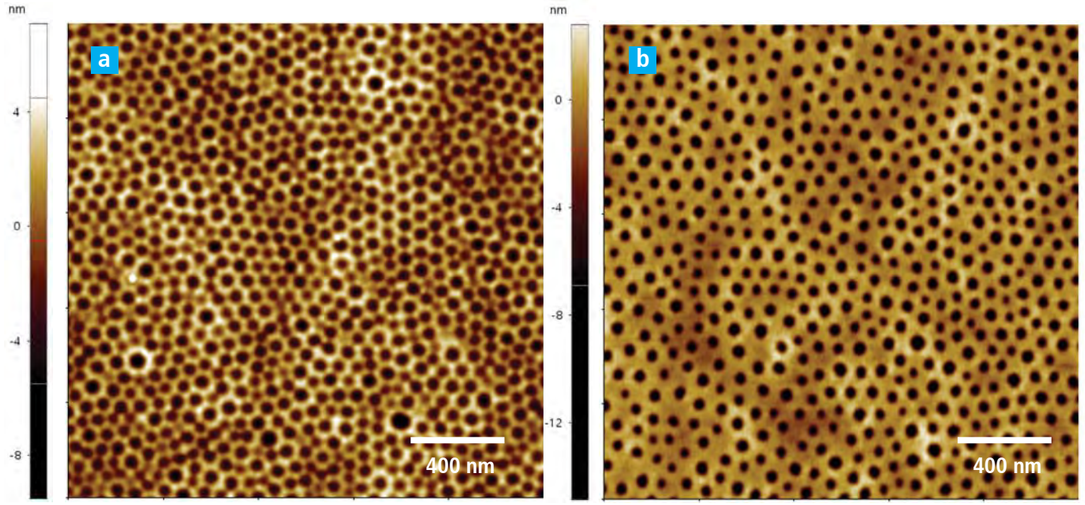
Zoom in



Peak to valley: 238 nm

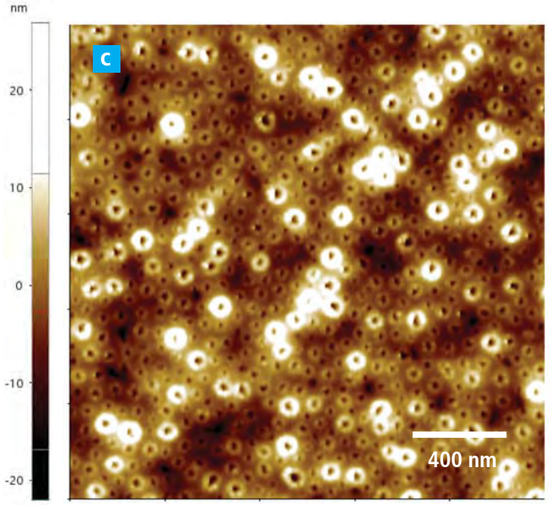
System: Park NX10
Scan Mode: Non-contact
Scan Size: 30 µm x 30 µm, 10 µm x 10 µm
Image Resolution: 512 px x 512 px, 512 px x 512 px

Polymers



Peak to valley: 16 nm

Peak to valley: 17 nm

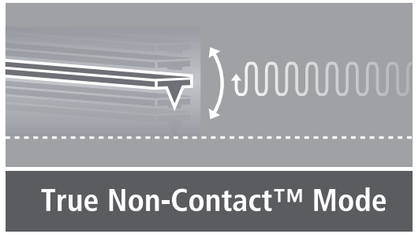


Peak to valley: 48 nm

a. poly(vinyl alcohol)-poly(3-Hexylthiophene)
b. poly(2-vinylpyridine)
c. poly(styrene-b-2-vinyl pyridine)

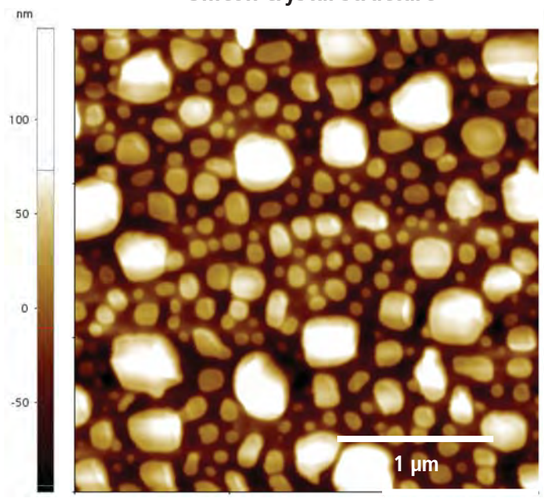
System: Park NX10
Scan Mode: Non-contact
Scan Size: 2 µm × 2 µm
Image Resolution: 512 px x 512 px, 512 px x 512 px

Microchannel pattern



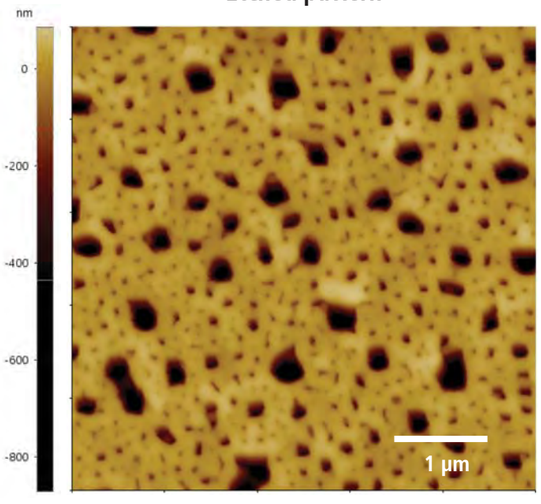
In this technique, the cantilever oscillates just above the surface as it scans. A precise, high-speed feedback loop prevents the cantilever tip from crashing into the surface, keeping the tip sharp and leaving the surface untouched. As the tip approaches the sample surface, the oscillation amplitude of the cantilever decreases. By using the feedback loop to correct for these amplitude deviations, one can generate an image of the surface topography.

Silicon crystal structure



Peak to valley: 245 nm

Etched pattern

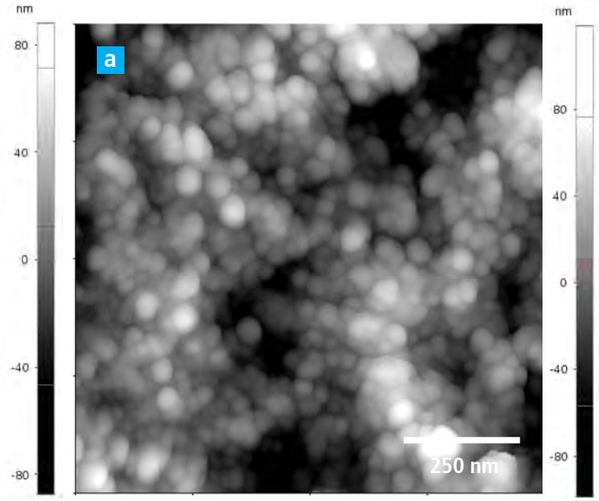


Peak to valley: 957 nm

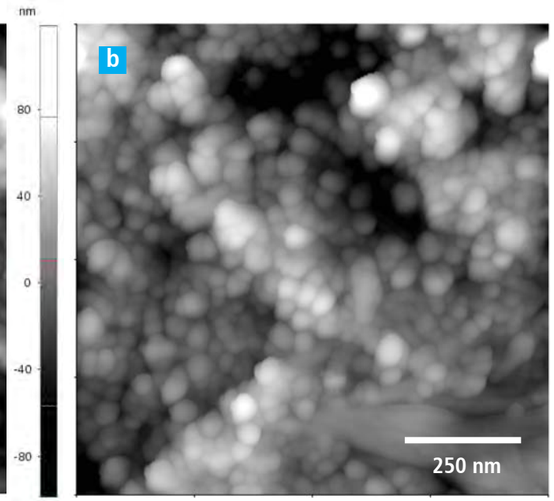
Patterns are used to reduce liquid flow speed in microchannel.

System: Park NX10
Scan Mode: Non-contact
Scan Size: 3 µm × 3 µm, 5 µm × 5 µm
Image Resolution: 512 px x 256 px, 512 px x 256 px

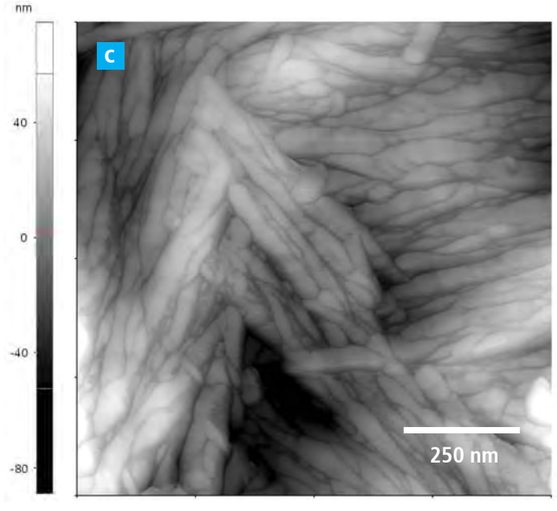
Calcium hydroxyapatite: Ca10(PO4)6(OH)2



Peak to valley: 175 nm



Peak to valley: 217 nm



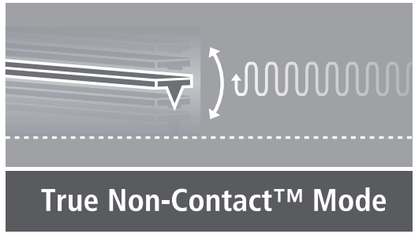
Peak to valley: 163 nm

Hydroxylapatite crystals grow according to annealing time. At 24 hours, the crystals' shapes become clear.

a. Annealing time: 6 hours
b. Annealing time: 12 hours
c. Annealing time: 24 hours

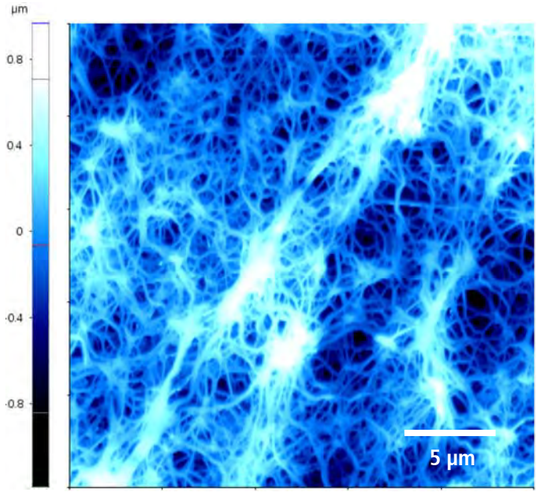
System: Park NX10
Scan Mode: Non-contact
Scan Size: 1 µm ×1 µm
Image Resolution: 512 px × 256 px

Polytetrafluroethylene membrane filter



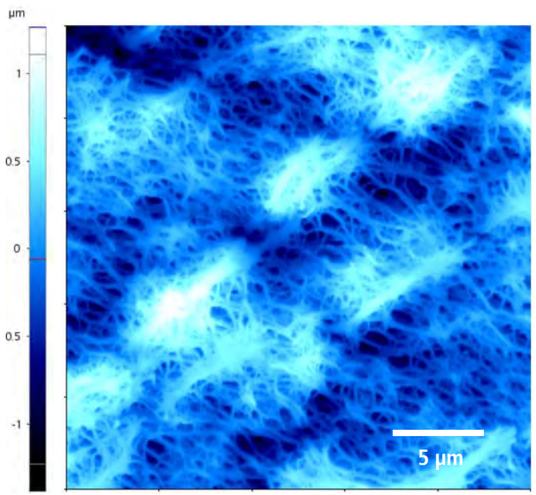
In this technique, the cantilever oscillates just above the surface as it scans. A precise, high-speed feedback loop prevents the cantilever tip from crashing into the surface, keeping the tip sharp and leaving the surface untouched. As the tip approaches the sample surface, the oscillation amplitude of the cantilever decreases. By using the feedback loop to correct for these amplitude deviations, one can generate an image of the surface topography.

Filter 1



Peak to valley: 2,157 nm

Filter 2

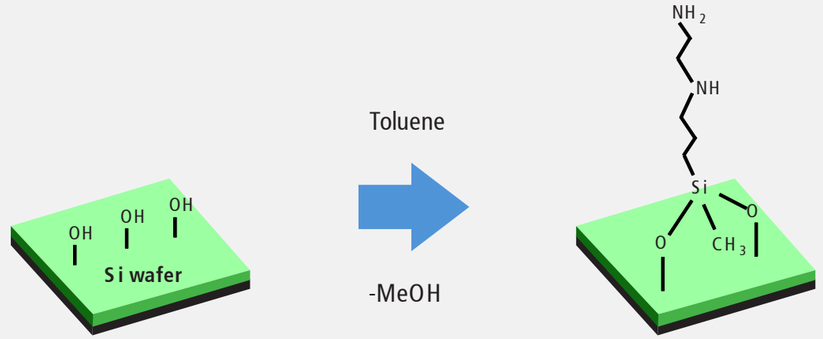


Peak to valley: 2,646 nm

System: Park NX20
Scan Mode: Non-contact
Scan Size: 25 µm×25 µm
Image Resolution: 512 px x 512 px

AEAPDES self-assembled monolayer

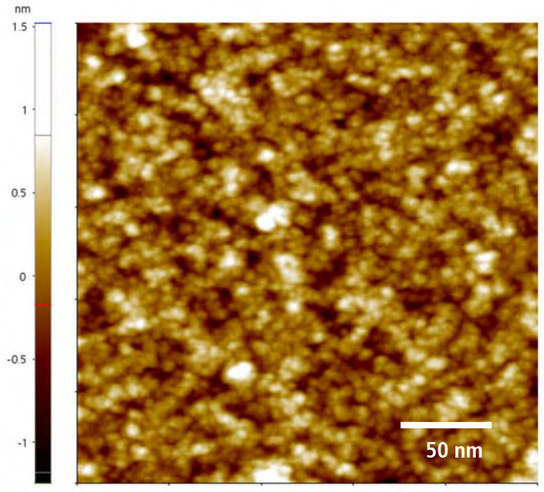
Sample Preparation



Clean the Si surface using Piranha treatment

Amine modified substrate

AEAPDES ; 3-(2-Aminoethylamino)propyldimethoxymethylsilane

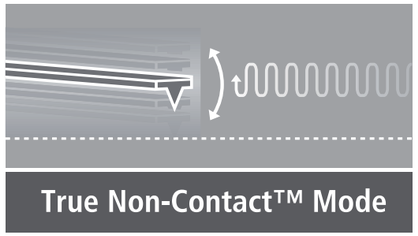


rms roughness: 0.3 nm

Sample courtesy: Organic Thin Films Laboratory
Hanyang University
Republic of Korea

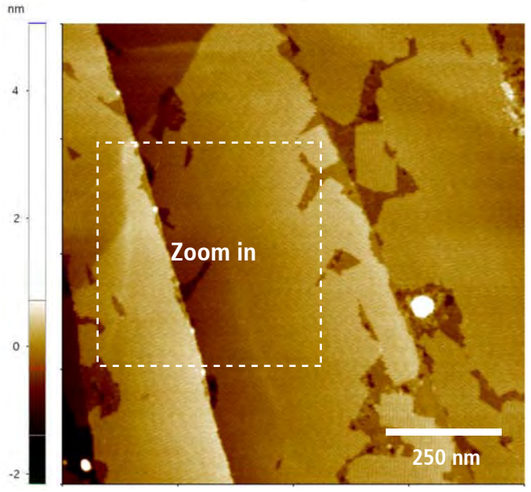
System: Park NX10
Scan Mode: Non-contact
Scan Size: 0.25 µm x 0.25 µm
Image Resolution: 256 px x 256 px

Hexacontene



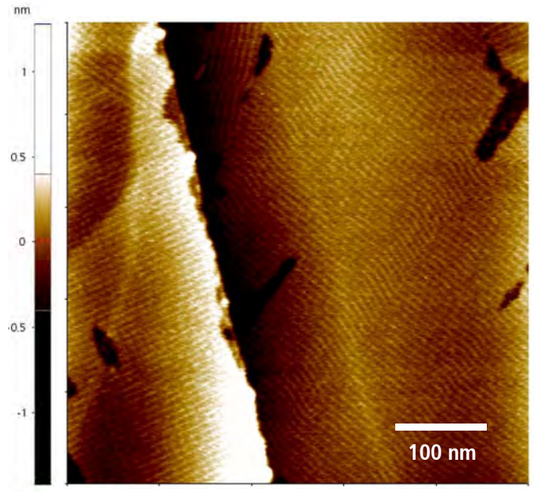
In this technique, the cantilever oscillates just above the surface as it scans. A precise, high-speed feedback loop prevents the cantilever tip from crashing into the surface, keeping the tip sharp and leaving the surface untouched. As the tip approaches the sample surface, the oscillation amplitude of the cantilever decreases. By using the feedback loop to correct for these amplitude deviations, one can generate an image of the surface topography.

Height



Peak to valley: 7.2 nm

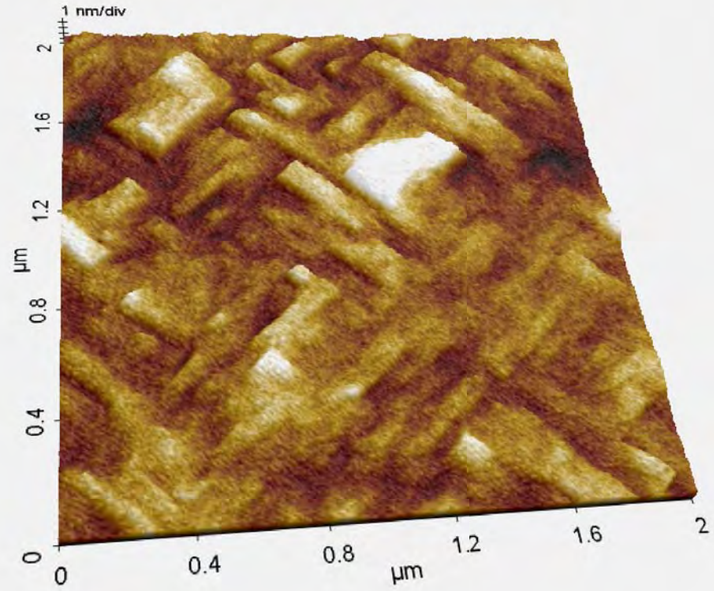
Zoom in



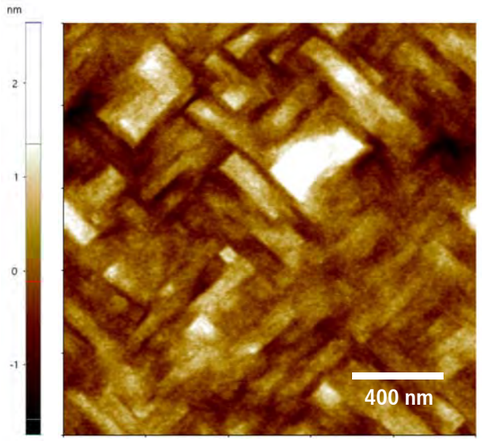
Peak to valley: 2.6 nm

System: Park NX10
Scan Mode: Non-contact
Scan Size: 1 μm × 1 μm, 0.5 μm × 0.5 μm
Image Resolution: 512 px × 512 px, 512 px x 512 px

Chromium-gold surface



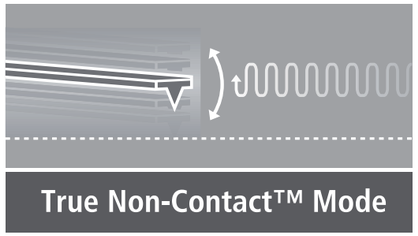
Scale (X : Y : Z) = 1 : 1 : 30



Peak to valley: 4.3 nm

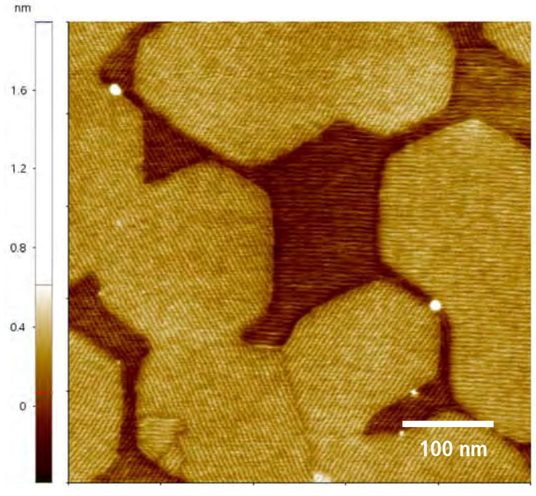
System: Park NX10
Scan Mode: Non-contact
Scan Size: 2 μm × 2 μm
Image Resolution: 256 px x 256 px

Graphene on boron nitride



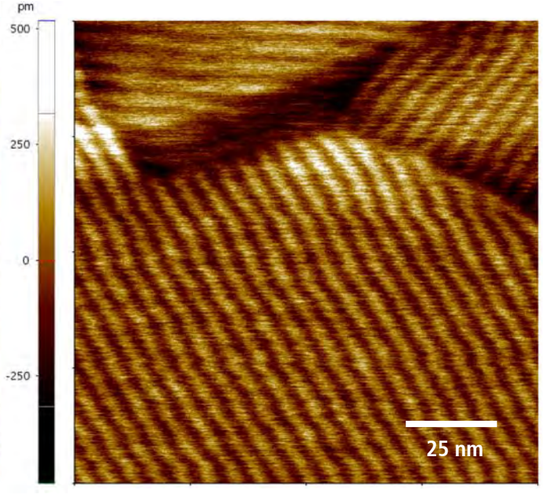
In this technique, the cantilever oscillates just above the surface as it scans. A precise, high-speed feedback loop prevents the cantilever tip from crashing into the surface, keeping the tip sharp and leaving the surface untouched. As the tip approaches the sample surface, the oscillation amplitude of the cantilever decreases. By using the feedback loop to correct for these amplitude deviations, one can generate an image of the surface topography.

Height scan 1



Peak to valley: 2.3 nm

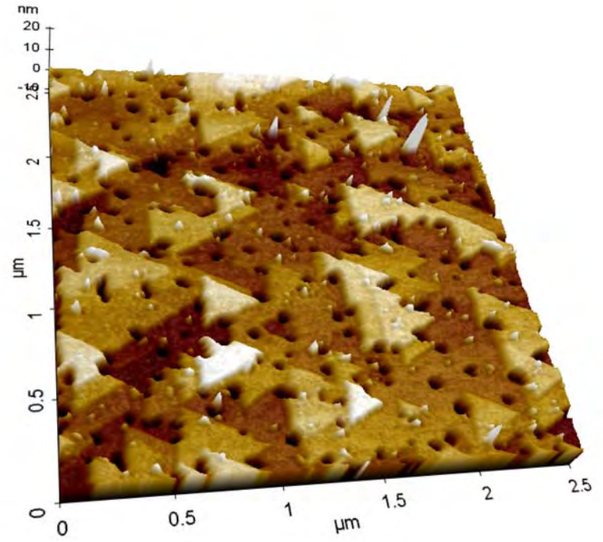
Height scan 2



Peak to valley: 1.0 nm

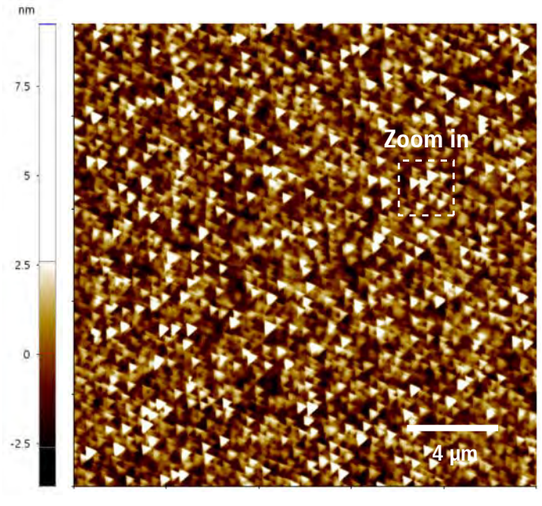
System: Park NX10
Scan Mode: Non-contact
Scan Size: 0.5 μm × 0.5 μm, 0.1 μm × 0.1 μm
Image Resolution: 512 px × 512 px, 256 px × 256 px

Lithium niobate wafer



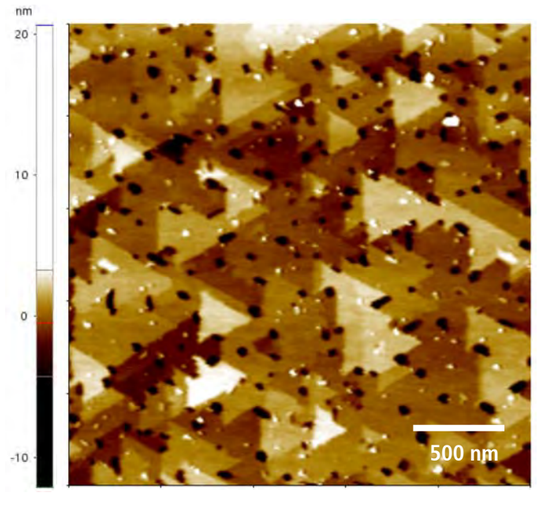
Scale (X : Y : Z) = 1 : 1 : 15

Height



Peak to valley: 50 nm

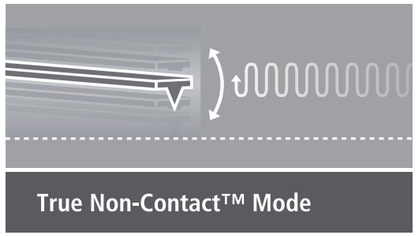
Zoom in



Peak to valley: 32 nm

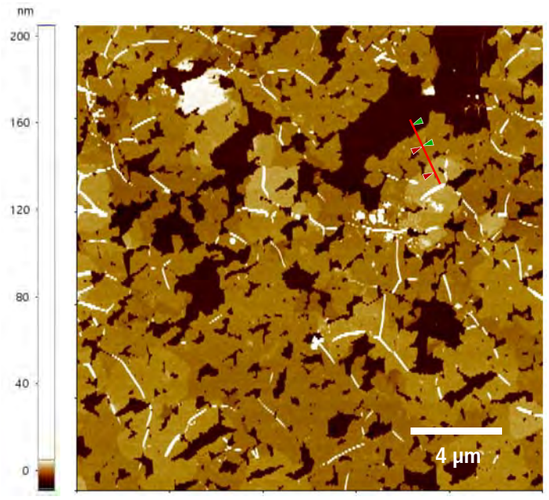
System: Park NX10
Scan Mode: Non-contact
Scan Size: 20 μm x 20μm, 2.5 μm x 2.5 μm
Image Resolution: 512 px x 512 px, 256 px x 256 px

Topological insulator film

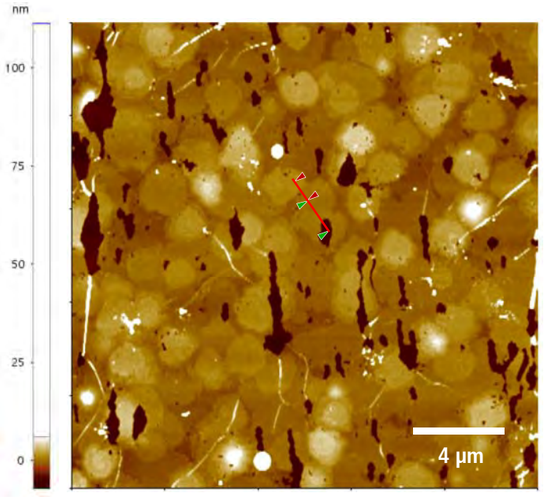


In this technique, the cantilever oscillates just above the surface as it scans. A precise, high-speed feedback loop prevents the cantilever tip from crashing into the surface, keeping the tip sharp and leaving the surface untouched. As the tip approaches the sample surface, the oscillation amplitude of the cantilever decreases. By using the feedback loop to correct for these amplitude deviations, one can generate an image of the surface topography.

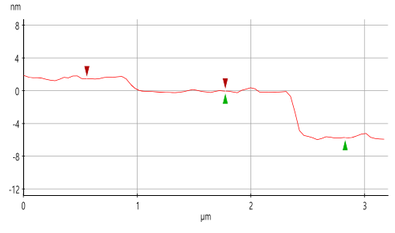
Sample 1



Sample 2

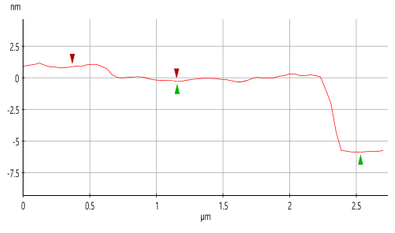


Line profile



Cursor	ΔY(nm)
Red	1.504
Green	5.682

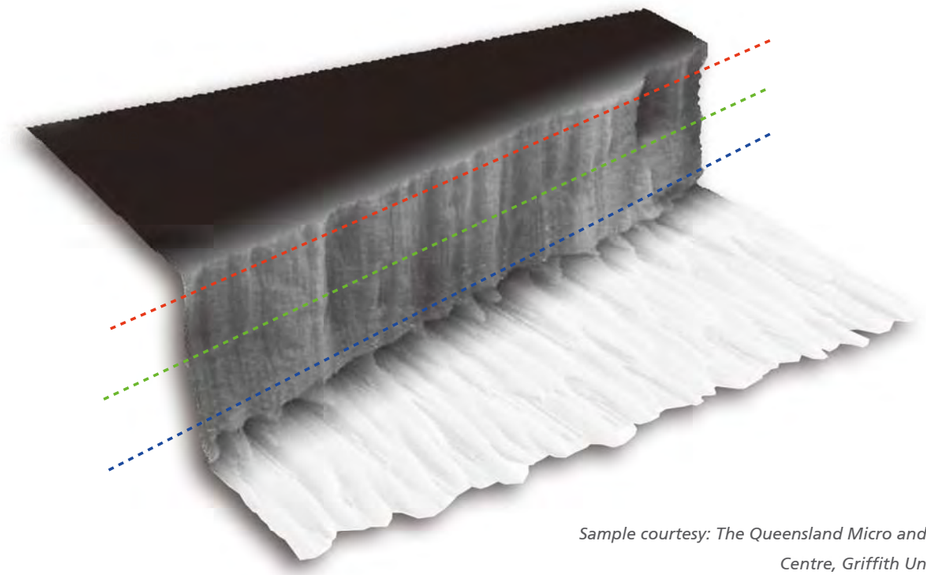
Line profile



Cursor	ΔY(nm)
Red	1.504
Green	5.682

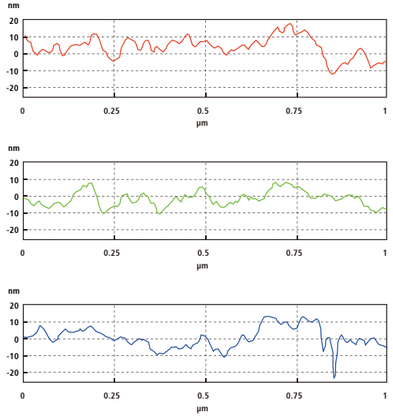
System: Park NX10
Scan Mode: Non-contact
Scan Size: 20 μm x 20 μm
Image Resolution: 512 px x 512 px

Silicon carbide film

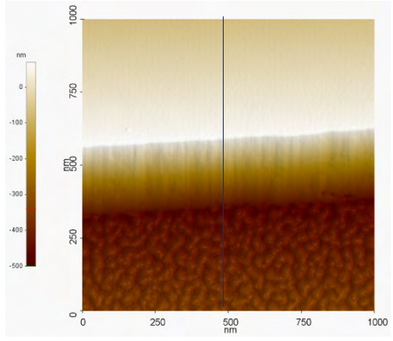


Sample courtesy: The Queensland Micro and Nanotechnology Centre, Griffith University, Australia

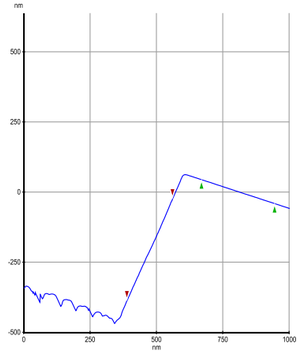
Line profile of sideWall



Height

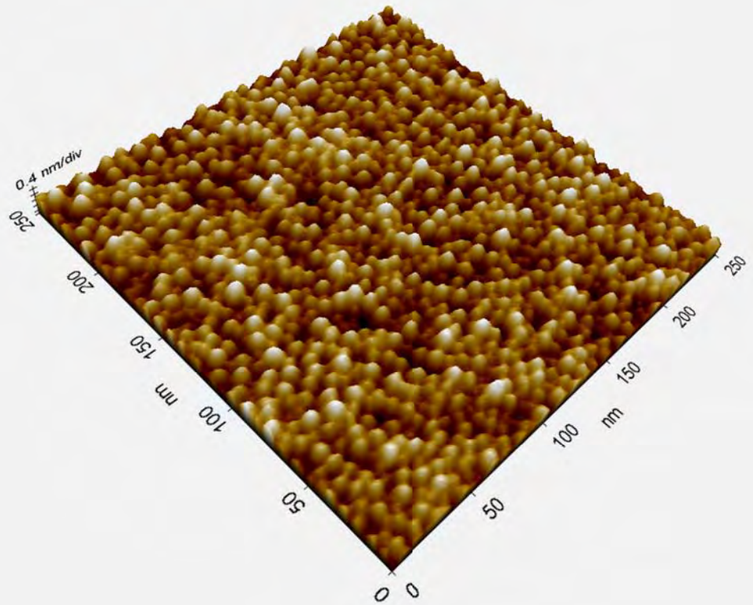


Cursor	Angle(deg)
Red	64.679
Green	-17.164

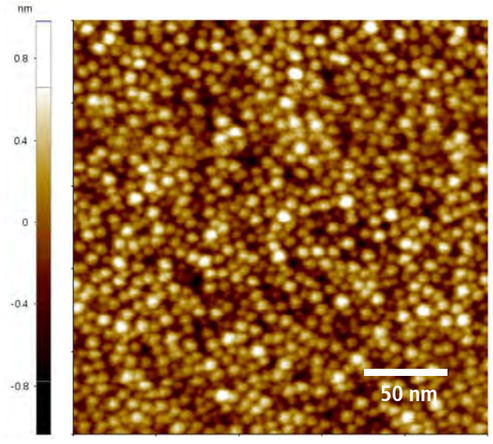


System: Park NX20
Scan Mode: Non-contact
Scan Size: 1 μm × 1 μm
Image Resolution: 512 px × 1024 px

Hard disk media



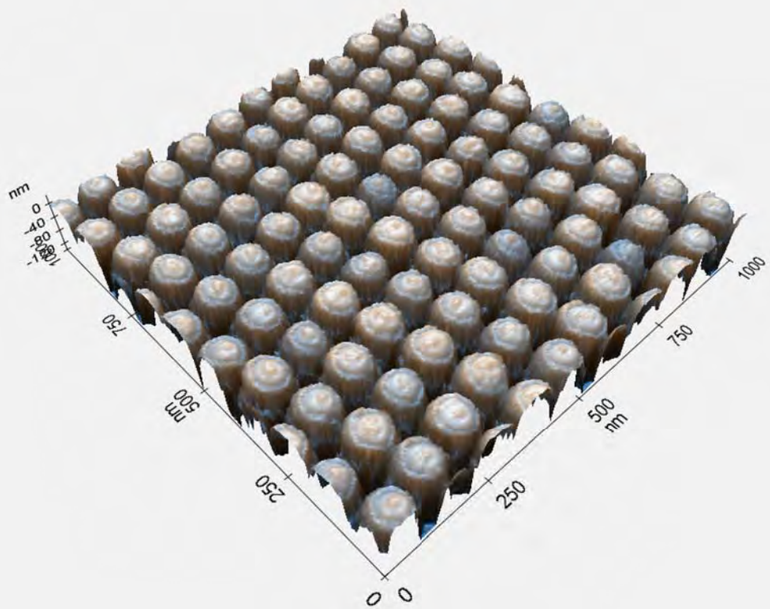
Scale (X : Y : Z) = 1 : 1 : 10



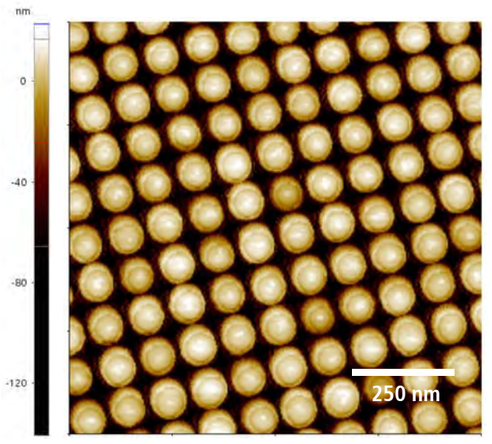
Peak to valley: 170 nm

System: Park NX20
Scan Mode: Non-contact
Scan Size: 0.25 μm x 0.25 μm
Image Resolution: 512 px x 512 px

Imprint Sample



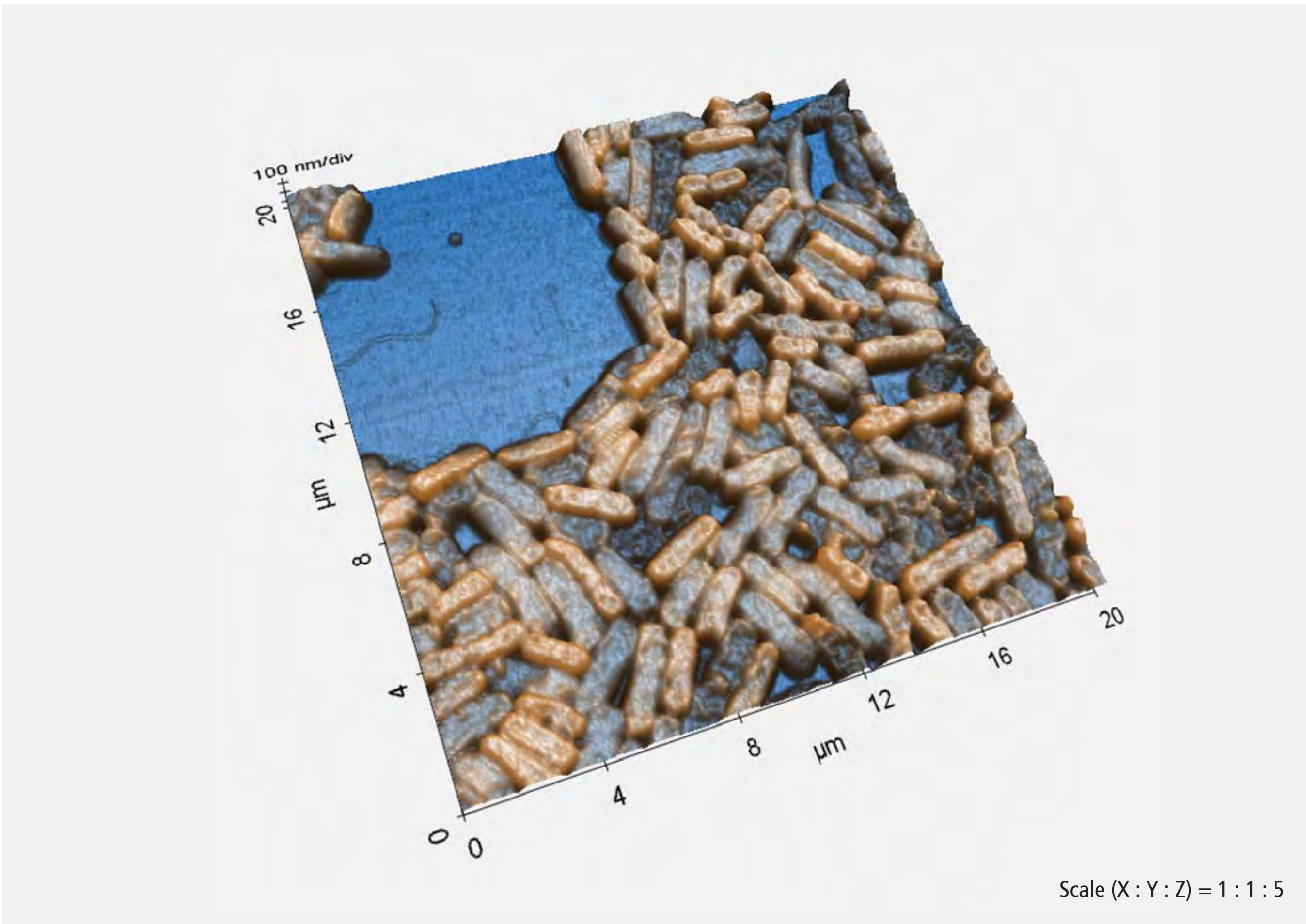
Scale (X : Y : Z) = 1 : 1 : 1

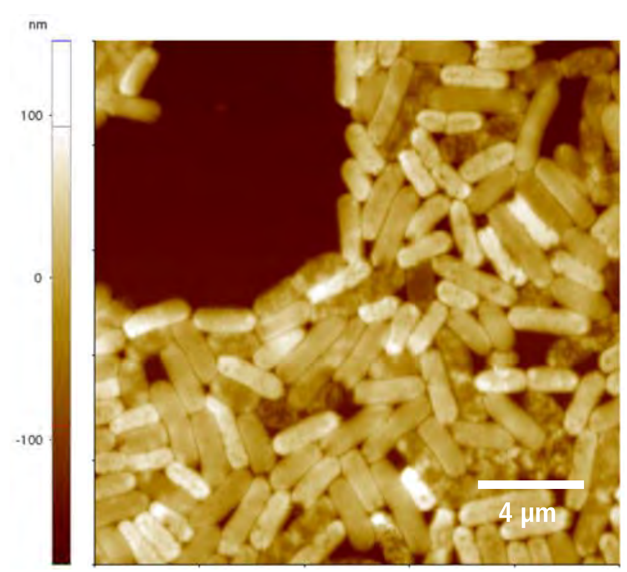


Peak to valley: 170 nm

System: Park NX10
Scan Mode: Non-contact
Scan Size: 1 μm × 1 μm
Image Resolution: 256 px × 256 px

Bacteria

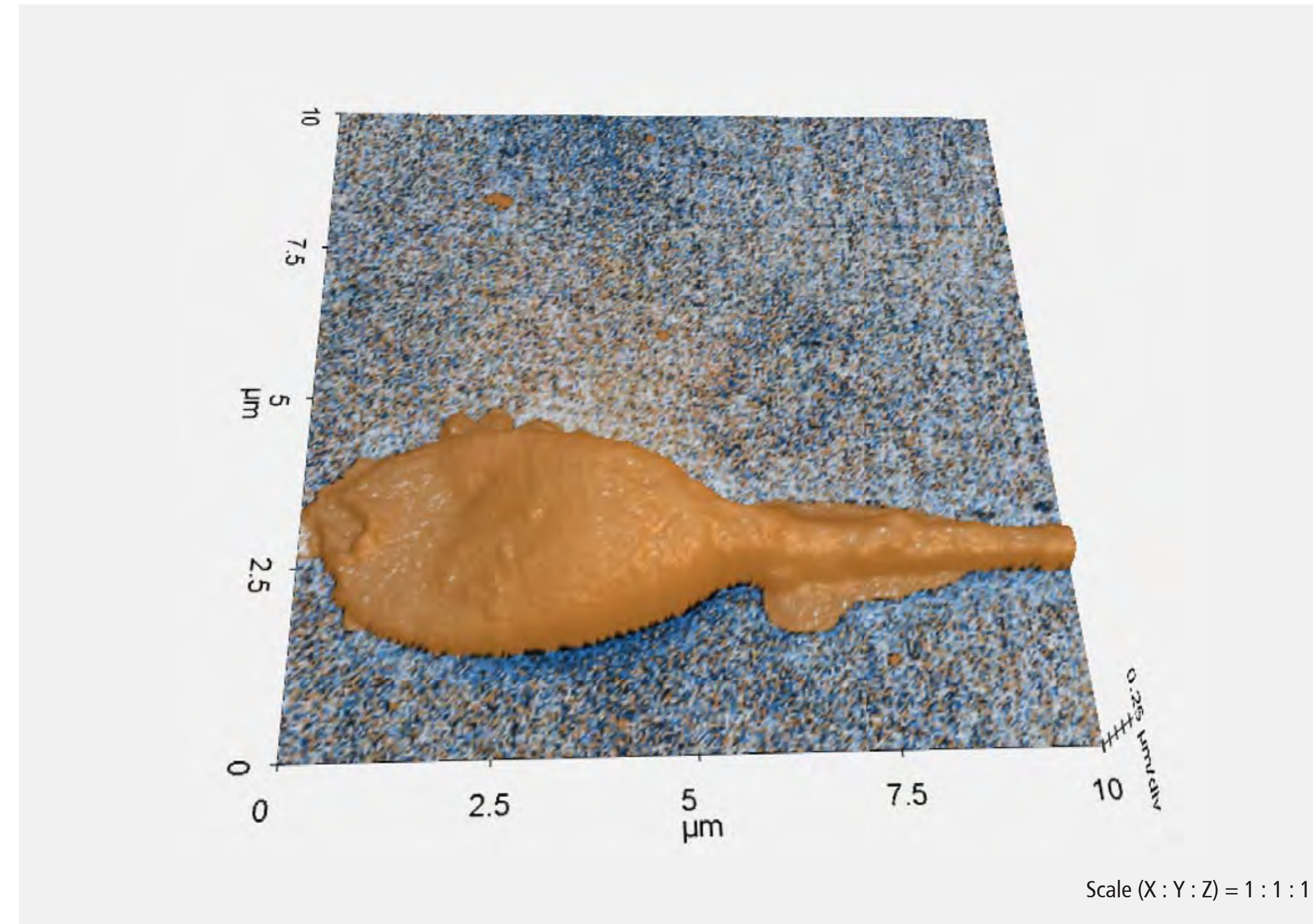


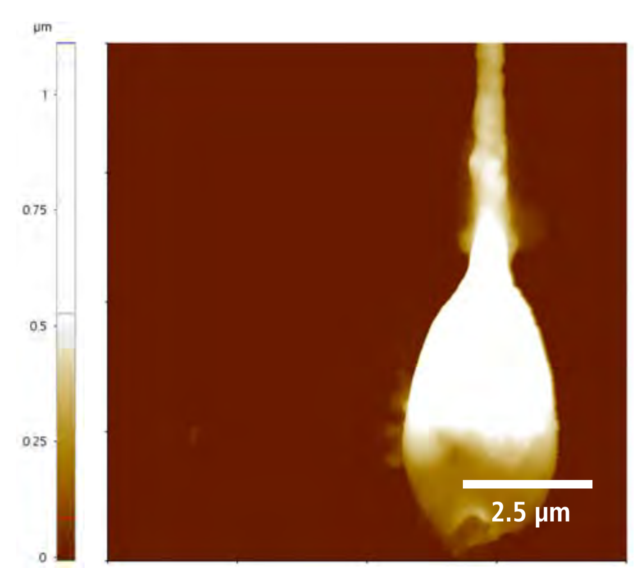


Peak to valley: 323 nm

System: Park NX10
Scan Mode: Non-contact
Scan Size: 20 µm x 20 µm
Image Resolution: 512 px x 256 px

Sperm with defect

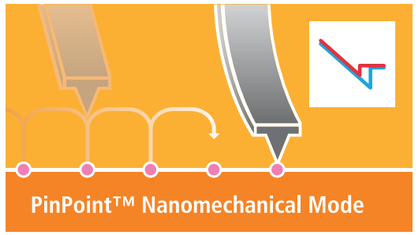




Peak to valley: 1,117 nm

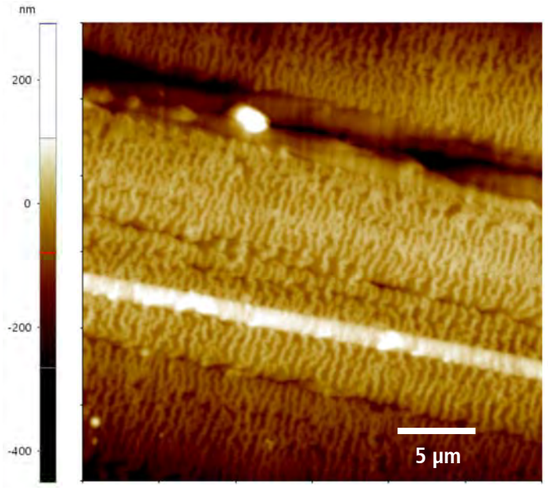
System: Park NX10
Scan Mode: Non-contact
Scan Size: 10 µm x 10 µm
Image Resolution: 512 px x 512 px

Adhesive system



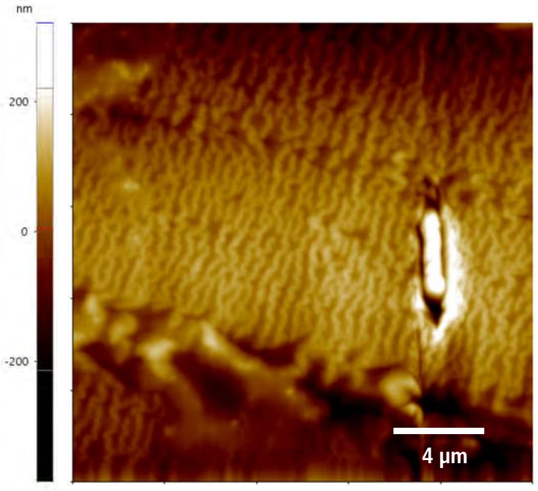
PinPoint™ Nanomechanical mode obtains the best of resolution and accuracy for nanomechanical characterization. Stiffness, elastic modulus, adesion force are acquired simultaneously in real-time. While the XY scanner stops, the high speed force-distance curves are taken with well defined control of contact force and contact time between the tip and the sample. Due to controllable data acquisition time, PinPoint™ Nanomechanical mode allows optimized nanomechanical measurement with high signal-to-noise ratio over various sample surfaces.

Position 1



Peak to valley: 742 nm

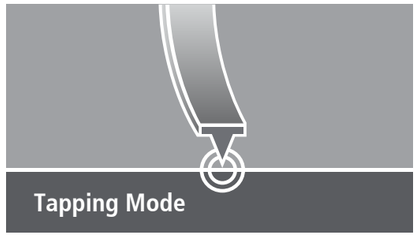
Position 2



Peak to valley: 706 nm

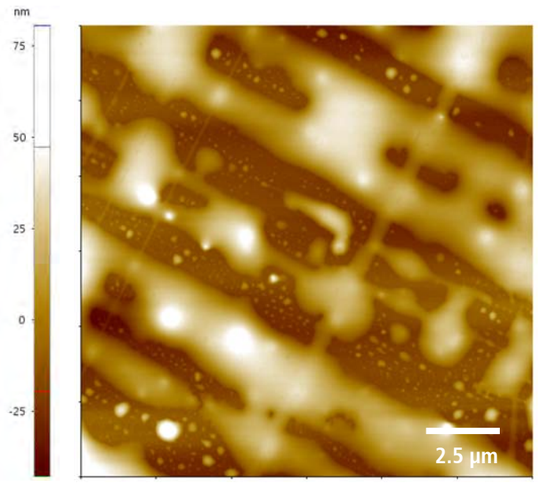
System: Park NX10
Scan Mode: PinPoint™ Nanomechanical Mode
Scan Size: 30 µm x 30 µm , 20 µm x 20 µm
Image Resolution: 256 px x 256 px

Polydimethylsiloxane liquid crystal



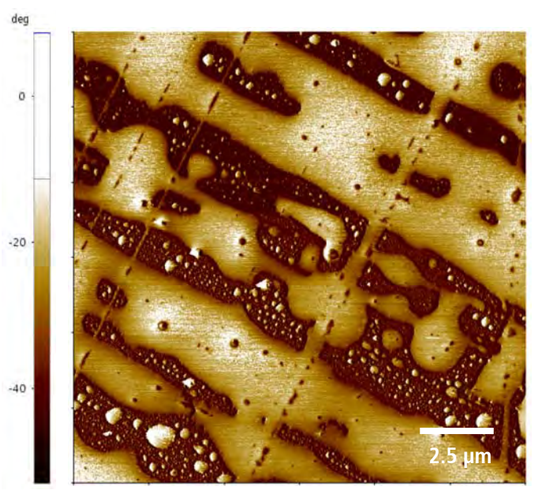
In this imaging mode, the cantilever also oscillates (as in non-contact mode) with the probe coming into intermittent contact with the sample surface. This enables improved imaging capability for certain samples whose surfaces require this type of interaction for optimal characterization.

Height



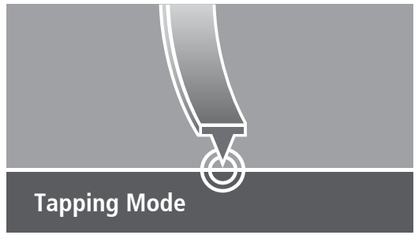
Peak to valley: 123 nm

Phase

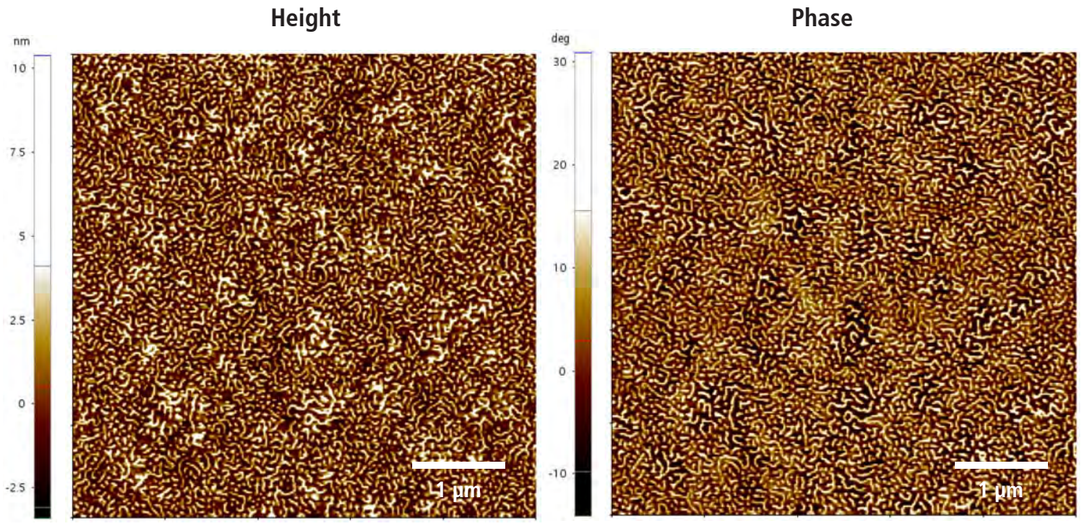


System: Park NX10
Scan Mode: Tapping
Scan Size: 15 µm x 15 µm
Image Resolution: 512 px x 512 px

Block copolymer I



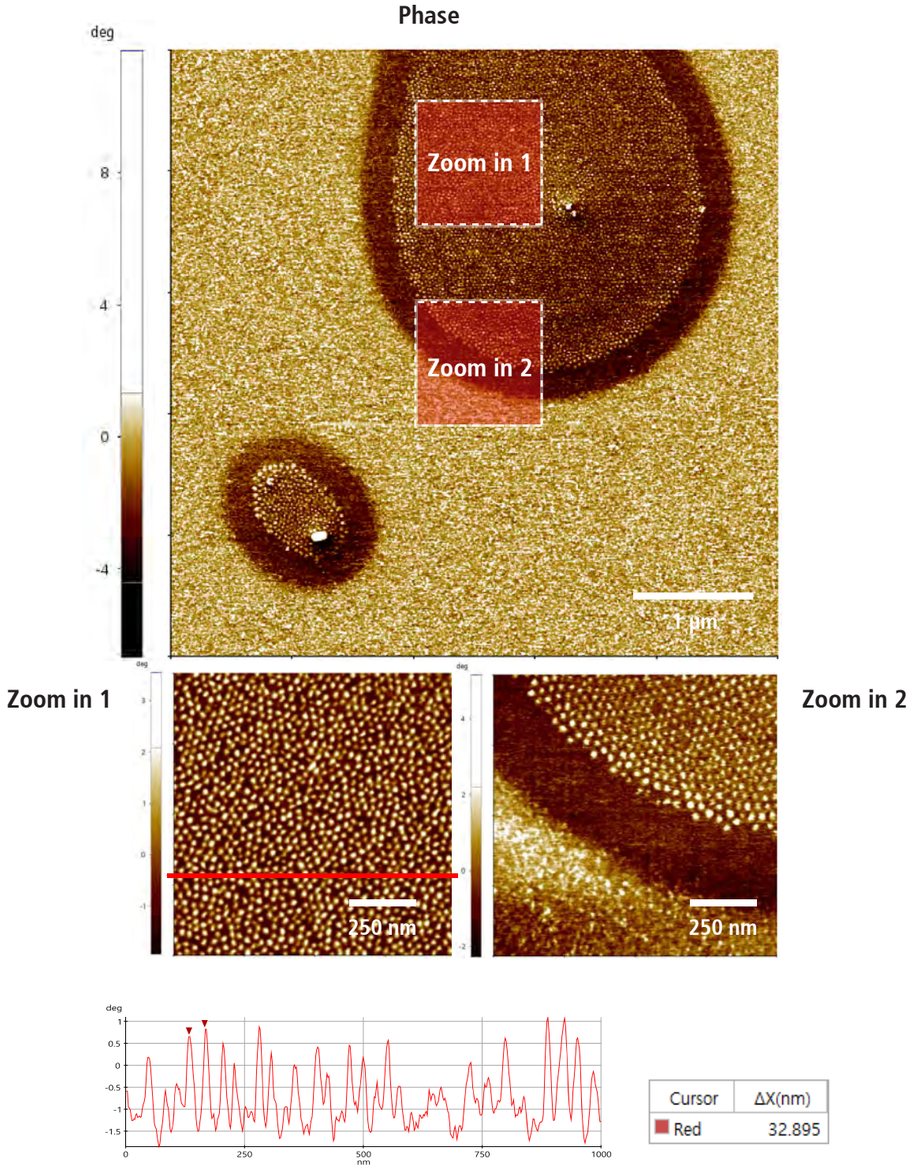
In this imaging mode, the cantilever also oscillates (as in non-contact mode) with the probe coming into intermittent contact with the sample surface. This enables improved imaging capability for certain samples whose surfaces require this type of interaction for optimal characterization (e.g., block copolymers).



Peak to valley: 13 nm

System: Park NX20
Scan Mode: Tapping
Scan Size: 5 μm x 5 μm
Image Resolution: 512 px x 512 px

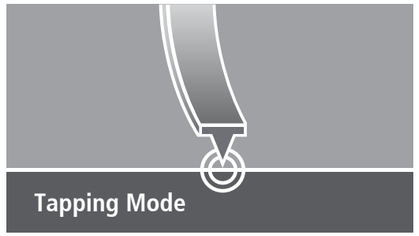
Block copolymer thin film



Sample courtesy: Wonseok Hwang
University of Maryland, College Park
United States of America

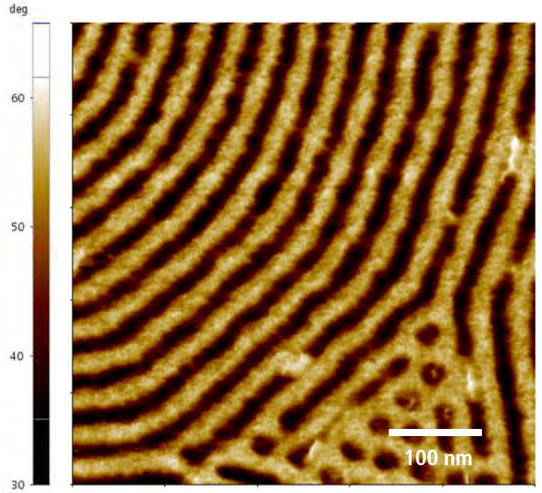
System: Park NX10
Scan Mode: Tapping
Scan Size: 5 μm x 5 μm, 1 μm x 1 μm
Image Resolution: 512 px x 512 px, 512 px x 512 px

Block copolymer II

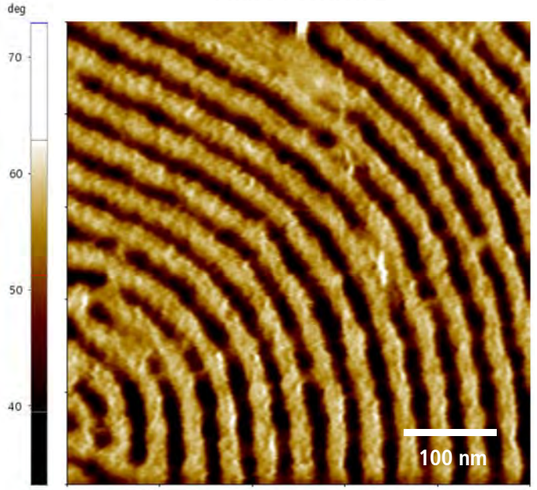


In this imaging mode, the cantilever also oscillates (as in non-contact mode) with the probe coming into intermittent contact with the sample surface. This enables improved imaging capability for certain samples whose surfaces require this type of interaction for optimal characterization (e.g., block copolymers).

Phase Position 1



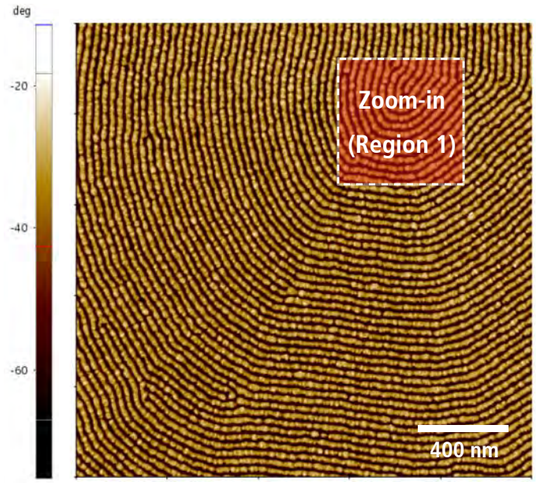
Phase Position 2



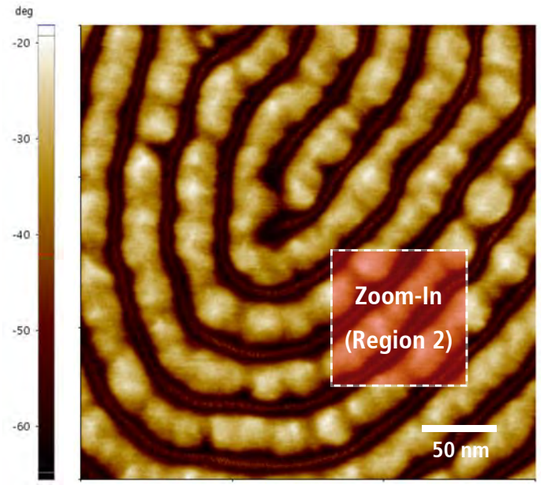
System: Park NX10
Scan Mode: Tapping
Scan Size: 0.5μm × 0.5 μm
Image Resolution: 256 px × 256 px

Block copolymer III

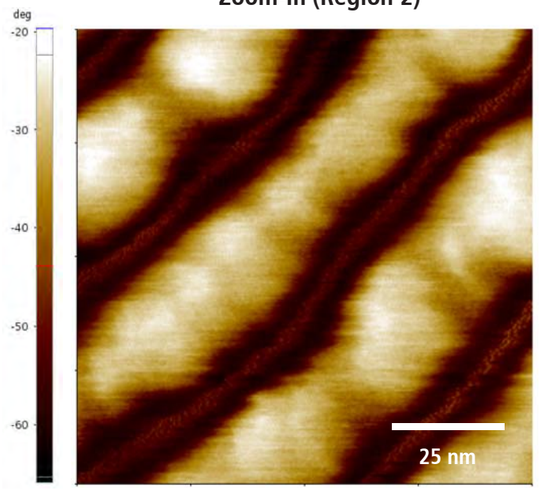
Phase



Zoom-in (Region 1)

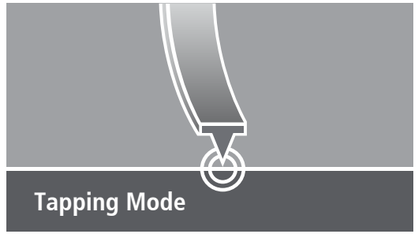


Zoom-In (Region 2)

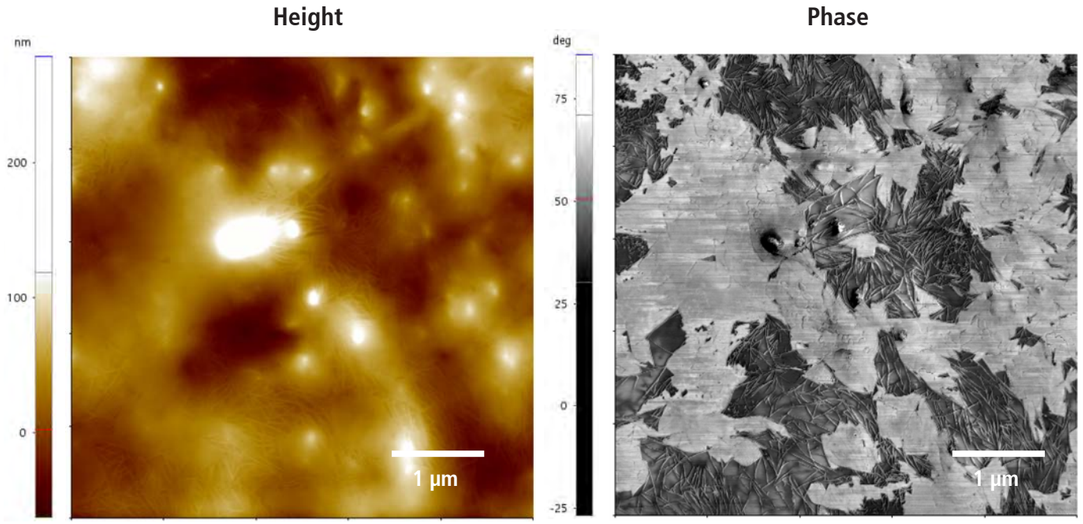


System: Park NX10
Scan Mode: Tapping
Scan Size: 2 μm x 2 μm, 0.3 μm x 0.3 μm, 0.1 μm x 0.1 μm
Image Resolution: 512 px x 512 px , 256 px x 256 px , 256 px x 256 px

Polymer blend with nanofibers



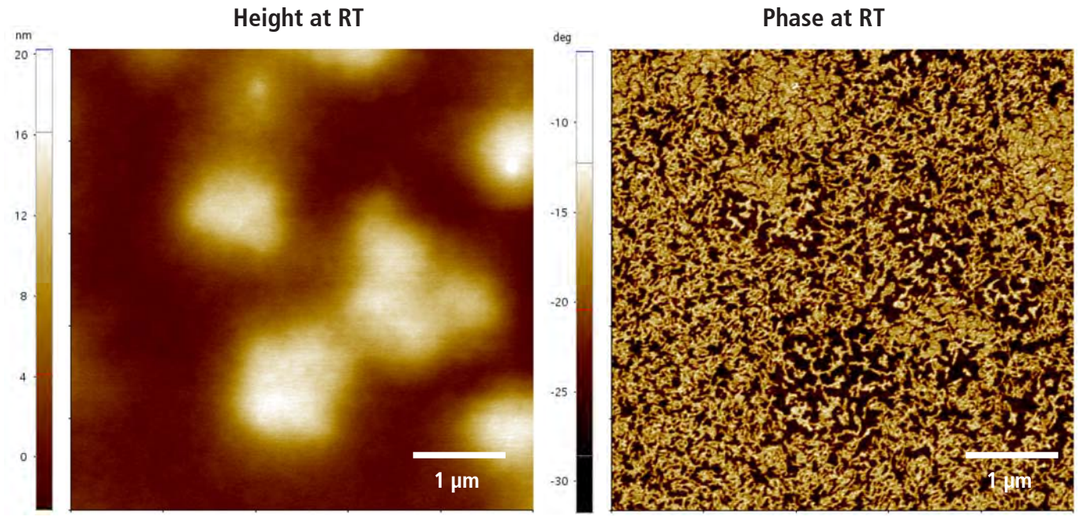
In this imaging mode, the cantilever also oscillates (as in non-contact mode) with the probe coming into intermittent contact with the sample surface. This enables improved imaging capability for certain samples whose surfaces require this type of interaction for optimal characterization (e.g., block copolymers).



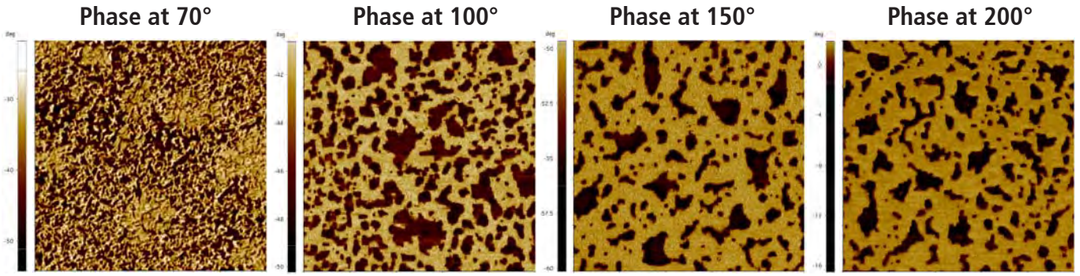
Peak to valley: 342 nm

System: Park NX10
Scan Mode: Tapping
Scan Size: 5 µm x 5 µm
Image Resolution: 512 px x 512 px

Block copolymer phase change by temp.



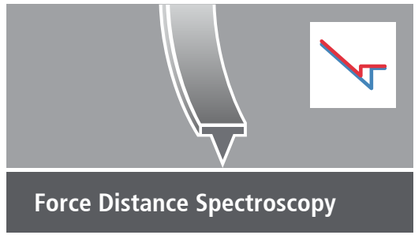
Peak to valley: 22 nm



Phase change by temperature

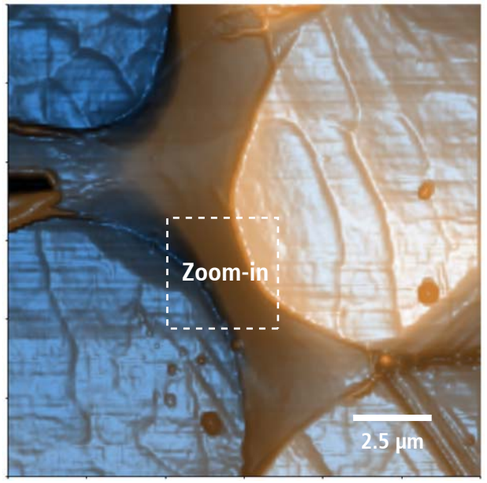
System: Park NX10
Scan Mode: Tapping,TCS2
Scan Size: 5 µm x 5 µm
Image Resolution: 512 px x 256 px

Kevlar fiber



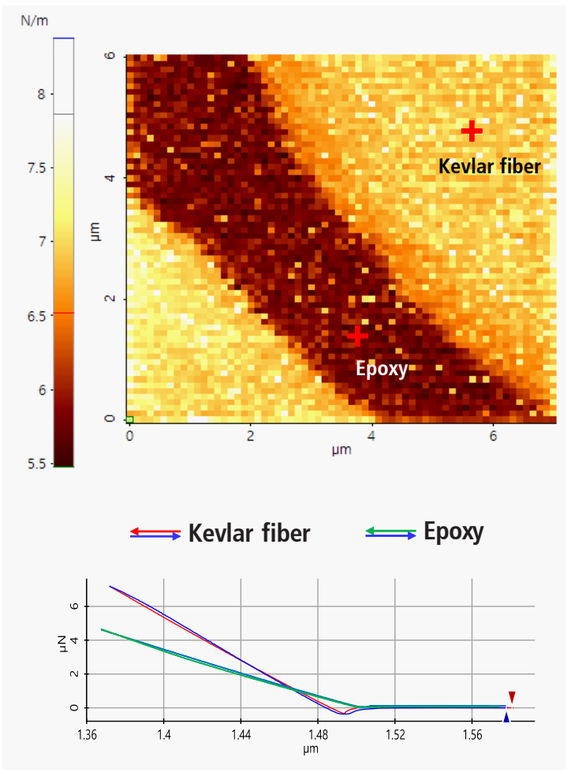
A force-distance curve is acquired by bringing the cantilever tip into contact with the sample surface. The shapes of specific regions of force-distance curves offer insight into different mechanical properties, such as adhesion, Young's modulus, etc.

Height



Peak to valley: 481 nm

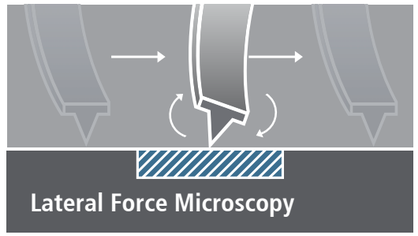
Force-Volume Stiffness



F/D mapping Conditions
Mapping Size: 6 μm x 7 μm
Mapping Points: 64 x 64
F/D Curve Pixels: 1,024
Force Limit: 6 V
Approach Speed: 1 μm/s
Retract Speed: 1 μm/s

System: Park XE7
Scan Mode: Non-contact, F/D mapping
Scan Size: 15 μm × 15 μm
Image Resolution: 512 px ×256 px

Graphene on Cu

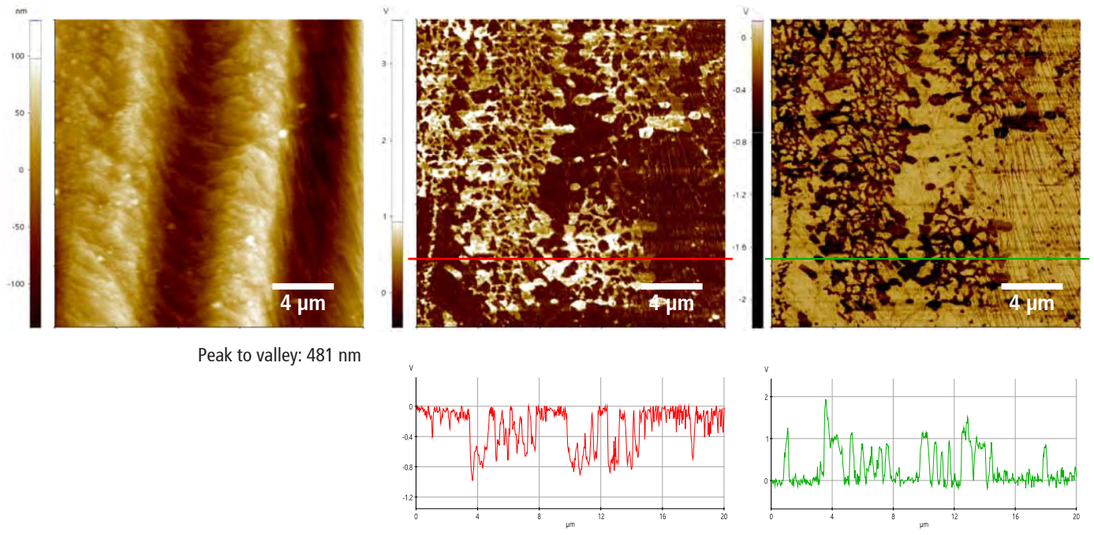


While more traditional AFM techniques focus on vertical deflections of the cantilever to image the surface topography, lateral force microscopy (LFM) instead focuses on torsional deflections as the cantilever twists as the tip is dragged across a sample surface provides useful insight into the frictional force and adhesion properties of the sample.

Height

LFM Forward

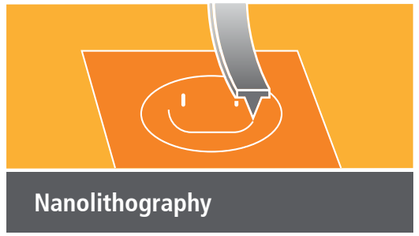
LFM Backward



Peak to valley: 481 nm

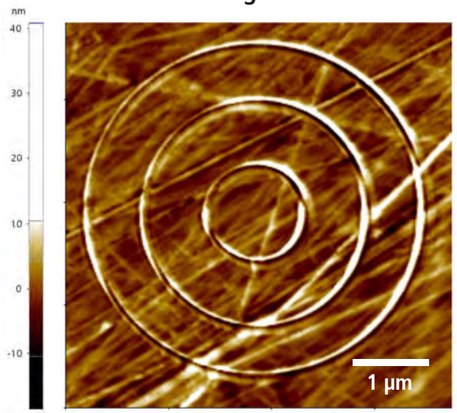
System: Park NX10
Scan Mode: LFM
Scan Size: 20 μm x 20 μm
Image Resolution: 512 px x 512 px

Lithography on compact disk

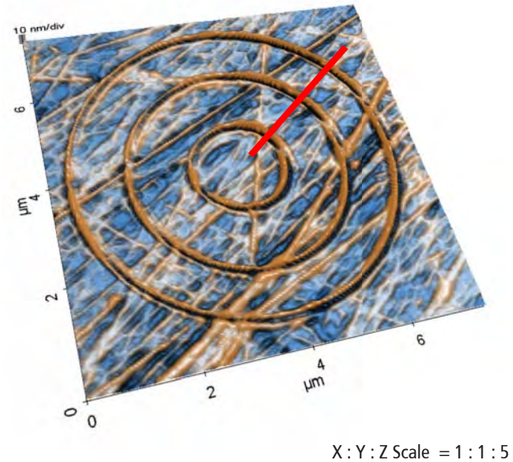


Here, the cantilever is used to intentionally modify the sample surface via mechanical and/or electrical means. To mechanically alter a surface, a specialized, robust cantilever gouges the surface with excessive force. To electrically alter a surface, a cantilever with a high bias is used to oxidize local surface regions.

Height

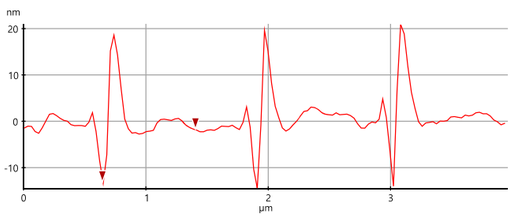


Peak to valley: 59 nm



X : Y : Z Scale = 1 : 1 : 5

Line profile



Cursor	ΔY(nm)
Red	11.421

⊿Y = Lithography depth

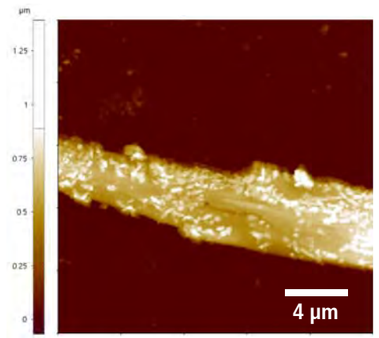
System: Park XE7
Scan Mode: Non-contact, F/D mapping
Scan Size: 15 µm x 15 µm
Image Resolution: 512 px x 256 px

Metallo DNA system with silver(I) inserted

PinPoint™ Conductive Probe AFM

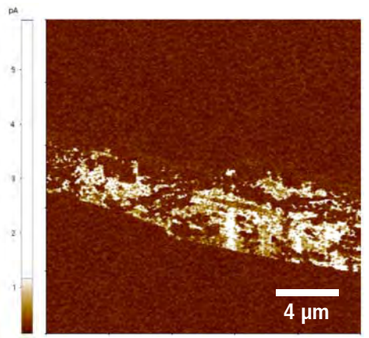
PinPoint™ CD-AFM was developed for well defined electric contact between the tip and the sample. They XY scanner stops while measuring the electric current with contact time controlled by a use. PinPoint™ CD-AFM allows higher spatial resolution, without lateral force, with optimized current measurement over different sample surface.

Height



Peak to valley: 1,462 nm

Current



Current Amplifier:

External Amplified Ultra Low-Noise Conductive AFM with 100 fA ~ 100 pA range

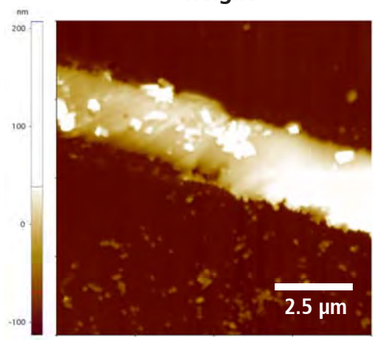
Sample Courtesy: University of Granada
Spain

System: Park NX10
Scan Mode: PinPoint CP-AFM
Scan Size: 20 µm x 20 µm
Image Resolution: 256 px x 256 px
Sample Bias: 10 V

Scanning Kelvin Probe Microscopy

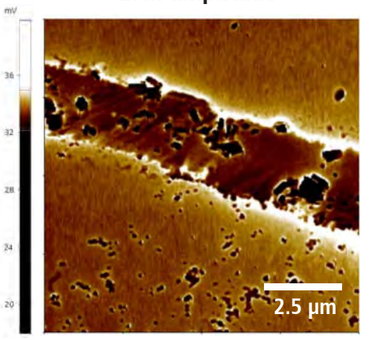
In Scanning Kelvin Probe Microscopy (SKPM), the AFM operates in non-contact mode while a conductive cantilever, oscillated at its fundamental resonant frequency, laterally scans over the sample surface. The resulting electrostatic signal provides information related to surface potential and the capacitance gradient. The topographic data is taken by controlling the force between the tip and the sample.

Height



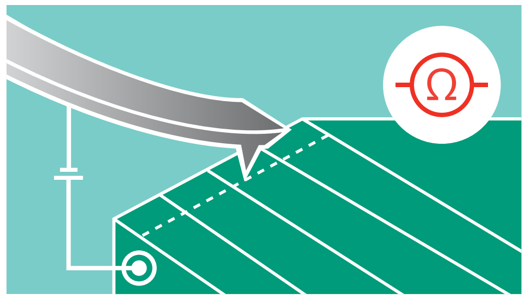
Peak to valley: 319 nm

EFM amplitude



System: Park NX10
Scan Mode: EFM
Scan Size: 10 µm x 10 µm
Sample Bias: 5 V
Image Resolution: 512 px x 512 px

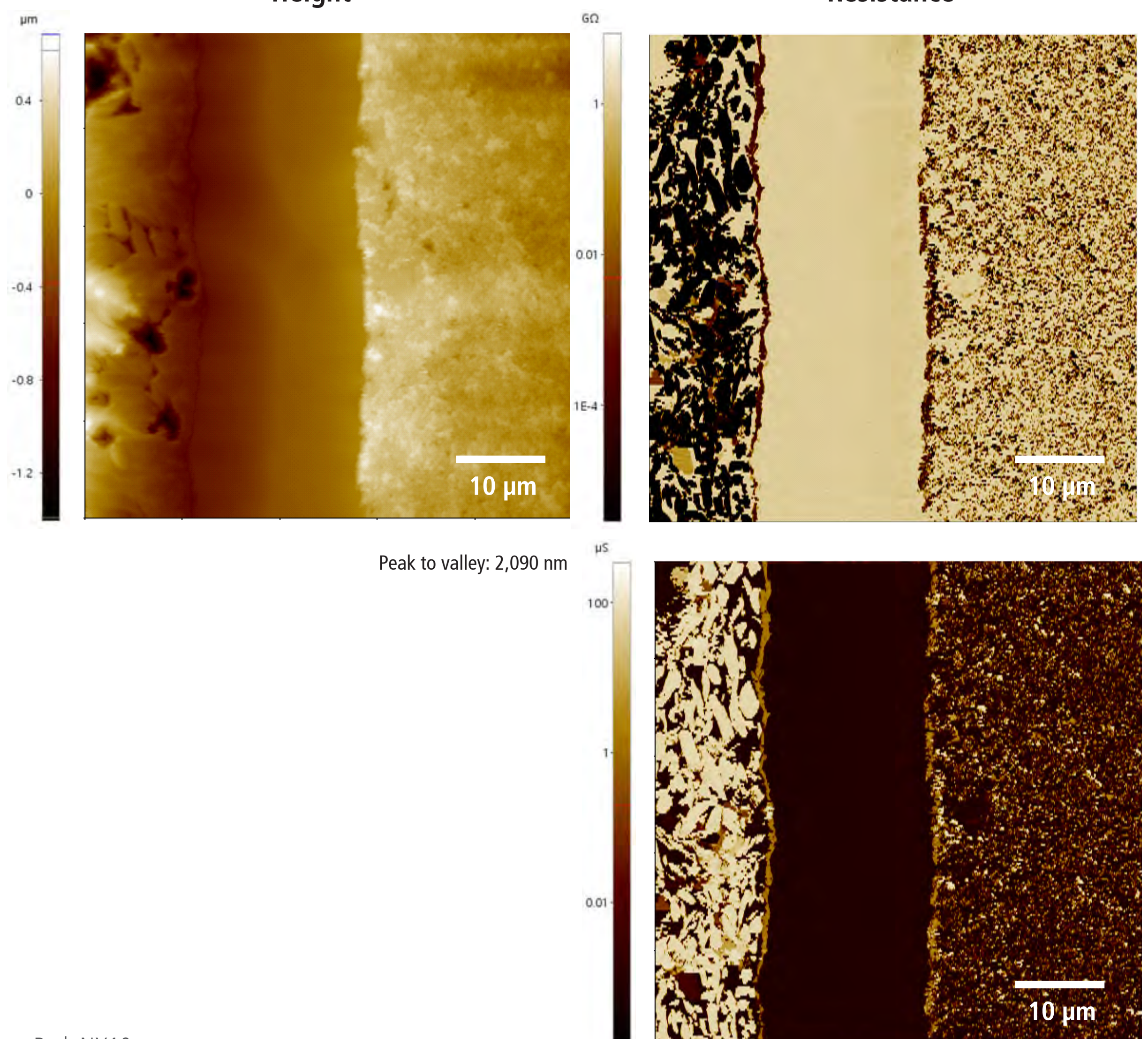
Device failure analysis



Scanning Spreading Resistance Microscopy

Our SSRM mode precisely measures the local resistance over a sample surface by using a conductive AFM tip to scan a small region while applying DC bias.

Height | Resistance

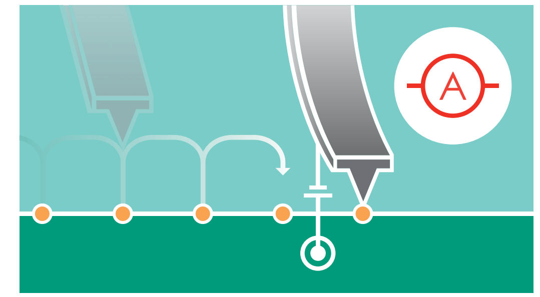


Peak to valley: 2,090 nm

Conductance

System: Park NX10
Scan Mode: SSRM
Scan Size: 50 µm x 50 µm
Image Resolution: 512 px x 256 px
Sample Bias: 0.5 V

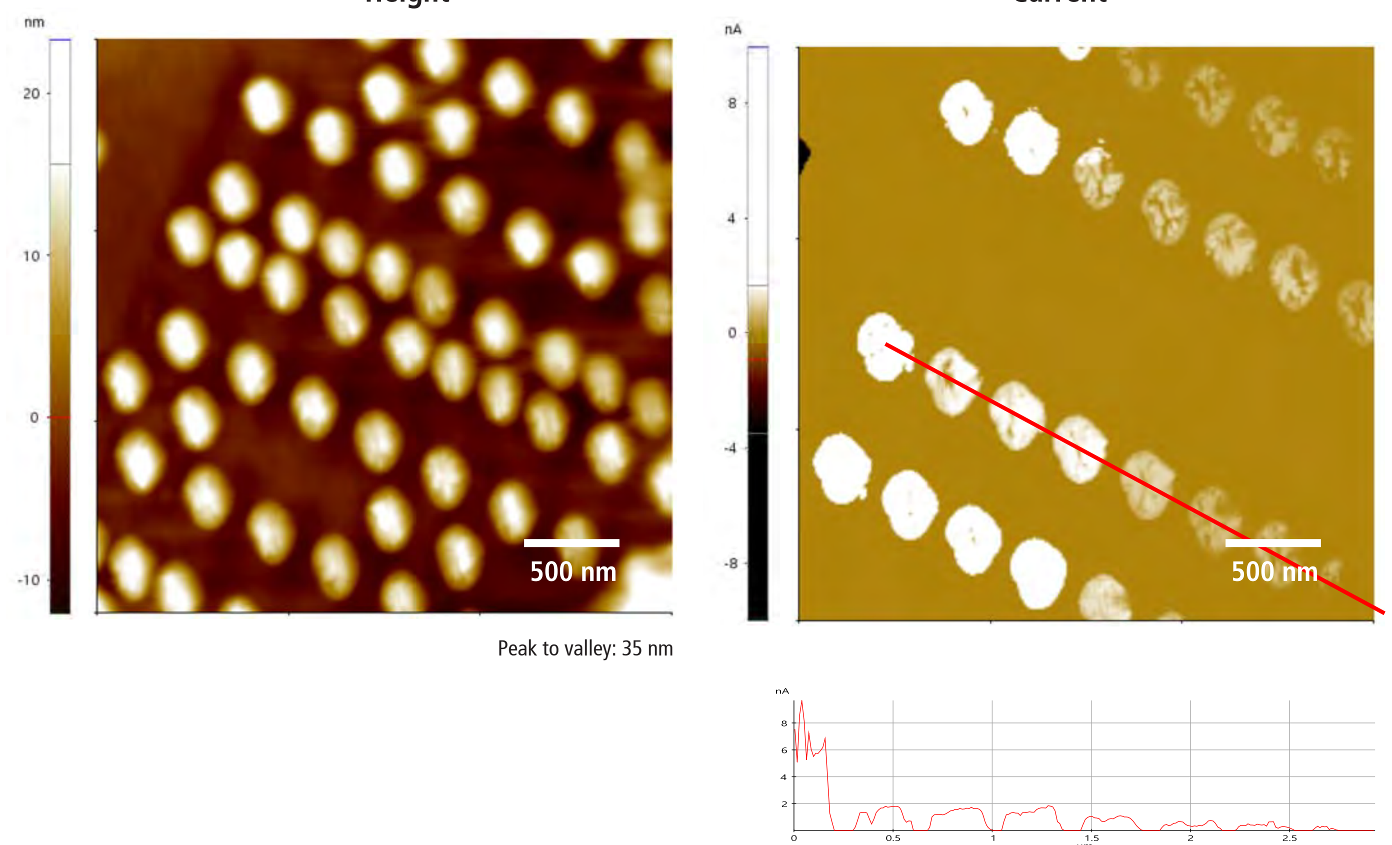
SRAM



PinPoint™ Conductive Probe AFM

PinPoint™ CD-AFM was developed for well defined electric contact between the tip and the sample. They XY scanner stops while measuring the electric current with contact time controlled by a use. PinPoint™ CD-AFM allows higher spatial resolution, without lateral force, with optimized current measurement over different sample surface.

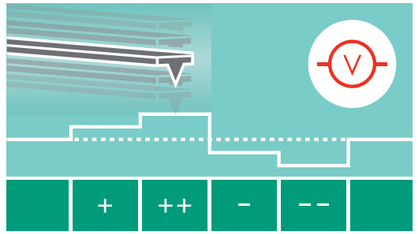
Height | Current



Peak to valley: 35 nm

System: Park NX10
Scan Mode: PinPoint CP-AFM
Scan Size: 3 µm x 3 µm
Image Resolution: 256 px x 256 px
Sample Bias: 0.5 V

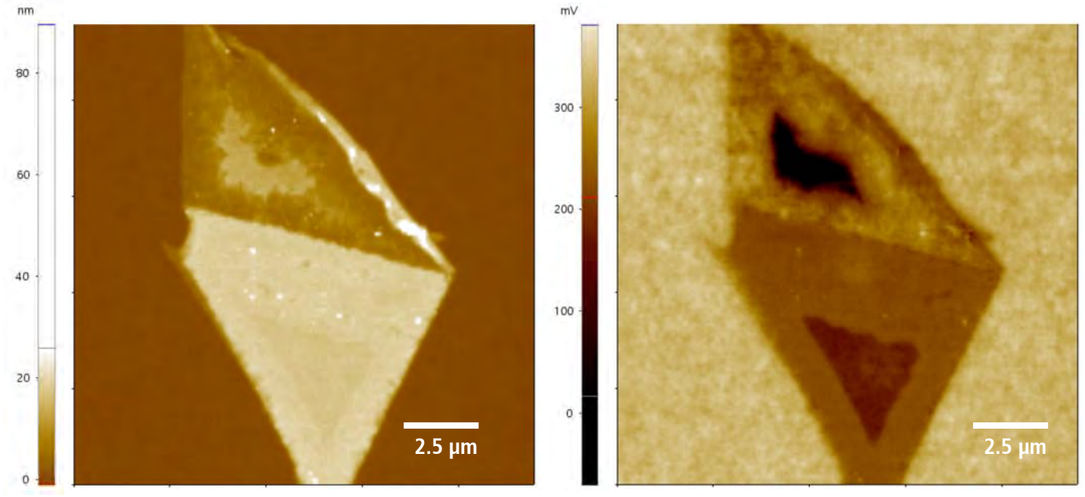
MoS_2



Kelvin Probe Force Microscopy

In Kelvin Probe Force Microscopy (KPFM), the AFM operates in non-contact mode while a conductive cantilever, oscillated at its fundamental resonant frequency, laterally scans over the sample surface. The resulting electrostatic signal provides information related to surface potential and the capacitance gradient. The topographic data is taken by controlling the force between the tip and the sample.

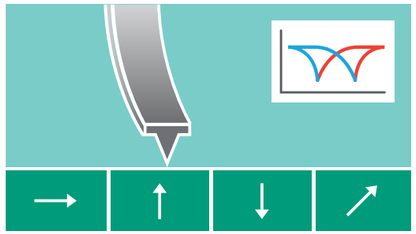
Height **Potential**



Peak to valley: 90 nm

System: Park NX10
Scan Mode: KPFM
Scan Size: 12 µm x 12 µm
Image Resolution: 256 px x 256 px
Sample Bias: 0 V (DC)
Tip Bias: 0.8 V (AC)

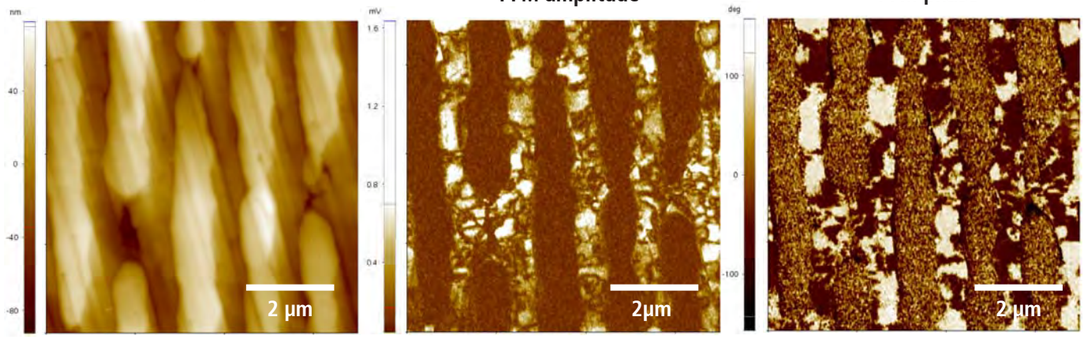
Multi-layer ceramic capacitor



Piezoelectric Force Microscopy

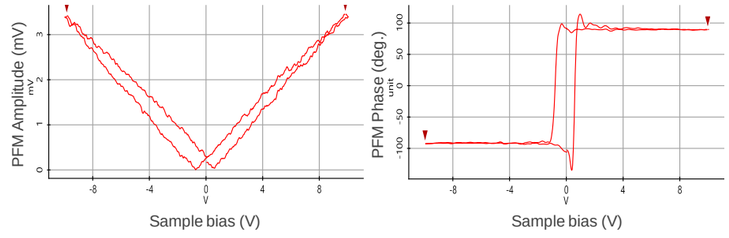
PFM is a scanning probe microscopy technique that utilizes the piezoelectric effect of materials to generate contrast. In PFM, a conductive AFM tip is brought into contact with the surface of the studied ferroelectric or piezoelectric materials, and a pre-set voltage is applied between the sample surface and the AFM tip, establishing an external electric field within the sample. Due to the electrostriction, or "inversed piezoelectric" effects of such ferroelectric or piezoelectric materials, the sample would locally expand or contract according to the electric field.

Height **PFM amplitude** **PFM phase**



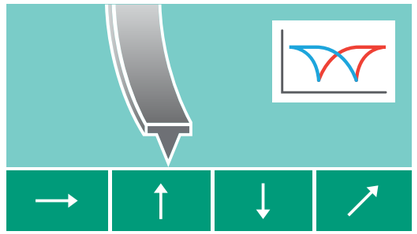
Peak to valley: 170 nm

Piezoelectric response curve



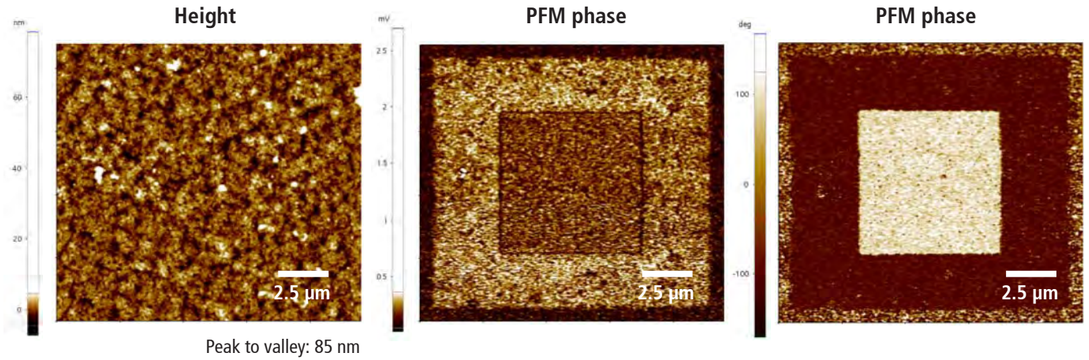
System: Park NX20
Scan Mode: PFM (lateral signal)
Scan Size: 7 µm x 7 µm
Image Resolution: 256 px x 256 px
Sample Bias: 0 V (DC)
Tip Bias: 2 V (AC)

100 nm lead zirconate titanate Film



Piezoelectric Force Microscopy

PFM is a scanning probe microscopy technique that utilizes the piezoelectric effect of materials to generate contrast. In PFM, a conductive AFM tip is brought into contact with the surface of the studied ferroelectric or piezoelectric materials, and a pre-set voltage is applied between the sample surface and the AFM tip, establishing an external electric field within the sample. Due to the electrostriction, or "inversed piezoelectric" effects of such ferroelectric or piezoelectric materials, the sample would locally expand or contract according to the electric field.

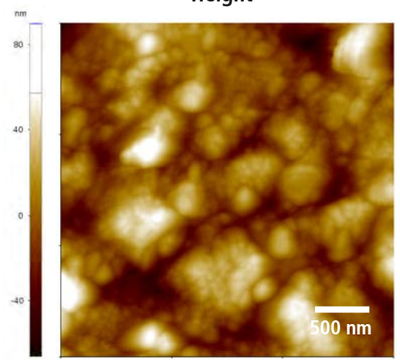


Peak to valley: 85 nm

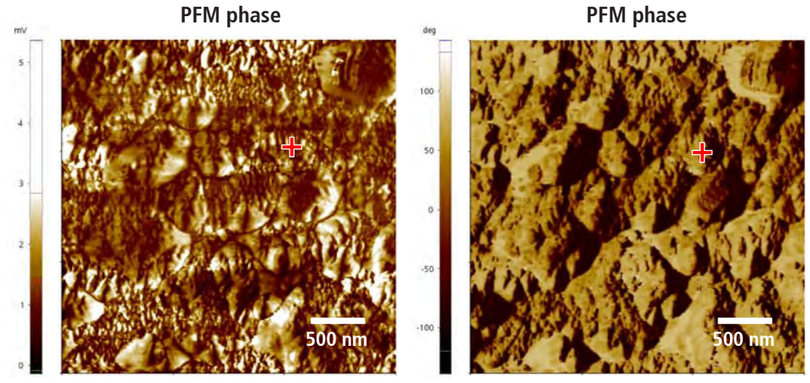
Domain switching
- Sample bias for outer square: -10 V (DC)
- Sample bias for inner square: +10 V (DC)

System: Park NX10
Scan Mode: PFM (vertical signal)
Scan Size: 12 µm x 11 µm
Image Resolution: 256 px x 256 px
Sample Bias: 0 V (DC)
Tip Bias: 1 V (AC)

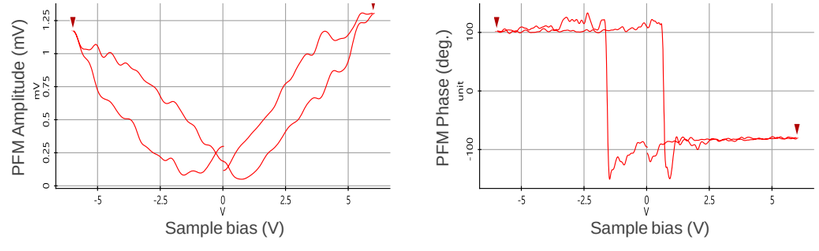
Polyvinylidene fluoride film



Sample Courtesy: Division of Surgery & Interventional Science,
University College London
United Kingdom

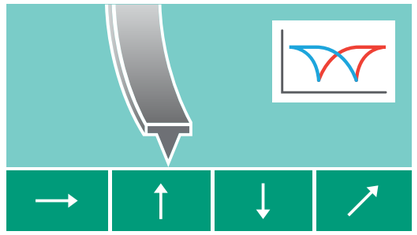


Piezoelectric response curve



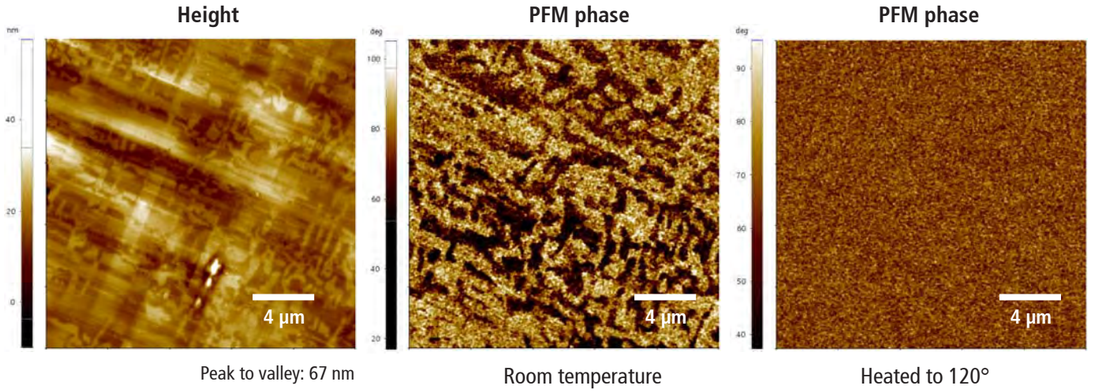
System: Park NX10
Scan Mode: PFM (lateral signal)
Scan Size: 3 µm x 3 µm
Image Resolution: 256 px x 256 px
Sample Bias: 10 V (DC)
Tip Bias: 1 V (AC)

BTO



Piezoelectric Force Microscopy

PFM is a scanning probe microscopy technique that utilizes the piezoelectric effect of materials to generate contrast. In PFM, a conductive AFM tip is brought into contact with the surface of the studied ferroelectric or piezoelectric materials, and a pre-set voltage is applied between the sample surface and the AFM tip, establishing an external electric field within the sample. Due to the electrostriction, or "inversed piezoelectric" effects of such ferroelectric or piezoelectric materials, the sample would locally expand or contract according to the electric field.



Peak to valley: 67 nm

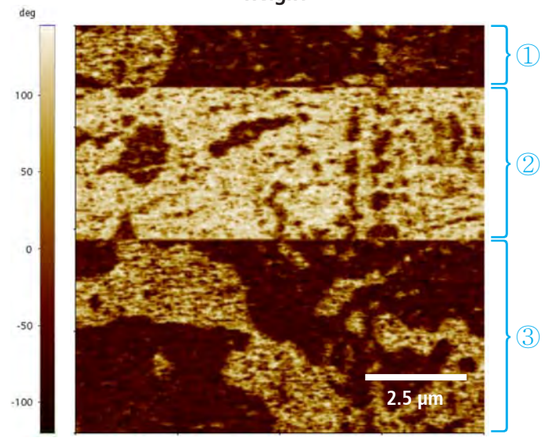
Room temperature

Heated to 120°

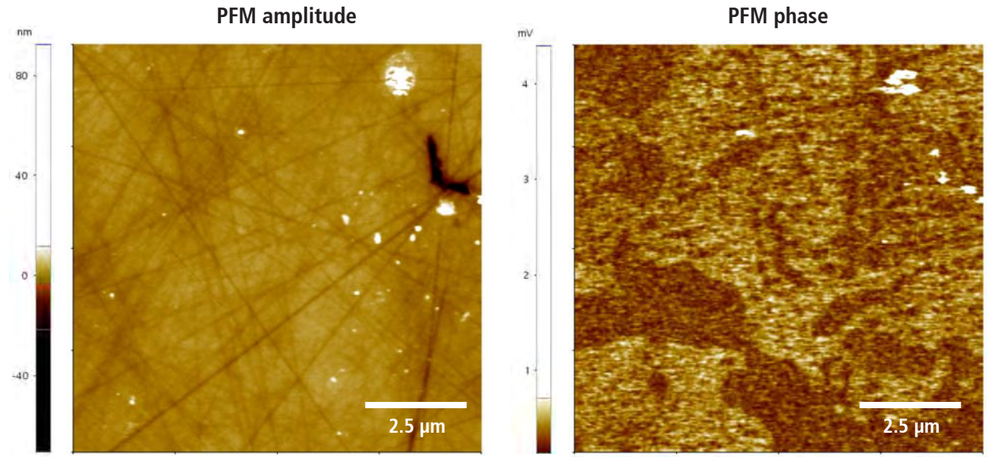
Ferroelectric phase transition at 120°C

System: Park XE7
Scan Mode: PFM (vertical signal)
Scan Size: 20 µm x 20 µm
Image Resolution: 256 px x 256 px
Sample Bias: 0 V (DC)
Tip Bias: 1 V (AC)

Lead magnesium niobate – lead titanate single crystal



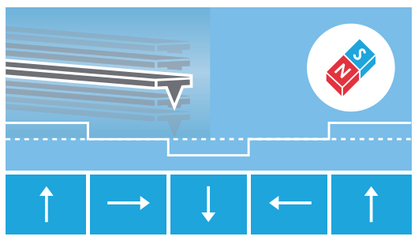
Lock-in reference phase value:
1. +90 deg
2. -90 deg
3. +90 deg



Peak to valley: 162 nm

System: Park NX10
Scan Mode: PFM (vertical signal)
Scan Size: 10µm×10µm
Image Resolution: 256 px x 256 px
Sample Bias: 0 V (DC)
Tip Bias: 2 V (AC)

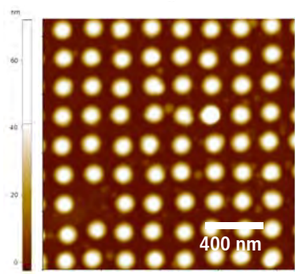
Magnetic patterned array



Magnetic Force Microscopy

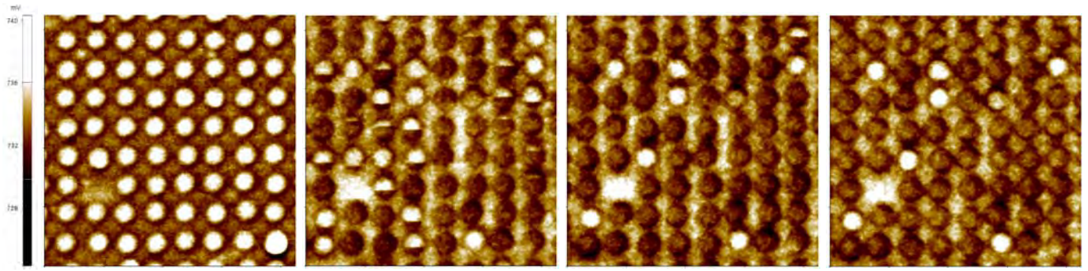
As much as EFM couples a topography scan with a separate scan for electrical properties, Magnetic Force Microscopy (MFM) combines a topography scan with a separate scan for magnetic properties. MFM features a contact AFM scan to obtain the topography, and a scan farther from the surface to probe long-range magnetic force. In this cantilever correspond to regions of magnetization on the sample surface.

Height



Peak to valley: 75 nm

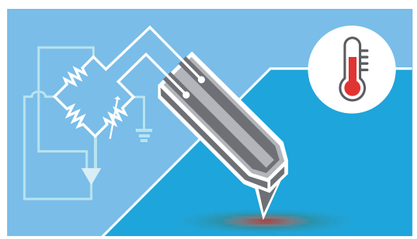
MFM phase shifts by time on the same position



Initial phase | After 4 minutes | After 8 minutes | After 12 minutes

System: Park NX10
Scan Mode: MFM
Scan Size: 1.7 µm x 1.7 µm
Image Resolution: 256 px x 128 px

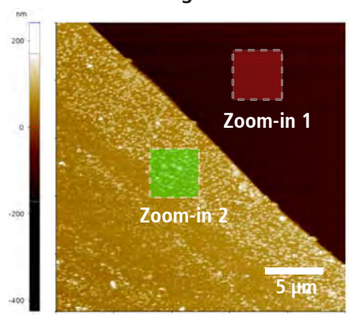
Boron nitride thin film on silicon



Scanning Thermal Microscopy

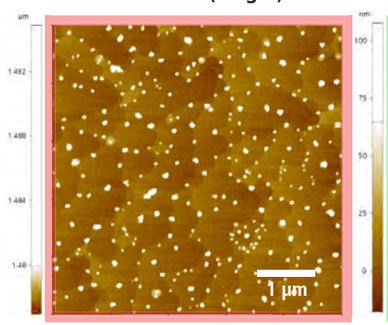
In order to measure the thermal properties of a sample surface, a contact AFM scan is performed using a cantilever with temperature-dependent resistivity. Any changes in the tip resistance during the scan are recorded and correlated into a thermal image of the sample surface.

Height



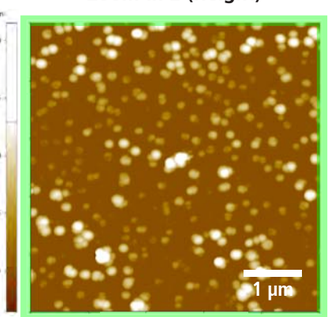
Peak to valley: 667 nm

Zoom-in 1 (Height)



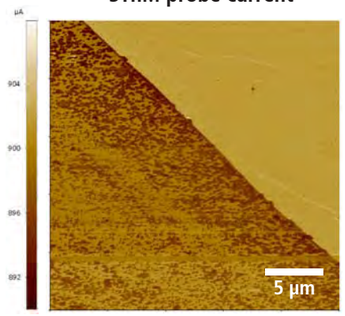
Peak to valley: 18 nm

Zoom-in 2 (Height)

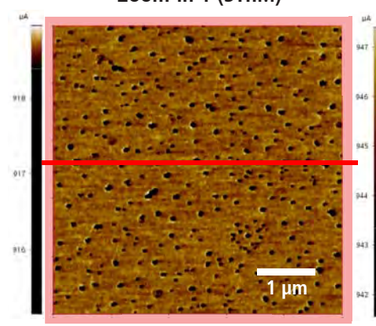


Peak to valley: 125 nm

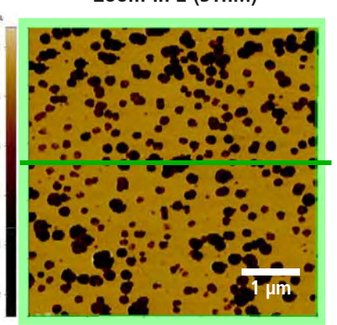
SThM probe current



Zoom-in 1 (SThM)

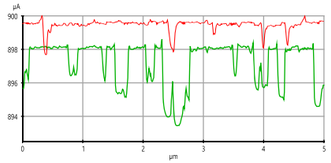


Zoom-in 2 (SThM)



Sample courtesy: Prof. Edwin Teo,
School of Electrical & Electronic Engineering,
Nanyang Technological University,
Singapore

Line profile



System: Park NX10
Scan Mode: SThM
Scan Size: 25 µm x 25 µm, 5 µm x 5 µm
Image Resolution: 256 px x 256 px, 256 px x 256 px

ATOMIC FORCE MICROSCOPY

Park Systems

Dedicated to producing the most accurate and easiest to use AFMs

General AFMs

Park Systems provides a range of popular AFMs for general research and industrial applications. Designed to be extremely versatile while still providing the accuracy and functionality necessary to do high quality work, our line of general AFMs offer researchers and engineers alike the ability to get extremely accurate results quickly and easily.

Applications:

- Biological Science
- Materials Science
- Failure Analysis
- Semiconductor Analysis
- Hard Disk Media Analysis

Park NX10

The world's most accurate easy-to-use research AFM

Park NX20

Power, versatility, ease of use, brilliantly combined for large sample AFM

Park XE15

Capable, adaptable, and affordable -the best value large sample AFM

Park XE7

True research-grade AFM for the practical budget

Park NX-Hivac

The most advanced high vacuum AFM for failure analysis and sensitive materials research

Bio and Chemistry

Allowing users to take highly accurate measurements and complete their work more quickly, these tools can improve efficiency in the workplace and reduce errors, leading to more profitable, more consistent development and productive processes.

Park NX10 SICM

Cutting-edge nanoscale imaging in aqueous environments

Park NX-Bio

Three compelling nanoscale microscopies in one innovative platform

Park NX12

The most versatile AFM platform for your nanoscale microscopy needs

Industrial AFMs

Park Systems is dedicated not just to advancing research, but industry as well. That's why our designers have worked to build a line of the most effective AFMs for FA engineers and industrial applications. Allowing users to take highly accurate measurements and complete their work more quickly, these tools can improve efficiency in the workplace and reduce errors, leading to a more profitable, more consistent development and production process.

Applications:

- Failure Analysis
- Semiconductor Analysis
- Hard Disk Media Analysis

Park NX-HDM

The most innovative AFM for automated defect review and surface roughness measurement

Park NX-PTR

Fully automated AFM for accurate inline metrology of hard disk head sliders

Park NX-Wafer

Low noise, high throughput atomic force profiler with automatic defect review

Park NX-3DM

Innovation and efficiency for 3D metrology

The most accurate and easiest to use Atomic Force Microscope

Park NX10

Better data

Park NX10 produces data you can trust, replicate, and publish at the highest nano resolution. It features the world's only true non-contact AFM that prolongs tip life while preserving your sample, and flexure based independent XY and Z scanner for unparalleled accuracy and resolution.

Better productivity

Powered by our revolutionary operating software **Park SmartScan™**, Park NX10 is capable of quicker, easier setup and more optimal data collection than ever before. Park SmartScan's **auto mode** allows novices to quickly collect high quality nanoscale images with just **single click** of a mouse while its manual mode provides all of the functionality necessary for veterans to **customize** their workflow as needed.

Better research

With more time and better data, you can focus on doing more innovative research. And the Park NX10's wide range of measurement modes and customizable design means it can be easily tailored to the most unique projects.

Park SYSTEMS

Park SYSTEMS

Park NX12

The most versatile atomic force microscope for analytical and electrochemistry

- *Built on proven Park AFM performance*
- *Equipped with inverted optical microscope*

Proven Performance
The Park NX12 is based on the Park NX10, one of the most trusted and widely used AFMs for research. Users can rest assured that they are taking measurements with a cutting-edge tool.

Built for Versatility
Multi-user labs need a versatile microscope to meet a wide range of needs. The Park NX12 was built from the ground up to be a flexible modular platform to allow shared facilities to invest in a single AFM to perform any task.

Competitive Pricing
Early career researchers need to do great work with cost-effective tools. Despite its outstanding pedigree, the Park NX12 is priced affordably—ideal for those on a constrained budget.