

[Spm] Cleaning grating TGT-01

Rostislav V. Lapshin [rlapshin at yahoo.com](mailto:rlapshin@yahoo.com)

Thu Sep 10 01:50:20 EDT 2009

- Previous message: [\[Spm\] Postdoctoral position - ORNL](#)
- Next message: [\[Spm\] low Sum-signal E-scope](#)
- **Messages sorted by:** [\[date \]](#) [\[thread \]](#) [\[subject \]](#) [\[author \]](#)

Hello Christopher, hello Colleagues!

To remove organic impurities, an oxygen RF-plasma (13.56 MHz) can be used. In particular, I am using a machine for plasmachemical treatment of wafers Plasma 600 (Research Institute of Semiconductor Engineering, Russian Federation). Such machines are used in microelectronic processing, for example, for photoresist removal. Instead of oxygen, filtered room air can be used. Process parameters depend on type and degree of impurities.

Typical parameters when using air (RH 50-60%):

- residual pressure in the process chamber 0.5-1 Torr
- current 30-100 uA (corresponds to approx. power 120-400 W)
- anode current of the RF-tetrode 0.4-0.8 A
- treatment time 1-5 minutes

To remove, beside organic, more firm formations - solid particles, oxide films, etc., surface bombardment by Ar ions can be used. I particularly use ion coater IB-3 (Eiko Engineering, Co., Japan). Similar coaters are used frequently in SEM for sputtering thin metal films on nonconducting samples.

Typical parameters of the process using Ar (99.99%):

- residual pressure in the process chamber 0.2 Torr
- glow discharge current 3 mA (accelerating voltage on cathode is equal to about 420 V)
- treatment time 1-3 minutes

When removing impurities, to avoid removal or damage to the structure itself, the process parameters of treating in Ar-plasma should be adjusted. I would recommend to start with short times and small currents (accelerating voltages), gradually increasing them until the required values are found. The operation sequence can be as follows: treat sample; check results, first, with an optical microscope, then with an ACM or SEM; change parameters; treat again and so on.

Hope that helps. Feel free to contact me offline, if necessary.

Best regards,
Rostislav Lapshin

Rostislav V. Lapshin, Ph. D.
Staff Scientist
Solid Nanotechnology Laboratory, Nanoelectronics Department
Institute of Physical Problems named after F. V. Lukin
State Scientific Center of Russian Federation
Zelenograd, Moscow, 124460
Russian Federation

tel (lab): +7 (499) 736-9379, 736-9324
tel (office): +7 (499) 731-9843
fax (office): +7 (499) 731-5592, 731-4656

pri email: [rlapshin at yahoo.com](mailto:rlapshin@yahoo.com)
sec email: [rlapshin at gmail.com](mailto:rlapshin@gmail.com)

web: <http://www.niifp.ru/staff/lapshin/en/>
<http://www.nanoworld.org/homepages/lapshin/>

----- Original Message -----

From: "Chris Honig" <[cdhonig at vt.edu](mailto:cdhonig@vt.edu)>
To: [spm at spmlist.di.com](mailto:spm@spmlist.di.com)
Subject: Cleaning grating TGT-01
Date: Tuesday, September 1, 2009 4:40 AM

To whom it may concern,

We have a TGT-01 reverse tip grating of Si spikes that are about 750nm high, spaced on a 2-D grid at about 3 um separation. The grating has gradually accumulated dust and other crud over many years of use and it's ability to image spheres on cantilevers is steadily getting worse. Do you have a good procedure for cleaning this grating?

Thanks,
Chris Honig.

Christopher Honig

Ducker Group
Department of Chemical Engineering
141 Randolph Hall
Virginia Tech
Blacksburg VA 24061 USA

Email: [cdhonig at vt.edu](mailto:cdhonig@vt.edu)

-
- Previous message: [\[Spm\] Postdoctoral position - ORNL](#)
 - Next message: [\[Spm\] low Sum-signal E-scope](#)
 - **Messages sorted by:** [\[date \]](#) [\[thread \]](#) [\[subject \]](#) [\[author \]](#)

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[Spm] image comparison and subtraction

Rostislav V. Lapshin [rlapshin at yahoo.com](mailto:rlapshin@yahoo.com)

Thu Apr 9 01:21:37 EDT 2009

- Previous message: [\[Spm\] AFM Calibration Forum, and Image Contest](#)
 - Next message: [\[Spm\] RE:Water Quality](#)
 - **Messages sorted by:** [\[date \]](#) [\[thread \]](#) [\[subject \]](#) [\[author \]](#)
-

Dear Iain,

You can use the method of counter-scanned images. The method allows correcting drift in SPM images (direct and counter) followed by matching the corrected images in a coincidence point (the common point for both images). Usually, after matching, the corrected images are averaged within the overlap area but you can subtract one image from another. Both linear and nonlinear drift correction approaches may be applied, depending on the accuracy required.

See details in the following paper "Automatic drift elimination in probe microscope images based on techniques of counter-scanning and topography feature recognition" (Measurement Science and Technology, vol. 18, iss. 3, pp. 907-927, 2007). The paper is available online at <http://www.nanoworld.org/homepages/lapshin/publications.htm#automatic2007>

Hope that will help. Feel free to contact me offline with any questions.

Best regards,
Rostislav Lapshin

Rostislav V. Lapshin, Ph. D.
Staff Scientist
Solid Nanotechnology Laboratory, Nanoelectronics Department
Institute of Physical Problems named after F. V. Lukin
State Scientific Center of Russian Federation
Zelenograd, Moscow, 124460
Russian Federation

tel (lab): +7 (499) 736-9379
tel (office): +7 (499) 731-9843
fax (office): +7 (499) 731-5592

pri email: [rlapshin at yahoo.com](mailto:rlapshin@yahoo.com)
sec email: [rlapshin at gmail.com](mailto:rlapshin@gmail.com)

web: <http://www.nanoworld.org/homepages/lapshin/>
<http://www.niifp.ru/staff/lapshin/en/>

```
>From: Iain McNab <imcnab at chem.utoronto.ca>
>To: spm at spmlist.di.com
>Subject: [Spm] image comparison and subtraction
>Date: Tue, 31 Mar 2009 19:31:59 -0400 (EDT)
>
>Dear All,
>
>Could someone please recommend to me the best
>(and simplest) way of doing the following:
>
>(1) Comparing two images (that have drift between
>them) to find the best possible overlap (I'm guessing
>a correlation program of some sort).
>(2) Then trimming both images so they show the same
>area.
>(3) Subtracting the resulting images from one another.
>
>I know I can do this "visually" in photoshop etc., but I'm
>hoping there is a more precise solution on offer. At
>present I have the images as both bitmaps, and also in
>RHK's native format, *.SM4.
>
>All help will be most gratefully received, thank you for
>your time.
>
>Best regards.... Iain McNab
>
>URL: http://www.utoronto.ca/jpolanyi
>URL: http://www.phys.ncl.ac.uk/research/atomic/irm/mcnabgroup.htm
>*****
>Iain R. McNab
>Department of Chemistry
>University of Toronto
>80 St. George Street
>Toronto, Ontario, M5S 3H6
>Canada
>
>Tel. No.: (416) 978-3625
>Fax No.: (416) 978-7580
>E-mail: imcnab at chem.utoronto.ca
>*****
```

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- Previous message: [\[Spm\] AFM Calibration Forum, and Image Contest](#)
 - Next message: [\[Spm\] RE:Water Quality](#)
 - **Messages sorted by:** [\[date \]](#) [\[thread \]](#) [\[subject \]](#) [\[author \]](#)
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[Spm] SPM atomic imaging

Rostislav Lapshin [rlapshin at yahoo.com](mailto:rlapshin@yahoo.com)

Fri Mar 21 01:58:06 EST 2008

- Previous message: [\[Spm\] DI 3000 Piezo](#)
- Next message: [\[Spm\] Four point probe accessory module for Dimension AFMs](#)
- **Messages sorted by:** [\[date \]](#) [\[thread \]](#) [\[subject \]](#) [\[author \]](#)

Dear stone,

Professor Vladimir K. Nevolin and his research team from the Moscow Institute of Electronic Technology obtain atomic resolution of CNTs with STM in ambient conditions. Take a look at <http://nanotube.ru/galereaperexod/nanotub.htm>

Best regards,

Rostislav Lapshin

Rostislav V. Lapshin, Ph. D.
Staff Scientist
Solid Nanotechnology Laboratory
Institute of Physical Problems named after F. V. Lukin
State Scientific Center of Russian Federation
Zelenograd, Moscow, 124460
Russian Federation

tel (lab): +7 (495) 536-9379, 536-9308, 536-9324

tel (office): +7 (495) 531-9843

fax (office): +7 (495) 531-5592, 531-4656

pri email: [rlapshin at yahoo.com](mailto:rlapshin@yahoo.com)

sec email: [rlapshin at gmail.com](mailto:rlapshin@gmail.com)

web: <http://www.nanoworld.org/homepages/lapshin/>

>From: "s stone" <[stoneliao2000 at yahoo.com](mailto:stoneliao2000@yahoo.com)>

>To: [spm at spmlist.di.com](mailto:spm@spmlist.di.com)

>Date: Thu, 13 Mar 2008 19:03:34 -0700 (PDT)

>Subject: [Spm] SPM atomic imaging

>

>Dear colleagues;

>We need to image atomic resolution of the surface of our cnt samples

>with afm or stm, is this possible? any suggestions?

if anyone can help

>us to image, we can send samples to.

>thanks a lot

>

>stone

-
- Previous message: [\[Spm\] DI 3000 Piezo](#)
 - Next message: [\[Spm\] Four point probe accessory module for Dimension AFMs](#)
 - **Messages sorted by:** [\[date \]](#) [\[thread \]](#) [\[subject \]](#) [\[author \]](#)

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[Spm] blunt pyramidal tips

Rostislav Lapshin [rlapshin at yahoo.com](mailto:rlapshin@yahoo.com)

Mon Aug 4 09:06:04 EDT 2008

- Previous message: [\[Spm\] lateral signal fluctuation](#)
- Next message: [\[Spm\] blunt pyramidal tips](#)
- **Messages sorted by:** [\[date \]](#) [\[thread \]](#) [\[subject \]](#) [\[author \]](#)

Dear Valeria Cassina,

You can take a sharp probe and blunt it as necessary by scanning a hard surface. We had to deposit a single particle of colloidal gold 50-100 nm in diameter on the probe top. To do so, we had to prepare a plane area on top of the probe of size comparable with the size of the particle.

By scanning in contact a polished surface of a silicon wafer with a probe of 10 nm radius, it is fairly easy to obtain an area of 60-150 nm in diameter using a test structure TGT01 or TGG01 for size control. The size of the ground off area depends on the applied force and the length passed.

Beside you get a well defined area of proper size, you take still another advantage of this approach. While measuring, if you press a cell with the same force that was applied during the blunting, you will always contact the cell surface exactly with the fabricated area, not any other part of a bought blunt probe.

Hope that helps. Feel free to contact me offline, if necessary.

Best regards,

Rostislav Lapshin

Rostislav V. Lapshin, Ph. D.
Staff Scientist
Solid Nanotechnology Laboratory
Institute of Physical Problems named after F. V. Lukin
State Scientific Center of Russian Federation
Zelenograd, Moscow, 124460
Russian Federation

tel (lab): +7 (495) 536-9379, 536-9308, 536-9324

tel (office): +7 (495) 531-9843

fax (office): +7 (495) 531-5592, 531-4656

pri email: [rlapshin at yahoo.com](mailto:rlapshin@yahoo.com)

sec email: [rlapshin at gmail.com](mailto:rlapshin@gmail.com)

web: <http://www.nanoworld.org/homepages/lapshin/>

>From: [valeria.cassina at unimib.it](mailto:valeria.cassina@unimib.it)

>To: [spm at spmlist.di.com](mailto:spm@spmlist.di.com)

>Date: Fri, 25 Jul 2008 17:42:28 +0200

>Subject: [Spm] blunt pyramidal tips

>

>Dear Colleagues,

>I'm looking for blunt pyramidal tips for cell
elasticity measurements,

>can you suggest me where to buy it?

>

>thank you

>Valeria

>_____

>

>Dott. Valeria Cassina

>

>Dipartimento di Medicina Sperimentale

>Facolta' di Medicina e Chirurgia

>Universita' di Milano - Bicocca

>Via Cadore 48

>20052 Monza (Milano)

>Italy

>

>Tel: +39-02-6448 8243

>Fax: +39-02-6448 8068

>E-mail: [valeria.cassina at unimib.it](mailto:valeria.cassina@unimib.it)

-
- Previous message: [\[Spm\] lateral signal fluctuation](#)
 - Next message: [\[Spm\] blunt pyramidal tips](#)
 - **Messages sorted by:** [\[date \]](#) [\[thread \]](#) [\[subject \]](#) [\[author \]](#)

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[Spm] drift elimination method

Rostislav Lapshin [rlapshin at yahoo.com](mailto:rlapshin@yahoo.com)

Thu Feb 15 03:25:28 EST 2007

- Previous message: [\[Spm\] RE: Spm Digest, Vol 31, Issue 8; estimation of tip penetration](#)
 - Next message: [\[Spm\] Abstract deadline extended for Seeing at the Nanoscale V](#)
 - **Messages sorted by:** [\[date \]](#) [\[thread \]](#) [\[subject \]](#) [\[author \]](#)
-

Dear Colleagues,

Drift elimination in SPM was much discussed in the maillist. I would like those interested in the problem to pay attention to a simple but effective method based on counter-scanning. Being used together with topography feature recognition, the method is fully automatic. If no suitable recognition software is available, the method may be used as semiautomatic. The method suggested is easy to embed in feature-oriented scanning (an active scanning approach which uses surface features as reference points).

Detailed description of the method is to be found in my paper "Automatic drift elimination in probe microscope images based on techniques of counter-scanning and topography feature recognition" recently published in Measurement Science and Technology (vol. 18, iss. 3, pp. 907-927, 2007). So far the paper is freely available at <http://stacks.iop.org/MST/18/907>.

Thank you for your attention.

Best regards,

Rostislav V. Lapshin

Rostislav V. Lapshin, Ph. D.
Staff Scientist
Solid Nanotechnology Laboratory
Institute of Physical Problems
Zelenograd, Moscow, 124460
Russian Federation

tel: +7 (495) 536-9379

fax: +7 (495) 531-5592

pri email: [rlapshin at yahoo.com](mailto:rlapshin@yahoo.com)

sec email: [rlapshin at gmail.com](mailto:rlapshin@gmail.com)

web: <http://www.nanoworld.org/homepages/lapshin/>

- Previous message: [\[Spm\] RE: Spm Digest, Vol 31, Issue 8; estimation of tip penetration](#)
 - Next message: [\[Spm\] Abstract deadline extended for Seeing at the Nanoscale V](#)
 - **Messages sorted by:** [\[date \]](#) [\[thread \]](#) [\[subject \]](#) [\[author \]](#)
-

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[Spm] Finding specific micron sized features using an AFM

Rostislav Lapshin [rlapshin at yahoo.com](mailto:rlapshin@yahoo.com)

Tue Jun 28 12:27:04 EDT 2005

- Previous message: [AW: AW: \[a\] \[Spm\] Trouble of tapping engage in fluid.](#)
 - Next message: [\[Spm\] Non-linear friction data](#)
 - **Messages sorted by:** [\[date \]](#) [\[thread \]](#) [\[subject \]](#) [\[author \]](#)
-

Dear Jeffrey Werbin,

If your feature making process may be localized within some area (an operational zone) inside a navigation structure like that described in paper "Feature-oriented scanning methodology for probe microscopy and nanotechnology" (Nanotechnology, vol.15, no.9, pp.1135-1151, 2004), you can automatically find your local modifications by following the approach suggested in that paper. The navigation structure mentioned represents a system of feature chains converging into operational zone. All that needs to be done is to approach the SPM probe to any location within the bounds of the navigation structure and then set the direction toward its center, approximately. In some cases, this technique may require a coarse XY positioner ("walker" type positioners are preferable here). See details in the paper.

Email me off-line if you have any questions.

Best regards,

Rostislav Lapshin

Rostislav V. Lapshin, Ph. D.
Staff Scientist
Solid Nanotechnology Laboratory
Institute of Physical Problems
Zelenograd, Moscow, 124460
Russia

tel (lab): +7 (095) 536-9379

email: [rlapshin at yahoo.com](mailto:rlapshin@yahoo.com)

web: <http://www.nanoworld.org/homepages/lapshin/>

-----Original Message-----

From: JEFFREY WERBIN

To: [spm at spmlist.di.com](mailto:spm@spmlist.di.com)

Sent: Monday, June 20, 2005 4:16 PM

Subject: Finding specific micron sized features using an AFM

My problem is one of registration.

I can make features that are around a micron in diameter in a serial fashion. This has limited the number of these feature that I can make in a reasonable period of time. When I put my surfaces into the AFM I often have trouble finding them.

I have taken to using photoetched coverslips, these have been helpful but not quite ideal.

Has anyone come up with any other solutions to this sort of registration problem?

Any suggestions or advice would be greatly appreciated.

Jeff

-
- Previous message: [AW: AW: \[a\] \[Spm\] Trouble of tapping engage in fluid.](#)
 - Next message: [\[Spm\] Non-linear friction data](#)
 - **Messages sorted by:** [\[date \]](#) [\[thread \]](#) [\[subject \]](#) [\[author \]](#)
-

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SPM Digest for Monday, September 13, 2004

Today's Topics:

- 1) Jim Logajan 2nd RFD: sci.techniques.microscopy.scanning-probe
- 2) Rostislav Lapshin Re: molecular ordering and compactness
- 3) Mary McKeown-Christi 2005 SPM Calendar Contest
- 4) Jean Jarvaise Re: diamond nanoindenter cleaning

Submissions: spm@di.com
Archive Search: <http://spm.di.com/query.asp>
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If this fails and the issue is fairly recent, try sending this message
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To contact a human, send a message to majordomo-owner@di.com

Subject: [Re: molecular ordering and compactness](#)

From: Rostislav Lapshin <rlapshin@yahoo.com>

Date: 13 Sep 2004 06:46:46

Message-ID: <#2>

[\[Next\]](#) [\[Prev\]](#) [\[Top\]](#) [\[Post Reply\]](#) [\[Bibliography\]](#)

Dear Dr. Oncins,

To solve your problem, I would suggest a feature-oriented scanning (FOS) approach. Although it may be applied to any surface type (ordered, quasiordered, disordered), measurement accuracy is highest on closely packed ordered surfaces. While FOS, feature statistics (distance between features, square of feature basement, diameter of feature basement, feature height/depth, feature volume, compactness, and density of features) are gathered automatically. A ball model of the surface may be build also by using FOS data. There are a lot of other advantages of the method.

For details, see my recently published article "Feature-oriented scanning methodology for probe microscopy and nanotechnology" (Nanotechnology, vol.15, iss.9, pp.1135-1151, 2004) available at <http://stacks.iop.org/0957-4484/15/1135> (still free of charge).

Feel free to contact me off-line, if necessary.

Best regards,

Rostislav Lapshin

Rostislav V. LAPSHIN, Ph. D.
Staff Scientist
Solid Nanotechnology Laboratory
Institute of Physical Problems
Zelenograd, Moscow, 124460
Russia

tel: +7 (095) 536-9379

fax: +7 (095) 531-5592

email: rlapshin@yahoo.com

web: <http://www.nanoworld.org/homepages/lapshin/>

>Date: Thu, 2 Sep 2004 20:39:16
>From: Gerard Oncins <gerard@megazero.sct.ub.es>
>Subject: molecular ordering and compactness
>
>Dear SPMers,
>
>does anyone knows which is the most suitable
>technique to study the
>ordering and compactness of an organic monolayer?
>(area per molecule
>should be calculated).
>Any ideas or references would be really helpful.
>
>Thanks in advance.
>
>Gerard Oncins
>Laboratory of Electrochemistry and Materials
>University of Barcelona
>Scientific-Technical Services
><http://www.qf.ub.es/a2/nano/web/principal.html>
>+ 34 934 021 398 (fax)
>+ 34 934 021 349
>+ 34 934 021 352

SPM Digest for Tuesday, October 26, 2004

Today's Topics:

- 1) Yang Gan Silica particles with ultra-smooth surface
- 2) Rostislav Lapshin Re: noise removal & contrast enhancement by image
- 3) Ijeoma Nnebe RE: thermal probes
- 4) Peter Lombrozo Fwd: New SPM List Server
- 5) Peter Lombrozo FW: Test of new SPM Mailing List

Submissions: spm@di.com
Archive Search: <http://spm.di.com/query.asp>
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To unsubscribe, send this message to majordomo@di.com
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get spm-digest digest/YYYY/MM/YYYYMMDD.txt
If this fails and the issue is fairly recent, try sending this message
get spm-digest digest/YYYYMMDD.txt

To contact a human, send a message to majordomo-owner@di.com

Subject: [Re: noise removal & contrast enhancement by image averaging software](#)

From: Rostislav Lapshin <rlapshin@yahoo.com>
Date: 24 Oct 2004 22:33:57
Message-ID: <#2>
[\[Next\]](#) [\[Prev\]](#) [\[Top\]](#) [\[Post Reply\]](#) [\[Bibliography\]](#)

Dear Ignacio,

Feature-oriented scanning (FOS) approach is exactly intended for topography and spectroscopy data averaging. Since drift of a microscope probe relative to the sample surface is eliminated during such scanning, number of averagings is principally unlimited. In practice, however, number of averagings is mainly restricted by a long-term stability of the investigated surface, experimental environment, and the probe microscope itself. There are a lot of other advantages of the FOS method.

You can find all details in the recently published article "Feature-oriented scanning methodology for probe microscopy and nanotechnology" (Nanotechnology, vol.15, no.9, pp.1135-1151, 2004) available at <http://stacks.iop.org/0957-4484/15/1135>.

Feel free to contact me off-line, if you have any questions.

Best regards,

Rostislav Lapshin

Rostislav V. Lapshin, Ph. D.
Staff Scientist
Solid Nanotechnology Laboratory
Institute of Physical Problems
Zelenograd, Moscow, 124460
Russia

tel: +7 (095) 536-9379
fax: +7 (095) 531-5592
email: rlapshin@yahoo.com
web: <http://www.nanoworld.org/homepages/lapshin/>

>Date: Wed, 20 Oct 2004 17:12:32 +0200
>From: Ignacio Casuso <icasuso@pcb.ub.es>
>Subject: Noise removal & contrast enhacement by image averaging Software
>Message-ID: <#2>

>
>Hi,
>
>I=B4m interested in finding software to perform averaging of AFM images.
>
>Any comments on experiences using image averaging will also be welcome.
>
>Thanks 2 all
>
>Ignacio
>
>Ignacio Casuso-P=Elramo
>Laboratory of NanoBioEngineering
>Barcelona Science Park
>C/Josep Samitier 1-5
>08028-Barcelona
>Spain
>Email: icasuso@pcb.ub.es
>Web: www.pcb.ub.es/nanobiolab
>Tel&Fax: +34-93 4037181
