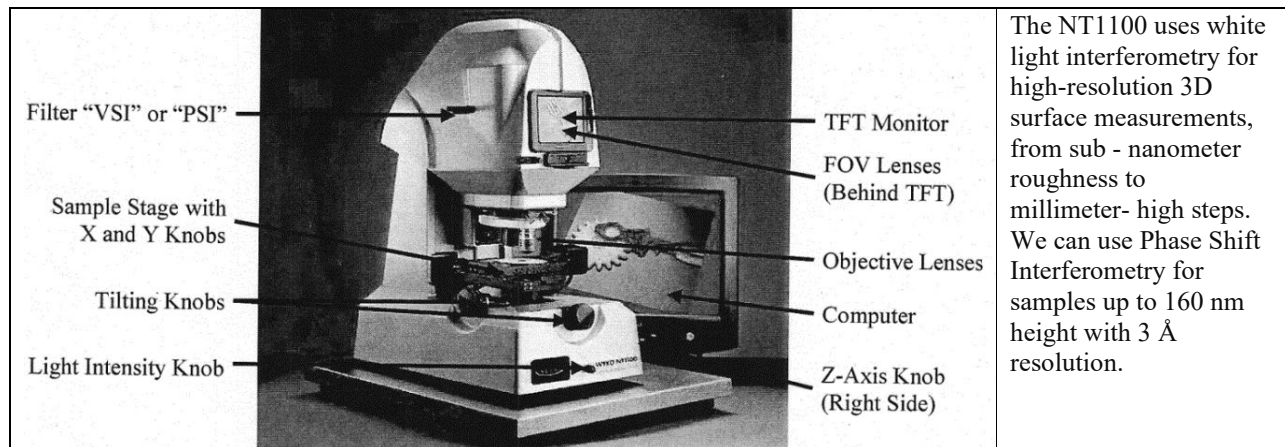


Washington State University Vancouver Cleanroom Standard Operating Procedure

Equipment Name:	Optical profiling system (Veeco WYK0 NT 1100)		
Process:	Inspection with Optical Profiler in the Phase Shift Interference (PSI) Mode		
Scheduling Name:	Optical Profiler (VEECO)	Revision Number:	1.0
Model:	WYK0 NT 1100	Revised by:	Sam Judd (360)546-9201
Location:	VECS046, Bay 3	Date:	10/23/2024



Procedure:

1. Power on the NT 1100 optical profiling system.
2. Power on the computer and start the Vision software.
3. Set the filter lever to PSI Low Mag or PSI High Mag as needed for your sample. The vertical range of PSI is 160 nm and the resolution is 3 Å.
4. Load sample onto the stage.
5. Adjust the Z-axis knob, on the right-hand side of the machine, to find the best focus. At the best focus, you can see the high contrast fringes.
6. From the Vision software, click "Hardware", then click "Measurement Options", choose "PSI" as the Measurement Type and select the correct optics setup.
7. PSI scans are very fast. Set the averaging to 10 scans or more.
8. Click "Set the Intensity" to open the "Light Intensity" window. Adjust the light intensity knob on the front side of the machine, until no red dots are shown on the "Light Intensity" window.
9. Make sure the sample is in focus with the highest contrast fringes again. Null the fringes by adjusting two tilting knobs, one on the left side and one on the front side of the stage. Make sure only 3-4 fringes are on a flat surface. The fewer number of fringes gives a better image. Adjust until fringes are horizontal to minimize slope in scan. Finally, focus on a high point of image for scan starting point.
10. Start the measurement from the Vision software by clicking "New". Add title and notes as desired at this point.
11. Data analysis and image processing.
 - a. [2D Analysis] shows the surface profile in 2D.
 - b. [3D Interactive Plot] shows the surface topography in 3D.
12. Save data and images.
 - a. The Vision software does not provide image export functions. Push "Print Screen" key to capture graphs and images. Paste the captured screen image in Windows Paint.
 - b. Save the images in JPEG or other photo formats. You can edit the images later.
 - c. You can save Database file to use later with Gwyddion software.
13. Decrease the light intensity to minimum (fully counterclockwise).
14. Power off the TFT monitor if used.
15. Turn off the Vision software.
16. Power off the computer and system.

Useful Information:

	Vertical Range	Resolution
Vertical Shift Interference (VSI)	1 mm	3 nm
Phase Shift Interference (PSI)	160 nm	3 Å

Filter	VSI	PSI Low Mag	PSI High Mag
Total Magnification	N/A	<10	≥10

Field Size (mm x mm)	5x	20x	50x (not available at WSU)
FOV: field of view			
FOV 0.5x	2.47x1.88	0.62x0.47	0.25x0.19
FOV 1x	1.24x0.94	0.31 x0.24	0.12x0.09
FOV 2x	0.62x0.47	0.15x0.12	0.06x0.04

Lamp rated for 100 hours. **Remember to turn it off after use.**

International Light Technologies

Tel: 978-818-6180

www.intl-lighttech.com

Part# L7388

6 volts, 20 watts, G4 base type, C-6 Filament type, 420 lumens

Also available as:

5DTP5 Grainger

Osram ESB FHE 64250 HLX lamp 20w 6v G4 Halogen Light Bulb

Definitions:

- 1) **Primary Scan** is the scan taken in a measurement.
- 2) **Backscan** is the distance back (up) from the starting point that the translator moves before starting the measurement. Adjust backscan to measure all points of interest above your point of focus.
- 3) **Length** is the distance the translator scans forward (down) from the original starting position.

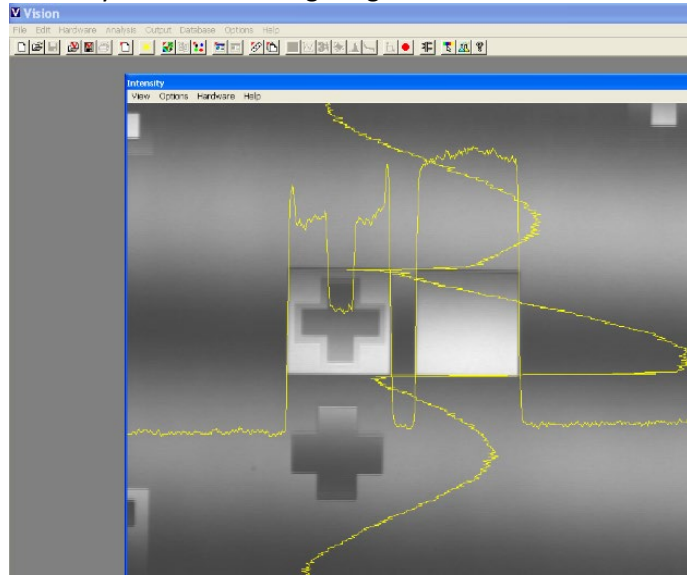
Software

Freeware analysis suite, Gwyddion, can use 3D image data files from NT1100, the NanoSurf AFM and other 3D image formats.

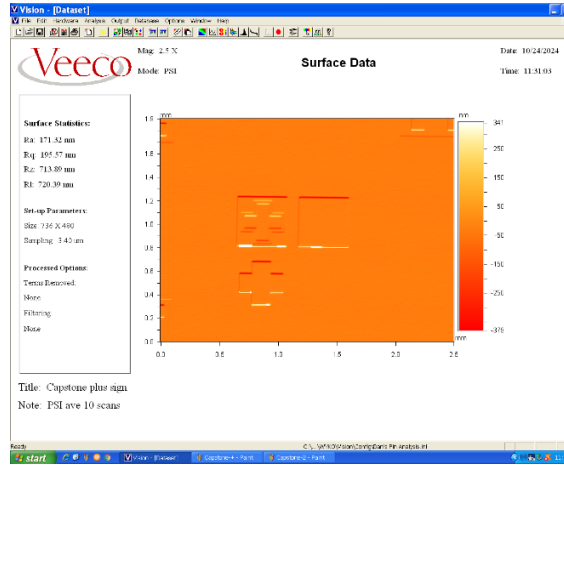
<http://gwyddion.net/download.php>

Vision software photos:

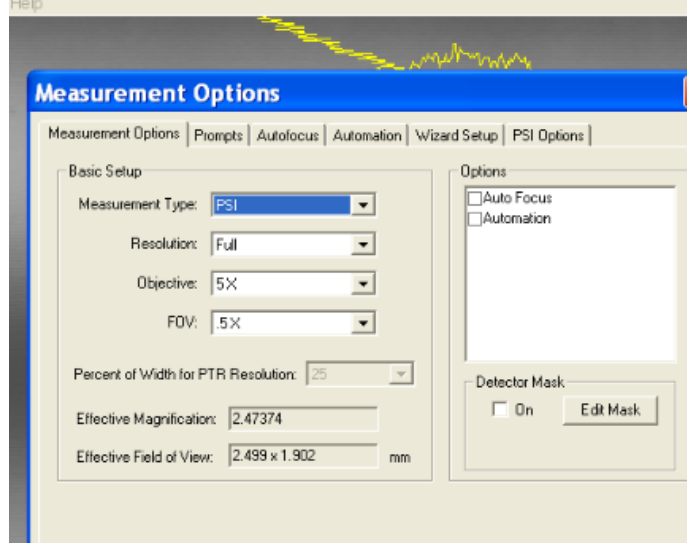
Intensity: focus and set lighting



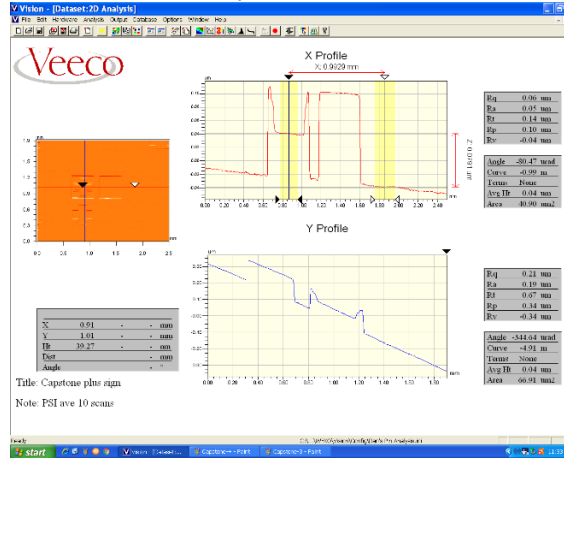
Surface Data



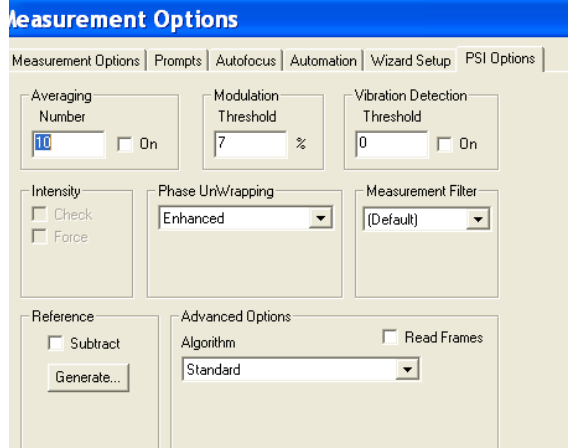
Measurement Options: Set Measurement Type, Objective & FOV



2D Profile: min. slope in direction of interest



PSI Options: Set Averaging # and Modulations



3D Interactive Display: drag cursor for best view

