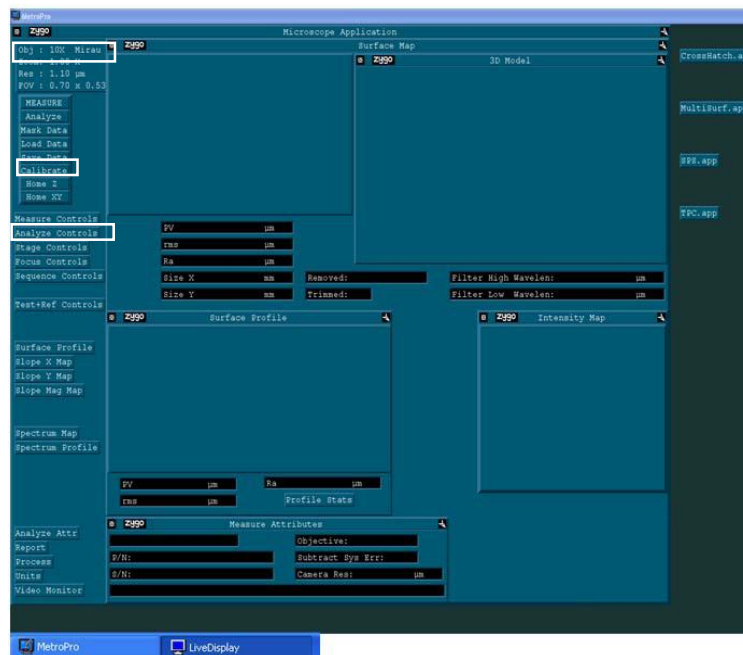


# ZYGO OPTICAL INTERFEROMETER SOP

Revised April 2020

## START UP

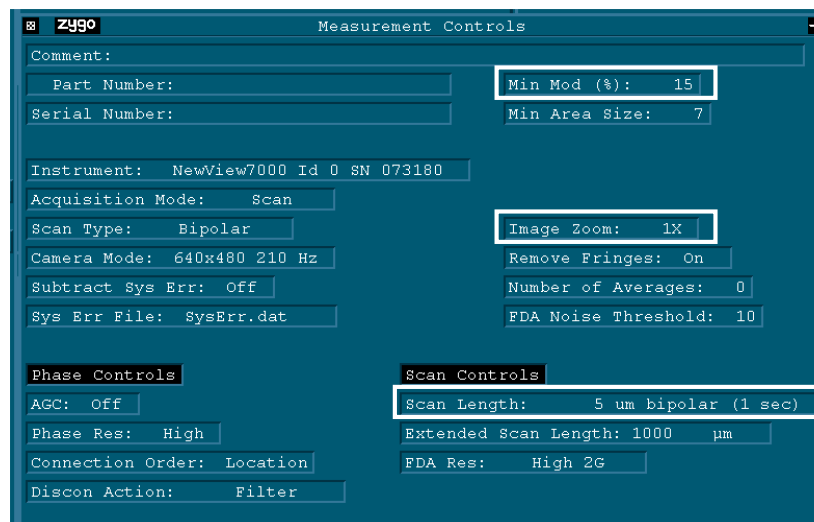
1. Login to the tool from your FOM account.
2. Open MetroPro software.
3. Click on Mirco7k.app to open measurement application.
4. Click on Live display window in the task bar.
5. Make sure the objective head is all the way up and place your sample on the stage.
6. Choose the right objective by clicking on **OBJ** located on the left top corner of the Micro7k application window. **Be sure to raise the height of the objectives before switching magnification, otherwise you may break an objective!**
7. **Setting Z-stop:** If Z-stop is not red and blinking, press on Z-stop once. Z-stop will start flashing. Move the objective down towards the sample (Z speed – Fast, Medium, and Slow) and when you see the sample in the live display click on Z-stop. Z-stop will turn **solid Red** from flashing Red.



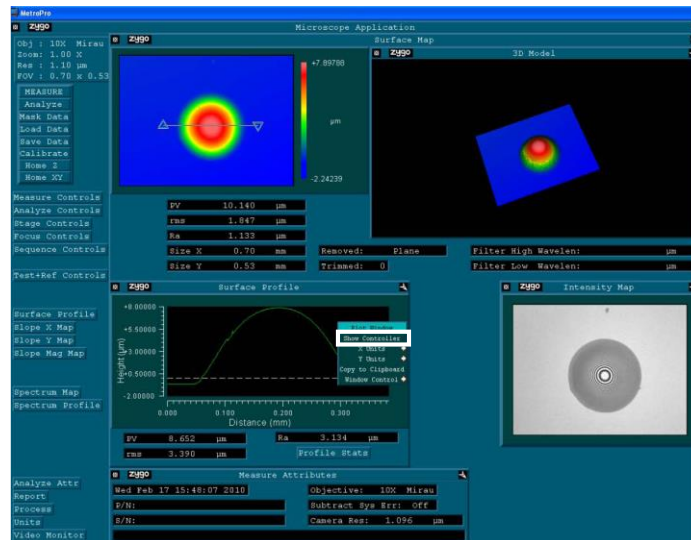
8. Look at the live display and approach the sample using the “Z rotation” on the joystick and alternatively press **F5** to adjust the light intensity when the live display turns red (saturation). Repeat this process until the sample comes into Focus. Once the sample comes into focus, fringes (alternatively bright and dark) will usually be seen on the live display.

## FRINGES ADJUSTMENT

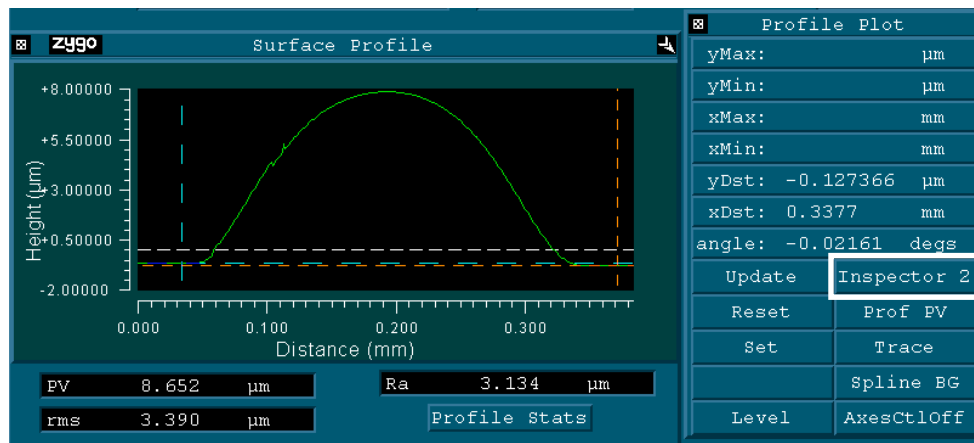
- 2 to 3 fringes on the screen should give the best results. For adjusting the number of fringes and the alignment of the fringes, press “P-R” (Pitch and Roll) on the joy stick.
  - In P-R setting, X and Y movement can be used to move the fringes to vertical or horizontal position on the display.
  - Moving the fringes in either P (X) or R(Y) will change the spacing of the fringes. Continue moving the joystick in this direction until you see 2 or 3 fringes on the screen. Also, Z rotation will help in moving the fringes to the center of the field of view if needed.
  - Make sure to eliminate saturation in all the fringes, even those outside the field of view by pressing F5 to auto-adjust the intensity.
9. Now press **F4** for light level and intensity adjustments. A new window opens with the following settings: Light level, peak intensity and saturation. Maintain the peak intensity between 95-96% and saturation to green. Following are the shortcut buttons for intensity and saturation adjustments.
- \* increase peak intensity in large steps
  - + increase peak intensity in small steps
  - / decrease peak intensity in large steps
  - decrease peak intensity in small steps
10. Go to **Measure controls** on the main window. Set the desired scan length and image zoom in scan controls.



11. Hit **F1** to make a measurement.
12. Filled plot, surface profile, intensity map, and 3D model of the sample are seen on the window.



13. On the filled plot, place the cursors where desired to measure the heights. This gives the average PV, rms and Ra value of the filled plot.
14. Surface profile: Right click on surface profile and go to **show controller** which opens profile plot window. Click on the **Inspector** icon in **profile plot** twice to see both the cursors. The surface profile allows leveling and gives the PV, rms and Ra at a particular location on the filled plot.



## SAVING DATA

- Click on **Save data** to save all the data. By saving the data as a **.dat** file you can use MetroPro software to modify your data at a later point of time.

**NOTE:** MetroPro 8.3.2 can be downloaded from <http://www.zygo.com/?sup=/resource/software.cgi>

- For saving individual plots, right click on Zygo icon located at the left-top corner of each window and save as **.tiff** or **.bmp** file.

## SHUTTING DOWN

15. Move the head all the way UP. Unload your samples and close MetroPro.
16. Log out from the tool I your FOM account.

## ADDITIONAL NOTES

### a. Z-Stop

- Red and flashing, Z-stop is not set and objective might crash onto the sample.
- Solid Red, Z-stop is set.
- Green and you hear a beep sound when the objective is approaching the sample; you reached your set working distance. If the sample is still not visible either move the objective in the upward direction or set a new Z-stop.

b. When the objective is approaching the sample, it is always advisable to change the Z-speed to medium or slow.

c. Hit **F5** for auto light adjustment when the display turns red (saturation) during any step.

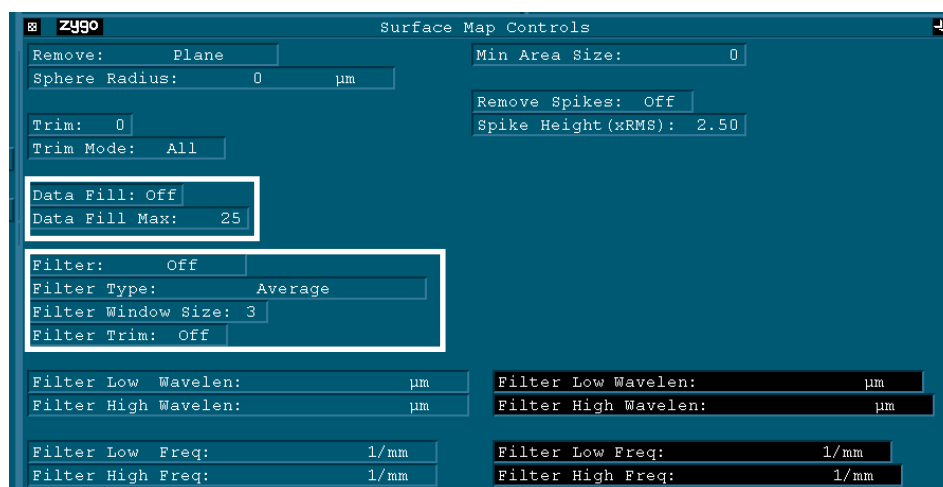
d. Make sure to eliminate saturation in all the fringes, even those outside the field of view. For this move the stage in X-Y direction.

### e. Measurement controls:

- After making a measurement, if you notice a lot of data dropout in the filled plot, go to measurement controls and lower the **min mod %** (do not go below 5%) and click analyze on the main window.
- Add comments in measurement control window if desired.
- Click on image zoom to change the magnification if desired (multipliers available 0.5X, 1X, 2X).

### f. Analyze controls (see figure below):

- If you are trying to determine the roughness of a sample and you see large peaks which are modifying your data, go to **analyze controls** and use a **filter** as desired or turn **ON Remove spikes** and specify the height of the spikes, then click analyze on the main window.
- **Data fill option** can be turned **ON** if you have a data drop out which cannot be fixed using Min Mod%. But, be sure you are not changing your real data or getting false data.



Click on Films7k.app to open measurement application if you have multiple transparent layers on your sample

1. Go to measure control and generate Sys Char File
  - Choose a surface without multi-layer films for this measurement. (e.g. Plain silicon wafer)
  - Desired file name can be typed in at **Sys Char file : @**
  - Then click on Generate Sys Char File with 5-6 fringes on the live display.
  - Once the system char. file is saved, you can click on select **Sys Char** file and select your file the next time you want to make a measurement.
2. Go to the area of interest and repeat the process explained in **Micro7k.app**
3. Also, thickness of the films can be measured using **film controls** on **measure control** window

