How to use the Ellipsometer

0. Be very mindful of the EMERGENCY STOP button during the whole analysis. If you accidentally press it, just inform Yann Lavanchy (MXD 115, 32849)

1. For the control laptop :
    i.   Username : operator
    ii. Password : semilab123

2. For the CAE laptop :
    i.   Username : administratorlp
    ii. Password : <blank>

3. Login to CAE using your GASPAR credentials

4. Select MXC905 ellipsometre

5. Click " Valider "

6. On the control laptop, open the SAM software (if the initialization fails, close SAM using the Task Manager (CTRL+Shift+Esc) and try again 1-2 times)

7. Login to SAM (top right) :
    i.   Username : MHMC User
    ii. Password : MHMC123

8. Place your sample on the middle of the stage (be careful not to accidentally bump the Microspot)

9. Under Manual, you will see the stage controls at the bottom. You can, for example, move the stage to the center by selecting the StageToCenter position and then click Move to...

10. Enter the substrate thickness in Sample Thickness [µm] (850 for silicon wafer) and click Go to PreFocus

11. Under Vision System Monitor, you can turn up the light by setting the LED_LIGHT_SOURCE to 100% and adjust the Exposure according to your sample's reflectiveness

12. You can enable the Joystick Mode (above Move to...) to look for an adequate spot (remember that the ellipsometer spot is not perfectly aligned with the camera's cross)

13. Under RC Focus by Signal -> Focus Settings, you can enter the following parameters :
    i.   Focusing Type : Automatic
    ii.   Sensor Name : VIS
    iii. Attenuator Mode : Auto
    iv.   Spot Optic Mode : Microspot
    v.   Measure Wavelength : 633.93
    vi.   Incident Angle [deg] : 70
    vii. Integration Time [ms] : 100
    viii. Measure Count : 12
    ix.   Step Size [µm] : 35
    x.   And press Start on the right to perform automatic focus

xi. If you observe no signal, the cause could be :

- The Microspot are not properly in place : check that the small arrows align
- Your sample is way out of focus : check the sample thickness
- Your sample absorbs too much light at this wavelength : try a different wavelength
- The Xenon lamp is off : contact Yann Lavanchy (MXD 115, 32849)

14. If the peak is out of the frame, tweak the sample thickness (± 300 µm, don't forget to press Go to PreFocus to apply the change) to shift the peak to the left (by decreasing the thickness) or right (by increasing the thickness) until the system detects the maximum

15. Under RC Ellipsometry Measurement -> Measurement Settings -> Measurement, set the following parameters :

i. Spot Optic Mode : Microspot

ii. Measurement Type : PsiDelta

iii. Incidence Angle [°] : 70.00

iv. Background : First

v. Detector Settings : VIS

vi. Mirror Correction : ON

vii. Depolarization Correction : OFF

viii. Attenuator Mode : Auto

ix. Integration Time [ms] : 2000-5000

16. Under RC Ellipsometry Measurement -> Measurement Settings -> Analysis, you can enable analysis and select your .ses model if you have one

17. Once you're ready, click on Start Measurement on the right. Don't forget to manually save your data after each measurement

18. Once you're done, transfer your data on a thumb-drive using one of the laptop USB port (**do not use the hub**)

19. **Set the LED_LIGHT_SOURCE to 0% and turn off the vacuum if you've used it**

20. Leave all the softwares open and don't forget to log out of your CAE session

Molecular and Hybrid Materials Characterization Center

EPFL STI IMX LP
MXD 115
Station N° 12
CH - 1015 Lausanne

Phone :   +4121 693 28 49
E-mail :   yann.lavanchy@epfl.ch
Website :   epfl.ch/research/domains/mhmc