

Standard Operational Procedure

Fixed Angle Spectroscopic Ellipsometer MM-16 Horiba Yvon-Jobin

Last Updated: March 23 /2010

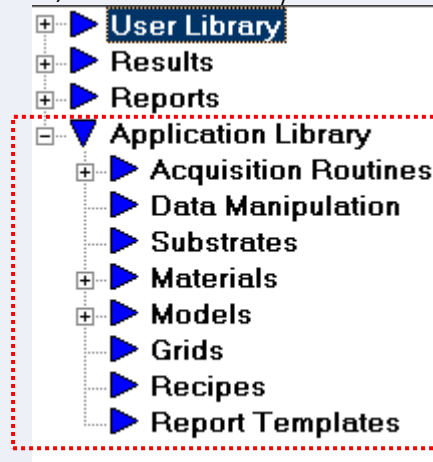
Instrument location: Room: 4D LABS Clean room 6060.2

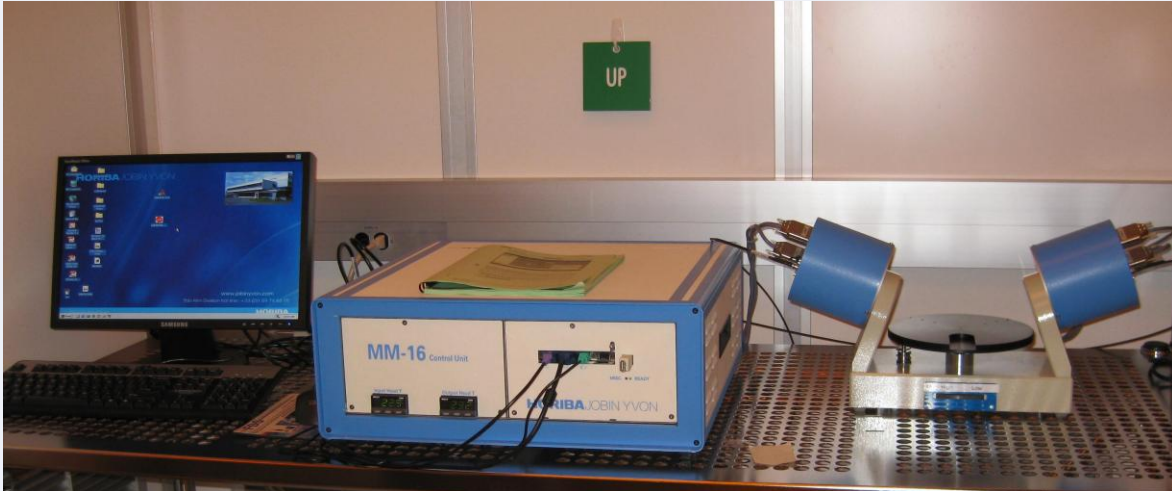
Purpose of instrument: determine thickness and optical properties of thin films and multilayers structures (wavelength range: 400 – 850 nm).

BEFORE STARTING

- Don't step, kink, kick, bite or bend the optic fiber.
- A cool-down period of ~30 minutes is required before restarting the lamp.
- If no one use the system about 2-3 days, turn off the system after you use. Otherwise keep the system ON.

NB: *All parameters in the APPLICATIONS LIBRARY are shared by all users. DO NOT MODIFY THEM. If you do modify, let me know, and I can retrieve parameters from the installation CD.*





GETTING STARTED



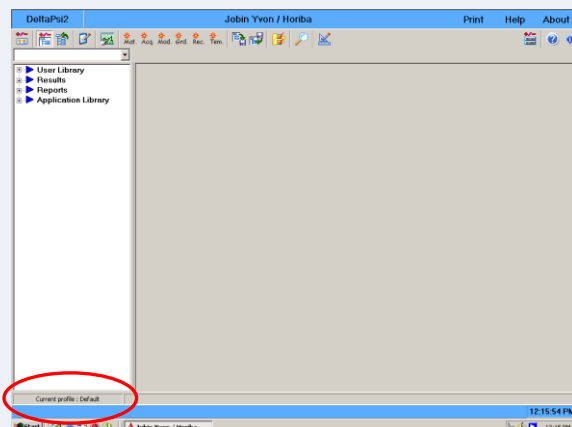
1. Turn on the power (on the power bar) (located on the back of computer monitor)

(Waiting for Input and Output temperature to be 30 °C, take about 30 min)

2. Running DeltaPsi2 software.



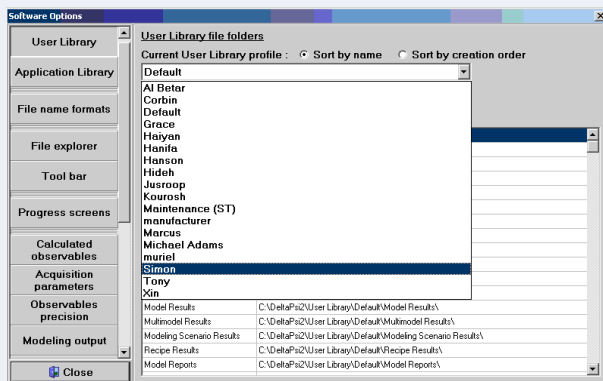
- Using the mouse, double-click on DeltaPsi2 icon located on the desktop
- The software will start up (and the shutter will open) , and the following screen will be displayed



Make sure you are in your own user library. The current user can be seen in the lower left corner of the screen. If you are not the current user:

3. Click on the **SOFTWARE OPTIONS**  tab

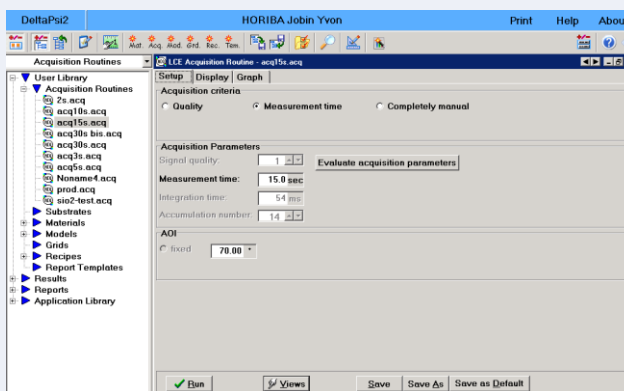
2. Select your name, and close the window.

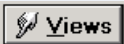


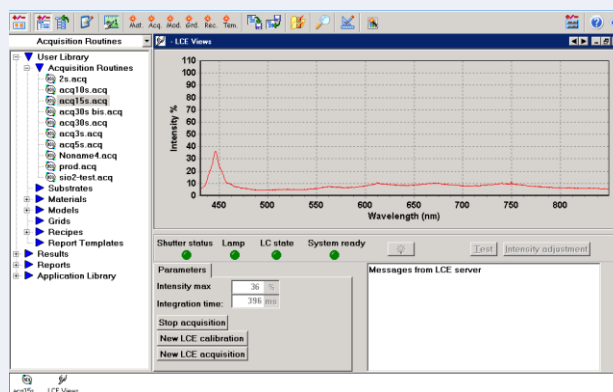
4. Place your sample in the center of the stage. Move your sample such that the beam is well away from edges, non-uniformities (scratches, piece of dirt, finger print...).



5. Double click on "User Library"
6. Double click on "acquisition routine"
7. Double click on "acq 15s.acq" (recommended), and the following screen will be displayed



8. Press **views**  and the following screen will be displayed



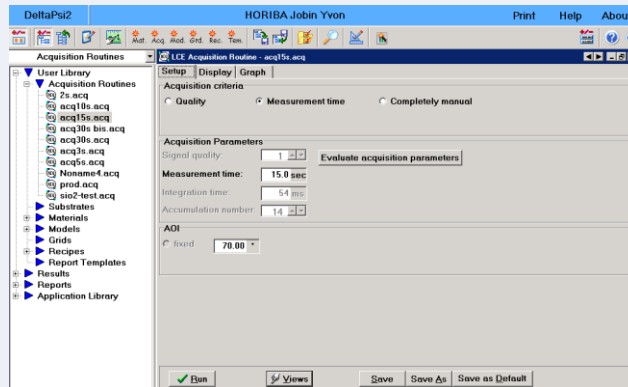
9. Turn the Z stage adjustment to increase and find the maximum signal level of the spectrum



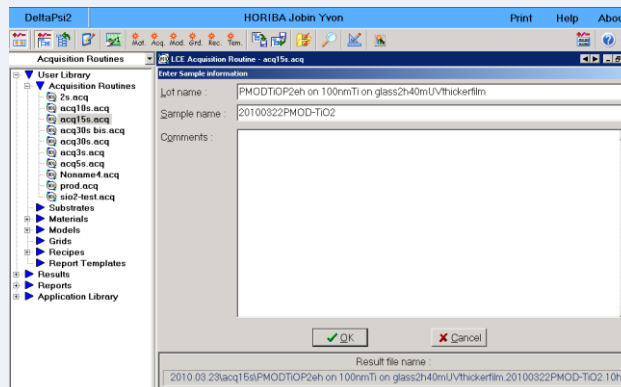
10. Press **“Stop acquisition”** and **“Intensity adjustment”** to adjust the spectral intensity

11. If necessary, press **“Run acquisition”** and then repeat 9-10 until obtain the max intensity

12. Then close the window, and press **“Evaluate acquisition parameters”**



13. Press **Run**. Enter the sample information in next window, and press **OK** to start acquisition



SHUTDOWN SYSTEM

1. Log off the computer



2. Turn off the power (on the power bar)
3. Remember: take your sample with you.

REGULAR MAINTENANCE

THERE IS A MAINTENANCE USER PROFILE THAT HAS THE ACQUISITION ROUTINES REQUIRED FOR MAINTENANCE.



BE CAREFUL WHEN HANDLING THE NIST STANDARD, TO KEEP IT FREE OF CONTAMINATIONS AND SCRATCHES.

Measurements on the NIST SiO₂/Si standard sample should be performed on a **weekly** basis, or every time the instrument is used after a long period of inactivity. The appropriate measurement is saved in **ACQUISITION ROUTINE \ NIST TRACKING**. It measures from 300 to 700 nm, every 10 nm.

These steps should be carried out on a semi-regular basis, in particular if the values obtained when measuring the NIST standard sample are a bit off:

1. Turn the lamp **ON** and allow it to warm up.
2. Change the user to Maintenance.
3. With no sample on the stage, run **ACQUISITION ROUTINE \ STEP 1**.
4. Place the aluminum mirror on the stage, adjust height and level (AOI = 70° ; l = 450 nm).
5. Run **ACQUISITION ROUTINE \ STEP 2**.
6. Run NIST standard sample. If every thing seems OK, log in the values obtained from fitting the NIST standard, and you are done.
7. If values obtained after running the NIST standard are a bit off, palce the mirror back on the stage (AOI = 70° ; l = 450 nm) and run **ACQUISITION ROUTINE \ STEP 3**. This will recalibrate the monochromator. This step takes about 1½ hours to complete.
8. Run NIST standard sample. If every thing seems OK, log in the values obtained from fitting the NIST standard, and you are done.