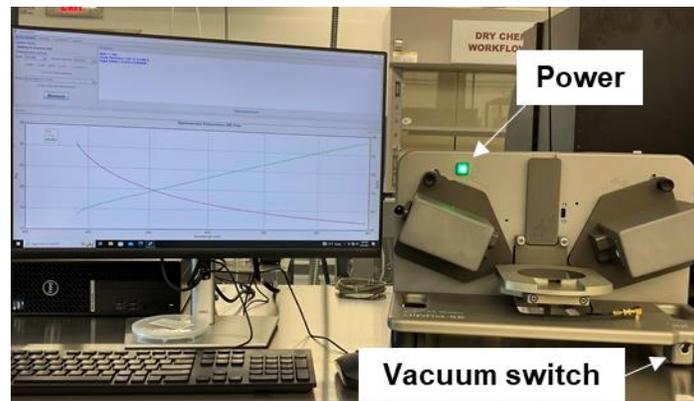
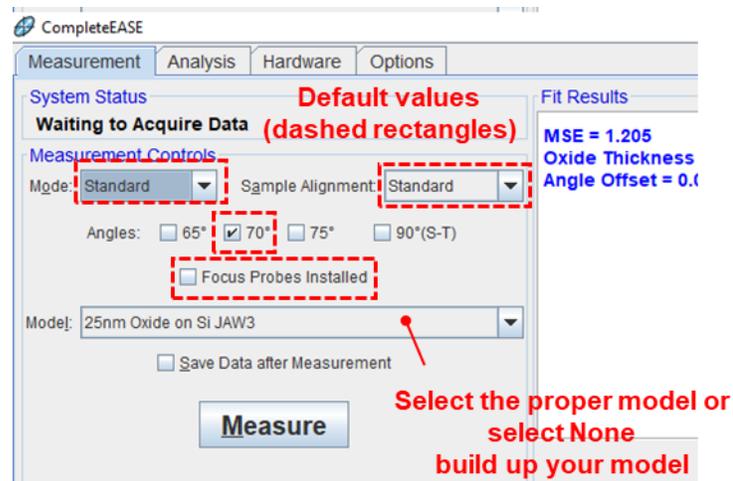


# Woollam alpha-SE Spectroscopic Ellipsometer

1. Turn on and initialize the ellipsometer



- a. Log in iLab
  - b. Switch on the power of the ellipsometer
  - c. Turn on the vacuum pump on the floor and the vacuum pump switch (figure)
  - d. Place the sample on the stage.
  - e. Switch on the vacuum switch
  - f. Start the 'CompleteEASE' software on the desktop. The device will be initialized
2. Wait until 'Waiting to Acquire Data' is displayed in the 'measurement' tap.
  3. Set measurement parameters in the 'Measurement' tap. The recommended setting is in the figure. Notice: Do not try to change the measurement Angle. Please contact staff to change the Angles.



- a. Mode: standard for majority of measurements.
    - i. *Standard*: most popular measurements (~ 10 seconds)
    - ii. *Fast*: Quick measurements (~ 3 seconds)
    - iii. *Long*: Low reflectivity samples or high precision measurements (~ 30 seconds)
    - iv. *M.M.*: Mueller-matrix measurements – anisotropic and depolarizing samples
    - v. *M.M.Long*: High Accuracy Mueller-matrix measurements
  - b. Sample Alignment: standard for majority of measurements.
    - i. None: Stage location is below beam for Straight-Through (90°) measurements
    - ii. Standard: Standard reflected measurements.
    - iii. Robust: A through alignment of the light beam that searches
    - iv. Fixed Height
    - v. Prompt Height
  - c. Focus Probes installed: leave it unchecked
  - d. Model
    - i. None: Collect data only, allowing analysis at a later time
    - ii. Choose from File Dialog
    - iii. If a proper model is not shown, a new model file needs to be made.
  - e. Save Data after Measurement: data will be saved upon measurement if the box is checked.
4. Press the 'Measure' button to acquire data.
    - a. If 'None' is selected, nothing happens.
    - b. If Model is selected, models will be appeared.
    - c. If the "Save Data after Measurement" checked box was selected, a dialog box will appear for data saving.

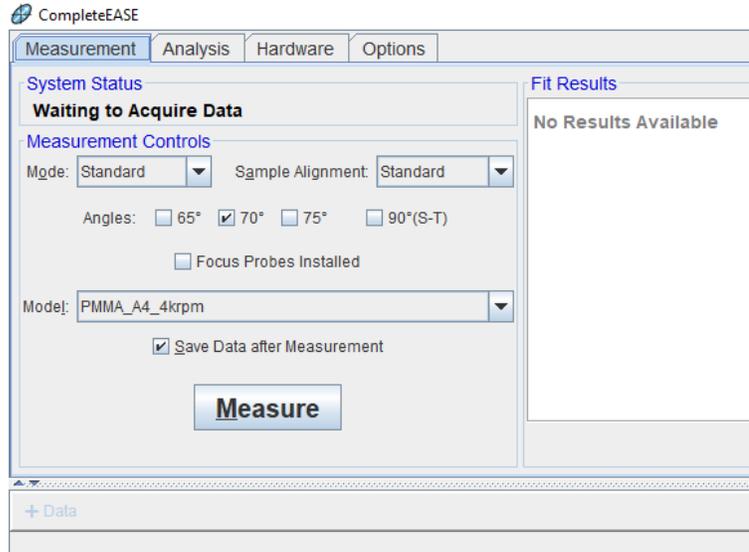
Note: CompleteEASE data files are encrypted & saved with ".SE" or ".iSE" extensions, which are accessible by the CompleteEASE program.

5. Do analyze your data in the 'Analysis' tap. See the appendix for detail.
6. Turn off the system.
  - a. Switch off the ellipsometer
  - b. Turn off the vacuum pump.
7. Log off from iLab.

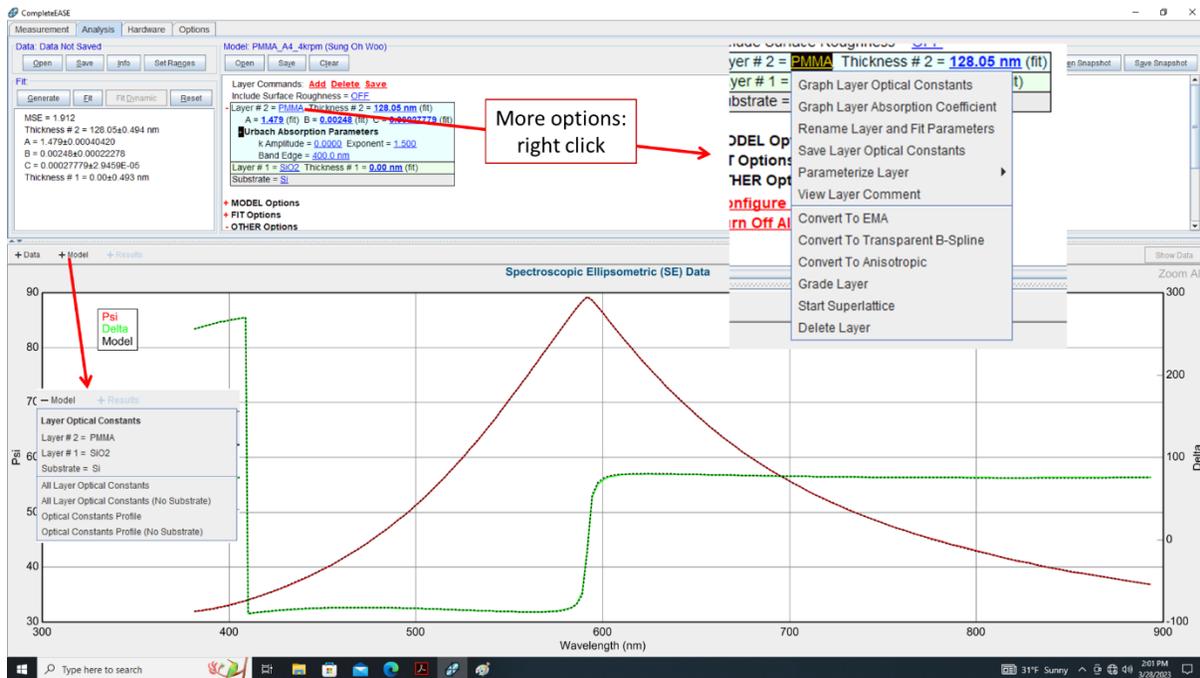
# Appendix

With a proper model.

1. Select it in the Model drop down menu.



2. Click on the 'Measure' button. Then, data and fits will be displayed. If fits are not good, adjust parameters and fits data. There are options when click '+' symbol or right click on the layer name.



Without a model, select 'None' in the Model.

1. Click on the 'Measure'
2. In the 'Analysis' tap, build your structures by adding a substrate and layers.
3. Adjust parameters and try to fit data.

