

Fluorimeter Instructions

Turn on the fluorimeter with the rocker switch located on the right hand side of the instrument towards the rear. After hearing three beeps, start up the connected PC – ALWAYS turn on the instrument and PC in this order! After logging in, launch the FluorEssence software package by double clicking on the desktop icon. The main FluorEssence window, Figure 1, should appear after the program initializes and connects to the instrument.

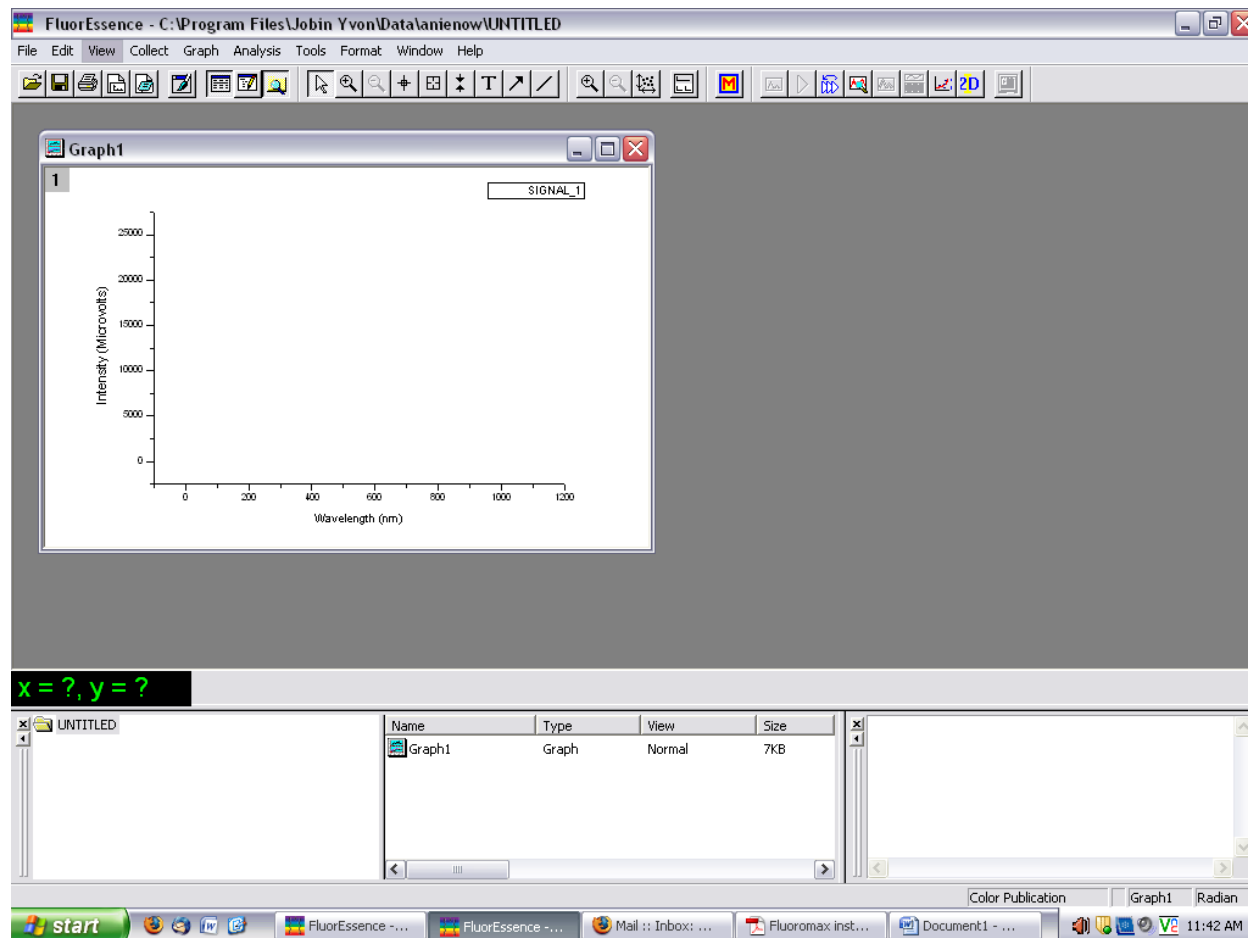


Figure 1. Main window of the FluorEssence software program.

You should now save a project file which will contain all of the spectra that you collect for a particular experiment. For instance, you can create a project file for each of the semiconductor quantum dot samples that you study. Open the “File” / “Save project as” menu and navigate to a folder on your Z: drive or another obvious location. Give the project a name and save it.

To initiate an experiment, click the “Experiment Menu” button (looks like an M) on the toolbar. Wait for the instrument to initialize if needed (click next when done) and then select “Spectra” from the window that opens. Finally, select either “Excitation” or “Emission” as the “Experiment Type” in the next window. Clicking on the “Next>>”

button brings up the “Experiment Setup” window where you can set the spectral collection parameters, Figure 2. Click on the “Monos” icon in the left column to set the wavelength parameters for the excitation and emission monochromators, including the spectral slit width and wavelength increment. The “Detectors” window is used to activate the signal and reference detectors and set the integration time. For stronger signals that saturate the detector (i.e, gives counts above 2 million), the integration time can be decreased from the default value of 100 msec. Alternatively, the integration time can be increased for weaker fluorescence. (The spectral slit width can also be adjusted to control the signal level. Finally, a descriptive name for the spectrum should be input into the “Data Identifier” field. [For more specific information on the parameters for a given experiment, see your instructor or any additional handouts provided.]

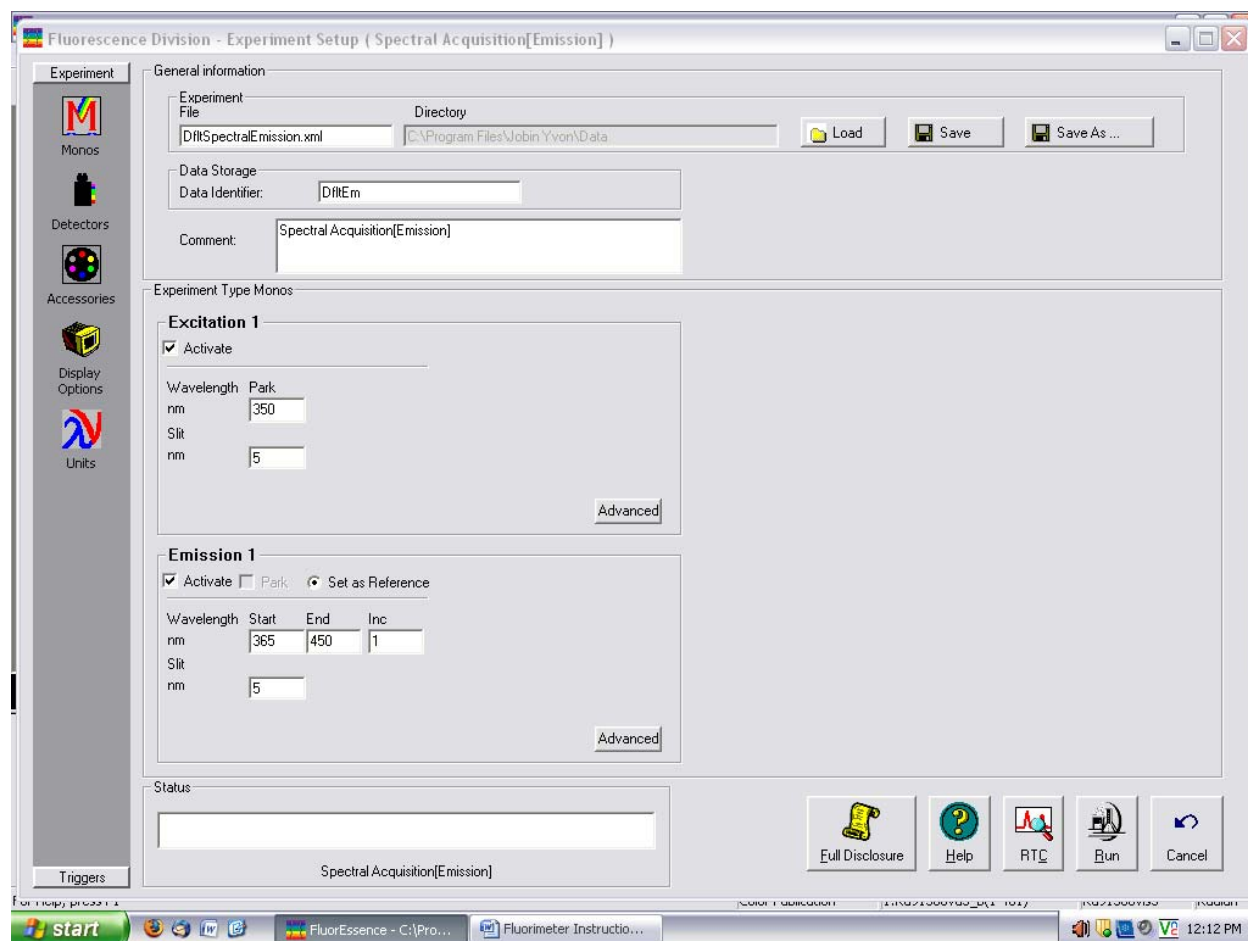


Figure 2. The “Experimental Setup” window showing the “Monos” options.

Once all the data collection parameters have been set, click the “Run” button to begin the scan. An “Intermediate Display” window will appear to plot the spectrum as it is collected, autoscaling as it scans. The resultant plot appears in the main window. Subsequent scans of the same type, emission or excitation, can be quickly set up by clicking on the “Previous Experiment Type” button (to the right of the “Experiment Menu” button) on the toolbar. A repeat spectrum with all the same parameters can be initiated

immediately by clicking on the “Auto Run Previous Experiment” button (to the right of the “Previous Experiment Type” button).

Each new plot appears in the main window and is also displayed by name in a list in a window at the bottom of the main display. Multiple project files can be open at the same time and the spectra list changes depending on which project is highlighted in the left most window. Double clicking on the spectra name changes the plots in the main window to data files. There is also a “Notes” file associated with each spectrum that contains data collection information, such as monochromator wavelength parameters and other information. There are a number of tools available to manipulate the spectra, such as being able to zoom the display and automatically locate spectral peaks. The cursor tool, , can be used to manually locate peaks by clicking on the spectrum to place the cursor and reading out the coordinates displayed in the main window.

The spectra can be printed using the “File” / “Print” command. The print dialog window has an option to print either the highlighted spectrum or all of the spectra contained in the project. The individual spectra can be made easier to identify by right clicking on the plot (inside the axes, not on the plot border) and selecting “New Legend” from the pop up menu. The legend of the plot will now contain the “Data Identifier” name. Alternatively, the same menu can be used to “Add Text” to the plot to add descriptive information. The data can also be exported as an ASCII data file from the “File” / “Export” menu. The file can then be opened in SigmaPlot or Excel for plotting and analysis.

Finally, should the toolbar buttons become greyed out, try the “Collect” / “System UI Reset” to restore the interface. The fluorimeter should be shut down at the end of the experiment using the main power switch. Also turn off the PC.