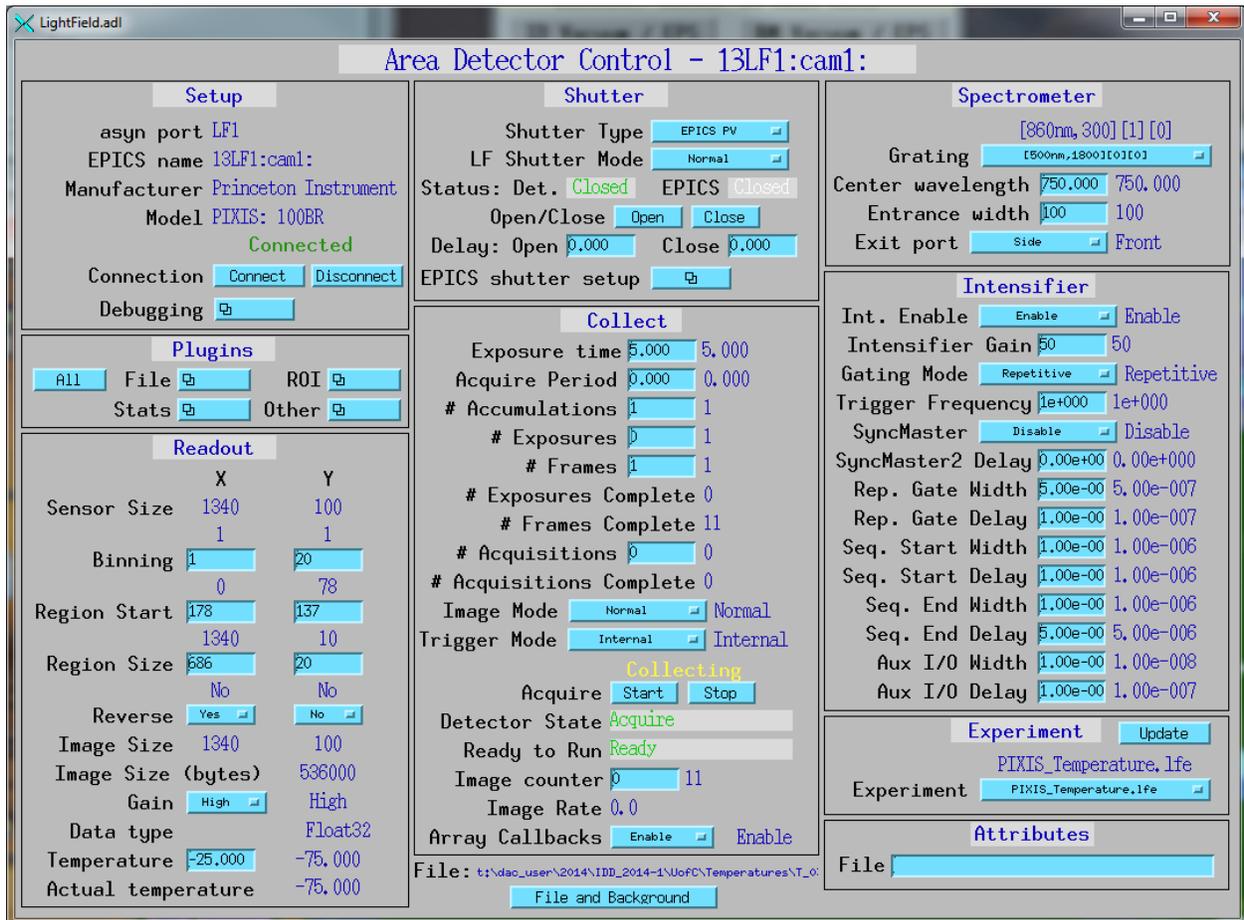


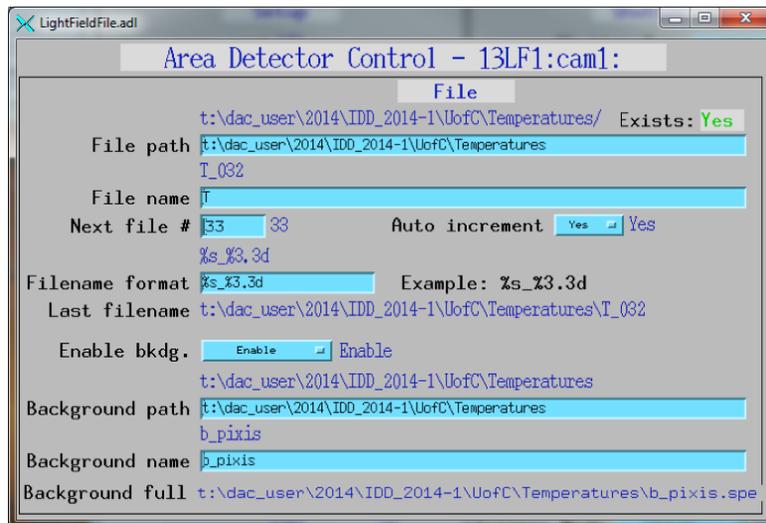
Spectrometer Measurement Setup Instructions

1. Double click the **Start Lightfield** button on the MALIBU Desktop. It will start an instance of the *light field* software and connect to the EPICS control window. (it can take about 2-5 Minutes to load everything)
 - a. If it fails to load, please close all Lightfield.adl and the lightfield windows and check task manager, if an Addinprocess.exe is still running please end it.
2. When everything is loaded a new EPICS control windows **LightField.adl** will appear:



3. For Temperature measurements:
 - b. Select **PIXIS_Temperature.lfe** as *Experiment*
 - c. Select **[860nm,300][1][0]** as *Grating*
 - d. Set the *Center wavelength* to **750** and the *Entrance width* to **100**
4. For Ruby measurements:
 - e. Select **PIXIS_Ruby.lfe** as *Experiment*

- f. Select **[1800nm,300][1][0]** as Grating
 - g. Set the *Centerwavelength* to near your expected ruby peaks and the *Entrance width* to **50**.
5. If you want to change the folders for background and data files please click **File and Background**.



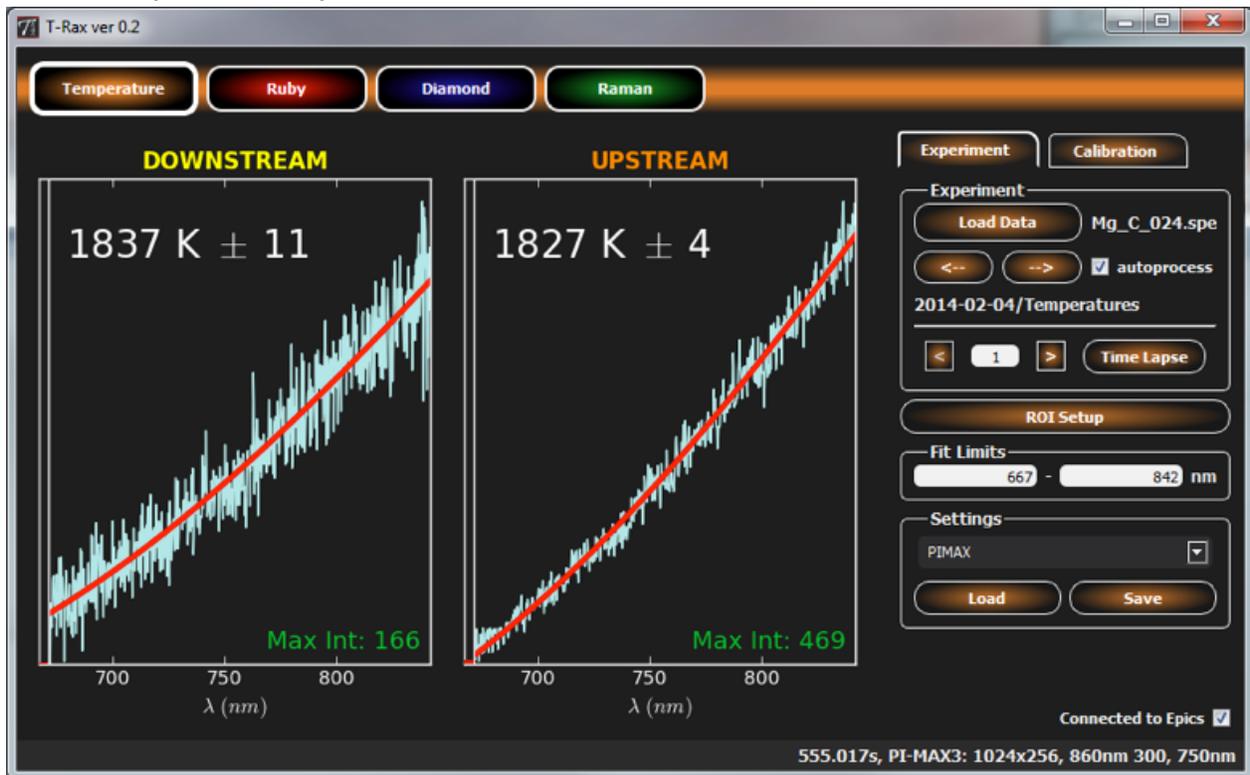
A new window will appear where you can enter paths and filenames for both.

6. Before the first data measurement you should collect a new background file:
 - h. Change *Image Mode* to **Background**
 - i. Click *Acquire Start*
 - j. Change *Image Mode* back to **Normal**
7. Now everything is setup for Measurement. The Measurements can be triggered either by clicking **start** in the **Lightfield.adl** window or clicking **Measure T** in the main IDD control. (Measure T also works for ruby measurements)
8. File names, file numbers and exposure time can be quickly assessed by using the text boxes close to the **Measure T** button in the main IDD control.
9. All parameters can also be accessed by clicking the **more** buttons next to the **Measure T** in the main IDD control window.

Data analysis

1. Start T-Rax by double clicking either the “run_T_rax.py” or “T-Rax” symbol on the Desktop.

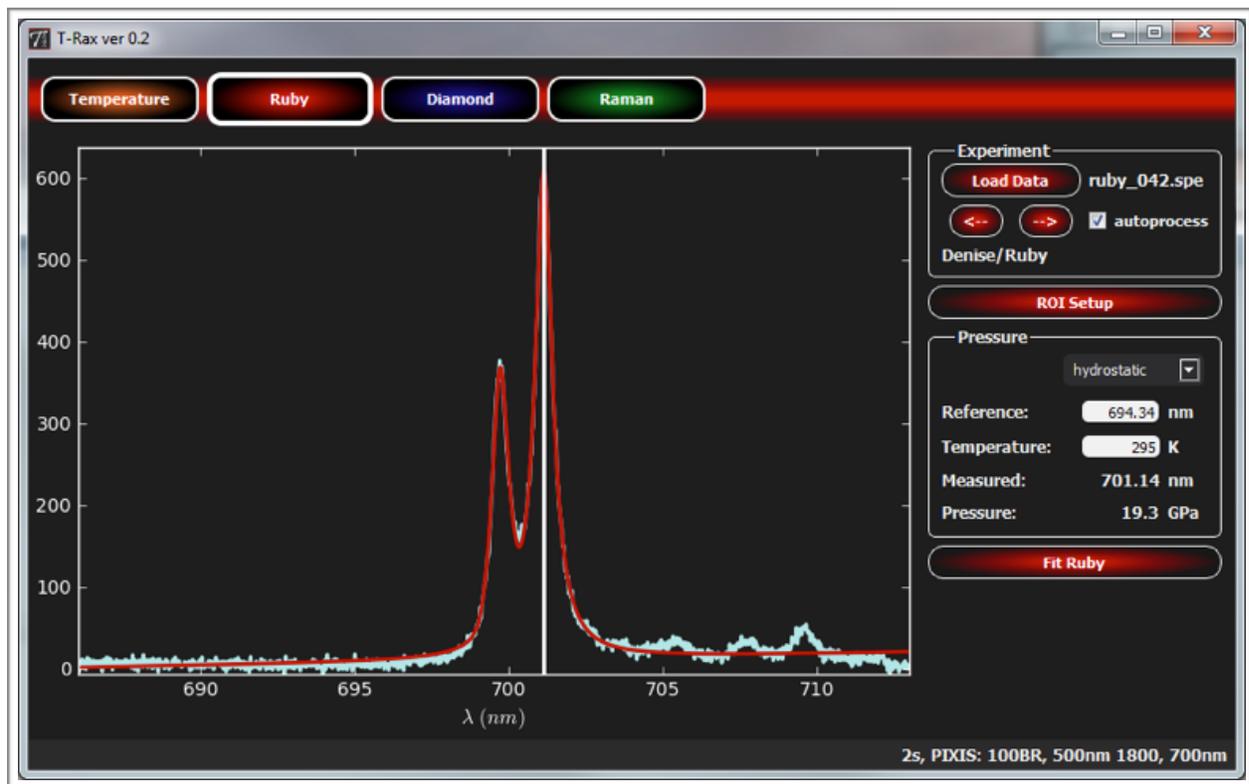
2. **Temperature analysis:**



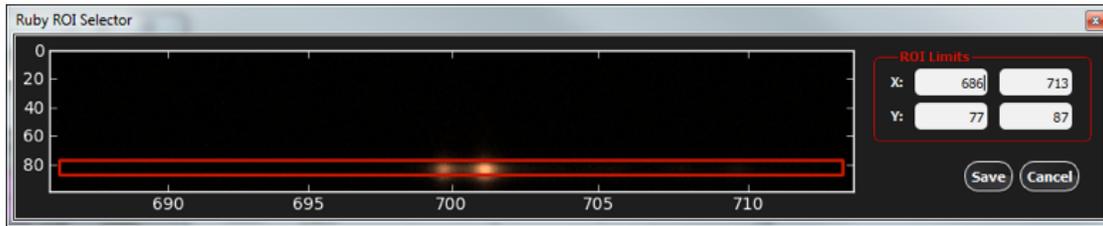
- make sure that **temperature** is selected in the upper button menu.
- for analyzing temperatures of newly collected files the program needs to load the appropriate settings. Please Choose the correct settings of your chosen detector, exposure time and filter setup in the lower right part of the program window.
- Please also make sure that the **connected to epics** checkbox is enabled. This will update the temperatures and maximum intensities in the main medm control window and will also make sure that the correct temperatures are saved in the log file.
- Click **Load data** and select the collected file in the file browser.
- The data will be fitted immediately and temperature values for upstream and downstream should show up in the graph window. If the fit looks suspicious please check that the right setting is selected. Another reason could be that the intensity of the collected data is too high or too low, which will be indicated by big red warning messages in the graph widget.
- If the **autoprocess** checkbox is enabled any new spectrum files in the same folder will be loaded and processed automatically.

- g. You can fast browse between different file numbers by using the left and right (<—, —>) buttons below the **Load data** button.
- h. If the current file contains several frames an additional line will appear below the folder name. There it is possible to switch between the individual frames and open a **time lapse** plot window which will show a plot of the fitted temperatures against frame and also show the average temperatures with standard deviation for upstream, downstream and combined.

3. Ruby analysis:



- a. Please select the red **Ruby** button in the button menu bar on the top of the program.
- b. Click **Load data** and select the collected file in the file browser.
- c. If the **autoproprocess** checkbox is enabled any new spectrum files in the same folder will be loaded automatically.
- d. You can fast browse between different file numbers by using the left and right (<—, —>) buttons below the **Load data** button.
- e. To make sure that the correct region of interest (ROI) of the collected image is selected please click the **ROI setup** button. A new window showing the collected image will appear. Please choose the appropriate ROI either by changing the values on the right side of the new window or by dragging and resizing of the rectangle in the image.



- f. To check pressure you can click into the graph window and a line will appear selecting the specific wavelength. The program will automatically show you on the right side the calculated pressure. Please make sure that you select the right parameters for temperature correction and the ambient ruby peak reference value.
- g. To zoom in to the graph window just use the mouse wheel or the ROI settings in the ROI setup window.
- h. if the two ruby peaks are still separable you can fit the spectrum by choosing a position close to the right ruby peak and click the **Fit ruby** button.