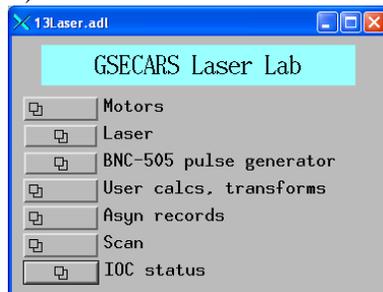# Offline laser heating

Laser setup

Instructions below describe how to perform the offline laser heating of the samples.
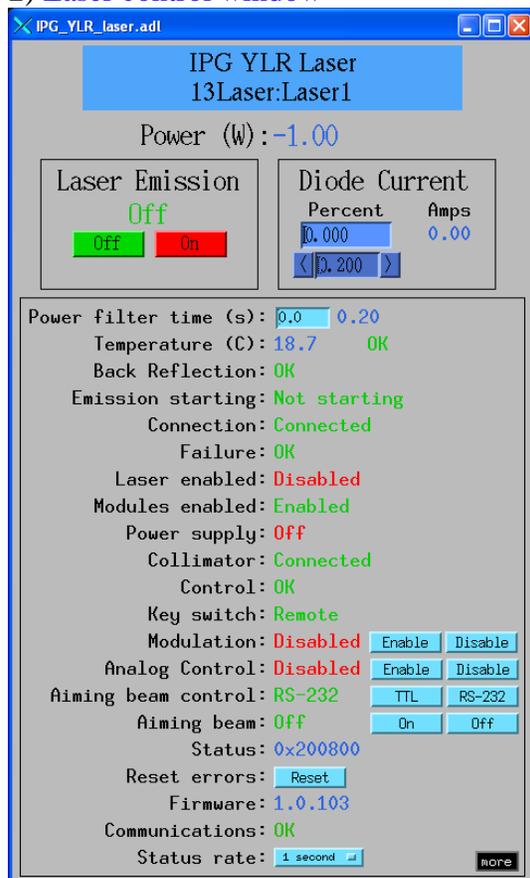
The laser system is operated by STUDEBAKER computer, temperature measurements are done by MAZDA computer (on top rack).
When the system is ready to operate, the following windows shall be opened:
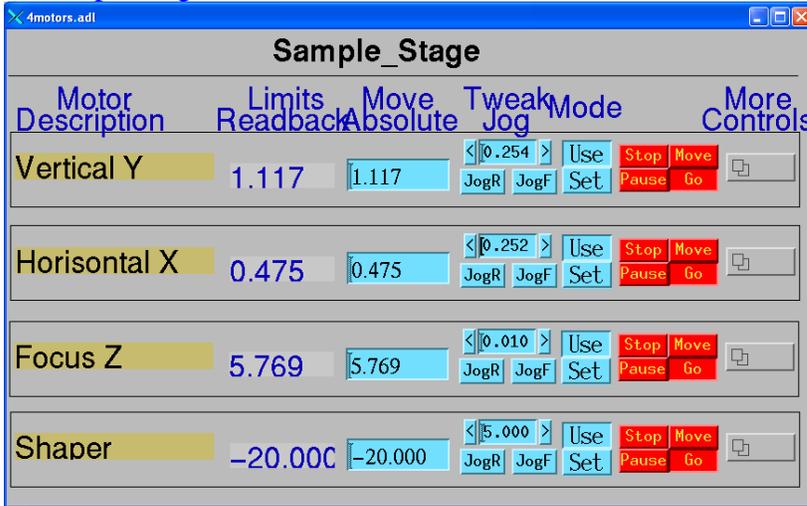1) GSECARS Laser Lab main control window:


2) Laser control window

Login: dac_user
Password: Daagbf

3) Sample stage motion control window:

Set the Shaper position at -35. if you desire to change the beam size, move the Shaper to 0 position and contact your beamline scientist. Please, be advised that the laser profile is NOT table top-like!

Besides these windows, you may want to check the status of two other windows (shown below):
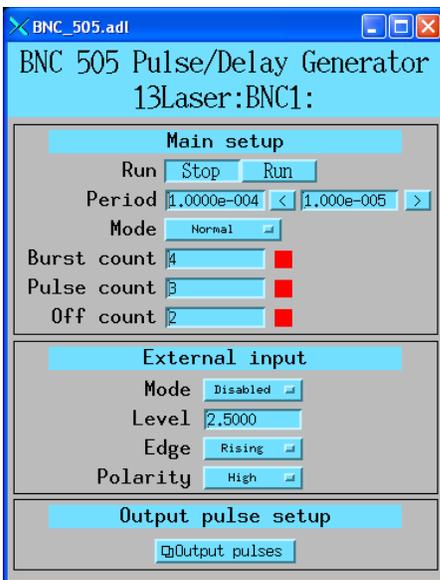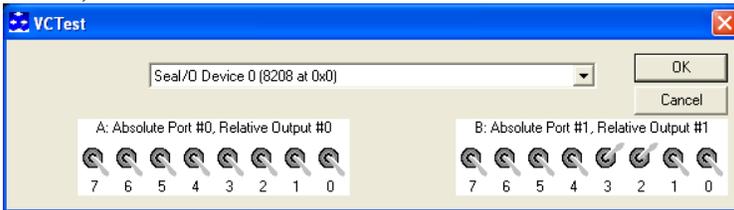
DO NOT RUN *IDL* AND '*Draw&Scan*' PROGRAM!!

5) What if you do not see those windows? (STUDEBAKER computer)
   a) Run Start_motors program (located on the desktop)
   b) Run VCTest program (located on the desktop)
   c) In 13Laser.adl window click on the 'Motors' tab, then 'Sample Stage'
   d) In 13Laser.adl window click on the 'Laser' tab.
   e) In the IPG YLR 13Laser:Laser1 control window 'Modulation' shall be
      DISABLED!
   f) In 13Laser.adl window click on the 'BNC-505 pulse generator' tab

Temperature measurements setup.

1) On the MAZDA computer (located on top rack), you shall run IDL. Then type in the command line 'spect'. The following window will appear:
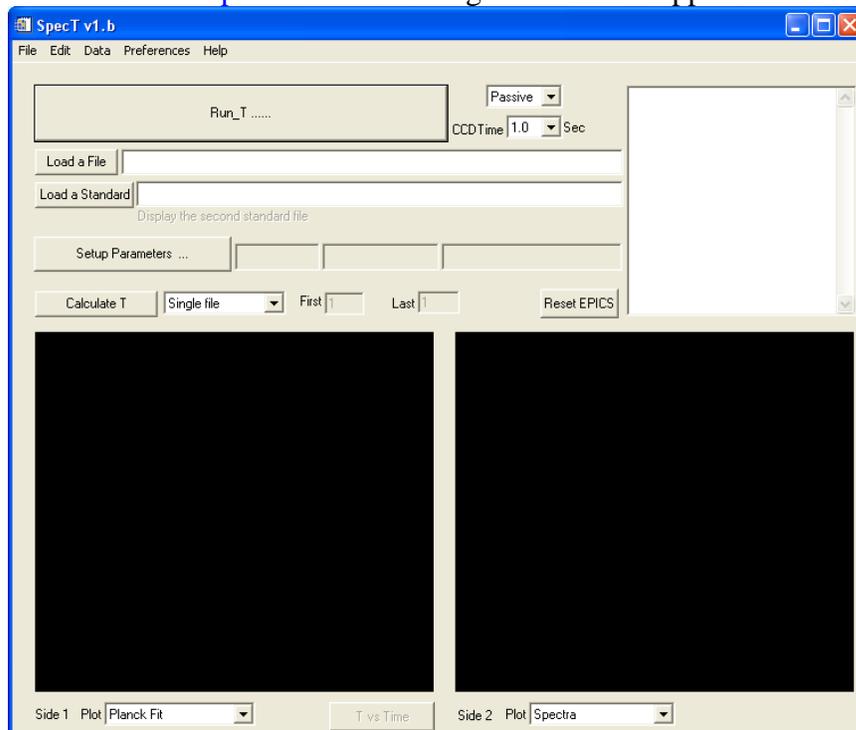

2) Click on the 'Setup Parameters…' tab inside SpecT window. If the parameters are not loaded automatically, you will be prompted to open the setup file. Go to C:\IDL\SpecT and open 'RunParam.txt' file.

3) Click on the 'Load a Standard' tab in the SpecT window. Find the file 'Calibr15_1.spe', located at T:\raman_user\setup\Offline_LH\TestRun_2011_1.

4) Make sure all the parameters are set as shown in the window below:
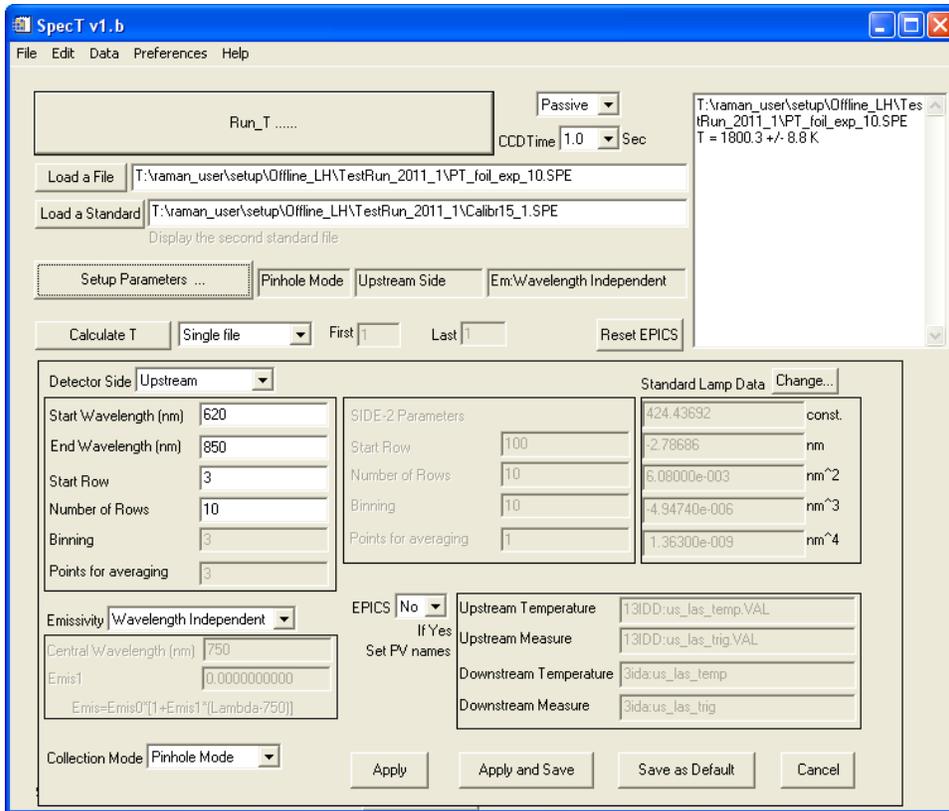
5) Open WinSpec program. Go to 'Acqusition', then 'Experiment Setup' tab, then 'ROI Setup' sub-tab. Set all the parameters up as shown below:
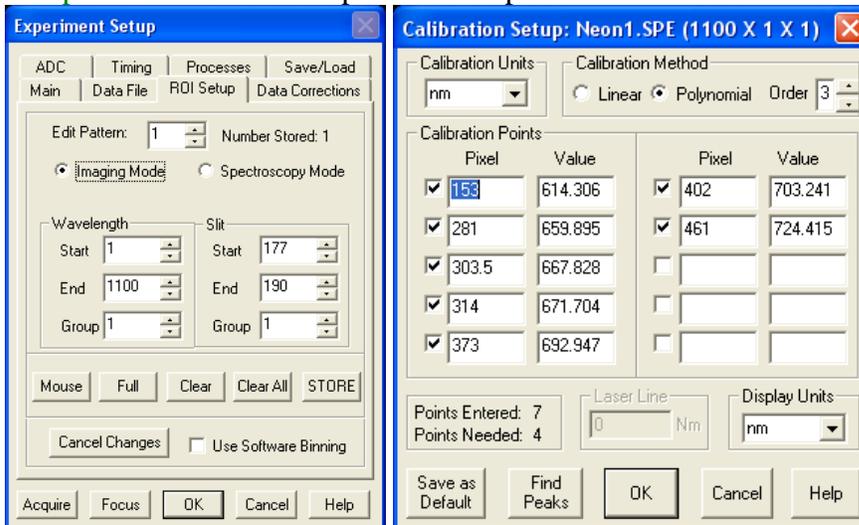

All setup parameters for both SpecT and WinSpec can be found in the file 'setup_offline_laser_heating_specT_WinSpec.doc', located at T:\raman_user\setup\Offline_LH

Running the offline laser heating.

a) Turn the key in the laser control box on the table. Green light under 'Interlock enabled' shall light up. Wait for a minute.
b) Push 'remote start' button. The second green light shall light up under 'Remote start'. Wait for the laser power box to warm up.
c) Hit 'On' button under the 'Emission' on the laser control box.
d) Go to IPGYLR Laser 13Laser:Laser1 window, set 'Diode Current Percent' to **ZERO(!)**, then choose the desired increment in diode current (in percent).
e) Collect the background for your measurements. Go to WinSpec program, then to 'Acqusition', then 'Experiment Setup' tab, choose 'Data correction' subtab and verify that the '*background*' box is unchecked.
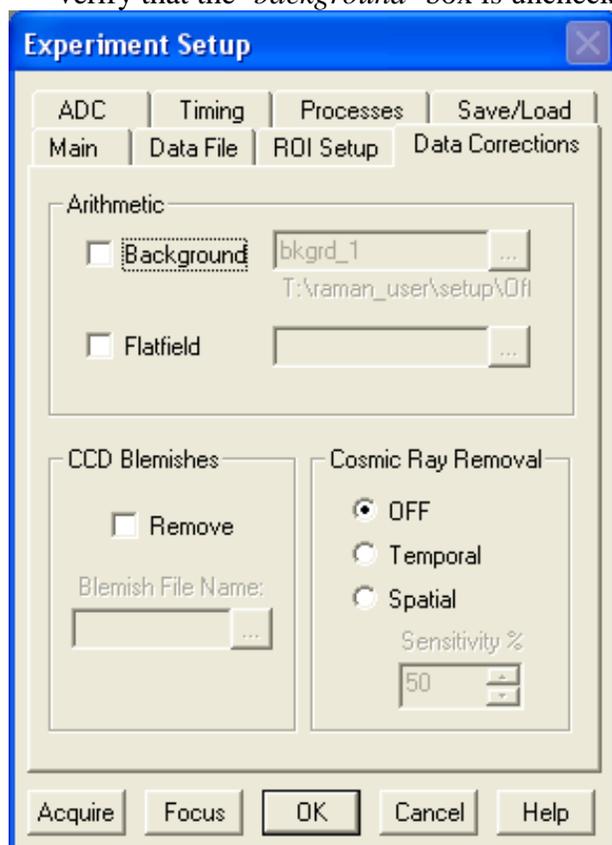
f) Go to 'Data file' sub-tab, choose the background file name and directory for your data. In the 'Main' sub-tab choose the acquisition time. Click '*OK*' when done.
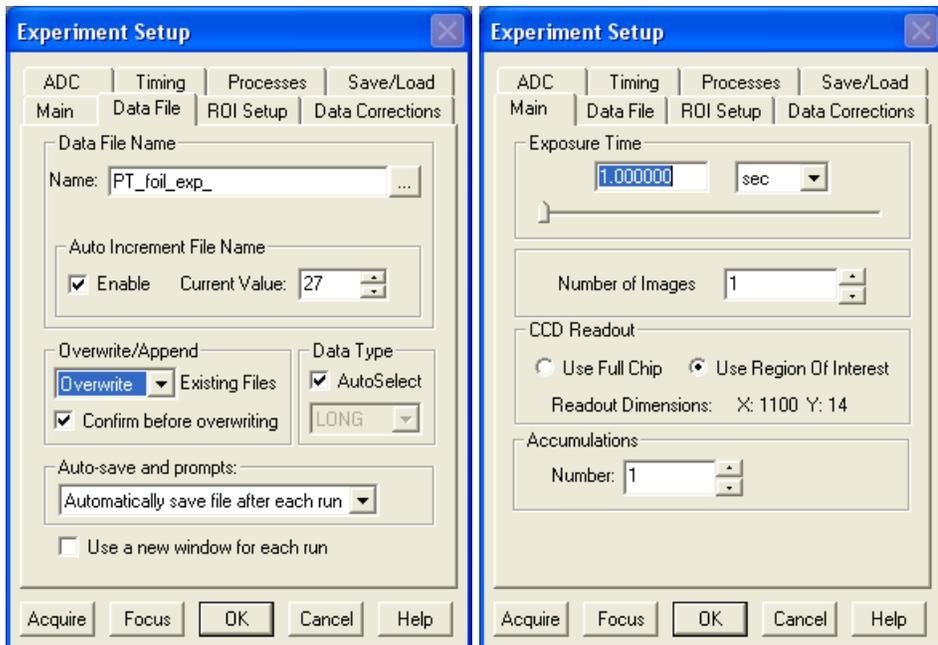
g) Click on the little green button with '*ACQ*' on it. Wait till background is acquired.
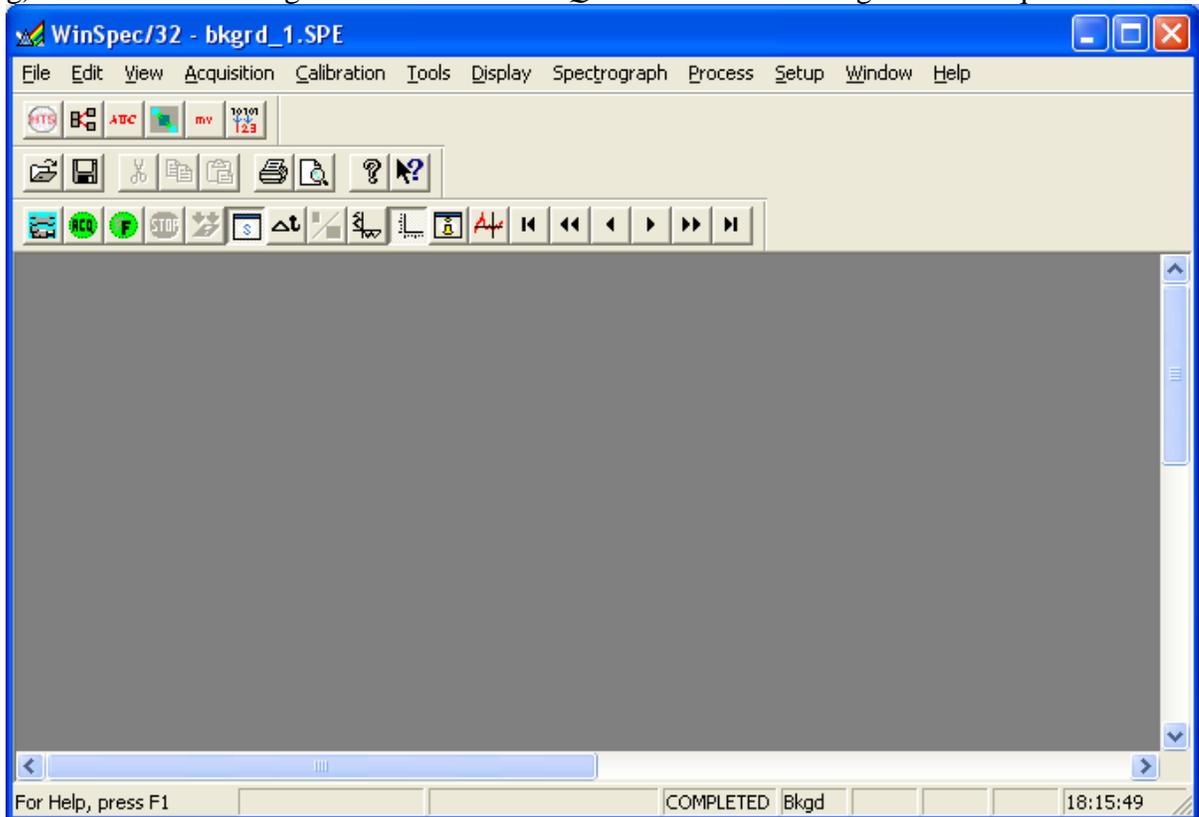
h) Go back to 'Experimental Setup' tab, choose 'Data correction' subtab and check the '*background*' box. Browse for your background file and then click '*OK*'.

i) Go back to the 'Data file' subtab, choose the file name for your sample heating measurements. Make sure you enable the auto-increment in file numbering to avoid overwriting older files. Click '*OK*' when done.

j) Start increasing the current on the laser diode. Laser will turn on when the power reaches 5 W. Then keep increasing the diode current until you reach the desired level of heating.
k) Go to the SpecT window and make sure the 'CCD time' is set to the same value as the acquisition time in WinSpec program. Click on the 'Run T ……' button.
l) When the collection is done, you will see the temperature of your sample calculated in the sub-window in the right upper corner of SpecT window, as well as in the sub-window at the bottom.
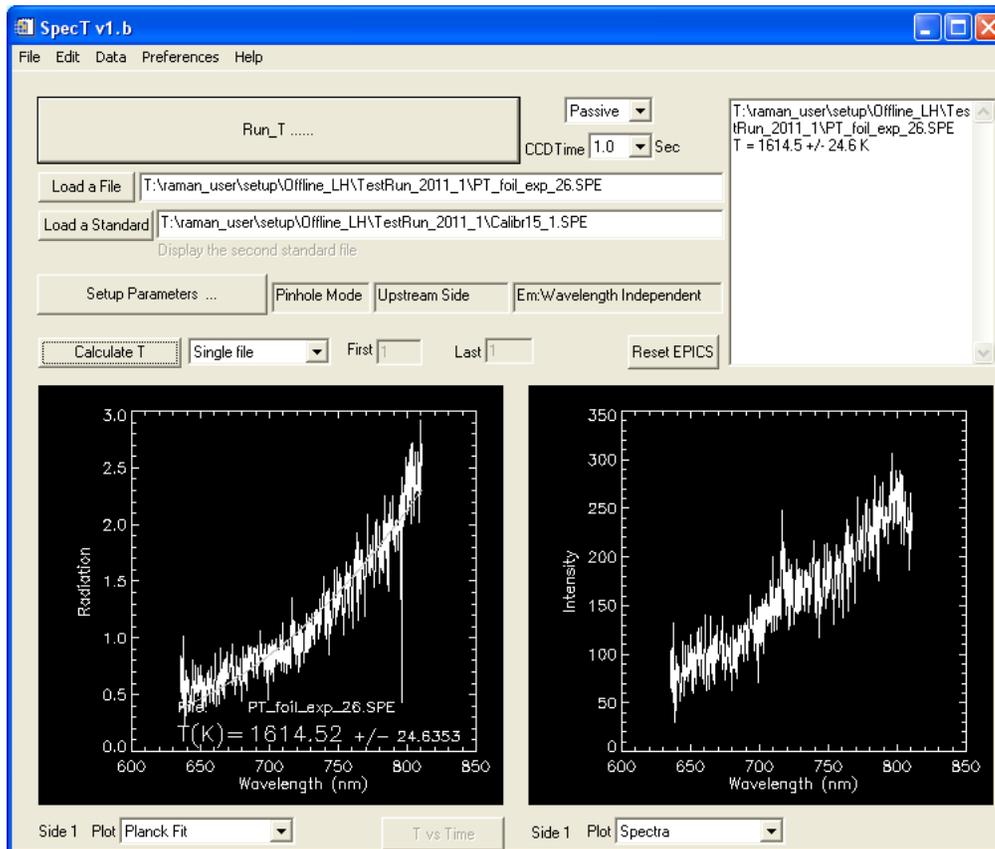
m) Repeat the heating with as many different laser powers as needed.
n) Once the heating is completed, turn off the laser by pushing 'Off' button on the laser control box, then turn the key to disable the interlock, open the door and take out your sample. **No jerky movements, please, when taking the sample holder out, be careful!** Make sure you set the diode current to 0 percent.

Attention: if something is not working as described above, stop and contact your beamline scientist. DO NOT ATTEMPT TO FIX ANYTHING YOURSELF!! NEVER EVER TRY TO TOUCH ANY OPTICS INSIDE THE ENCLOSURE!!!

All publications resulting from the work done using this system shall include appropriate acknowledgement of GSECARS offline laser heating system. The form of acknowledgement can be found at: http://gsecars.org/acknowledge.htm