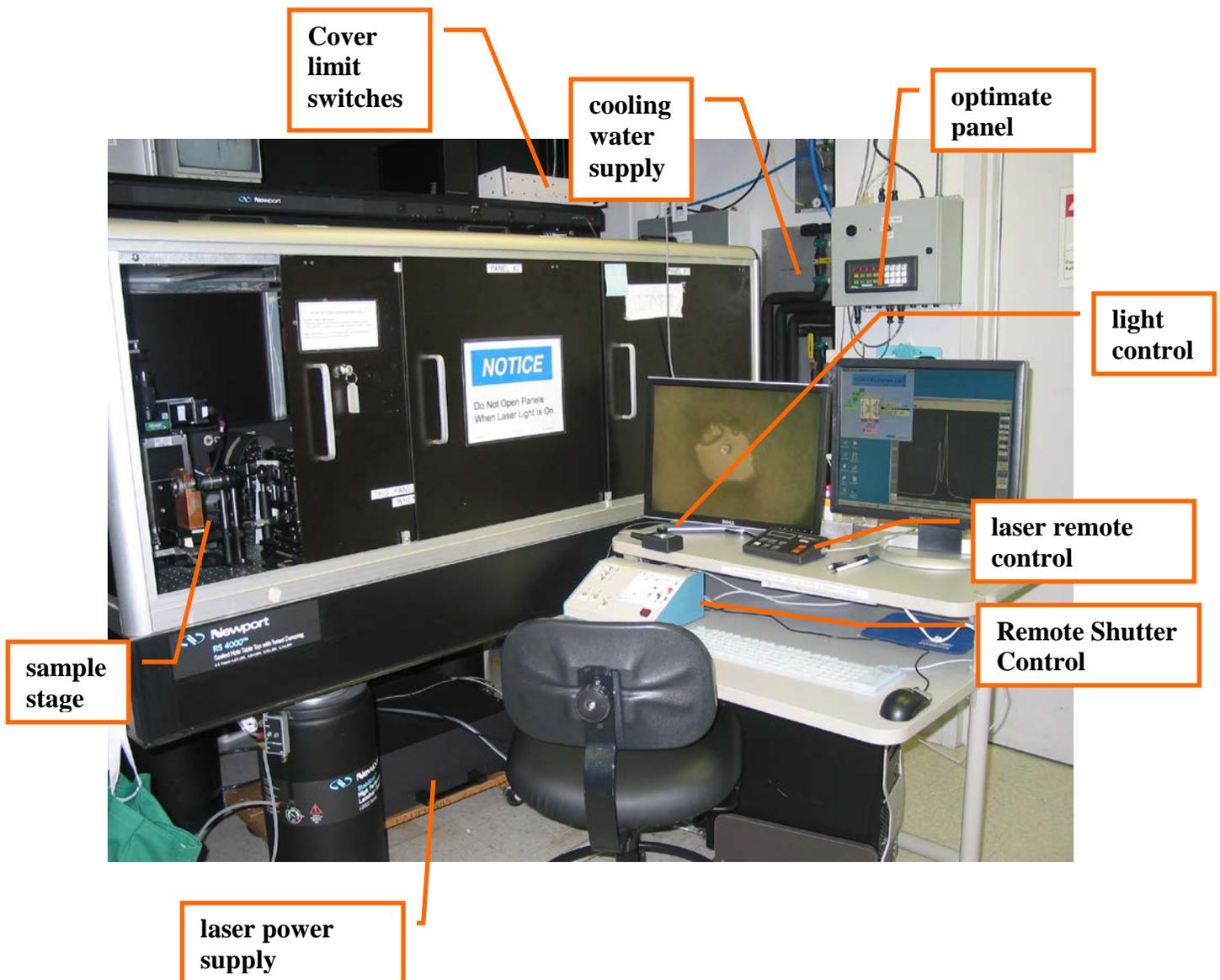


Raman Lab - Laser 1 operation



WARNING! Never ever try to adjust any optics inside the covers yourself!!! Contact your beamline scientist at once if you have questions or problems.

Enable the laser

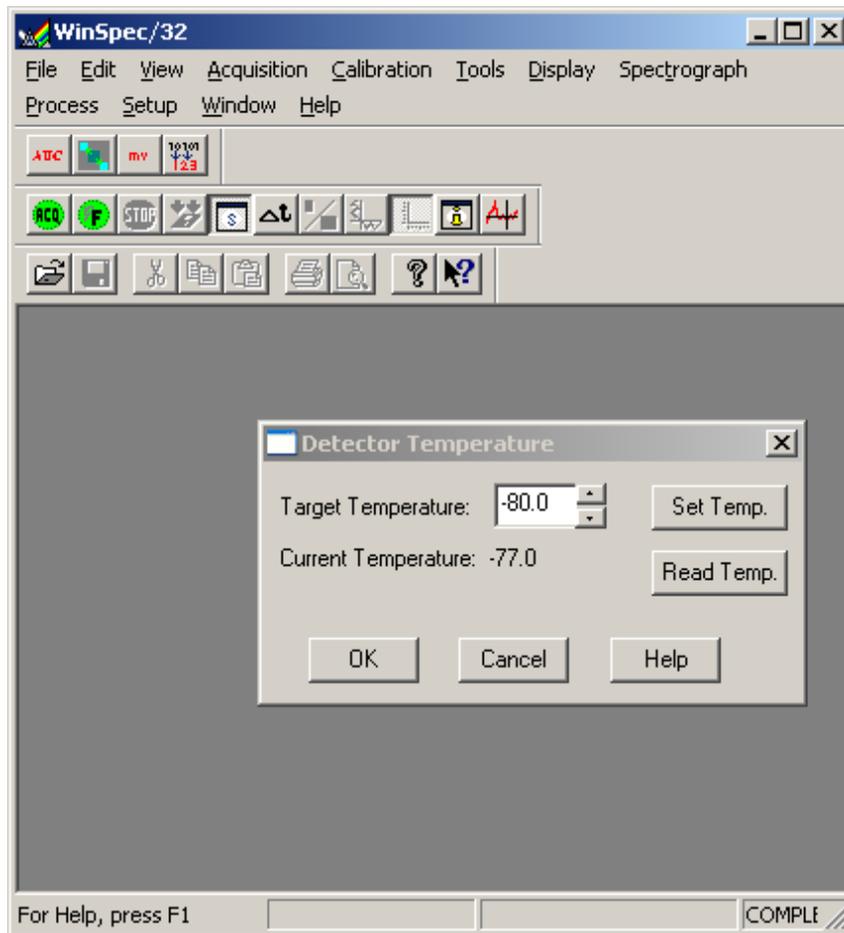
- 1) Wear safety goggles
- 2) Make sure the curtains are properly positioned and interlocked. Check red lights on the **Cover Limit Switches** box (see picture), they shall be off when the curtains are properly closed.
- 3) Press the "**Laser1 ENABLE**" and "**Laser1 SHUTTER ENABLE**" buttons on the optimate panel

Turn on the laser

- 1) Turn on the key of the laser power supply (located behind the laser table) in the "**on**" position
- 2) Make sure the cooling water supply and return of the **Neslab** cooler are open, then start the Neslab cooler by turning the switch on the front panel into "**On**" position. Cooling will start automatically in few minutes.
- 3) Turn the laser on by means of the **laser remote control** box located on the computer desk. Adjust the laser power if necessary

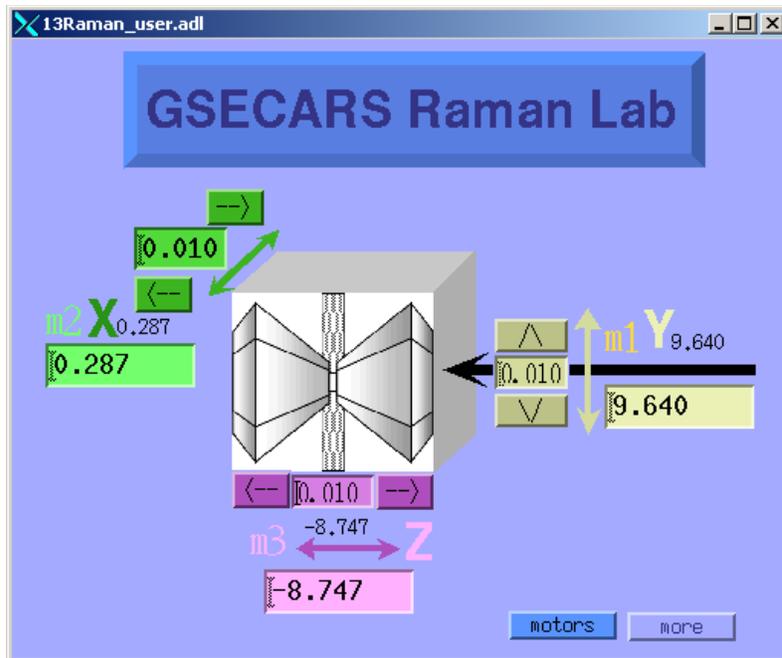
Detector cooling

- 1) The detector is cooled by means of a liquid nitrogen (LN) container located on the laser table, the container has to be manually refilled every ~20 hours
- 2) Check the detector temperature by opening **WinSpec32**, then choosing **Setup/Detector Temperature**. The status of the properly cooled detector shall be "**Current Temperature: Locked**". If the temperature is not locked, check whether the detector has been filled with LN and refill if necessary. Wait for half an hour until the temperature is locked. You can manually set the temperature to the desired level by changing the **Target Temperature**.



Positioning the sample

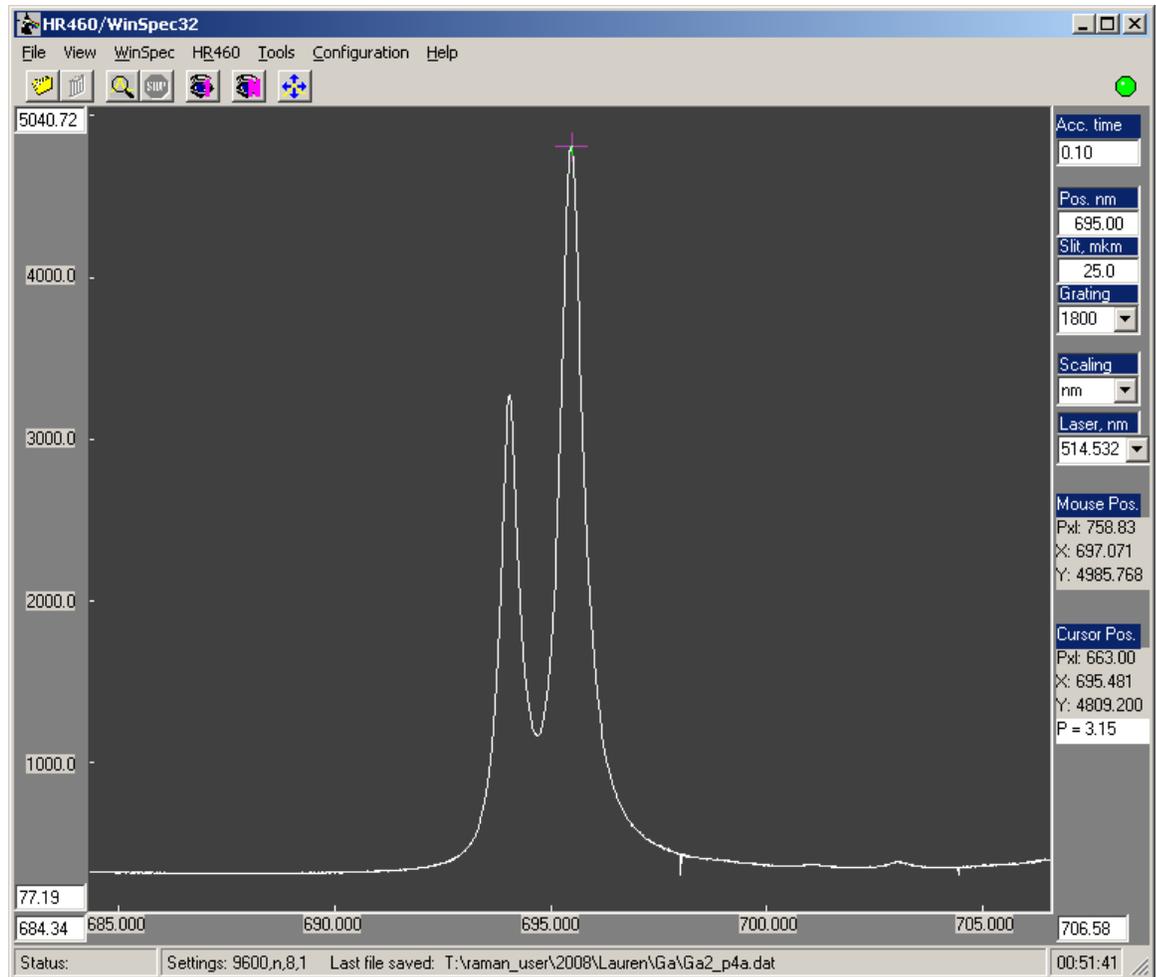
- a. Mount the sample on a standard BKL-4 holder and mount it on the sample stage in the Raman table
- b. Turn the light on with the **light remote control** on the computer table
- c. Turn on the **Remote Shutter Control** of the optical table (red button on the right corner)
- d. Make sure the **Camera** switch is **On** and **Slit** switch is **Off**.
- e. Insert the **unzoom mirror**, a low magnification image is shown on the video on top of the laser table
- f. Search for the sample position and bring into focus operating the sample stage motor through the EPICS control window



- g. Take the **unzoom mirror** out using the **Remote Shutter Control**, and insert the **zoom mirror**, a large magnification image will appear on the left side video on the desk, center your ruby or the sample on the crosshair position
- h. Flip the switch for the **Slit** into **On** position. Check if the slit is in the right position, i.e. your ruby is seen through the slit. If not, contact a beamline scientist.
- i. Take the **zoom mirror** out, **turn the light off!**

Collect spectra

1. Close the table enclosure, the three green lights on the optimate panel are on, red lights on **Cover Limit Switches** box are **off**.
2. Open the laser shutter using the **Remote Shutter Control** (!! if this is done with the enclosure open, an alarm will sound. Close the shutter, and on the wall panel press **Reset Faults** and **Laser 1 Shutter Enable** buttons)
3. Switch the **Camera** into **Off** position.
4. Insert the filters, if necessary, using the **Remote Shutter Control**
5. Double click on the **Wizspec32** icon on the desktop, the following window will open



6. Set the desired **acquisition time**
7. The 698 nm **position** is fine for ruby fluorescence measurement at low pressure, increase the value at large pressures appropriately
8. Check the **grating**. It shall be 1800 or 1200 grating.
9. Choose the appropriate **scaling** (in nm, cm^{-1} , or relative cm^{-1}).



10. Click on the  or the  icon to collect one spectrum or an average of N spectra respectively.
11. If there is no signal, check whether you have followed all the instructions correctly. If yes, contact beamline scientist, otherwise re-do everything according to these instructions

Good luck!!