# Horiba Photoluminescence and Raman Operating Procedures

Book and begin an iLabs session before using this instrument.

## Raman

1. Start Software (LabSpec6). Make sure in Acquisition Setting that the exit mirror is in CCD (steady state).

2. Press video camera button for live view of microscope (video acquisition)

3. Focus sample at lowest objective (10x) in brightfield mode. Make sure the Olympus lamp is on & light intensity isn't set to zero.

4. Focus sample at 50x, then at 100x. Need to use highest objective because Raman scattering is a weak signal.

5. Turn on laser (785nm). Mirror 1 down. Key to on position. **ONLY THE 785 NM LASER CAN BE USED FOR RAMAN SPECTROSCOPY**

6. Turn filter and knobs to allow laser through objectives. (Filter wheel set to "1 Spectroscopy/Signal", filter knob pulled to 785 Filter Set (II position), Method knob set to laser viewing (II position), pull knob on back of scope to I position(laser).

7. Select 785 Laser switch position. This opens the gates on the laser train, so the laser should be shown on the screen

8. DO NOT Focus the laser to the smallest spot size using video camera and Z focusing joystick. Keep the laser spot size as is.

9. Stop video camera, move method knob to "Spectroscopy" (III position).

10. In Acquisition tab, select "50x objective" and "785nm laser" under instrument setup submenu.

11. In display tab, set frequency to "cm^-1" for Raman scattering display.

12. In Acquisition tab, under Acquisition parameters submenu, set range to whatever you want, then click the radio button to make it active. Do not worry about Spectro. Other acquisition parameters control the signal and cleanliness of the recorded spectra.

13. To acquire spectrum, hit the circle button.

14. Data can be processed in LabSpec6. For a basic background subtract, go to Processing tab and "Baseline Correct" submenu. Press the "Fit" button to apply a fit, confirm the fit, then press "Sub" to subtract the background.

15. Save data as labspec6 file to keep all the metadata, or as a ".txt" file for plotting in an external program. Any data saved outside of this directory will be deleted. C:\Data\yournamehere\

16. To find peak value (cm-^-1), go to left screen and select "Add/remove/edit peak" and select peak.

17. Right click the value and select remove to remove peak.

18. If all fails, restart software.

# Photoluminescence

**633NM AND 532NM CANNOT BE USED FOR RAMAN. ONLY FOR PHOTOLUMINESCENCE!**

For 633nm and 532 nm:

1. Start Software (LabSpec6).
2. Press video camera button for live view of microscope (video acquisition).
3. There is a knob near eye piece lens, pull knob all the way out to camera option.
4. Focus sample at lowest objective (10x) in brightfield mode. Make sure the Olympus lamp is on & light intensity isn't set to zero.
5. Focus sample at 50x, then at 100x. Need to use highest objective because Raman scattering is a weak signal.
6. Before changing laser heads, make sure the power source is turned off.
7. Turn on desired laser. Make sure the plug on the back is properly plugged in and it is for the correct laser. Make sure the switch for the middle console is turned to on (back side). Turn the key to the

on position (3 o'clock). Make sure it is the correct key. It is the middle console/controller. Go to the lasers and make sure it has a light on beside "on" and "ready".

8. Turn the mirrors to the correct positions for the desired laser.
9. Turn filter and knobs to allow laser through objectives. (Filter wheel set to "1 Spectroscopy/Signal", filter knob pulled to 647 nm filter set for 633nm laser (III position) or pulled to 50/50 Beam splitter (IIII position) for 532nm laser. Method knob set to laser viewing (II position), pull knob on back of scope (on blue box) to I position (laser).
10. Keep the laser spot size as is (pink dot is for 633nm, green dot is for 532nm).**DO NOT Focus the laser to the smallest spot size** using the video camera and Z focusing joystick.
11. Stop video camera, move method knob to "Spectroscopy" (III position).
12. In display tab, set frequency to "cm^-1" for Raman scattering display.
13. In Acquisition tab, go to Instrument setup and select your laser 633 (or 532) nm laser. Make sure the objective is at x100 and grating is at 1200.
14. In Acquisition tab, under Acquisition parameters submenu, set range to whatever you want, then click the radio button to make it active.
15. Press the circle to take data.

**Sometimes changing the grating may crash the software. If this happens, STOP ALL and reset the program and hope that it doesn't crash again.**

# Line/Point Map Scan

Set up your sample/laser according to the instructions above.

1. Go to Brightfield mode and start video acquisition. On left side of screen there are multiple options: horz line map, vert line map, diag line map, points map.

2. Select whichever map scan is desired.

3. Under "Acquisition" in "Map", change "Size" to how many points you want on your line map scan or the "Step" (aka step size) for each point (this will also change the size).

4. In Maps, you can change where you want to have your line scan by dragging/moving the line.

5. For points map, click at wherever is needed.

6. Go to laser viewing mode to focus laser. Go to Spectroscopy.

7. Click Start Map Acquisition (circle with grid).

8. Click on the Raman spectroscopy (the window will be highlighted with a blue outline) and click save as. Save as lab spec 6 and .txt file.

9. Make sure to click STOP ALL before exiting the software and turn off the lamp source/laser source before finishing up your session.