ThermoFisher SCIENTIFIC

The world leader in serving science

Introduction to Atlμs Software

DXR User Training

Overview

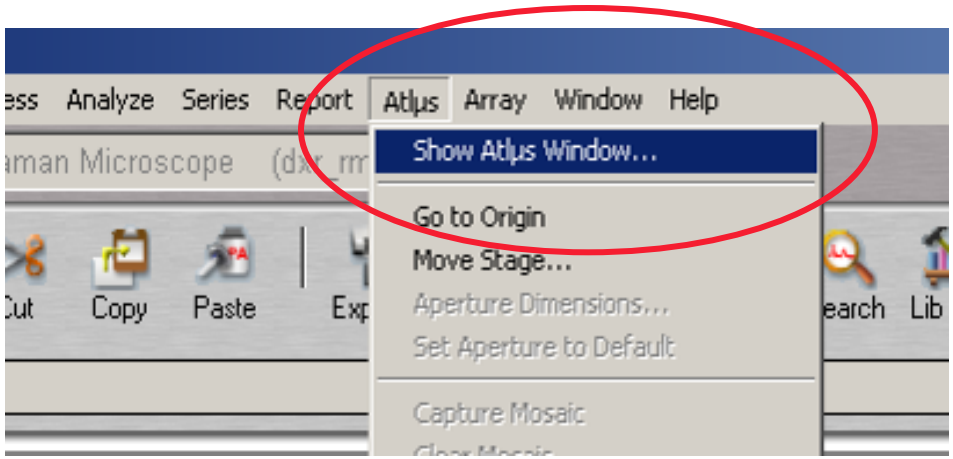
- Introduction to Atlμs
  - Mapping software for OMNIC – display, collect, and analyze maps
- Atlμs window
  - Shows microscope video images of sample
- Data Collection
  - Adds a tab to Experiment Set-up to control mapping collection
- Data Display
  - For viewing, and then analyzing collected data, in many formats
- Analysis
  - Starts with looking at individual points, to correlation, and chemigrams
- Advanced Analysis
  - Very powerful features

Introduction to Atlμs

- What is Atlμs?
  - Mapping software for OMNIC
- What do I need?
  - A motorized microscope stage and a video camera
- What can Atlμs do?
  - From individual points to two-dimensional maps, to depth profiling
- How do I use Atlμs?
  - Start with the Atlμs window, and we'll go from there
- Where do I get help with Atlμs?
  - Robust Help information in software
  - C:\Program Files\OMNIC\pdf – folder with user manuals and guides

Atlμs Window

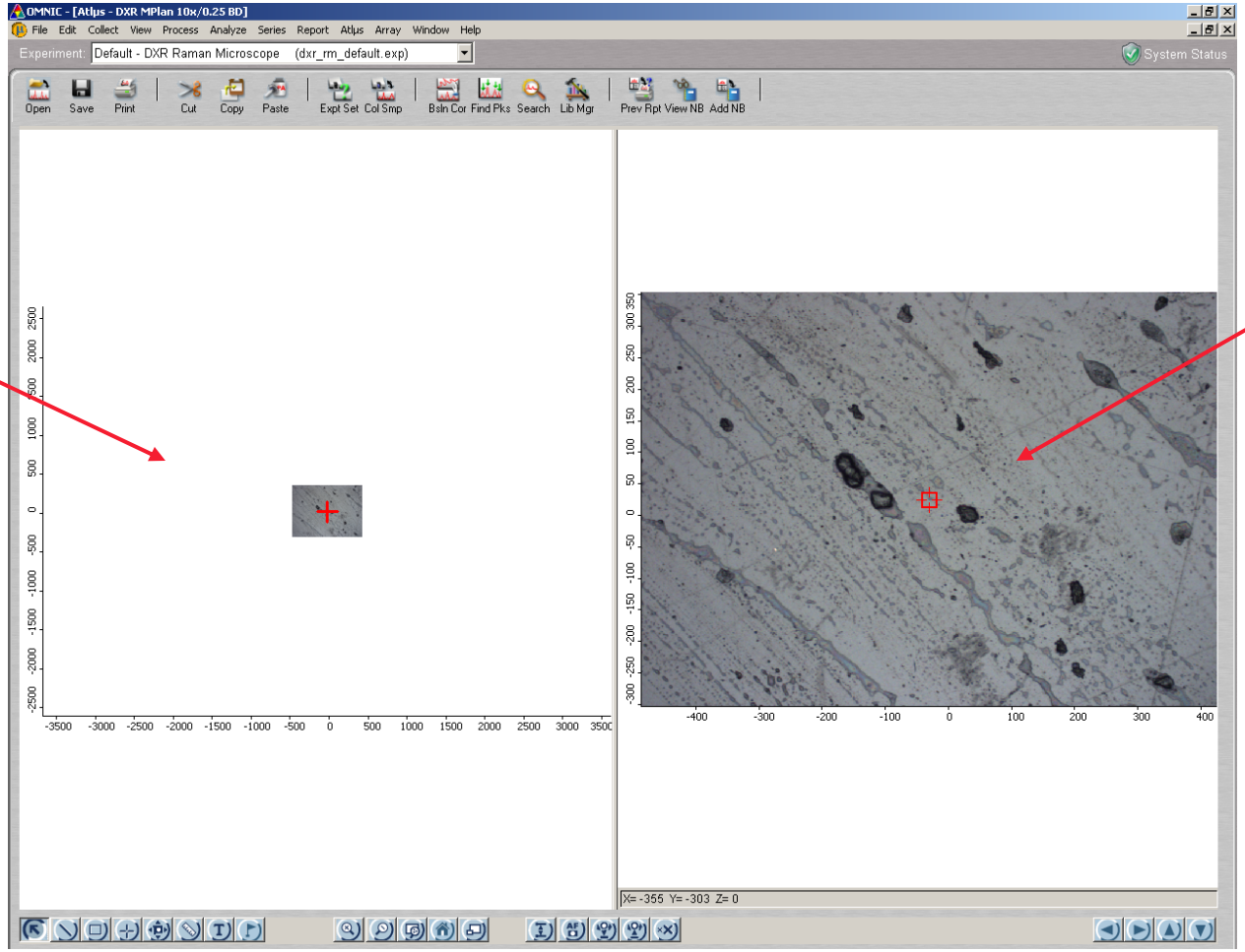
- To open the Atlμs window:
  - Open OMNIC
  - Atlμs is on the main menu bar
  - Open the menu and click on Show Atlμs Window…



ThermoFisher SCIENTIFIC

Atlμs Window

- The main Atlμs window



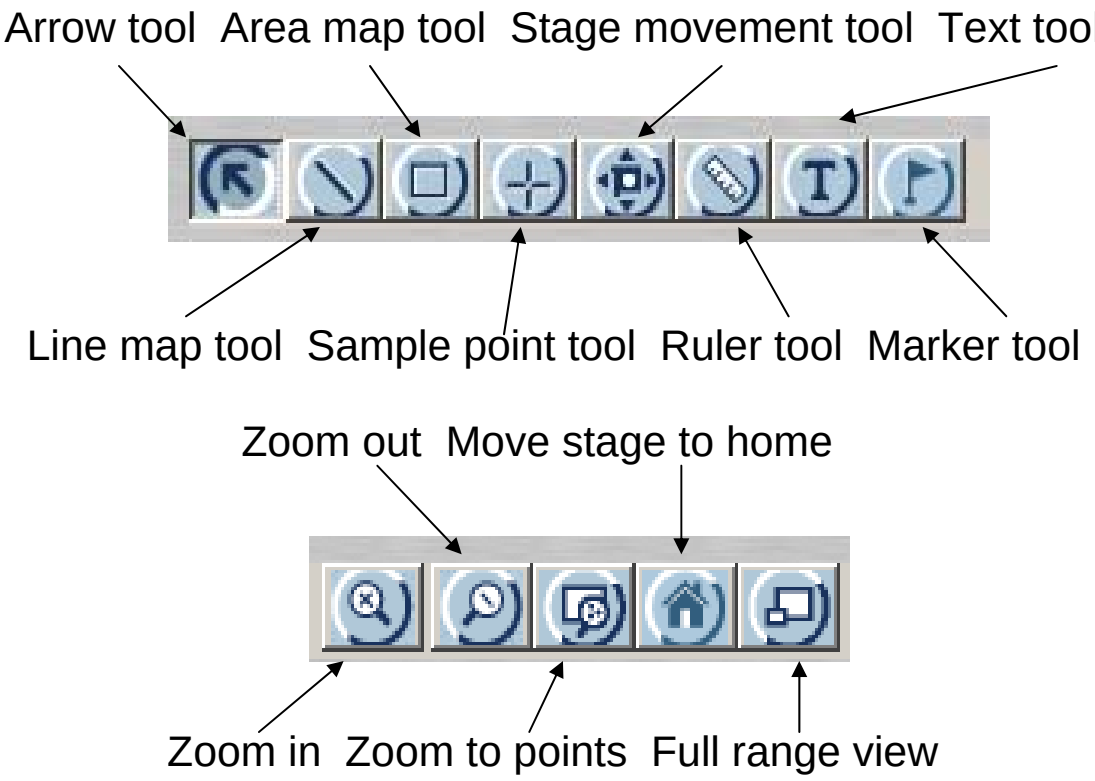
Zoom or mosaic window

Live window

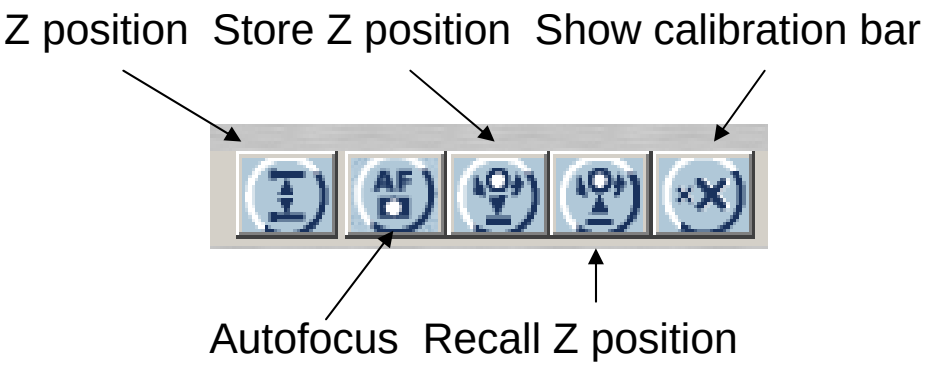
ThermoFisher SCIENTIFIC

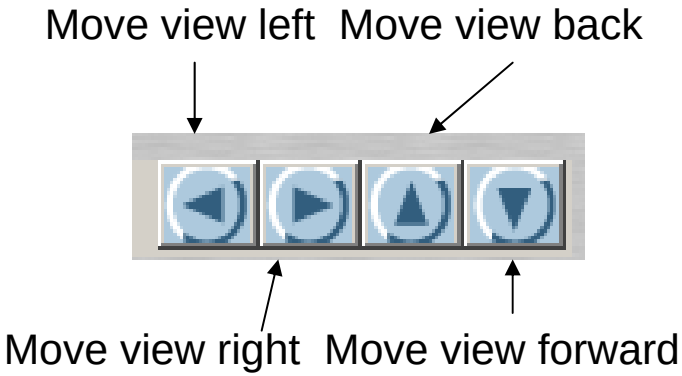
Atlμs window

- Toolbar on bottom of Atlμs window



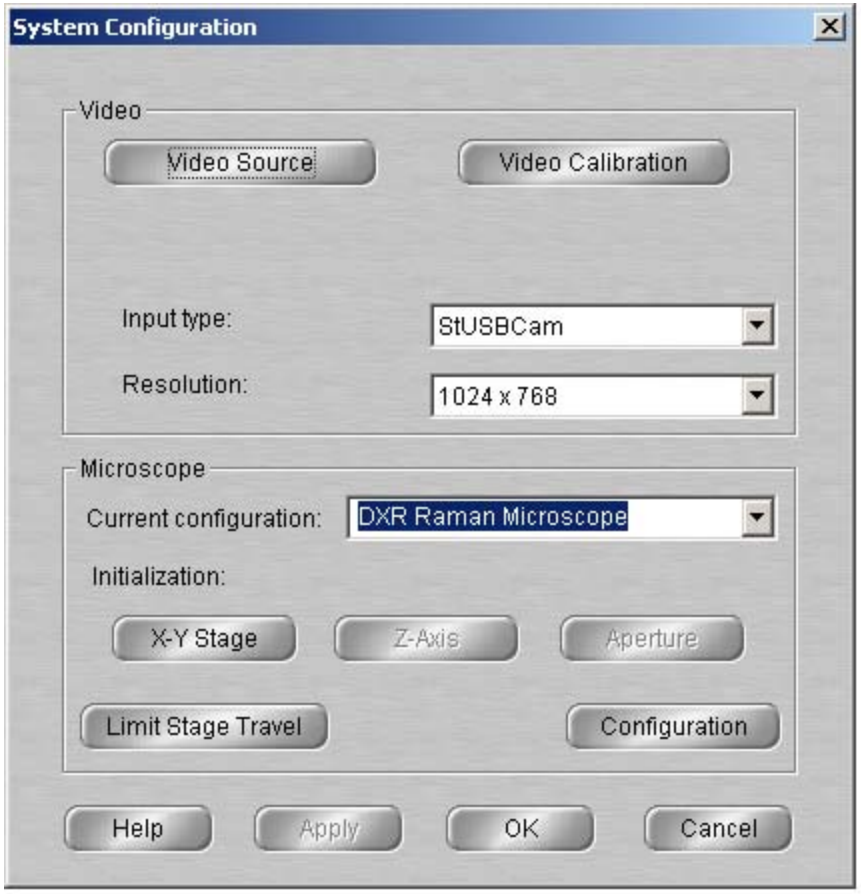
Atlμs window





Atlμs Configuration

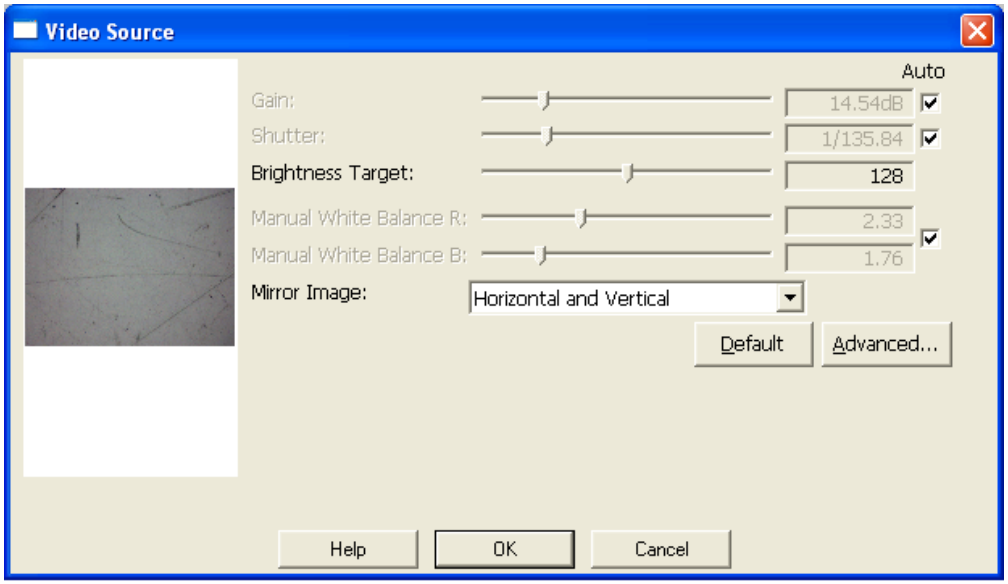
- System configuration

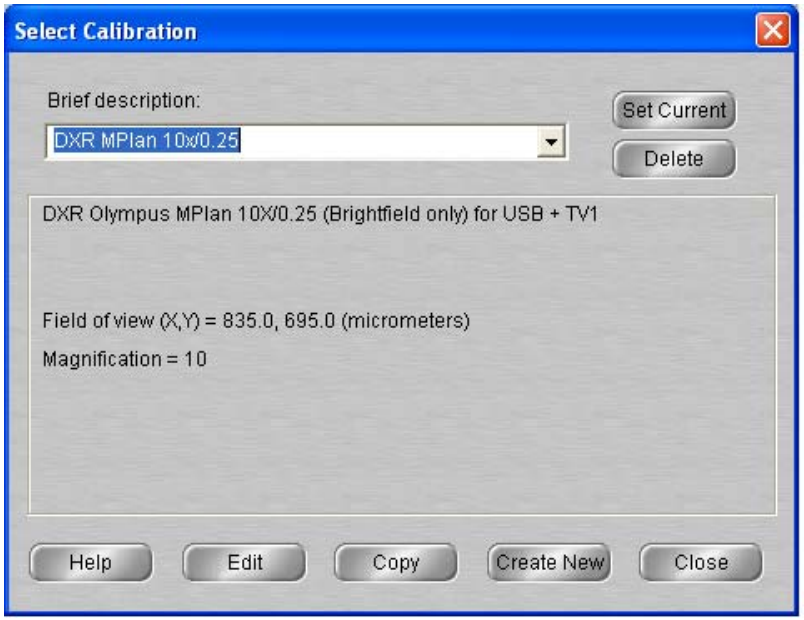


ThermoFisher SCIENTIFIC

Atlμs Configuration

- Video Source

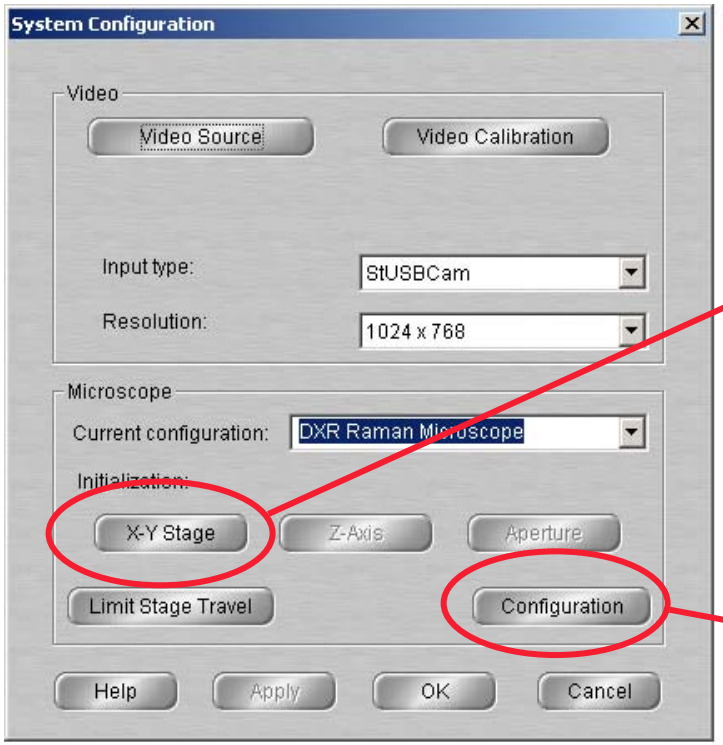


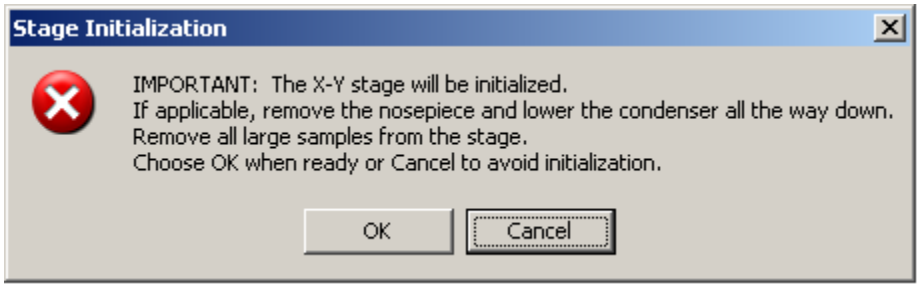


- Video Calibration

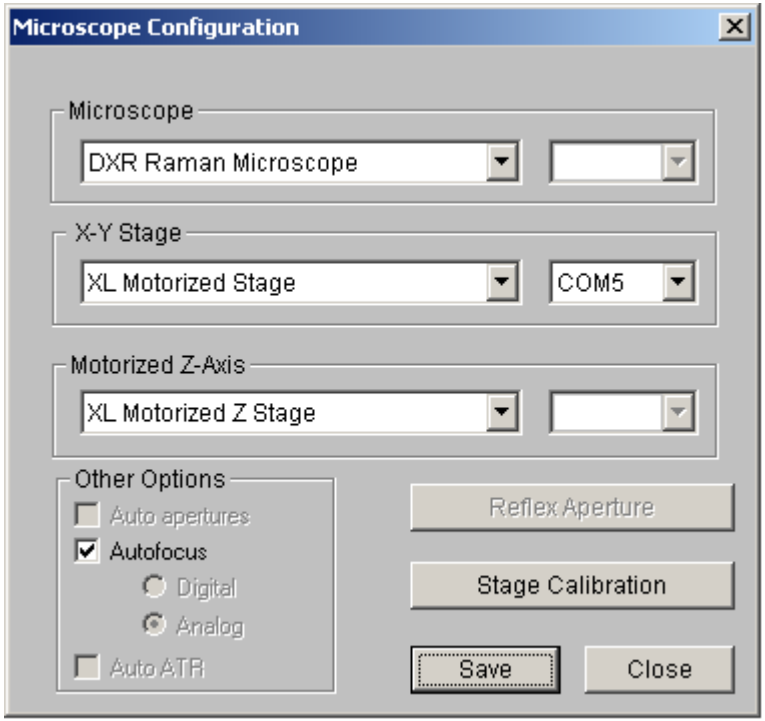
ThermoFisher SCIENTIFIC

Atlμs Configuration





Stage Initialization



Microscope Configuration

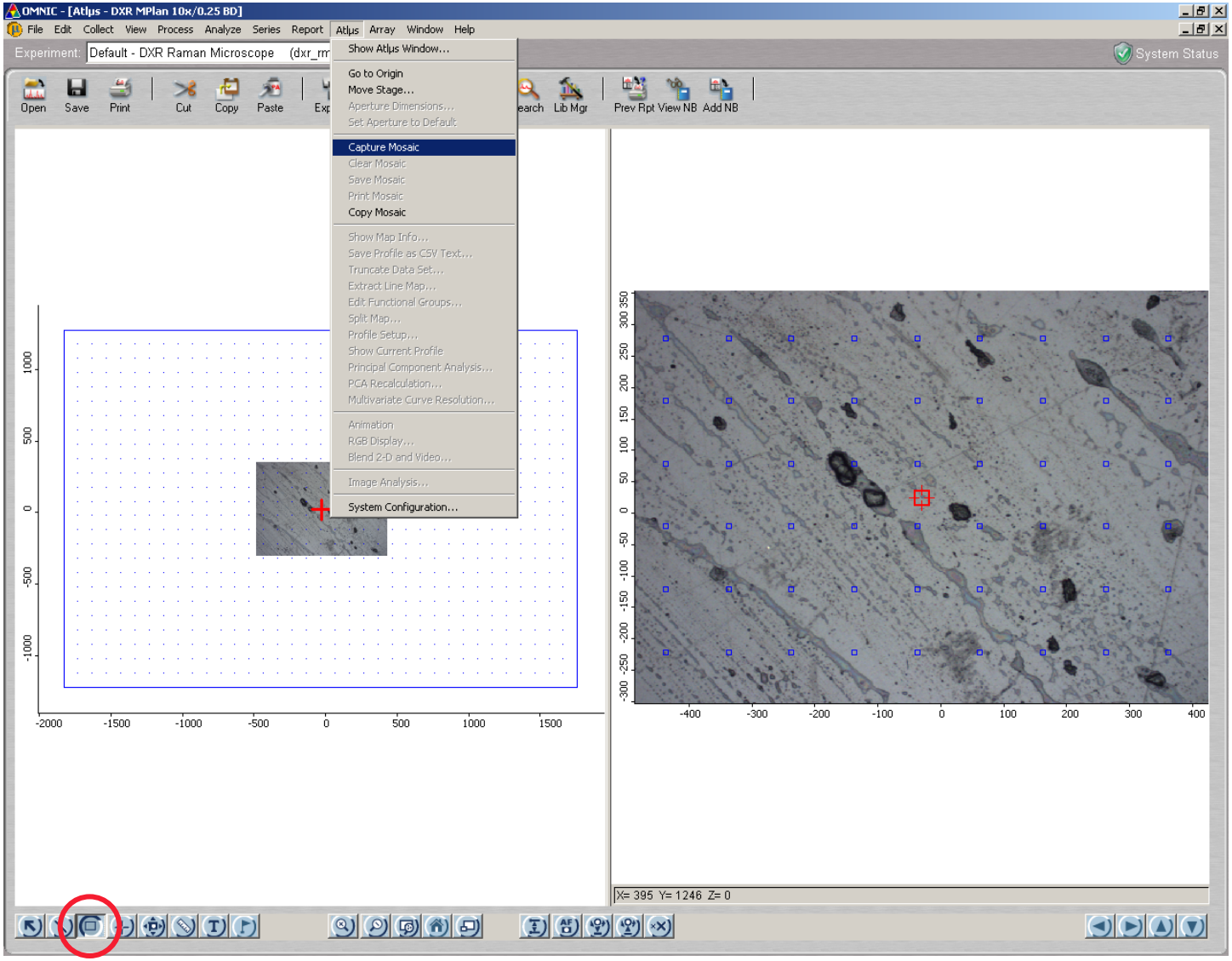
ThermoFisher SCIENTIFIC

Mosaics

- Mosaic
  - Multiple video images of the sample area are collected and pieced together for a larger view of the sample area.

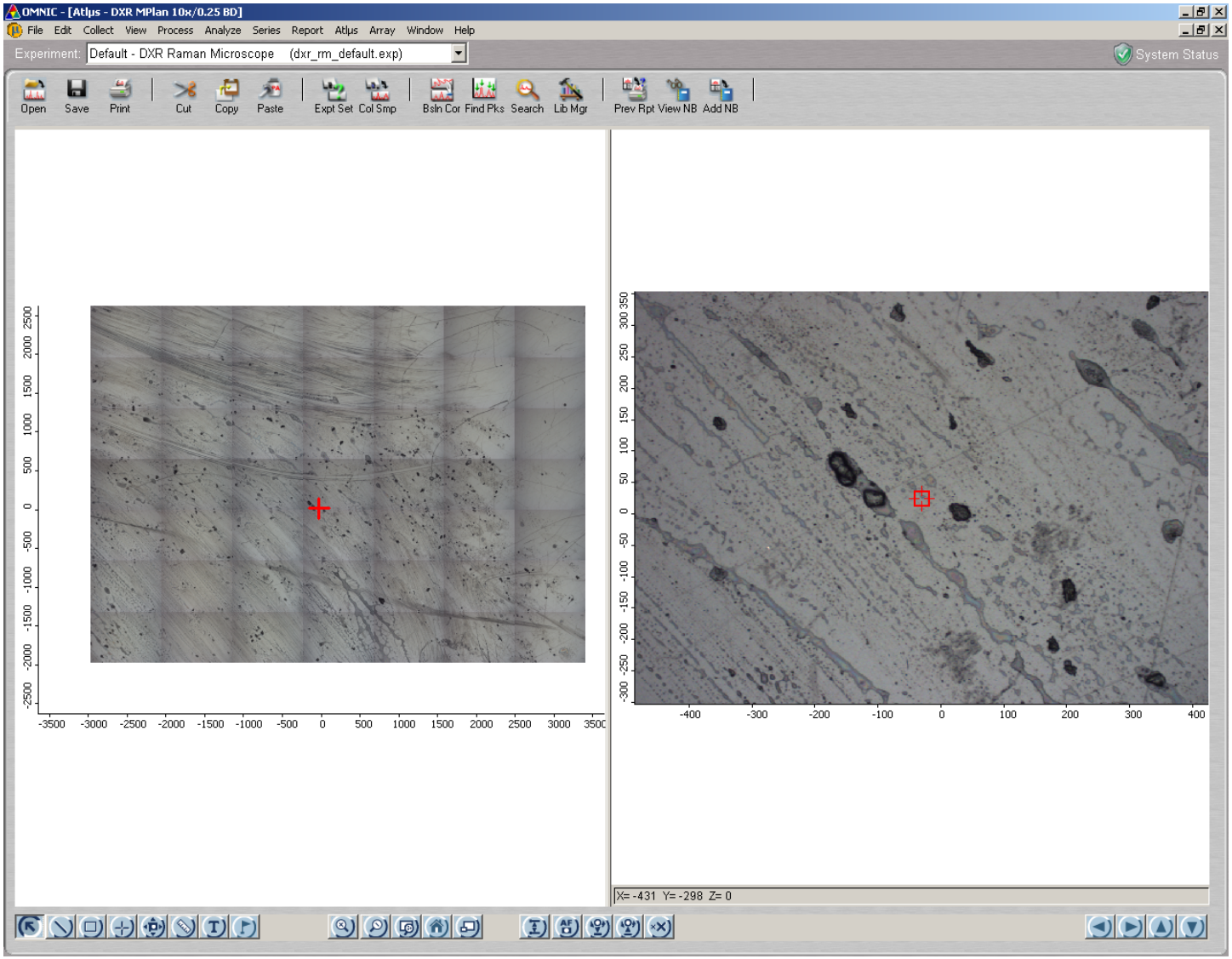
- Capturing a Mosaic
  - Select area that you want a mosaic of, using the Area Map tool from the toolbar at the bottom of the Atlus screen.
  - Go to Capture Mosaic in the Atlus Menu
  - The stage will move and capture the video images and assemble the mosaic
    - You can have the system do a visual autofocus on each frame.
  - You can save the Mosaic – Save Mosaic on Atlus menu, right below Capture Mosaic

Capturing a Mosaic



ThermoFisher SCIENTIFIC

Captured Mosaic



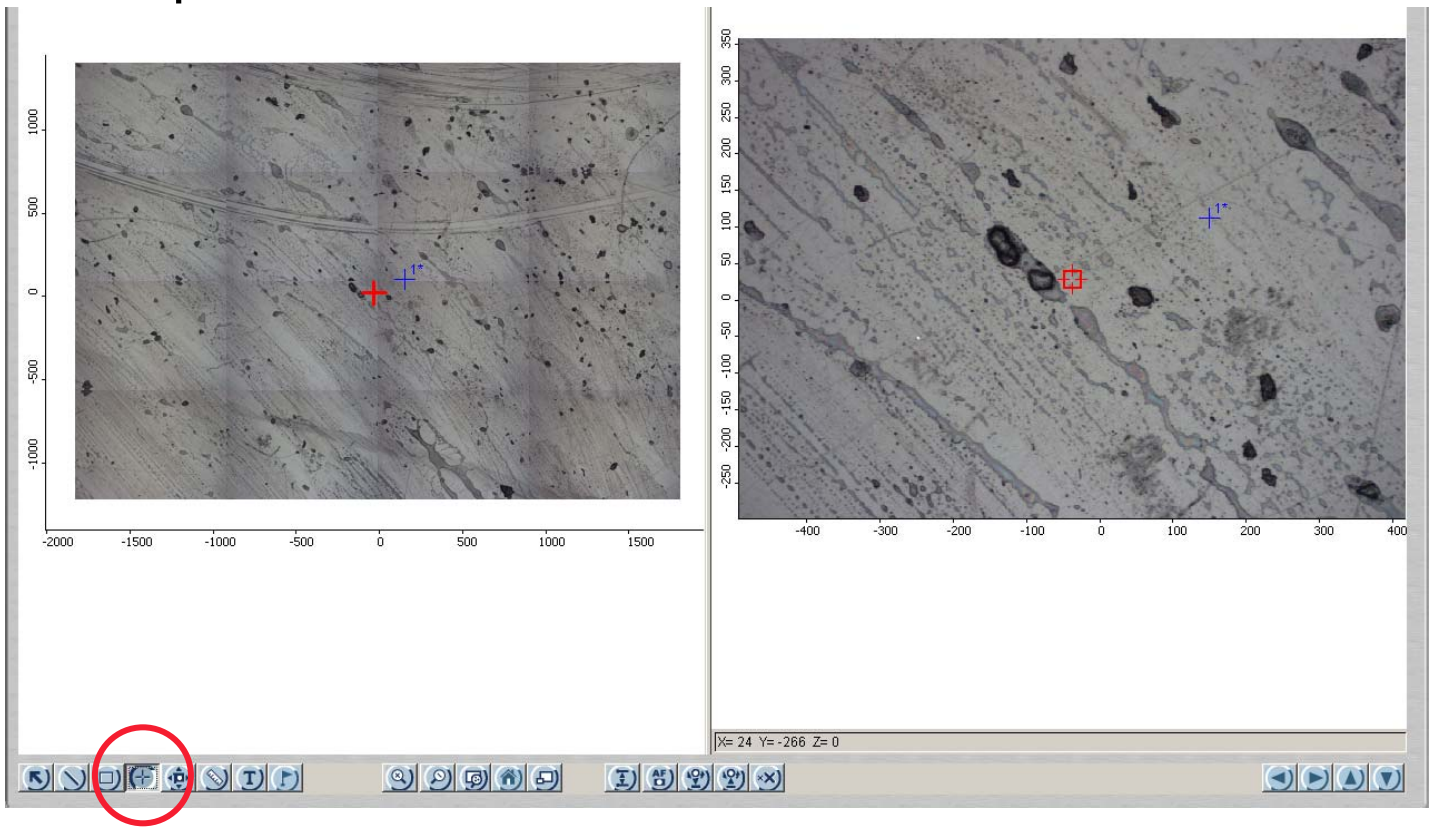
ThermoFisher SCIENTIFIC

Collecting Data

- Mapping options
  - Single Point
  - Multiple Point
  - Line
  - Depth Profile
  - Cross Section
  - Two Dimensional
- Start with sample on the stage
  - In focus
  - Mosaic collected if needed/wanted
- Select sample area(s)

Single Point

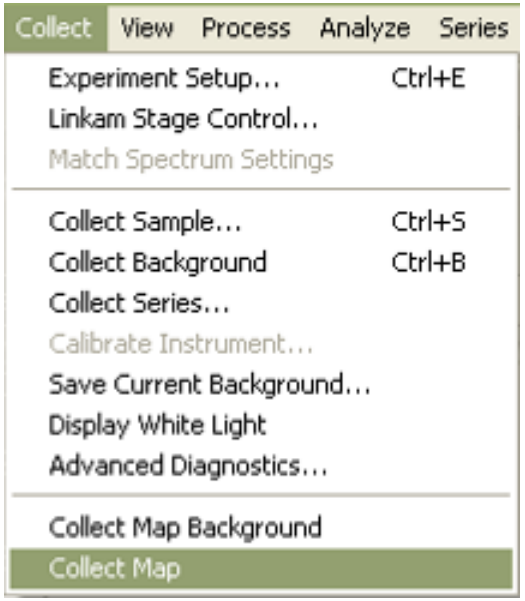
- Select point to be analyzed with Sample Point Tool
- Check collection parameters in Experiment Setup
- Collect sample

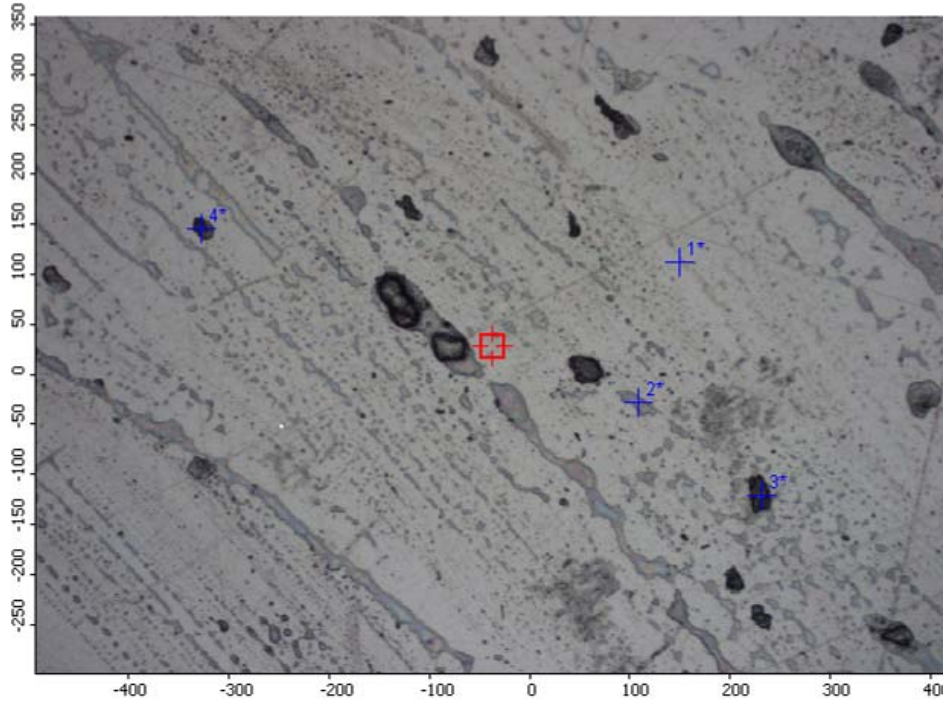


ThermoFisher SCIENTIFIC

Multiple Points

- Select the points to be analyzed, using the Sample Point Tool.
- Check Collection parameters
- On Collect menu on the main OMNIC menu bar
  - Click Collect Map option at bottom of menu

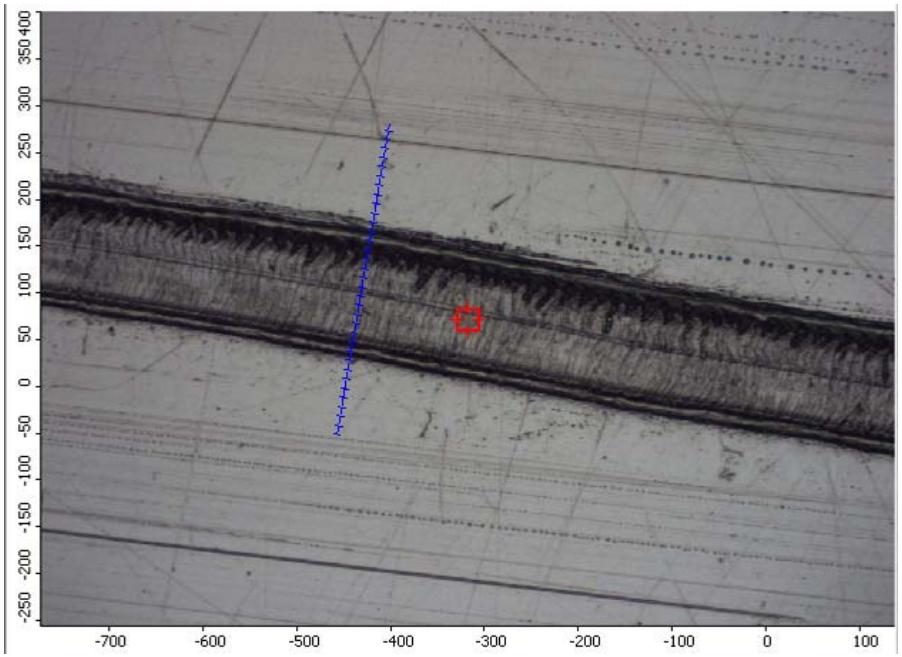


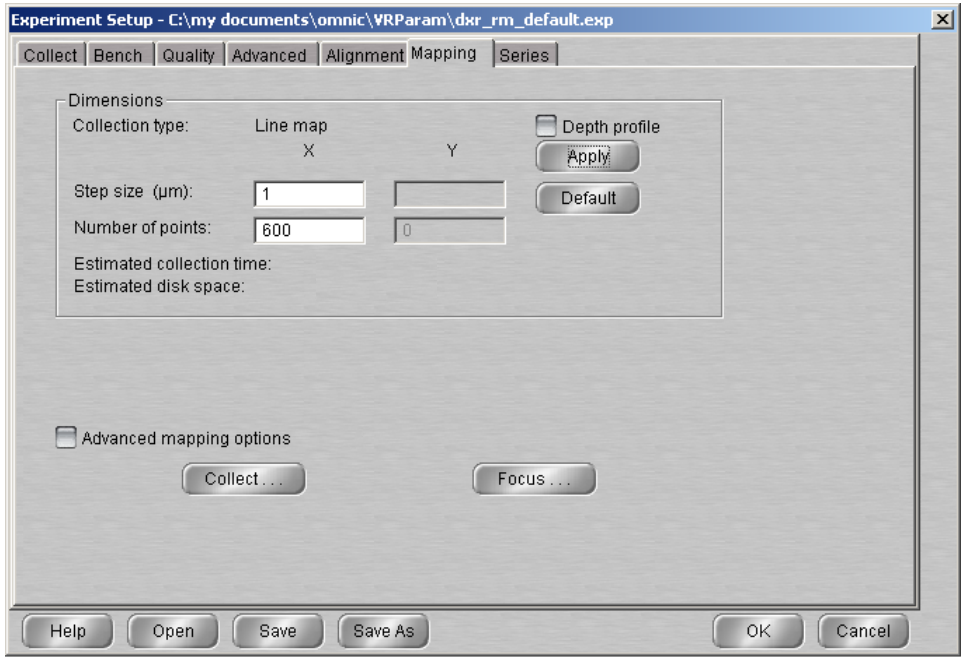


ThermoFisher SCIENTIFIC

Line maps

- Select the area that you want to map using the Line Map Tool
- Check collection parameters in Collect Tab of Experiment Setup
- Check parameters on the Mapping Tab in Experiment Setup
- Click on Collect Map

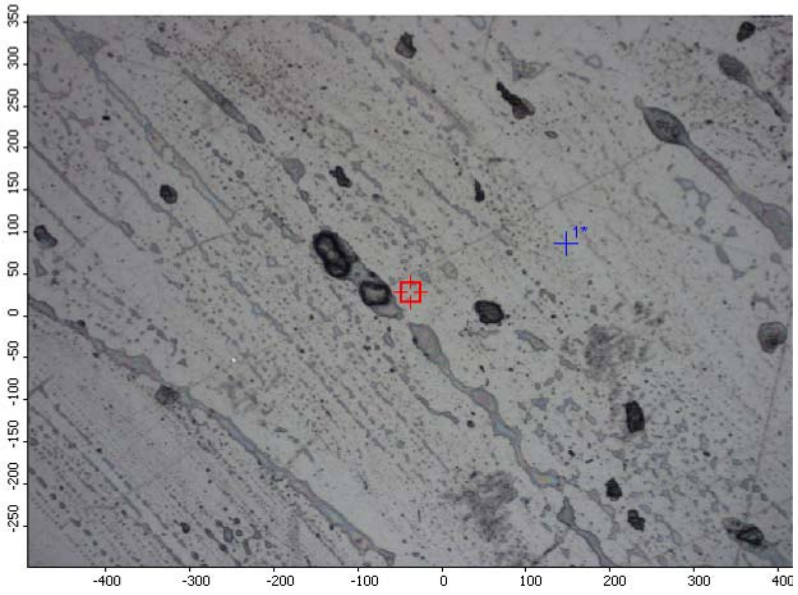


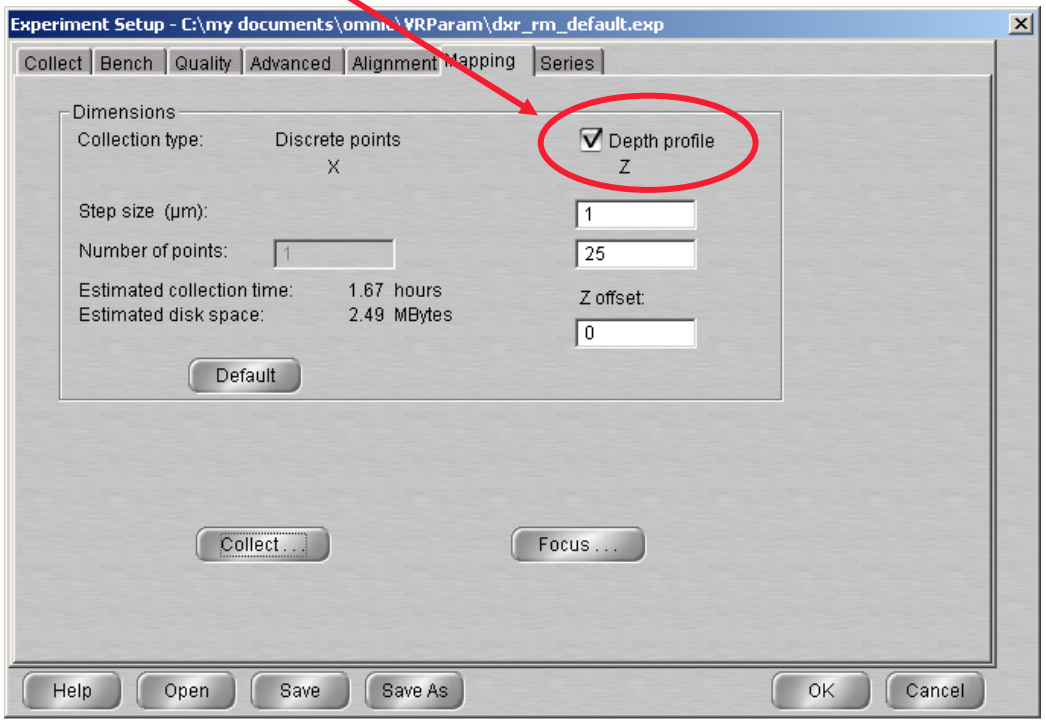


ThermoFisher SCIENTIFIC

Depth Profile

- Select point for the Depth Profile using Sample Point Tool
- Check Collection parameters
- Check parameters on Mapping tab
  - Make sure Depth Profile box is selected!
- Click Collect Map

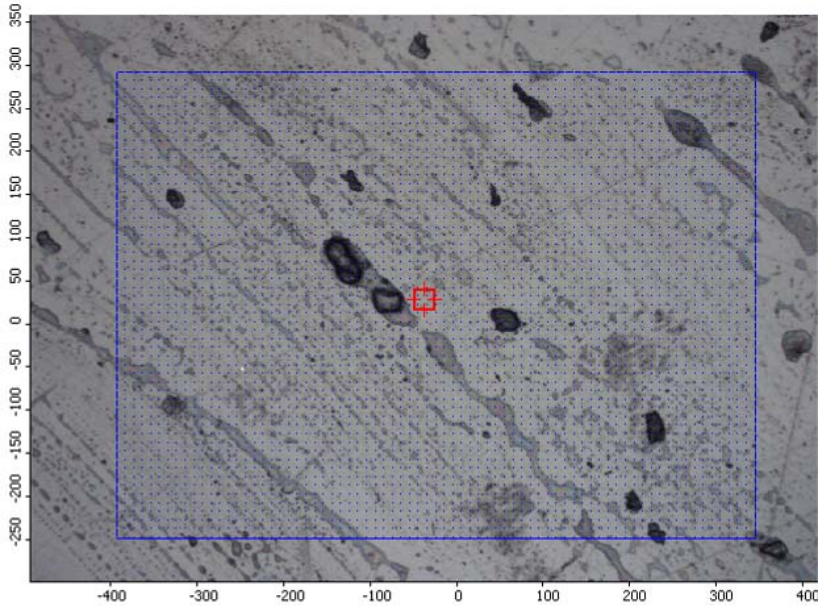


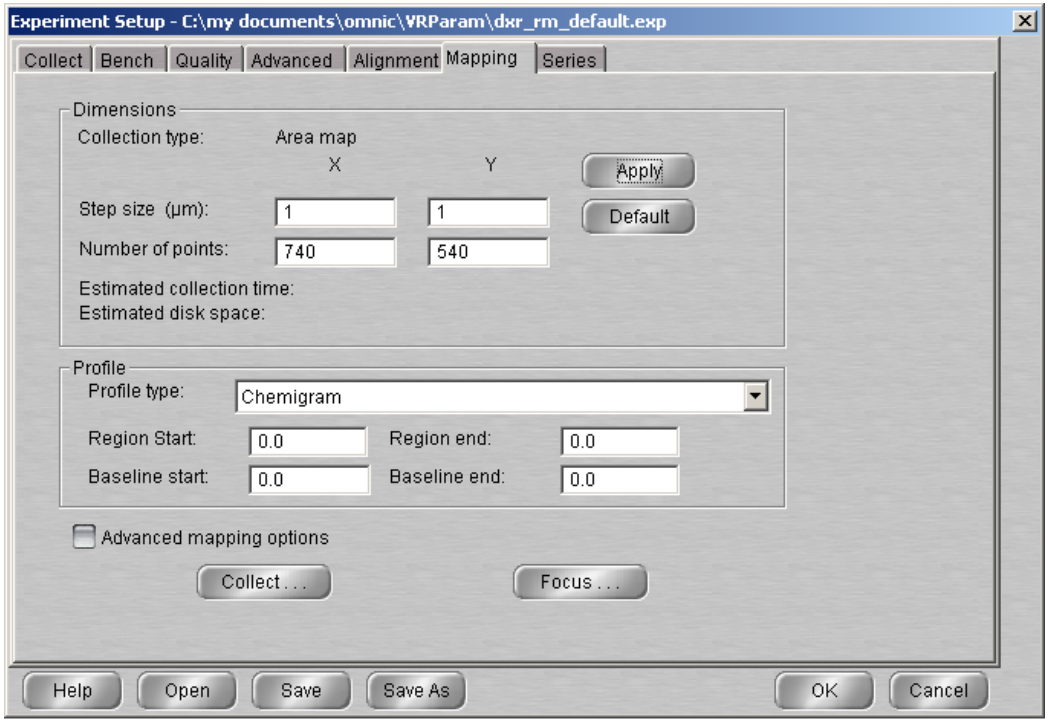


ThermoFisher SCIENTIFIC

Two Dimensional Mapping

- For a map of a surface – select area with Area Map Tool
- Check Collection parameters
- Check Mapping Parameters in Mapping tab
- Collect Map

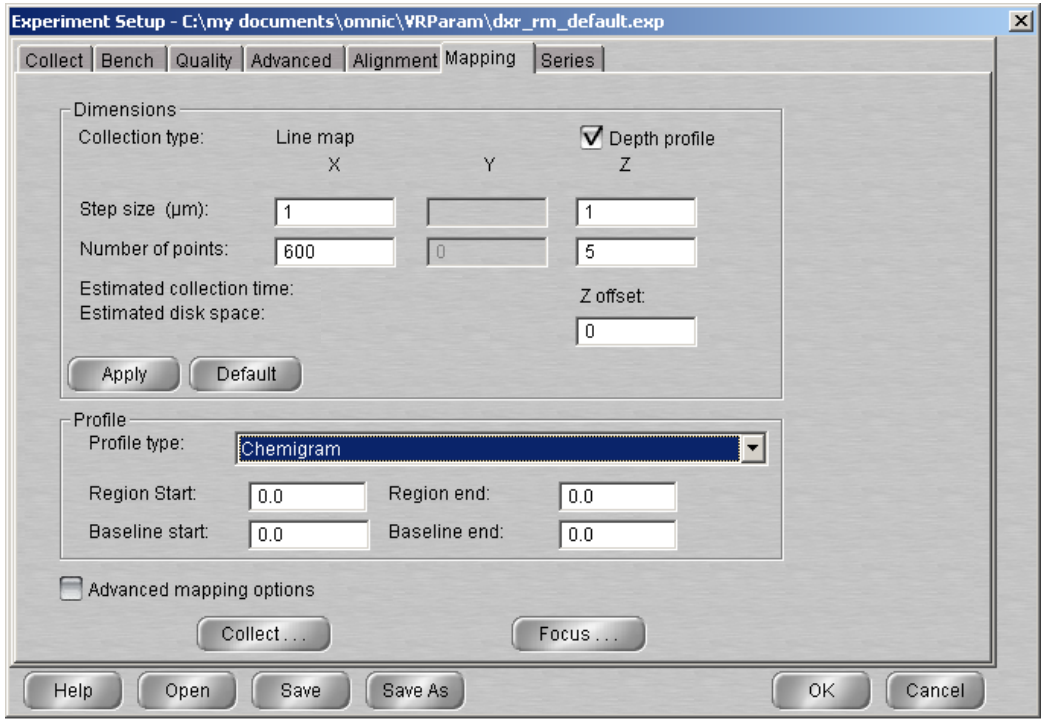




ThermoFisher SCIENTIFIC

Two Dimensional Mapping

- To capture a Cross section map
- Select line on surface of the sample using Line Map Tool
- Check Collection parameters
- In Mapping Tab – Check Depth Profile Box



ThermoFisher SCIENTIFIC

Data Display

- Data has been collected – now what?

- Can view map right after it is collected
- Or open a map file
  - Have to select the file type in the File > Open > Files of Type
    - Mapping Files (*.MAP) is near the bottom of the list

- General display elements
  - Chemigram – spectral map
  - Video image
  - Spectrum of selected point
  - 3D display of chemigram

Data Display

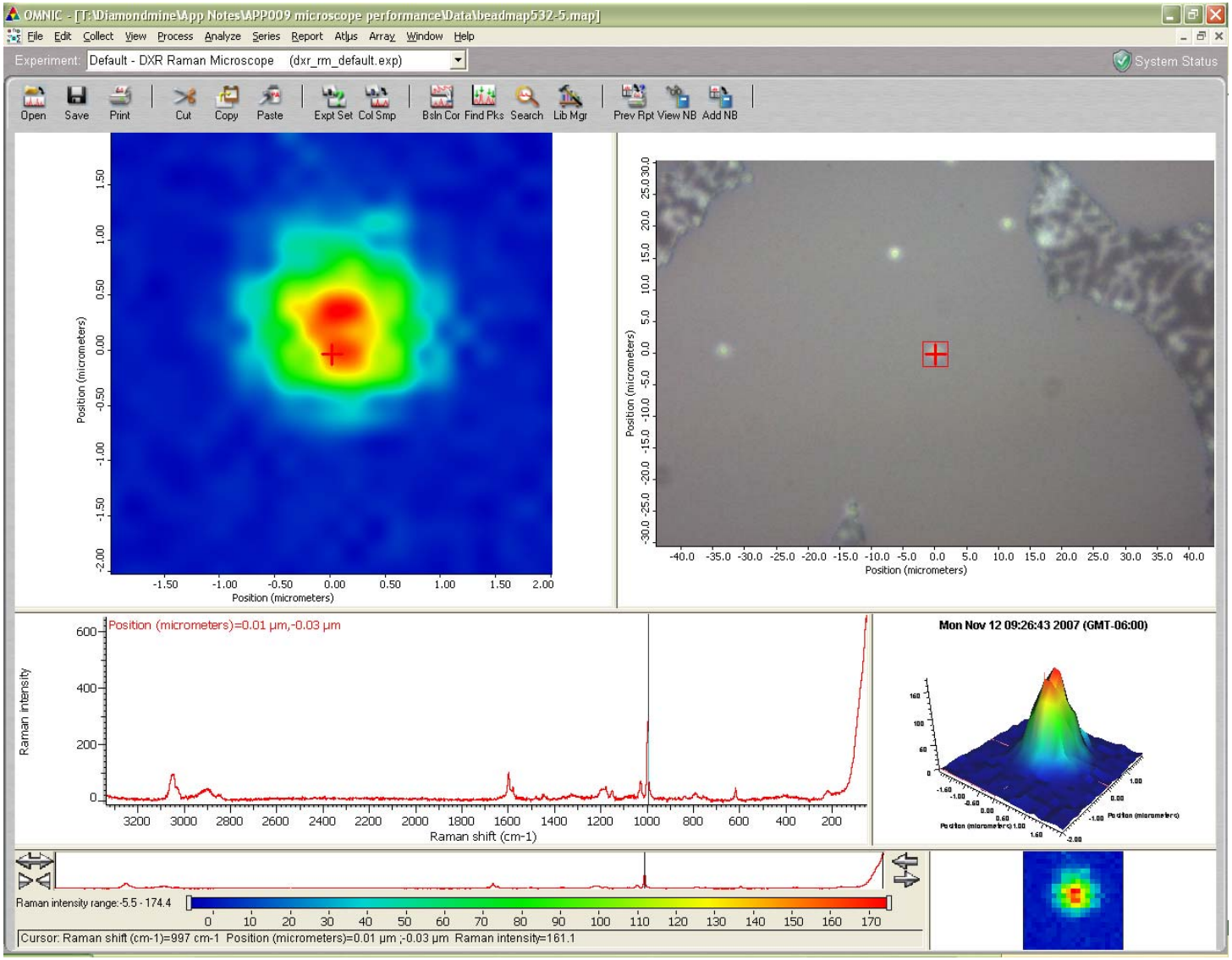
Chemigram

Video image

Spectrum at crosshairs

3D Display

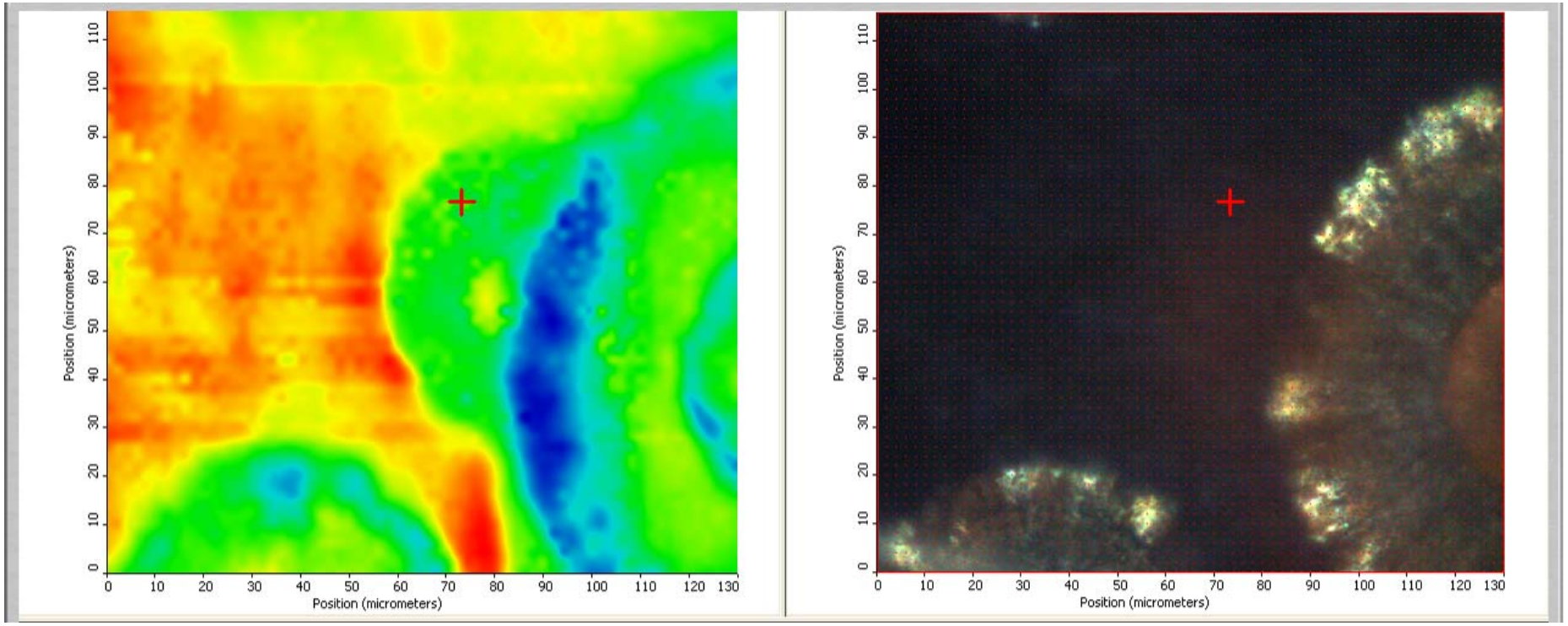
Intensity slider bar



ThermoFisher SCIENTIFIC

Data Display Options

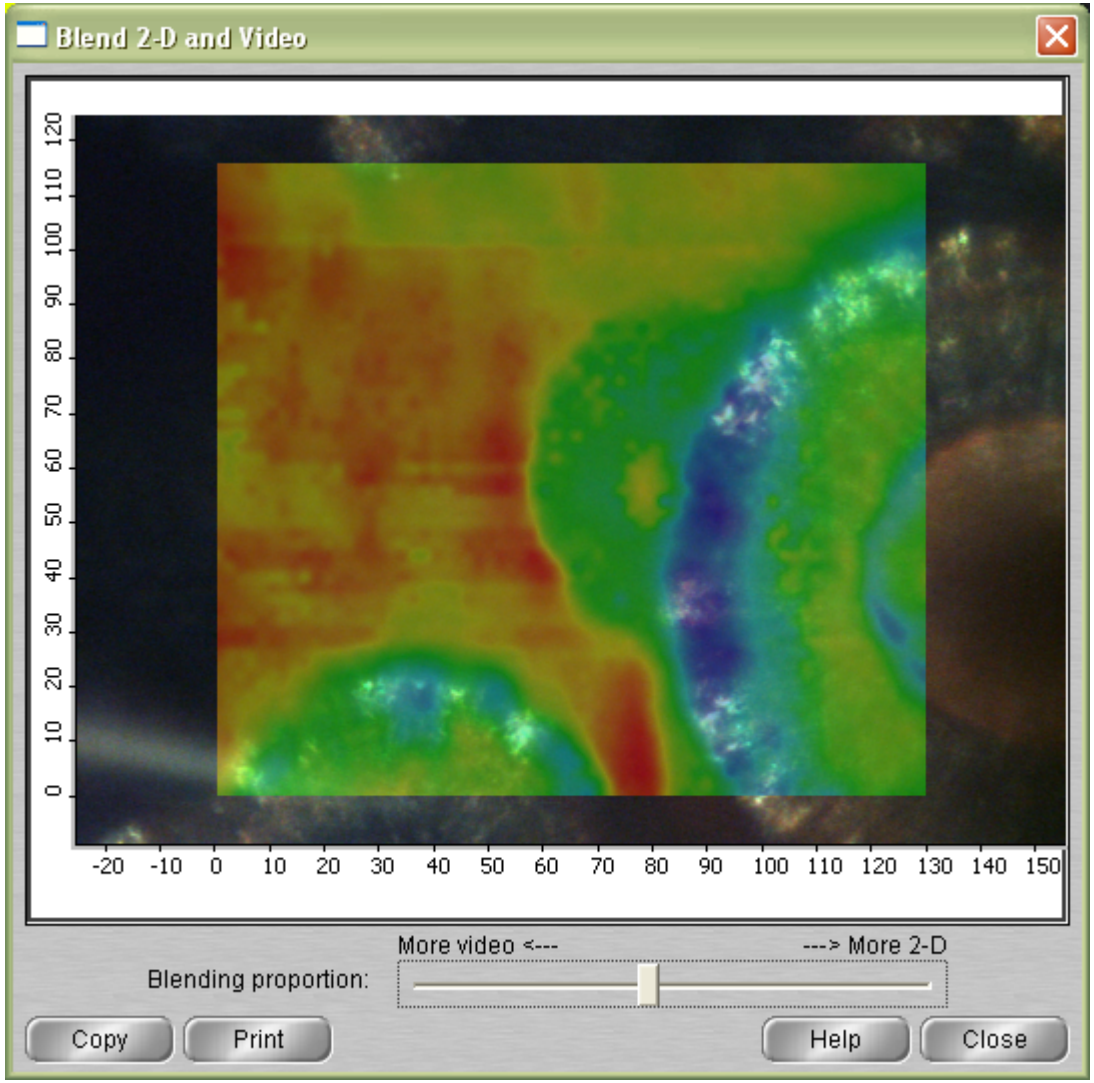
- Match Chemical Image Size – Video option
  - So that you can compare the video and chemical image to see if certain features match spectral features.



ThermoFisher SCIENTIFIC

Data Display Options

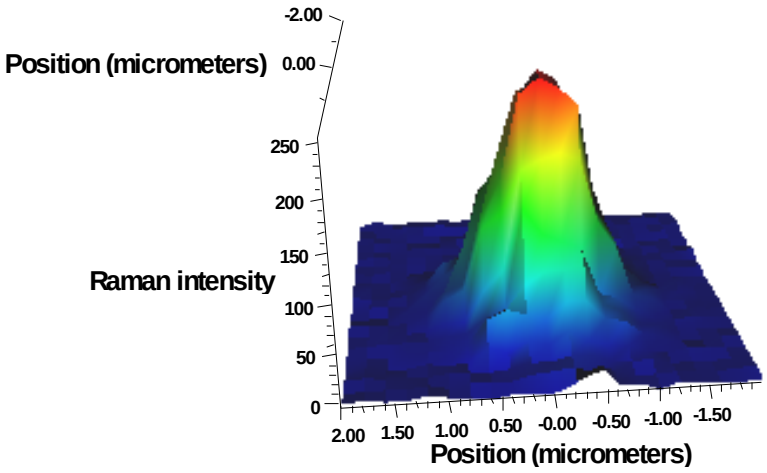
- Blend 2-D and Video
  - On Atlμs menu

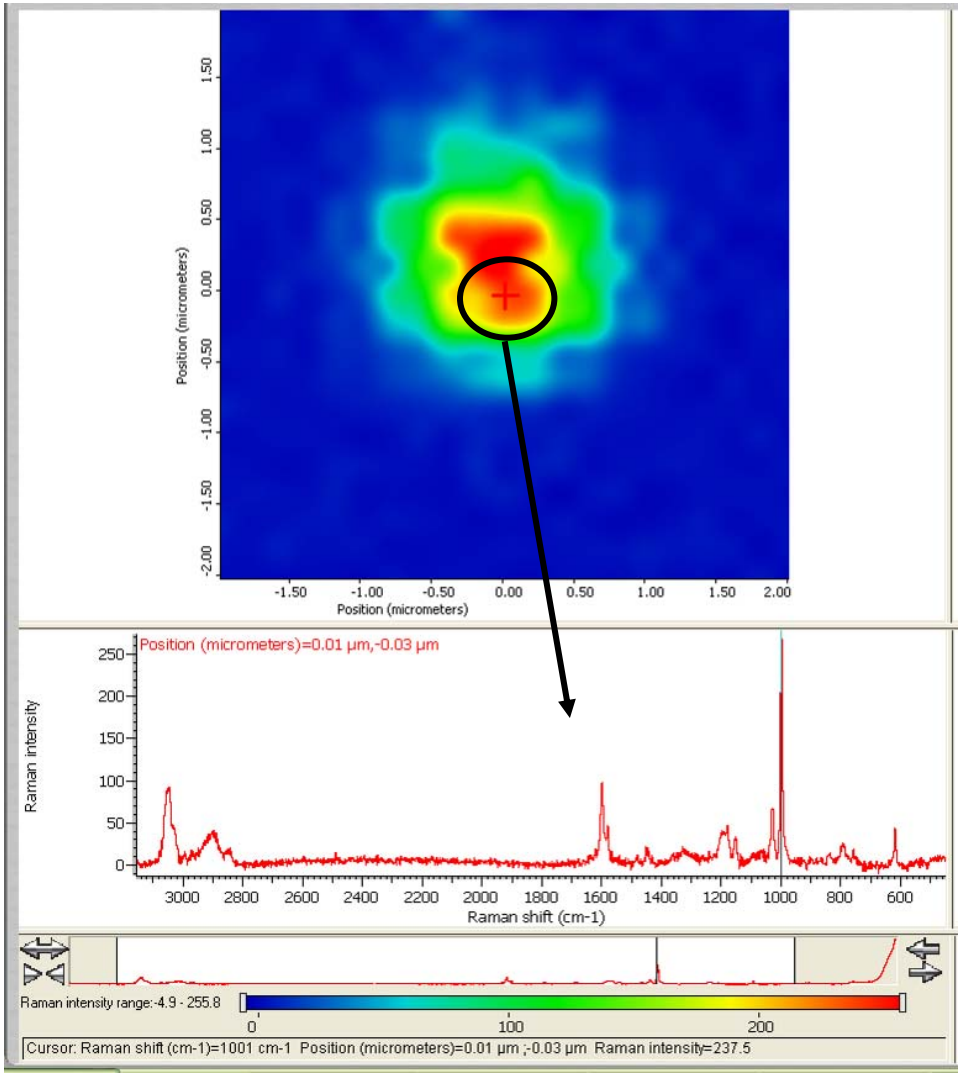


ThermoFisher SCIENTIFIC

Data Display Options

- 3D image – rotatable
- Slider bar
  - to control intensity scale
- Spectrum window – select peak for map and can select the region to look at.



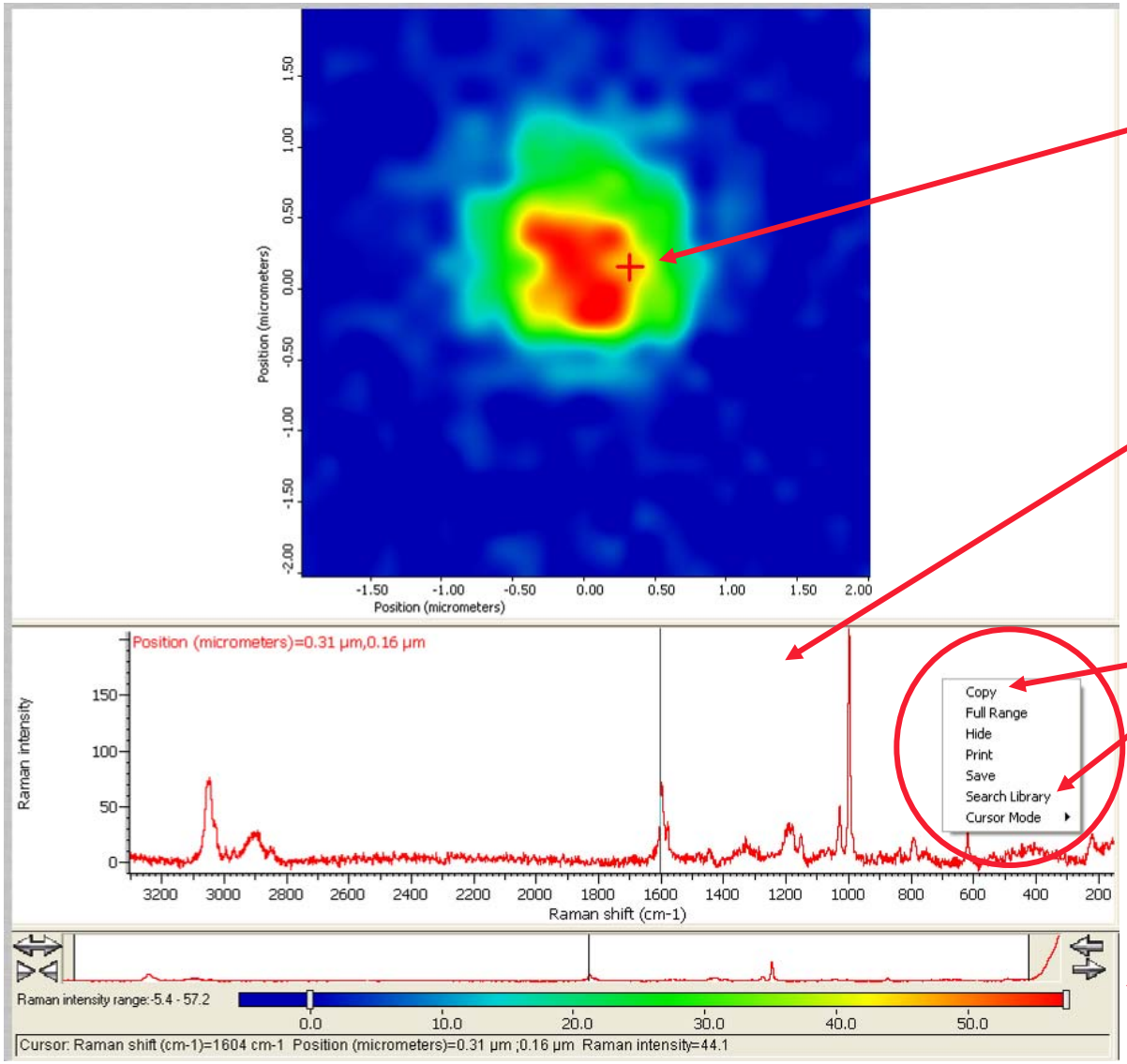


ThermoFisher SCIENTIFIC

Data Analysis

- Single point – analysis
  - Put crosshairs on point of interest
  - Spectrum will be displayed below the chemical map
  - Can right click, copy the spectrum and paste it into a regular OMNIC window
  - Can search the Library, right click over the spectrum and select Search Library

Data Analysis



Cursor selects point on the chemical map.

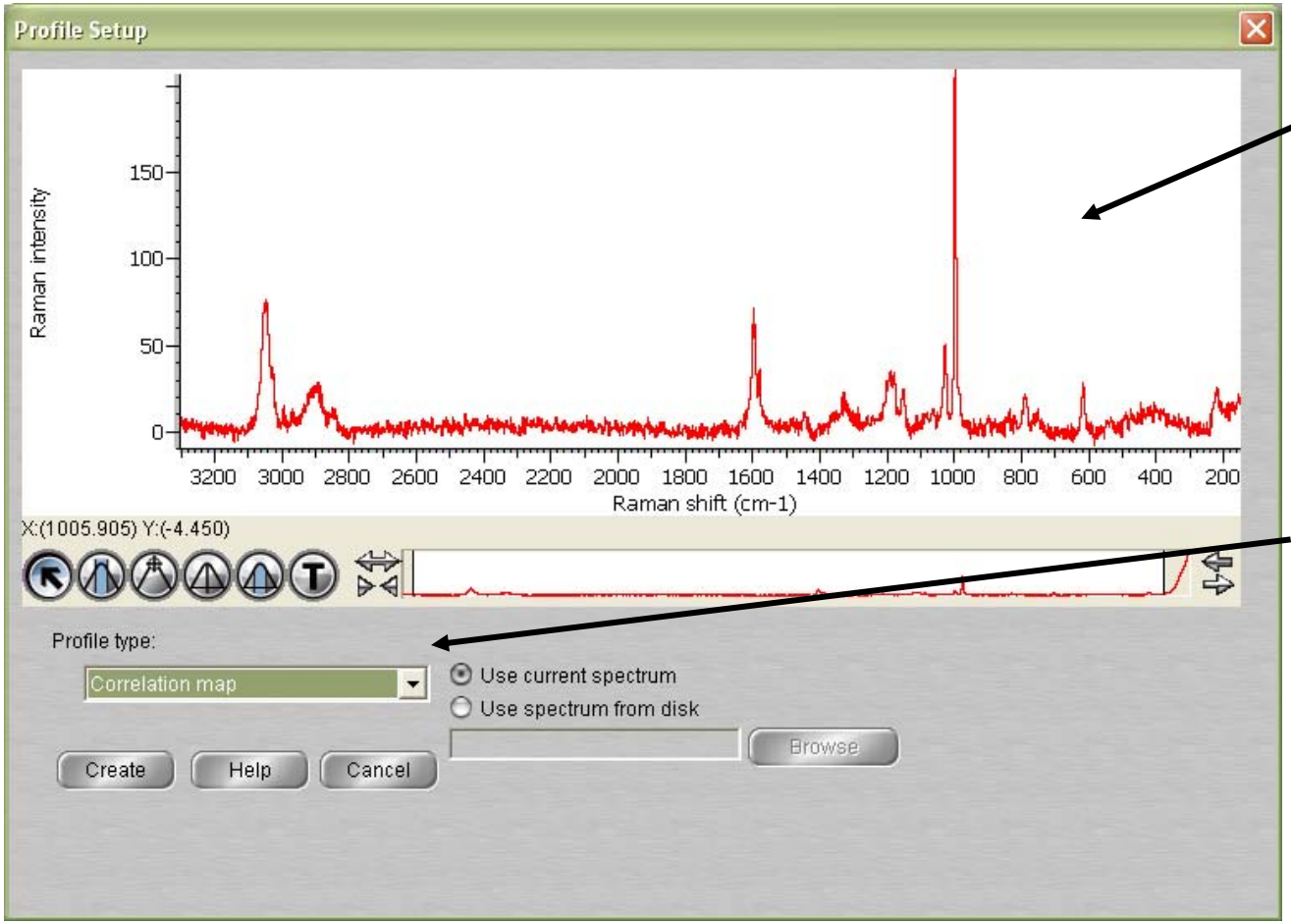
Spectrum is shown in window below. Bar selects wavenumber position for map.

Spectrum can be copied to a regular OMNIC window or searched against the Library.

Slider bar controls the intensity scale of the chemical map at top of screen.

Data Analysis

- Click on Profile Setup on Atlμs menu



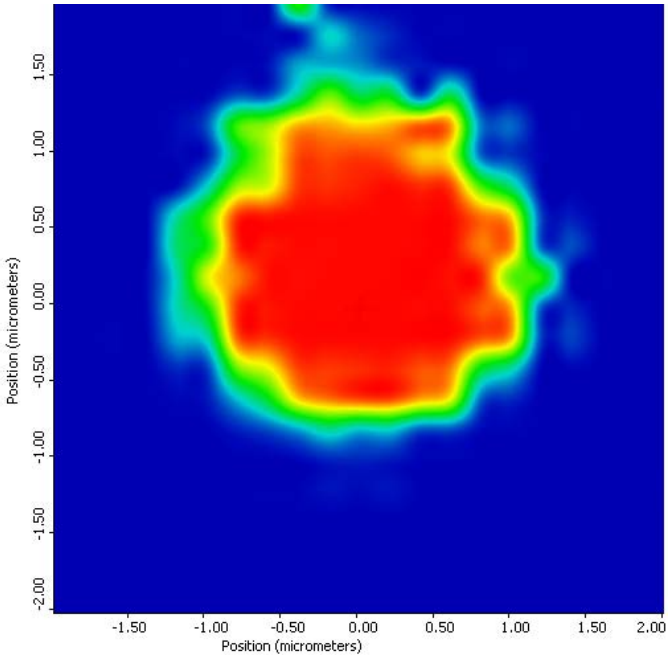
Shows spectrum from cursor

Profile types:

Correlation map
Peak height of one peak
Peak height ratio of two peaks
Peak area of one peak
Peak area ratio of two peaks
Chemigram
Functional group

Data Analysis

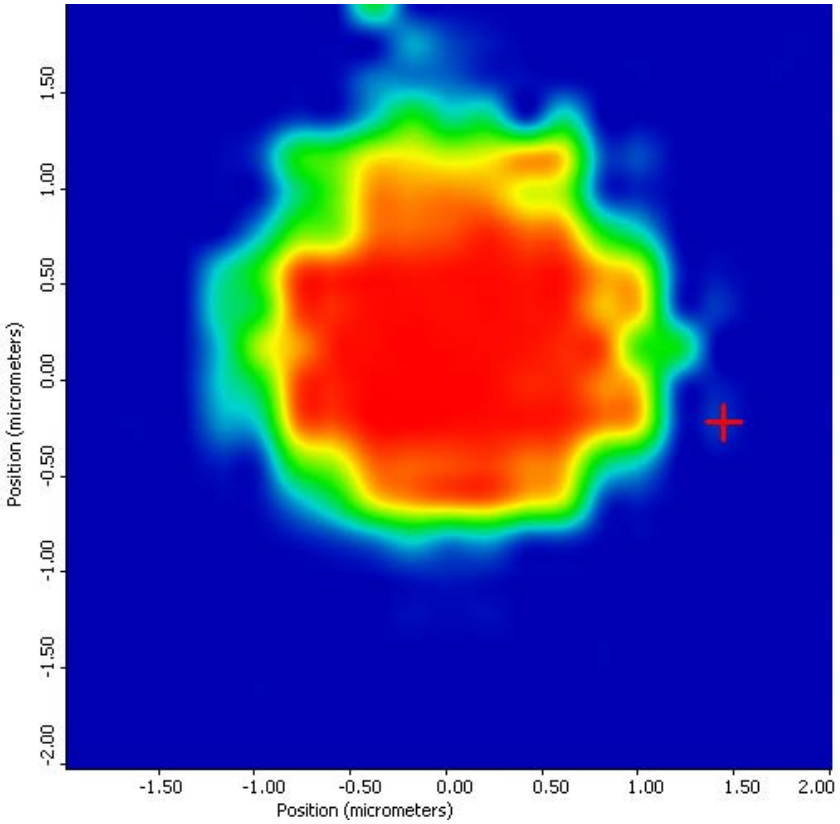
- Correlation map
  - Can use current spectrum – from cursor
  - Can use a stored spectrum
  - Creates a map that looks like a chemigram, but the intensity scale is calculated as a correlation using the spectrum selected.



Correlation map of the polystyrene bead using the current spectrum, (shown on the previous slide)

Data Analysis

- Correlation Map

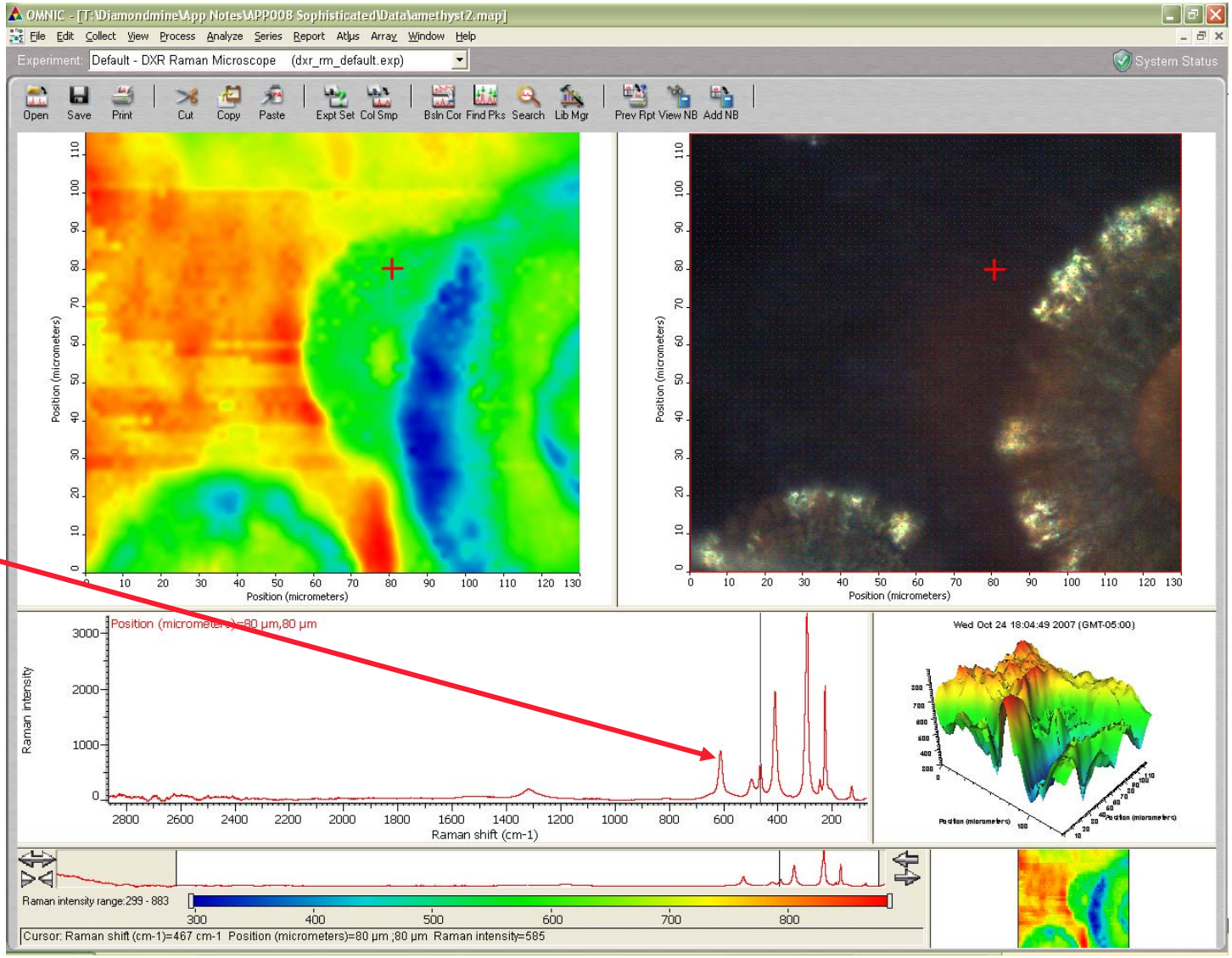


Correlation map of the polystyrene bead using a stored spectrum.

Data Analysis

- Peak Height

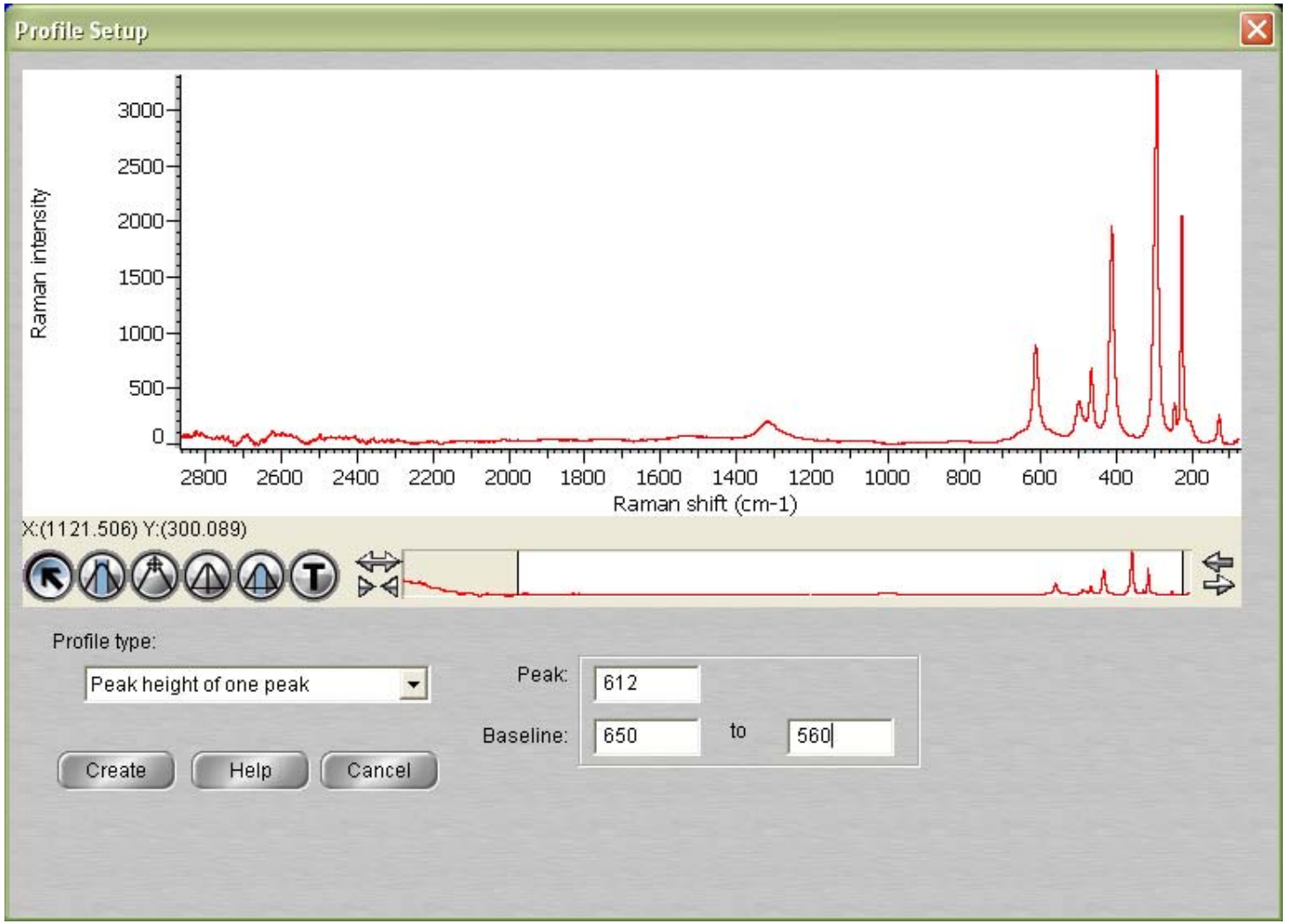
Peak at 612 cm^{-1} does not come from amethyst



ThermoFisher SCIENTIFIC

Data Analysis

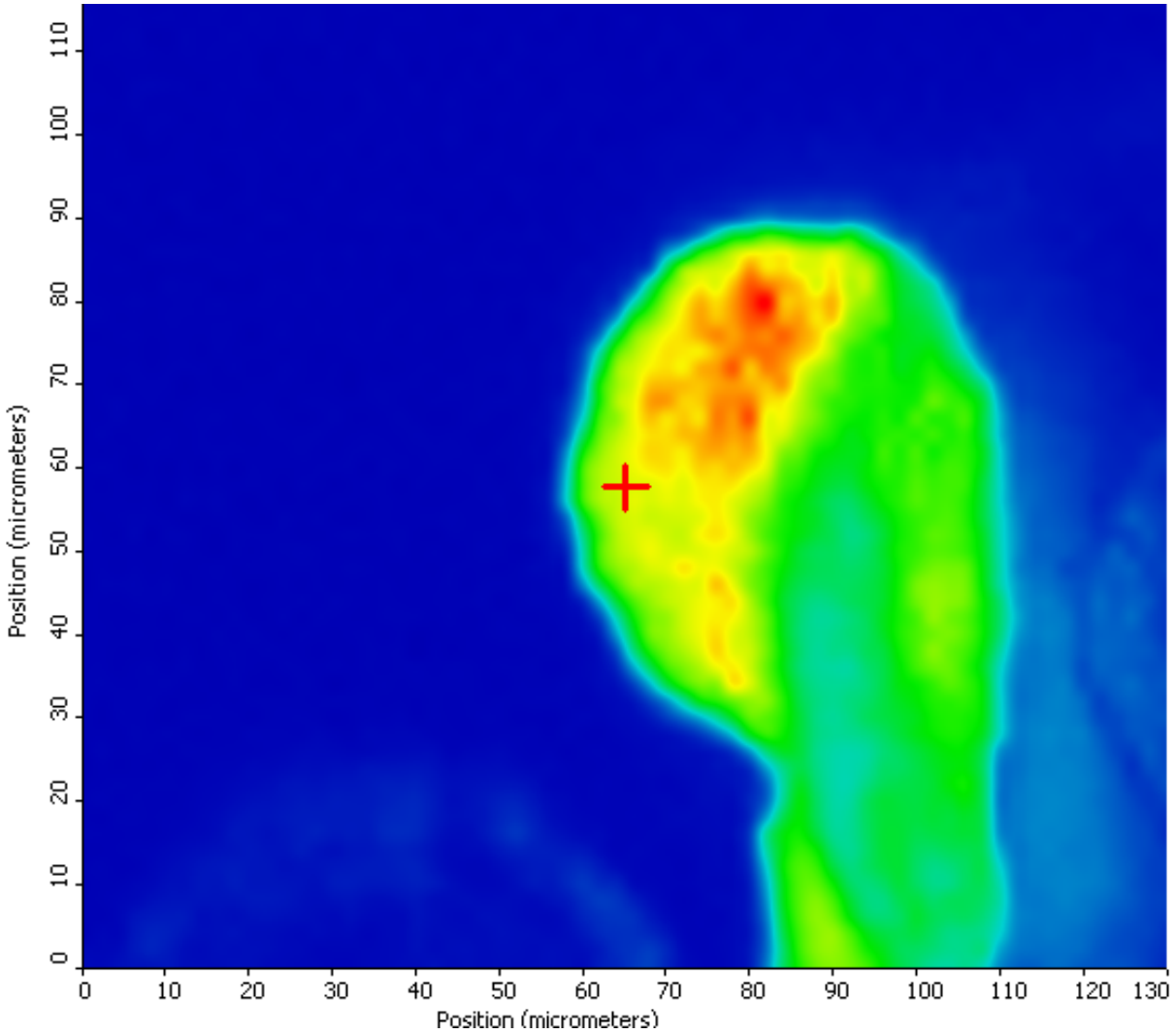
- Peak Height



ThermoFisher SCIENTIFIC

Data Analysis

- Peak Height Profile
  - Can also use area or a ratio of area or height



ThermoFisher SCIENTIFIC

Advanced Data Analysis

- More advanced data analysis methods available:
  - Multivariate Curve Resolution
  - Principal Component Analysis
  - Truncating a Map
  - Splitting a Map
  - Extracting a Line Map
  - Image Analysis

- See Atlμs User's Manual for information

- Experiment with a data set