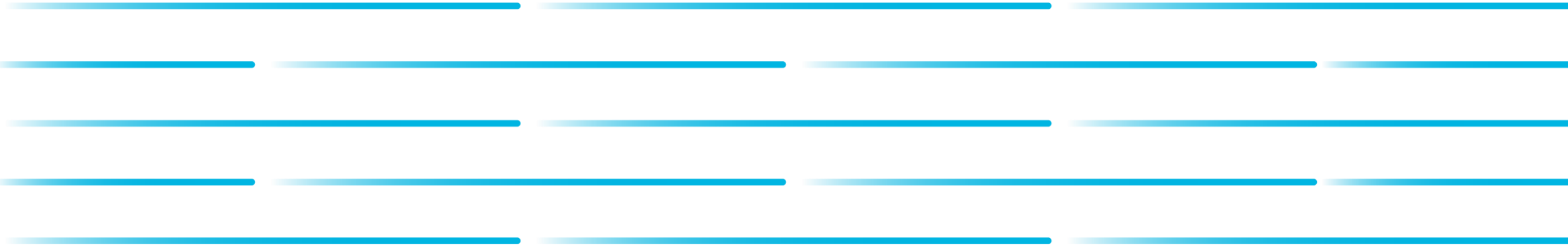




softWoRx 7.0

New features for DV Elite and OMX



DV Elite Specific Features

Significant new features for DV Elite

- Enhanced stage view window
- Changes to Channels tab including:
 - Decoupling of FA and Scan Sequence
 - Multi-channel Reference Image
- 6D file format enabling:
 - Paneling + Points
 - Improvements to Plate scanning file organization
- Experiment Designer processing improvements
- Refer to release notes for full list of new features and improvements

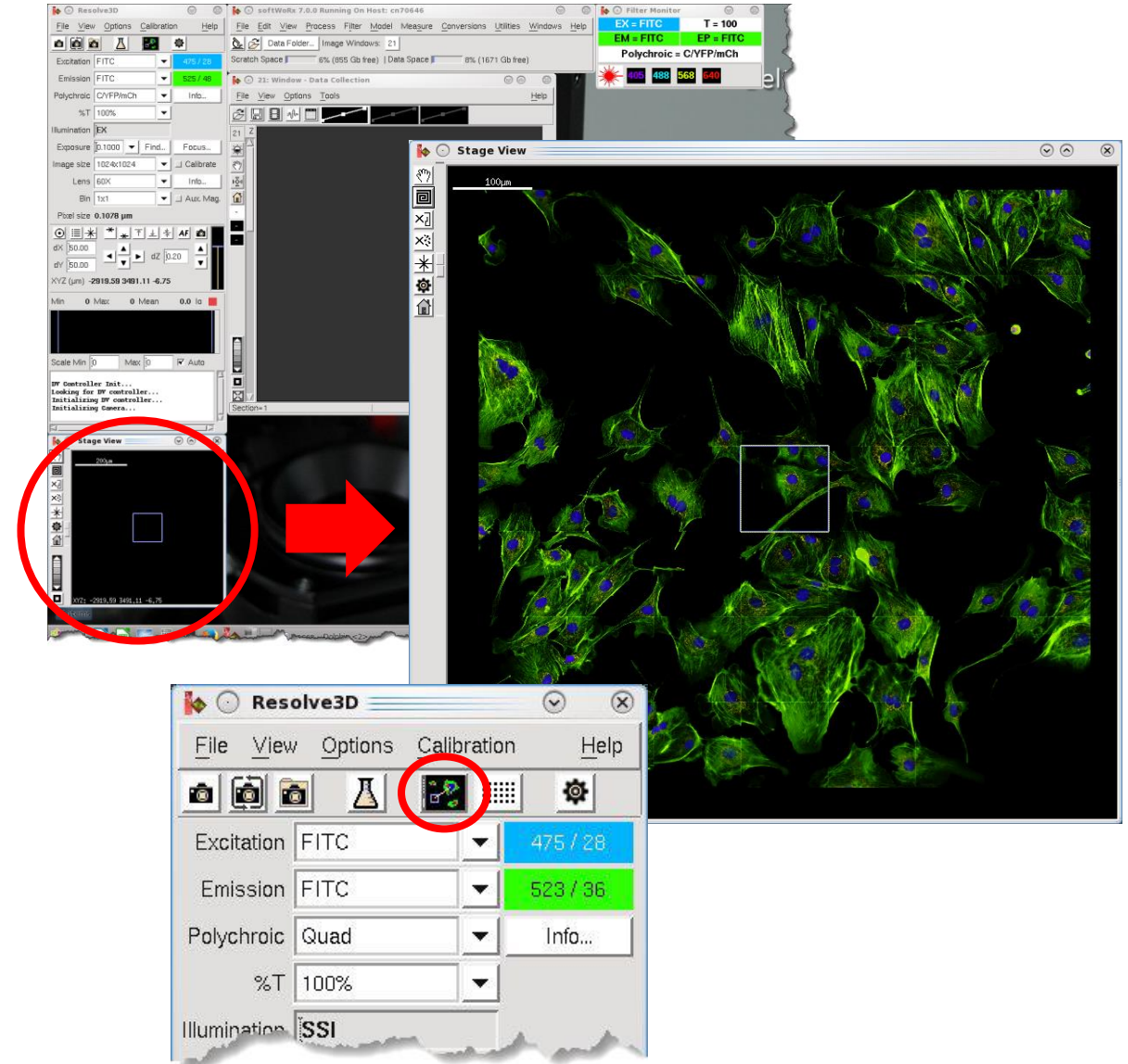


Enhanced Stage View window

Stage View is a separate window that can be resized to better visualize spiral mosaic data

Stage View can be minimized but can't be closed

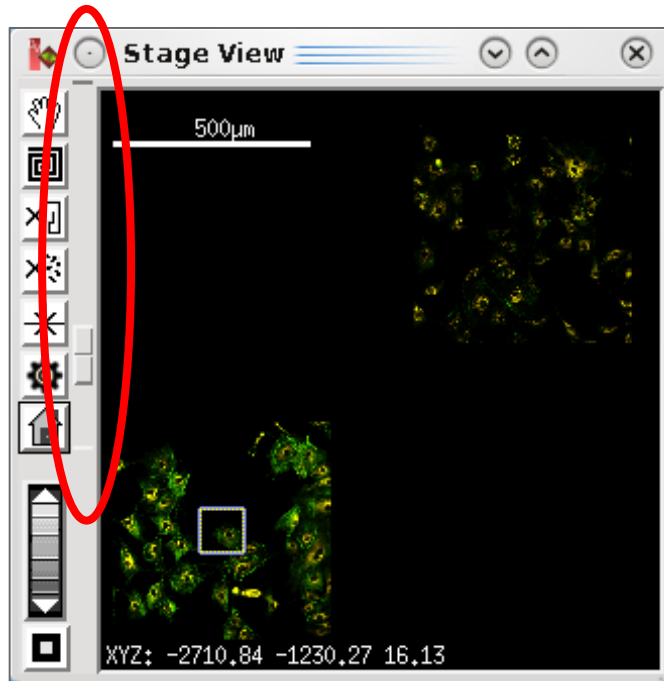
There is a new button at the top of Resolve3D window to "retrieve" Stage View if minimized or covered by other windows



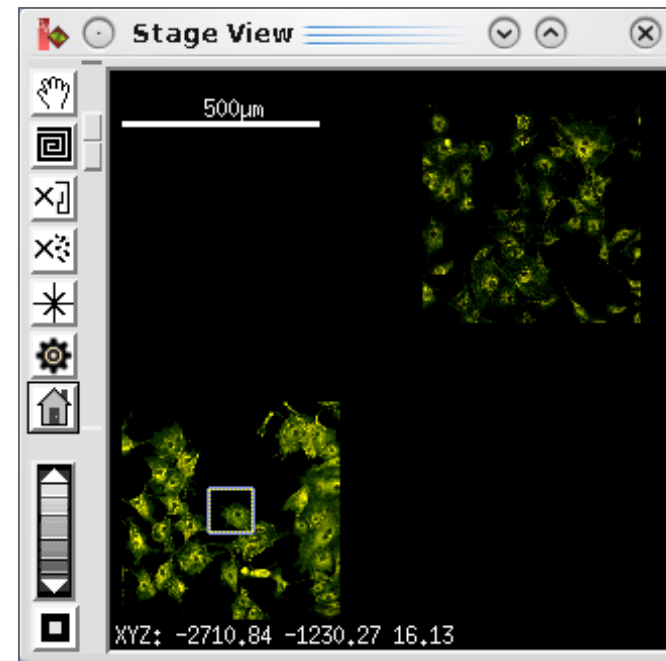
Enhanced Stage View window

Contrast adjustment

Contrast adjustment slider will modify display of all mosaics and all channels displayed in the Stage View



Low Contrast



High Contrast



Enhanced Stage View window Resolution setting

Three resolution settings for thumbnails in Stage View

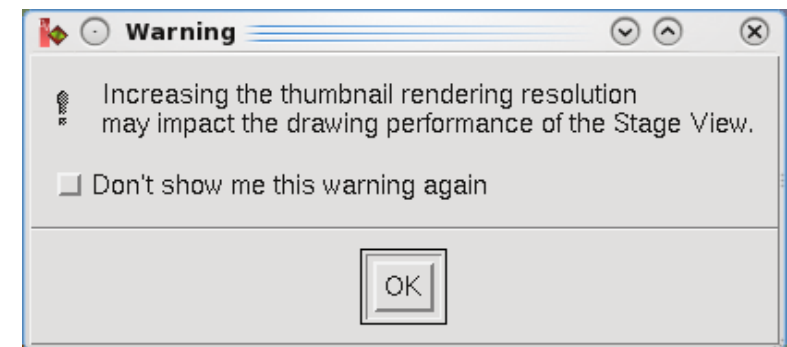
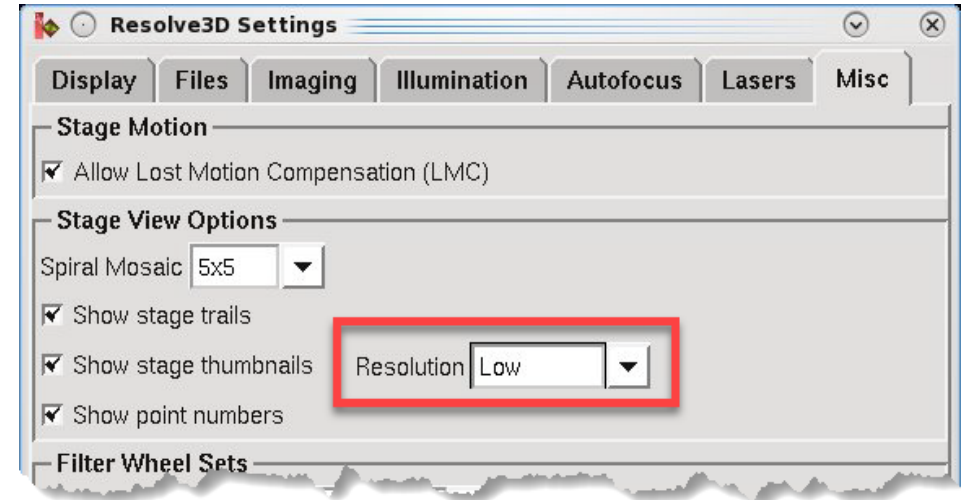
Resolution selected in Resolve3D Settings

Resolution setting will default to **Low** every time Resolve3D window is started

Collecting multiple medium/high resolution mosaics will affect mosaic acquisition/drawing speed

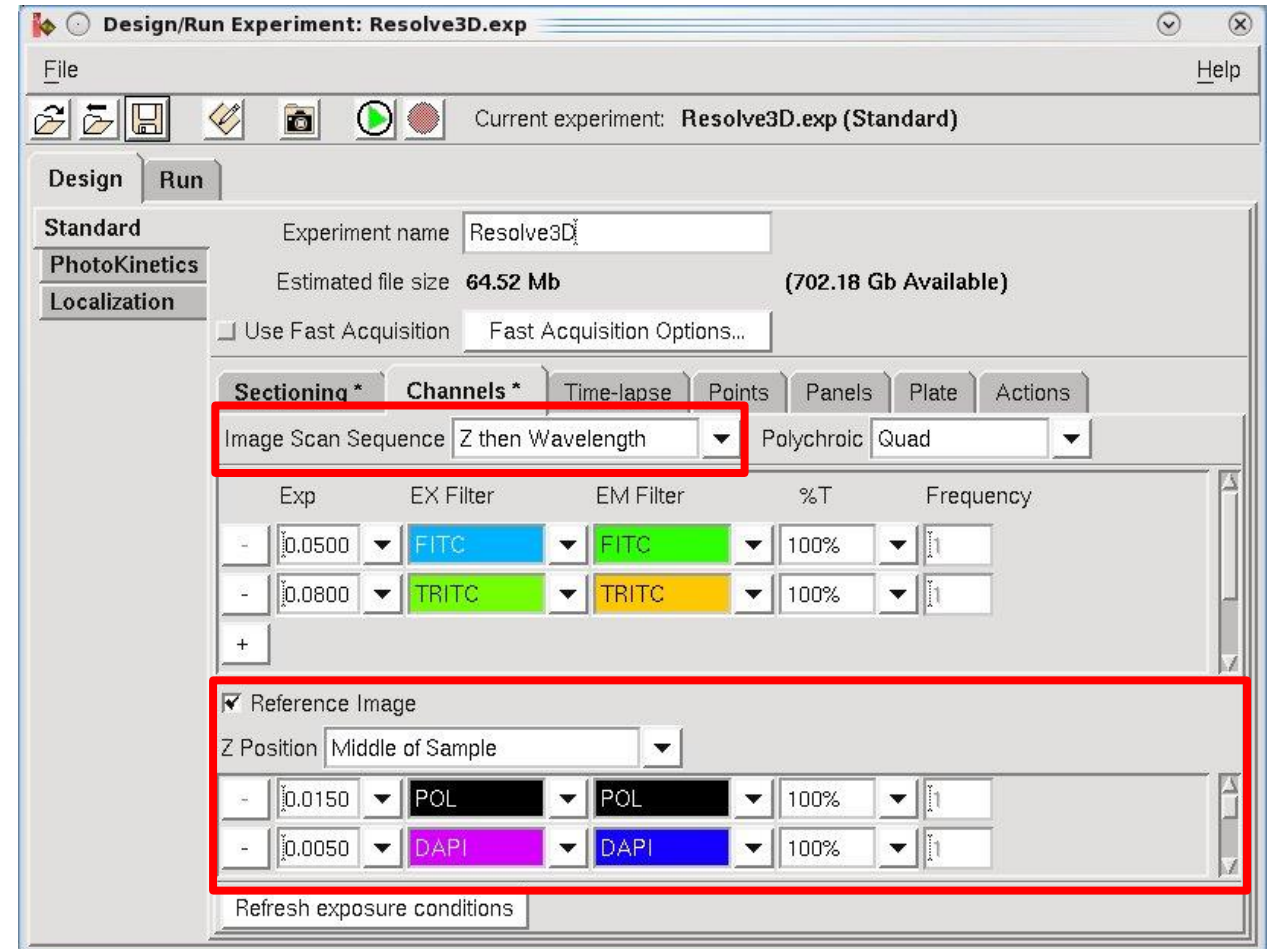
Use lowest resolution required to visualize structures/cells of interest

If high resolution is required, clear thumbnails often



Changes to Channels Tab

1. Image Scan Sequence decoupled from Fast Acquisition
2. Multi-channel Reference image



Changes to Channels Tab

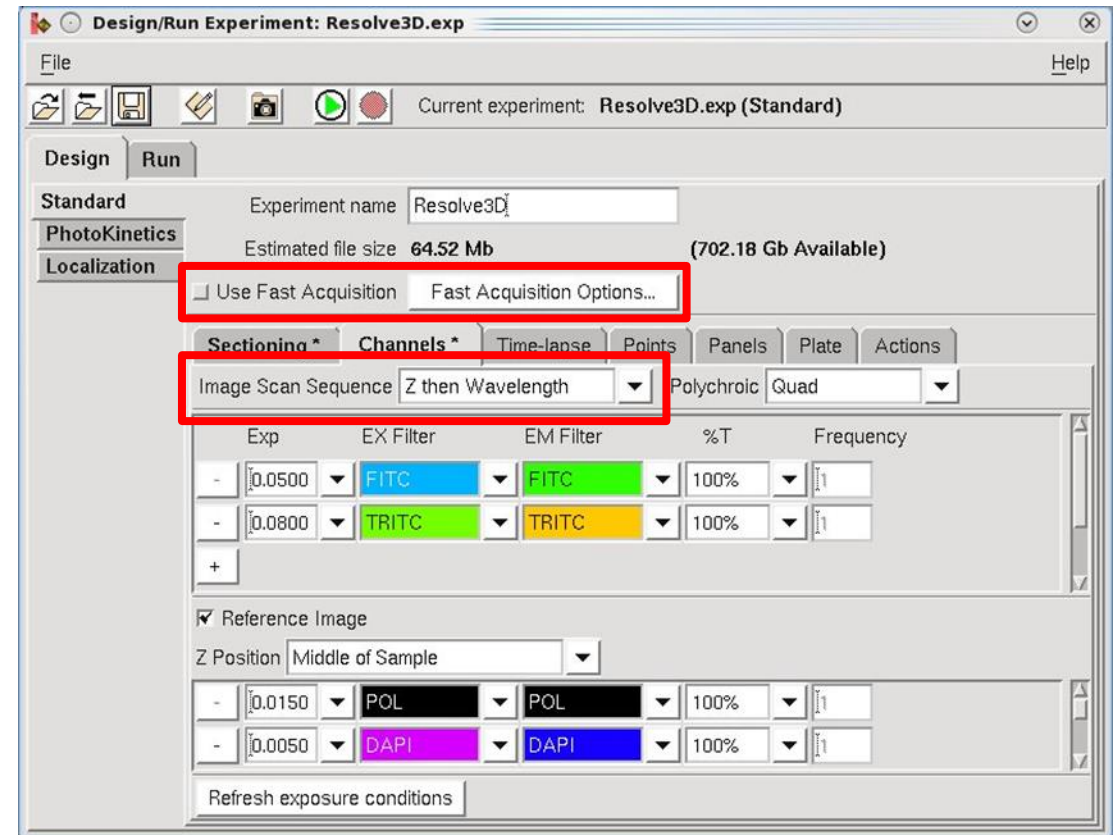
Image Scan Sequence decoupled from Fast Acquisition

Image Scan Sequence dictates order in which images are acquired in an experiment (Z then Wavelength or Wavelength then Z)

Previously, this was a part of Fast Acquisition (FA) options so was NOT adjustable in Conventional (non-FA) experiments

Now Scan Sequence can be modified in Conventional and FA experiments

FA is still not compatible with Reference images and UltimateFocus for time lapse intervals <5 sec or Actions



Changes to Channels Tab

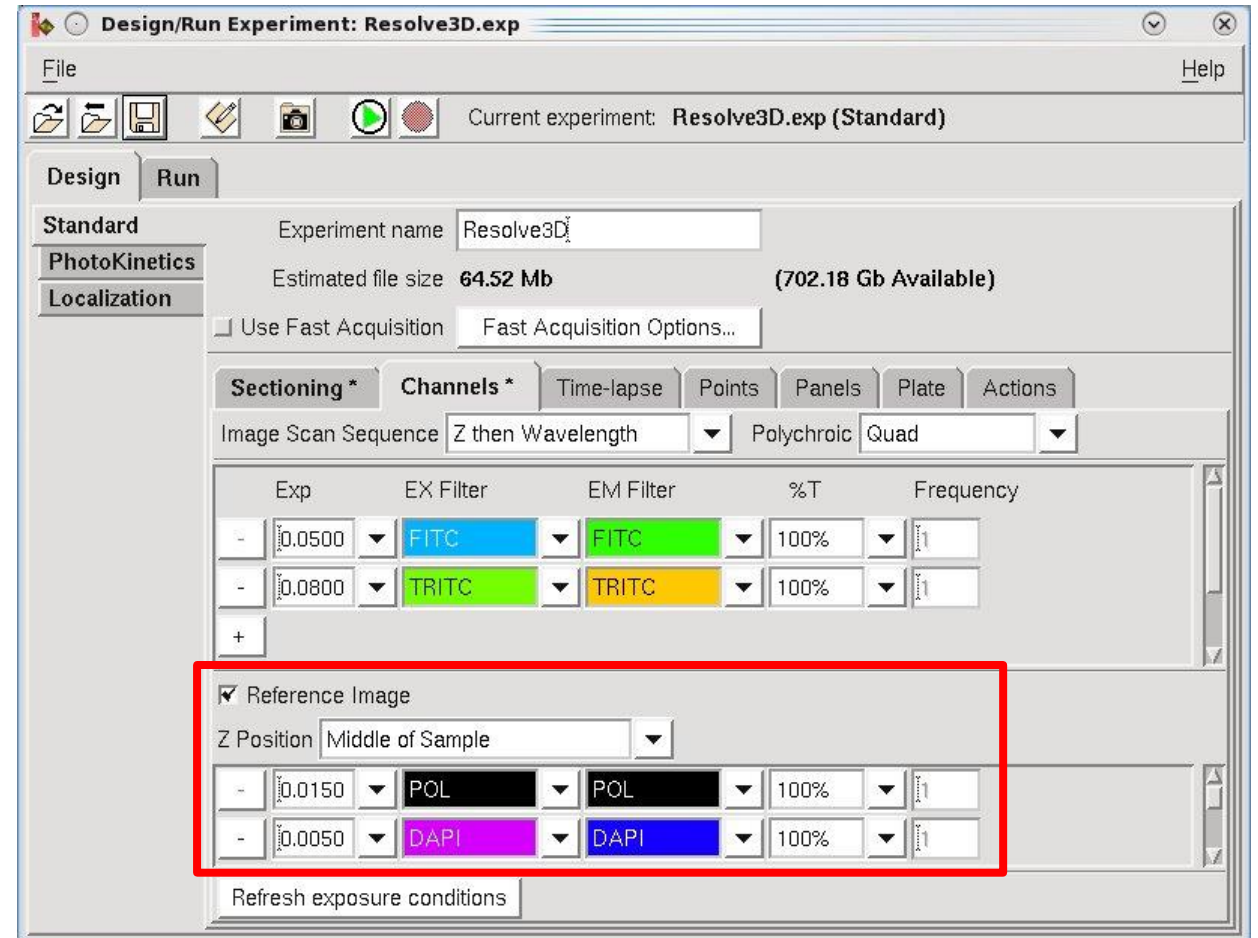
Multi-channel Reference Images

Can add up to 5 channels

Unique Frequency can be set for each reference channel

Similar to “regular” channels, all reference channels, regardless of frequency, will be written to a single image file

Z position is set for ALL reference channels



6D file format

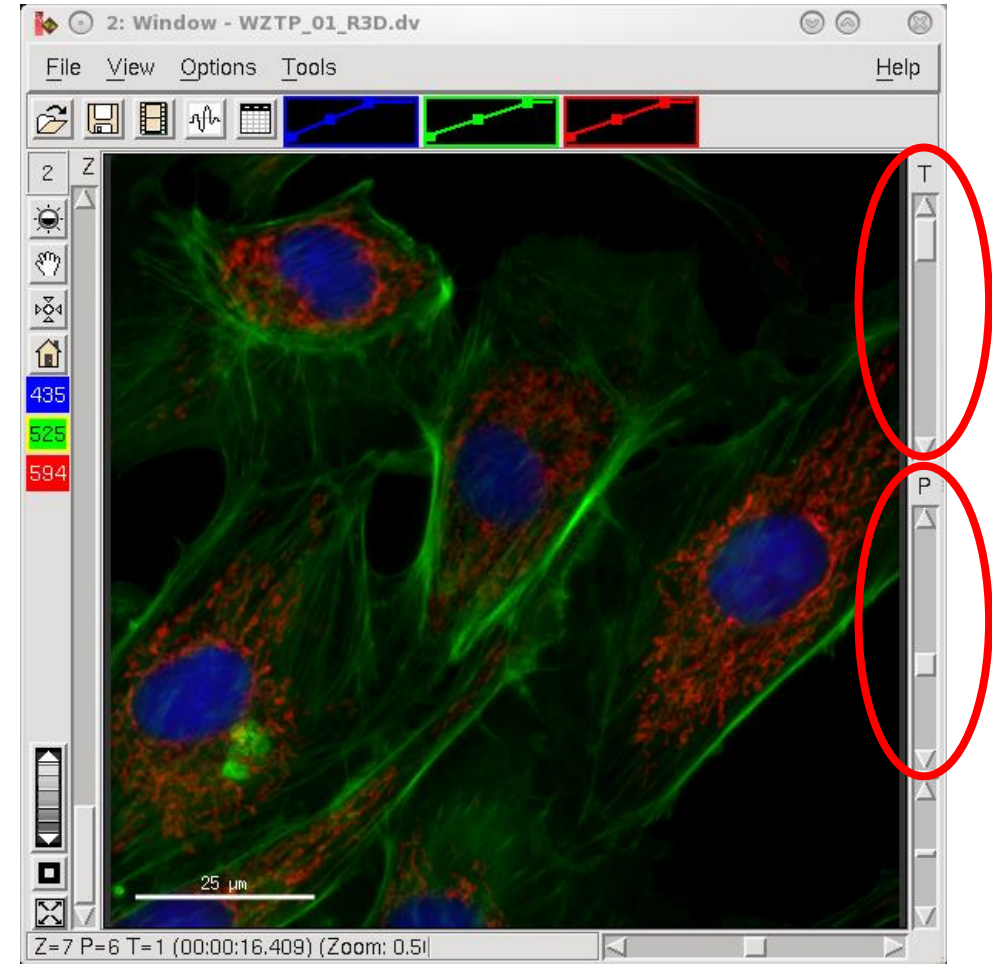
X/Y/Z/Channels/Time/Panels

Panels dimension is used for:

- Paneling experiments – each FOV is stored as a Panel prior to stitching
- Plate experiments – each well will result in a single image file with multiple FOVs in that well stored as Panels

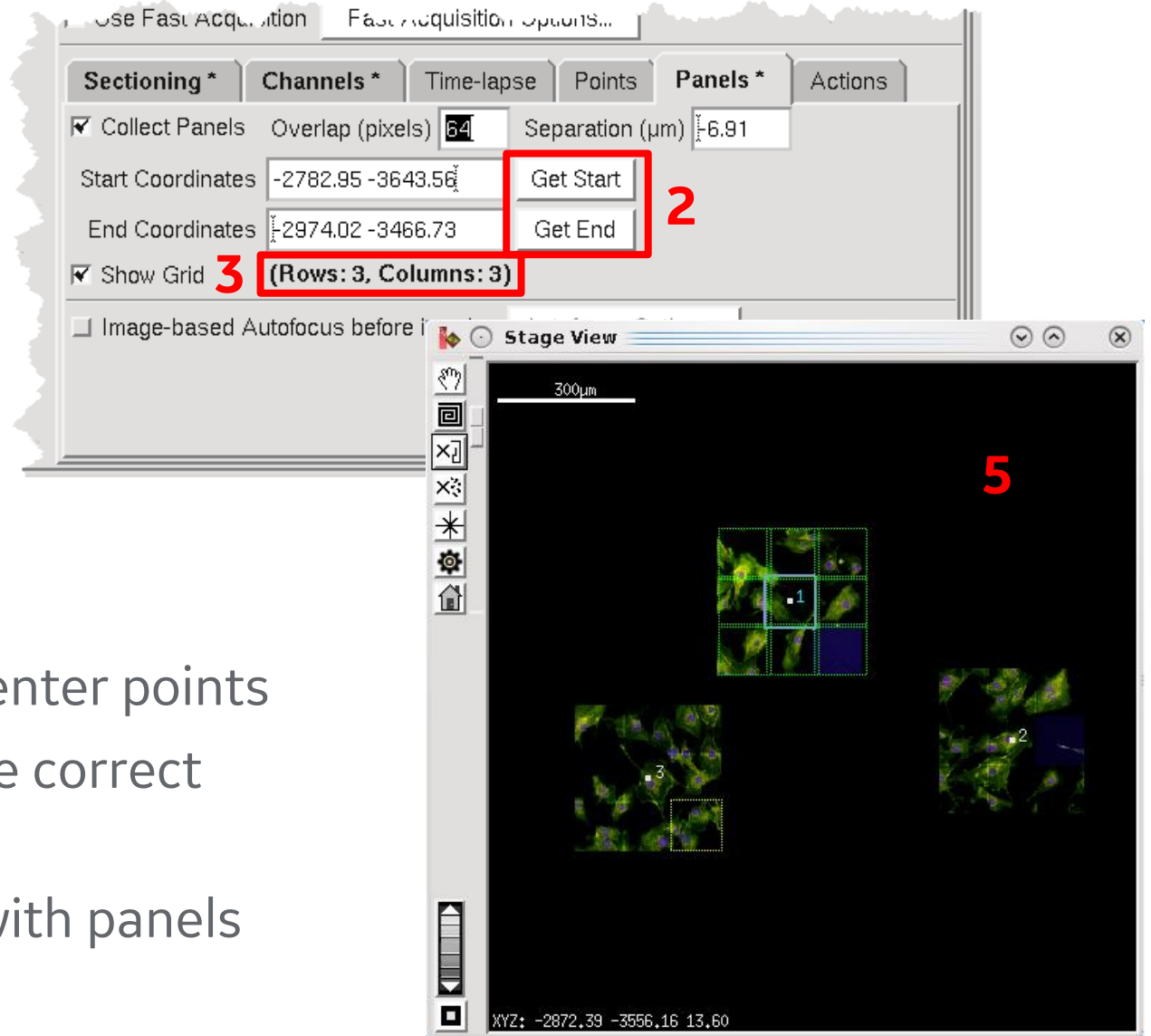
Enables Paneling + Points

Changes the way Plate experiments are collected



6D file format Paneling + Points

1. Mark points in the middle of the regions where you would like to collect panels
2. In Panels tab, use Get Start/Get End to define Paneling area at one point
3. Number of rows and columns will be displayed in Experiment Designer
4. In Points tab, click Visit Point List and enter points
5. Will center number of panels (using the correct overlap) around each marked point
6. Will result in separate .dv image files with panels for each point



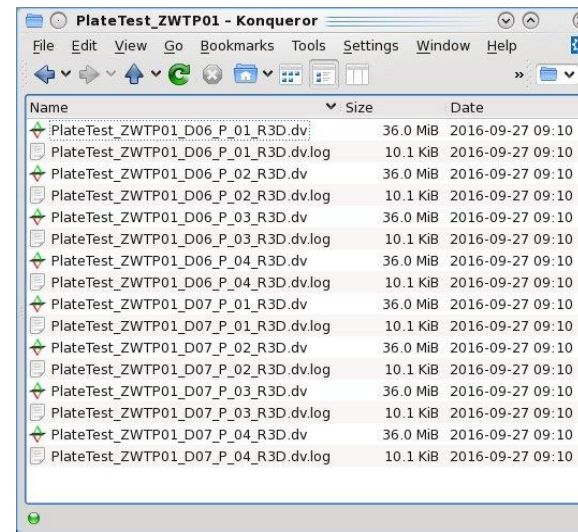
6D file format

Plate experiments

For Plate experiments, all FOV within a well will be saved in a single image file in the Panels dimension

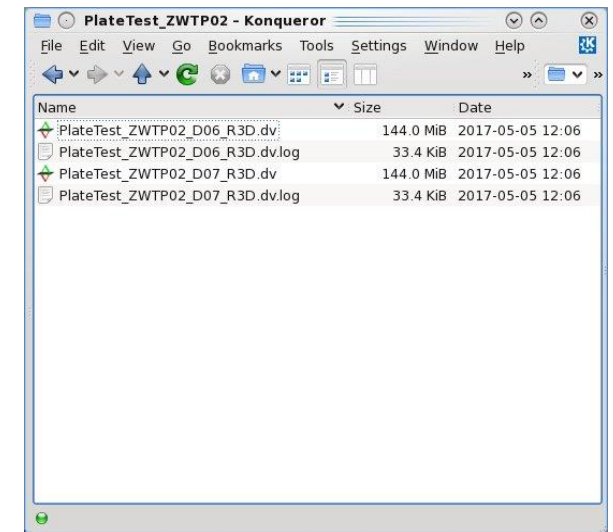
Vastly reduces the number of files created for a Plate experiment

softWoRx 6.5.2



| Name | Size | Date |
|--------------------------------------|----------|------------------|
| PlateTest_ZWTP01_D06_P_01_R3D.dv | 36.0 MiB | 2016-09-27 09:10 |
| PlateTest_ZWTP01_D06_P_01_R3D.dv.log | 10.1 KiB | 2016-09-27 09:10 |
| PlateTest_ZWTP01_D06_P_02_R3D.dv | 36.0 MiB | 2016-09-27 09:10 |
| PlateTest_ZWTP01_D06_P_02_R3D.dv.log | 10.1 KiB | 2016-09-27 09:10 |
| PlateTest_ZWTP01_D06_P_03_R3D.dv | 36.0 MiB | 2016-09-27 09:10 |
| PlateTest_ZWTP01_D06_P_03_R3D.dv.log | 10.1 KiB | 2016-09-27 09:10 |
| PlateTest_ZWTP01_D06_P_04_R3D.dv | 36.0 MiB | 2016-09-27 09:10 |
| PlateTest_ZWTP01_D06_P_04_R3D.dv.log | 10.1 KiB | 2016-09-27 09:10 |
| PlateTest_ZWTP01_D07_P_01_R3D.dv | 36.0 MiB | 2016-09-27 09:10 |
| PlateTest_ZWTP01_D07_P_01_R3D.dv.log | 10.1 KiB | 2016-09-27 09:10 |
| PlateTest_ZWTP01_D07_P_02_R3D.dv | 36.0 MiB | 2016-09-27 09:10 |
| PlateTest_ZWTP01_D07_P_02_R3D.dv.log | 10.1 KiB | 2016-09-27 09:10 |
| PlateTest_ZWTP01_D07_P_03_R3D.dv | 36.0 MiB | 2016-09-27 09:10 |
| PlateTest_ZWTP01_D07_P_03_R3D.dv.log | 10.1 KiB | 2016-09-27 09:10 |
| PlateTest_ZWTP01_D07_P_04_R3D.dv | 36.0 MiB | 2016-09-27 09:10 |
| PlateTest_ZWTP01_D07_P_04_R3D.dv.log | 10.1 KiB | 2016-09-27 09:10 |

softWoRx 7.0



| Name | Size | Date |
|---------------------------------|-----------|------------------|
| PlateTest_ZWTP02_D06_R3D.dv | 144.0 MiB | 2017-05-05 12:06 |
| PlateTest_ZWTP02_D06_R3D.dv.log | 33.4 KiB | 2017-05-05 12:06 |
| PlateTest_ZWTP02_D07_R3D.dv | 144.0 MiB | 2017-05-05 12:06 |
| PlateTest_ZWTP02_D07_R3D.dv.log | 33.4 KiB | 2017-05-05 12:06 |

Same plate experiment (2 wells, 4 FOV/well) run in old and new software. 16 files (8 image, 8 log) are generated in old software but only 4 files (2 image, 2 log) in new software



6D file format

Backwards compatibility with softWoRx

Prior versions of softWoRx do not “understand” files with data in the Panels dimension in the 6D file format

This could be an issue for sites with multiple DV systems or a standalone workstation that can not be upgraded past softWoRx 6.5.2 (i.e. systems with CentOS 4.X Operating System)

This would only be an issue with certain types of .dv image files:

- Images acquired without Panels will open as expected in earlier versions of softWoRx
- Images acquired with Panels will NOT open in earlier versions of softWoRx. The types of experiments affected are:
 - **Paneling experiments:** workaround is to stitch images in softWoRx 7.0 before transferring to an earlier version of softWoRx
 - **Plate experiments with more than 1 FOV per well:** there is not a good workaround here. If you have an MT stage, routinely perform Plate experiments with more than 1 FOV per well and must transfer data to a workstation that can not be upgraded, you may not want to upgrade your acquisition workstation to softWoRx 7.0.



6D file format

Backwards compatibility with third party software

The rules and workarounds with ImageJ/FIJI are the same as softWoRx at this time

- Images acquired without Panels will open as expected in ImageJ/FIJI
- Images acquired with Panels will NOT open in ImageJ/FIJI

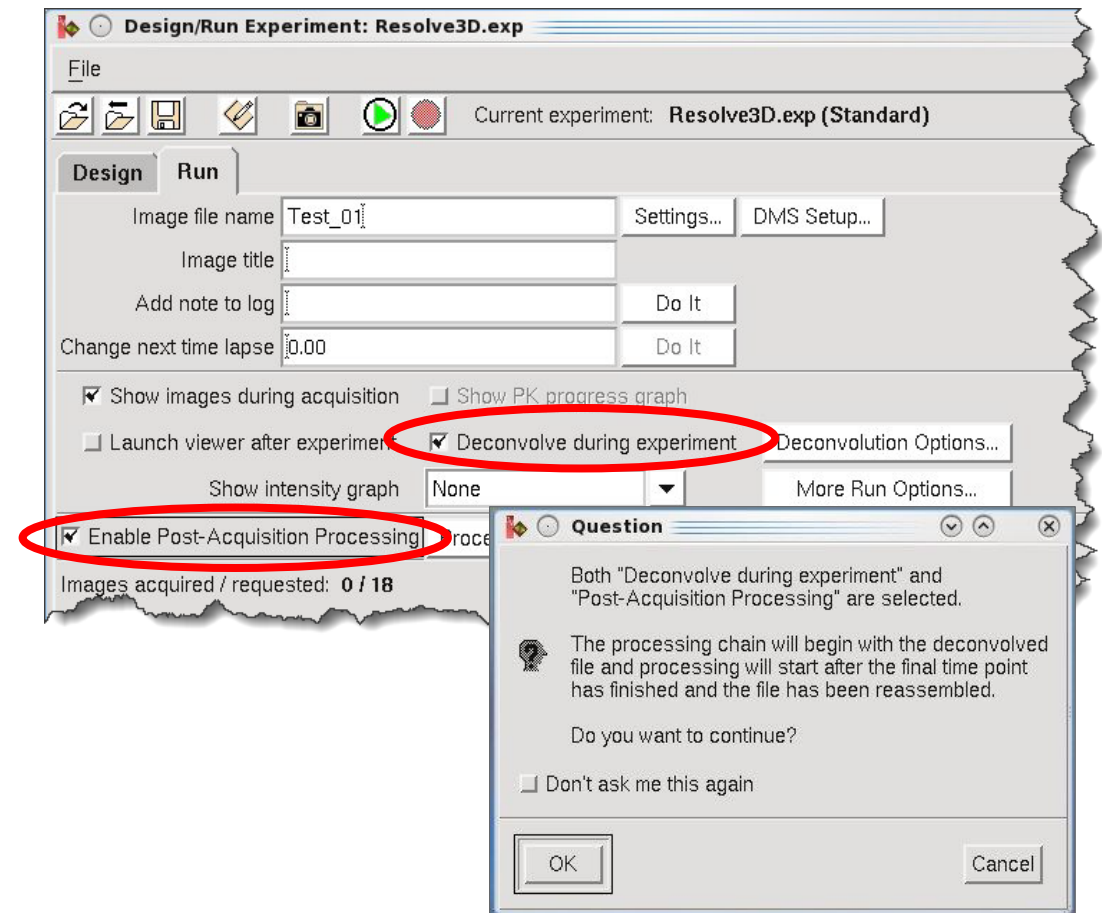
We are working with BioFormats to incorporate updated header information into .dv plug in for ImageJ/FIJI



Experiment Designer processing improvements

Post-Acquisition processing will use files from **Deconvolve during experiment** as input when both are selected

When both are selected the user will see a dialog box to inform them of what the system will do when they push run



Known bug with Rotate3D tool

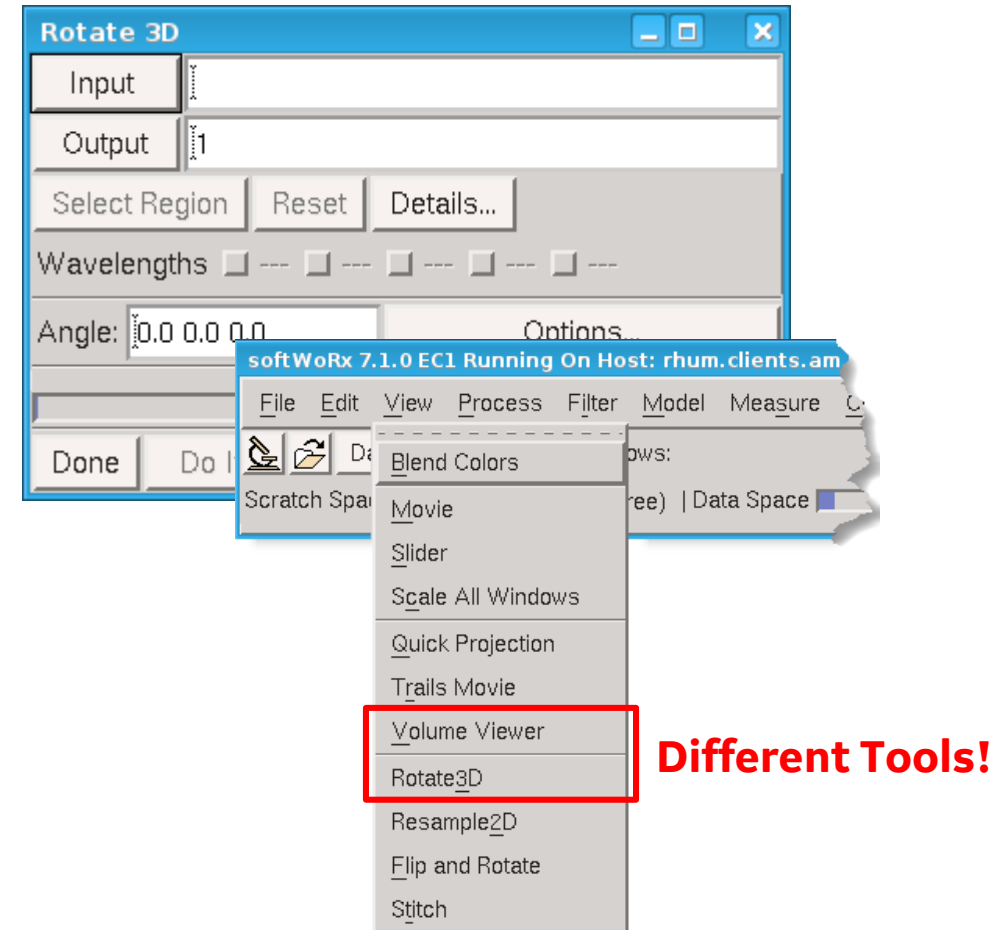
Rotate3D is a tool to reorient an image

The Rotate3D tool crashes when a file is loaded in 7.0

There is no workaround but it will be fixed in the next version of softWoRx

This tool is seldomly used so should not be an issue for most users

The Rotate3D tool is NOT the same as the Volume Viewer, there is **no** issue with the Volume Viewer






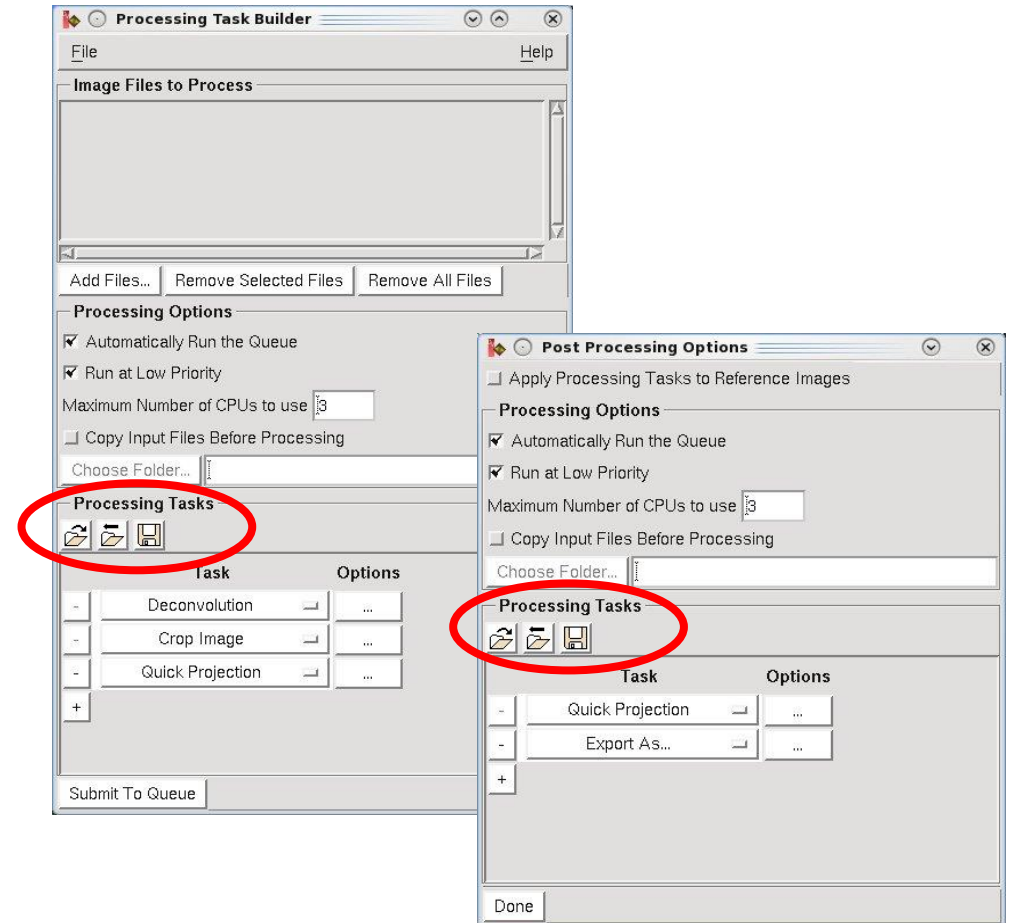
DV Elite and OMX Features

Save Task Builder processing chains

Will save tasks in processing chain as well as any associated options

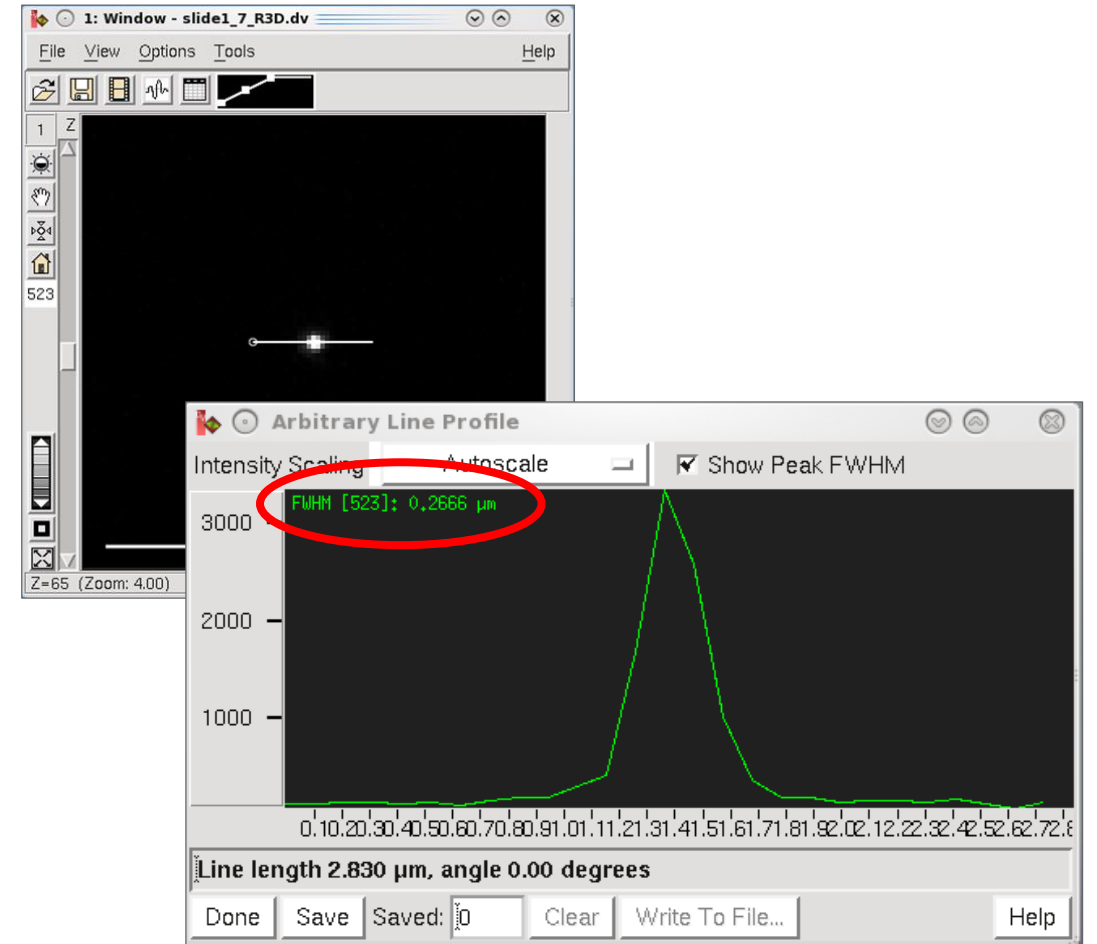
Works in main Task Builder as well as Post Acquisition Processing

-  Open saved processing chain
-  Open *last saved* processing chain
-  Save current processing chain



Arbitrary Line Profile FWHM improved

In previous versions the Arbitrary Line Profile tool didn't interpolate well enough to report accurate FWHM values used to be artificially high FWHM values should be more accurate now



OMX Specific Feature

New Image Alignment algorithm

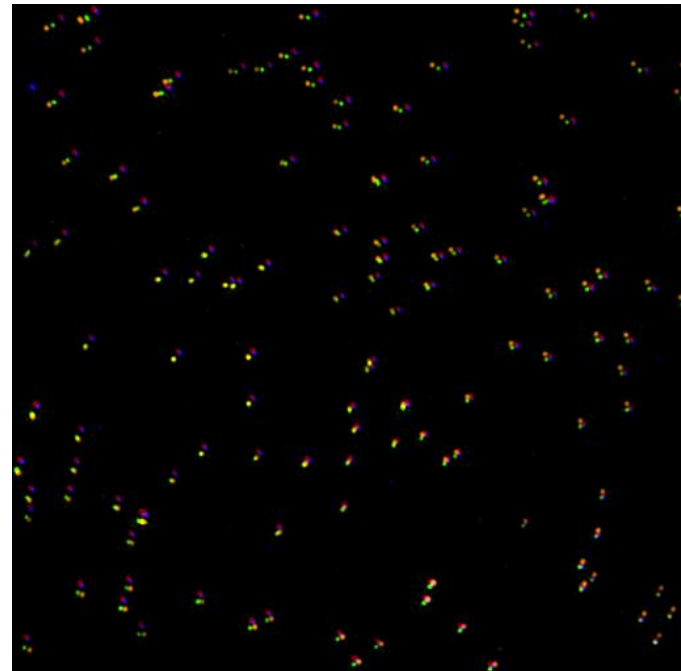
New Alignment algorithm is a two-step process to correct both global misalignment and local non-linear misalignment

Calibration data is used to create a list of matched fiducials between the reference channel and the channel(s) to be aligned

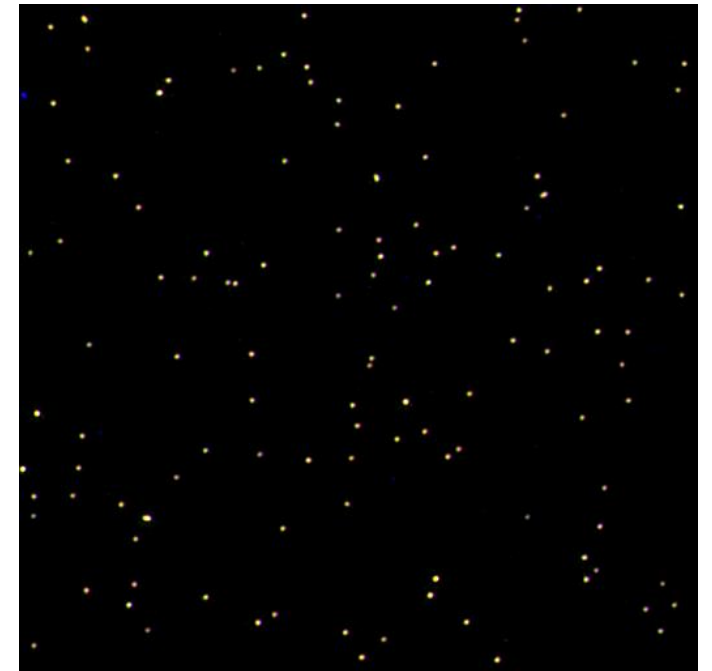
The matched fiducials are first used to apply a global alignment, correcting misalignment across the entire FOV

Localized warp alignment follows, using triangulation of the local fiducials to apply fine alignment.

Before Alignment



After Alignment



Tetraspeck™ beads acquired in four channels (blue, green, red, far red)



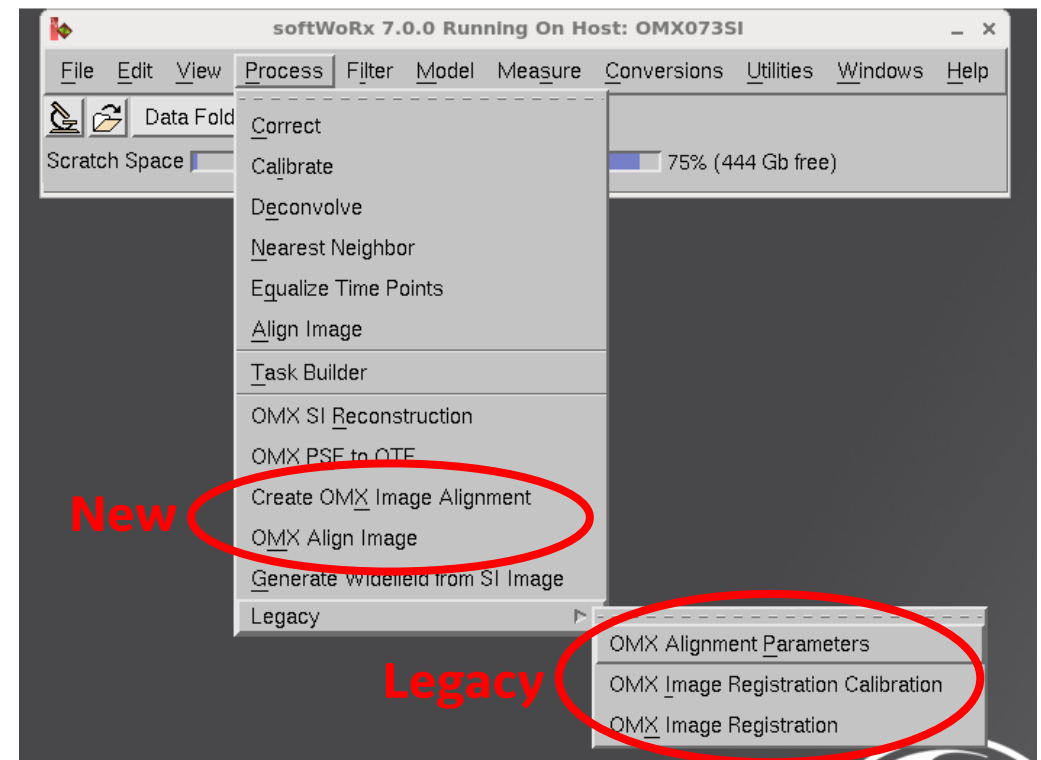
New Image Alignment algorithm

There is a new Image Alignment document on software download page that details:

- The differences between the new method and the two legacy methods
- Acquiring a Z stack of the alignment slide
- Creating an OMX Alignment calibration file
- Finalizing axial alignment using a TetraSpeck™ bead slide
- Evaluating Alignment quality

Please download and review!

Old Image Registration and Shift and Rotate methods are still available in **Legacy** menu



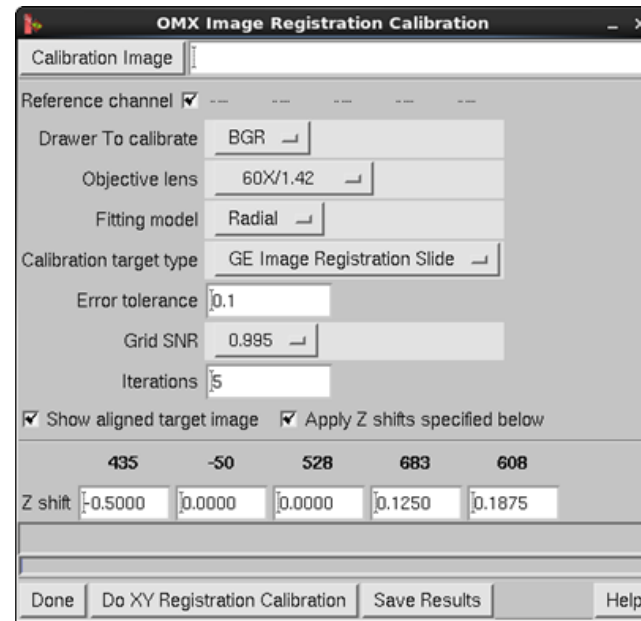
New Image Alignment algorithm

Still uses alignment slide for X/Y and Tetraspeck™ beads for Z

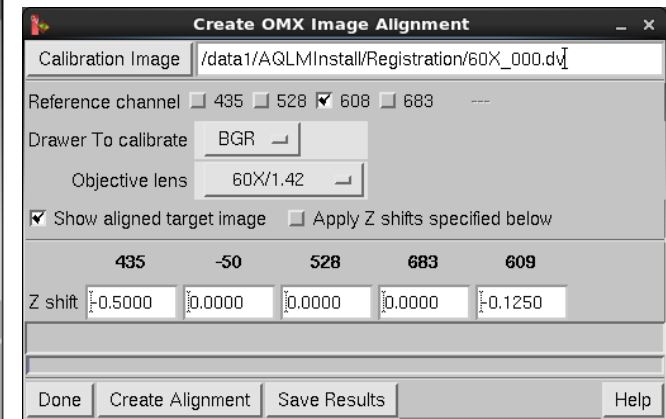
Fewer options/parameters that must be defined

More tolerant of low S:N in image of alignment slide

Creating new alignment parameters is faster than old method but applying the parameters is slightly slower



Old Image Registration



New Image Alignment



Supporting information

Where do I get the software?

softWoRx 7.0 is customer installable for both DV and OMX:

http://incelldownload.gehealthcare.com/bin/download_data/SoftWoRx/7.0.0/SoftWoRx.htm



Supporting information

The download site also contains:

- Release notes
- Upgrade instructions DV and OMX
- Training document to introduce new features
- OMX Image Alignment topic document

Please review all relevant documentation prior to upgrading



DV Elite users

Who should upgrade?

Who *can* upgrade:

- Any user with a workstation running **CentOS 5.X or newer** (softWoRx 6.5.2 is the last version that supported CentOS 4.X or older)

Who *should* upgrade:

- Any user that does not have a microtiter stage and does not regularly use the Rotate3D tool

Who should upgrade only *after* understanding the implications:

- Any user that has a standalone workstation running CentOS 4.X that must view/process data with Panels (specifically plate scanning with multiple FOV per well) on that standalone workstation
- Any user that uses a third party software to view/process data with Panels (specifically plate scanning with multiple FOV per well)
- Any user that routinely uses the Rotate3D tool



OMX users

Who should upgrade?

Any user with a workstation running **CentOS 5.X or newer** (softWoRx 6.5.2 is the last version that supported CentOS 4.X or older)



If you have any questions, please
contact your local GE Representative

