LaVue: Live viewing images from detectors - supports all 2D detectors used in PETRA III

communication with sardana

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Application Layout and Image Sources

Image source — Image name – Button box

General tools

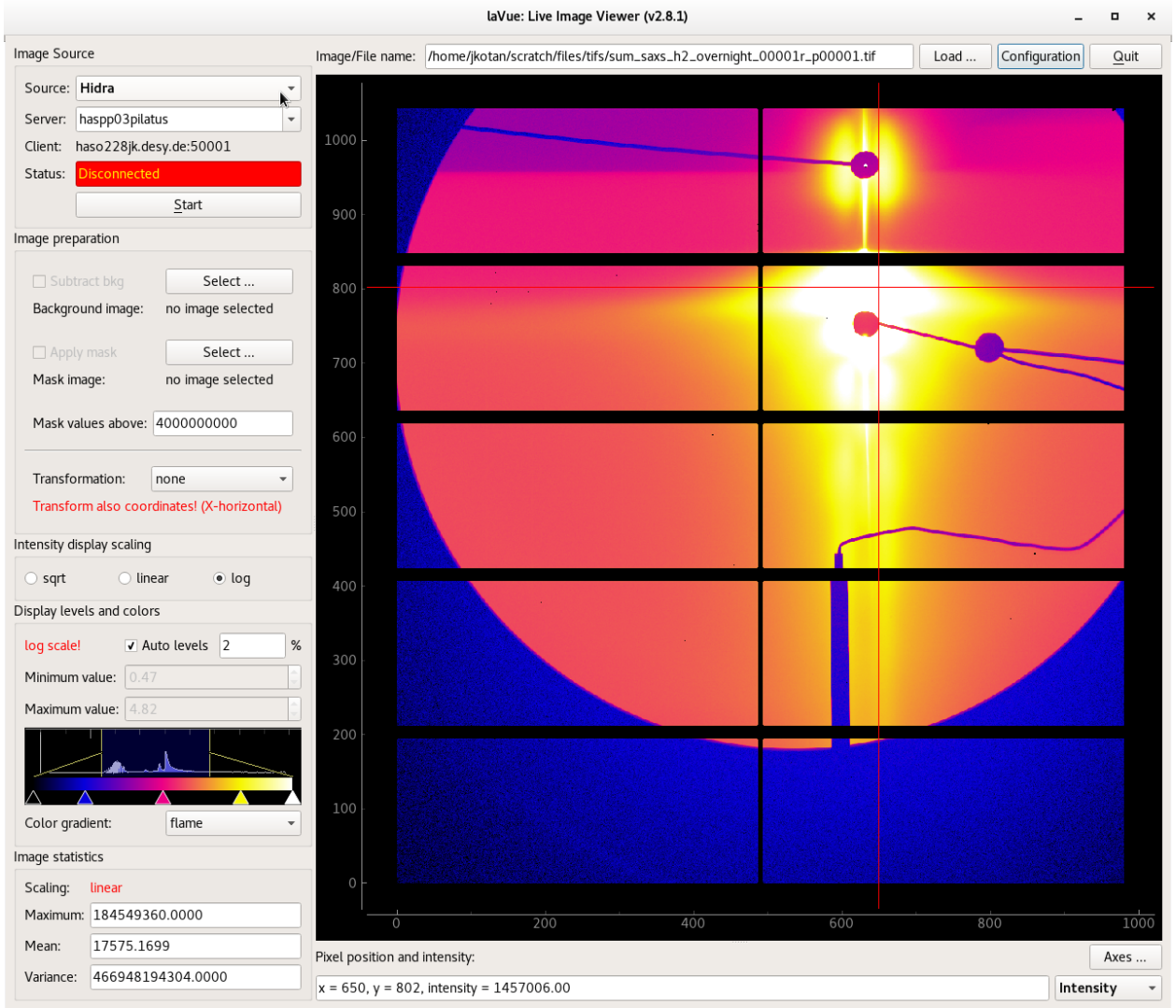
Preparation:

- Background image
- Mask image
- Transformations

Display intensity:

- Scaling
- Min./Max. levels
- Color gradient

Statistics



2D image – Specialised tools

Application Layout and Image Sources

Image source — Image name – Button box

HIDRA:
- Pilatus, Eiger
- PCO, Perkin Elemer

HTTP response:
- Eiger

Tango Attribute:
- Lambda, PCO
- Jungfrau, AGIPD
- LimaCCDs (e.g. Andor)

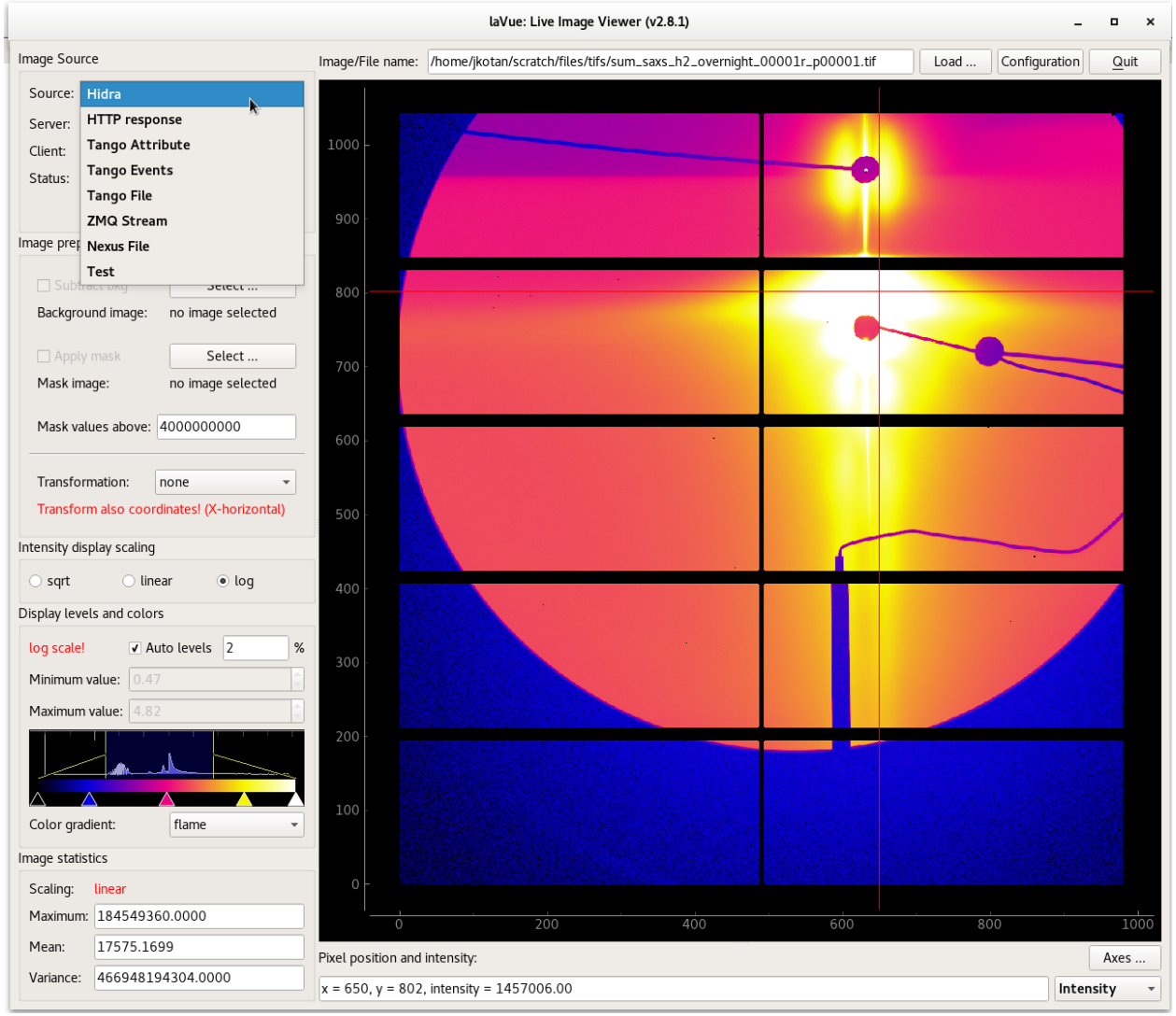
Tango Events:
- LimaCCDs

Tango File:
- Pilatus w/o Hidra

ZMQ Stream:
- processed image (P06)

Nexus File:
- Nexus Writer (SMWR)

Epics PV, DOOCS, Tine, ASAPO ...



2D image – Specialised tools

Application Layout and Image Sources

Image source — Image name – Button box

In the **expert mode:**

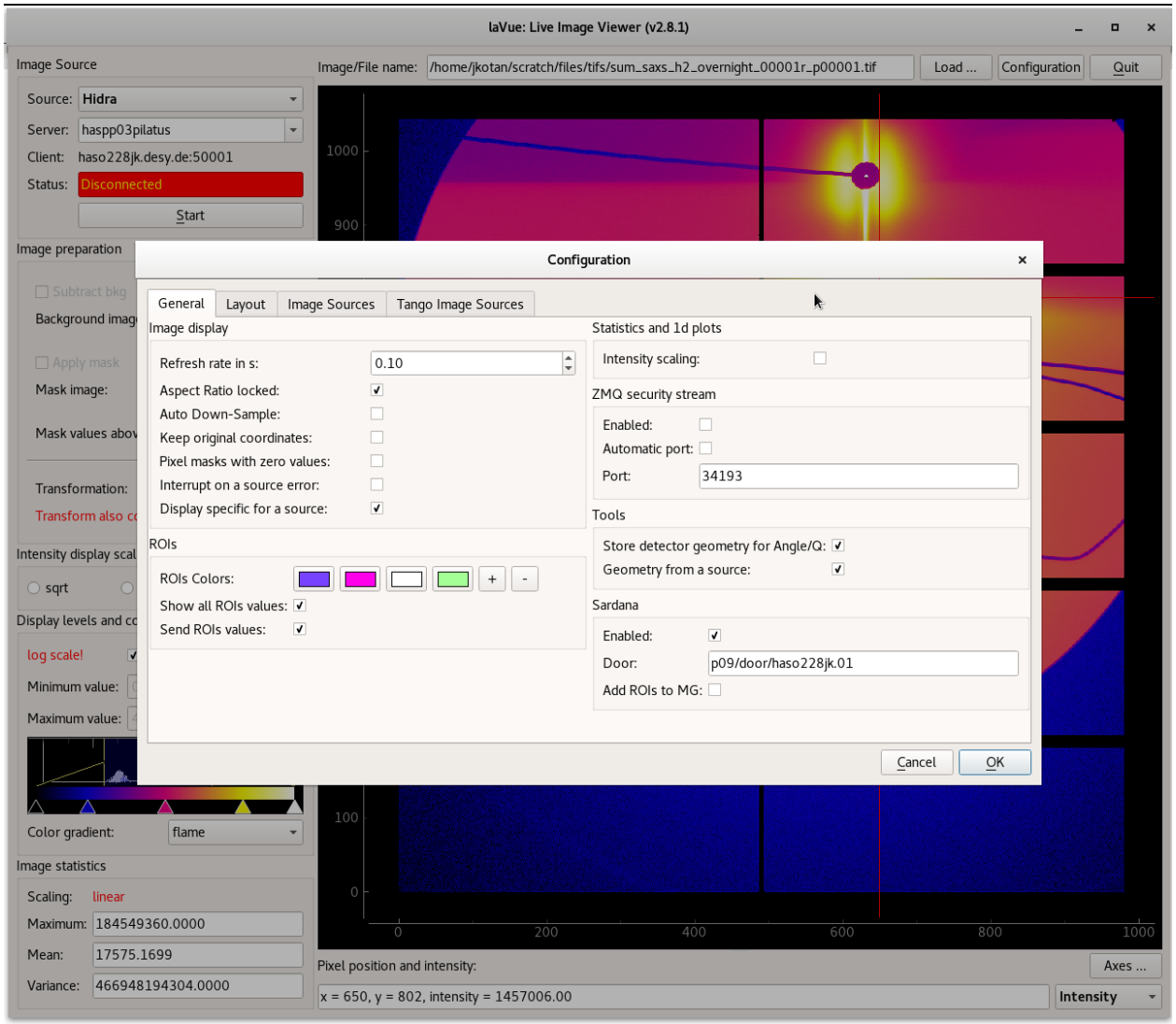
i.e. lavue -m expert

General configuration

Dialog layout

Bookmarks for image source parameters

Custom color gradients



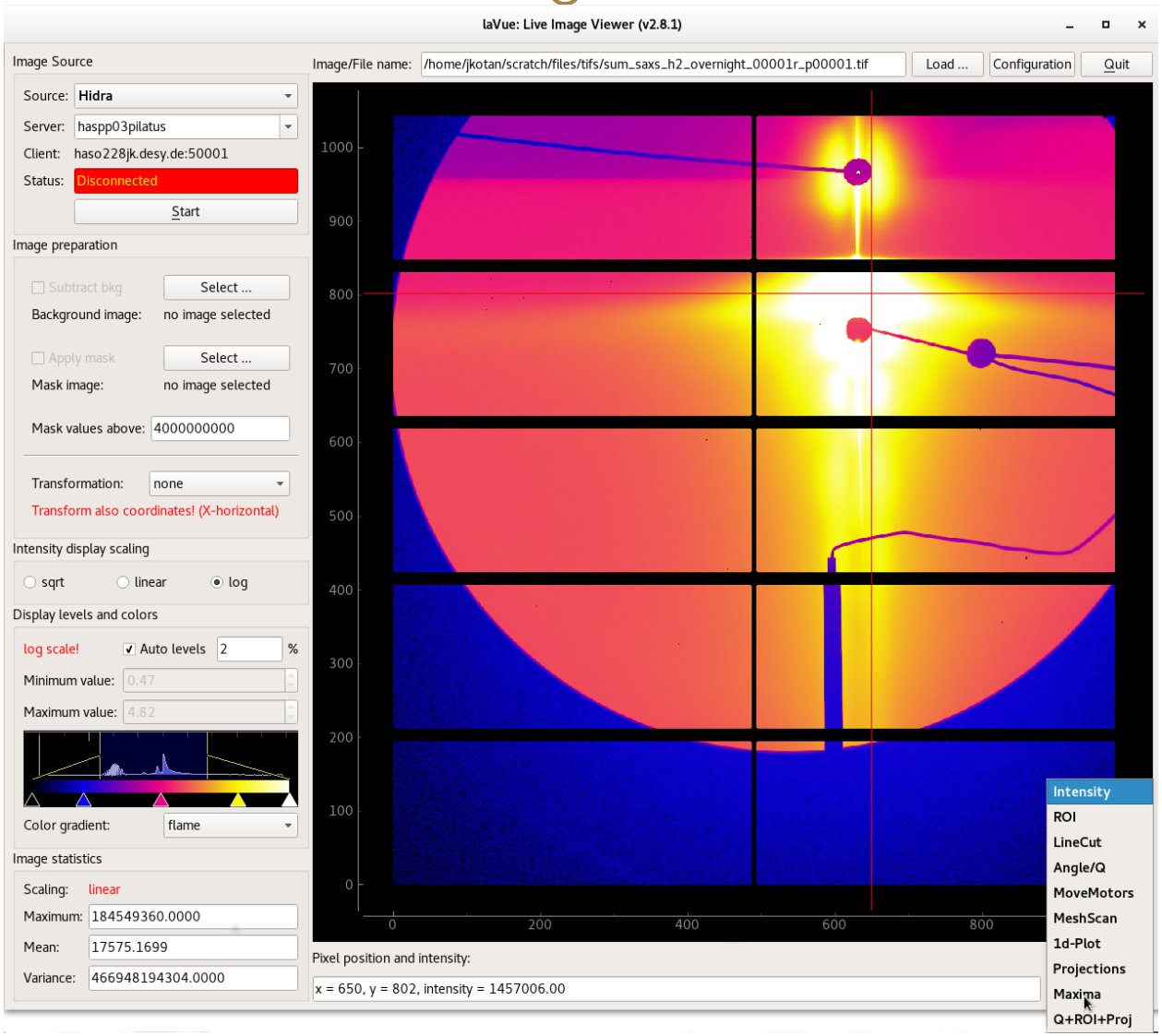
All stored in `$HOME/.config/DESY/LaVue.conf`

Application Layout and Image Sources

Image source — Image name – Button box

Specialized Tools

- Intensity
- ROI
- LineCut
- Angle/Q
- MoveMotors
- MeshScan
- 1d-Plot
- Projections
- Maxima
- Parameters
- Q+ROI+Proj
- Diffractogram

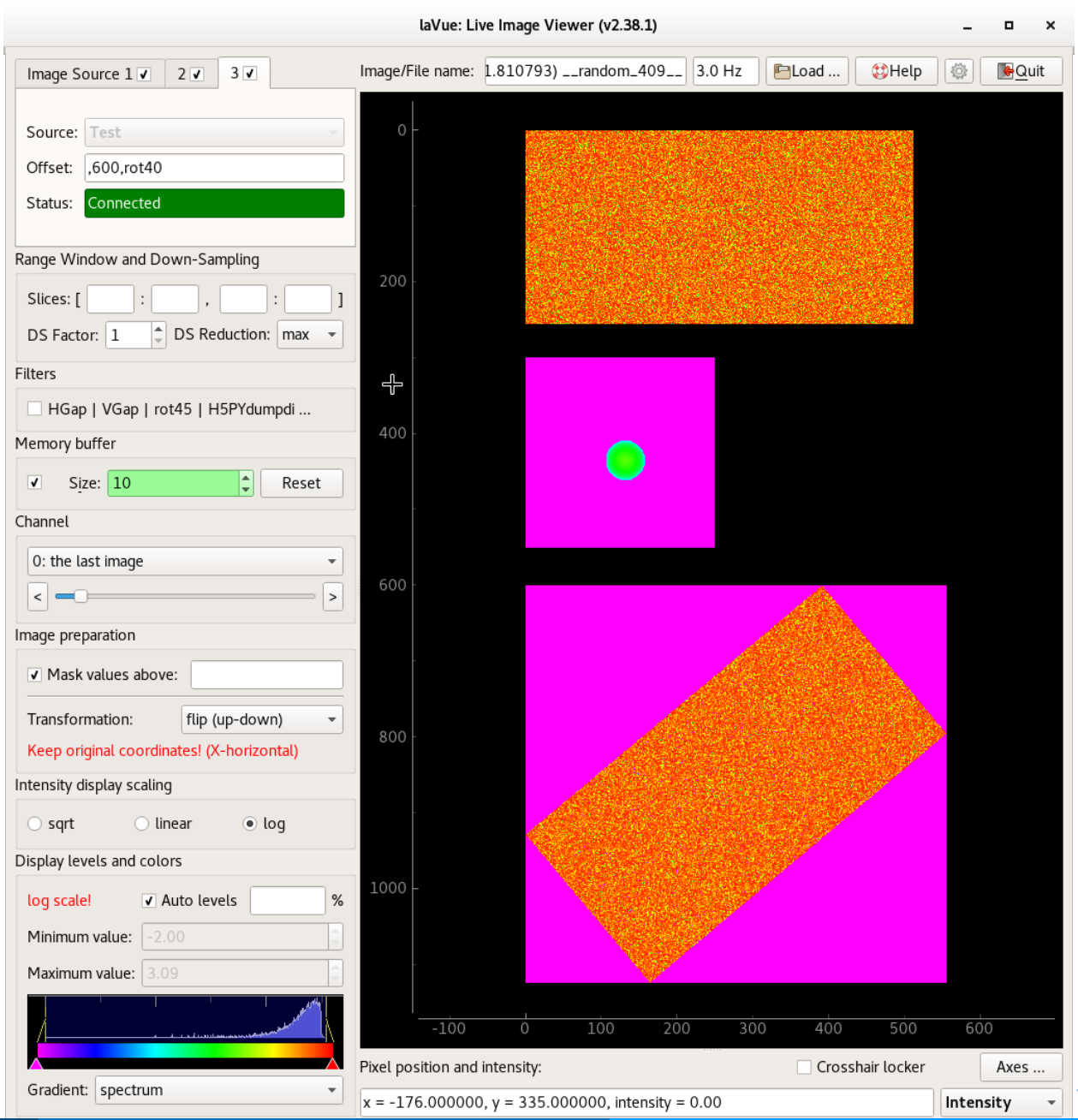


Tools added on request

Application Layout and Image Sources

General tools

- Multiple image source
- Range Window and Down-sampling
- Filters
- Memory buffer
- Color/RGB channels
- Image Subtraction
- Image Mask
- Mask high values
- Transformations
- Intensity scale
- Intensity levels
- Histogram user color gradients
- Statistics



Configuration

General
configuration

Image source:

- Number of image sources
- Refresh time in s

Image display:

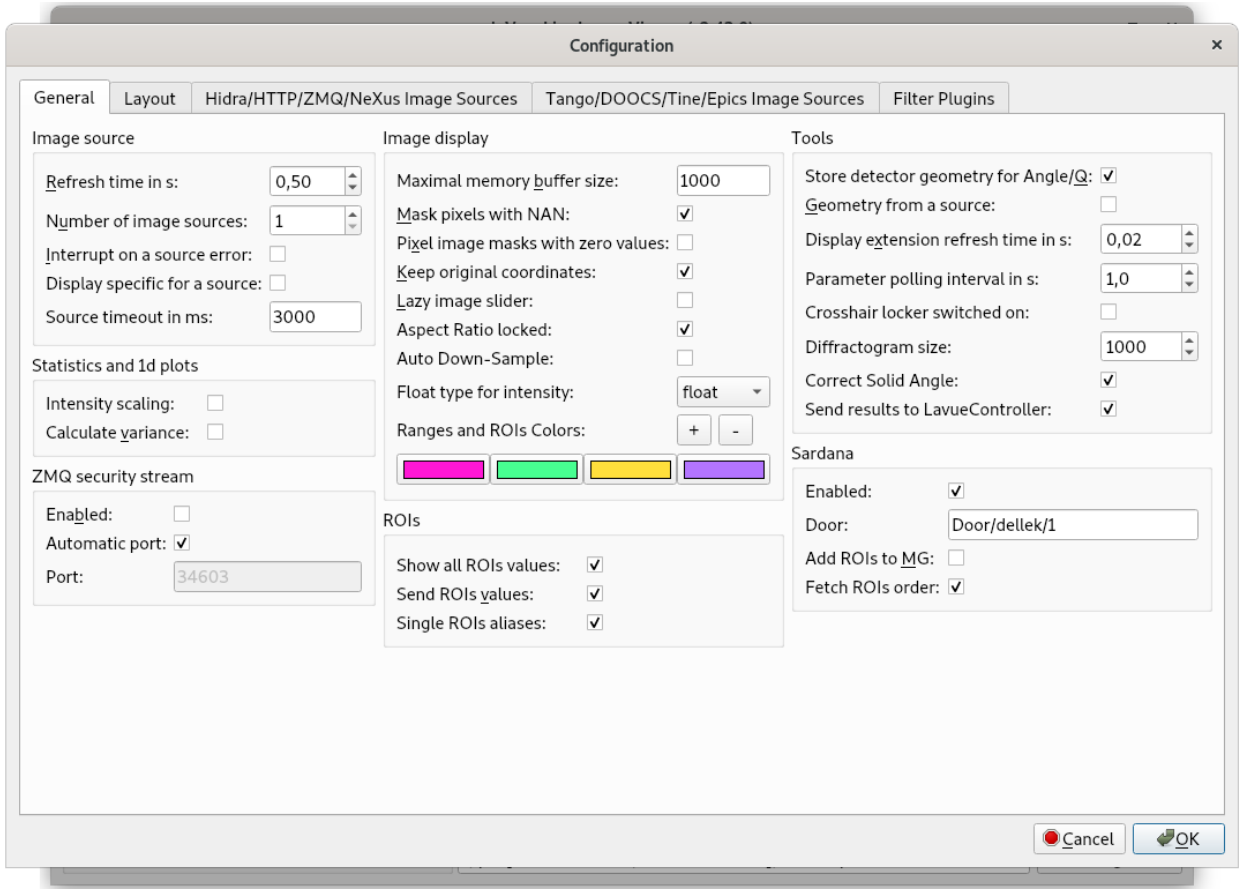
- Keep original coordinates
- Ranges and ROIs Colors

ROIs:

- Send ROIs values

Sardana:

- Enabled
- Door
- Add ROIs to MG with nxsadd macro
- Fetch ROIs order from Sardana Env.



In the **expert mode:**
i.e. lavue -m expert

All stored in `$HOME/.config/DESY/LaVue.conf`

Configuration

Layout
configuration

Show control bar widget:

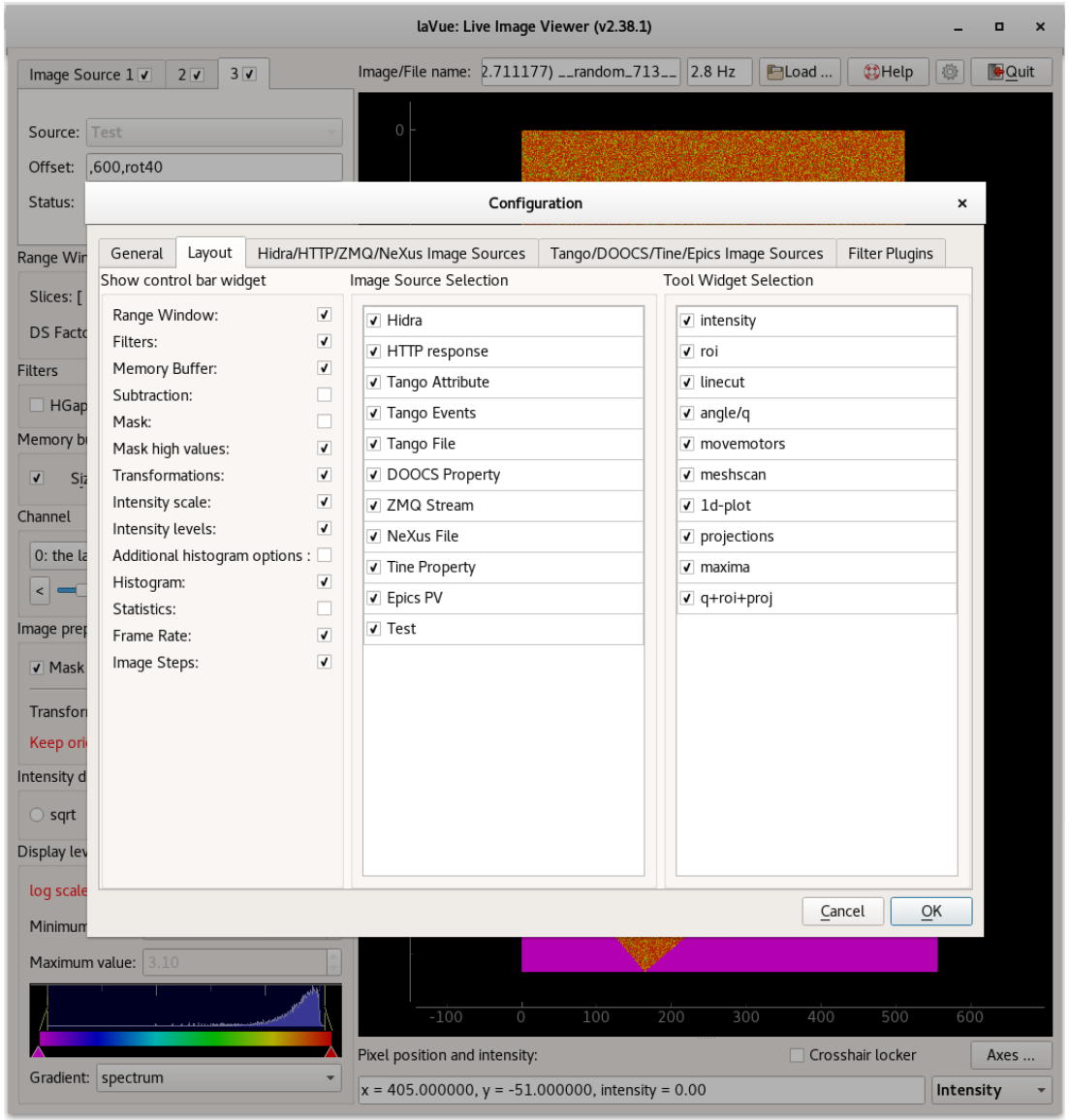
- more options

Image Source Selection:

Tool Widget Selection:

- select combobox content
- drag and drop

In the **expert mode:**
i.e. lavue -m expert



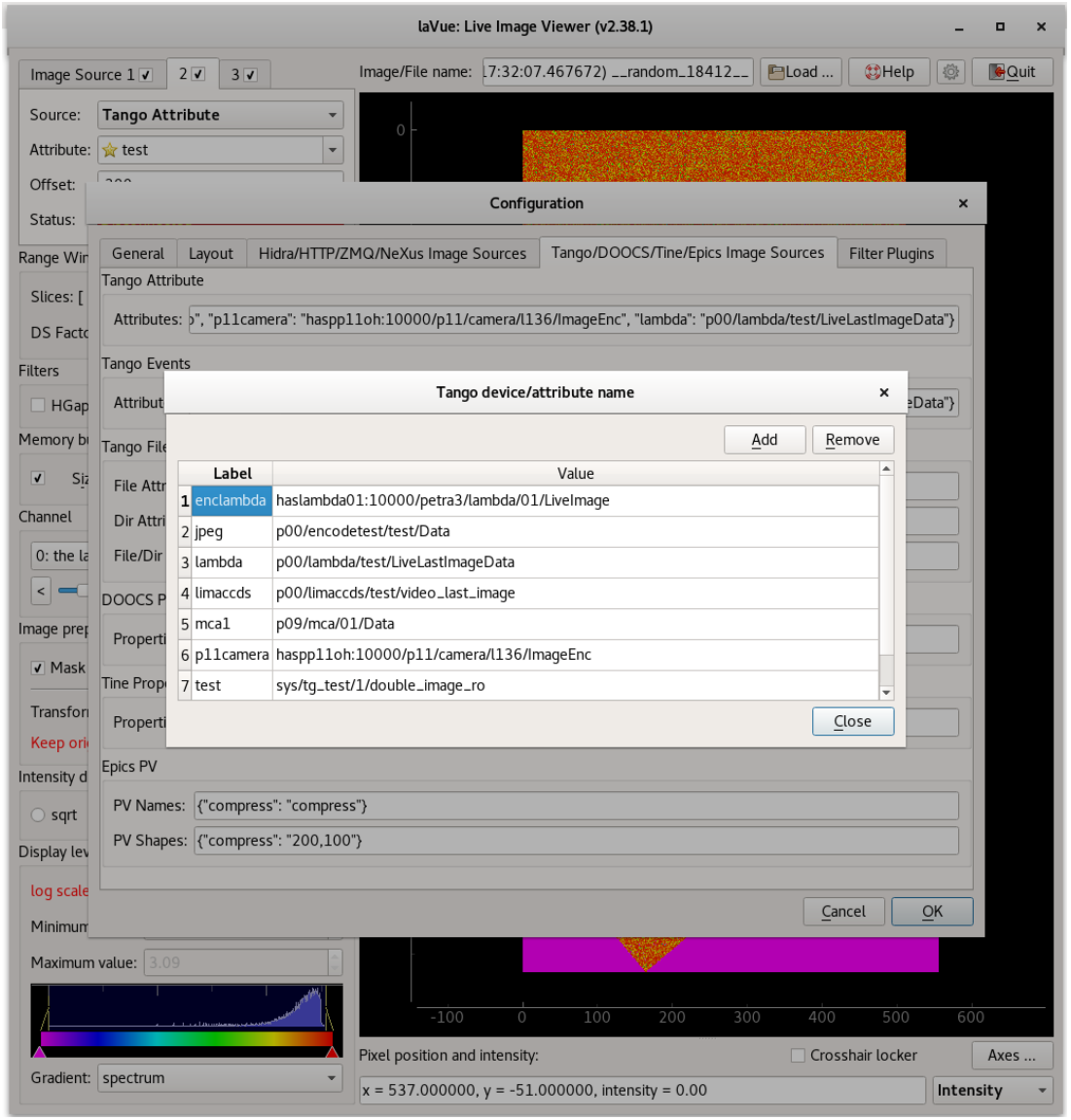
All stored in `$HOME/.config/DESY/LaVue.conf`

Configuration

Image Sources
configuration

Labels for Sources

- star and unstar
- widget with {Label: Value}



In the **expert mode:**
i.e. lavue -m expert

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Configuration

Filter Plugins
configuration

Widget with {filter: parameter}

Filters:

- package.module.class
- package.module.function

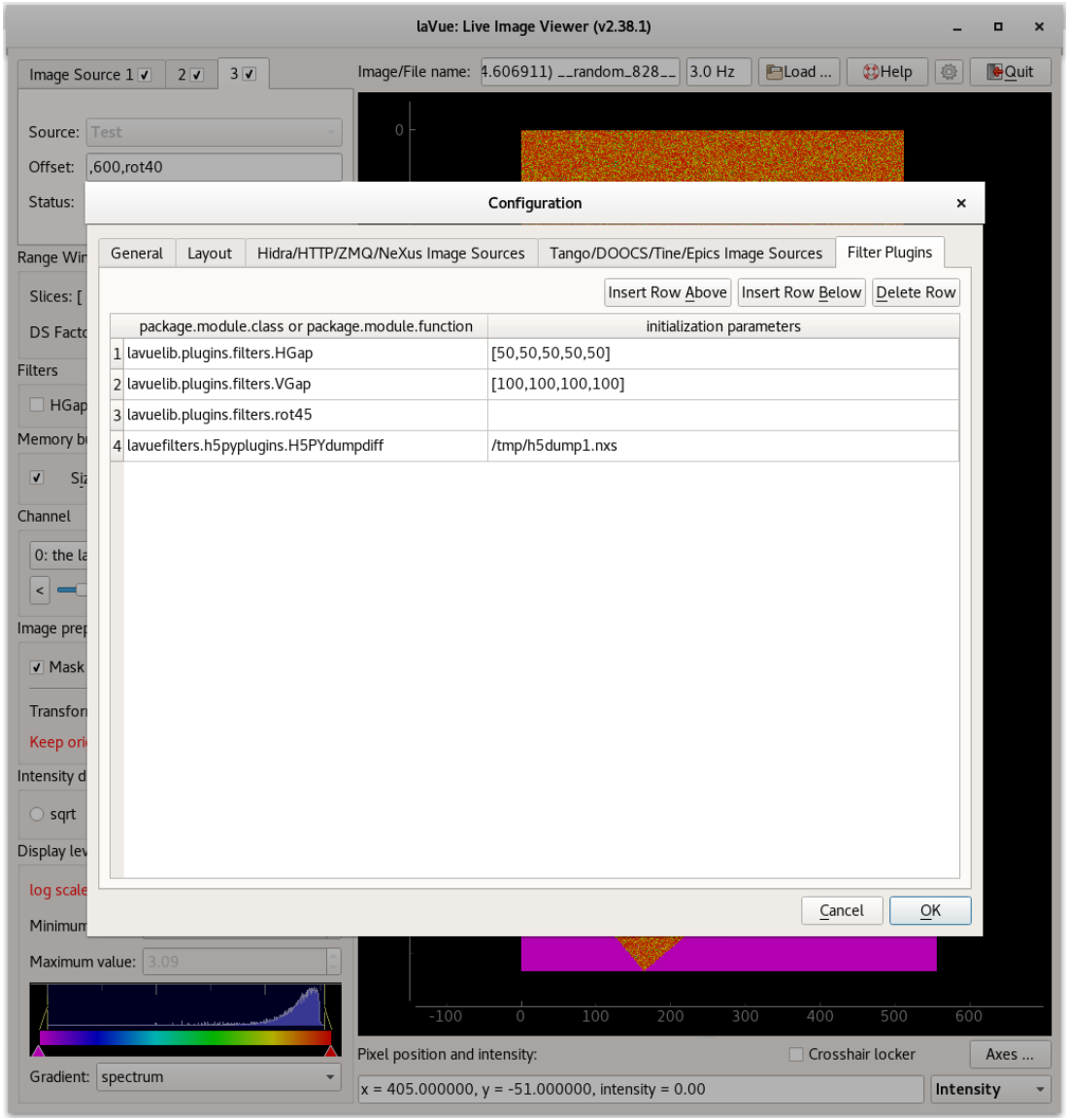
input: image, imagename, metadata and image widget
output: processed image

Parameters:

- any string - parameter

of filter class constructor

In the **expert mode:**
i.e. lavue -m expert -j myinstance



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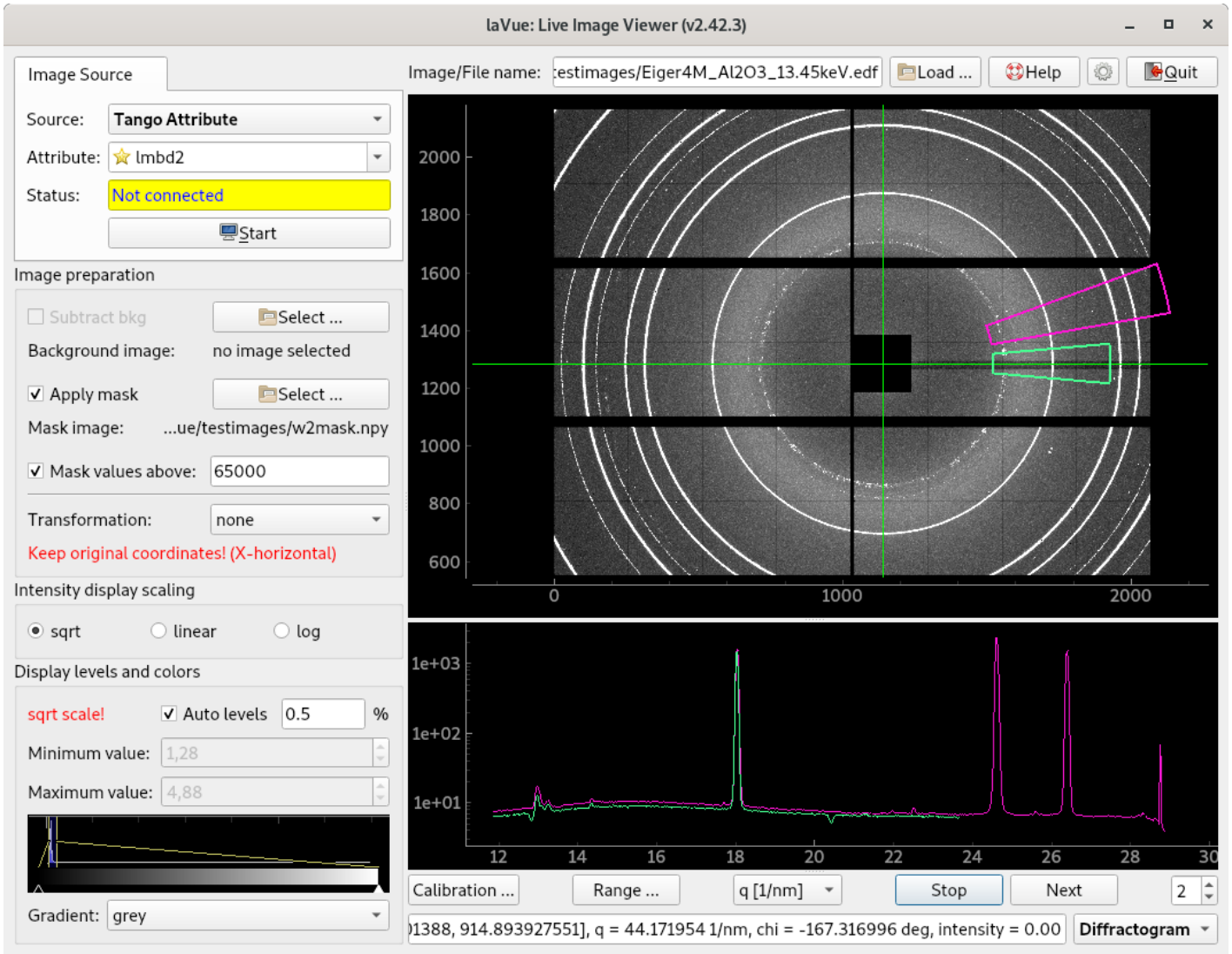
Specialized Tool - Diffractogram

Azimuth integration of defined range

- Calibration:
  - from pyFAI
- Range in deg
- Units:
  - q, 2theta or r
- Up to 4
  - diffractograms
- Show and Next buttons
- Results:
  - sent to tango LavueController.ToolResults



Lavue Controller - Tango Server

Comunicate with LaVue

via Tango interface

- exec: lavue -a p00/lavuecontroller/1

Get/Set Detector parameters

- BeamCenterX, BemCenterY, PixelSizeX, PixelSizeY
- Energy, DetectorDistance

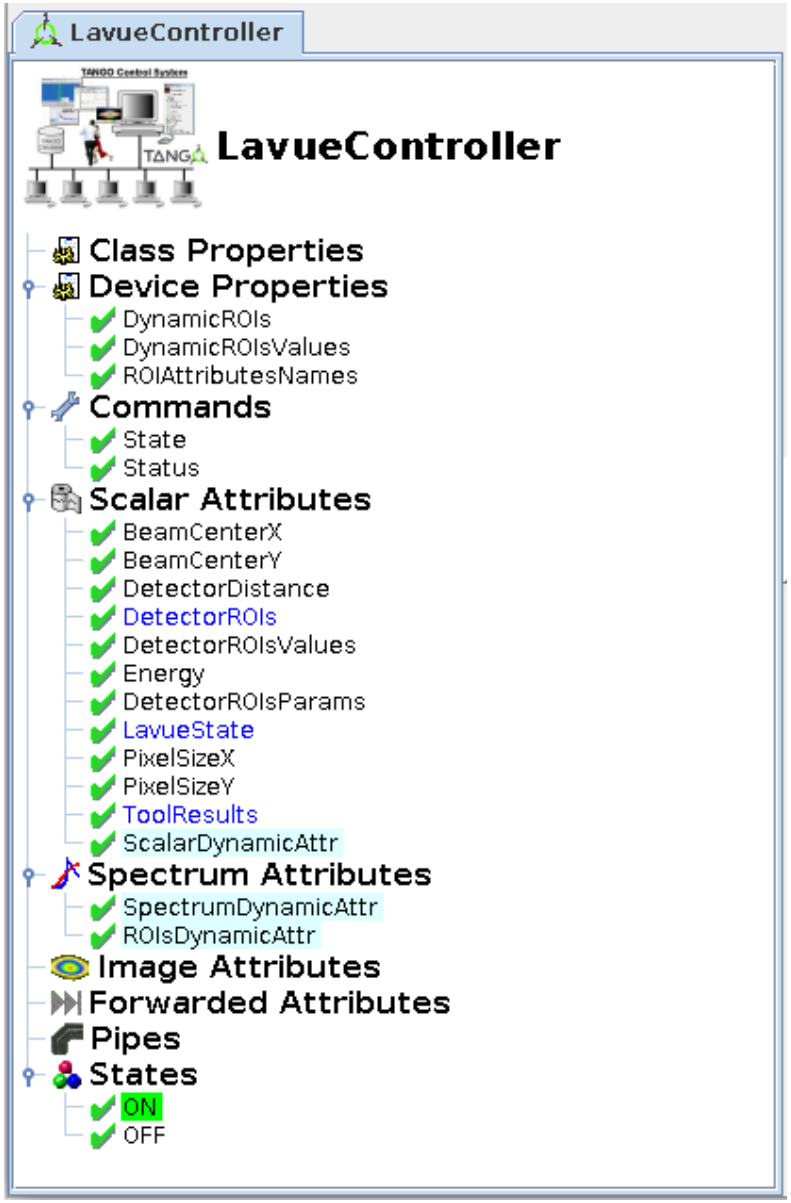
Get/Set ROI bounds

- DetectorROIs , *Values, *Params

Tools: ToolResults

Control LaVue via json LavueState:

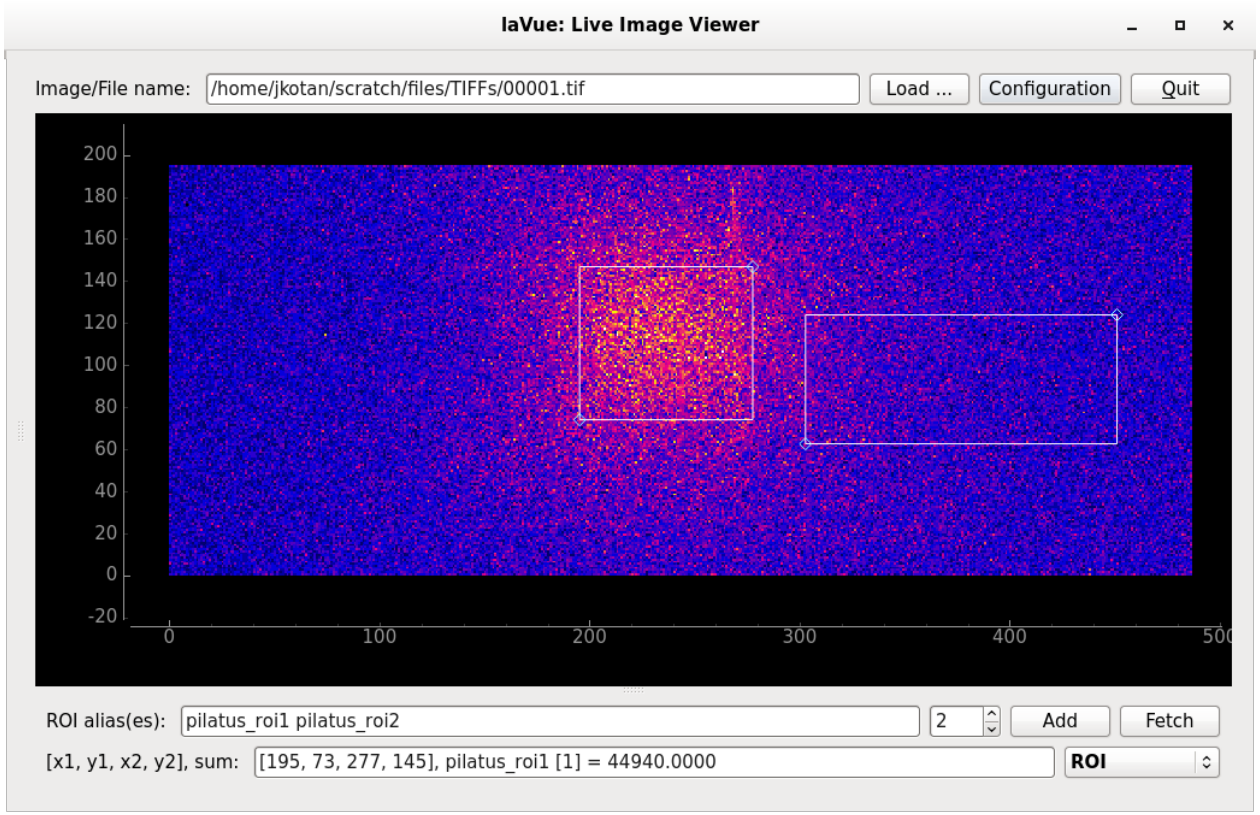
```
import tango

lc = tango.DeviceProxy('p09/lavuecontroller/1')

lc.LavueState = '{"source": "tangoattr", \
    "configuration": "sys/tg_test/1/double_image_ro"}'
lc.LavueState = '{"start": true}'
lc.LavueState = '{"tool": "roi"}'
lc.LavueState = '{"stop": true}'
```



Region Of Interest bounds

Send ROI bounds to a Tango Server by pressing `Add` button

- exec: lavue -n p00/lambdaonlineanalysis/1
- Tango server has a SPECTRUM `RoIs` attribute (python slice convention)



Send ROI bounds to Sardana MacroServer Environment

- variables: `DetectorROIs, DetectorROIsOrder, DetectorROIsParams`
- ROI alias(es) should be defined (or select 'Single ROIs aliases')

Summary

- Goal: LaVue supports all 2D detectors used in PETRA III
- Tuned to DESY needs: we implement your requests
- More info:
  https://confluence.desy.de/display/FSEC/LaVue+-+Live+Image+Viewer
- Sources: https://github.com/lavue-org/lavue/
- Debian packages: deb http://repos.pni-hdri.de/apt/debian

...

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Thank You !