

LaVue: Live image viewer

live-viewer for 2D detectors in our Tango environment

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Application Layout: Image Sources

Image source(s)

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, Vimba

Tango File:

Pilatus w/o Hidra

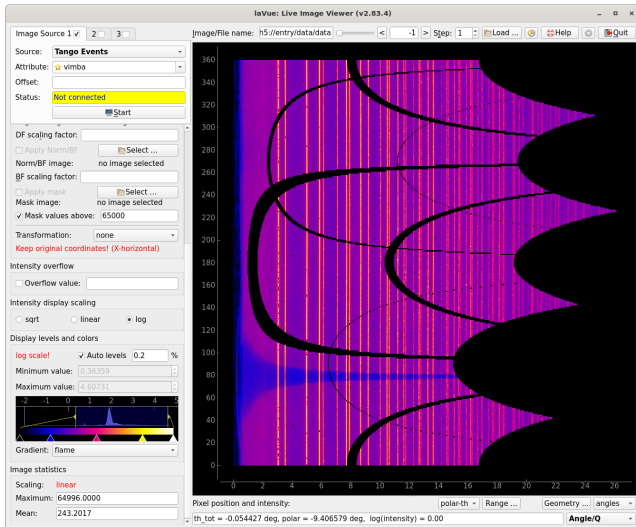
ZMQ or ASAPO:

processed image

Nexus File:

Nexus Writer (SMWR)

DOOCS, Tine, Epics, Test



2D image – Specialised tools



Application Layout: General tools

Image source(s)

Image name – Button box

General tools

Range window

Down-sampling

Filters

Python plugins

Memory buffer

Channel selection

Preparation:

Background image

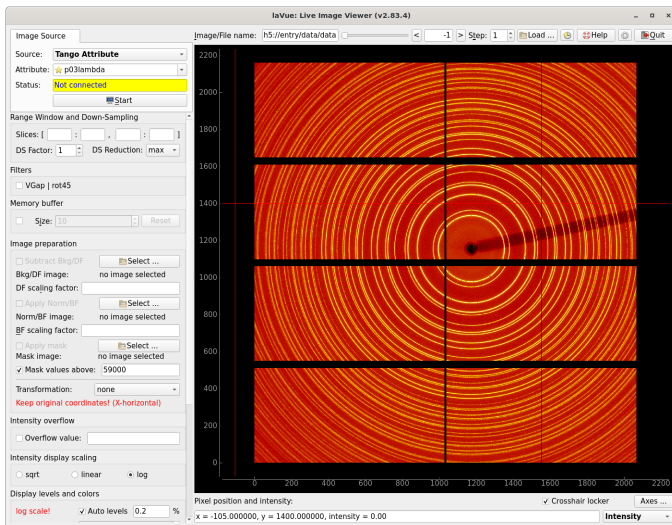
Normalization image

Mask image

High value mask

Transformations

rotation and flips



2D image – Specialised tools



Application Layout: General tools

Image source(s)

Image name – Button box

General tools

Intensity overflow

pixel bit overflow color

Intensity scaling

sqrt/linear/log

Display Levels:

Auto levels

Min./Max. levels

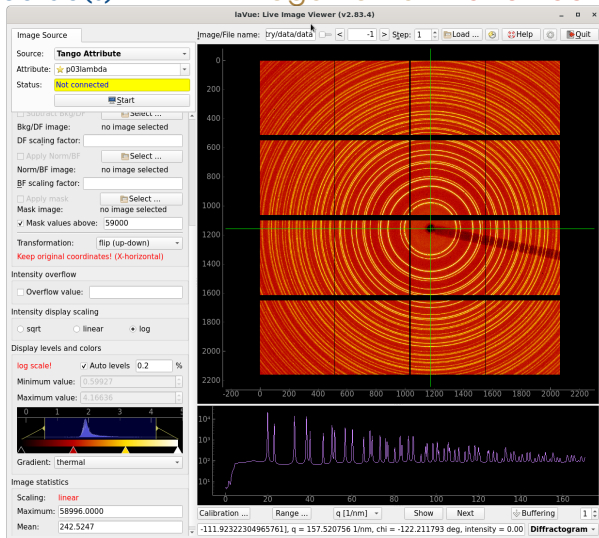
Color gradient

Statistics

Scaling

Maximum

Mean



2D image – Specialised tools



LaVue Configuration

General

settings

Dialog Layout

show/hide tools

Image Sources

labels for sources

- star and unstar

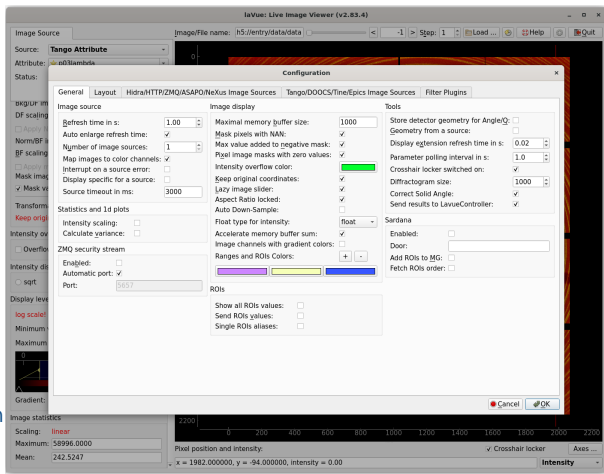
- widget customization

Filter Plugins

package.module.class

package.module.function

parameters



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

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

LaVue Controller - Tango Server

Communicate 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

Control LaVue via json LavueState and ToolResults:

```
import tango
```

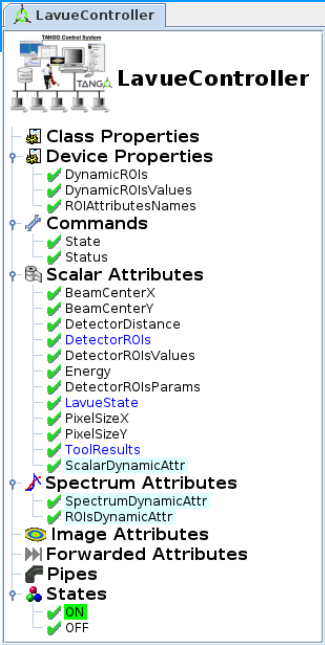
```
lc = tango.DeviceProxy('p09/lavuecontroller/1')
```

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

```
lc.LavueState = '{"start": true}'
```

```
lc.LavueState = '{"tool": "roi"}'
```

```
lc.LavueState = '{"stop": true}'
```



The screenshot shows the LaVueController interface with a tree view of properties and attributes. The tree is organized as follows:

- Class Properties**
- Device Properties**
 - DynamicROIs
 - DynamicROIsValues
 - ROIAttributesNames
- Commands**
 - State
 - Status
- Scalar Attributes**
 - BeamCenterX
 - BeamCenterY
 - DetectorDistance
 - DetectorROIs
 - DetectorROIsValues
 - Energy
 - DetectorROIsParams
 - LavueState
 - PixelSizeX
 - PixelSizeY
 - ToolResults
 - ScalarDynamicAttr
- Spectrum Attributes**
 - SpectrumDynamicAttr
 - ROIsDynamicAttr
- Image Attributes**
- Forwarded Attributes**
- Pipes**
- States**
 - ON
 - OFF

Specialized Tools

Intensity

ROI

LineCut

Angle/Q

MoveMotors

MeshScan

1d-Plot

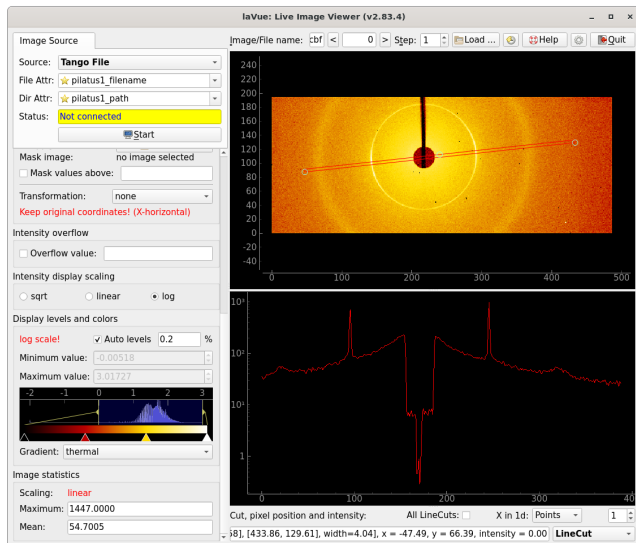
Projections

Maxima

Parameters

Diffractiongram

Q+ROI+Proj

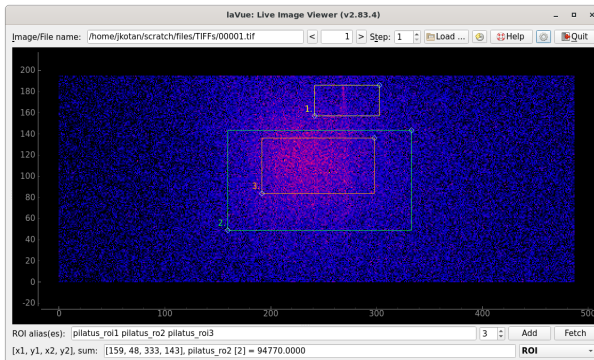


Tools added on request

Specialised Tools: ROI (Region Of Interest)

Send ROI bounds to a Tango Server by pressing Add button

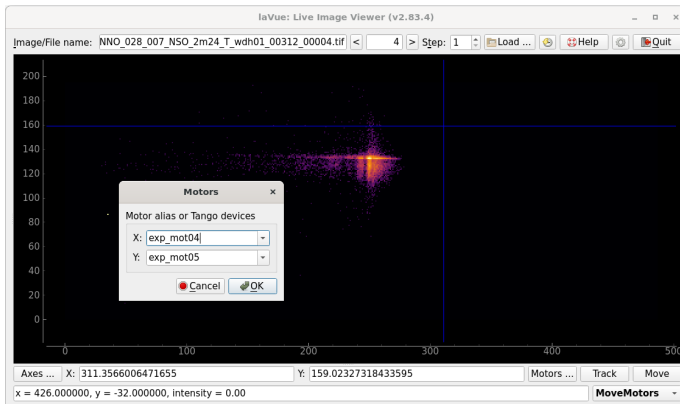
- exec: `lavue -n p00/lambdaonlineanalysis/1`
- Tango server has a SPECTRUM `ROI`s attribute
e.g. `LambdaOnlineAnalysis` from Teresa Núñez



Send ROI bounds to Sardana MacroServer Environment

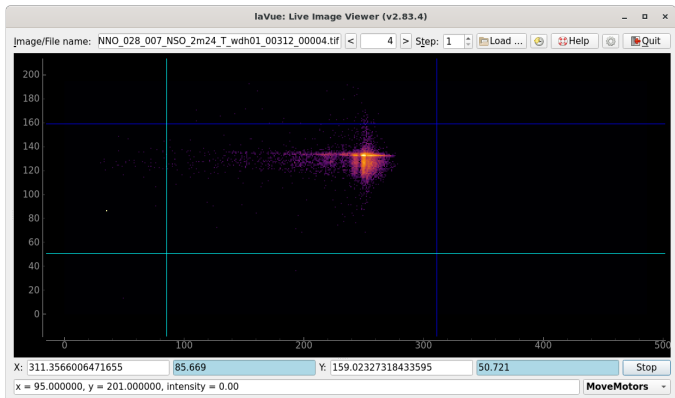
- variables: `DetectorROIs`, `DetectorROIsOrder`, `DetectorROIsParams`
- ROI alias(es) should be defined

Specialised Tools: Move motors



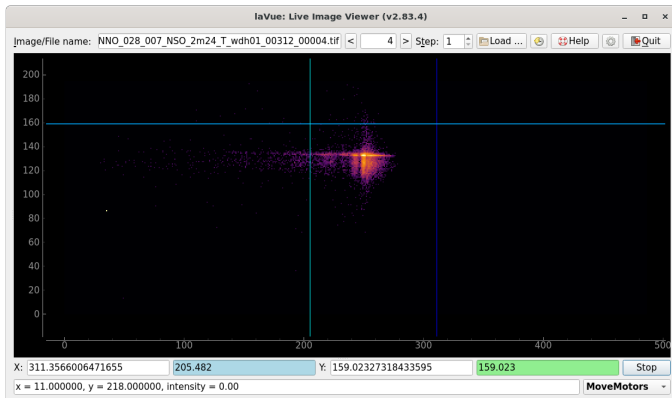
- Motors: select x,y motors
- Move/Stop motors
- Pixel intensity pointed by mouse and its position

Specialised Tools: Move motors



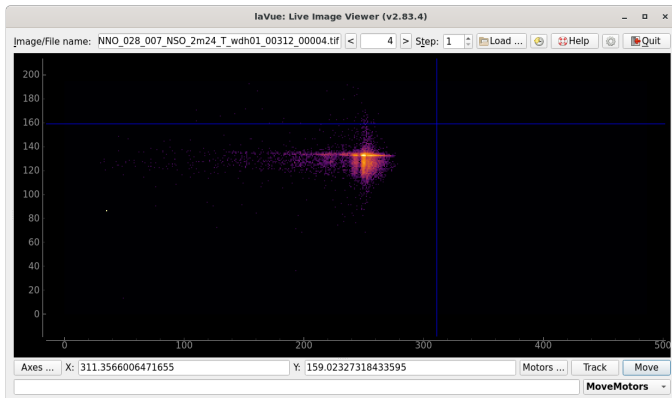
- Motors: select x,y motors
- Move/Stop motors
- Pixel intensity pointed by mouse and its position

Specialised Tools: Move motors



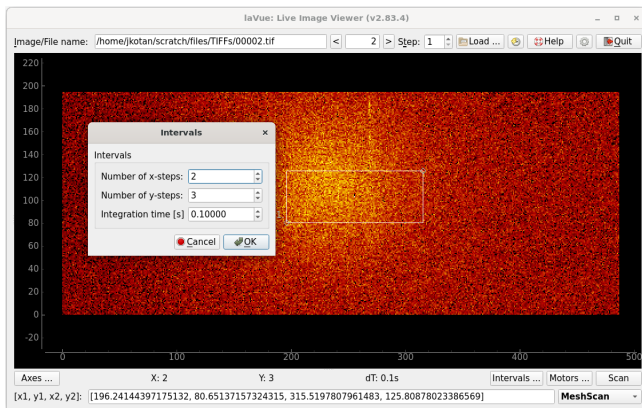
- Motors: select x,y motors
- Move/Stop motors
- Pixel intensity pointed by mouse and its position

Specialised Tools: Move motors



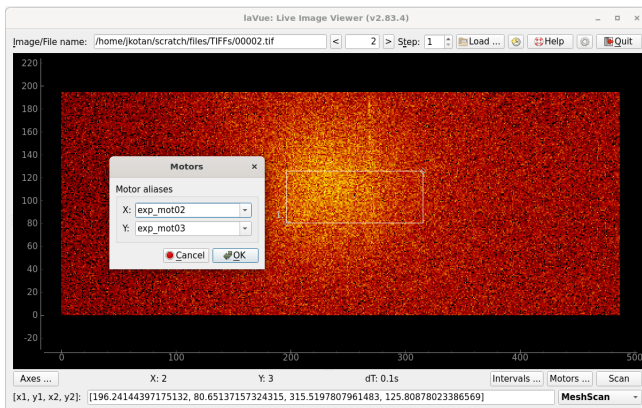
- Motors: select x,y motors
- Move/Stop motors
- Pixel intensity pointed by mouse and its position

Specialised Tools: Mesh scan



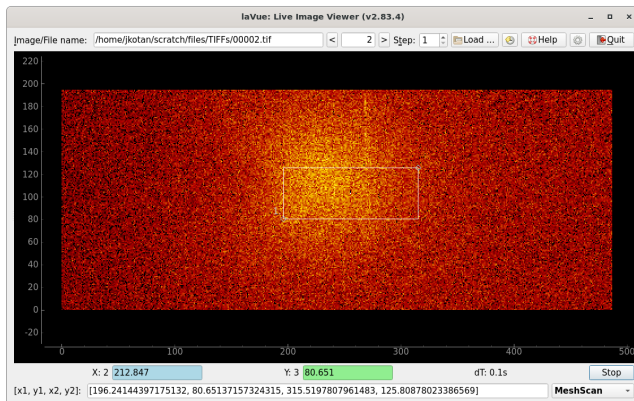
- Intervals: select x,y intervals and integration time
- Motors: select x,y motors
- Scan/Stop: Sardana mesh macro with the active MG
- Pixel intensity pointed by mouse and its position

Specialised Tools: Mesh scan



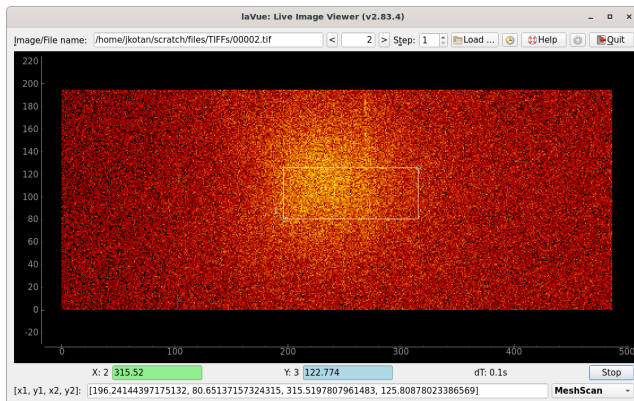
- Intervals: select x,y intervals and integration time
- Motors: select x,y motors
- Scan/Stop: Sardana mesh macro with the active MG
- Pixel intensity pointed by mouse and its position

Specialised Tools: Mesh scan



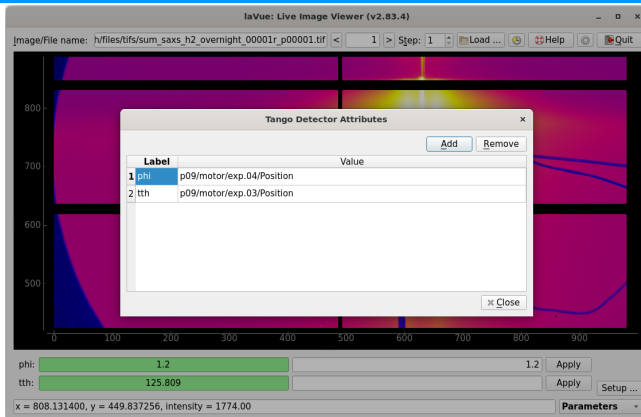
- Intervals: select x,y intervals and integration time
- Motors: select x,y motors
- Scan/Stop: **Sardana mesh macro** with the active MG
- Pixel intensity pointed by mouse and its position

Specialised Tools: Mesh scan



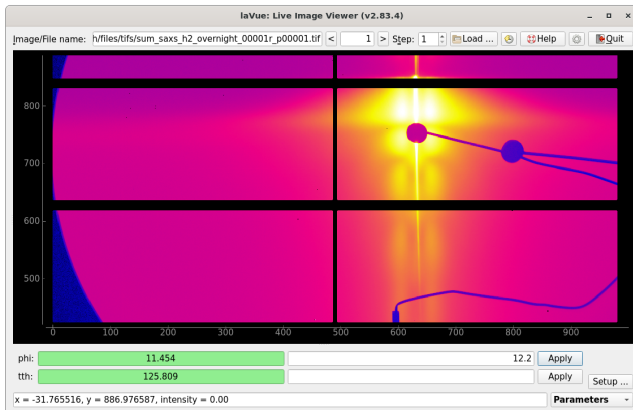
- Intervals: select x,y intervals and integration time
- Motors: select x,y motors
- Scan/Stop: **Sardana mesh macro** with the active MG
- Pixel intensity pointed by mouse and its position

Specialised Tools: Parameters



- Setup: select Tango attribute parameters
- view the current parameter values
- Apply: adjust the parameter values according to the live detector image

Specialised Tools: Parameters



- Setup: select Tango attribute parameters
- view the current parameter values
- Apply: adjust the parameter values according to the live detector image

Image Source

Source: **Tango Attribute**

Attribute: **p03lambda**

Status: **Not connected**

bkg/DF image:

DF scaling factor:

Apply Norm/BF

Norm/BF image:

BF scaling factor:

Apply mask

Mask image:

Mask values above:

Transformation:

Keep original coordinates

Intensity overflow

Overflow value:

Intensity display scaling

sqrt linear

Display levels and colors

log scale! Auto

Minimum value: 0.599

Maximum value: 4.166

Gradient: thermal

Image statistics

Scaling: **linear**


Maximum: 58996.0000

Mean: 242.5247

Image/File name: h5:/entry/data/data

Step: 1

Load ... Help Quit



LaVue Help

Live Image Viewer — LaVue 2.83.2 documentation

LaVue 2.83.2 documentation > Live Image Viewer

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Live Image Viewer

LaVue is a simple implementation of a live viewer front end. It is supposed to show a live image view from xray-detectors at PETRA3 @ desy.de, e.g. Pilatus, Lambda, Eiger, PerkinElmer, PCO, LimaCC, and others.

Title: Live Image Viewer (2.83.2)

Image Source

Source: Tango Attribute

File: h5:/entry/data/data

Attribute: p03lambda

Status: Not connected

Mask values above

Transformation: none

Keep original coordinates (if not scaled)

Intensity display scaling

sqrt linear log

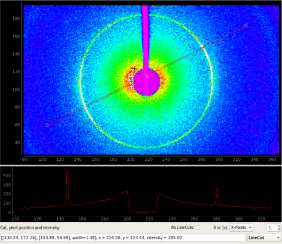
Display levels and colors

log scale! Auto

Minimum value: 0.599

Maximum value: 4.166

Gradient: thermal



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Pixel position and intensity: Crosshair locker

x = 1787.000000, y = 7.000000, intensity = 99.00

Intensity

- Goal: **LaVue** supports all 2D detectors used in PETRA III
- Tuned to our user needs: we implement **our user requests**
- More info: <https://lavue-org.github.io/lavue/latest/index.html>
- Sources: <https://github.com/lavue-org/lavue>
- Debian/Ubuntu packages in our HDRI repo, e.g.:
<http://repos.pni-hdri.de/apt/debian> bookworm main
<http://repos.pni-hdri.de/apt/ubuntu> jammy main

...

- Goal: LaVue supports all 2D detectors used in PETRA III
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Thank You !