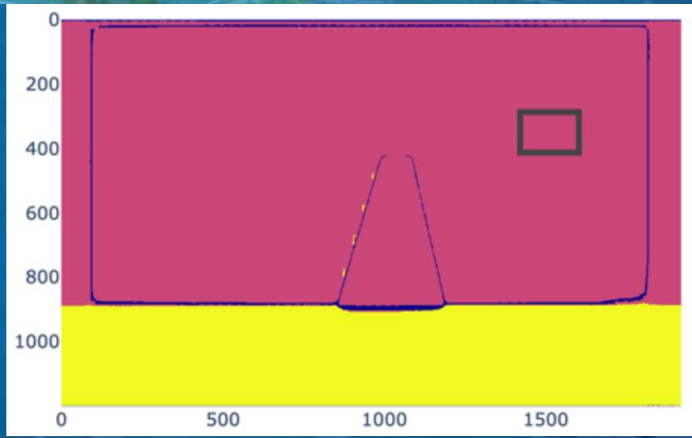
SATURDAY, NOVEMBER 30, 2024

# AUTOMATED BEAMLINE / SAMPLE ALIGNMENT




VIKTORIYA YAREMA, JUN-SANG PARK, PETER KENESEI, JONATHAN ALMER, ANTONINO MICELI, HEMANT SHARMA

XSD

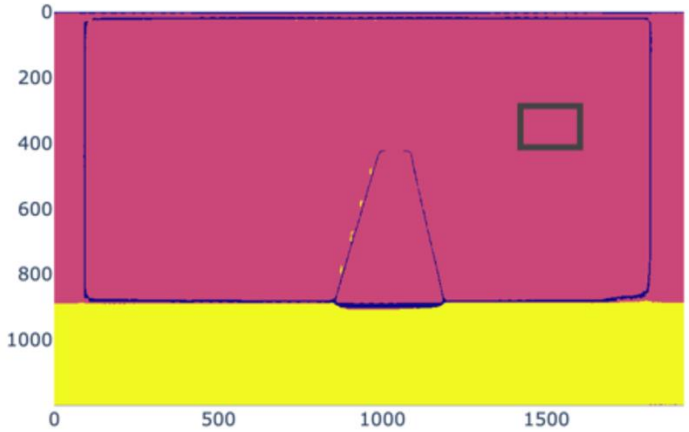
# MOTIVATION

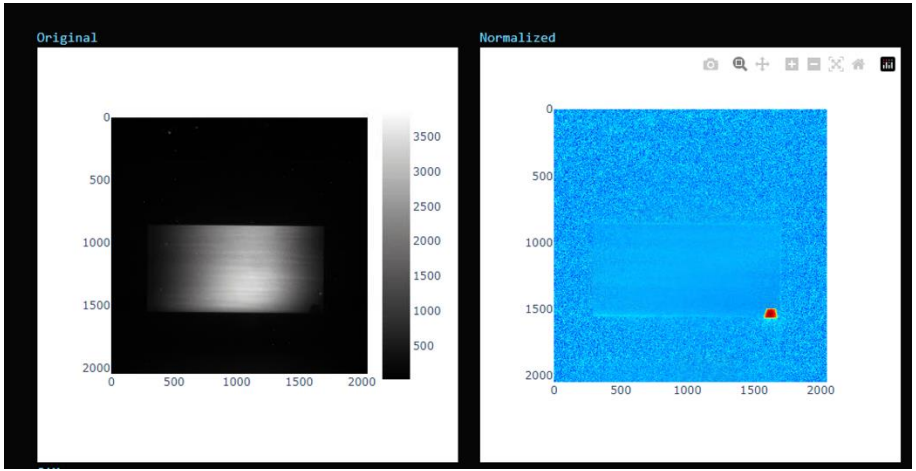
## Align rotation axis to the slits, align sample to the rotation axis

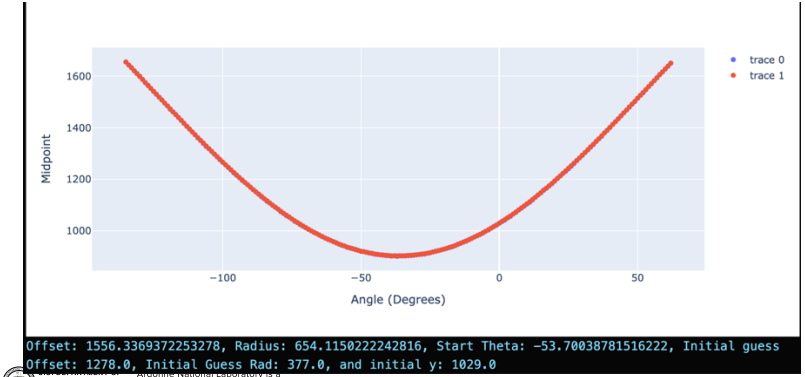
- Use a strongly attenuating ”pin” to figure out the position of the rotation axis.
- Use the pin position at 3 (or 4) angles spaced 90 degrees apart from each other.
- Try to remove the beamline scientist from the loop and do this in an automated manner.

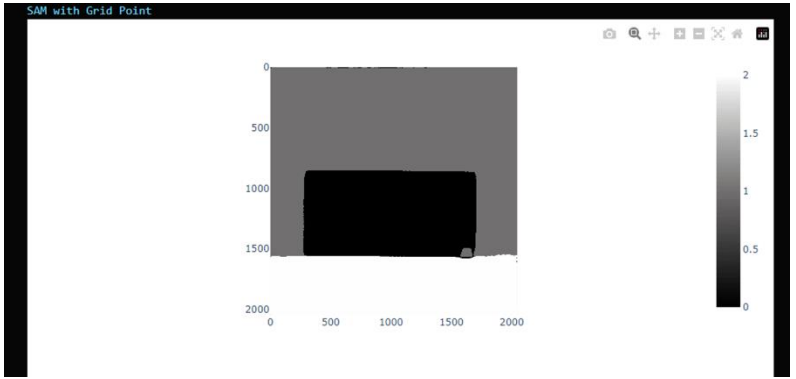
# DEMO

# EXAMPLES



Chrome File Edit View History Bookmarks Profiles Tab Window Help

Thu Aug 1 9:25 AM

Dash

Not Secure 164.54.100.140:8055

# Automated Beamline Alignment

## Instructions

1. Enter the directory, exposure time, and rotation step. Select or unselect the "Normalization" and then click "Run first image"
**** Optional: Enter Epics PV names for samXE, samYE, aeroX, aero, pixel size, file type, camera type, and camera name.
****

2. Select the "Draw rectangle" tool in the upper right hand corner of the "SAM" image. Select the beam in the SAM image and click "Submit beam".

3. Select the "Zoom" tool in the upper right hand corner of the "SAM" image. Select the middle of the object in the SAM image and click "Run all images".

4. Once offset, radius, and start theta are displayed, click the "Center pin and verify" button to center the beam.

Directory:

Exposure Time (seconds): 2

Rotation Step (degrees): 1

samXE (optional): 1ide1:m34

samYE (optional): 1ide1:m35

aeroXE (optional): 1ide1:m101

aero (optional): 1ide:m9

Pixel size (microns) (optional): 1.172

File type (optional): TIFF1

Camera type (optional): cam1

Camera name (optional): 1idPG1

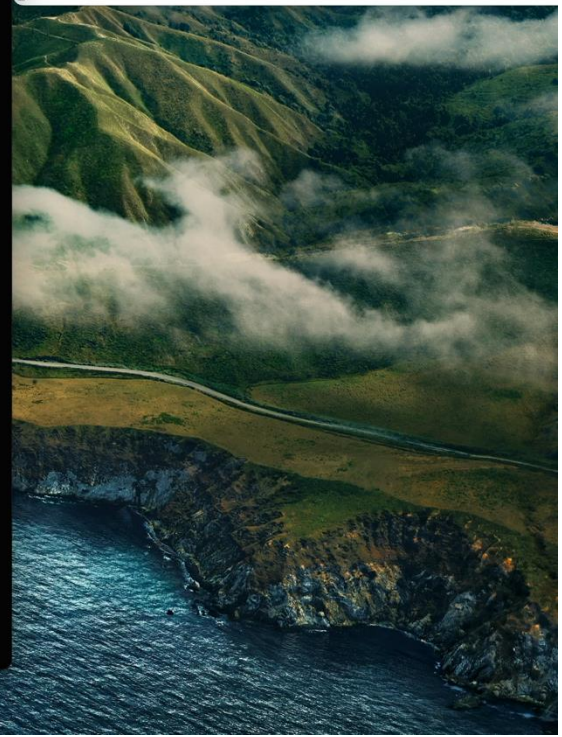
☐ Add normalization

Run first image | Submit beam | Run all images | Center pin and verify

Original Normalized

viki — vyarema@alleppey:~/bl — ssh vyarema@alleppey.xray.aps.anl.gov...

```
  File "/home/beams/VYAREMA/anaconda3/envs/envname/lib/python3.9/site-packages/dash/_grouping.py", line 35, in flatten_grouping
    validate_grouping(grouping, schema)
  File "/home/beams/VYAREMA/anaconda3/envs/envname/lib/python3.9/site-packages/dash/_grouping.py", line 210, in validate_grouping
    SchemaTypeValidationError.check(grouping, full_schema, path, (tuple, list))
  File "/home/beams/VYAREMA/anaconda3/envs/envname/lib/python3.9/site-packages/dash/_grouping.py", line 162, in check
    raise SchemaTypeValidationError(value, full_schema, path, expected_type)
dash._grouping.SchemaTypeValidationError: Schema: [<Output `sam-grid.figure`>, <Output `my-graph.figure`>, <Output `output-data.children`>]
Path: ()
Expected type: (<class 'tuple'>, <class 'list'>)
Received value of type <class 'NoneType'>:
    None
164.54.62.68 - - [01/Aug/2024 09:25:36] "POST /_dash-update-component HTTP/1.1" 500 -
164.54.62.68 - - [01/Aug/2024 09:25:36] "POST /_dash-update-component HTTP/1.1" 500 -
```

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