

Beamline 7.3.3 SAXS/WAXS

Advanced training

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Purpose: That you will be able to use the Beamline
independently

WHAT NOT TO DO!!!

DO NOT EXPOSE DETECTOR TO DIRECT BEAM !!!
(Double check, then double check AGAIN)

Before opening the shutter, THINK

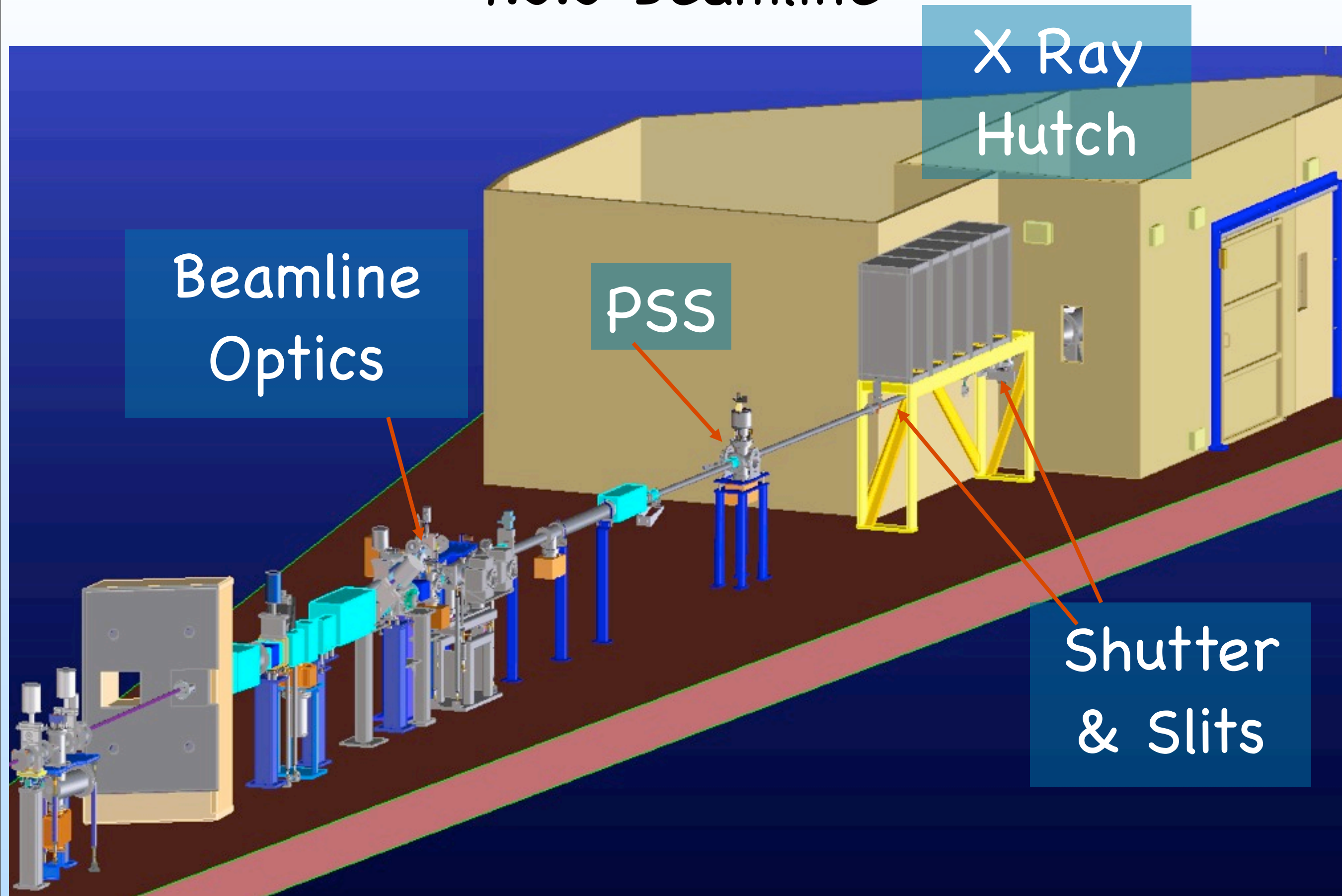
Info on Website

- www.SAXSWAXS.com
- Phone numbers
- Emails
- ESS webpage with David Malone info
- Ring Status webpage
- IgorPro webpage Nika

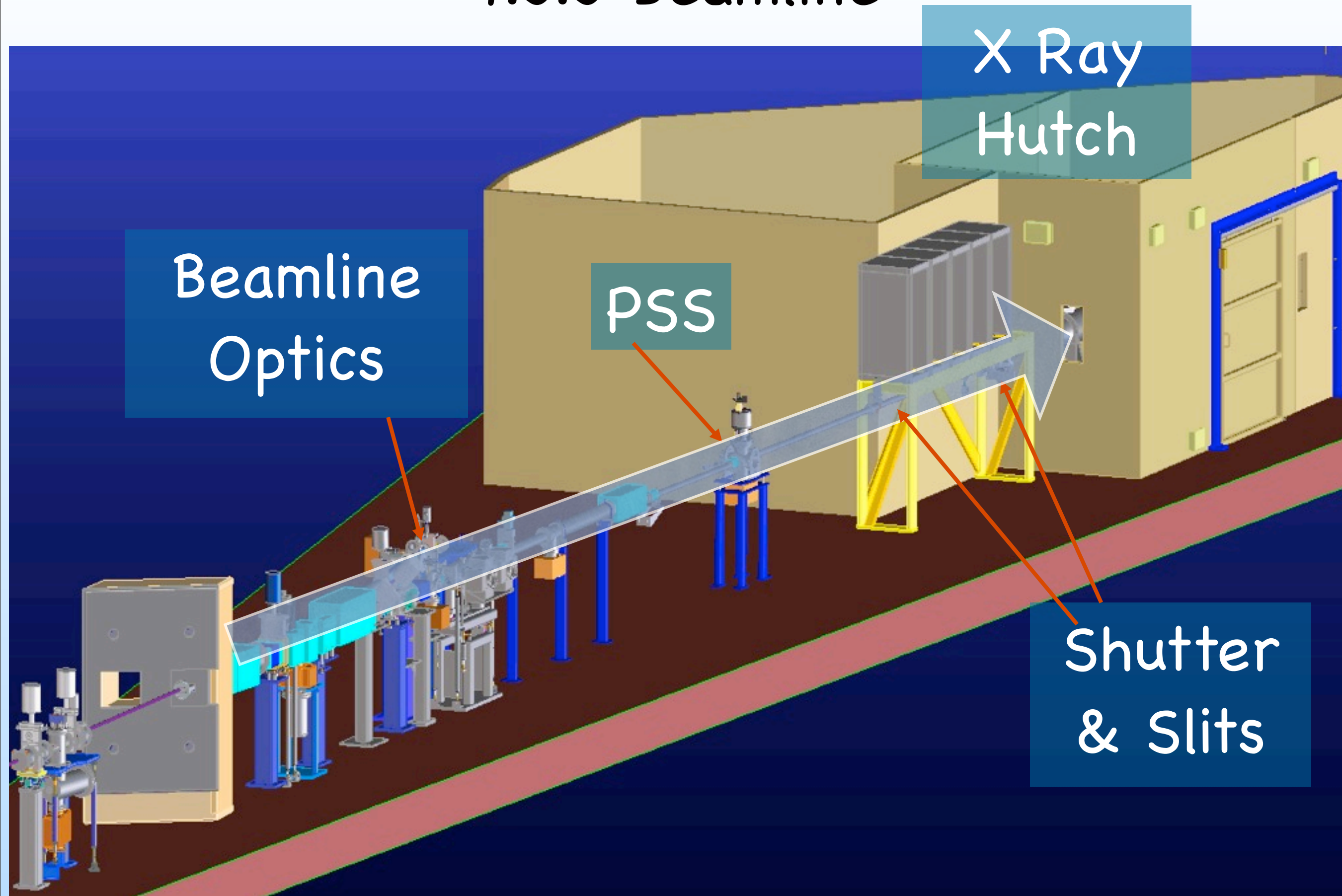
Outline

- Beamline Schematic
- Before you get to the BL
- When you get to the BL (Preparing BL)
- Performing your Experiment
- Analysis
- Leaving Beamline

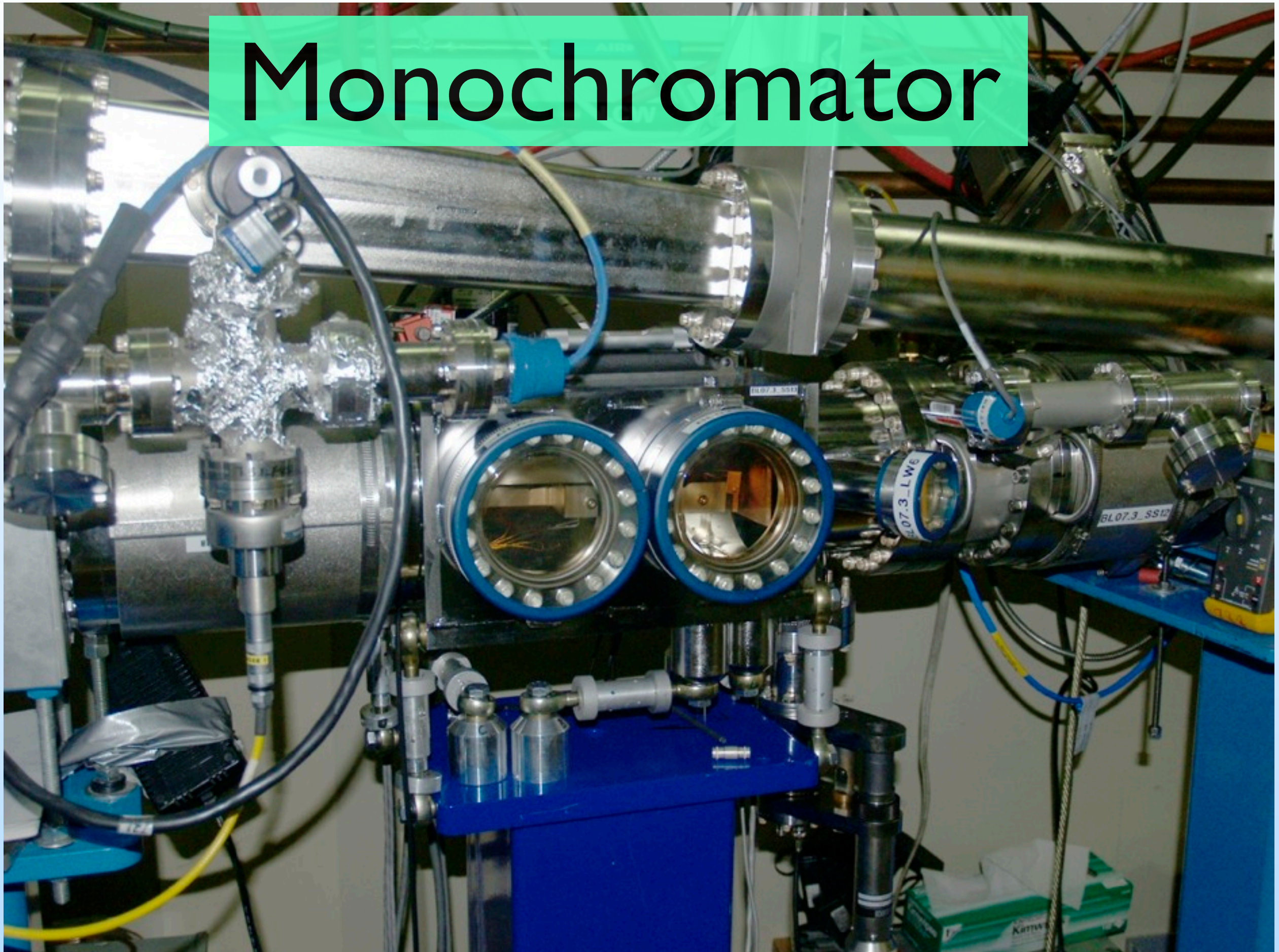
7.3.3 Beamline



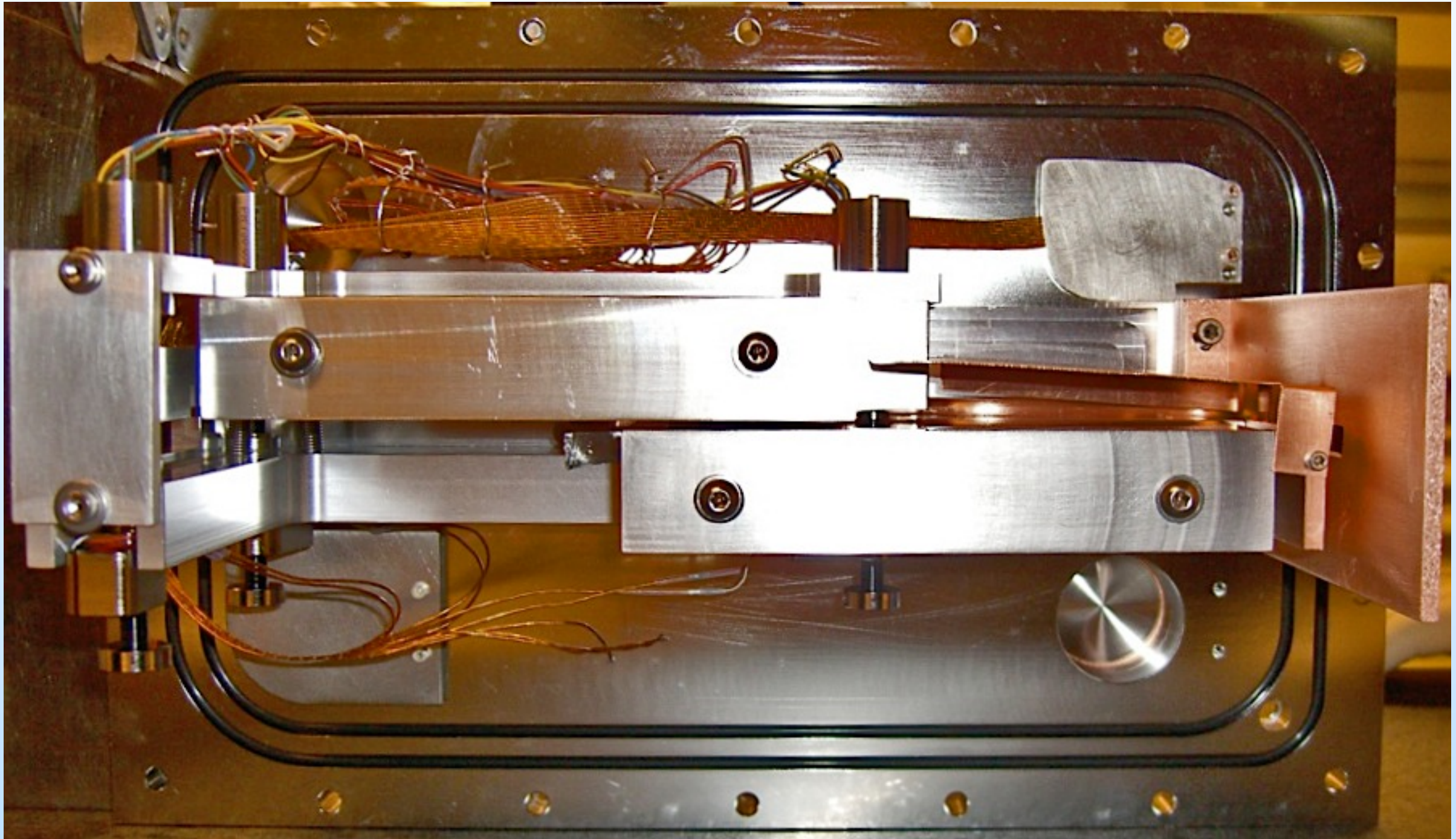
7.3.3 Beamline



Monochromator



Monochromator



Monochromator

Coating:

Material pair: Mo/B₄C

d-spacing: 2.0nm +/-0.1nm

N: 250

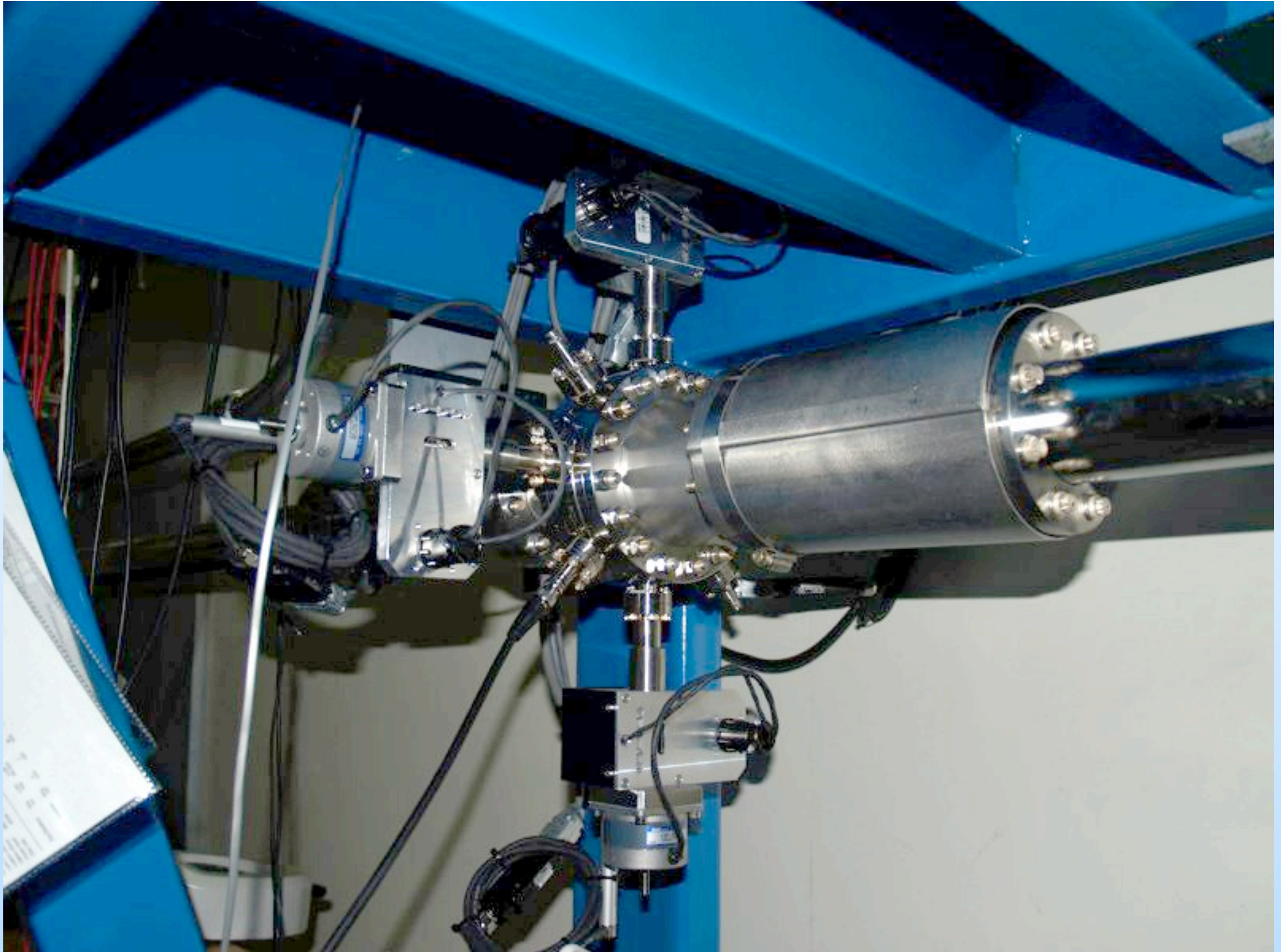
Substrates:

Material: Silicon <100>

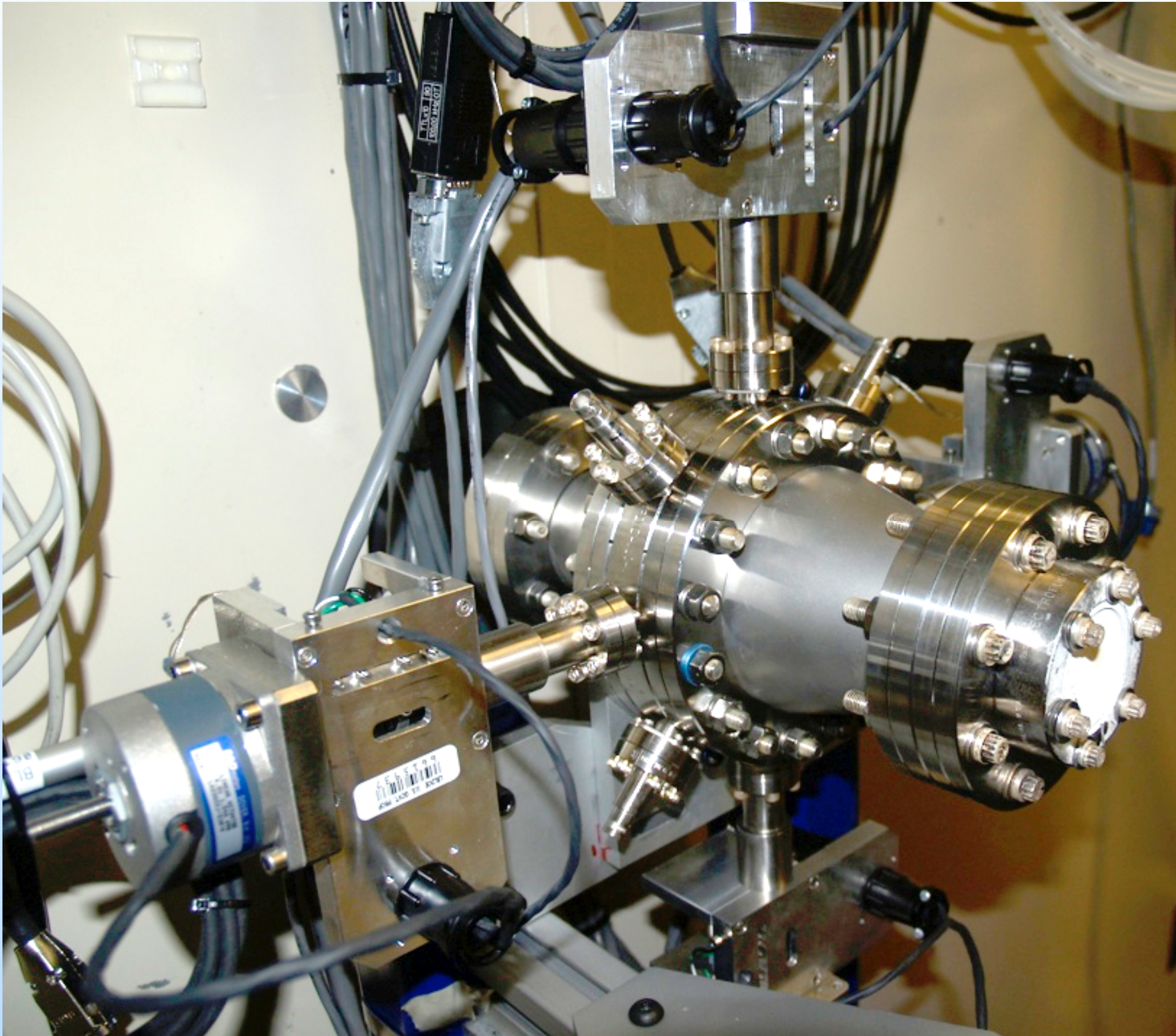
Target Energy: 10keV

$$E/\Delta E = 100$$

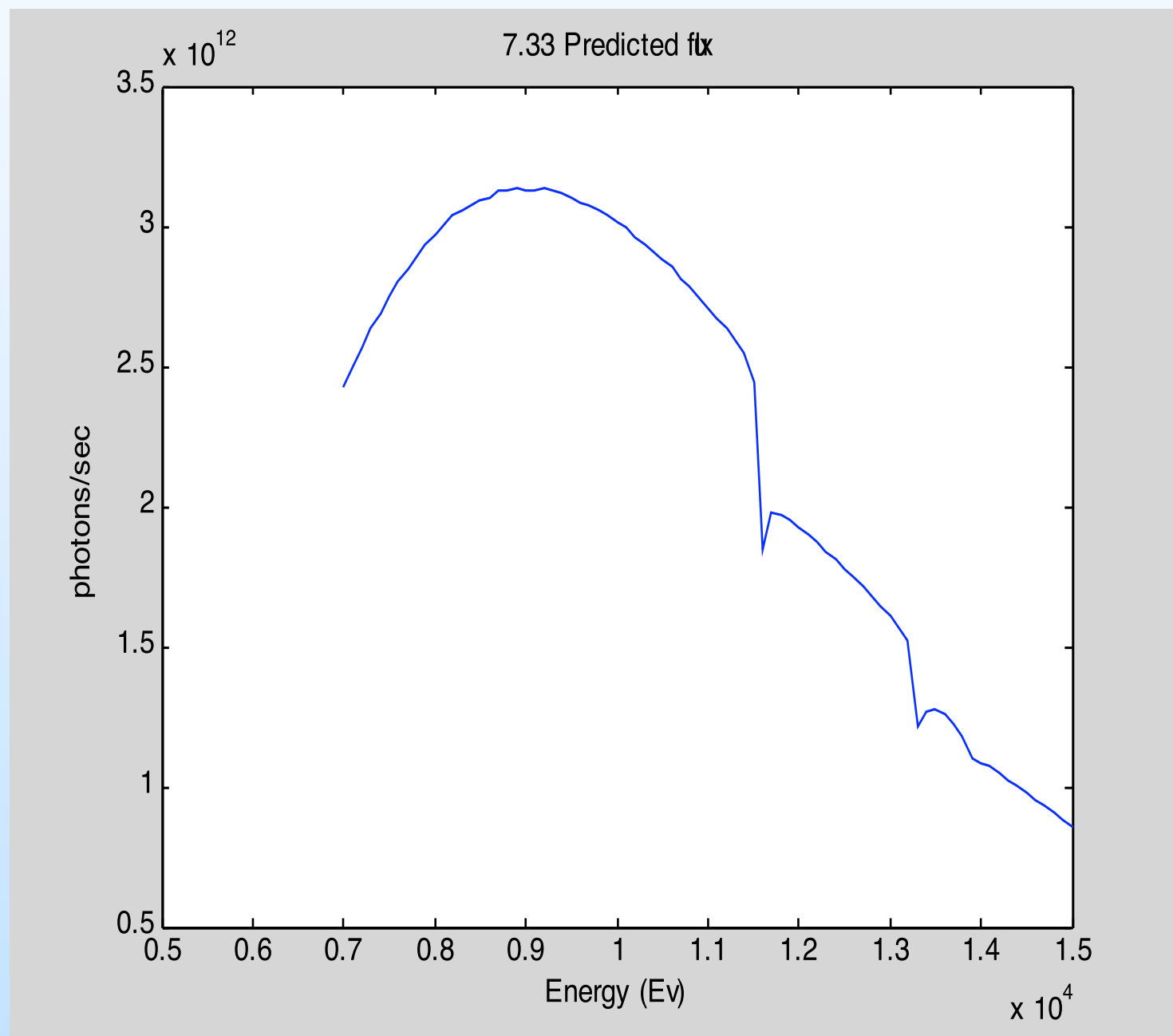
Scatter Slits



Exit Slits



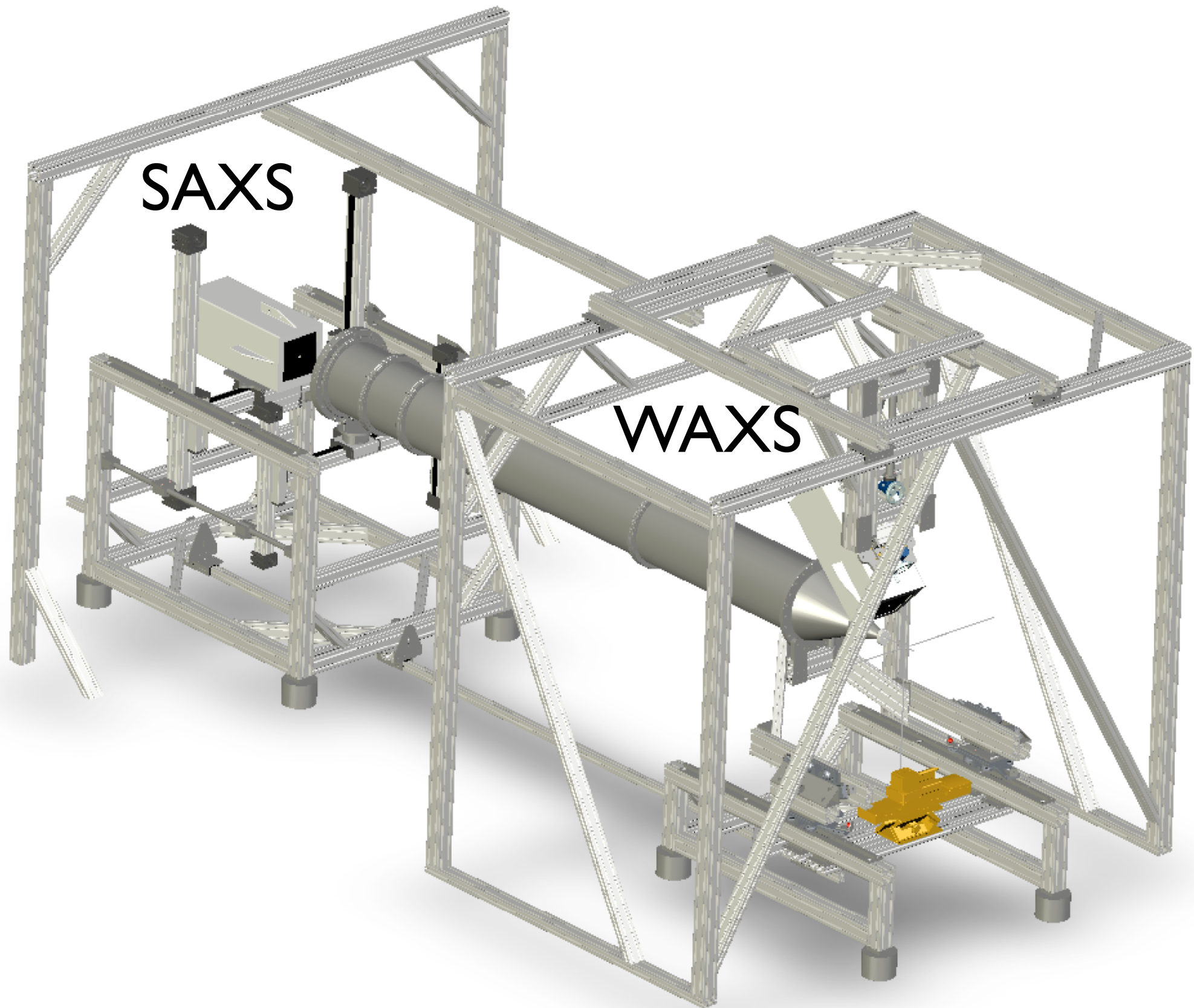
Predicted flux



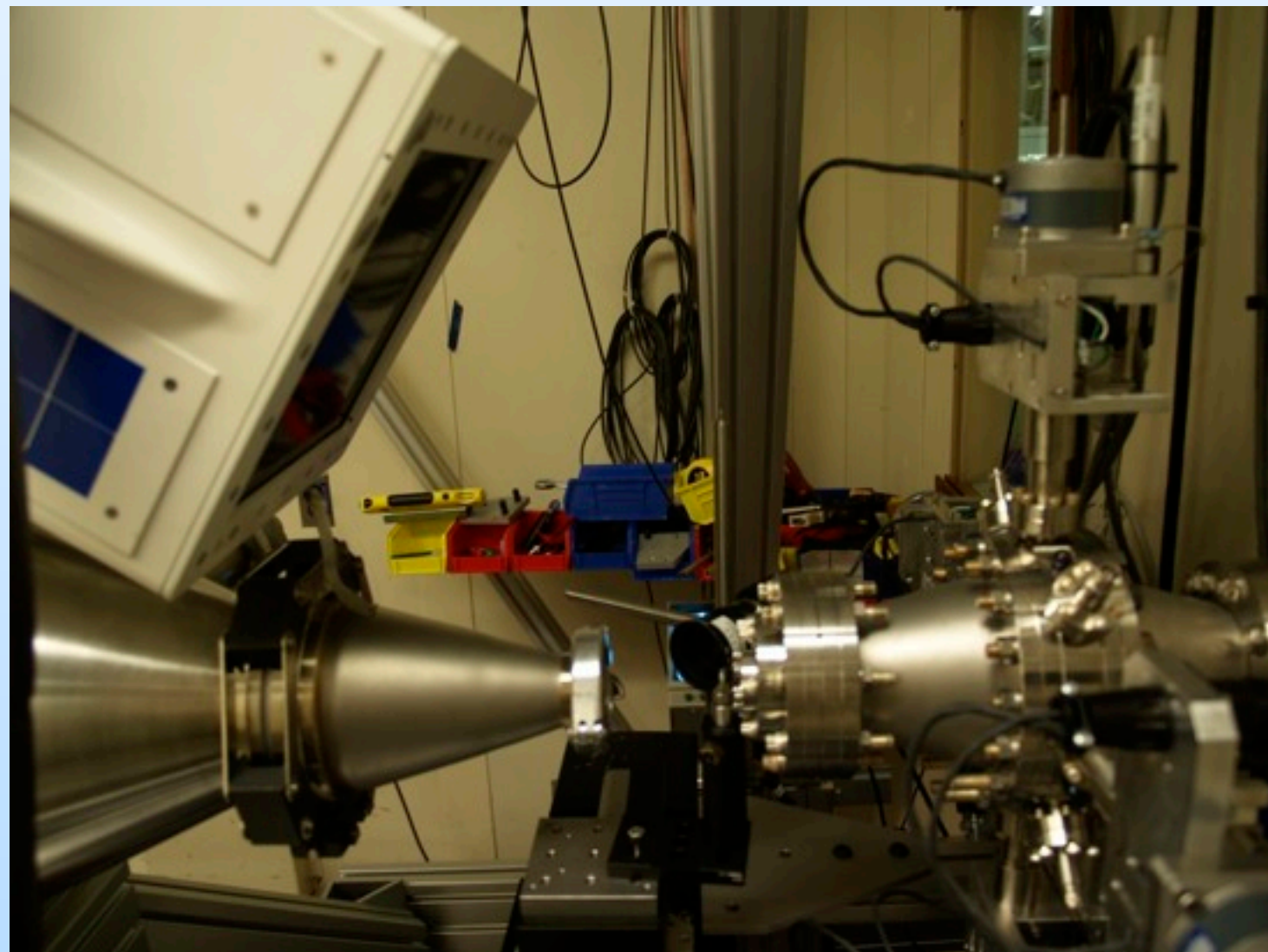
We measured 1.8 e12 ph/sec. This is 60% of predicted.

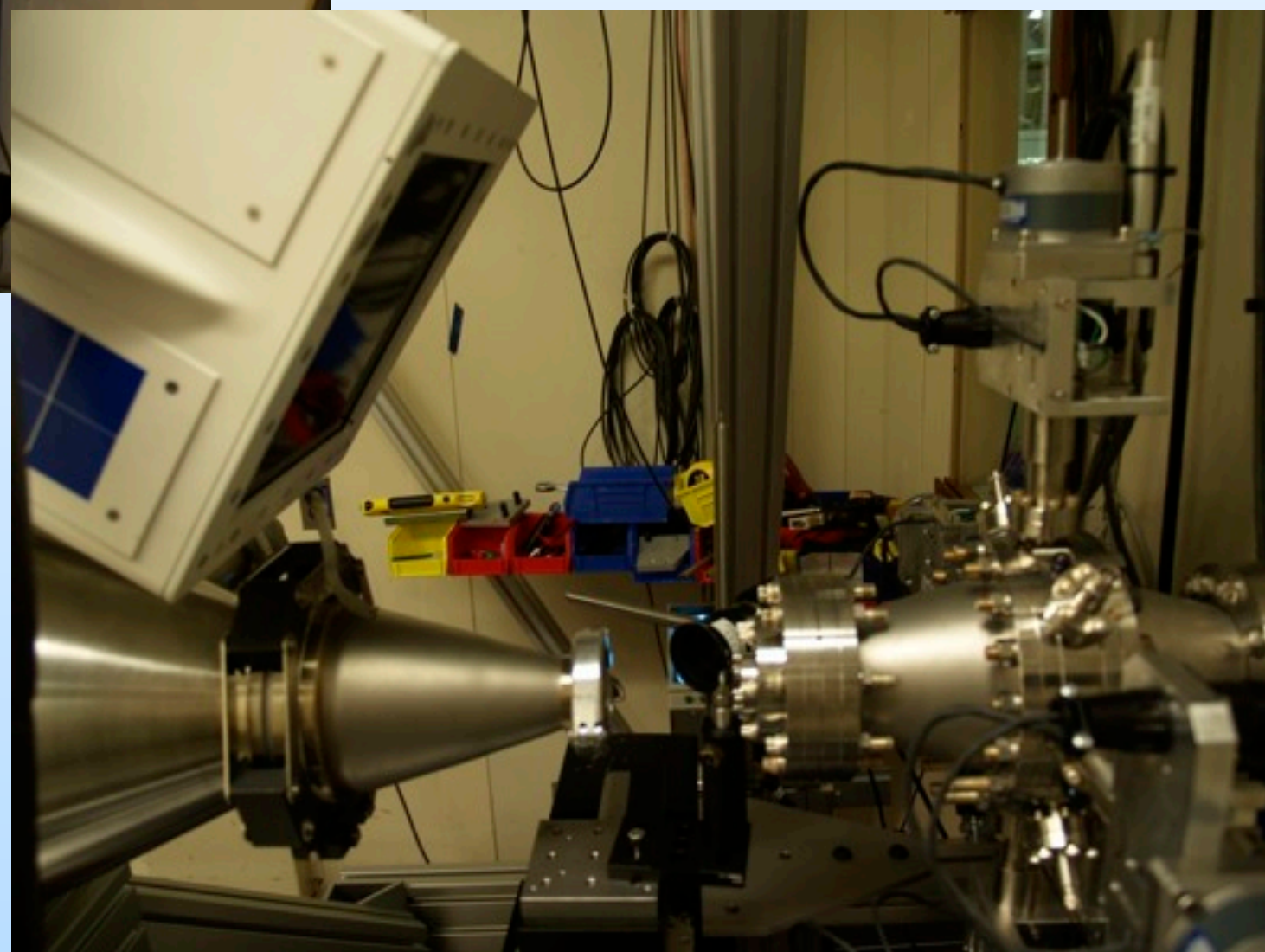
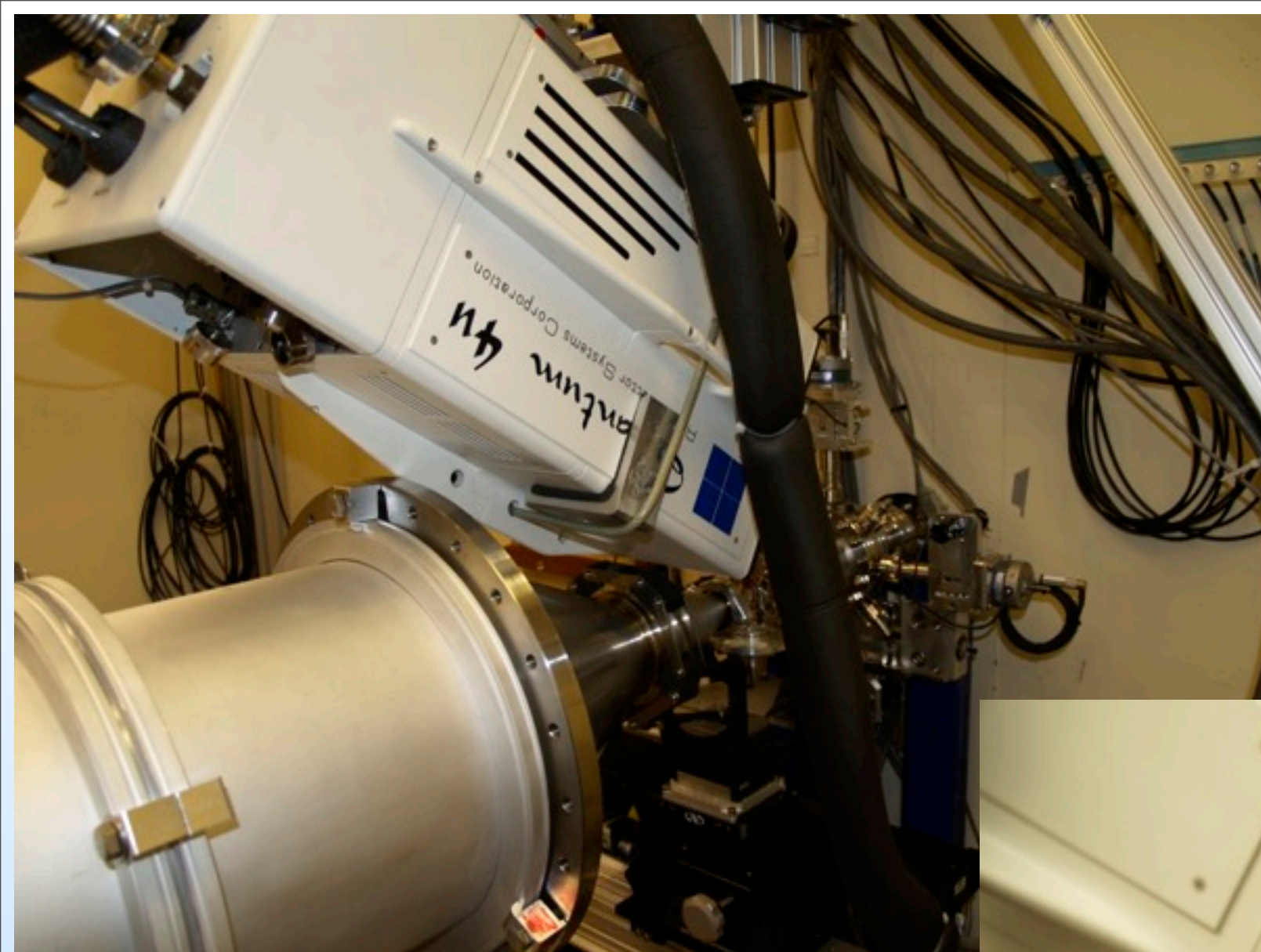
Spot size at sample position:
0.180 mm x 0.780 mm

Sample Stage and Detector

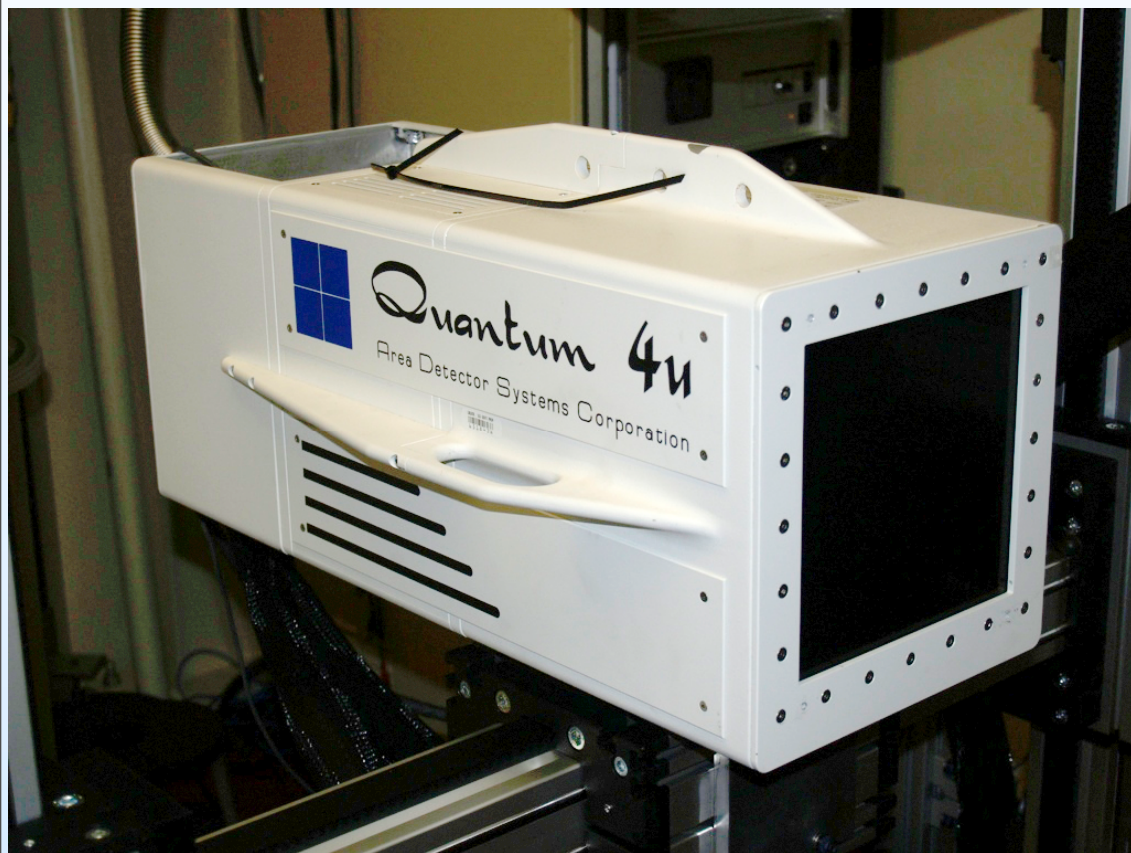




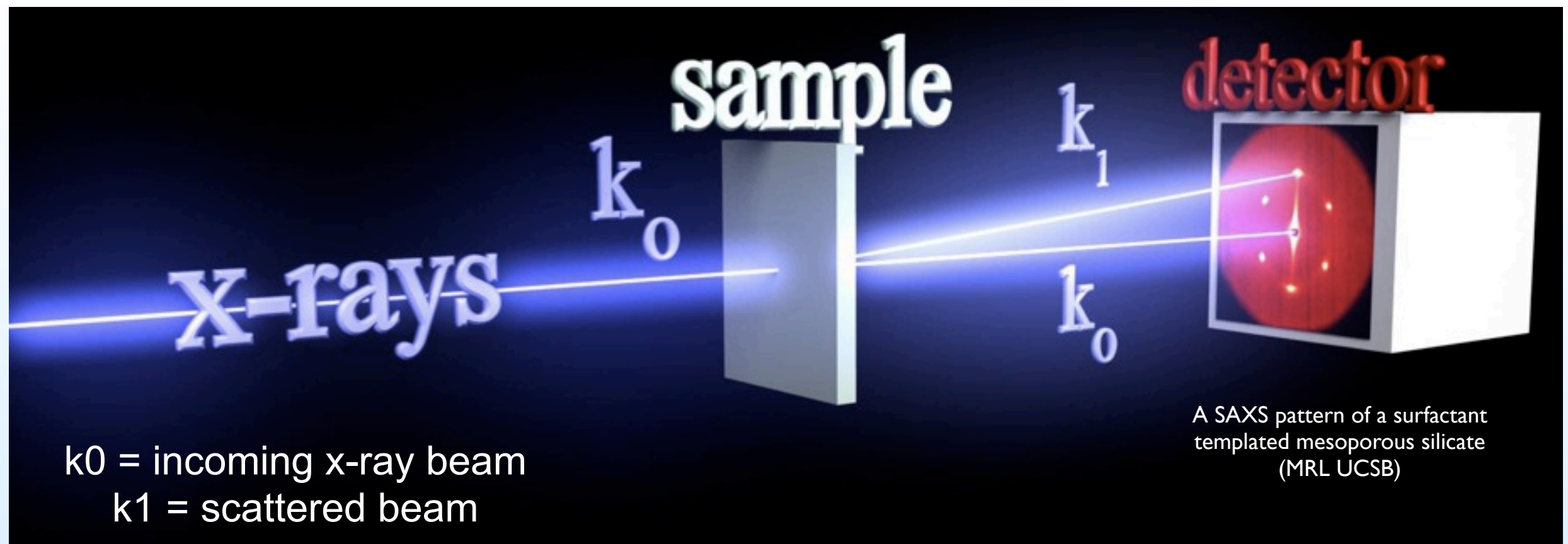




Detector Quantum 4



188mmx188mm	area
2304x2304 pixels	pixels
82um x 82um	pixels size
9 sec and 3 sec	read out time (full resolution)
1.1 ADU/photon	Front End Gain
16	Bits



SAXS (CCD detector) Sample detector distance = 0.7m - 4.3m

WAXS (CCD detector) Sample detector distance = 0 m - 1m

Wavelength = 1.2389 Å (10 keV)

q-range = 0.004 Å⁻¹ - 8.7 Å⁻¹

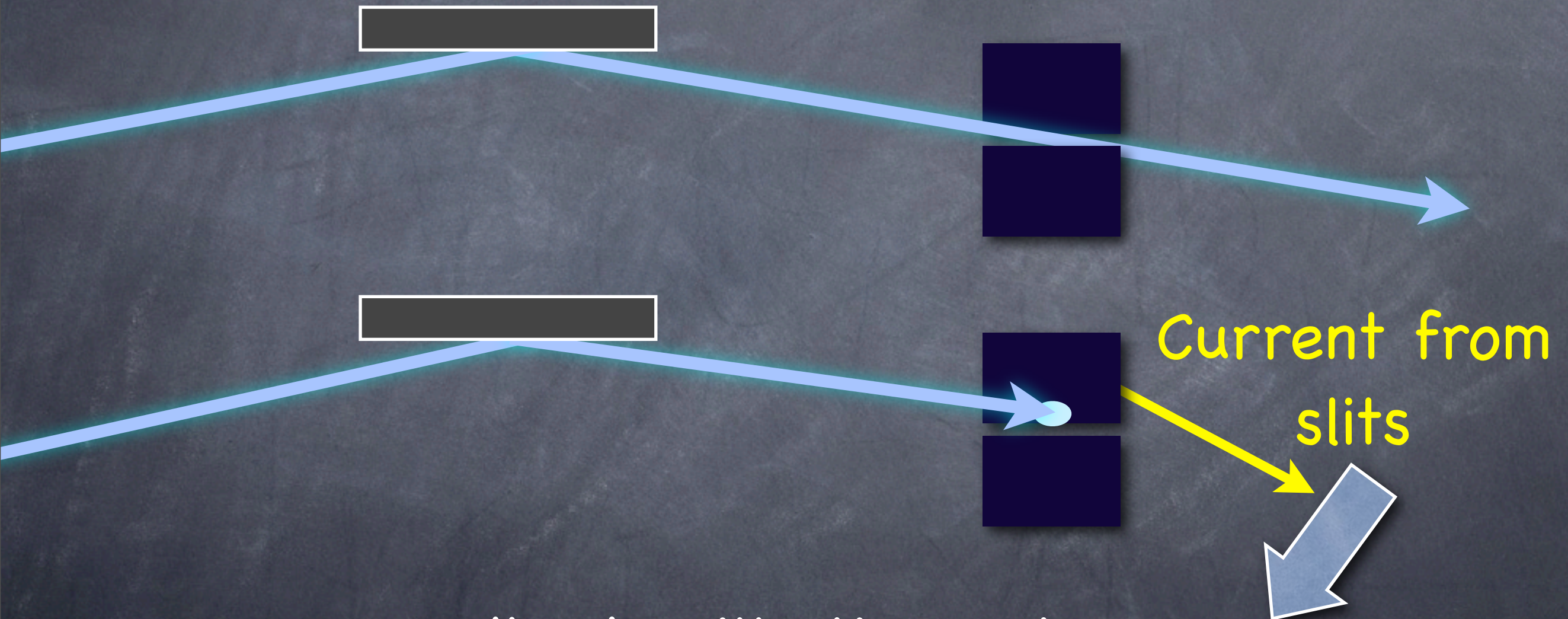
d-range = 1500 Å - 0.8 Å

Feedback System

Movement of Beam due to Monochromator
stirs beam into → slits to avoid this use Feedback

M1 mirror

Scatter slits



Feedback will stir M1 to move
beam back between slits

Screen blinking **RED** means feedback is not working

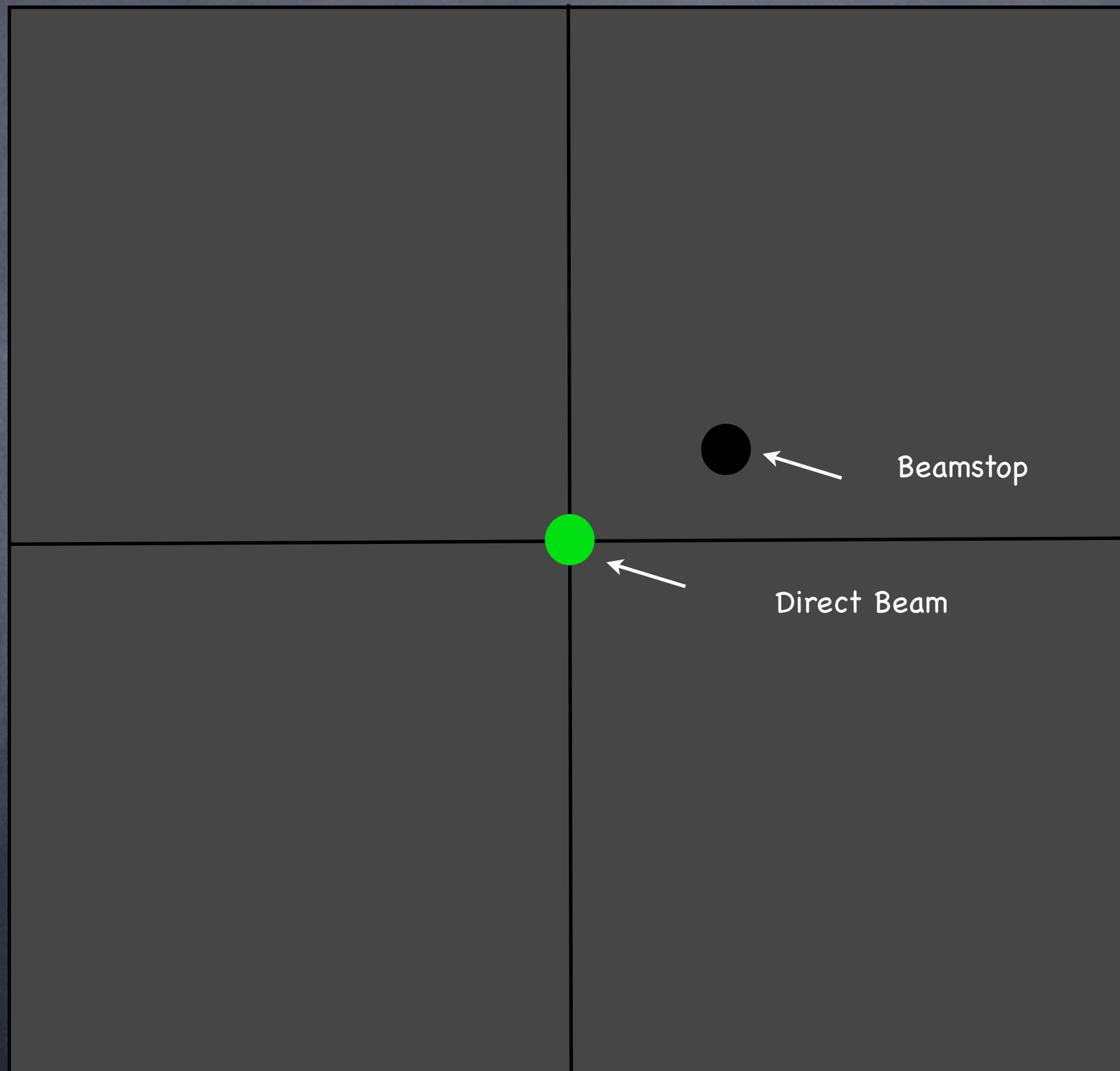
Before you get to the BL

- Fill out ESS
- Make sure everyone is an ALS user
- Take the JHQ and all training you will need including Rad safety, and Hoist, as well as anything else you will use (ie laser, cryo etc)
- Calculate q-range and sample detector distance for 10keV
- Plan experiment ahead: GISAXS then SAXS etc. (call us before)

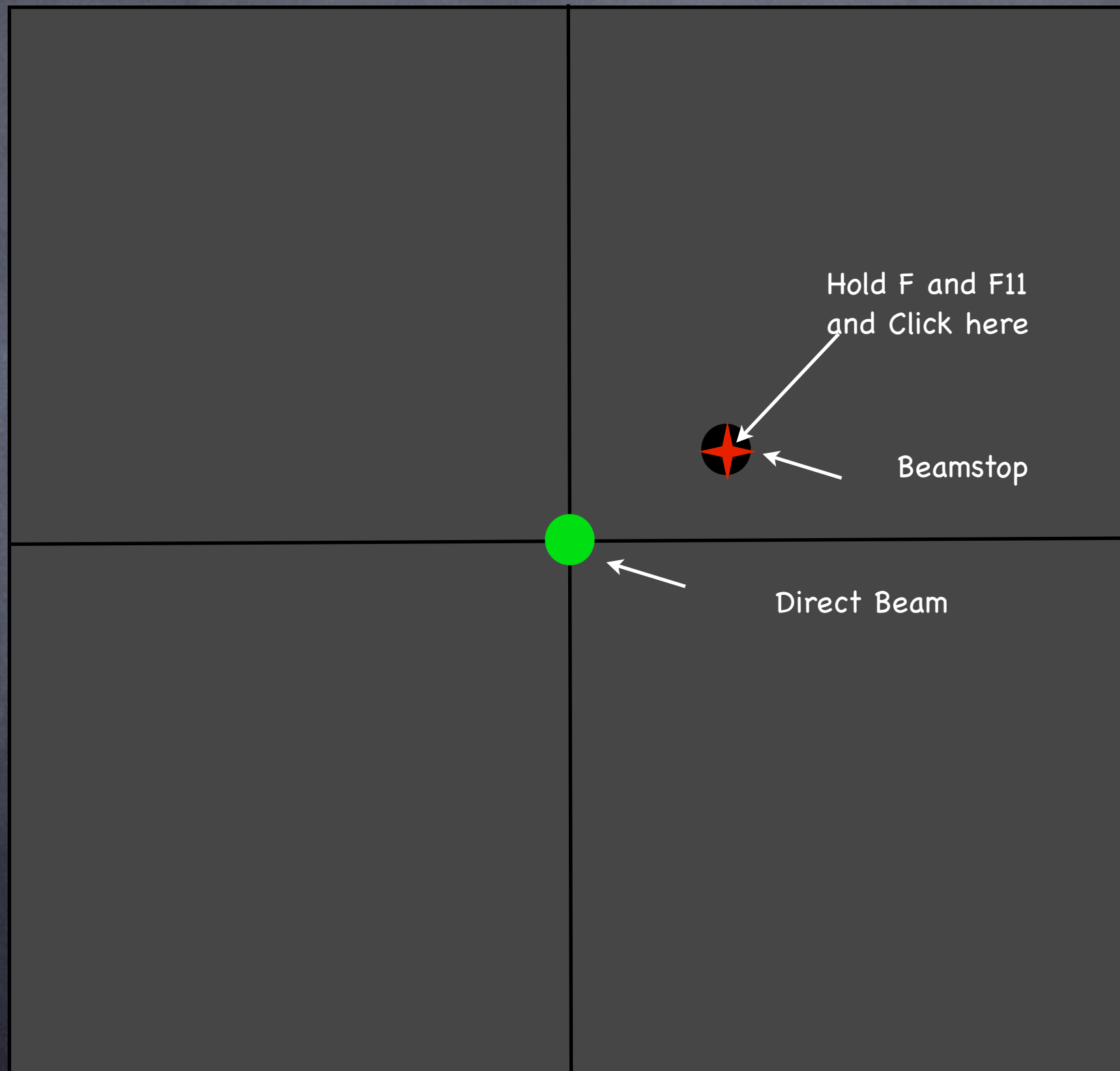
When you get to the BL

- Call or Email us, check beam status
- Check that previous user is done and cleaned up, if not call us
- Set Flight tube
 - Set Length, check beam path is unobstructed
 - Align beamstop (might have to change actual beamstop)
- Set up sample holder (DSC, SAXS, WAXS, GISAXS, Gas)

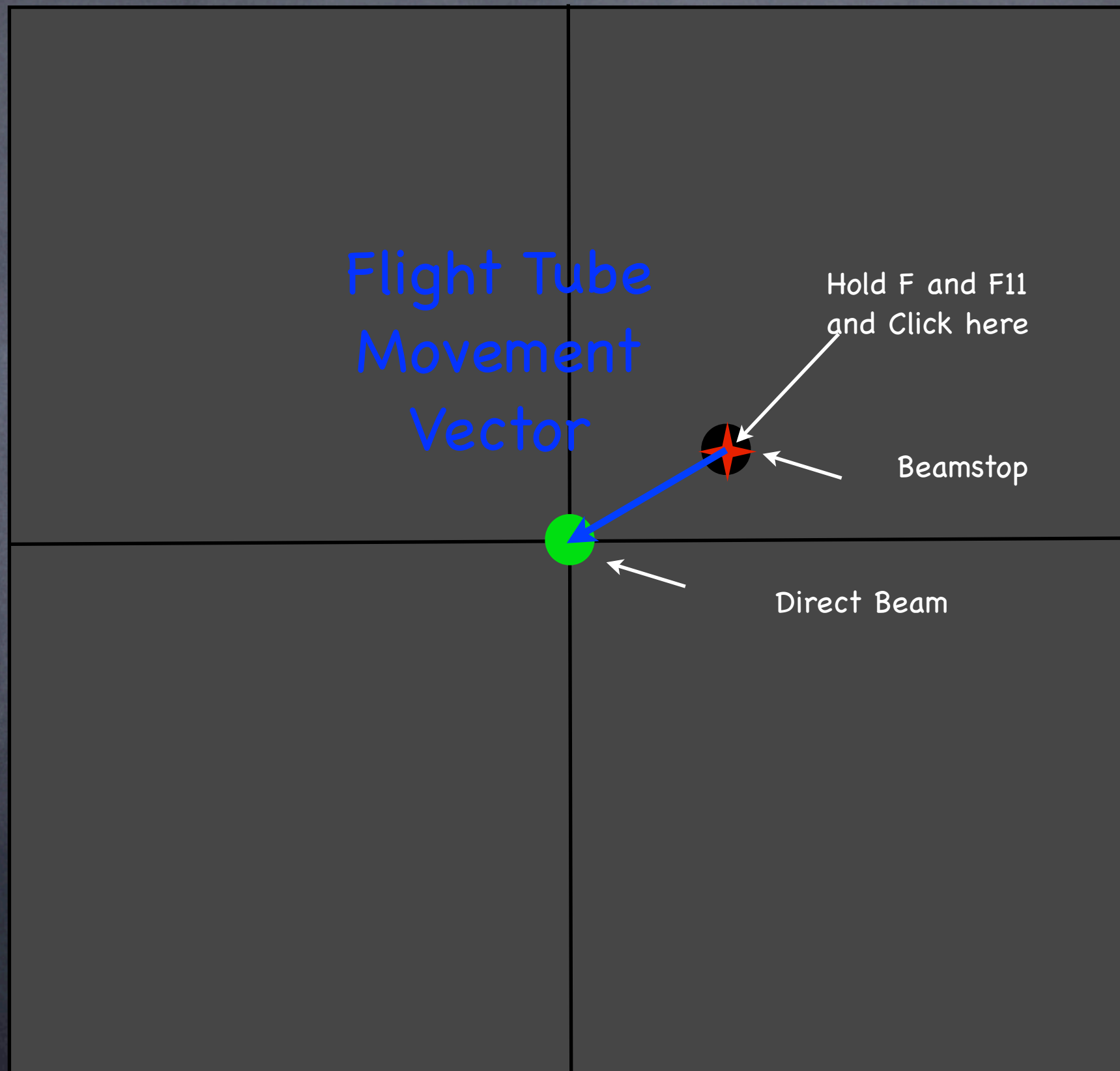
Alignment



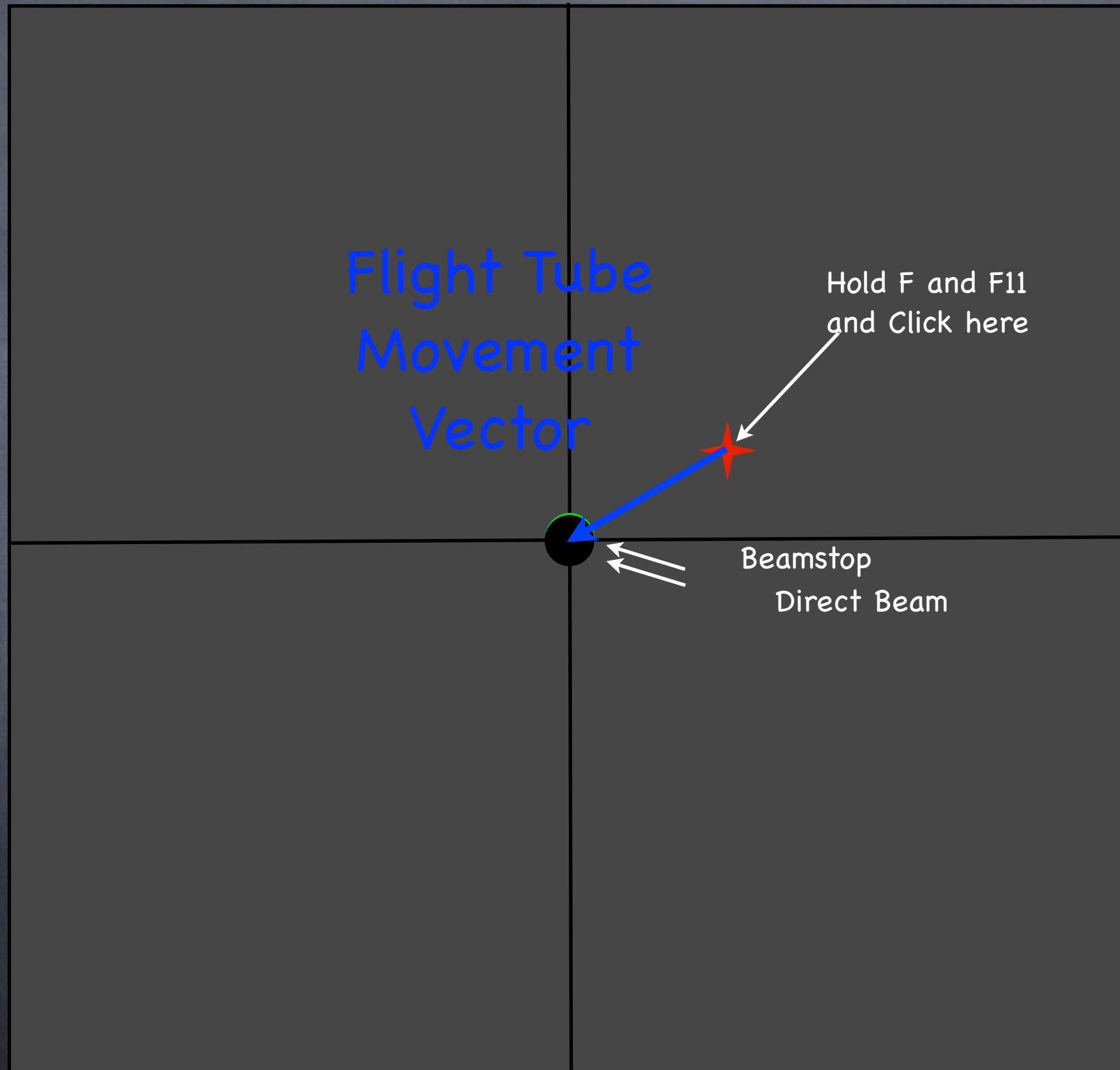
Alignment



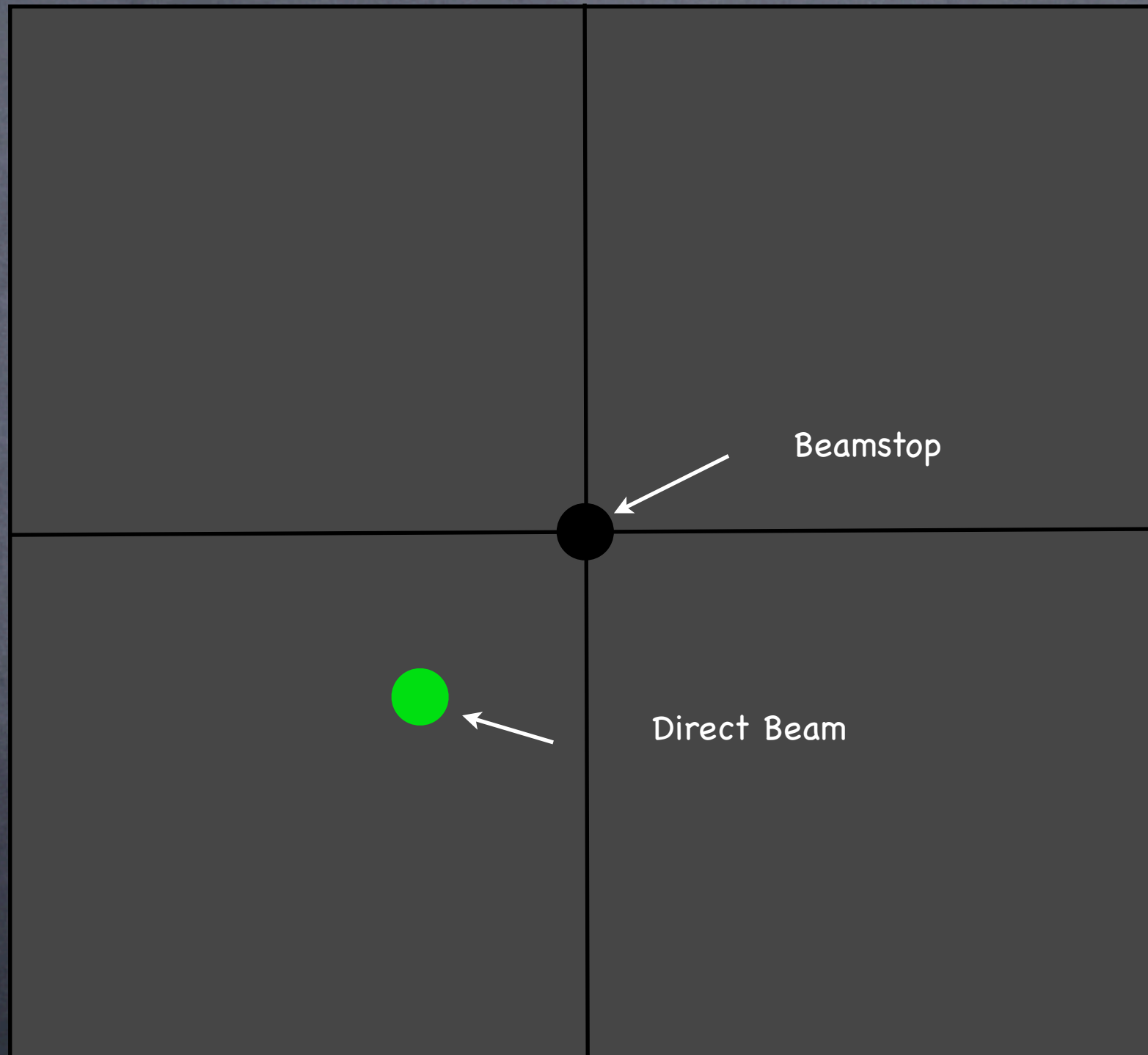
Alignment



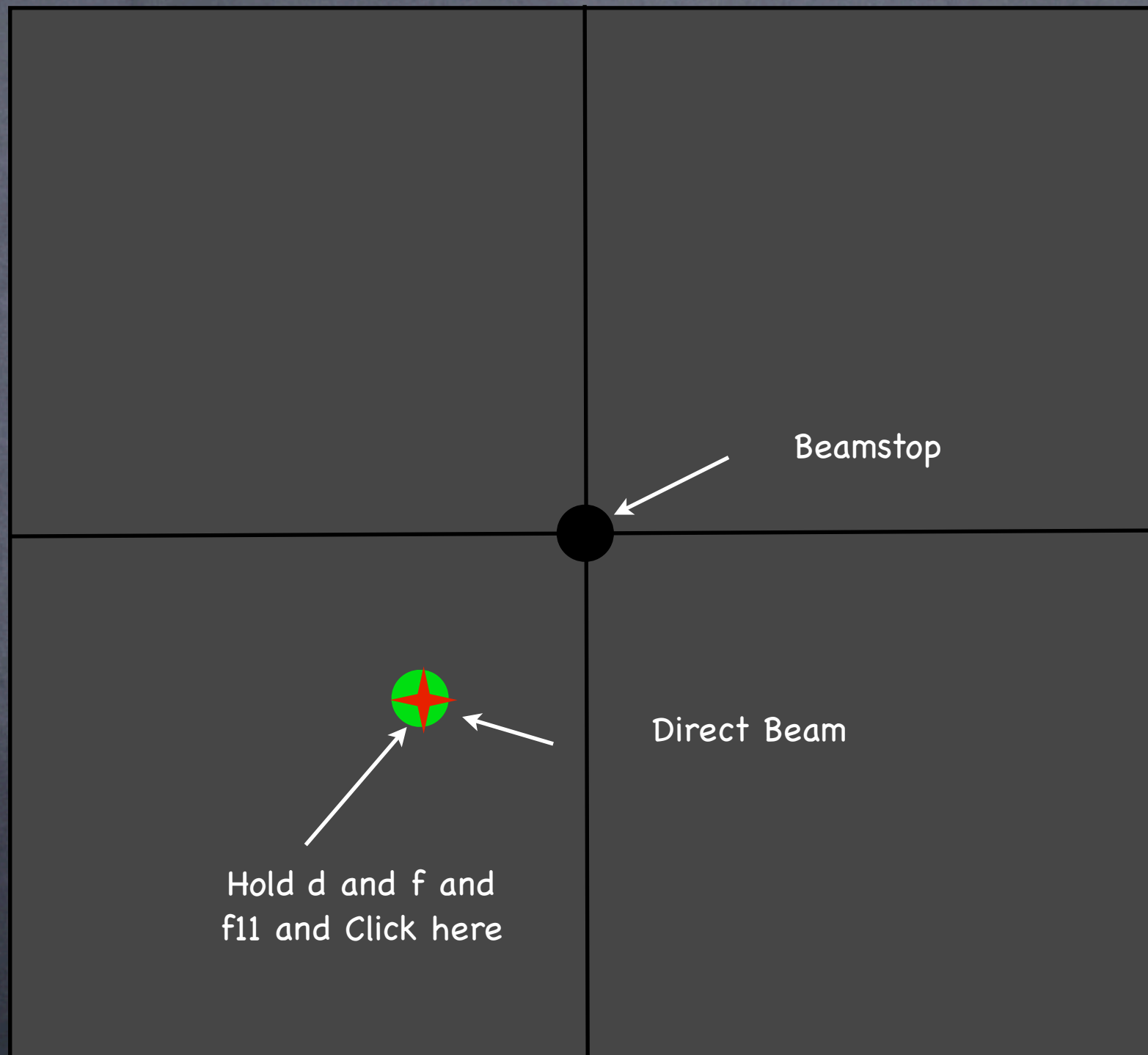
Alignment



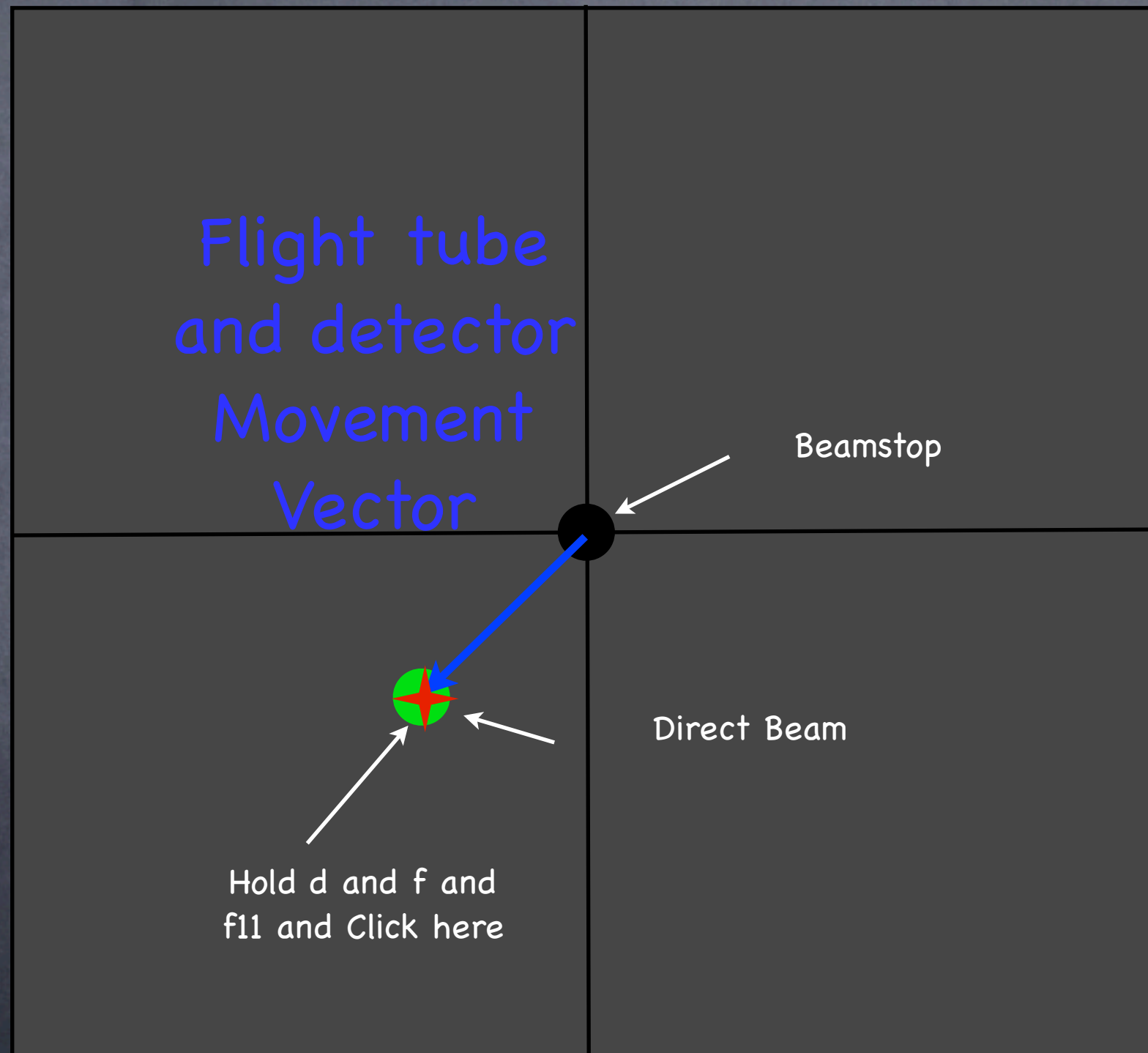
Alignment



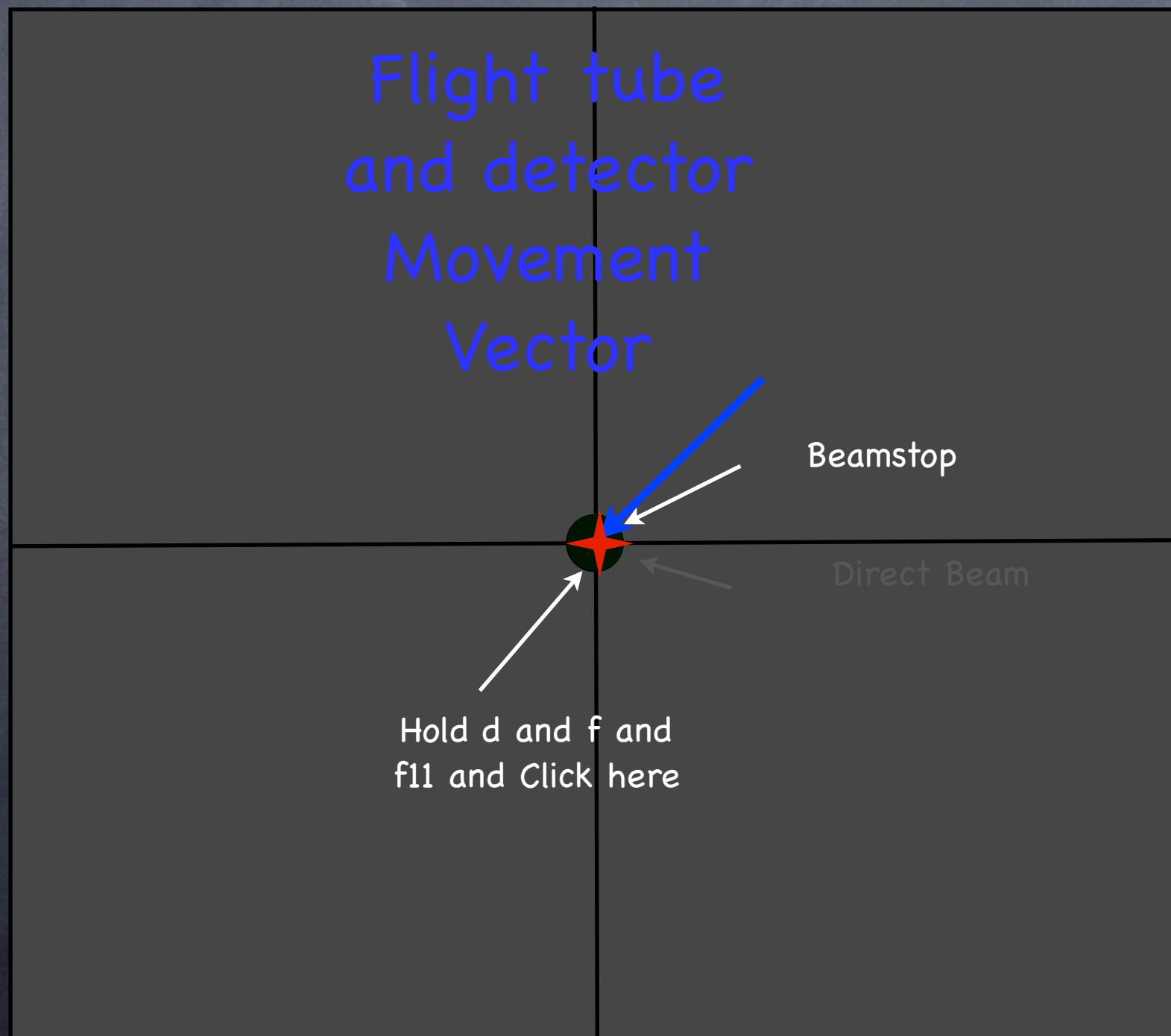
Alignment



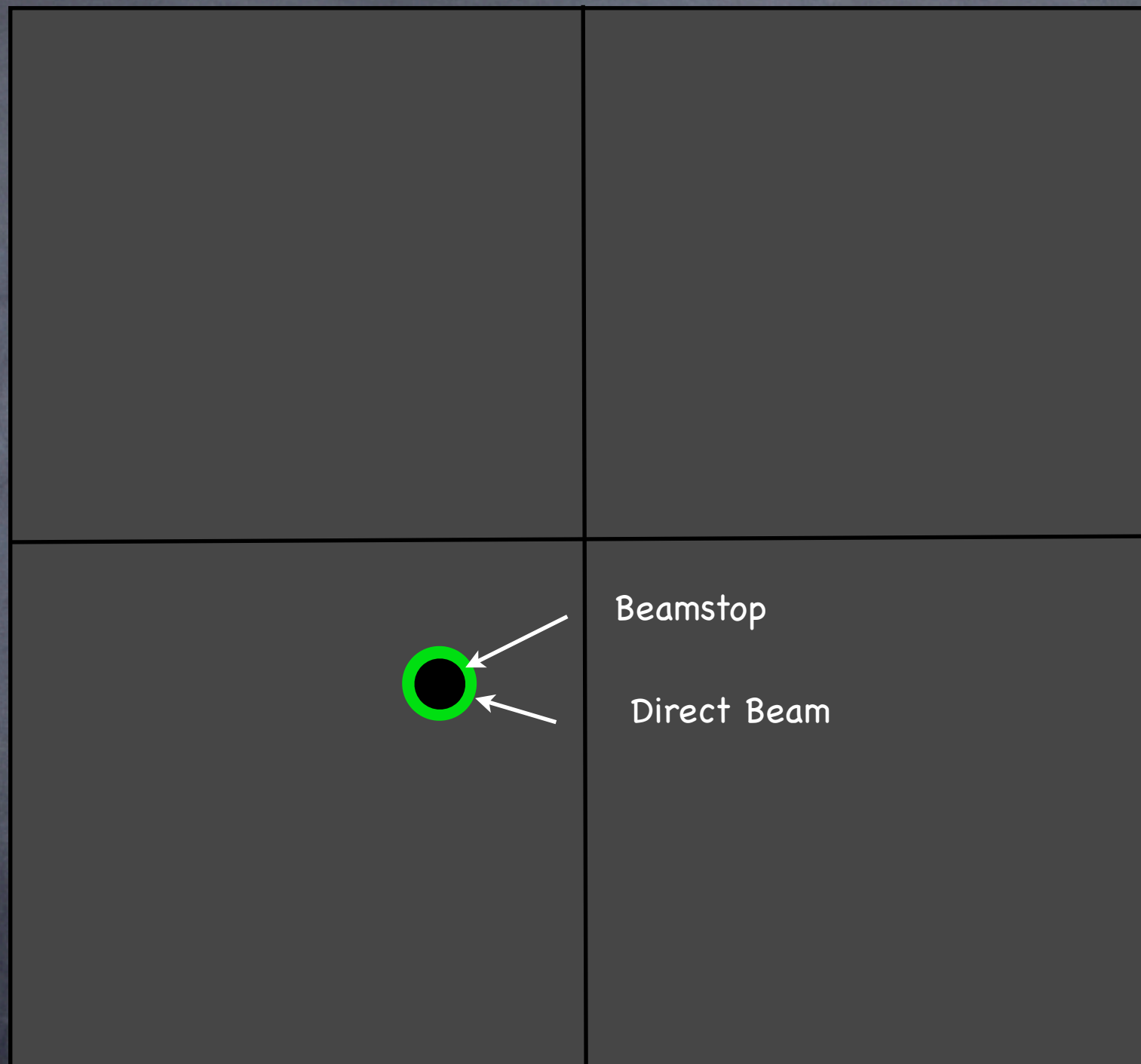
Alignment



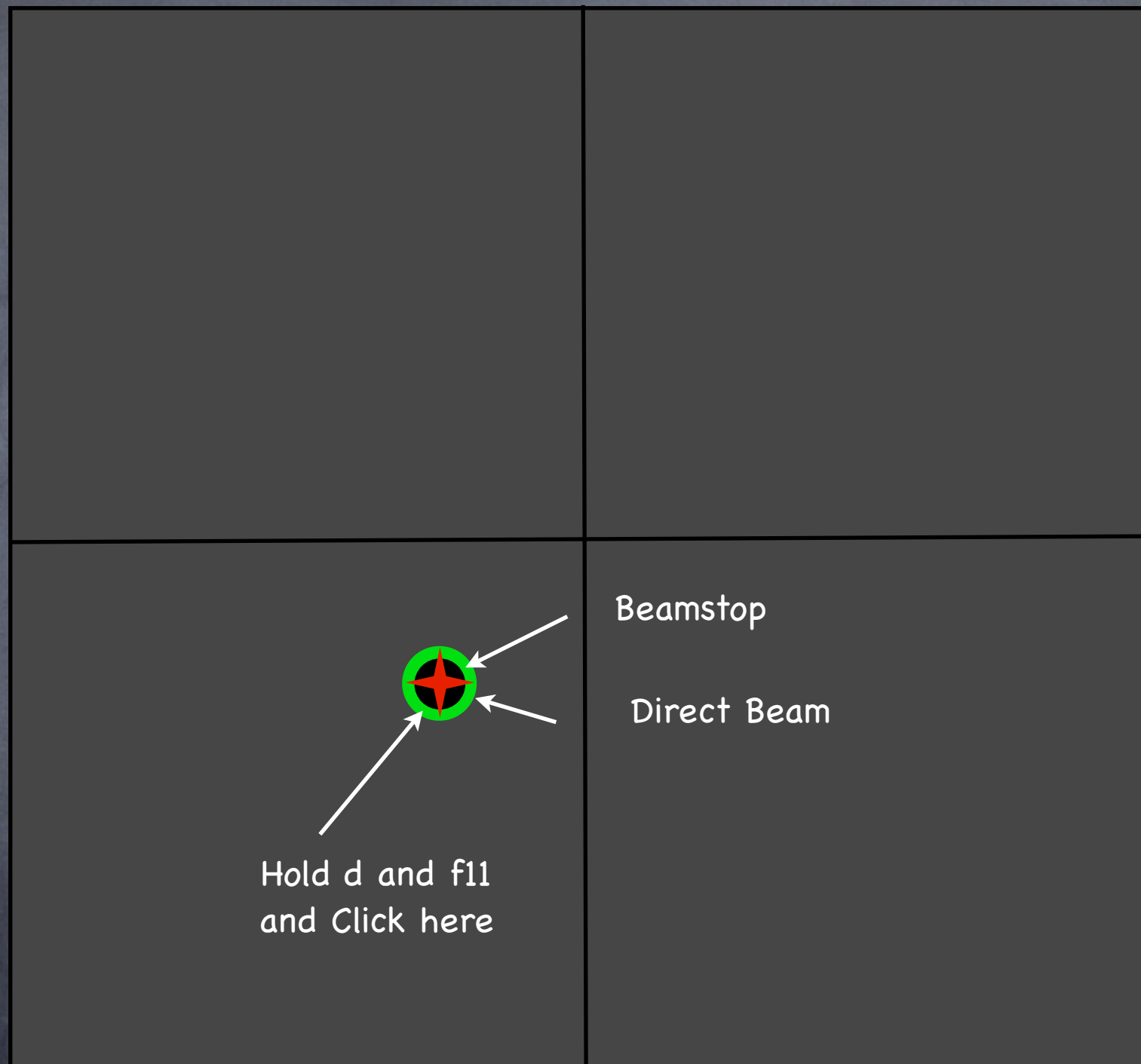
Alignment



Alignment

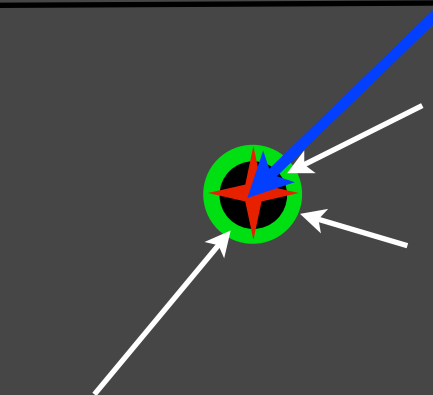


Alignment



Alignment

Detector
Movement
Vector

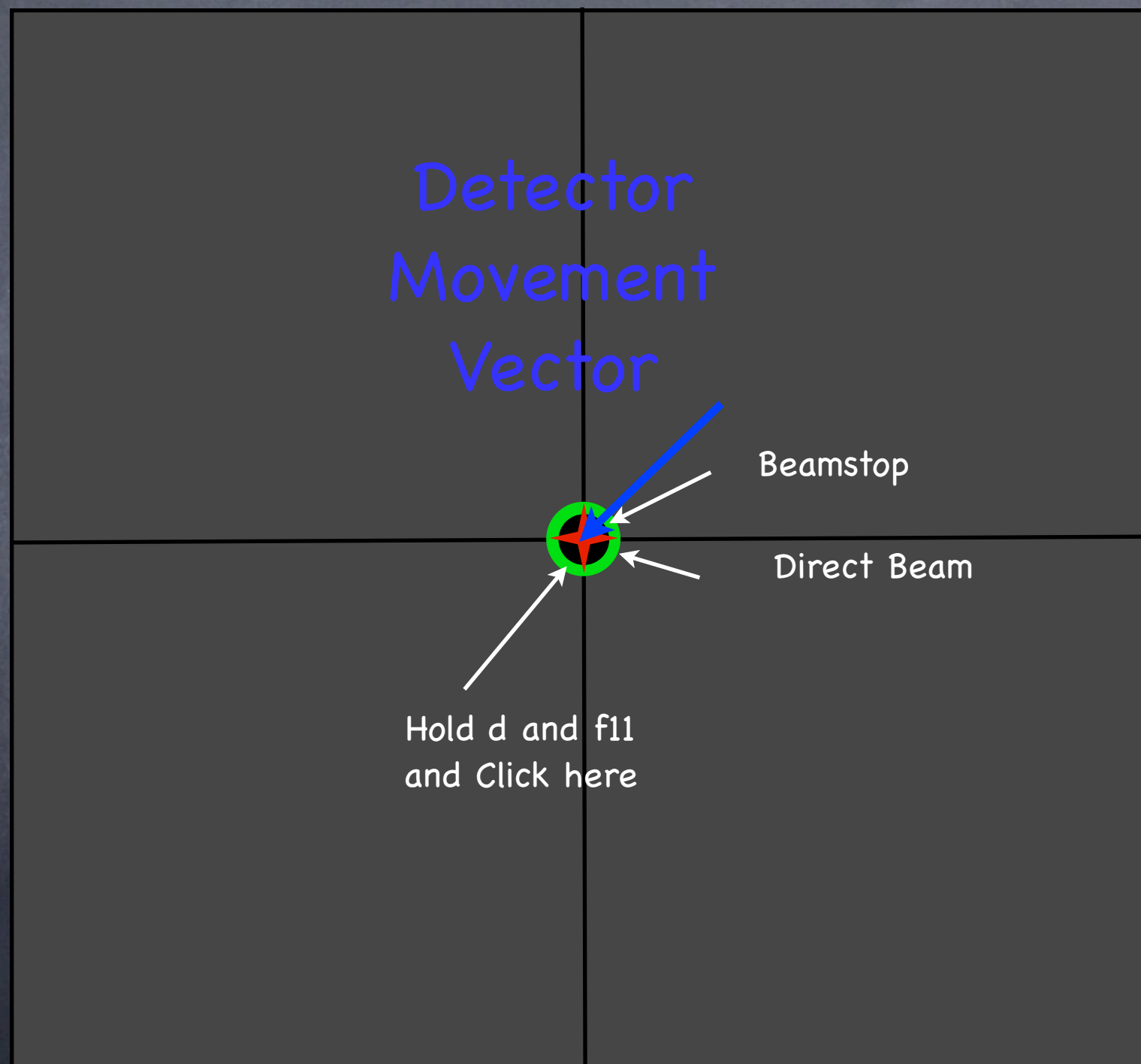


Hold d and f11
and Click here

Beamstop

Direct Beam

Alignment



Alignment

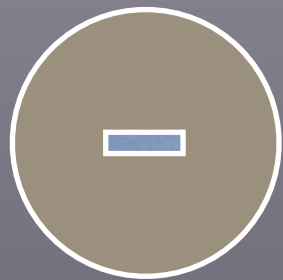
Alignment

RISKS

- There is High Risk of messing this up and hurting the detectors!
- Don't trust that the program or the motors moved correctly
- Assume the worst and DOUBLE CHECK that detectors are safe
- ALWAYS check beamstop at least once (more if you are nervous) before taking any pictures

DSC stage alignment

DSC stage



alignment
spot (black)

step size

1 → 0.3 mm

2 → 1 mm

3 → 3 mm

4 → 10 mm

x-rays

y-axis

x-axis



DSC stage alignment

alignment
spot (black)

step size

1 → 0.3 mm

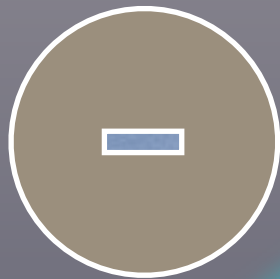
2 → 1 mm

3 → 3 mm

4 → 10 mm

DSC stage

x-rays

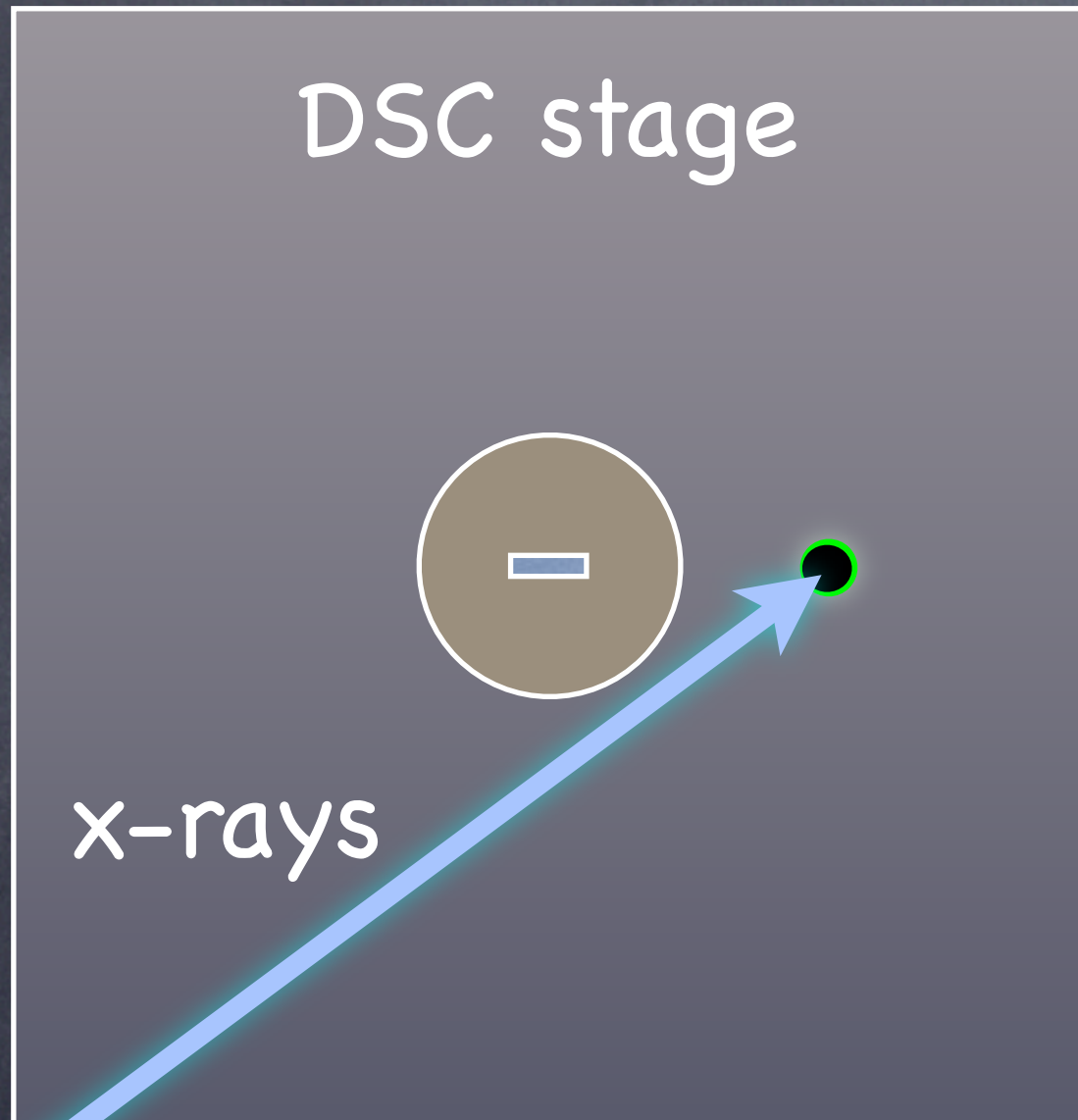


y-axis

x-axis



DSC stage alignment



alignment
spot (black)

step size

1 → 0.3 mm

2 → 1 mm

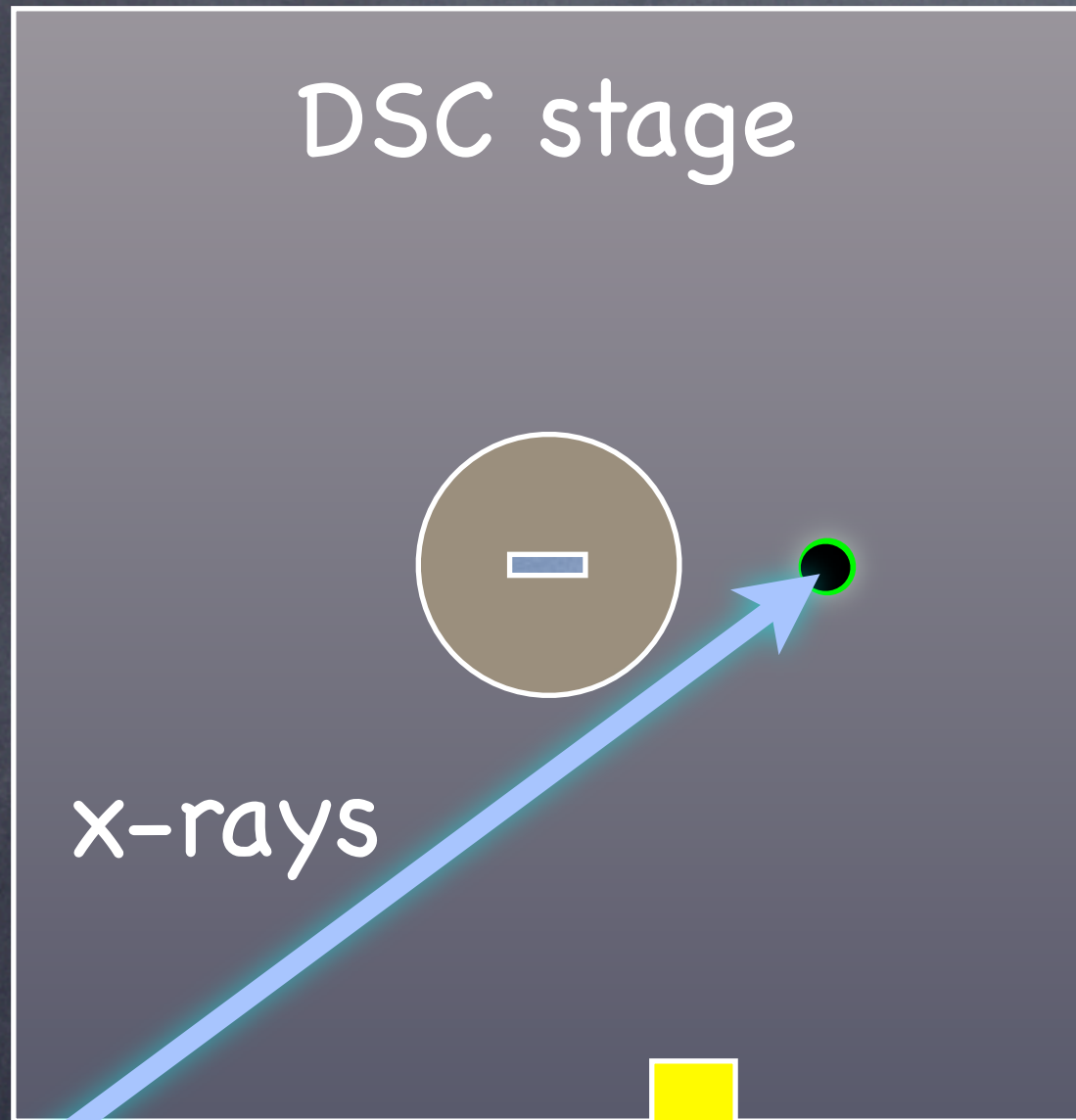
3 → 3 mm

4 → 10 mm

y-axis
x-axis



DSC stage alignment



alignment
spot (black)

step size

1 → 0.3 mm

2 → 1 mm

3 → 3 mm

4 → 10 mm

x-rays

y-axis

x-axis



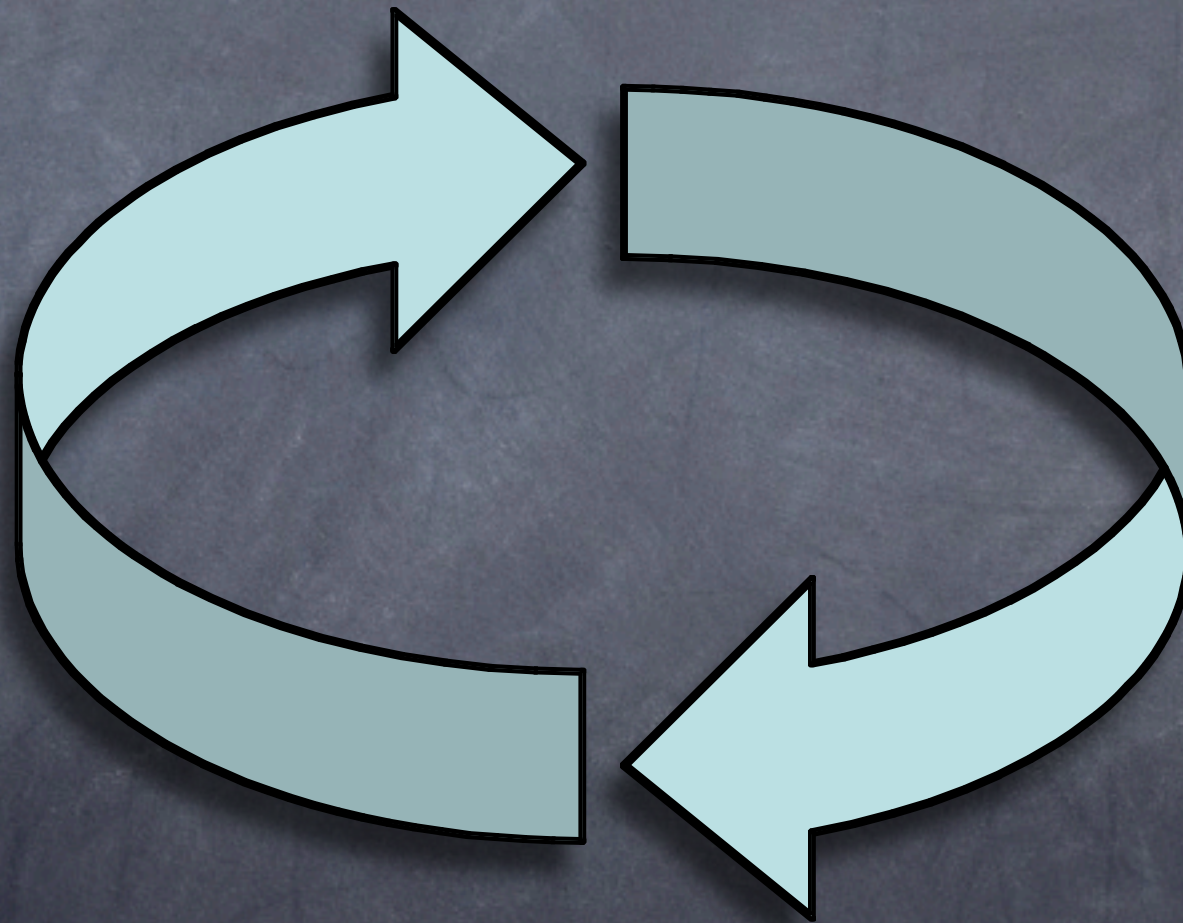
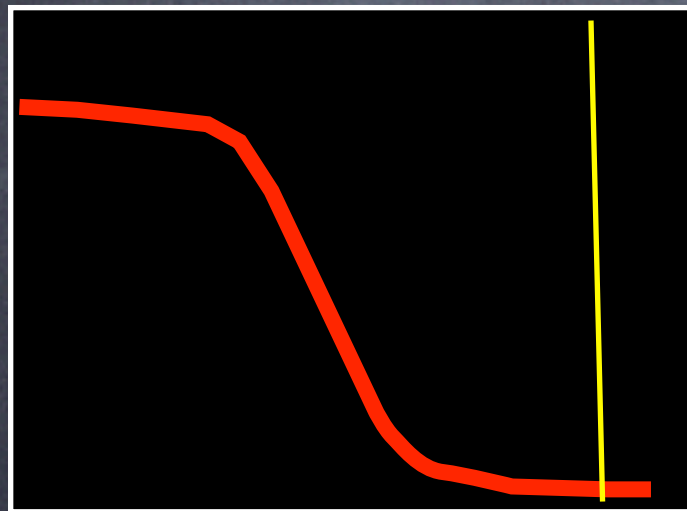
then move 17.22 mm
to the right

GISAXS

adjust x to center sample in beam



scan y: set to
1/2 intensity

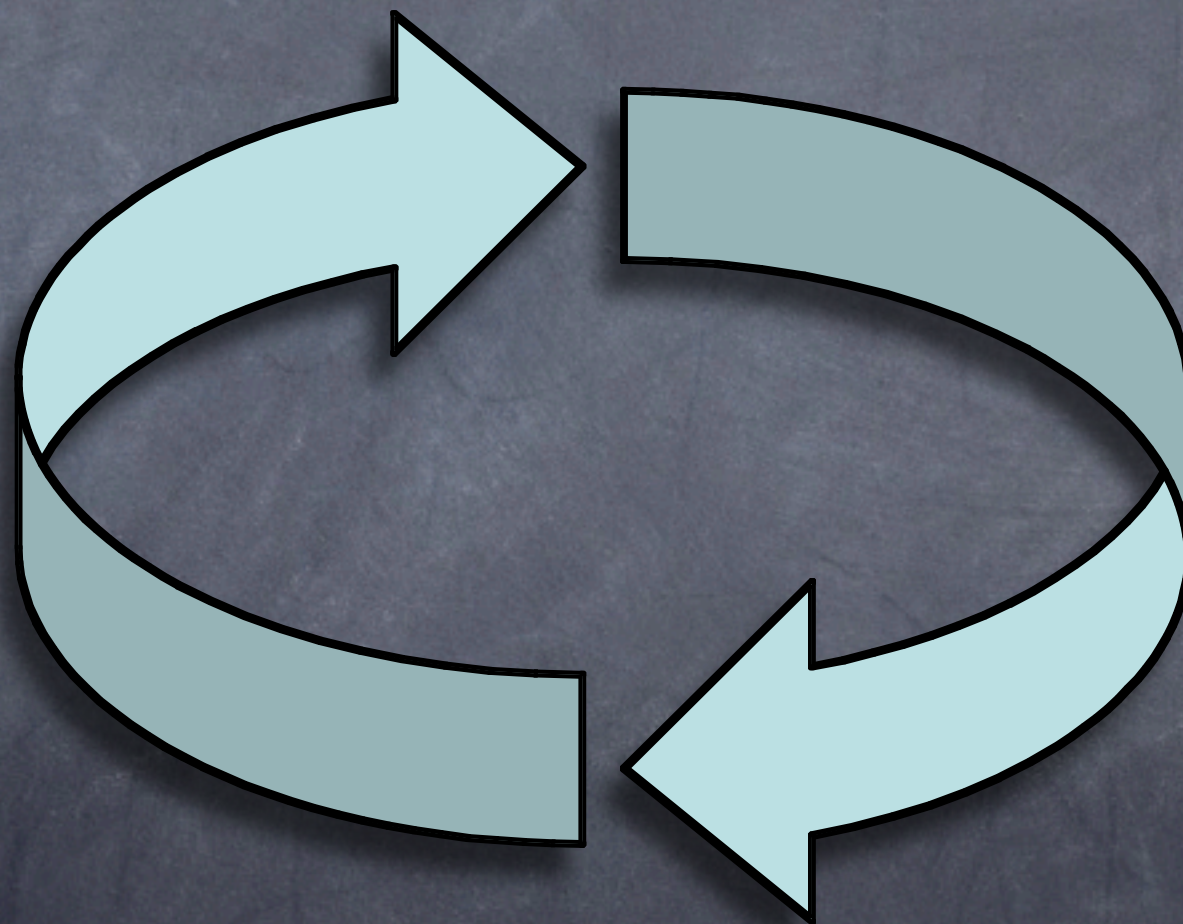
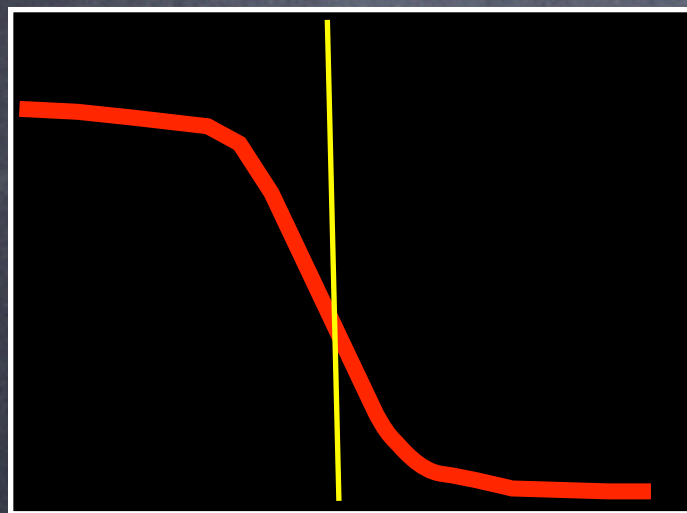


GISAXS

adjust x to center sample in beam



scan y: set to
1/2 intensity

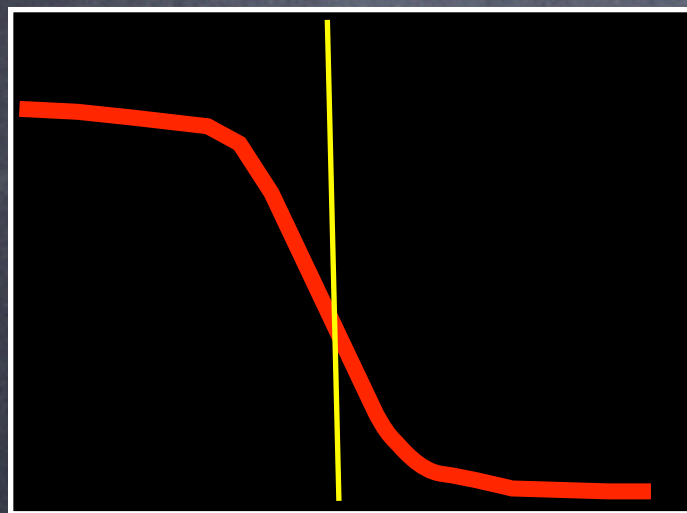


GISAXS

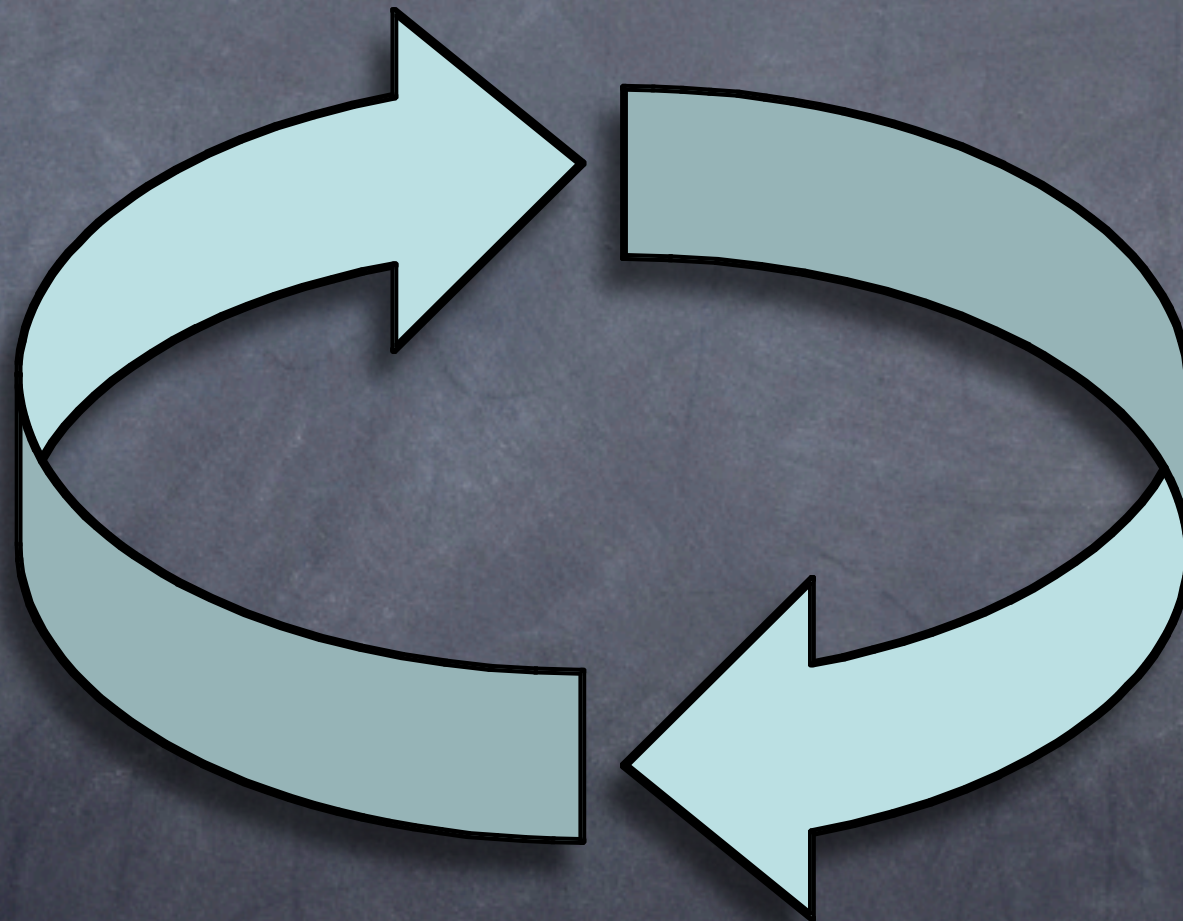
adjust x to center sample in beam



scan y: set to
1/2 intensity



Go to Cursor

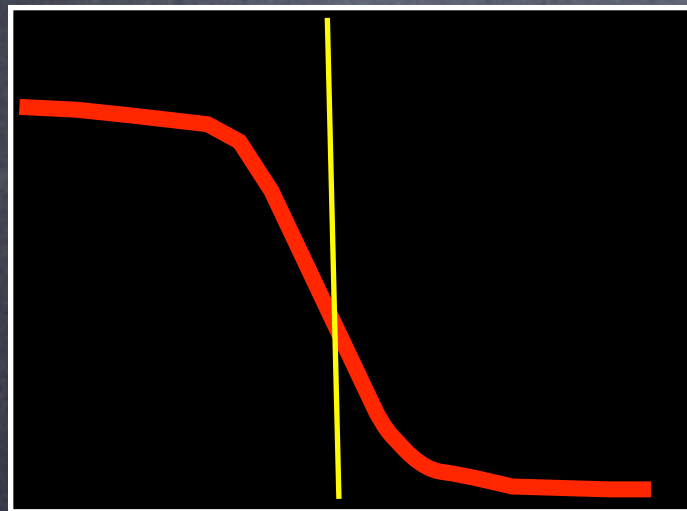


GISAXS

adjust x to center sample in beam

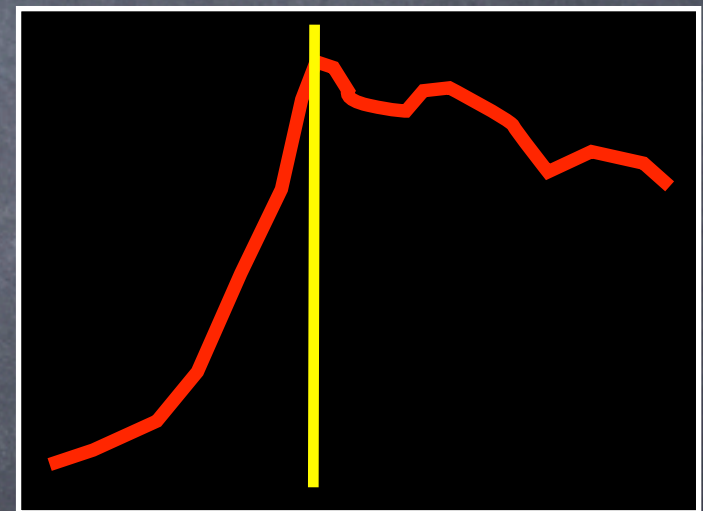


scan y: set to
1/2 intensity

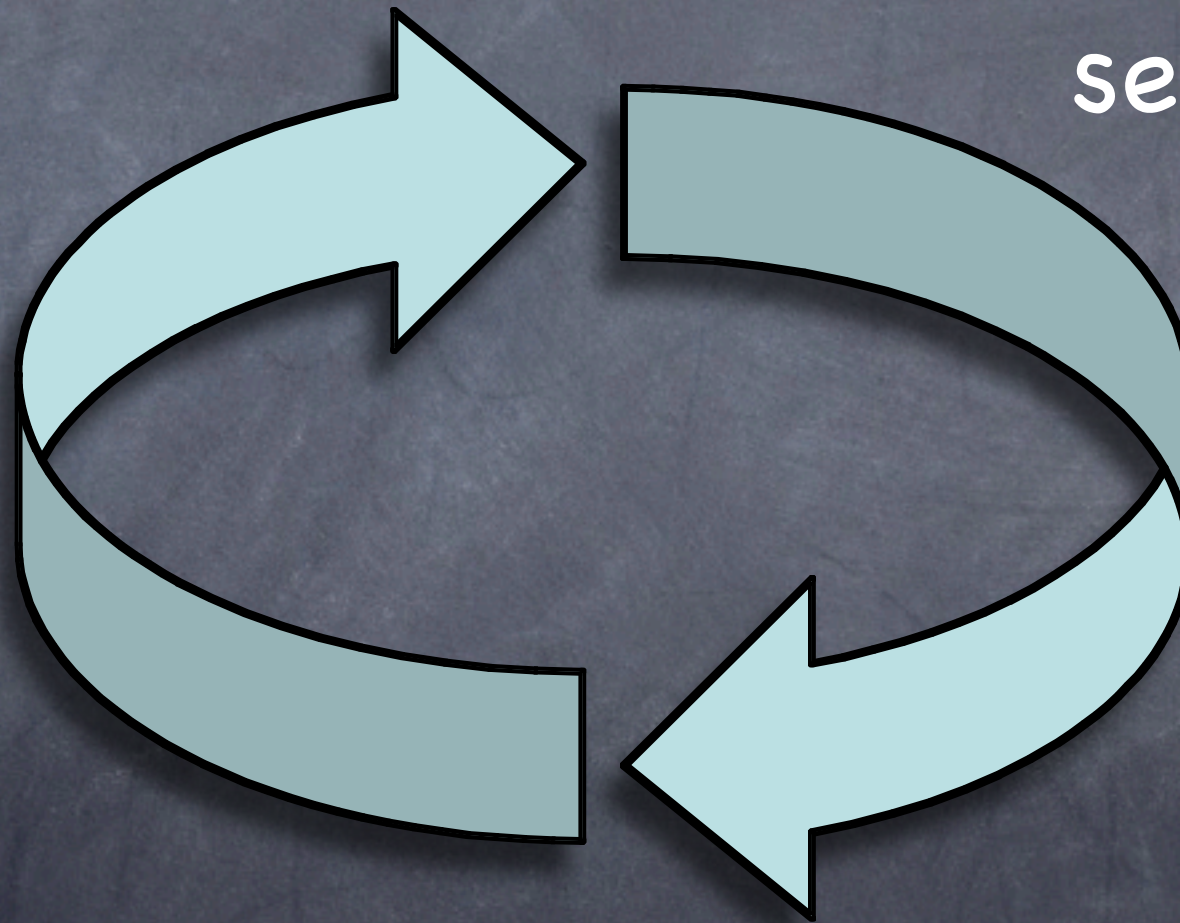


Go to Cursor

scan alpha angle:
set to max point



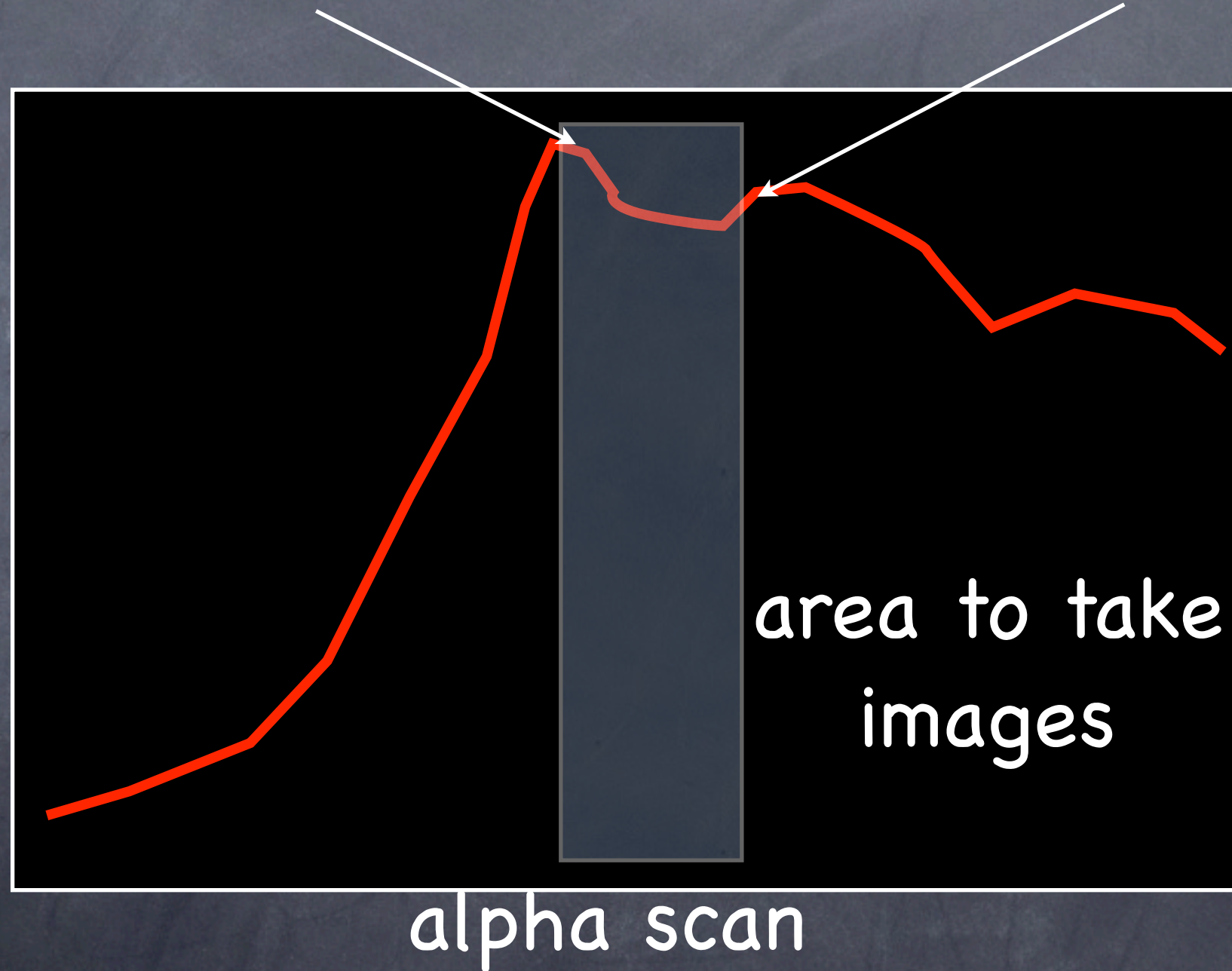
Go to Cursor



GISAXS

critical angle polymer

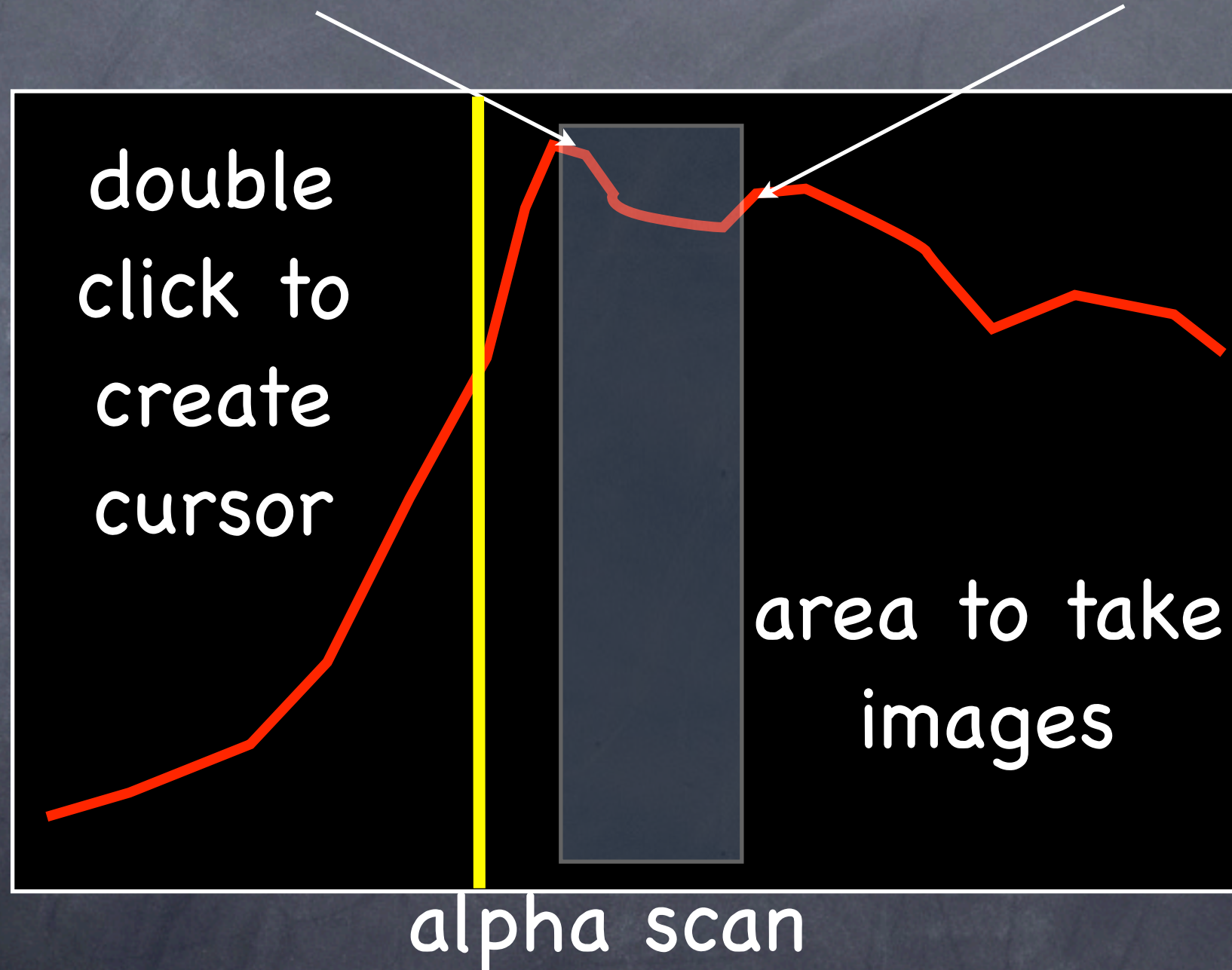
critical angle substrate



GISAXS

critical angle polymer

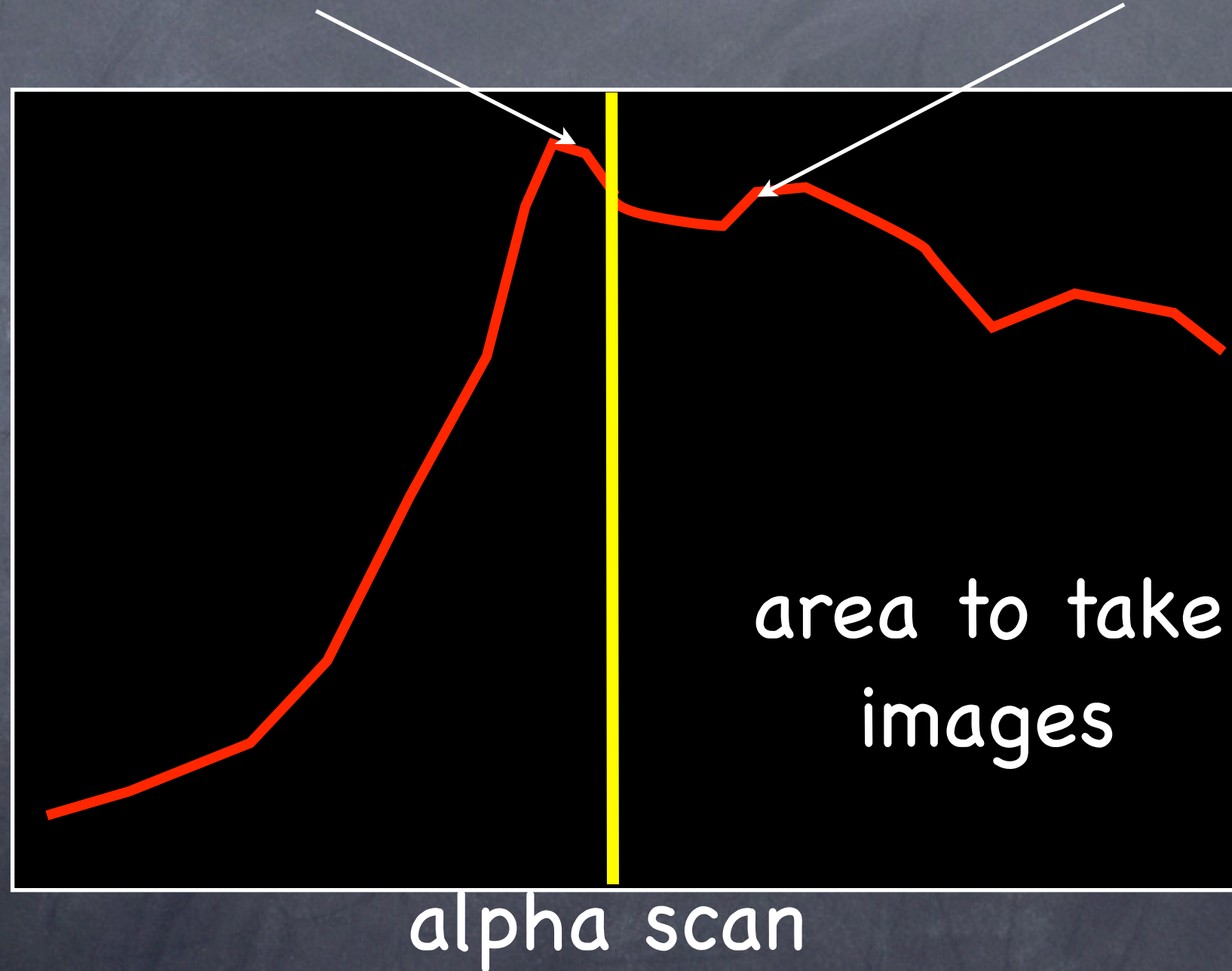
critical angle substrate



GISAXS

critical angle polymer

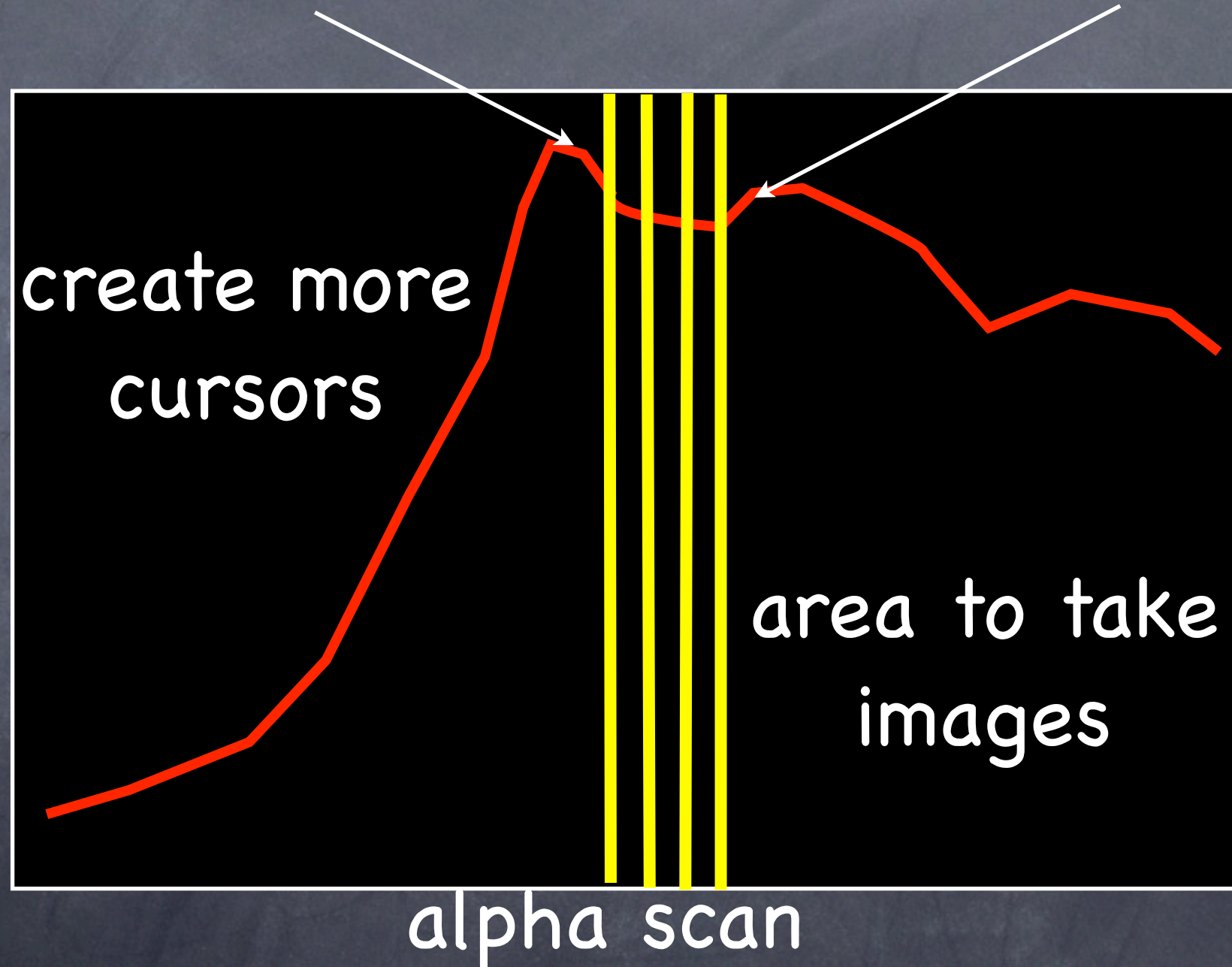
critical angle substrate



GISAXS

critical angle polymer

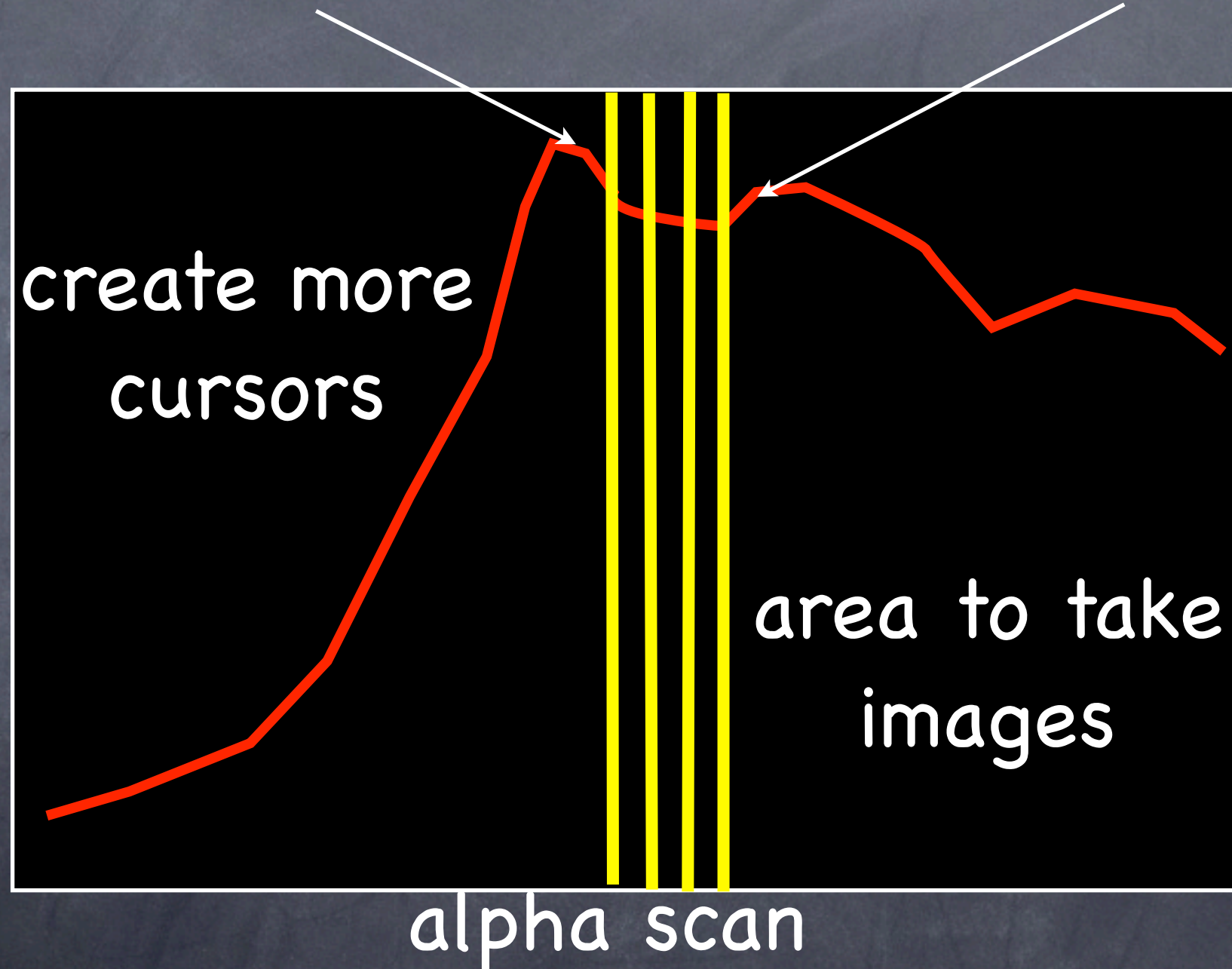
critical angle substrate



GISAXS

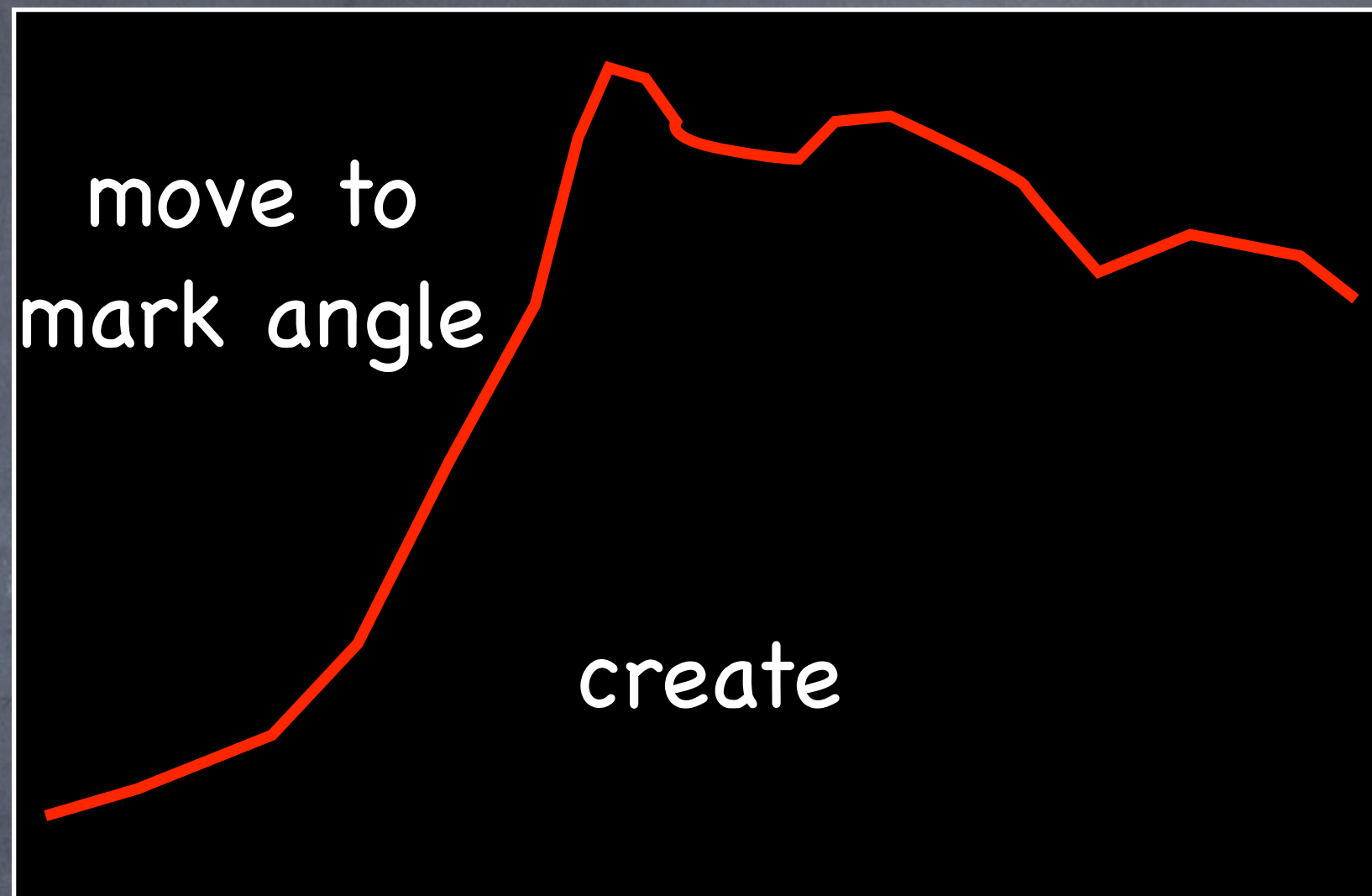
critical angle polymer

critical angle substrate



Bookmark Cursors

GISAXS



alpha scan

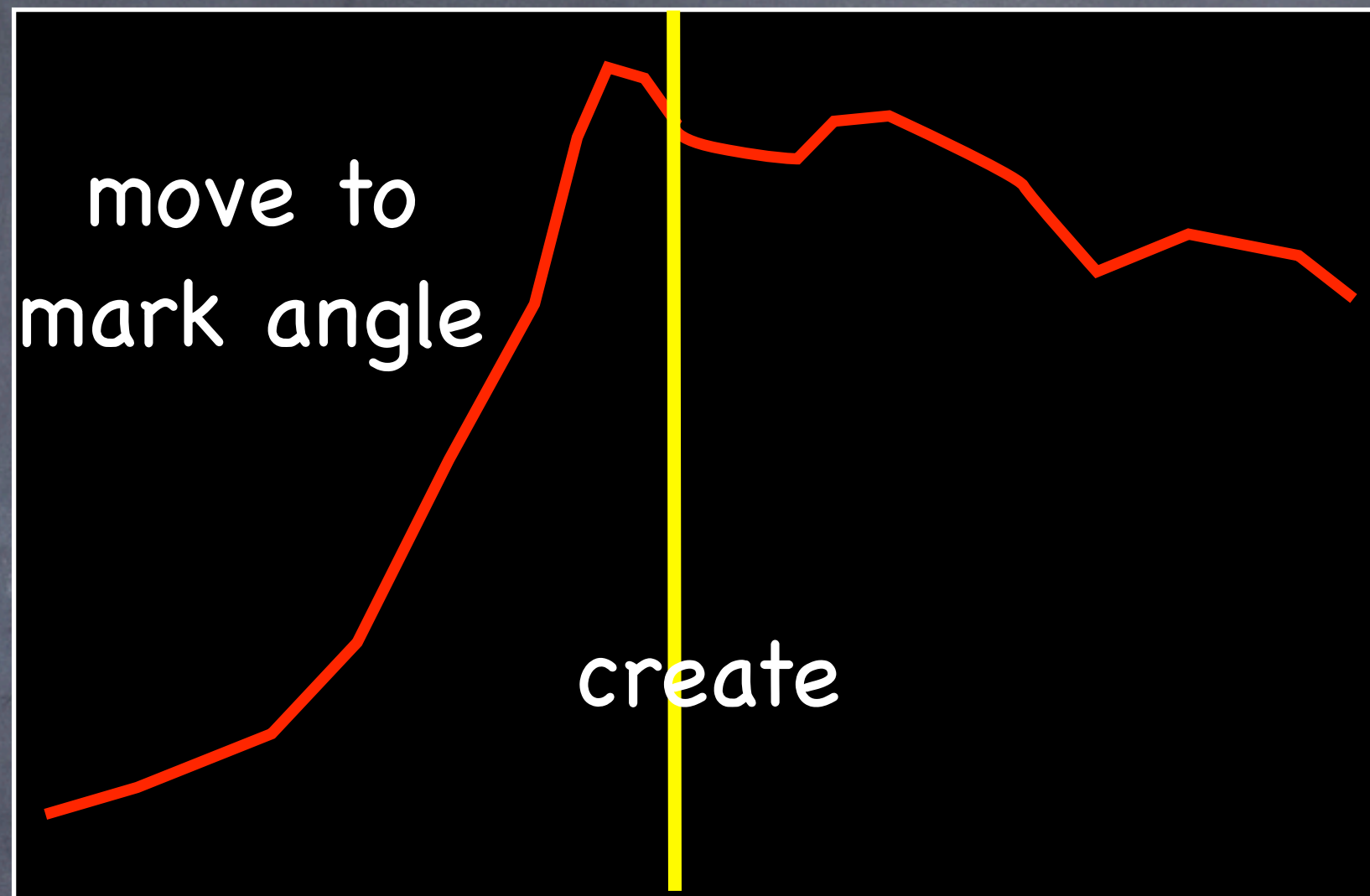


Bookmark cursors



Create Queue: e.g. take 15 scans between cursors

GISAXS



alpha scan

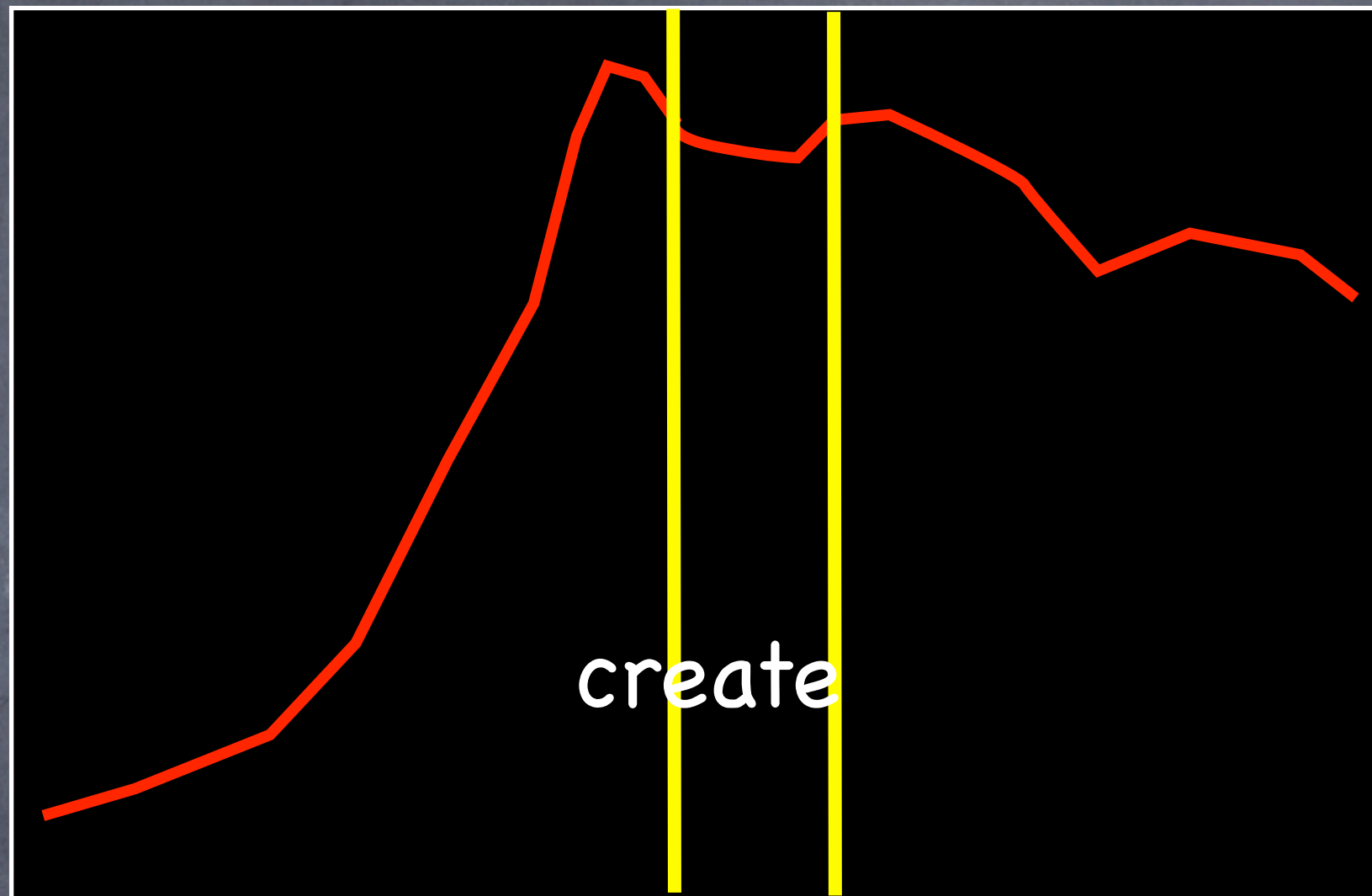


Bookmark cursors



Create Queue: e.g. take 15 scans between cursors

GISAXS



alpha scan



Bookmark cursors

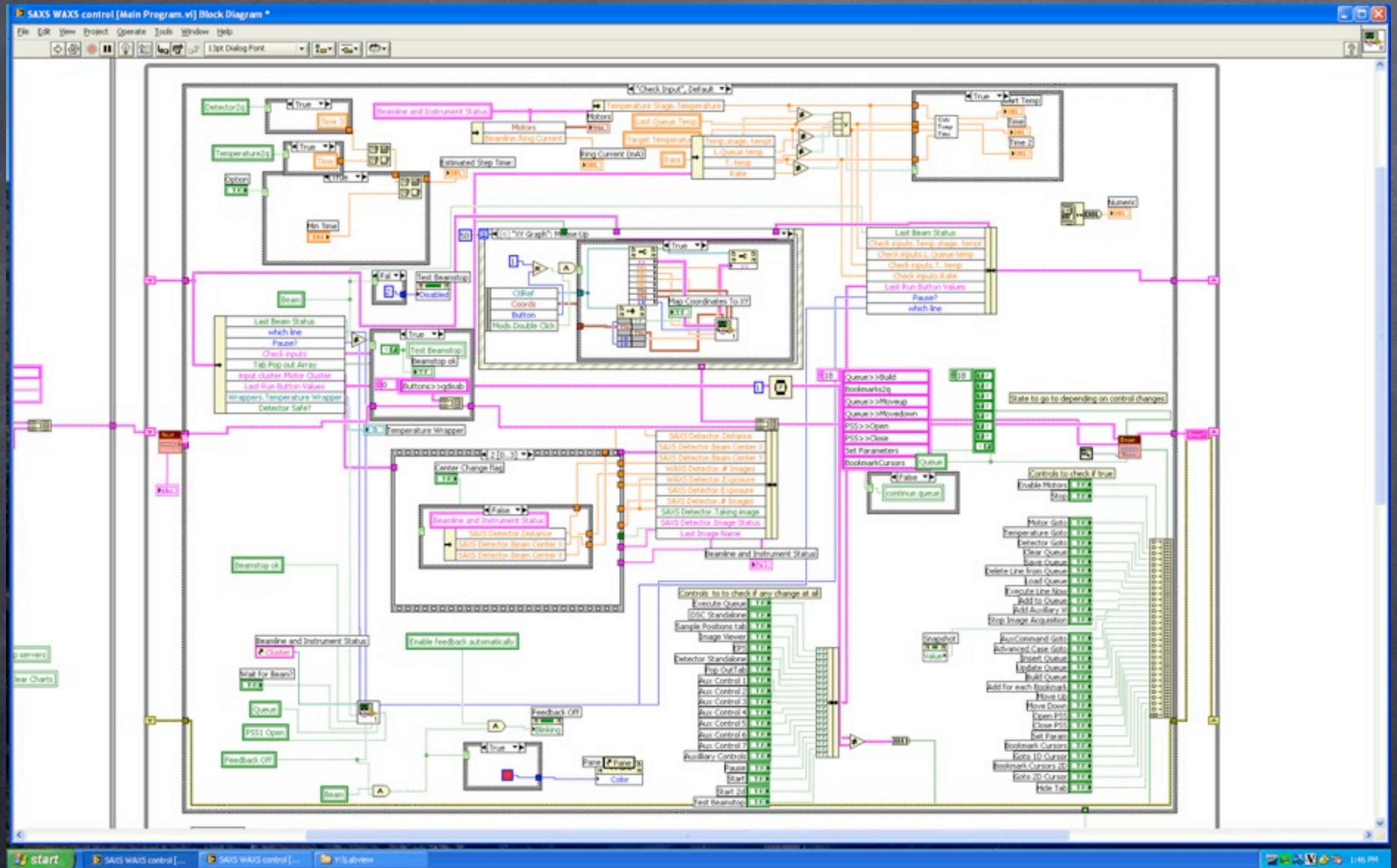


Create Queue: e.g. take 15 scans between cursors

Performing Your Experiment

- Software
- When something unexpected happens
- Take Calibration!!! update header every time detector or flight tube might have moved
- Take Empty Cell
- Typical Experiments
 - SAXS
 - DSC SAXS
 - GISAXS
 - SAXS/WAXS

Beamline Software



Beamline Software

Control Lights

(what's the program doing?)

The screenshot displays the Beamline Software interface, which is divided into several functional areas:

- Top Status Bar:** Includes buttons for "DSC Standalone" and "Auxiliary Controls". A row of status indicators shows "Motor Disabled" (green), "Queue" (red), "Motors" (yellow), "Detector" (green), "Exposing" (blue), "Temp" (blue), "Beam" (purple), and "Feedback Off" (red). On the right, it shows "X: -50.2995 mm", "Y: 6.76408 mm", "Theta: -0.3994 deg", "Phi: -3 deg", "Alpha: 0.5 deg", "Ring Current (mA): 252.998", and the date/time "1:55:03 PM Tuesday, January 08 2008".
- Left Panel:** Contains a "Main" tab and a "Sample Scan" tab. Below these are buttons for "Move Up", "Move Down", "Delete Line (del)", "Queue", "Save Queue", and "Load Queue".
- Center Panel:** Features a large "Execute Queue" button and a "Pause" button. Below these are tabs for "Single Step", "Multiple Steps", "Temperature", "Positions", and "Detector". The "Single Step" section includes checkboxes for "The Motors will not move", "no images will be taken", "Temperature will not be ramped", "Wait the calculated minimum time", and "Don't Execute any extra command before taking images". It also has input fields for "# Images", "Exposure Time (sec)", "Delay 2", "root filename", "Start Temp", "Target Temperature", "Rate", and "In Aux".
- Right Panel:** Displays a large image of a sample scan, which appears to be a dark, textured surface. To the right of the image is a color scale bar ranging from -61 to -20. Below the image are buttons for "Refresh" and "Auto Load Newest".
- Bottom Panel:** Contains a "SnapShot" section with fields for "Detector", "# Images", "Exposure Time (s)", "Image name", and a file path. It also has a "Snap" button. Below this are buttons for "Add Step to End of Queue", "Insert Step Before selection", and "Estimated Step Time".

Beamline Software

The screenshot shows the Beamline Software interface. At the top, there is a row of status buttons: 'DSC Standalone', 'Auxiliary Controls', 'Motor Disabled' (highlighted with a red arrow), 'Queue', 'Motors', 'Detector', 'Exposing', 'Temp', 'Beam', and 'Feedback Off'. To the right of these buttons are fields for X, Y, Theta, Phi, and Alpha coordinates, and a 'Ring Current (mA)' field showing 252.998. Below the status buttons is a large table for the queue, with columns for 'Move Up', 'Move Down', 'Delete Line (del)', 'Clear Queue', 'Save Queue', and 'Load Queue'. The main area of the interface is a large dark red rectangular plot with a yellow crosshair. To the right of the plot is a color scale bar ranging from -20 to 61. At the bottom, there are several control panels including 'SnapShot', 'Single Step', and 'Add Step to End of Queue'. The 'SnapShot' panel has fields for 'Detector', '# Images', 'Exposure Time (s)', and 'Image name'. The 'Single Step' panel has checkboxes for 'no images will be taken', 'Temperature will not be ramped', 'Wait the calculated minimum time', and 'Don't Execute any extra command before taking images'. The 'Add Step to End of Queue' panel has fields for 'Center X', 'Center Y', 'Distance mm', and 'Pixel Size mm'.

Motor Disabled
Hutch is not made up
All motors cannot be enabled while
Hutch is open
Hutch is made up but motors are disabled
click Enable Motors

Beamline Software

The screenshot displays the Beamline Software interface. At the top, a status bar includes buttons for 'DSC Standalone', 'Auxiliary Controls', and a row of indicator lights for 'Motor Disabled' (green), 'Queue' (red, highlighted by a red arrow), 'Motors', 'Detector', 'Exposing', 'Temp', 'Beam', and 'Feedback Off'. To the right, a 'Click to Test Beamstop and Enable Queue' button is visible. Further right, a table shows parameters: X (-50.2995 mm), Y (6.76408 mm), Theta (-0.3994 deg), Phi (-3 deg), and Alpha (0.5 deg). A 'Ring Current (mA)' field shows 252.998. The date and time are 'Tuesday, January 08 2008' at '1:55:03 PM'. Below the status bar, a large table for the queue is shown with columns for 'Move Up', 'Move Down', 'Delete Line (del)', 'Clear Queue', 'Save Queue', and 'Load Queue'. An 'Execute Queue' button is present. A 'Snapshot' section includes fields for 'Detector' (SAGS), '# Images' (1), 'Exposure Time (s)' (1), 'Image name' (snap_0016.tif), and a file path (Y:\userdata\test\save). A 'Snap' button is also there. The bottom section has tabs for 'Single Step', 'Multiple Steps', 'Temperature', 'Positions', and 'Detector'. A text box indicates 'In this Step, The Motors will not move'. A large data plot on the right shows a grid of dark red squares with a color scale from -20 to 61. The bottom right corner contains a 'Refresh' button and a 'Set Header from Agb' button.

Queue

Queue is running (scanning and taking images is disabled)

Beamline Software

The screenshot displays the Beamline Software interface. At the top, a row of status indicators includes 'Motor Disabled' (green), 'Queue' (red), 'Motors' (green), 'Detector' (green), 'Exposing' (blue), 'Temp' (blue), 'Beam' (blue), and 'Feedback Off' (red). A red arrow points to the 'Motors' indicator. Below this, a large table for the queue is visible. To the right, a panel shows beam parameters: X: -50.2995 mm, Y: 6.76408 mm, Theta: -0.3994 deg, Phi: -3 deg, Alpha: 0.5 deg, and Ring Current: 252.998 mA. The date and time are 1:55:03 PM, Tuesday, January 08 2008. A large image of the beamstop is shown on the right. At the bottom, a 'Single Step' configuration panel is visible, showing settings for the current step.

Motors

Motors are moving, do not scan or move motors while this light is lit

Beamline Software

Detector

Detectors are working, do not start another detector run now

The screenshot displays the Beamline Software interface, which is divided into several functional areas:

- Top Status Bar:** Contains indicators for 'DSC Standalone', 'Auxiliary Controls', 'Motor Disabled' (green), 'Queue' (red), 'Motors' (blue), 'Detector' (green, highlighted with a red arrow), 'Exposing' (blue), 'Temp' (blue), 'Beam' (blue), and 'Feedback Off' (red).
- Left Panel:** Includes buttons for 'Move Up', 'Move Down', 'Delete Line (del)', 'Clear Queue', 'Save Queue', and 'Load Queue'.
- Center Panel:** Features a large table for the queue and a 'Snapshot' section with fields for 'Detector' (SAGS), '# Images' (1), 'Exposure Time (s)' (1), 'Image name' (snap_0016df), and a file path. A 'Snap' button is also present.
- Bottom Left Panel:** Contains tabs for 'Single Step', 'Multiple Steps', 'Temperature', 'Positions', and 'Detector'. The 'Detector' tab is active, showing options for 'In this Step', 'The Motors will not move', 'no images will be taken', 'Temperature will not be ramped', and 'Wait the calculated minimum time'. It includes fields for '# Images', 'Exposure Time (sec)', 'Delay 2', 'root filename', 'Start Temp', 'Target Temperature', 'Rate', and 'Estimated Step Time'.
- Bottom Right Panel:** Displays a large image of the detector output, showing a dark, noisy field. It includes a color scale on the right (ranging from -50 to 20) and a 'Refresh' button.
- Right Panel:** Contains a 'Center X' field (952), 'Center Y' field (1416), 'Distance mm' field (1579.41), and 'Pixel Size mm' field (0.0816). It also has a 'Quick Radial Integration using these values' button and a 'Set Header from Agb' button.

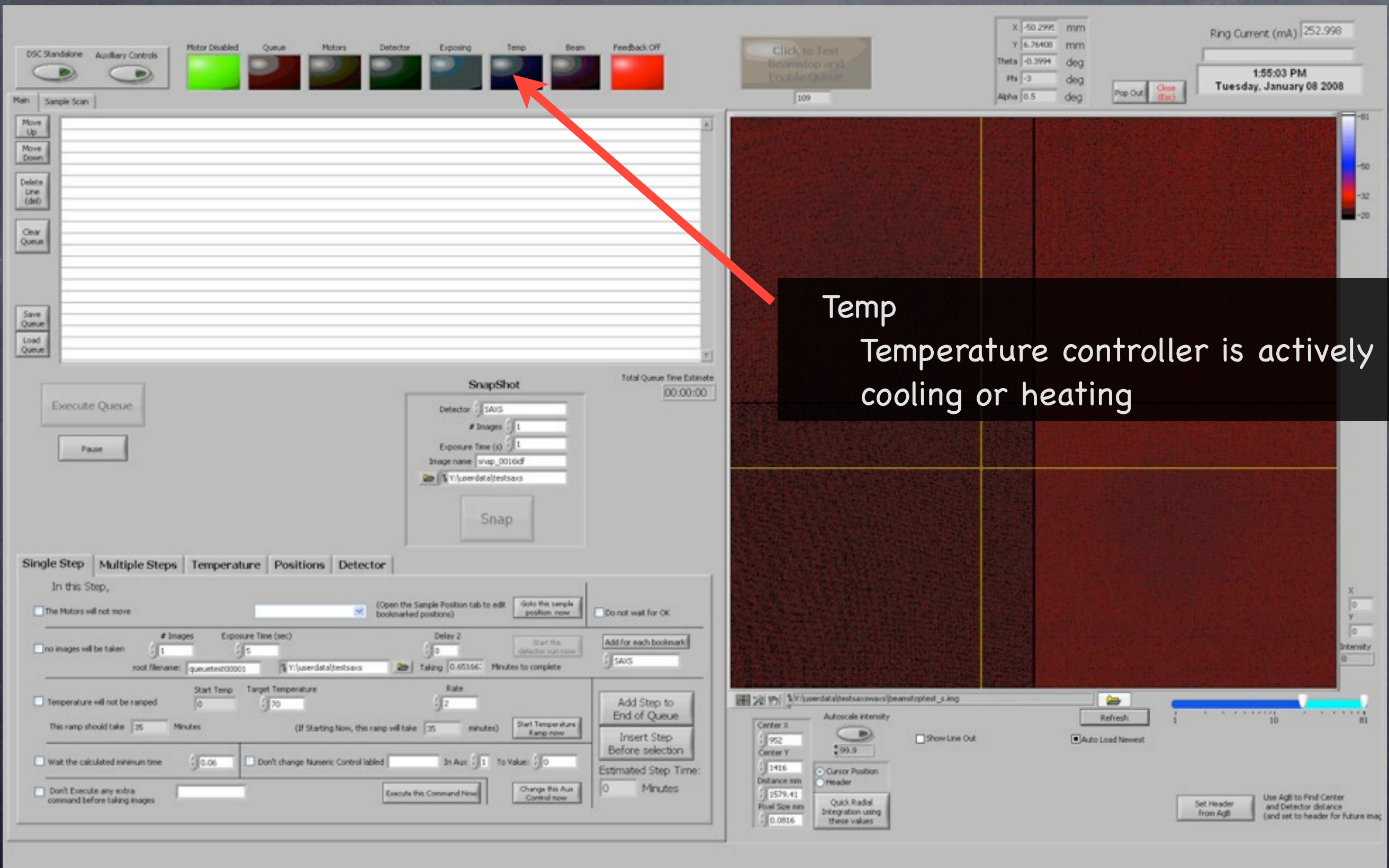
Beamline Software

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- Right Panel:** Displays "Ring Current (mA)" at 252.998 and the date/time "1:55:03 PM Tuesday, January 08 2008". It also shows a "Pop Out" button and a "Close (Esc)" button.
- Left Panel:** Contains a "Main" tab and a "Sample Scan" tab. Below these are buttons for "Move Up", "Move Down", "Delete Line (del)", "Clear Queue", "Save Queue", and "Load Queue".
- Center Panel:** Features a large "Execute Queue" button and a "Pause" button. Below these is a "Snapshot" section with fields for "Detector" (SAXS), "# Images" (1), "Exposure Time (s)" (1), "Image name" (snap_0016.tif), and a file path (Y:\userdata\testsaxs). A "Snap" button is located at the bottom of this section.
- Bottom Panel:** Includes tabs for "Single Step", "Multiple Steps", "Temperature", "Positions", and "Detector". The "Single Step" tab is active, showing options for "In this Step," "The Motors will not move," "no images will be taken," "Temperature will not be ramped," and "Wait the calculated minimum time." It also includes fields for "Start Temp," "Target Temperature," "Rate," and "Estimated Step Time."
- Right Panel (Data Grid):** A large grid displaying a 2D image, likely a diffraction pattern. The grid is divided into four quadrants by a yellow crosshair. The image shows a dark background with a grid of small, bright spots. A color scale bar on the right indicates intensity levels from -81 to 81.

Exposing
Xrays are actually in the hutch

Beamline Software



Beamline Software

The screenshot displays the Beamline Software interface, which is divided into several functional areas:

- Top Status Bar:** Includes buttons for "DSC Standalone" and "Auxiliary Controls". A row of status indicators shows "Motor Disabled" (green), "Queue" (red), "Motors" (grey), "Detector" (green), "Exposing" (blue), "Temp" (blue), "Beam" (red), and "Feedback Off" (red). A button labeled "Click to Test Beamstop and Enable Queue" is also present.
- Top Right:** Displays "Ring Current (mA)" at 252.998 and the date/time "1:55:03 PM Tuesday, January 08 2008".
- Left Panel:** Contains a "Main" tab and a "Sample Scan" tab. Below these are buttons for "Move Up", "Move Down", "Delete Line (del)", "Clear Queue", "Save Queue", and "Load Queue".
- Center Panel:** A large, empty table with multiple rows and columns, likely for managing a scan queue.
- Bottom Left:** Features an "Execute Queue" button and a "Pause" button.
- Bottom Center:** A "SnapShot" section with fields for "Detector" (SAIS), "# Images" (1), "Exposure Time (s)" (1), "Image name" (snap_0016df), and a file path. A "Snap" button is at the bottom.
- Bottom Right:** A large detector image showing a dark, noisy field. A red arrow points from the "Beam" status indicator to this image. A text box overlay on the image reads "Beam Beam is ready to go in hutch".
- Right Panel:** Displays a color scale for intensity from -61 to -20. Below the image are controls for "Center X" (1952), "Center Y" (1416), "Distance mm" (1579.41), and "Pixel Size mm" (0.0816). There are also buttons for "Add Step to End of Queue", "Insert Step Before selection", and "Estimated Step Time: 0 Minutes".

Beamline Software

The screenshot displays the Beamline Software interface. At the top, a row of status indicators includes Motor Disabled (green), Queue (red), Motors (blue), Detector (green), Exposing (blue), Temp (blue), Beam (blue), and Feedback Off (red). A red arrow points to the Feedback Off indicator. To the right, a panel shows X and Y coordinates, Theta, Phi, and Alpha values, along with a Ring Current (mA) of 252.998 and a timestamp of 1:55:03 PM on Tuesday, January 08, 2008. Below the status indicators, there is a large table for the queue, buttons for Move Up, Move Down, Delete Line (del), Clear Queue, Save Queue, and Load Queue, and an Execute Queue button. A Snapshot section shows Detector: SAOIS, # Images: 1, Exposure Time (s): 1, Image name: snap_0016df, and a Snap button. The bottom section contains tabs for Single Step, Multiple Steps, Temperature, Positions, and Detector. The Single Step tab is active, showing options for motor movement, image taking, temperature ramping, and step execution. A text box on the right side of the interface reads: "Feedback Off. If Hutch is closed, and beam is on, feedback should be on. if the feedback stays off, even after enabling it, Let us know, image taking is possible, but the beam center may wander".

Feedback Off

If Hutch is closed, and beam is on, feedback should be on

if the feedback stays off, even after enabling it, Let us know, image taking is possible, but the beam center may wander

Beamline Software

What is a Queue

The screenshot displays the Beamline Software interface, which is divided into several functional areas:

- Top Status Bar:** Includes buttons for "DSC Standalone" and "Auxiliary Controls". A row of status indicators shows "Motor Disabled" (green), "Queue" (red), "Motors" (yellow), "Detector" (green), "Exposing" (blue), "Temp" (blue), "Beam" (purple), and "Feedback Off" (red). A "Click to Test Beamstop and Enable Queue" button is also present.
- Top Right Panel:** Displays "Ring Current (mA)" at 252.998, the time "1:55:03 PM", and the date "Tuesday, January 08 2008". It also shows "Pop Out" and "Close (Esc)" buttons.
- Top Right Controls:** A table of coordinates: X: -50.2995 mm, Y: 6.76408 mm, Theta: -0.3994 deg, Phi: -3 deg, Alpha: 0.5 deg.
- Left Panel:** Contains a "Main" tab and a "Sample Scan" tab. Below these are buttons for "Move Up", "Move Down", "Delete Line (del)", "Clear Queue", "Save Queue", and "Load Queue".
- Queue Management Window:** A large window titled "What is a Queue" with a list of queue entries. It includes an "Execute Queue" button and a "Pause" button.
- Snapshot Section:** A "SnapShot" section with fields for "Detector" (SAXS), "# Images" (1), "Exposure Time (s)" (1), "Image name" (snap_0016.tif), and a file path (Y:\userdata\testsaxs). A "Snap" button is located below these fields. A "Total Queue Time Estimate" of 00:00:00 is shown.
- Single Step Configuration:** A section with tabs for "Single Step", "Multiple Steps", "Temperature", "Positions", and "Detector". It includes checkboxes for "The Motors will not move", "no images will be taken", "Temperature will not be ramped", and "Wait the calculated minimum time". It also features fields for "Start Temp", "Target Temperature", "Rate", and "Delay 2".
- Main Control Panel:** A large panel on the right side of the interface. It displays a "Refresh" button, a "Show Line Out" checkbox, and a "Quick Radial Integration using these values" button. It also shows a "Set Header from Agb" button and a "Use Agb to Find Center and Detector distance (and set to header for future images)" button.

Beamline Software

The screenshot displays the Beamline Software interface, which is divided into several functional areas:

- Top Status Bar:** Includes buttons for "DSC Standalone" and "Auxiliary Controls". A row of status indicators shows "Motor Disabled" (green), "Queue" (red), "Motors" (yellow), "Detector" (green), "Exposing" (blue), "Temp" (blue), "Beam" (purple), and "Feedback Off" (red). A "Click to Test Beamstop and Enable Queue" button is also present.
- Top Right:** Displays "Ring Current (mA)" at 252.998 and the date/time "1:55:03 PM Tuesday, January 08 2008".
- Left Panel:** Contains a "Main" tab and a "Sample Scan" tab. Below these are buttons for "Move Up", "Move Down", "Delete Line (del)", "Clear Queue", "Save Queue", and "Load Queue".
- Center Panel:** A large table for managing the scan queue. It has columns for "Move Up", "Move Down", "Delete Line (del)", "Clear Queue", "Save Queue", and "Load Queue".
- Bottom Left:** Features an "Execute Queue" button and a "Pause" button.
- Bottom Center:** A "SnapShot" section with fields for "Detector" (SAXS), "# Images" (1), "Exposure Time (s)" (1), "Image name" (snap_0016.tif), and a file path (Y:\userdata\testsaxs). A "Snap" button is located below these fields.
- Bottom Right:** A large "Single Step" configuration panel with tabs for "Multiple Steps", "Temperature", "Positions", and "Detector". It includes checkboxes for "The Motors will not move", "no images will be taken", "Temperature will not be ramped", and "Wait the calculated minimum time". It also has input fields for "Start Temp", "Target Temperature", "Rate", and "Delay 2". A "Start this detector right now" button is present.
- Right Panel:** A large data visualization area showing a 2D plot of intensity. A color scale on the right ranges from -20 to 61. The plot is divided into four quadrants by a vertical and a horizontal line.
- Bottom Right Panel:** A "Refresh" button and a "Set Header from Agb" button. It also includes a "Quick Radial Integration using these values" button.

Beamline Software

Do any number of these actions in a step by checking the corresponding check box:

The screenshot displays the Beamline Software interface, which is divided into several functional areas:

- Top Status Bar:** Includes indicators for 'DSC Standalone', 'Auxiliary Controls', and a row of status lights for 'Motor Disabled' (green), 'Queue' (red), 'Motors' (yellow), 'Detector' (green), 'Exposing' (blue), 'Temp' (blue), 'Beam' (purple), and 'Feedback Off' (red). It also shows 'X' and 'Y' coordinates in mm, 'Theta' in deg, and 'Ring Current (mA)' at 252.998.
- Main Control Panel:** Features a large queue list with buttons for 'Move Up', 'Move Down', 'Delete Line (del)', 'Clear Queue', 'Save Queue', and 'Load Queue'. An 'Execute Queue' button and a 'Pause' button are also present.
- Snapshot Panel:** Allows for taking a snapshot with fields for 'Detector' (SAIS), '# Images' (1), 'Exposure Time (s)' (1), 'Image name' (snap_0016df), and a file path. A 'Snap' button is at the bottom.
- Single Step Configuration:** A tabbed interface for configuring individual steps. The 'In this Step,' section includes checkboxes for: 'The Motors will not move', 'no images will be taken' (with fields for # Images, Exposure Time, and Delay 2), 'Temperature will not be ramped' (with fields for Start Temp, Target Temperature, Rate, and time), 'Wait the calculated minimum time', and 'Don't Execute any extra command before taking images'. It also includes a 'Start this detector right now' button and an 'Add for each bookmark' button.
- Bottom Control Panel:** Contains buttons for 'Add Step to End of Queue', 'Insert Step Before selection', and 'Estimated Step Time: 0 Minutes'. It also has a 'Quick Radial Integration using these values' button and a 'Set Header from Agb' button.
- Central Display:** A large area showing a grid of images or data. The bottom right corner shows a color scale for 'Intensity' ranging from 0 to 81.

Beamline Software

The screenshot shows the Beamline Software interface. At the top, there are status indicators for Motor Disabled (green), Queue (red), Motors (yellow), Detector (green), Exposing (blue), Temp (blue), Beam (purple), and Feedback Off (red). Below these are buttons for DSC Standalone and Auxiliary Controls. A large queue list is in the center-left, with buttons for Move Up, Move Down, Delete Line (del), Clear Queue, Save Queue, and Load Queue. To the right of the queue is a 'Click to Test' button. Below the queue are 'Execute Queue' and 'Pause' buttons. A 'SnapShot' panel on the right shows Detector: SAOS, # Images: 1, Exposure Time (s): 1, Image name: snap_0016df, and a file path. A red arrow points from the 'SnapShot' panel to the 'In this step,' section. The 'In this step,' section has checkboxes for 'The Motors will not move', 'no images will be taken', 'Temperature will not be ramped', 'Wait the calculated minimum time', and 'Don't Execute any extra command before taking images'. It also has input fields for # Images, Exposure Time (sec), Delay 2, root filename, Start Temp, Target Temperature, Rate, and minutes to complete. There are buttons for 'Start this detector right now', 'Add for each bookmark', 'Add Step to End of Queue', 'Insert Step Before selection', 'Estimated Step Time', 'Execute this Command Now', and 'Change this Aux Control now'. A large semi-transparent black box with white text is overlaid on the right side of the interface, containing the text 'Do any number of these actions in a step by checking the corresponding check box:' and a bullet point '• Move to Bookmarked Motor location'. The bottom right of the interface shows a 'Refresh' button, 'Auto Load Newest' checkbox, and a 'Set Header from Agb' button. A status bar at the bottom right shows 'Use Agb to Find Center and Detector distance (and set to header for future images)'.

Do any number of these actions in a step by checking the corresponding check box:

- Move to Bookmarked Motor location

Beamline Software

The screenshot shows the Beamline Software interface. At the top, there are status indicators for Motor Disabled (green), Queue (red), Motors (yellow), Detector (green), Exposing (blue), Temp (blue), Beam (purple), and Feedback Off (red). Below these are buttons for DSC Standalone and Auxiliary Controls. The main area features a queue list with buttons for Move Up, Move Down, Delete Line (del), Clear Queue, Save Queue, and Load Queue. A 'SnapShot' panel on the right allows setting Detector (SAGS), # Images (1), Exposure Time (s) (1), Image name (snap_0016df), and a file path (Y:\userdata\testsave). The bottom section has tabs for Single Step, Multiple Steps, Temperature, Positions, and Detector. The 'Single Step' tab is active, showing checkboxes for 'The Motors will not move', 'no images will be taken', 'Temperature will not be ramped', 'Wait the calculated minimum time', and 'Don't Execute any extra command before taking images'. It also includes fields for Start Temp, Target Temperature, Rate, and Delay 2. A 'Snap' button is present. A semi-transparent text box with a black background and white text is overlaid on the right side of the interface, containing the text 'Do any number of these actions in a step by checking the corresponding check box:' followed by a bulleted list: '• Move to Bookmarked Motor location' and '• Take a Image'. Two red arrows point from the text box to the checkboxes in the 'Single Step' tab.

Do any number of these actions in a step by checking the corresponding check box:

- Move to Bookmarked Motor location
- Take a Image

Beamline Software

The screenshot shows the Beamline Software interface. At the top, there are status indicators for Motor Disabled (green), Queue (red), Motors (yellow), Detector (green), Exposing (blue), Temp (blue), Beam (purple), and Feedback Off (red). Below these are buttons for DSC Standalone and Auxiliary Controls. The main area features a queue list with buttons for Move Up, Move Down, Delete Line (del), and Clear Queue. On the left, there are buttons for Save Queue and Load Queue. The bottom section has tabs for Single Step, Multiple Steps, Temperature, Positions, and Detector. The Single Step tab is active, showing options for moving motors, taking images, and ramping temperature. A semi-transparent text box is overlaid on the right side of the interface, containing the following text:

Do any number of these actions in a step by checking the corresponding check box:

- Move to Bookmarked Motor location
- Take a Image
- Change the Temperature of the temperature stage

Red arrows point from the text box to the corresponding checkboxes in the Single Step tab: 'The Motors will not move', 'no images will be taken', and 'Temperature will not be ramped'.

Beamline Software

The screenshot shows the Beamline Software interface. At the top, there are status indicators for Motor Disabled, Queue, Motors, Detector, Exposing, Temp, Beam, and Feedback Off. Below these are buttons for Move Up, Move Down, Delete Line (del), Clear Queue, Save Queue, and Load Queue. A large queue list is in the center. To the right, there are coordinates (X, Y, Theta) and Ring Current (mA). A text overlay with a black background and white text lists actions: 'Do any number of these actions in a step by checking the corresponding check box:'. Below the list, there are four red arrows pointing to specific checkboxes in the 'Single Step' section: 'The Motors will not move', 'no images will be taken', 'Temperature will not be ramped', and 'Wait the calculated minimum time'. The 'Single Step' section also includes fields for # Images, Exposure Time (sec), Delay 2, root filename, Start Temp, Target Temperature, Rate, and various control buttons like 'Start this detector right now', 'Add for each bookmark', 'Add Step to End of Queue', 'Insert Step Before selection', 'Estimated Step Time', 'Execute this Command Now', and 'Change this Aux Control now'. The bottom right shows a live image of the beam spot and various control parameters like Center X, Center Y, Distance mm, Pixel Size mm, and a 'Quick Radial Integration' button.

Do any number of these actions in a step by checking the corresponding check box:

- Move to Bookmarked Motor location
- Take a Image
- Change the Temperature of the temperature stage
- Wait some number of minutes

Beamline Software

Do any number of these actions in a step by checking the corresponding check box:

- Move to Bookmarked Motor location
- Take a Image
- Change the Temperature of the temperature stage
- Wait some number of minutes
- Change AUX Labview control

Beamline Software

The screenshot shows the Beamline Software interface. At the top, there are status indicators for Motor Disabled, Queue, Motors, Detector, Exposing, Temp, Beam, and Feedback Off. Below these are buttons for Move Up, Move Down, Delete Line (del), Clear Queue, Save Queue, and Load Queue. A large list box is in the center. To the right of the list box, there is a 'SnapShot' section with fields for Detector, # Images, Exposure Time (s), Image name, and a Snap button. Below the list box, there are tabs for Single Step, Multiple Steps, Temperature, Positions, and Detector. The Single Step tab is active, showing various controls for the current step, including checkboxes for 'The Motors will not move', 'no images will be taken', 'Temperature will not be ramped', 'Wait the calculated minimum time', and 'Don't Execute any extra command before taking images'. There are also fields for Start Temp, Target Temperature, Rate, and Delay 2. A 'Start Temperature Ramp now' button is present. At the bottom right, there is a 'Quick Radial Integration' section with fields for Center X, Center Y, Distance mm, and Pixel Size mm, along with a 'Quick Radial Integration using these values' button. A large black box with white text is overlaid on the right side of the interface, listing actions and their corresponding checkboxes. Red arrows point from each action to its respective checkbox in the 'In this Step,' section.

Do any number of these actions in a step by checking the corresponding check box:

- Move to Bookmarked Motor location
- Take a Image
- Change the Temperature of the temperature stage
- Wait some number of minutes
- Change AUX Labview control
- Wait for User OK

Beamline Software

The screenshot shows the Beamline Software interface. At the top, there are status indicators for Motor Disabled, Queue, Motors, Detector, Exposing, Temp, Beam, and Feedback Off. Below these are buttons for Move Up, Move Down, Delete Line (del), Clear Queue, Save Queue, and Load Queue. A large list box is in the center. To the right of the list box, there is a 'SnapShot' section with fields for Detector, # Images, Exposure Time (s), Image name, and a Snap button. Below the list box, there are tabs for Single Step, Multiple Steps, Temperature, Positions, and Detector. The Single Step tab is active, showing various controls for the current step, including checkboxes for 'In this Step', 'The Motors will not move', 'no images will be taken', 'Temperature will not be ramped', 'Wait the calculated minimum time', and 'Don't Execute any extra command before taking images'. There are also fields for Start Temp, Target Temperature, Rate, Delay 2, and a 'Start this detector right now' button. At the bottom right, there is a 'Click Add or Insert into Queue' button and a 'Click to Test' button. The interface also displays a Ring Current (mA) of 252.998 and a timestamp of 1:55:03 PM.

Do any number of these actions in a step by checking the corresponding check box:

- Move to Bookmarked Motor location
- Take a Image
- Change the Temperature of the temperature stage
- Wait some number of minutes
- Change AUX Labview control
- Wait for User OK


Click Add or Insert into Queue

Beamline Software

Single Step | Multiple Steps | Temperature | **Positions** | Detector

X: -62.09 mm Theta: 0.00 Phi: -0.50 Alpha: -0.58
Y: 0.46 mm

Distance: 0.3

Angular Controls: 

	Name	X Position	Y Position	Theta	Phi	Alpha
Save Position	Alpha=0.1040					0.1040
Goto Position	Alpha=0.1140					0.1140
Delete Position	Alpha=0.1240					0.1240
Clear List	Alpha=0.1340					0.1340
Save Pos. List	Alpha=0.1440					0.1440
Load Pos. List						

Angular Controls -> Positions

error in (no error)

status: no error code: 0

source:

Beamline Software

Motor control



Beamline Software

Motor control

Motor control is done through bookmarks

The screenshot displays the 'Positions' tab of the Beamline Software. At the top, there are tabs for 'Single Step', 'Multiple Steps', 'Temperature', 'Positions', and 'Detector'. The 'Positions' tab is active, showing input fields for X (-62.09 mm), Y (0.46 mm), Theta (0.00), Phi (-0.50), and Alpha (-0.58). Below these are directional buttons (up, down, left, right) and a 'Distance' field set to 0.3. A table of bookmarks is visible, with columns for Name, X Position, Y Position, Theta, Phi, and Alpha. The table lists several bookmarks with names like 'Alpha=0.1040' and 'Alpha=0.1140'. A red box highlights the 'Bookmarks' text in the table. To the right, an 'error in (no error)' status window shows 'status' as 'no error' and 'code' as 0.

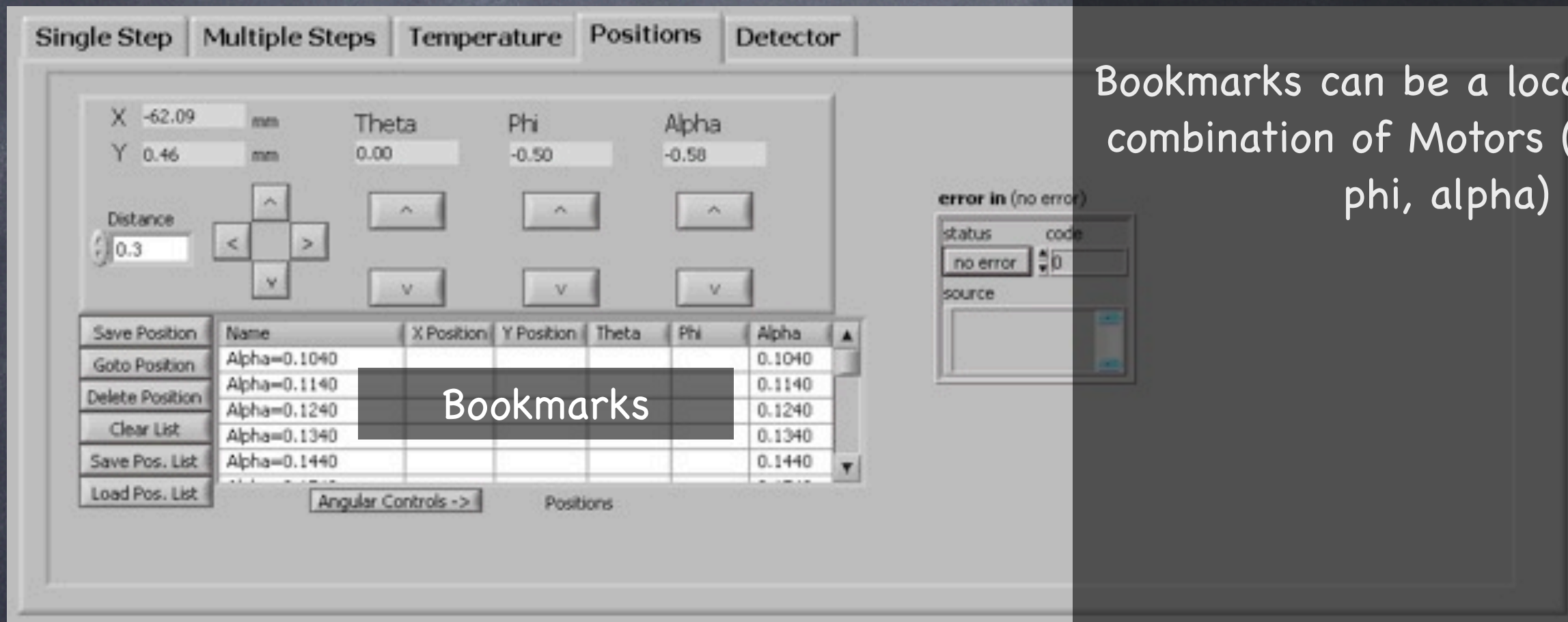
Name	X Position	Y Position	Theta	Phi	Alpha
Alpha=0.1040					0.1040
Alpha=0.1140					0.1140
Alpha=0.1240					0.1240
Alpha=0.1340					0.1340
Alpha=0.1440					0.1440

Beamline Software

Motor control

Motor control is done through bookmarks

Bookmarks can be a location of any combination of Motors (x, y, theta, phi, alpha)



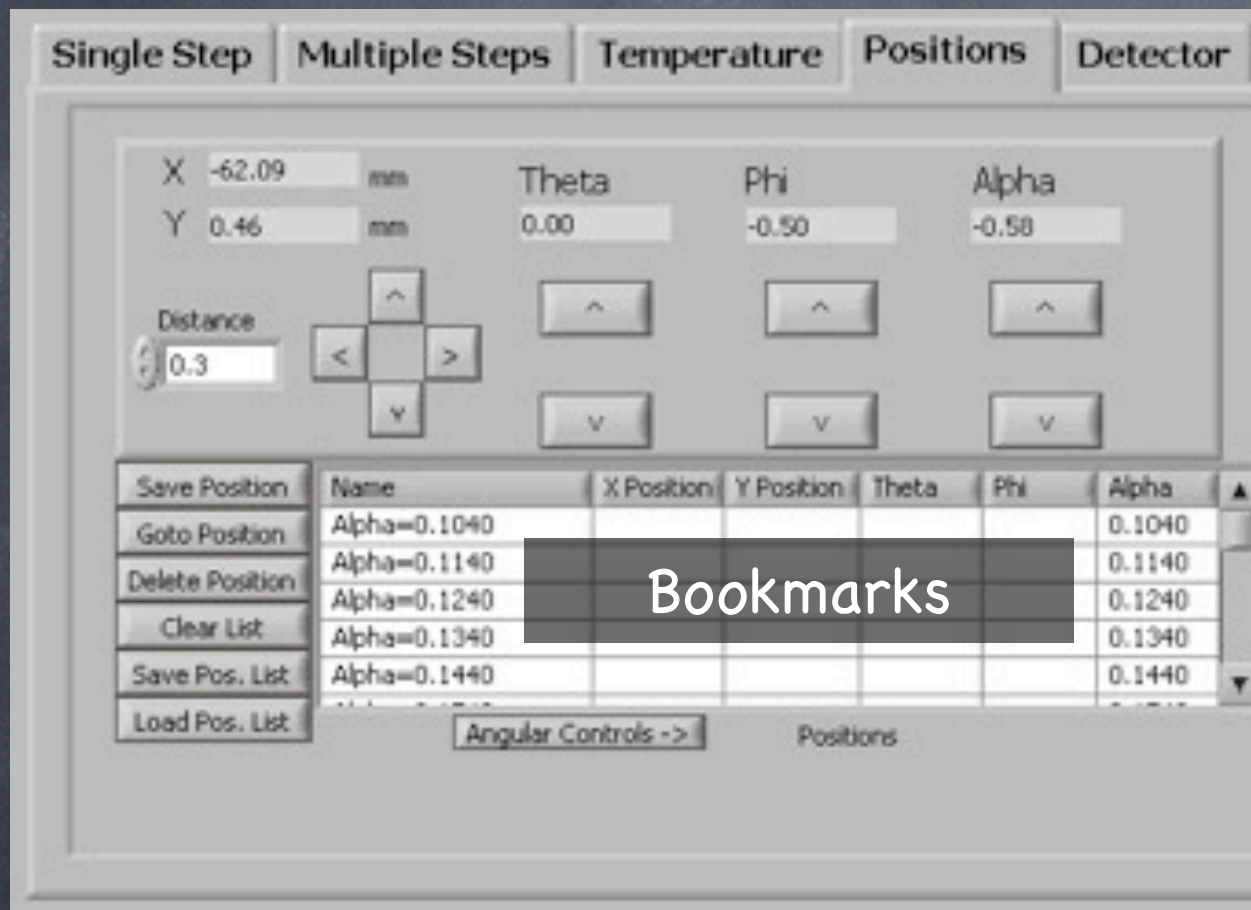
Beamline Software

Motor control

Motor control is done through bookmarks

Bookmarks can be a location of any combination of Motors (x, y, theta, phi, alpha)

They can be created directly from the "positions tab"



Beamline Software

Motor control

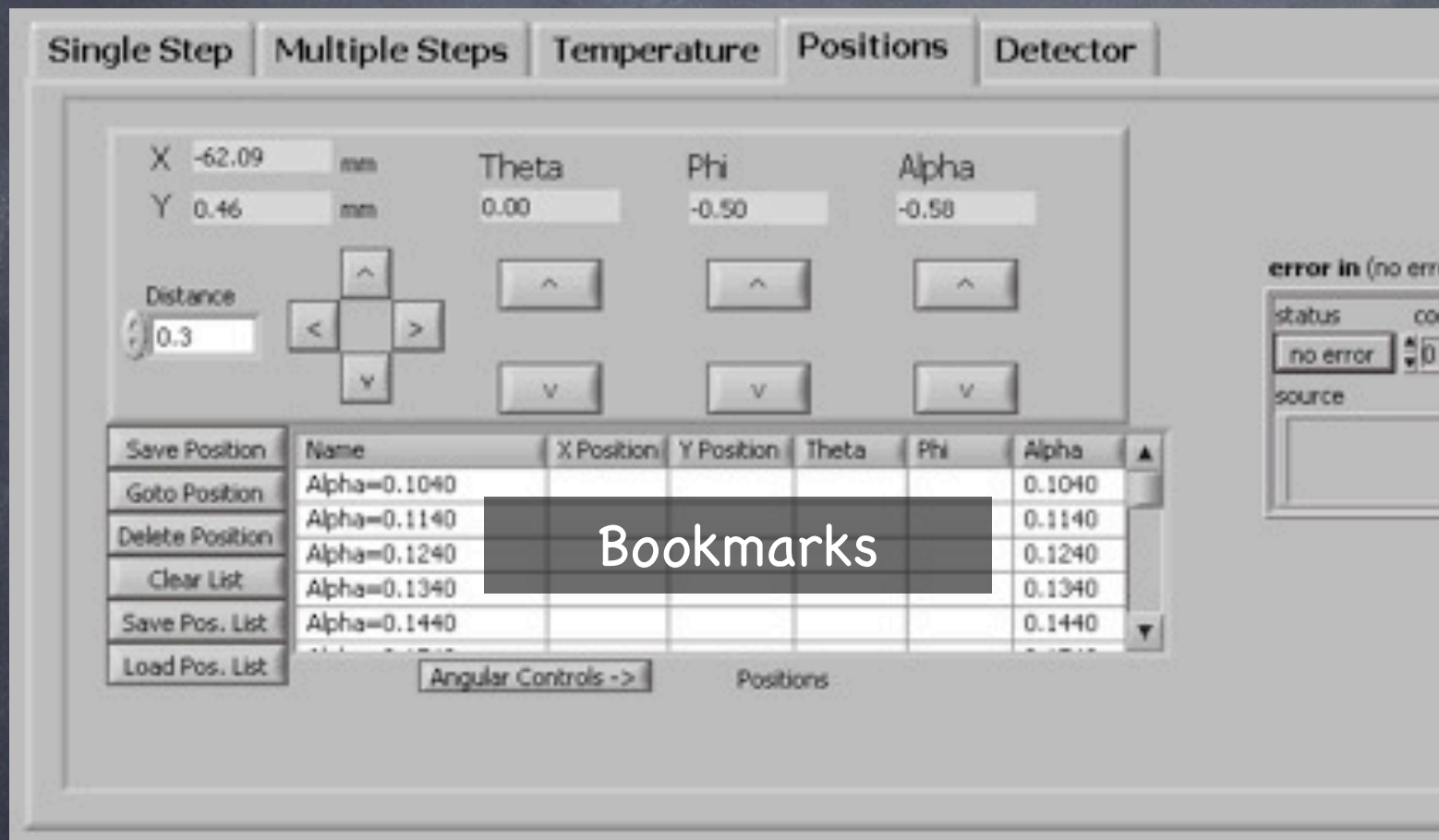
Motor control is done through bookmarks

Bookmarks can be a location of any combination of Motors (x, y, theta, phi, alpha)

They can be created directly from the "positions tab"

or

by bookmarking a cursor location in a sample scan



Beamline Software

Motor control

Motor control is done through bookmarks

Bookmarks can be a location of any combination of Motors (x, y, theta, phi, alpha)

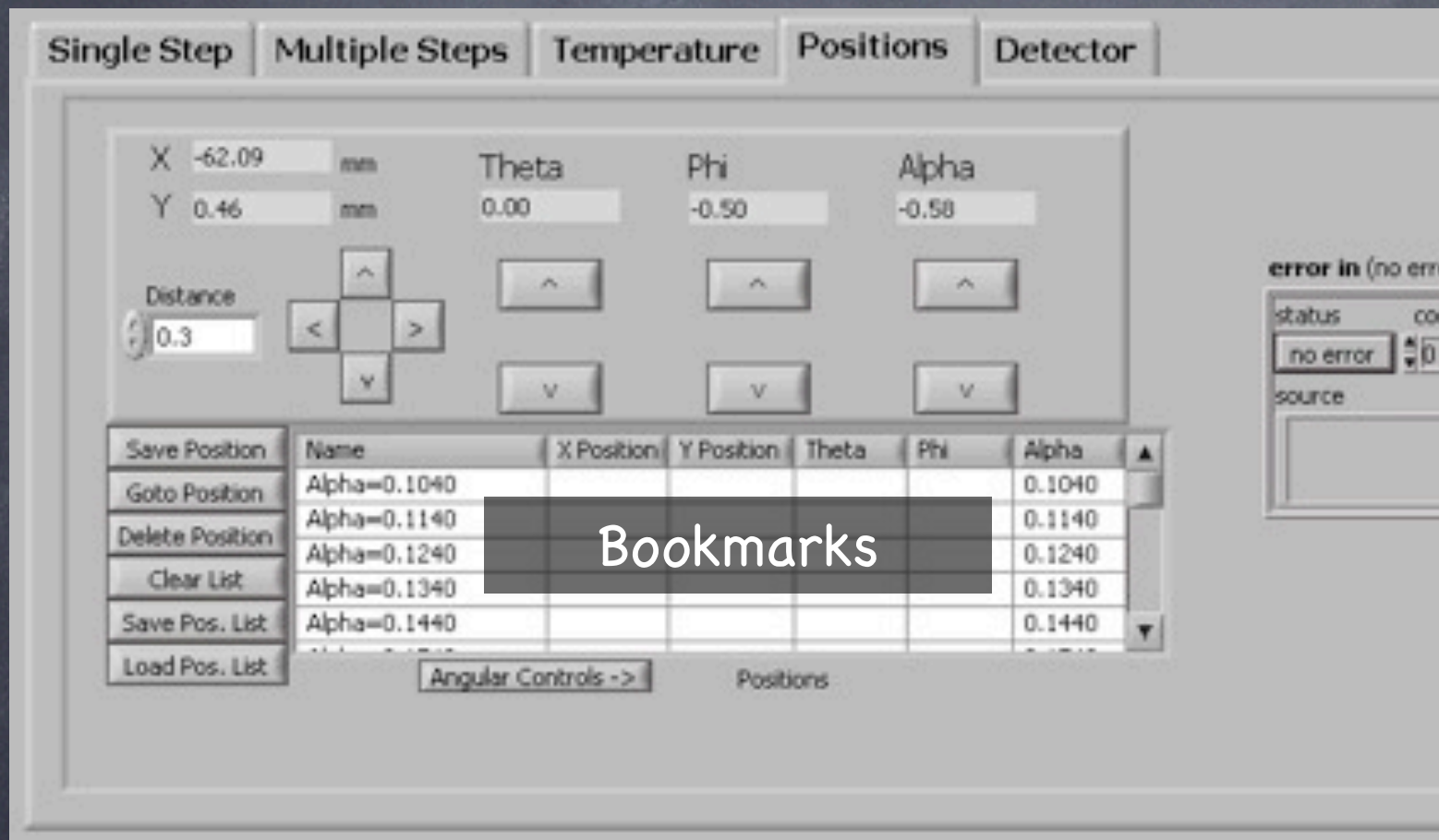
They can be created directly from the "positions tab"

or

by bookmarking a cursor location in a sample scan

or

automatically through "multiple steps" tab



Bookmarks

Beamline Software

Single Step Multiple Steps Temperature Positions Detector

Step Settings

Variable to Change	Start	Step	End	#Steps
Alpha	-0.666	0.01	-0.536	13

Use List? ☐ None
List will override step settings

Primary direction

Variable to Change	Start primary	Step primary	End primary
Phi	0	0.5	30

Wait time after change Use List? ☐ None

2 Dimensions?

Timing for each step (sec)

Wait time Before Images	Wait time after Images
<input type="text" value="0"/>	<input type="text" value="0"/>

Image Settings at each step

Exposure time (sec)	Image Directory	Using Detector
<input type="text" value="60"/>	Y:\userdata\Moon	<input type="text" value="SAKS"/>

Number of images Image Root name PS17S3wrRH98T2S4tr

Beamline Software

Multiple steps, (Queue Builder)

The screenshot shows the 'Multiple Steps' tab of the Beamline Software Queue Builder. The interface is divided into several sections for configuring a sequence of steps.

Step Settings: This section allows defining a range of steps. It includes a 'Variable to Change' dropdown set to 'Alpha', a 'Start' value of -0.666, a 'Step' value of 0.01, an 'End' value of -0.536, and a '#Steps' value of 13. There is also a 'Use List?' dropdown set to 'None' with a note: 'List will override step settings'.

Primary direction: This section defines the primary direction for the steps. It includes a 'Variable to Change' dropdown set to 'Phi', a 'Start primary' value of 0, a 'Step primary' value of 0.5, and an 'End primary' value of 30. There is also a 'Wait time after change' dropdown set to 0 and a 'Use List?' dropdown set to 'None'. A '2 Dimensions?' checkbox is checked.

Timing for each step (sec): This section allows setting wait times. It includes a 'Wait time Before Images' dropdown set to 0 and a 'Wait time after Images' dropdown set to 0.

Image Settings at each step: This section allows setting image parameters. It includes an 'Exposure time (sec)' dropdown set to 60, an 'Image Directory' text field with the path 'Y:\userdata\Moon', a 'Number of Images' dropdown set to 1, an 'Image Root name' text field with the value 'PS17S3wrRH98T2S4tr', and a 'Using Detector' dropdown set to 'SAXS'. A 'Build and add to Queue' button is located to the right of these settings.

Beamline Software

Multiple steps, (Queue Builder)

Dimensions : 1 or 2 dimensions

Pick Dimension



Single Step Multiple Steps Temperature Positions Detector

Step Settings

Variable to Change	Start	Step	End	#Steps
Alpha	-0.666	0.01	-0.536	13

Use List? ☐ None
List will override step settings

Primary dimension

Variable to Change	Start primary	Step primary	End primary
Phi	0	0.5	30

Wait time after change: 0
Use List? ☐ None

2 Dimensions? ☐ On

Timing for each step (sec)

Wait time Before Images	Wait time after Images
0	0

Image Settings at each step

Exposure time (sec)	Image Directory	Using Detector
60	Y:\userdata\Moon	SAXS

Number of Images: 1
Image Root name: PS17S3wrRH98T2S4hr

Build and add to Queue

Beamline Software

Multiple steps, (Queue Builder)

Pick List Option

Pick Dimension

Dimensions : 1 or 2 dimensions

For each dimension, the List option determines how the program will build the queue. The Options are:

The screenshot shows the 'Multiple Steps' tab of the Beamline Software Queue Builder. The interface is divided into several sections:

- Step Settings:** Includes fields for 'Variable to Change' (Alpha), 'Start' (-0.666), 'Step' (0.01), 'End' (-0.536), and '#Steps' (13). There is a 'Use List?' dropdown set to 'None' with a note 'List will override step settings'.
- Primary dimension:** Includes fields for 'Variable to Change' (Phi), 'Start primary' (0), 'Step primary' (0.5), and 'End primary' (30). It also has a 'Use List?' dropdown set to 'None'.
- 2 Dimensions?:** A button labeled 'ON'.
- Timing for each step (sec):** Includes 'Wait time Before Images' and 'Wait time after Images', both set to 0.
- Image Settings at each step:** Includes 'Exposure time (sec)' (60), 'Image Directory' (Y:\userdata\Moon), 'Image Root name' (PS17S3wrRH98T2S4tr), and 'Using Detector' (SAXS).
- Buttons:** A 'Build and add to Queue' button is located at the bottom right.

Two white arrows point from text boxes above to the 'Use List?' dropdowns in the 'Step Settings' and 'Primary dimension' sections.

Beamline Software

Multiple steps, (Queue Builder)

Dimensions : 1 or 2 dimensions

For each dimension, the List option determines how the program will build the queue. The Options are:

- Motor List : Use the list of Bookmarked motor Locations from positions tab

Pick List Option

Pick Dimension

The screenshot shows the 'Multiple Steps' configuration window. It includes fields for 'Variable to Change' (Alpha), 'Start' (-0.666), 'Step' (0.01), 'End' (-0.536), and '#Steps' (13). The 'Use List?' dropdown is set to 'None'. The 'Primary dimension' section has 'Variable to Change' (Phi), 'Start primary' (0), 'Step primary' (0.5), 'End primary' (30), and 'Use List?' set to 'None'. The '2 Dimensions?' checkbox is checked. The 'Timing for each step (sec)' section has 'Wait time Before Images' and 'Wait time after Images' both set to 0. The 'Image Settings at each step' section has 'Exposure time (sec)' (60), 'Image Directory' (Y:\userdata\Moon), 'Image Root name' (PS17S3wrRH98T2S4tr), and 'Using Detector' (SAXS). A 'Build and add to Queue' button is at the bottom right.

Beamline Software

Multiple steps, (Queue Builder)

Pick List Option

Pick Dimension

Dimensions : 1 or 2 dimensions

For each dimension, the List option determines how the program will build the queue. The Options are:

- Motor List : Use the list of Bookmarked motor Locations from positions tab
- Temperature List : Prompts for a file which contains columns of Temperature, rate to ramp, and wait time at that temperature, all separated by tabs

Single Step Multiple Steps Temperature Position Detector

Step Settings

Variable to Change: Alpha Start: -0.666 Step: 0.01 End: -0.536 #Steps: 13

Use List? None List will override step settings

Primary dimension

Variable to Change: Phi Start primary: 0 Step primary: 0.5 End primary: 30

Wait time after change: 0 Use List? None

2 Dimensions? ☒ ON

Timing for each step (sec)

Wait time Before Images: 0 Wait time after Images: 0

Image Settings at each step

Exposure time (sec): 60 Image Directory: Y:\userdata\Moon

Number of Images: 1 Image Root name: PS17S3wR4H98T2S4hr

Using Detector: SANS

Build and add to Queue

Beamline Software

Multiple steps, (Queue Builder)

Pick List Option

Pick Dimension

Single Step Multiple Steps Temperature Position Detector

Step Settings

Variable to Change: Alpha Start: -0.666 Step: 0.01 End: -0.536 #Steps: 13

Use List? None List will override step settings

Primary dimension

Variable to Change: Phi Start primary: 0 Step primary: 0.5 End primary: 30

Wait time after change: 0 Use List? None

2 Dimensions? ON

Timing for each step (sec)

Wait time Before Images: 0 Wait time after Images: 0

Image Settings at each step

Exposure time (sec): 60 Image Directory: Y:\userdata\Moon

Number of Images: 1 Image Root name: PS17S3wR4H98T2S4hr

Using Detector: SANS

Build and add to Queue

Dimensions : 1 or 2 dimensions

For each dimension, the List option determines how the program will build the queue. The Options are:

- Motor List : Use the list of Bookmarked motor Locations from positions tab
- Temperature List : Prompts for a file which contains columns of Temperature, rate to ramp, and wait time at that temperature, all separated by tabs
- None : Increment whichever variable from "start" to "stop", moving by "increment" at each step

Beamline Software

Multiple steps, (Queue Builder)

Dimensions : 1 or 2 dimensions

For each dimension, the List option determines how the program will build the queue. The Options are:

- Motor List : Use the list of Bookmarked motor Locations from positions tab
- Temperature List : Prompts for a file which contains columns of Temperature, rate to ramp, and wait time at that temperature, all separated by tabs
- None : Increment whichever variable from "start" to "stop", moving by "increment" at each step

The Image root name will be appended for each step

Pick List Option

Pick Dimension

Click Here to Build your Queue

Single Step Multiple Steps Temperature Position Detector

Step Settings

Variable to Change: Alpha Start: -0.666 Step: 0.01 End: -0.536 #Steps: 13

Use List? None List will override step settings

Primary dimension

Variable to Change: Phi Start primary: 0 Step primary: 0.5 End primary: 30

Wait time after change: 0 Use List? None

2 Dimensions? ON

Timing for each step (sec)

Wait time Before Images: 0 Wait time after Images: 0

Image Settings at each step

Exposure time (sec): 60 Image Directory: Y:\userdata\Moon

Number of Images: 1 Image Root name: PS17S3wrRH98T254tr

Using Detector: SANS

Build and add to Queue

Beamline Software

Beamline Software

Handling Errors

Beamline Software

Handling Errors

Do NOT just continue through an error on a Beamstop test, without repeating the test. This can cause a false negative and allow you to hurt the detectors

Beamline Software

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In any other situation, continuing though an error is fine, although this is an indication that something may be not working correctly, and your data is suspect

Beamline Software

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If an error occurs more than once

Beamline Software

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If an error occurs more than once
during an image

- First restart detector servers (see next slide)

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When moving a motor Make sure

- Motors are enabled

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Beamline Software

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Beamline Software

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- Motor path is not obstructed
- Motors are not at end of travel
- 7.3.3 labview on left-most monitor doesn't have any errors

Beamline Software

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Beamline Software

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When moving a motor Make sure

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- 7.3.3 labview on left-most monitor doesn't have any errors
- Then Call Eliot

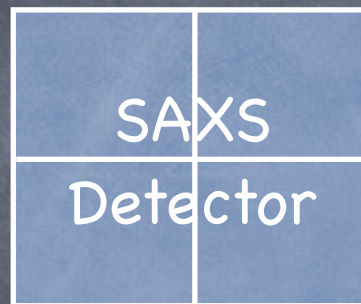
Otherwise for repeated errors, Write them down or leave them open and Call us

Beamline Software

ADSC Detector Schematic

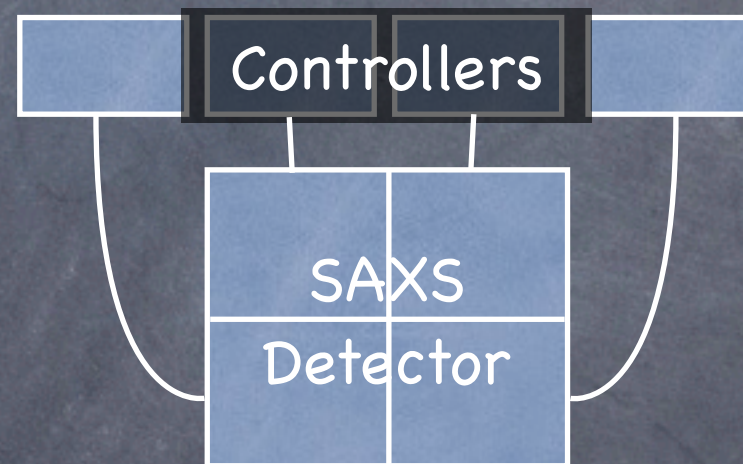
Beamline Software

ADSC Detector Schematic



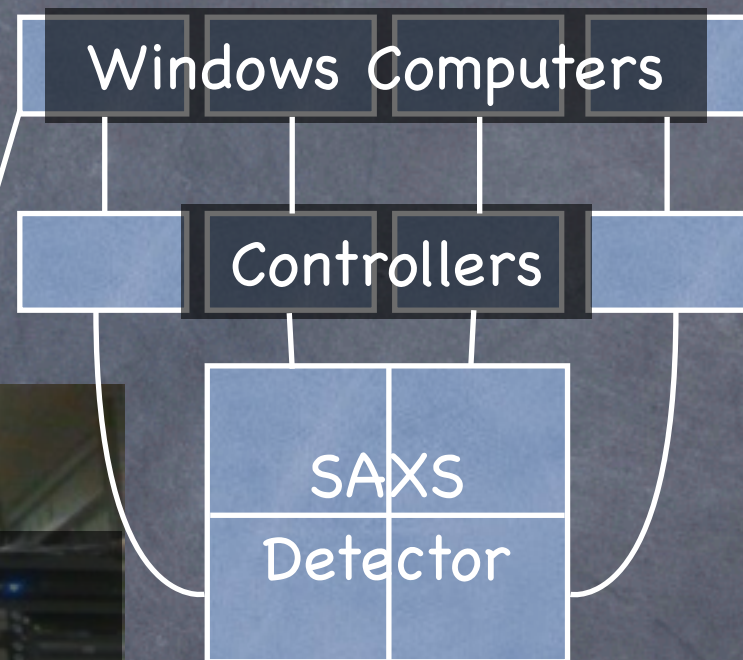
Beamline Software

ADSC Detector Schematic



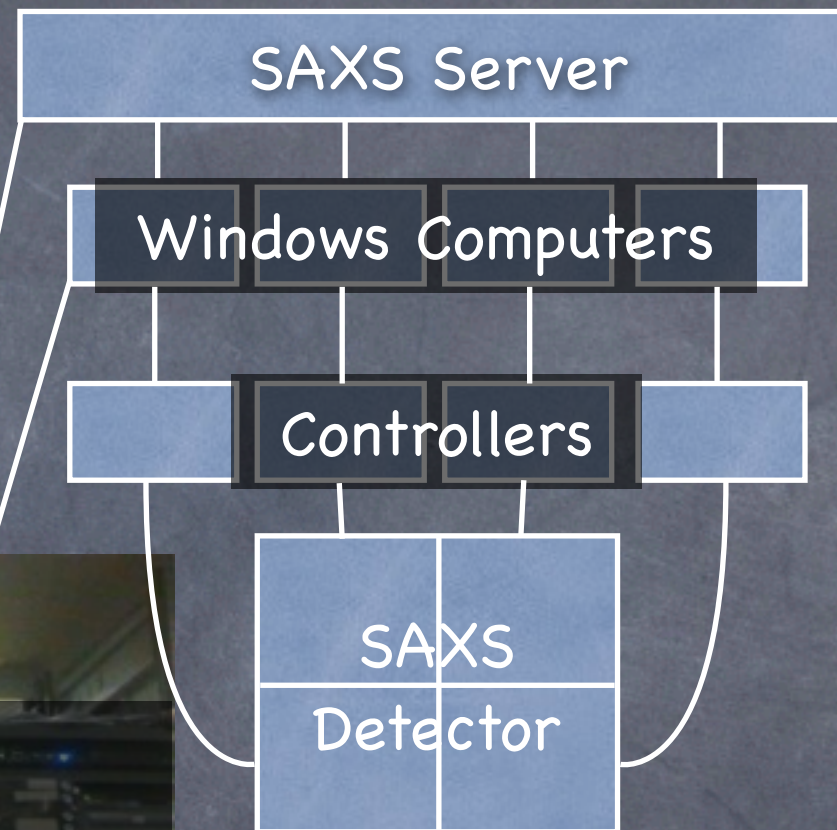
Beamline Software

ADSC Detector Schematic



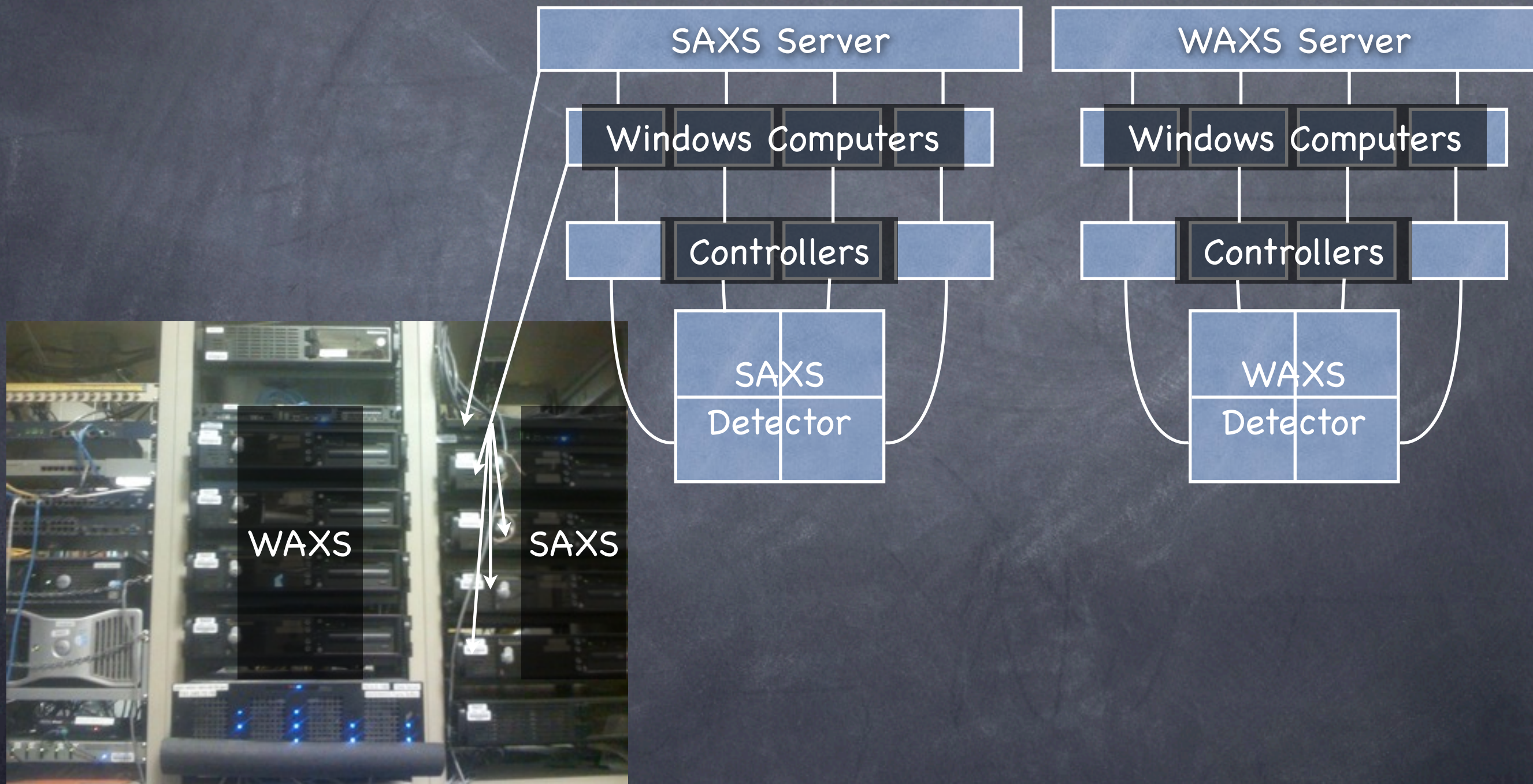
Beamline Software

ADSC Detector Schematic



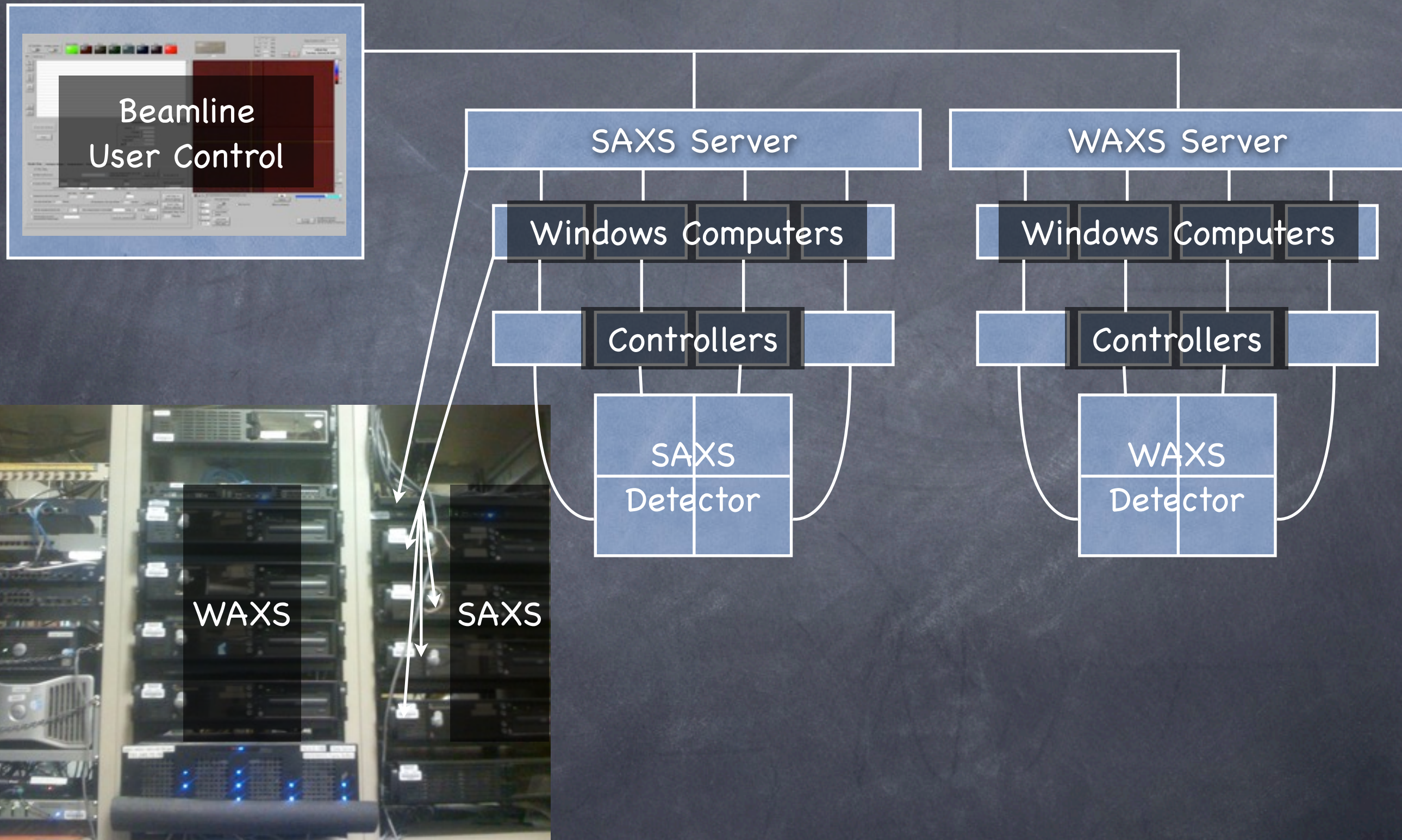
Beamline Software

ADSC Detector Schematic



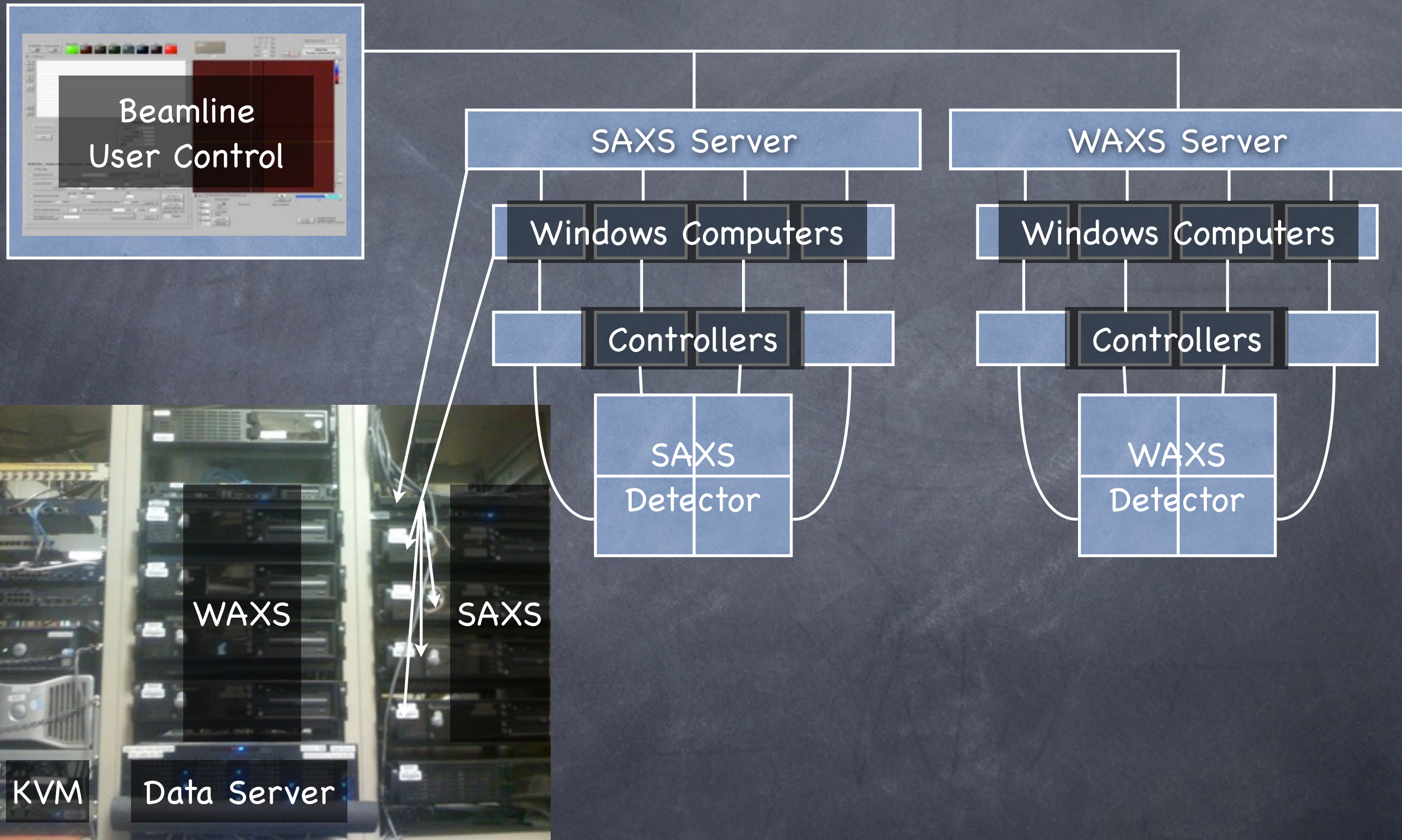
Beamline Software

ADSC Detector Schematic



Beamline Software

ADSC Detector Schematic



Beamline Software



Restarting Detector Servers

When to restart the servers:

- Error occurs when taking an image
- Images are delayed or offset, or acting funny

How to restart the servers:

Change KVM to SAXS and then WAXS

- on each of these computers in the terminal type: "startccd"
- hit enter and wait for all four connections to be accepted

If this doesn't work let us know



Beamline Software



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- Images are delayed or offset, or acting funny

How to restart the servers:

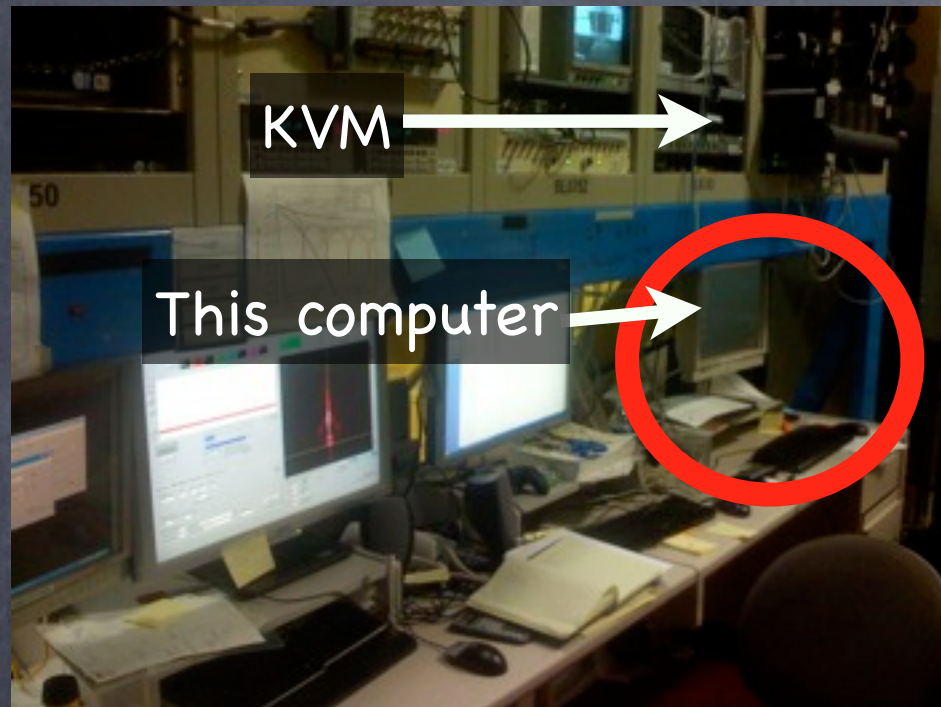
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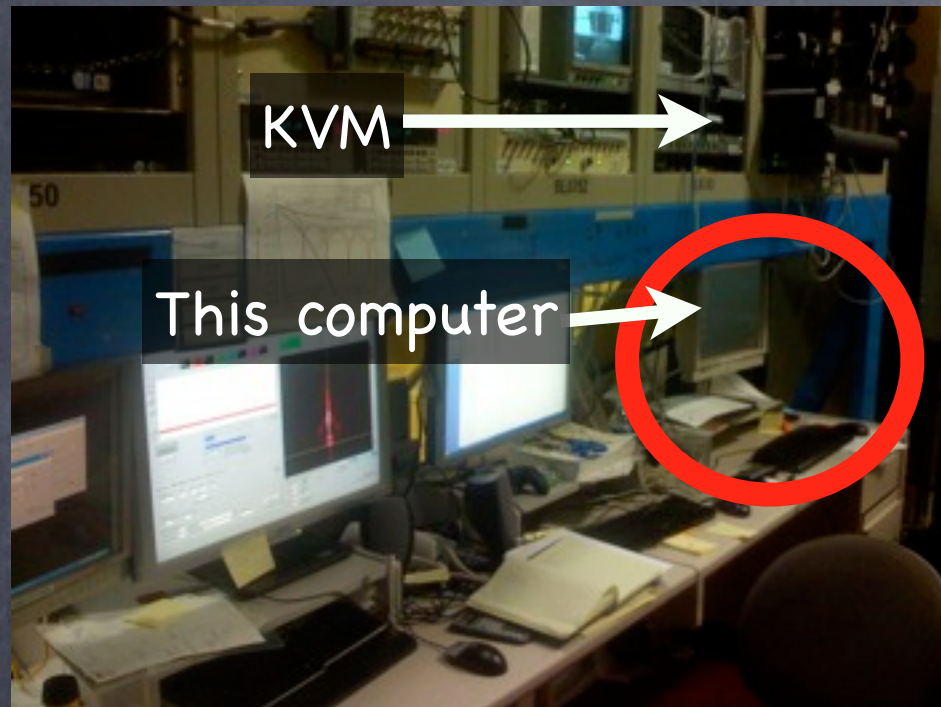
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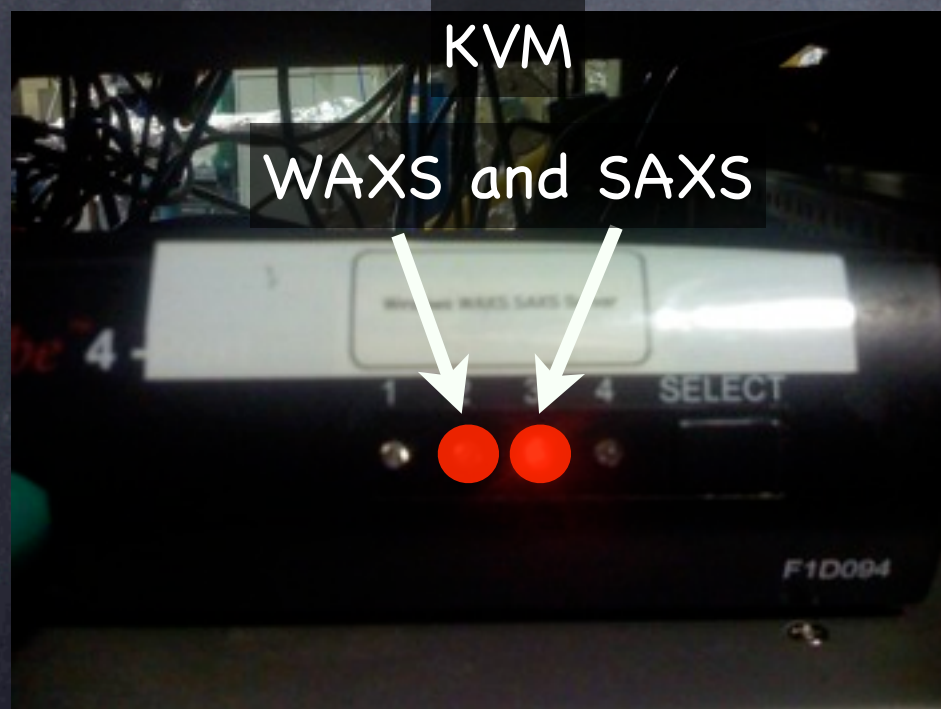
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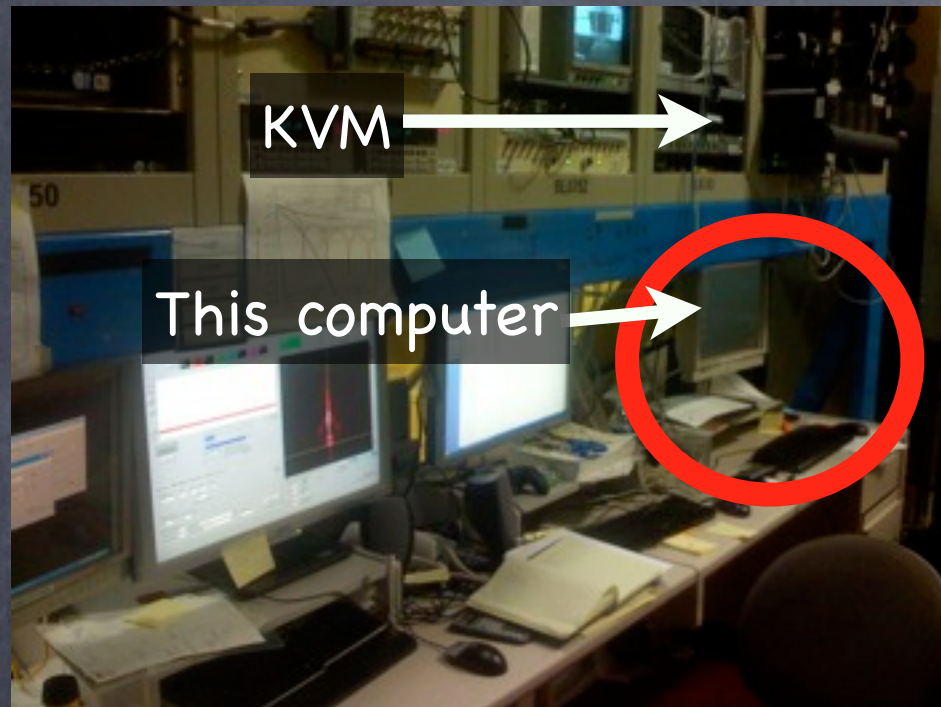
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Beamline Software



Restarting Detector Servers

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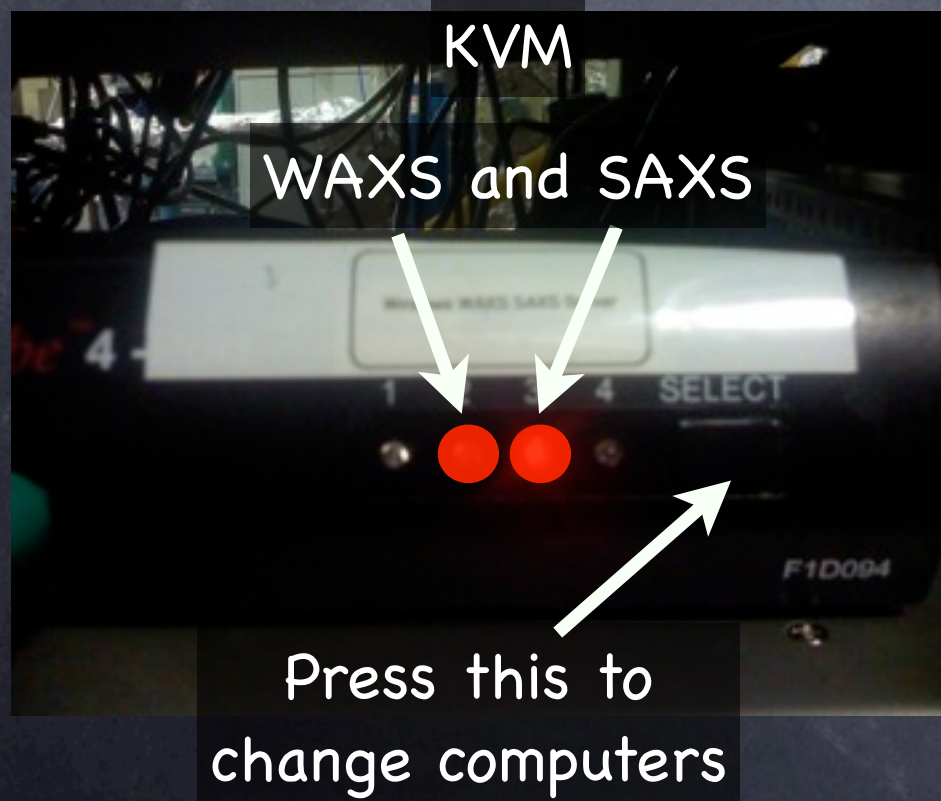
- Error occurs when taking an image
- Images are delayed or offset, or acting funny

How to restart the servers:

Change KVM to SAXS and then WAXS

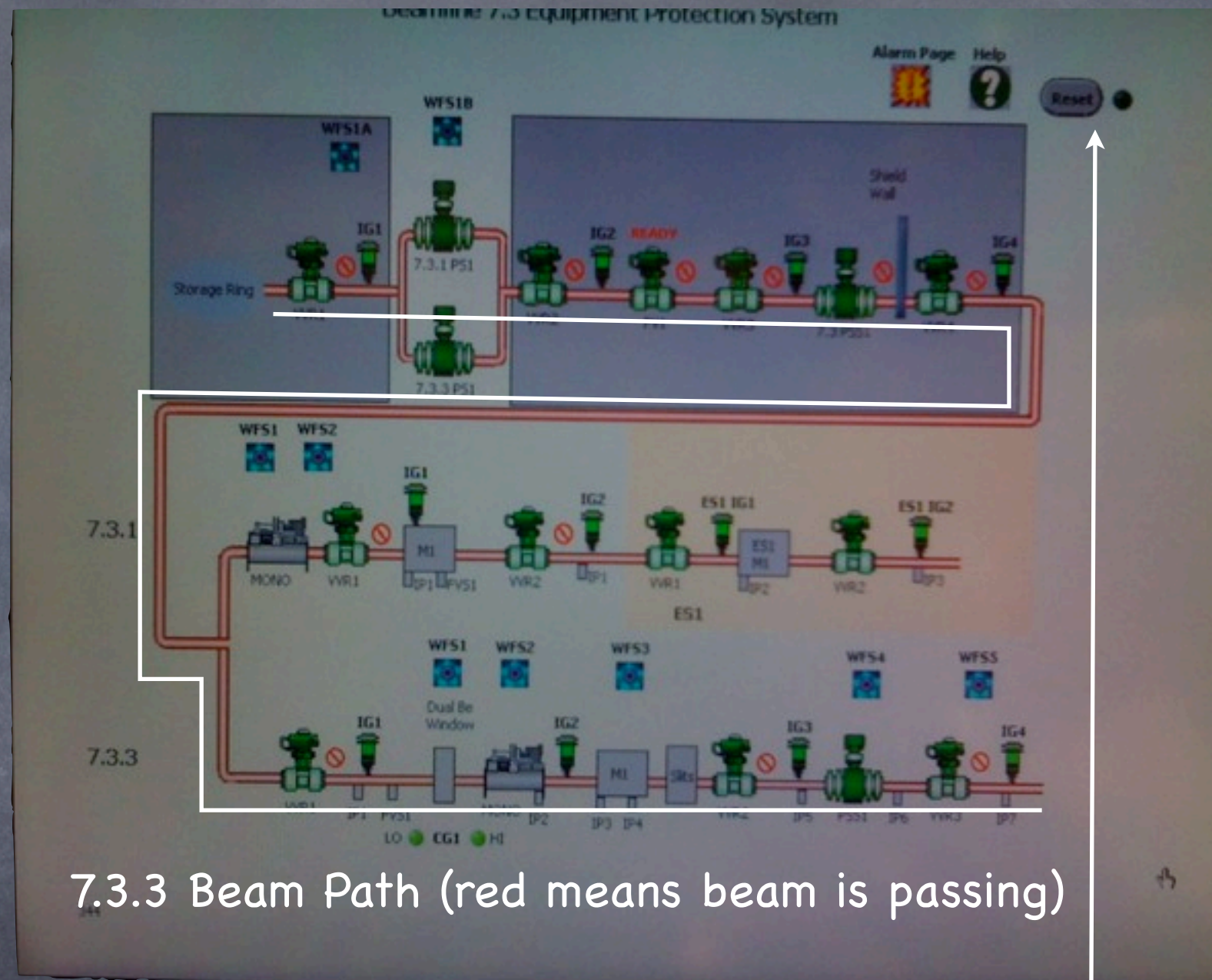
- on each of these computers in the terminal type: "startccd"
- hit enter and wait for all four connections to be accepted

If this doesn't work let us know



EPS Display

- When do we need to use it?
 - When ALS is running, PSS1 is open but no "beam pass" light is lit.
- Anything red or yellow on EPS display needs attention before beam will be available
- Report all errors
- Devices are Valves, Gauges, Pumps, and Water Flow Sensors
- Anything red is not working, ask Alex or Eliot, or beamline operators, or if none are available, the control room. they will put you in contact with the person who can fix the problem

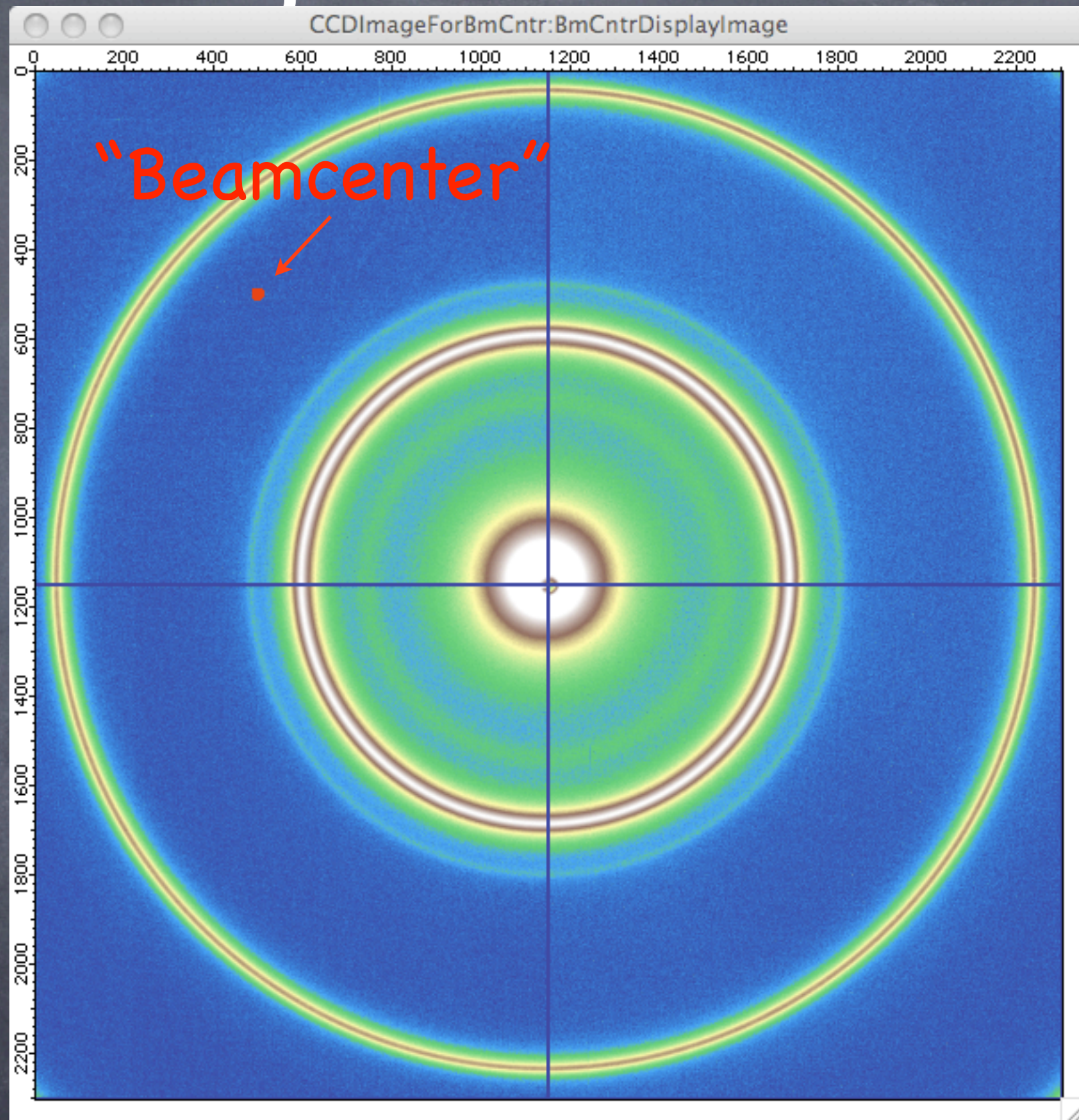
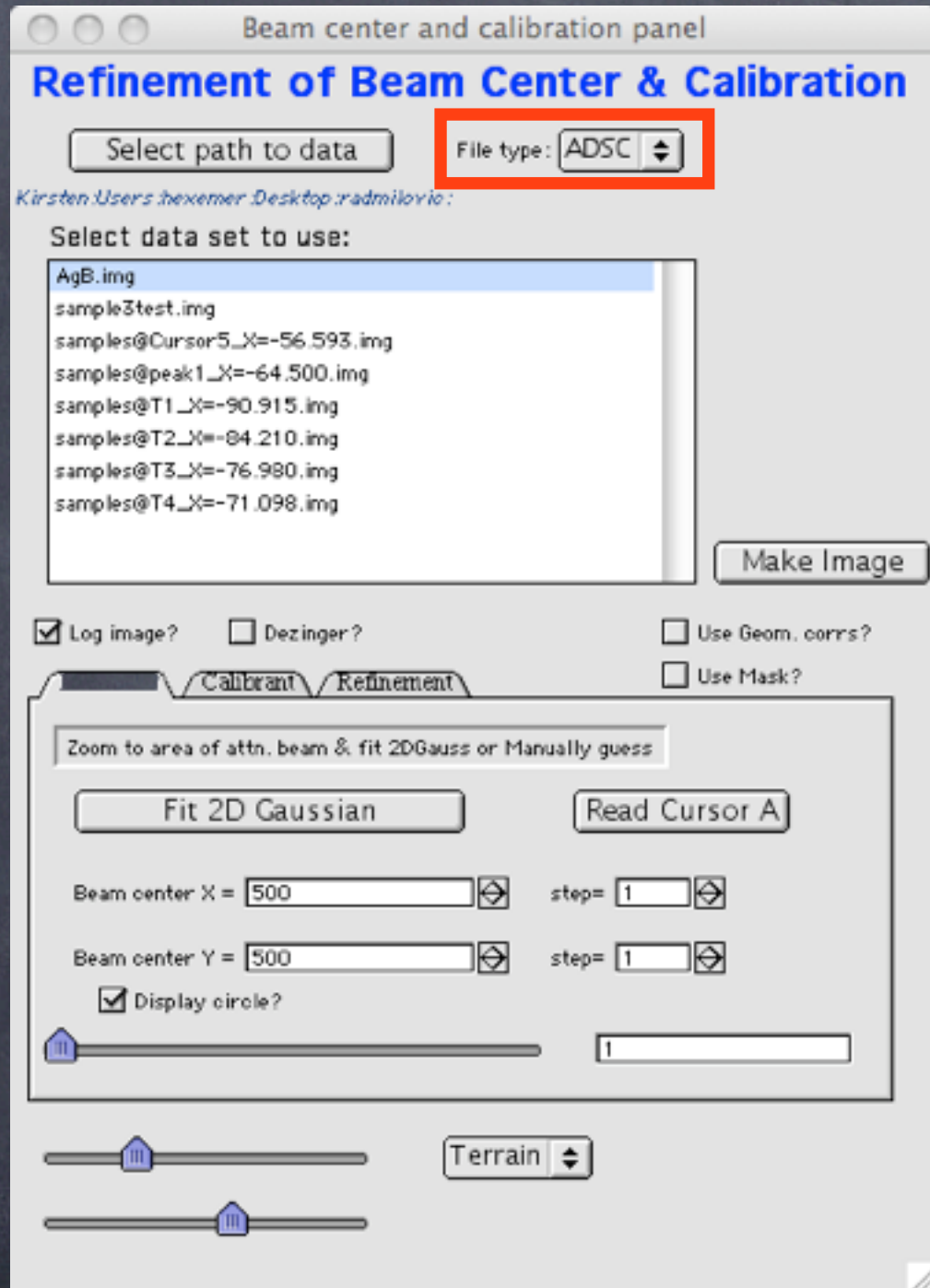


- Yellow Items can be "reset" by pressing reset
 - Still report anytime you need to reset the EPS display

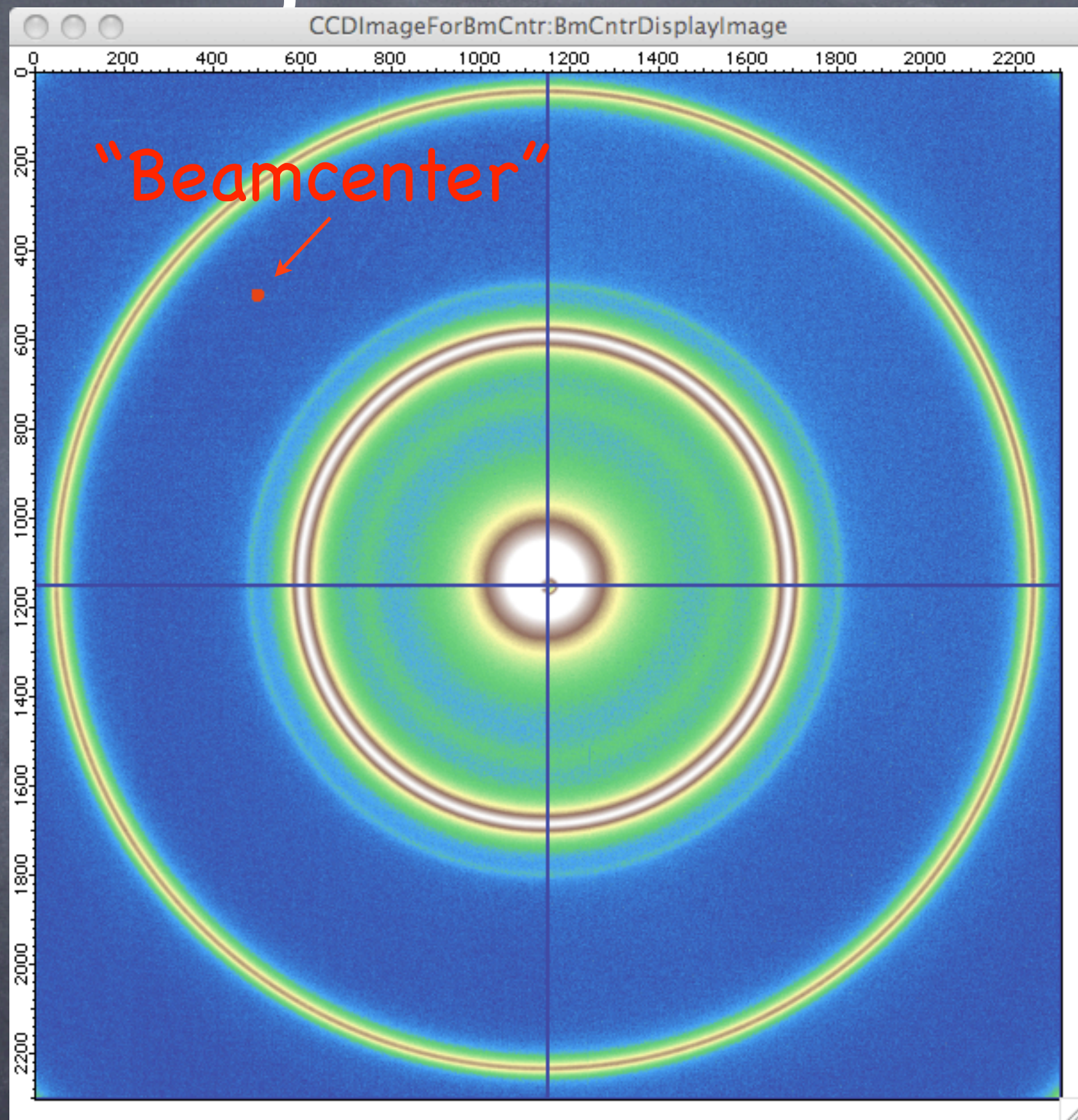
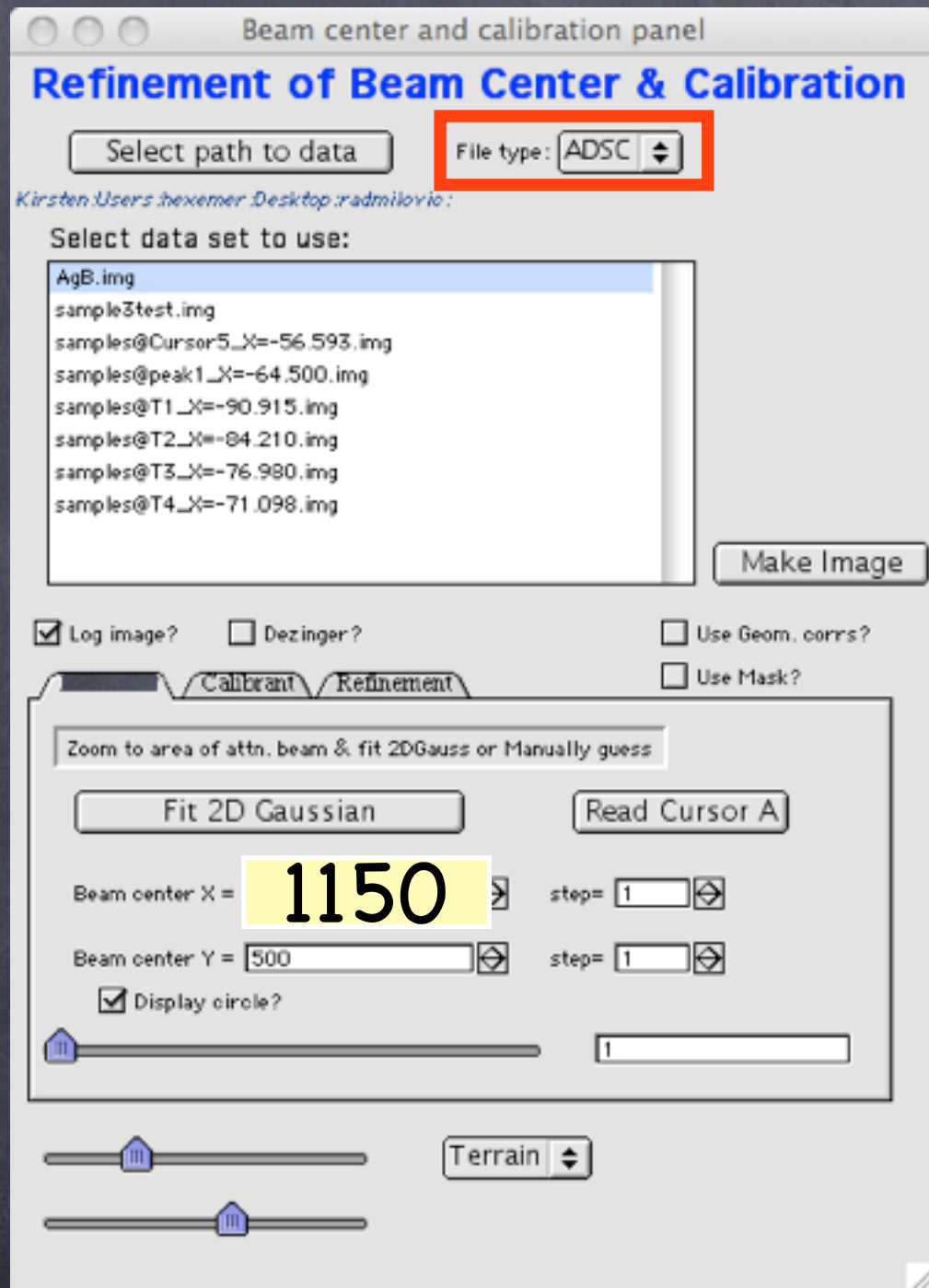
Analysis

- Find direct beam position and sample detector distance
- Sector graphs
- Radial integration
- Line profile and where are they
- Getting your data in Ascii

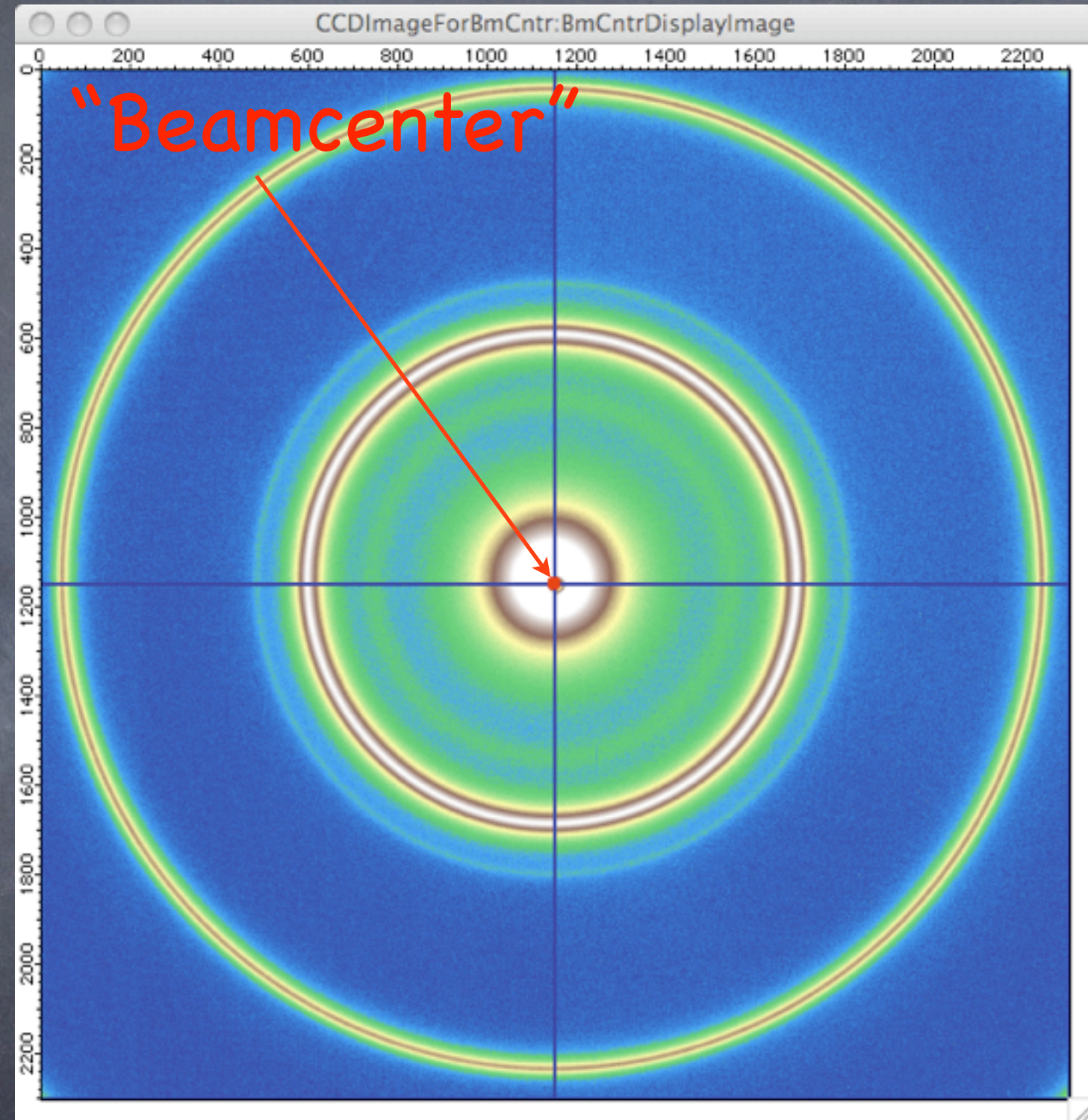
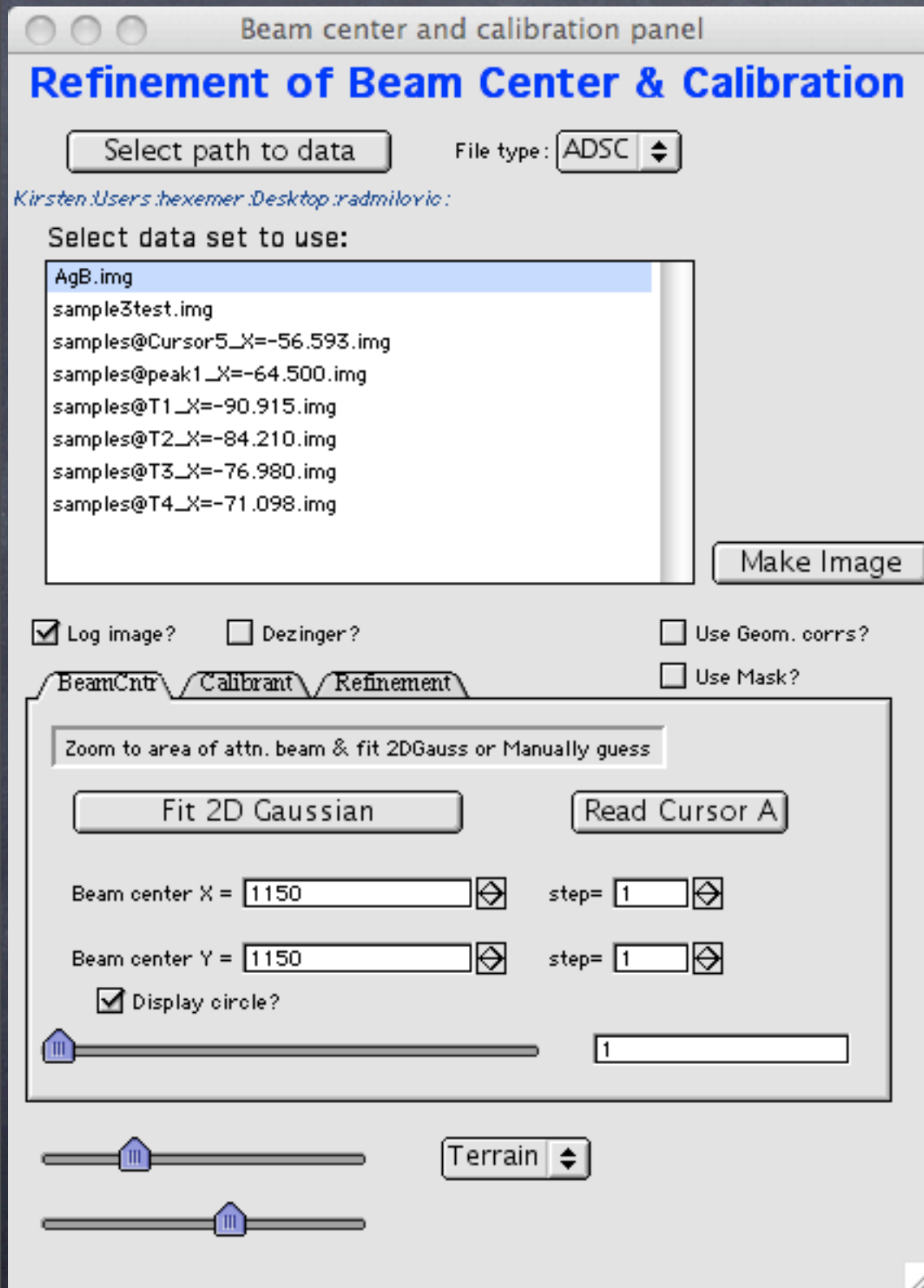
Beam alignment



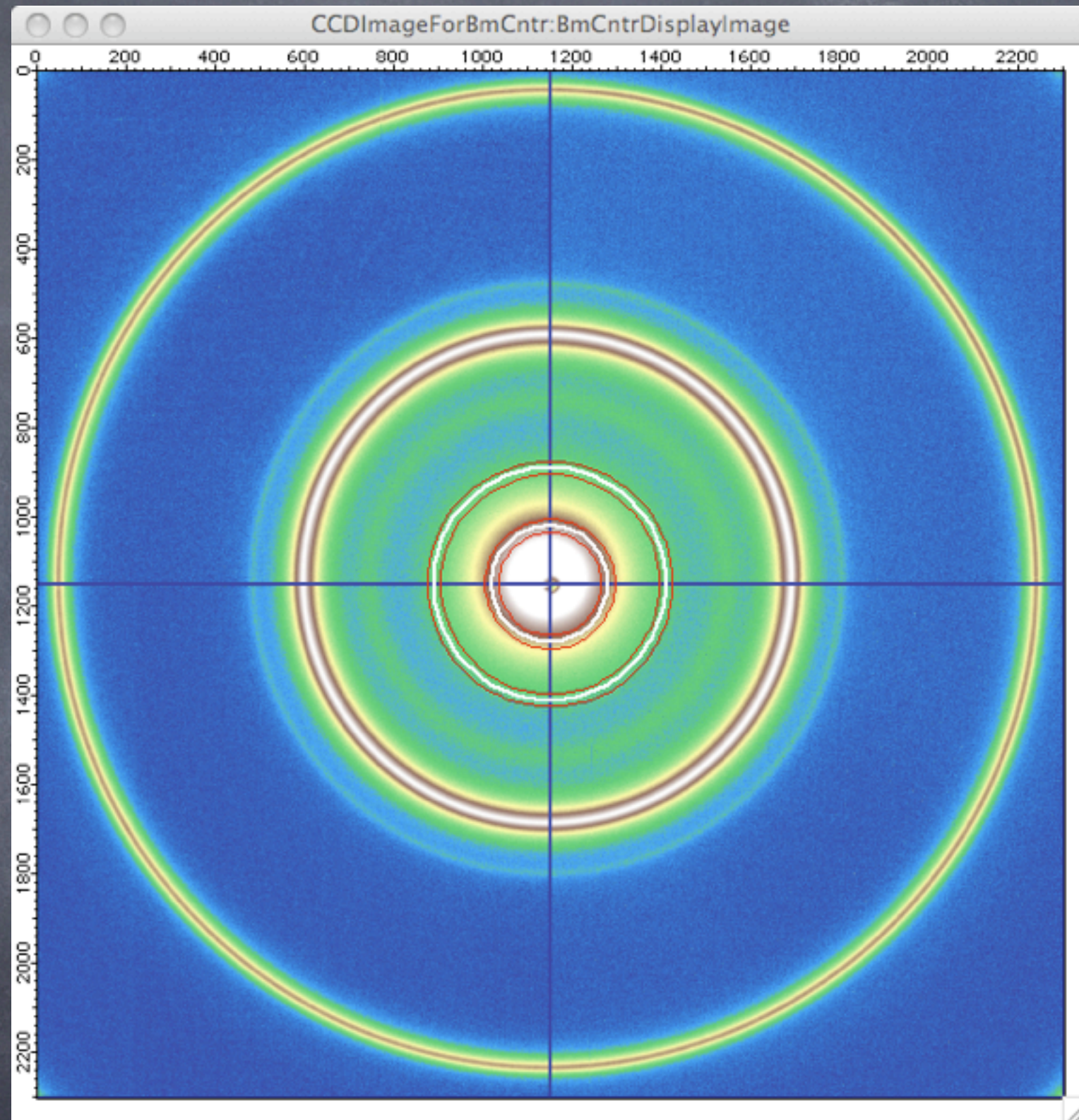
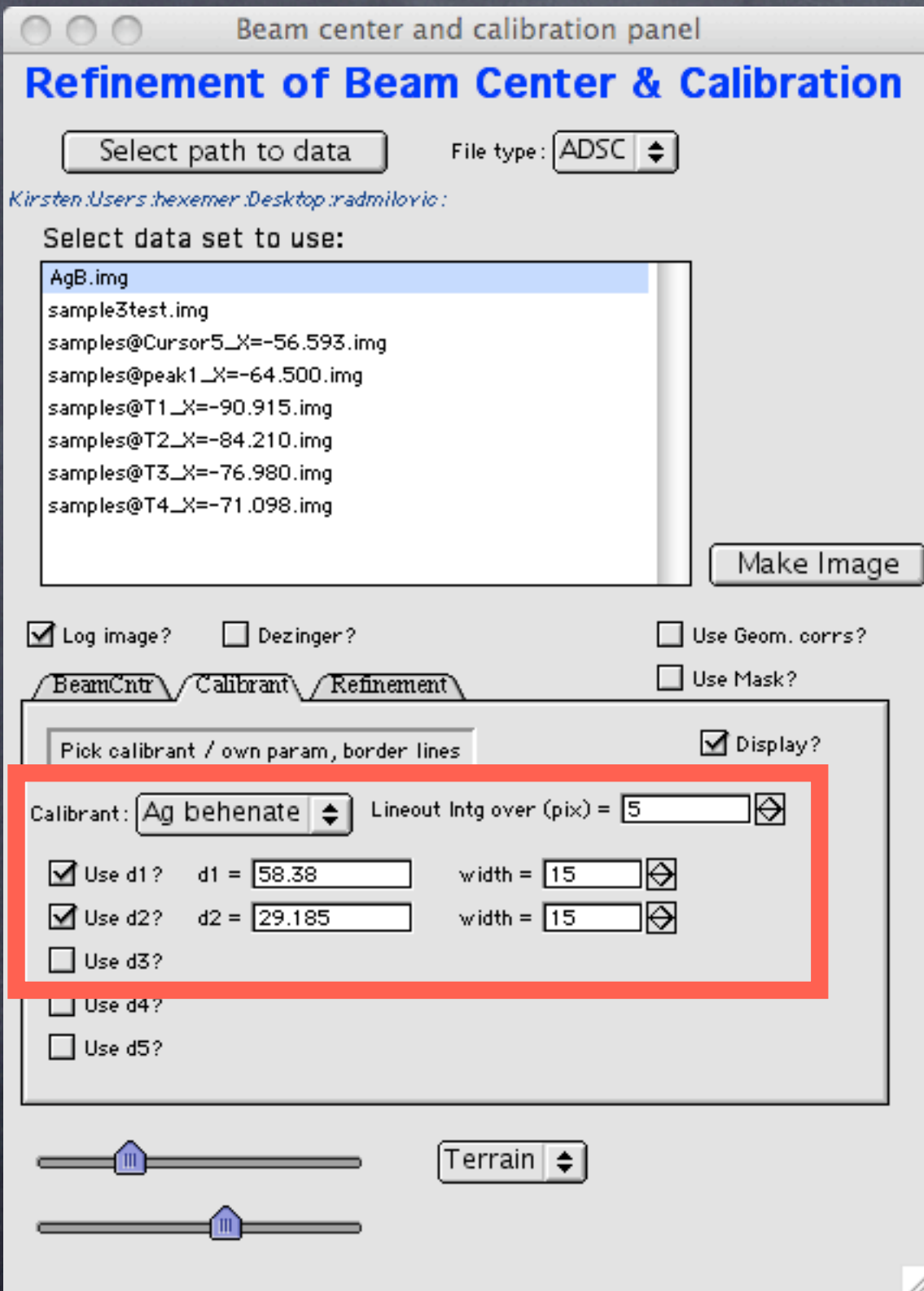
Beam alignment



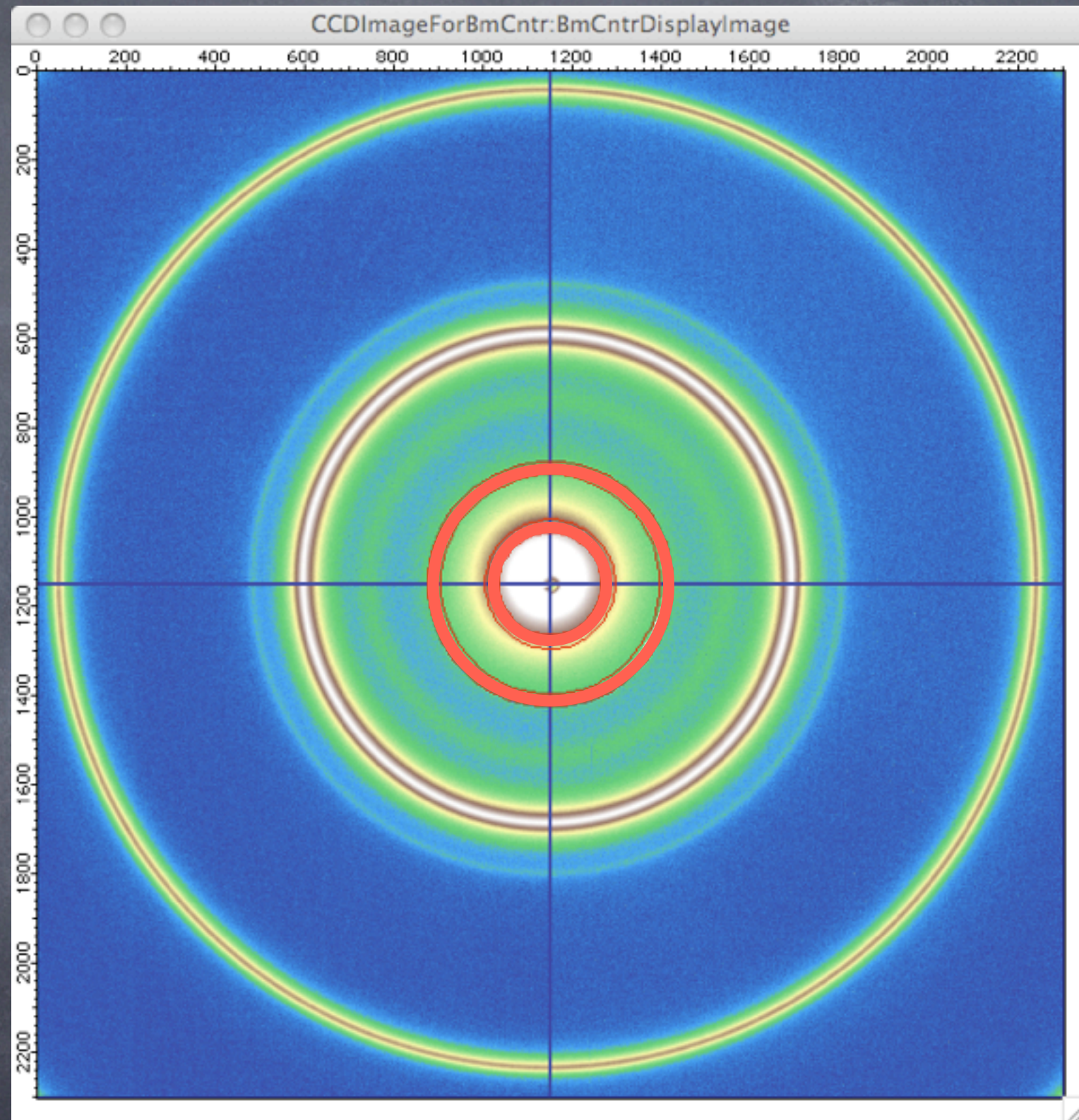
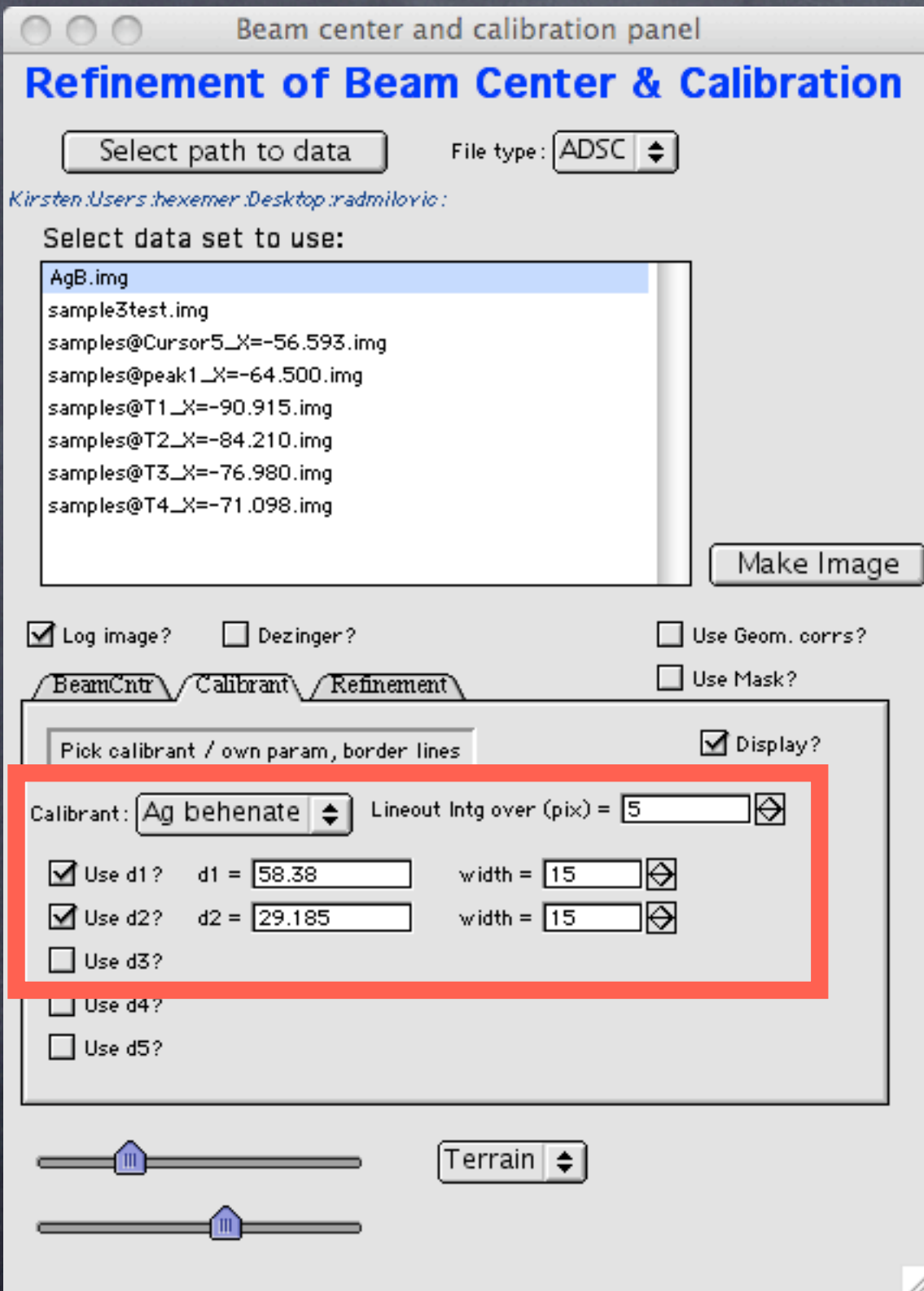
Beam alignment



Beam alignment



Beam alignment



Beam alignment

Beam center and calibration panel

Refinement of Beam Center & Calibration

Select path to data File type: ADSC

Kirsten:Users:hexemer:Desktop:radmilovic:

Select data set to use:

- AgB.img
- sample3test.img
- samples@Cursor5_X=-56.593.img
- samples@peak1_X=-64.500.img
- samples@T1_X=-90.915.img
- samples@T2_X=-84.210.img
- samples@T3_X=-76.980.img
- samples@T4_X=-71.098.img

Make Image

☒ Log image? ☐ Dezinging? ☐ Use Geom. corrs? ☐ Use Mask?

BeamCntr Calibrant Refinement

Select what to refine and run Peak shape function: Gauss

☒ Refine beam center? ☒ Refine Sa-Det distance? ☐ Refine wavelength? ☐ Refine tilts?

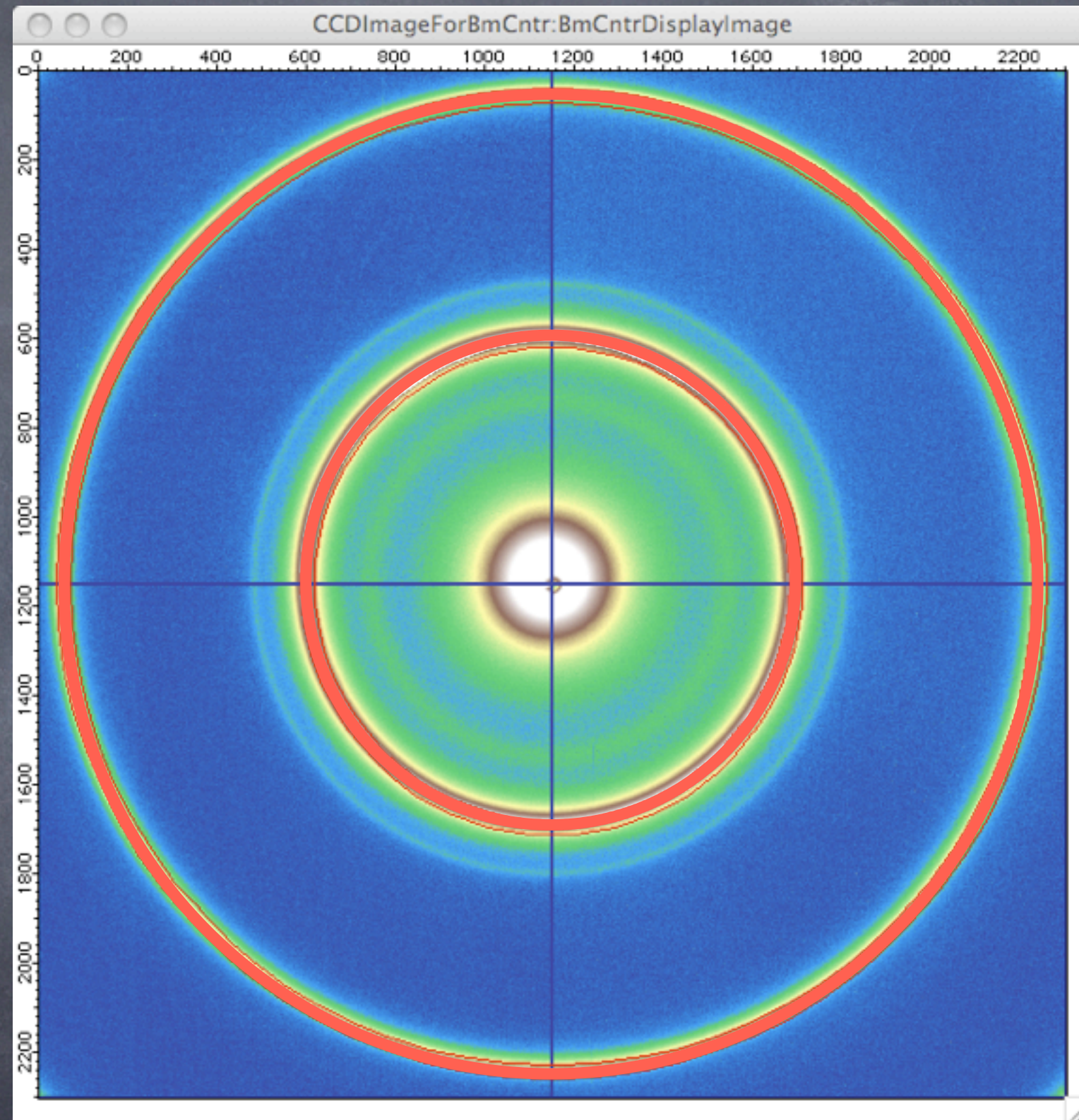
Sa-det distance [mm] 2100 Wavelength [Å] 1.23984 X-ray energy [keV] 10

Horizontal 0 Vertical 0

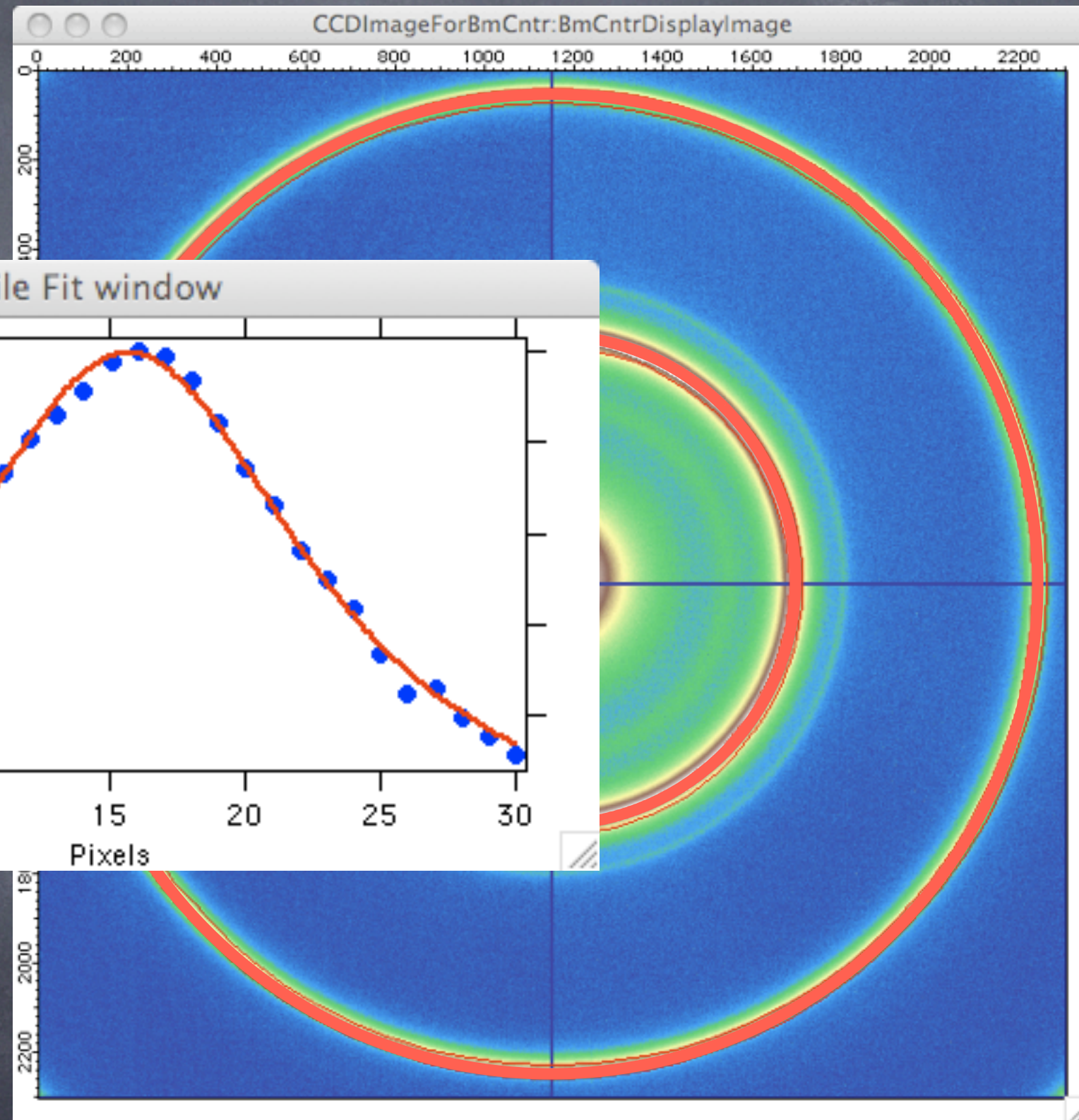
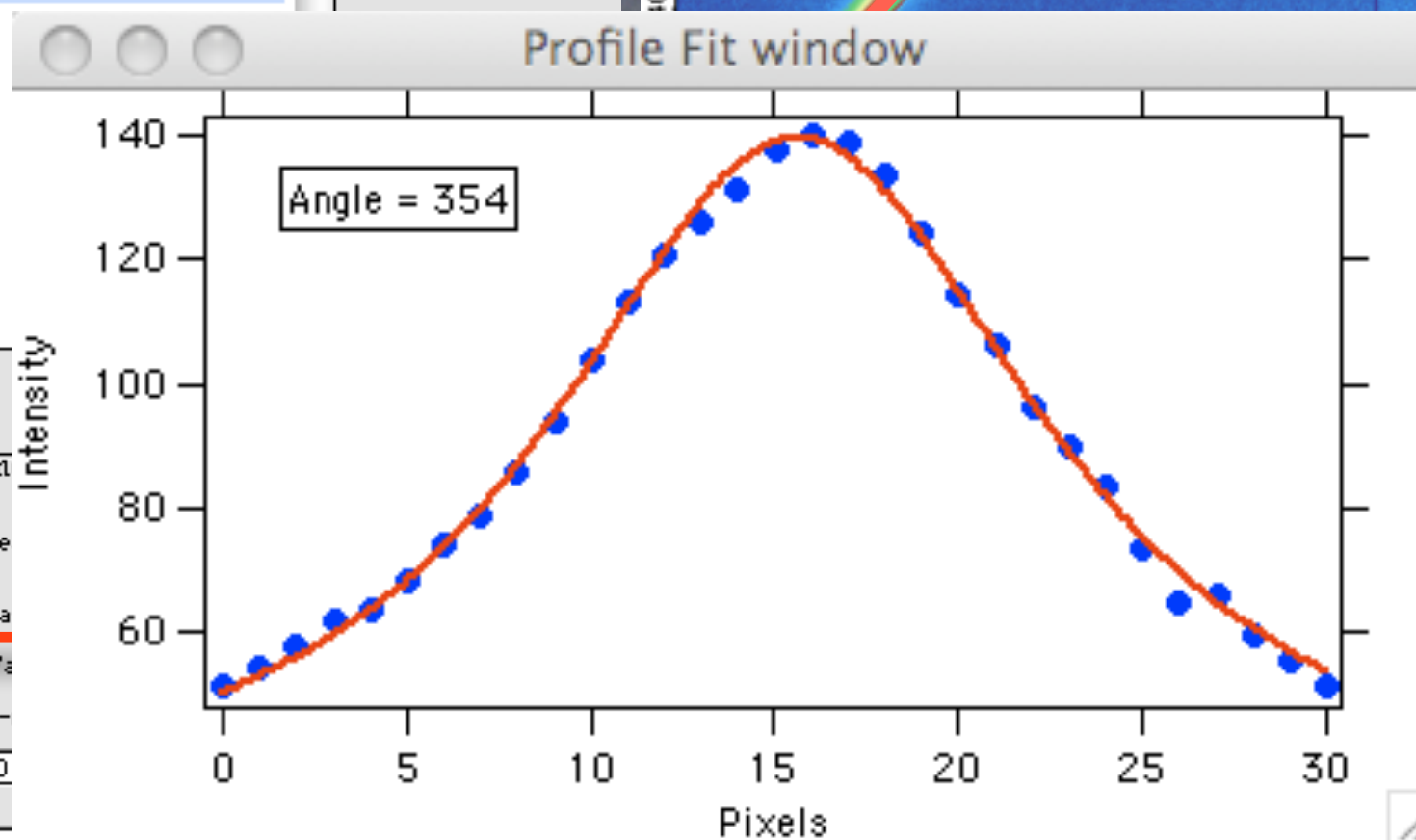
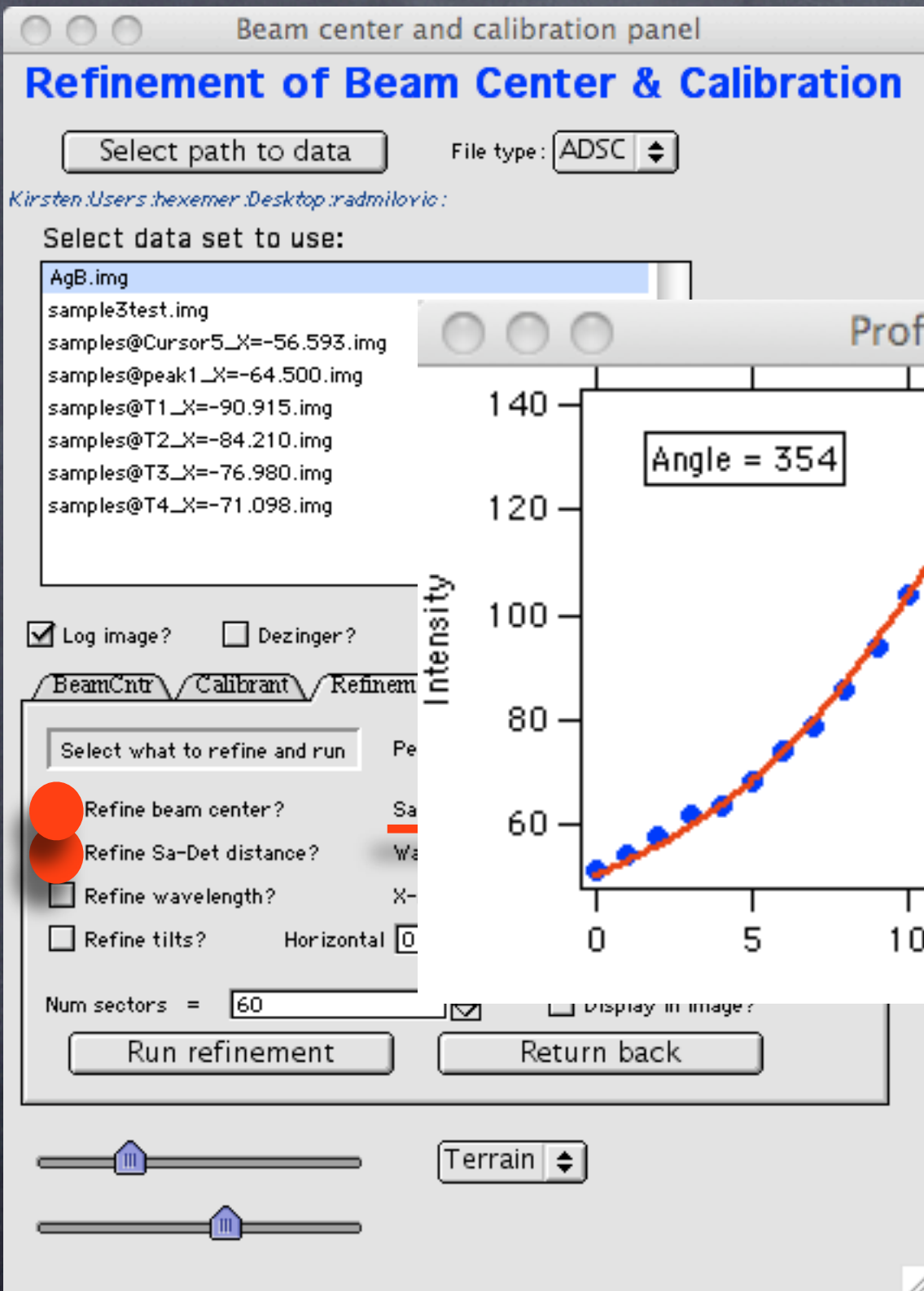
Num sectors = 60 ☐ Display in image?

Run refinement Return back

Terrain



Beam alignment



Main 2D to 1D conversion panel

2D to 1D data conversion panel

Select data path Image type **ADSC**

Kirsten\Users\hexemer\Desktop\radmilovic:

Select input data here ☐ Invert 0, 0 corner?

AgB.img

sample3test.img

samples@Cursor5_X=-56.593.img

samples@peak1_X=-64.500.img

samples@T1_X=-90.915.img

samples@T2_X=-84.210.img

samples@T3_X=-76.980.img

samples@T4_X=-71.098.img

Refresh

Save/Load Config

Export image

Store image

Start --- End ---

Select contiguous range:

Calibration Mask Processing LUT method Sector graph

Sample to CCD distance [mm] 2103.03

Wavelength [Å] 1.23984 X-ray energy [keV] 10

Direction X (horizontal)

CCD pixel size [mm] 0.0816

Beam center 1145.17

Horizontal Tilt 0

Y (vertical)

CCD pixel size [mm] 0.0816

Beam center 1139.28

Vertical Tilt 0

☐ Use sample thickness (St)?

☐ Use sample transmission (T)?

☐ Use sample Correction factor (C)?

☐ Use Monitor (IO)?

☐ Use Dark field (DF2D)?

☐ Use Empty field (EF2D)?

☐ Use pixel sensitivity (Pix2D)?

☐ Subtract constant from data (Ofst)?

☐ Use IO/IOref for empty field?

☐ Use sample measurement time (ts)?

☐ Use empty measurement time (te)?

☐ Use dark field measurement time (td)?

1*((Sa2D))

Ave & Display sel. file(s)

Ave & Convert N files N = 1

Convert sel. files 1 at time ☐ Skip bad files?

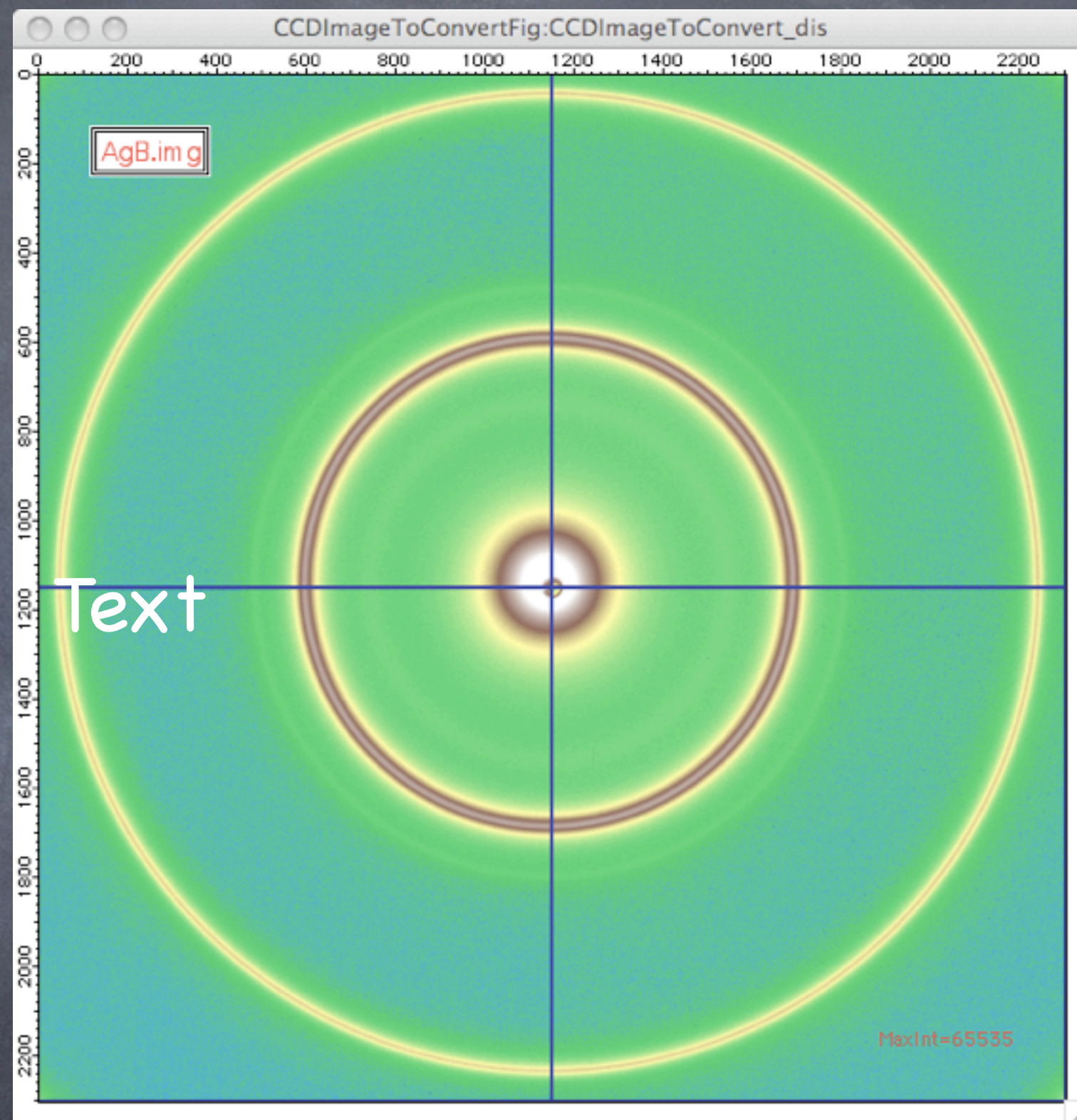
Ave & Convert sel. files

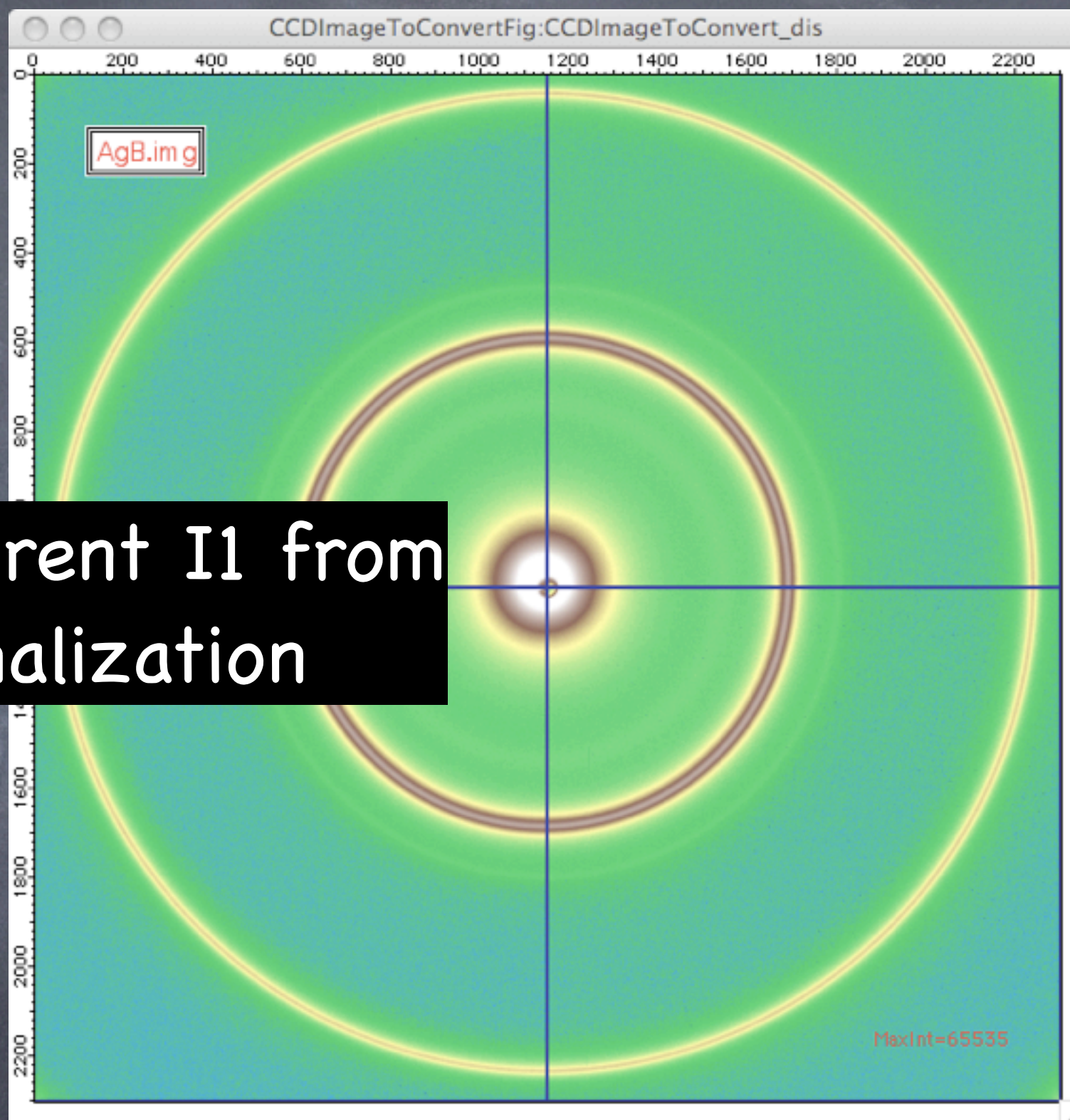
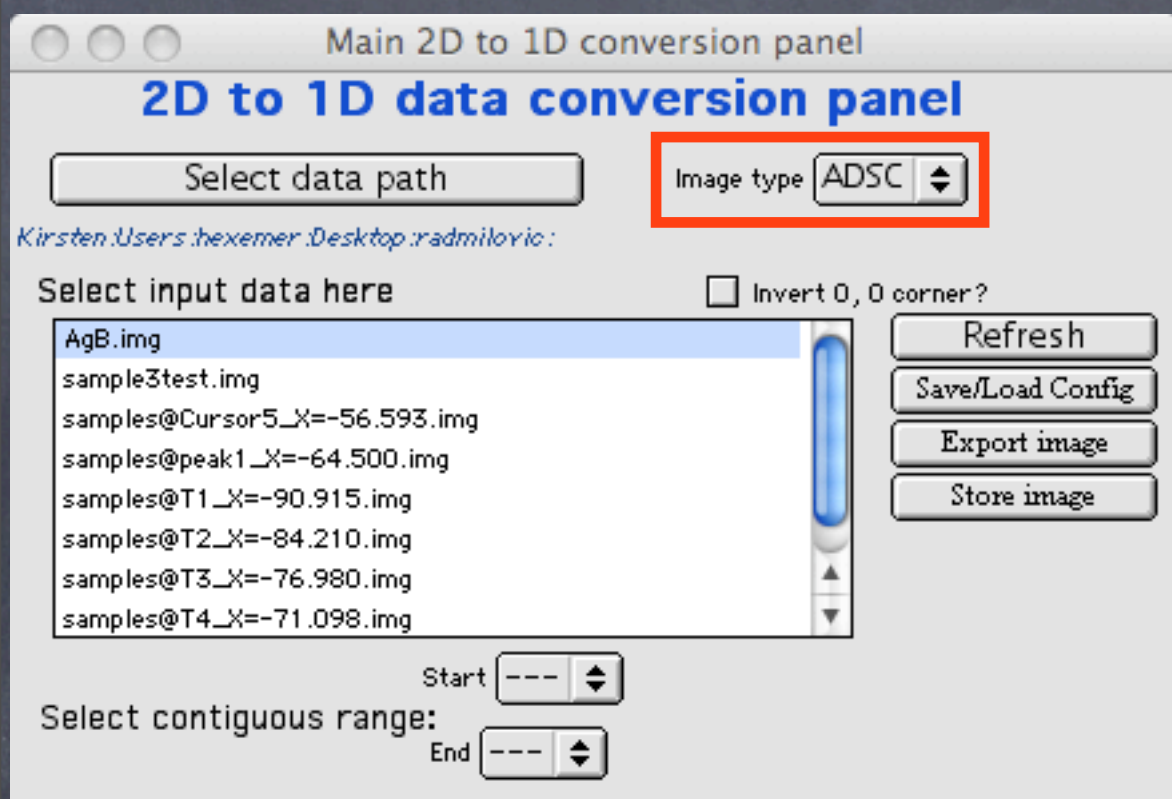
Colors Terrain

☐ Display beam center?

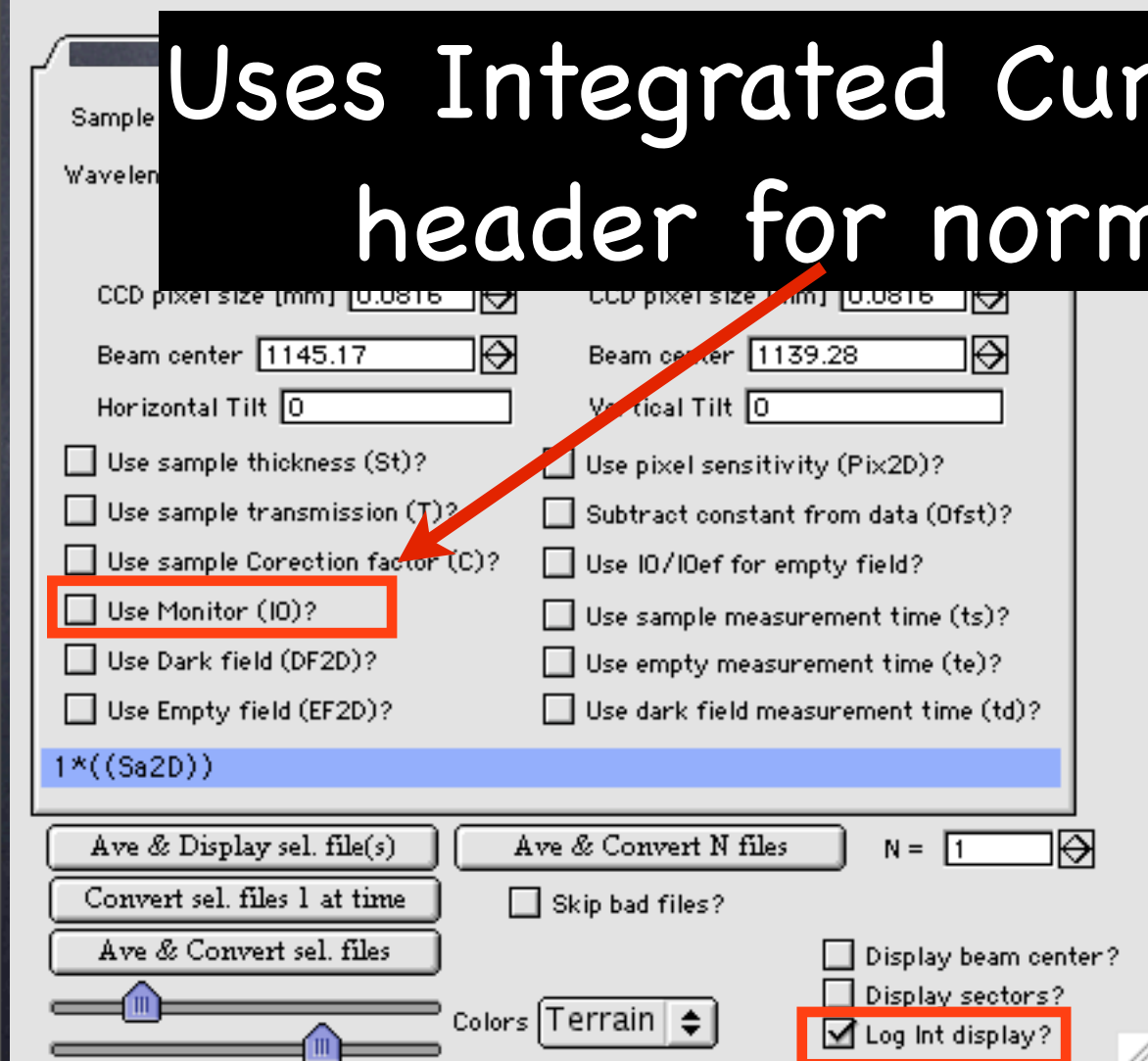
☐ Display sectors?

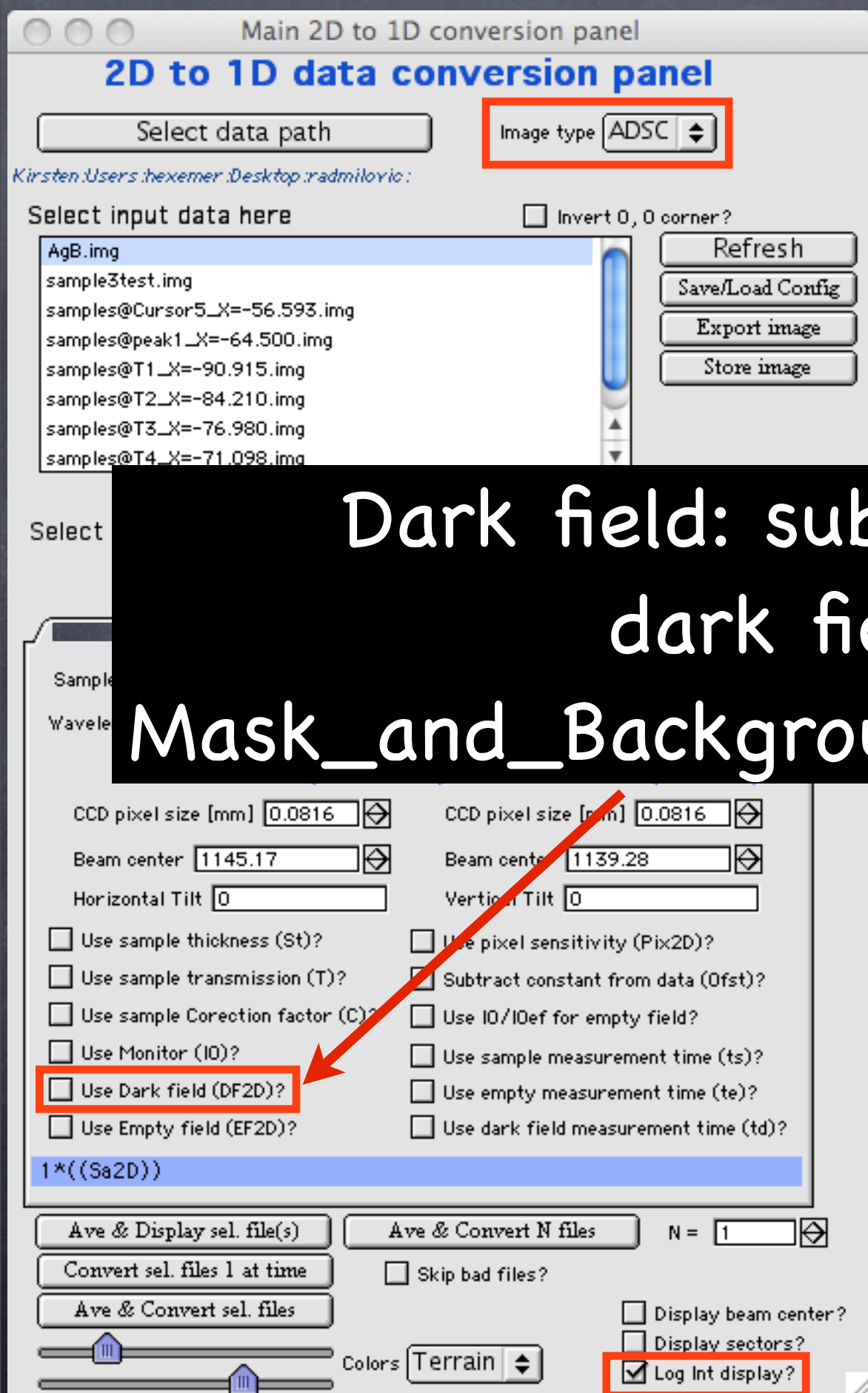
☒ Log Int display?





Uses Integrated Current I1 from header for normalization

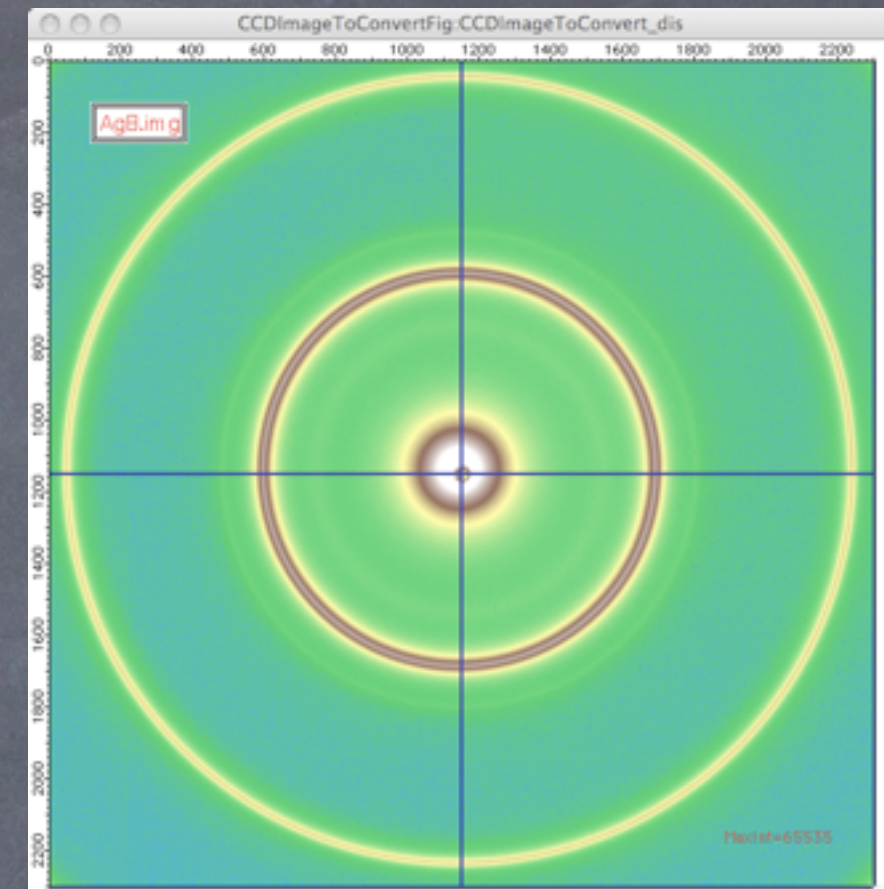
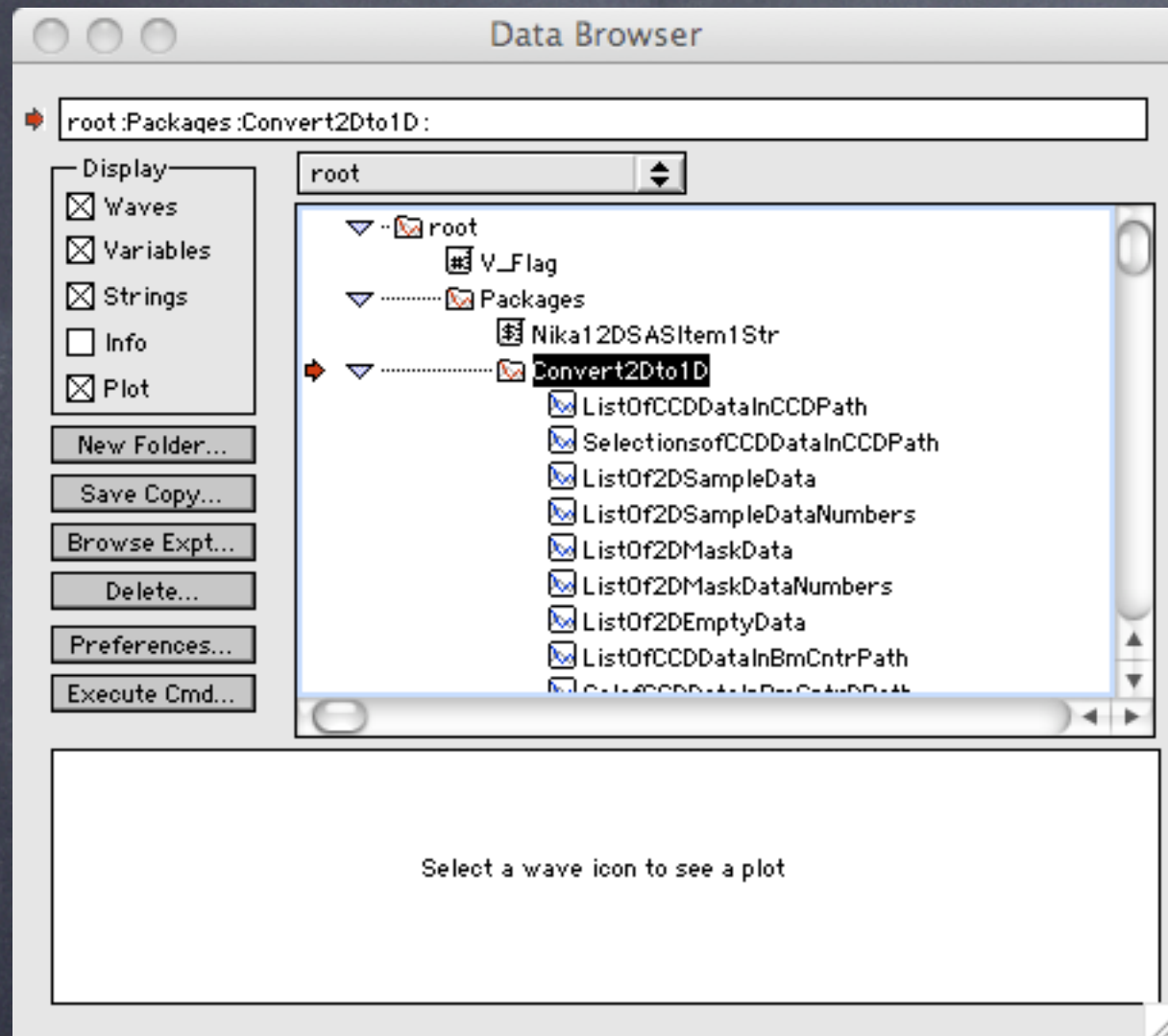




Dark field: subtracts averaged
dark field image
Mask_and_Background/2304pix_read.ibw

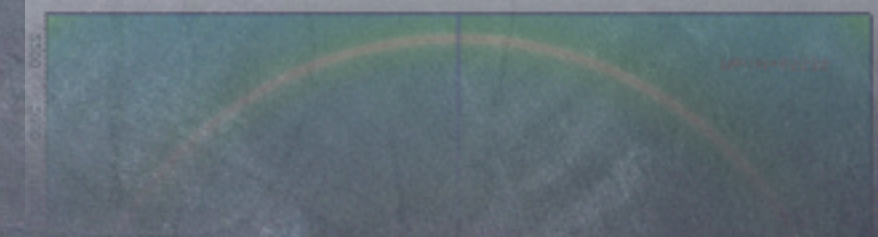
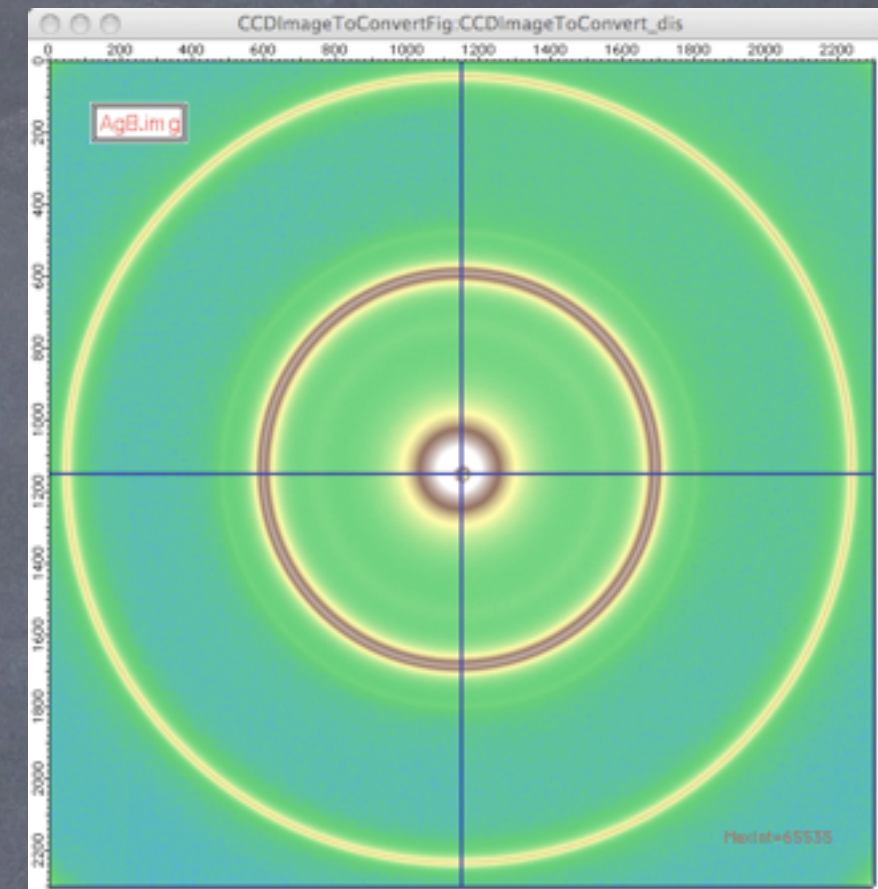
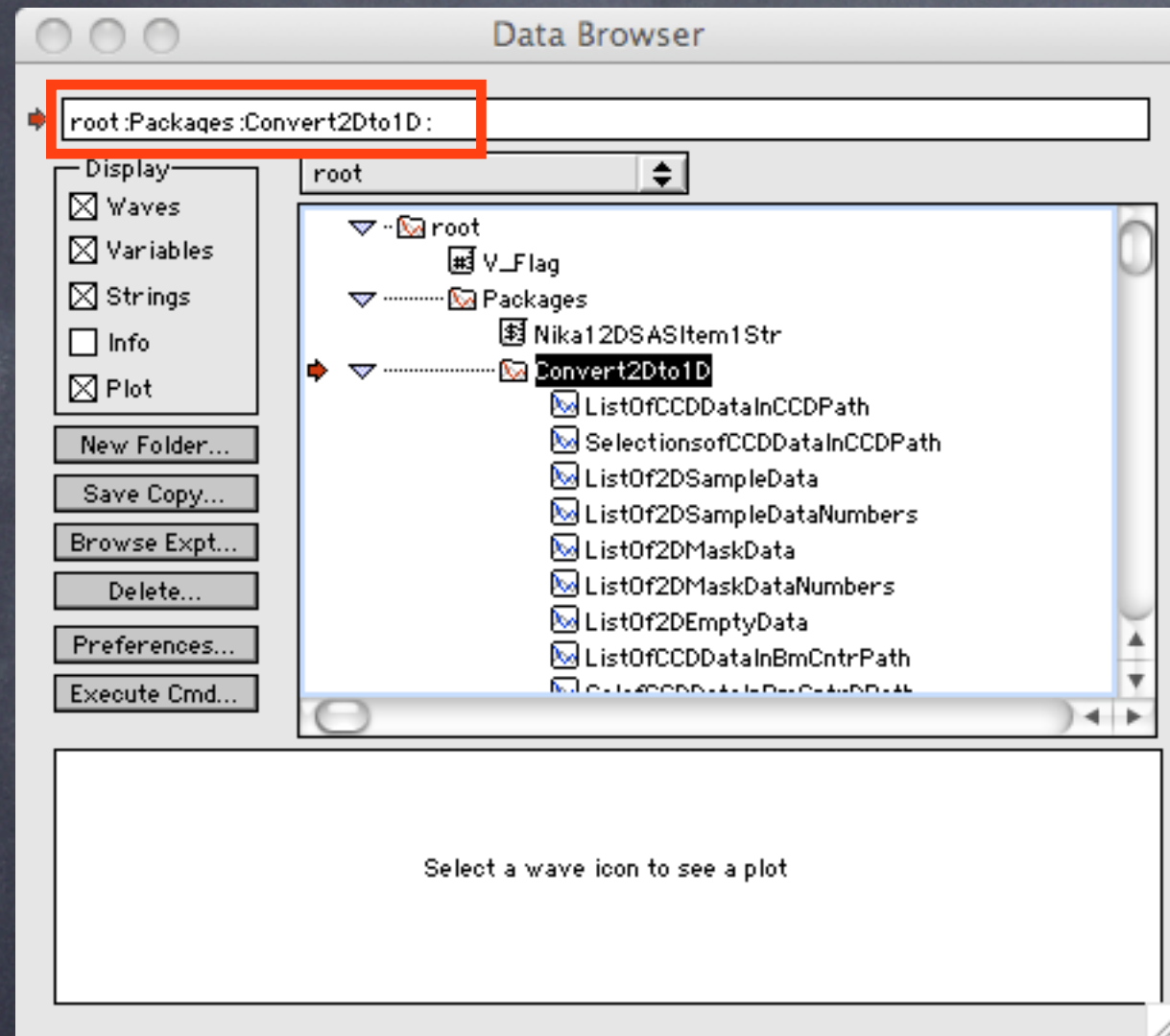
Where is the data?

Data → Data Browser



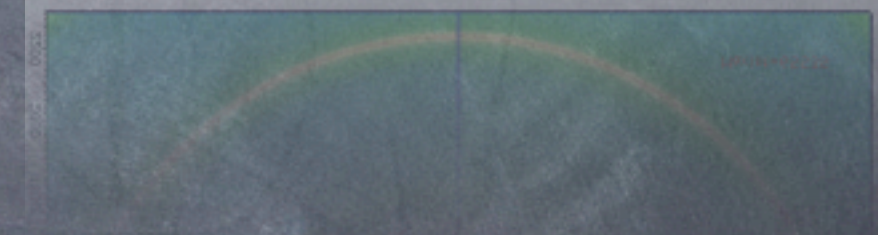
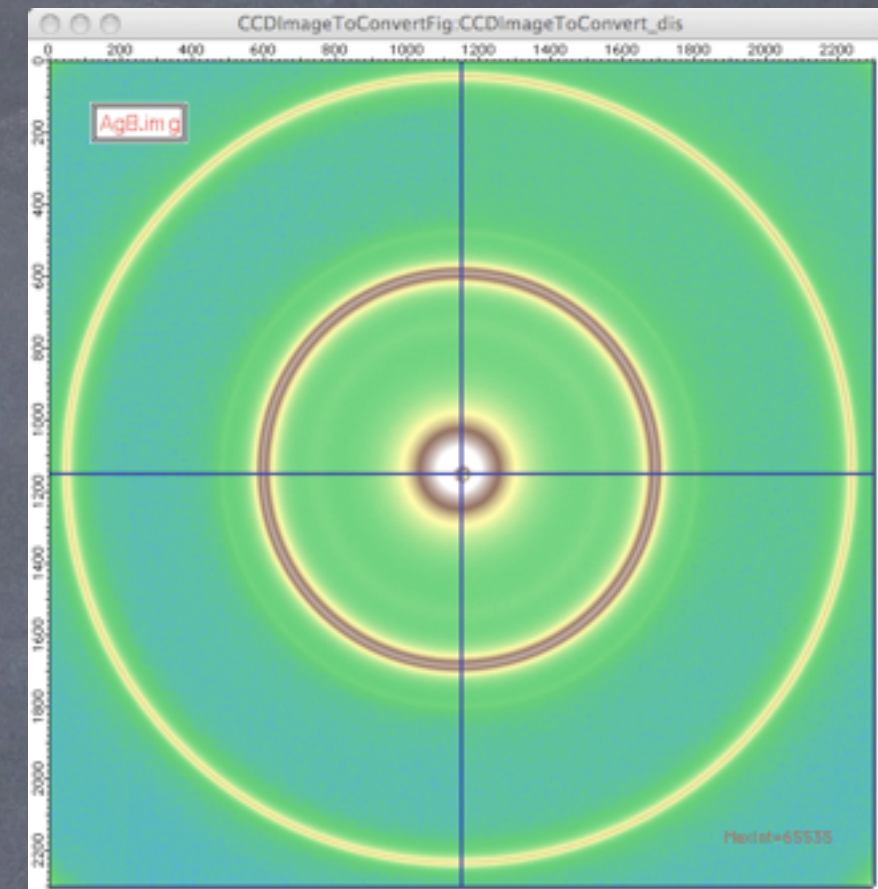
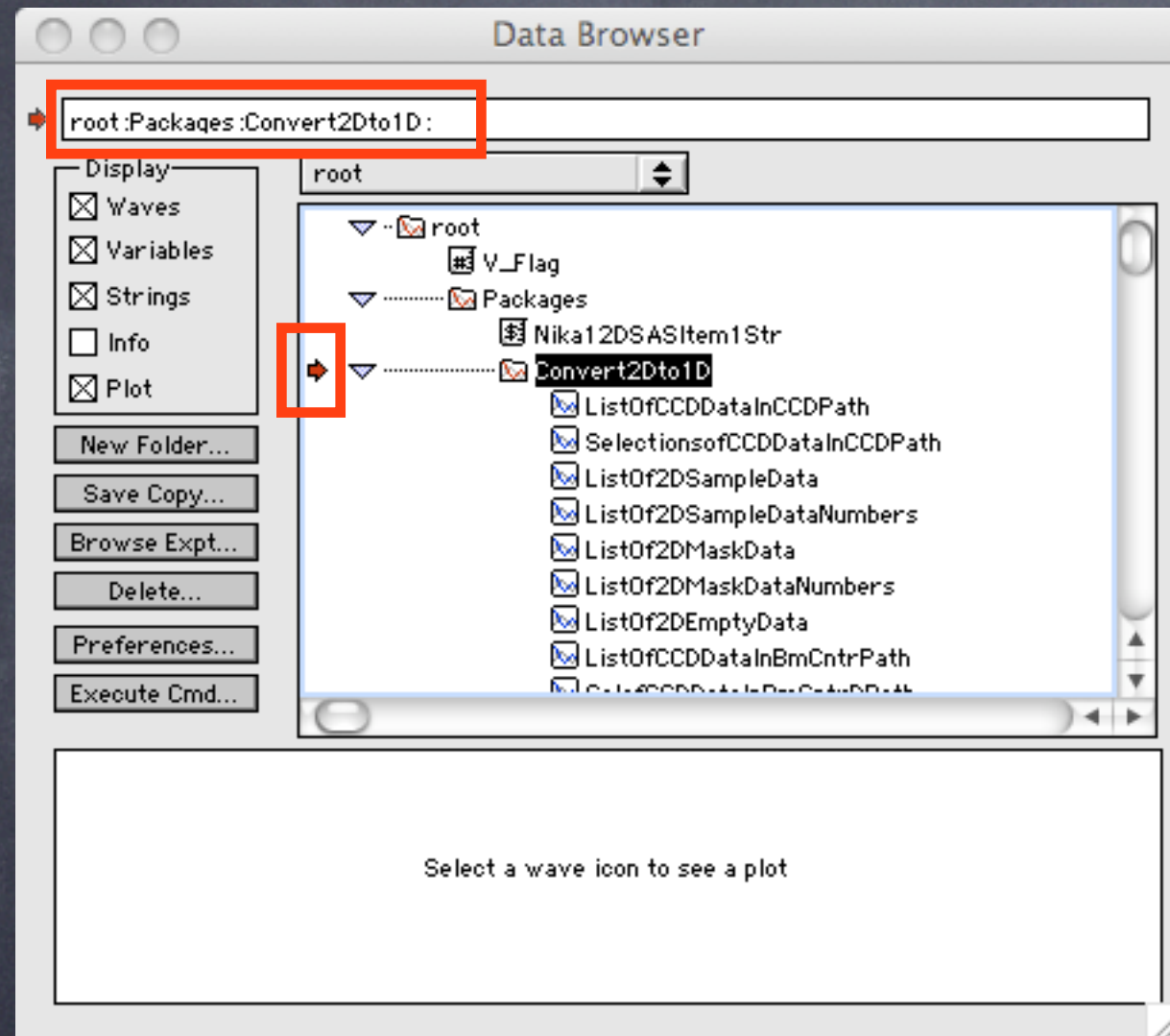
Where is the data?

Data → Data Browser



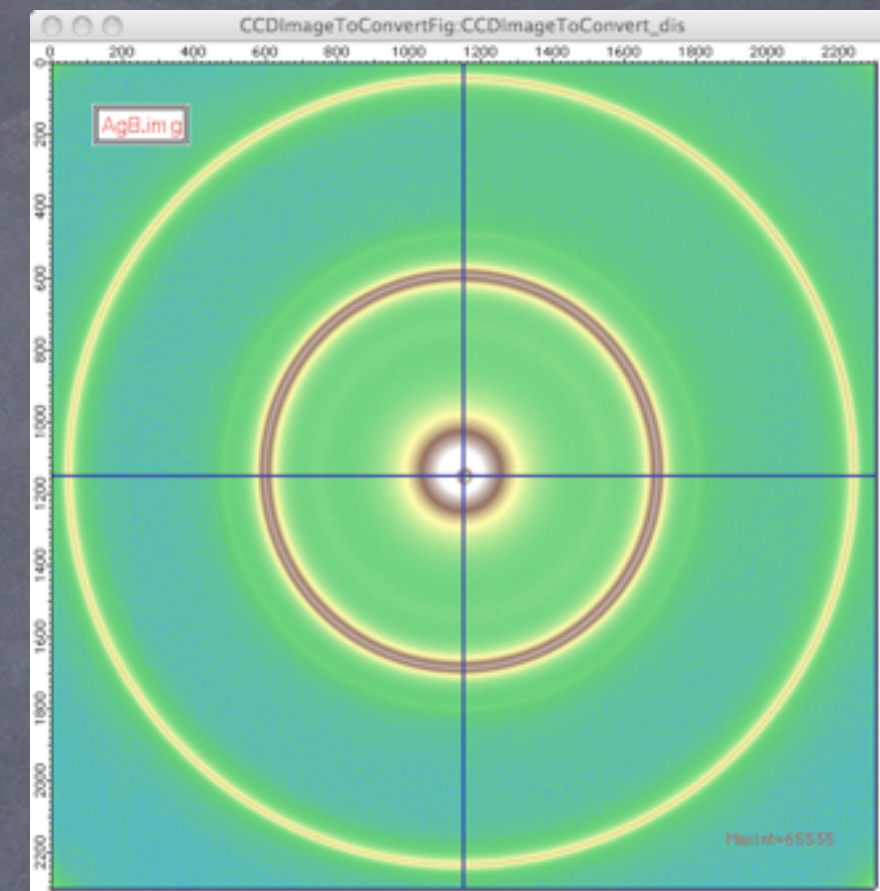
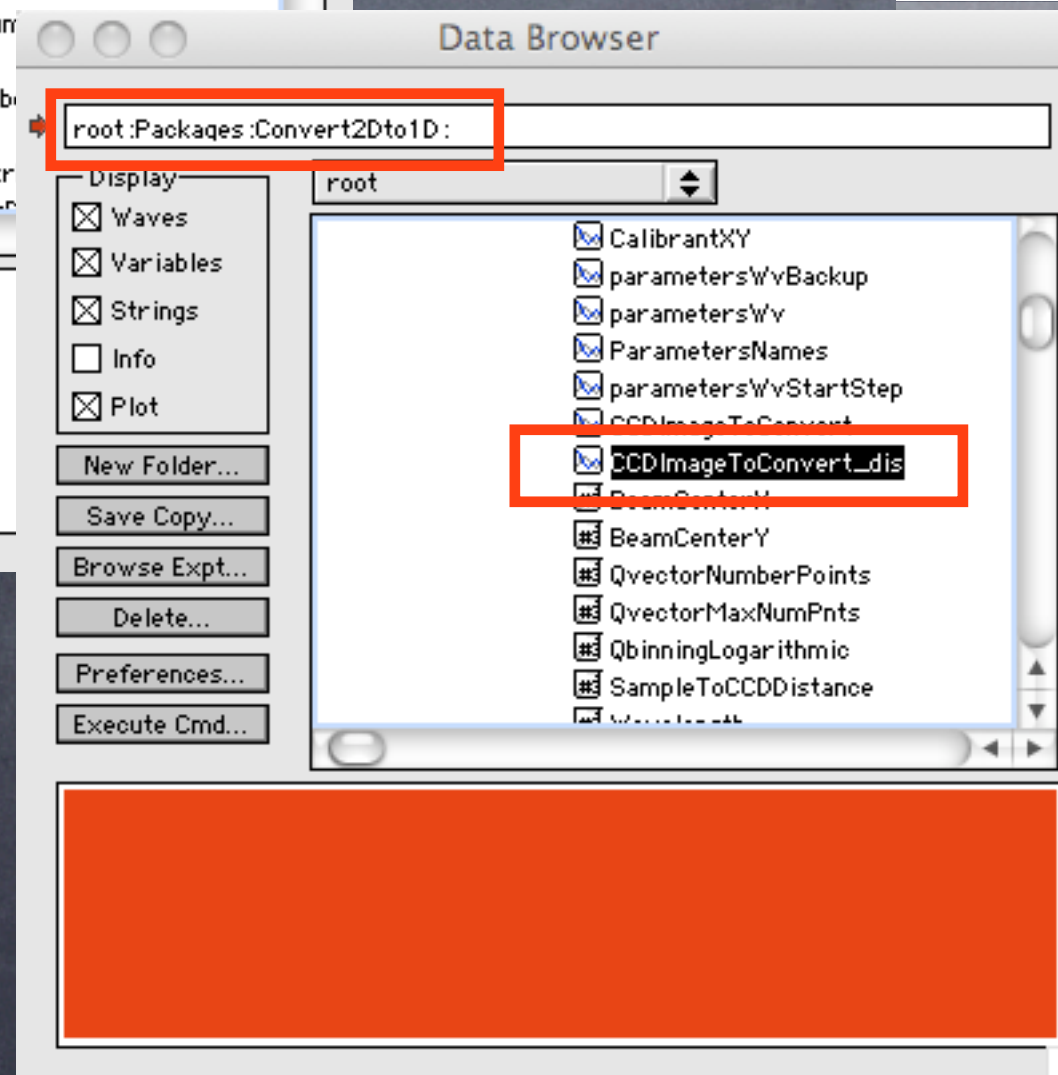
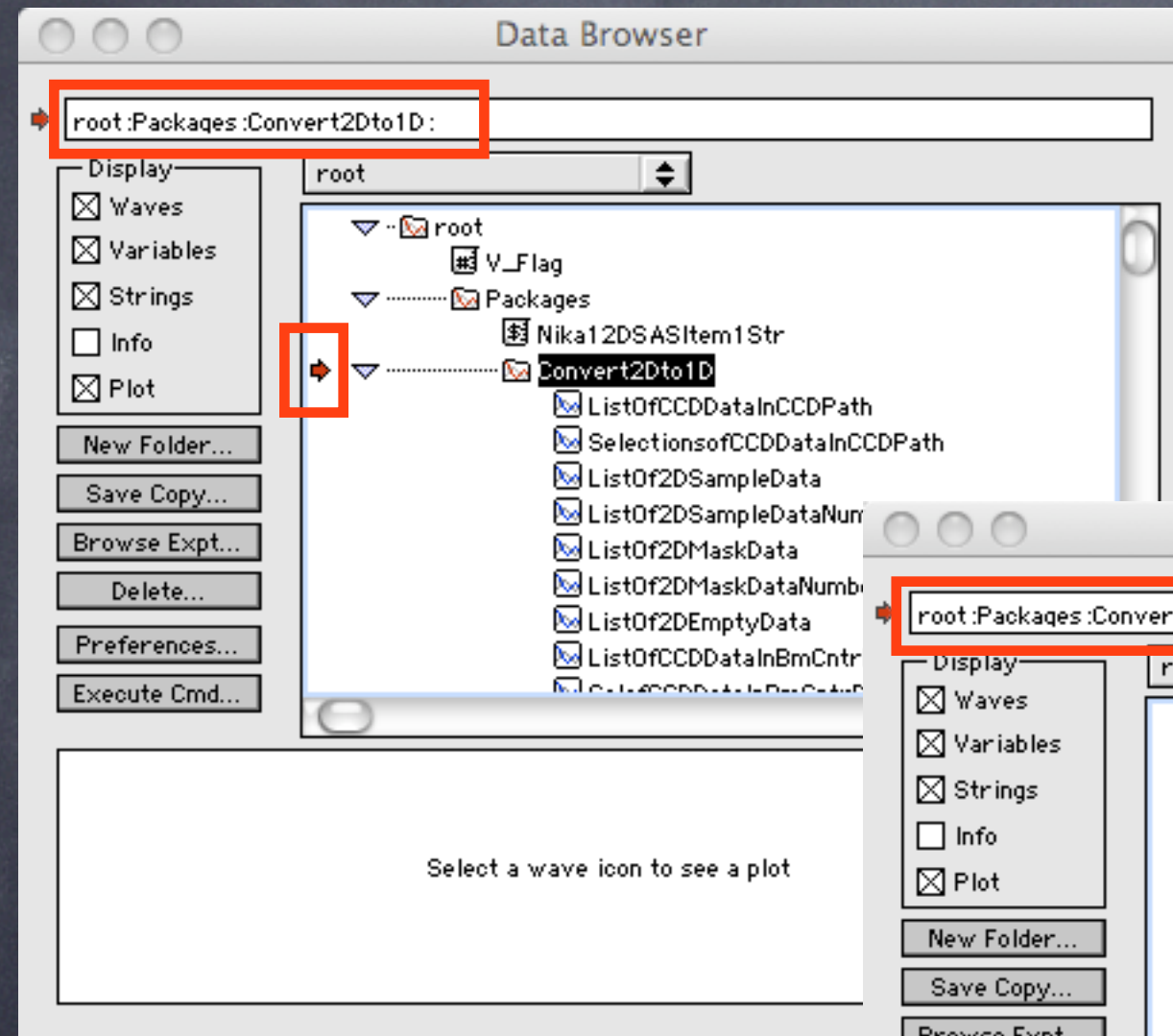
Where is the data?

Data → Data Browser



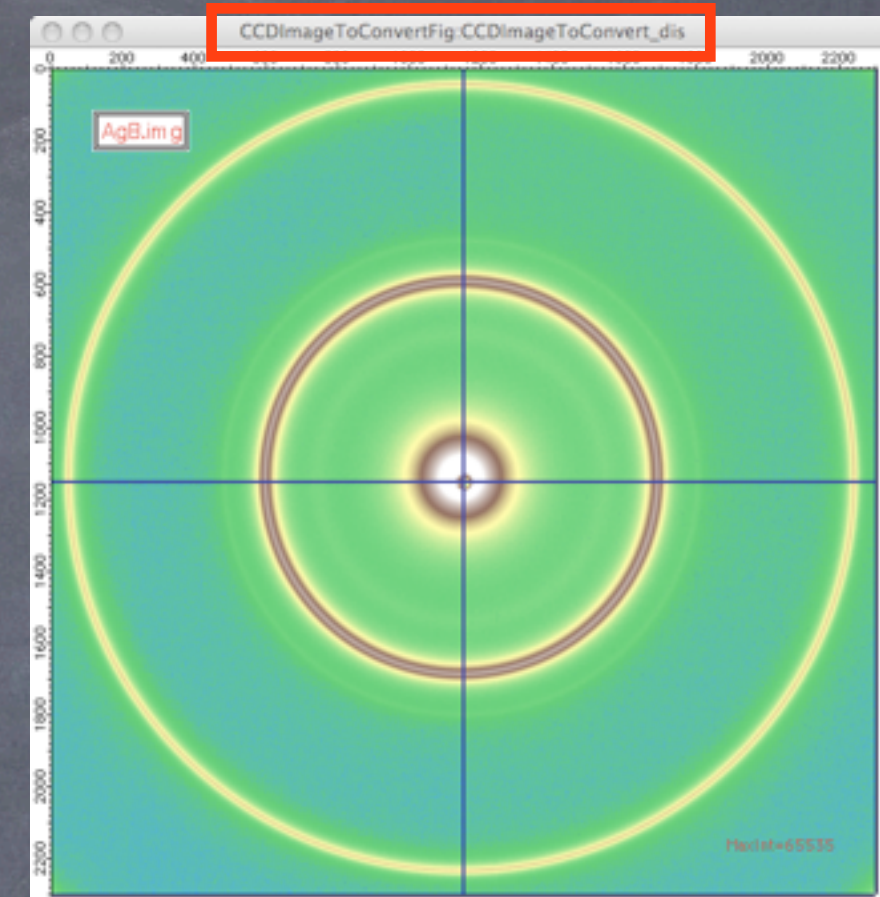
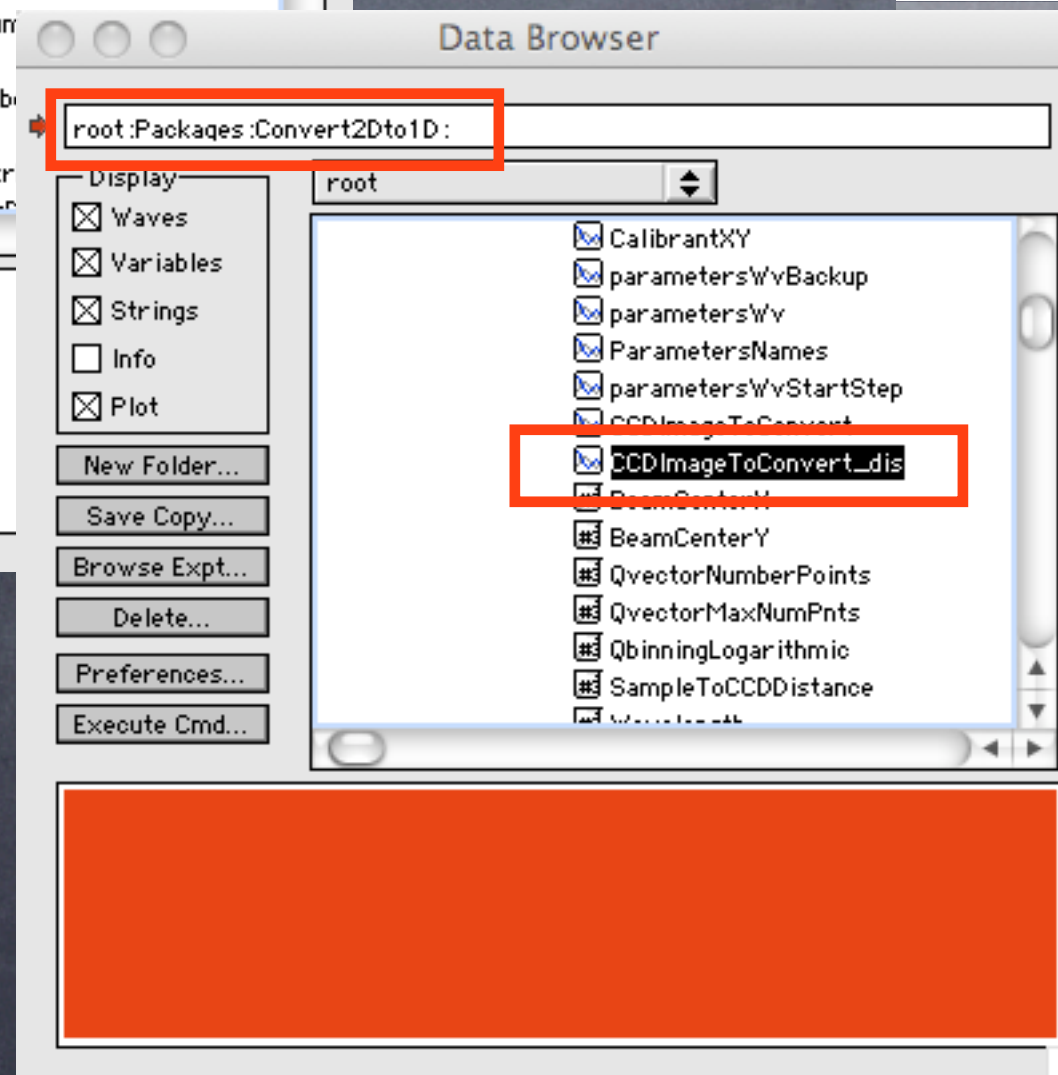
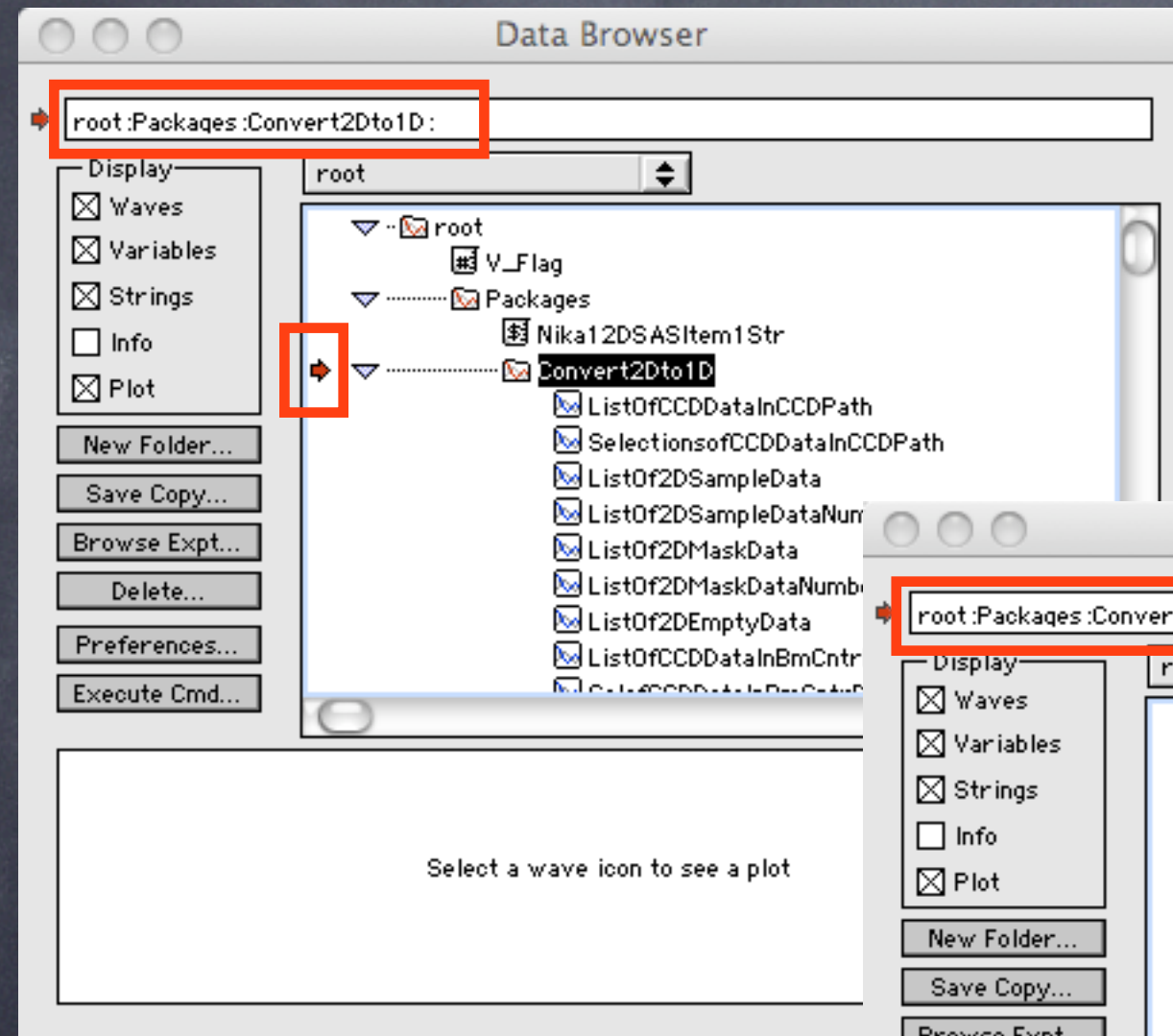
Where is the data?

Data → Data Browser



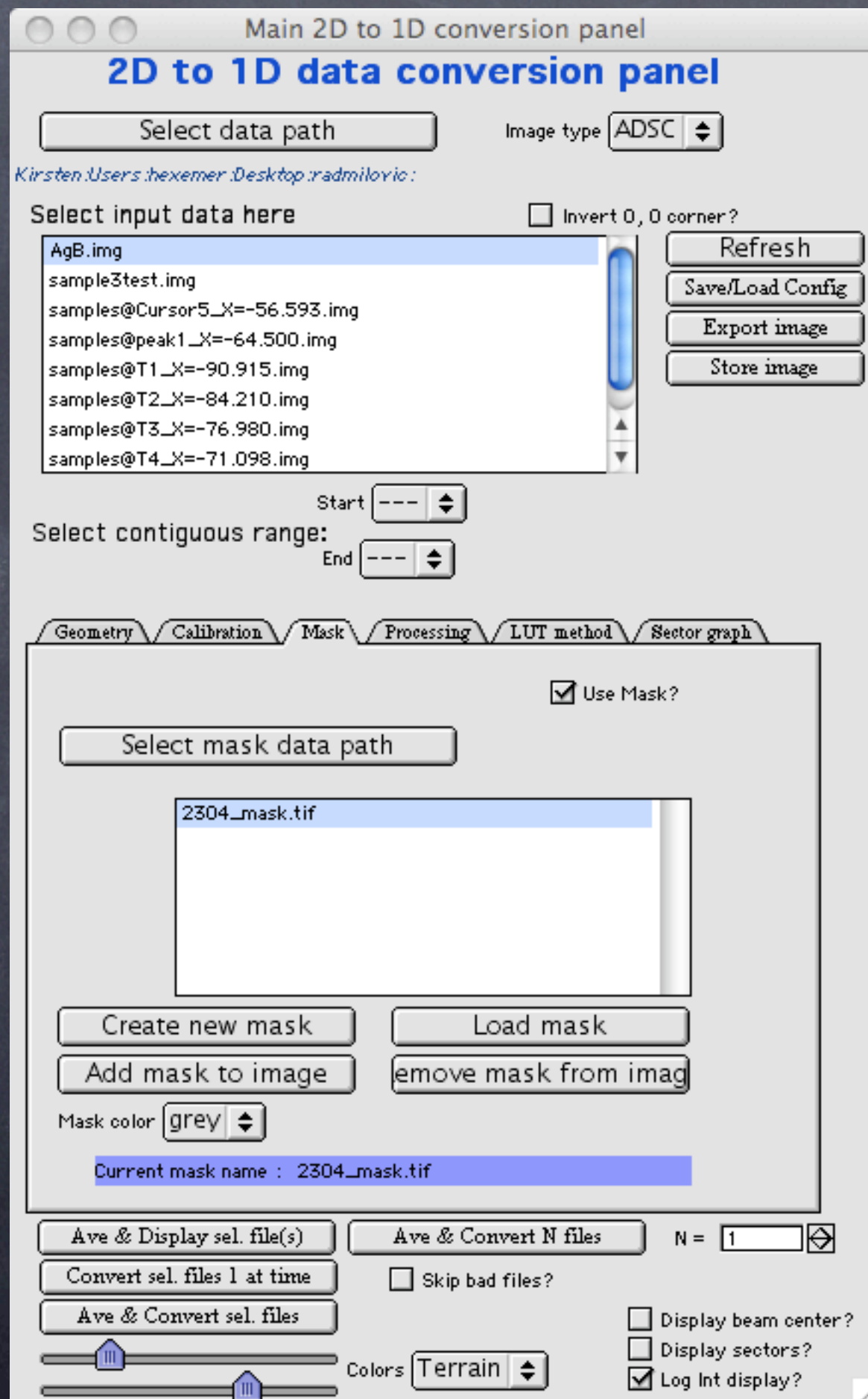
Where is the data?

Data → Data Browser



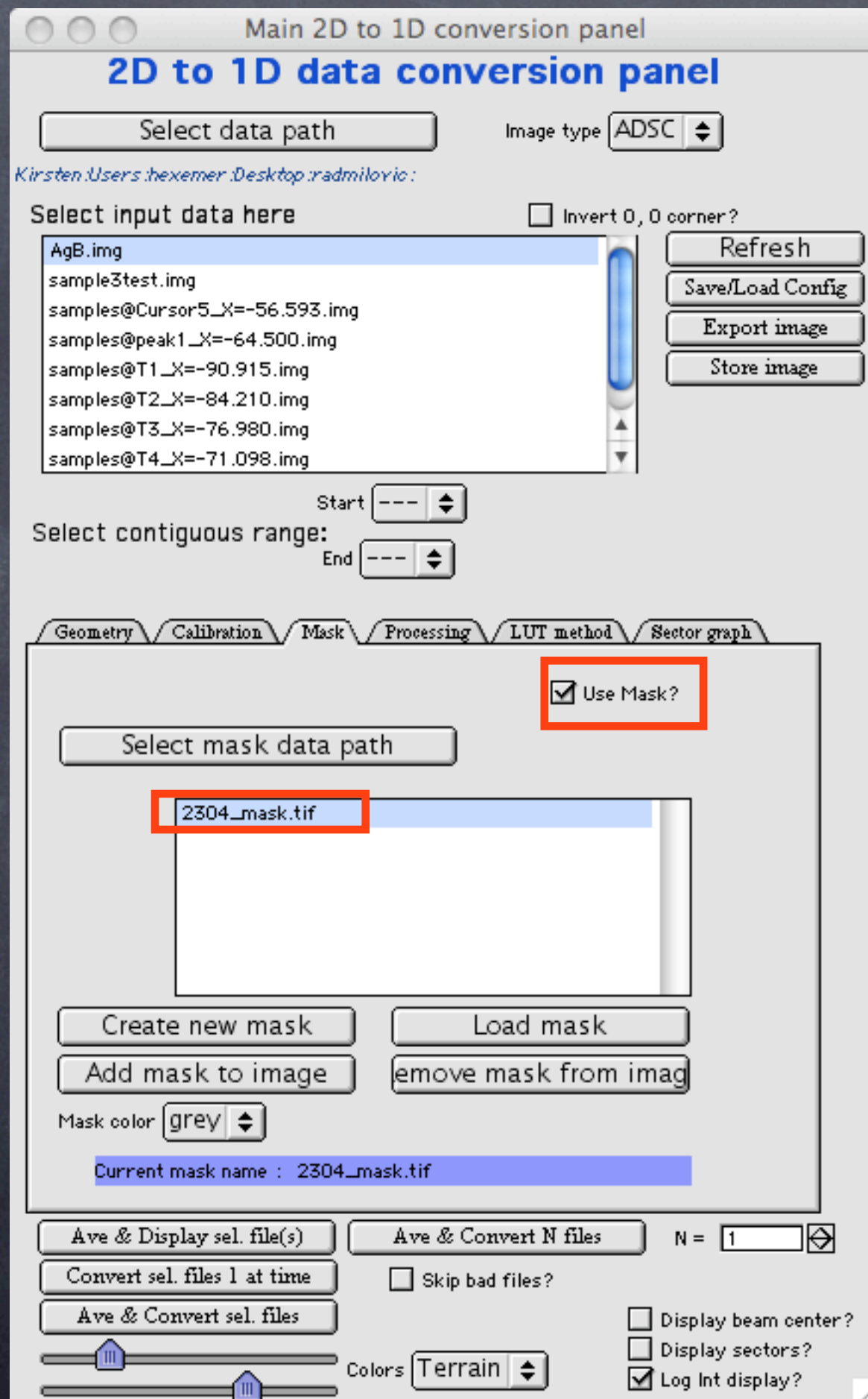
Radial Integration

Select "Use Mask" to mask gap between ccd modules



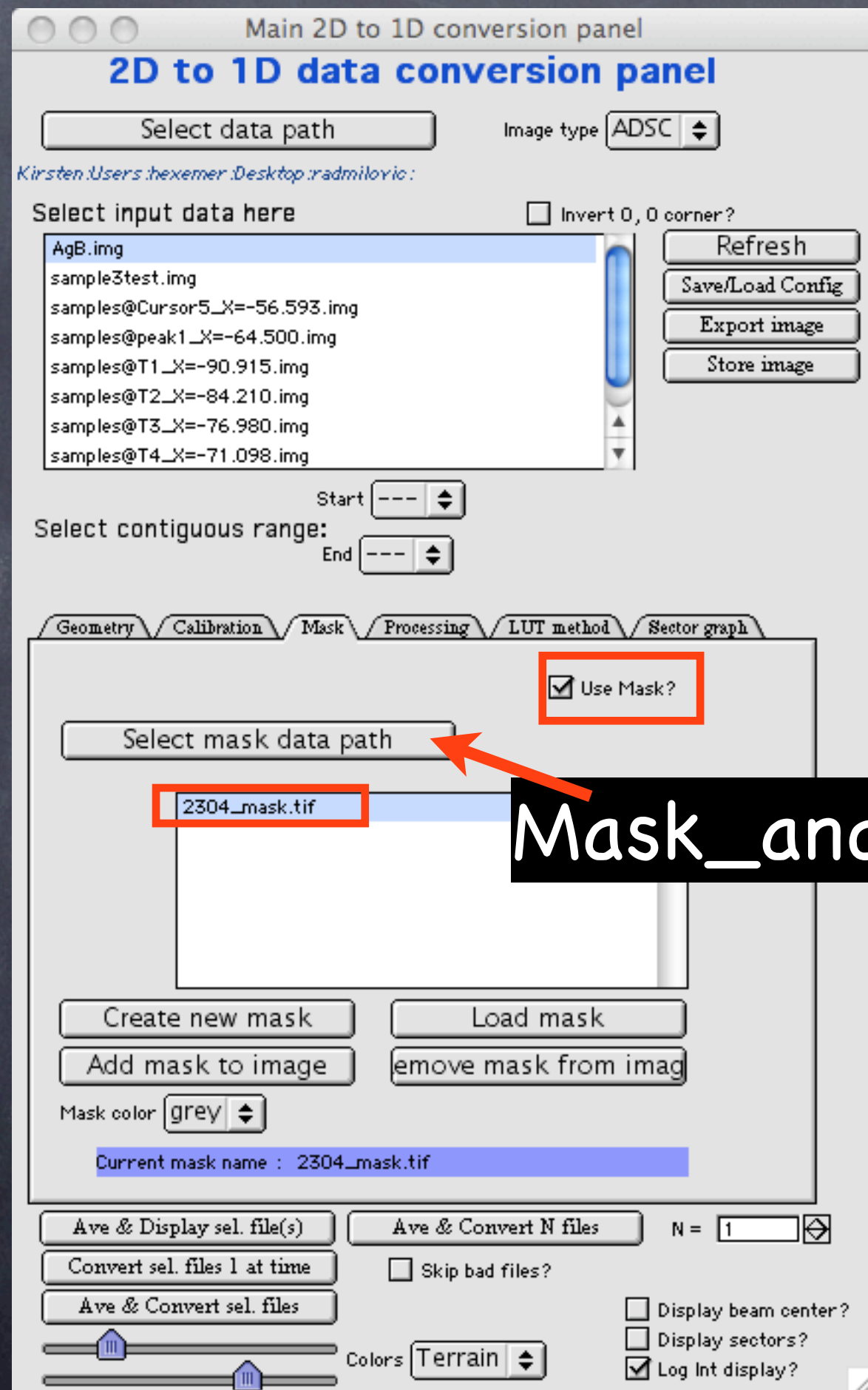
Radial Integration

Select "Use Mask" to mask gap between ccd modules



Radial Integration

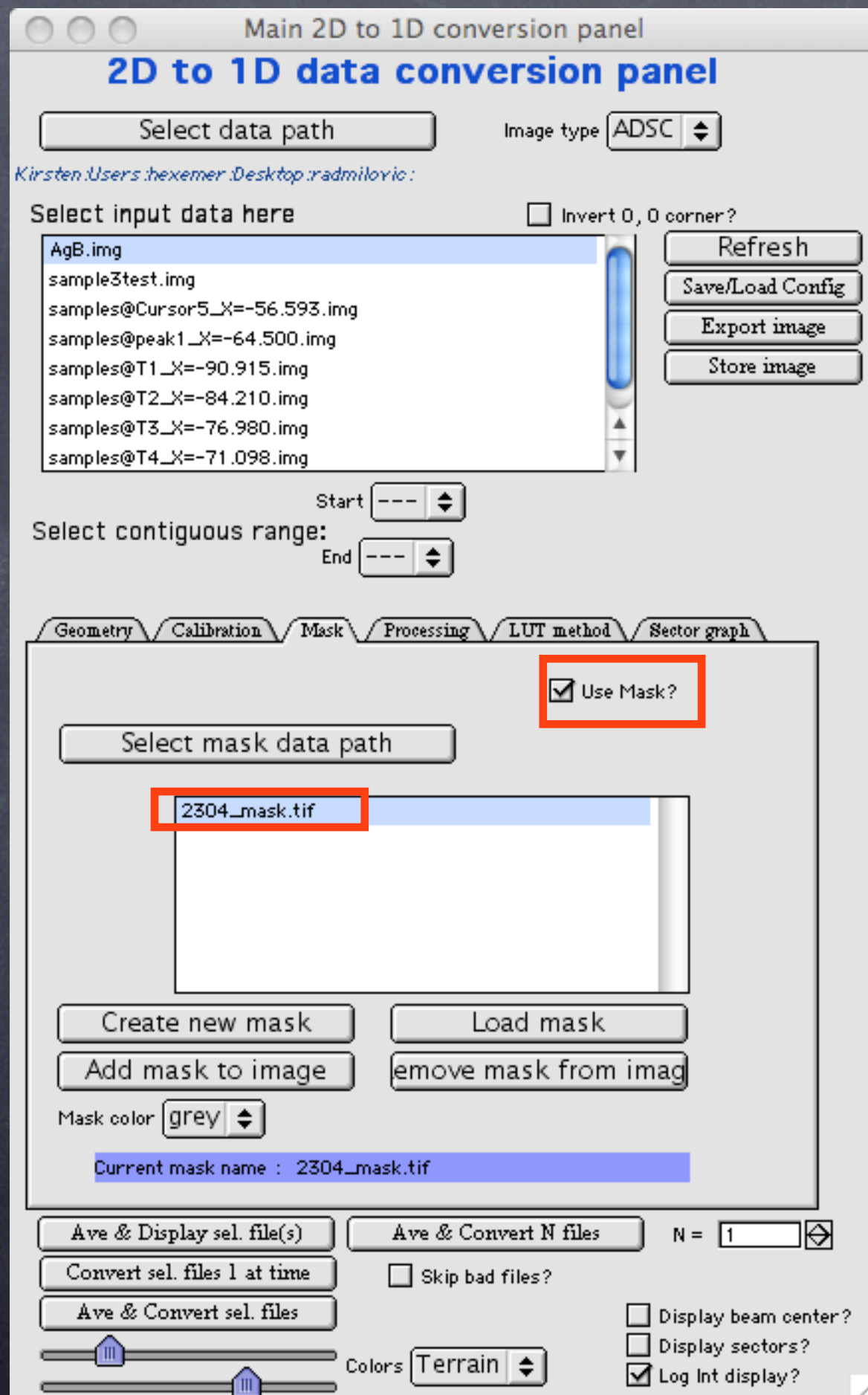
Select "Use Mask" to mask gap between ccd modules



Mask_and_Background/2304_mask.tif

Radial Integration

Select "Use Mask" to mask gap between ccd modules



Radial Integration

Select "LUT method"



Main 2D to 1D conversion panel

2D to 1D data conversion panel

Select data path: Image type:

Kirsten:Users:hexemer:Desktop:radmilovic:

Select input data here ☐ Invert 0, 0 corner?

- AgB.img
- sample3test.img
- samples@Cursor5_X=-56.593.img
- samples@peak1_X=-64.500.img
- samples@T1_X=-90.915.img
- samples@T2_X=-84.210.img
- samples@T3_X=-76.980.img
- samples@T4_X=-71.098.img

Refresh Save/Load Config Export image Store image

Start: End:

Select contiguous range:

Geometry Calibration Mask Processing **Processing** Sector graph

☒ Q space? ☐ d space? ☐ 2 Theta space?

Min Q (0 = automatic) Max Q (0 = automatic)

☐ Log binning? ☒ Max num points?

☒ Do circular average?

☐ Make sector averages?

☒ Create 1D graph?

☒ Store data in Igor experiment? ☒ Overwrite existing data if exists

☒ Export data as ASCII?

☒ Use input data name for output?

ASCII data name

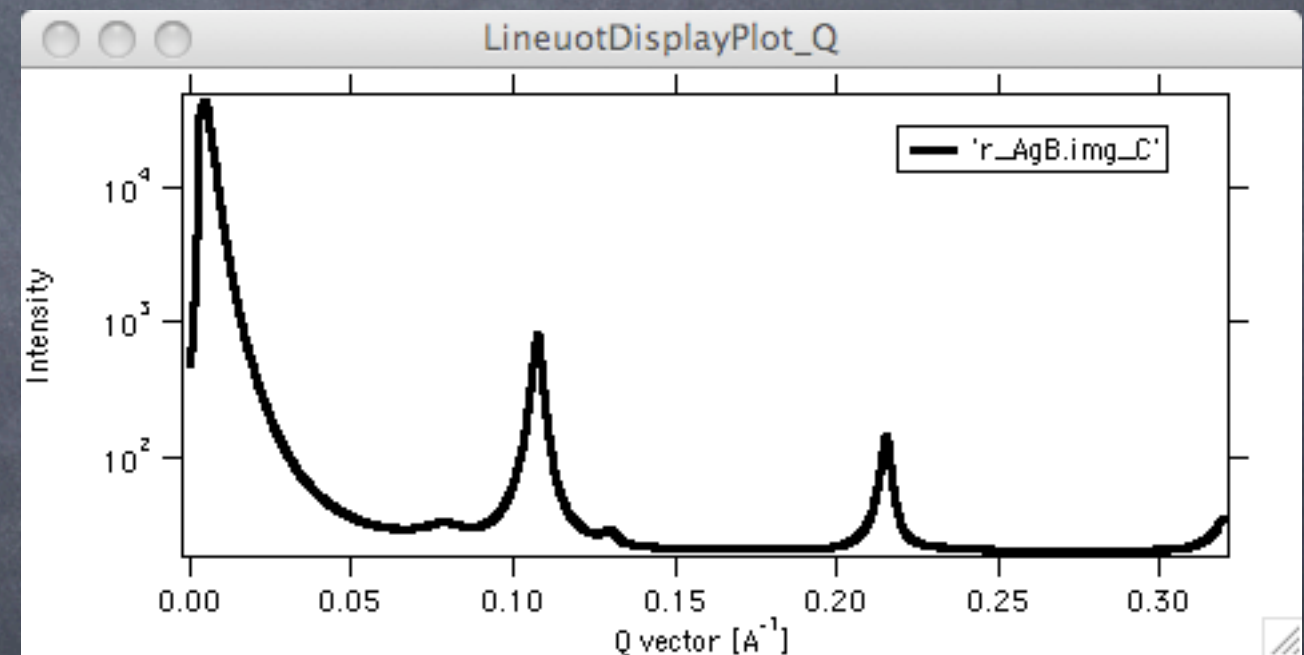
Ave & Display sel. file(s) Ave & Convert N files N =

Convert sel. files 1 at time ☐ Skip bad files?

Ave & Convert sel. files

Colors:

☐ Display beam center? ☐ Display sectors? ☒ Log Int display?



why does it take a long time for the first image?

Radial Integration

Select "LUT method"



Main 2D to 1D conversion panel

2D to 1D data conversion panel

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Kirsten:Users:hexemer:Desktop:radmilovic:

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- samples@T4_X=-71.098.img

Start: End:

Select contiguous range:

Geometry Calibration Mask Processing **Integration** Sector graph

☒ Q space? ☐ d space? ☐ 2 Theta space?

Min Q (0 = automatic): Max Q (0 = automatic):

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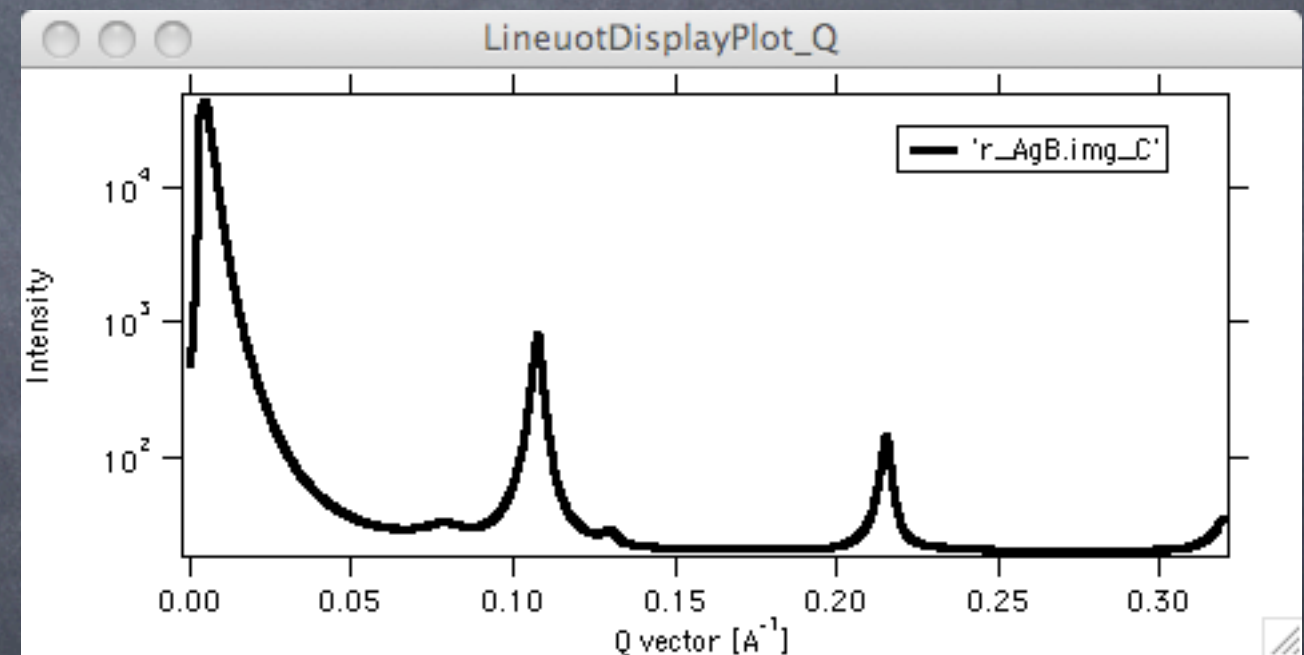
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Ave & Convert sel. files

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Radial Integration

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Main 2D to 1D conversion panel

2D to 1D data conversion panel

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- samples@T4_X=-71.098.img

☐ Invert 0, 0 corner?

Refresh
Save/Load Config
Export image
Store image

Select contiguous range: Start: End:

select a range

Geometry Calibration Mask Processing **Processing** Sector graph

☒ Q space? ☐ d space? ☐ 2 Theta space?

Min Q (0 = automatic) Max Q (0 = automatic)

☐ Log binning? ☒ Max num points?

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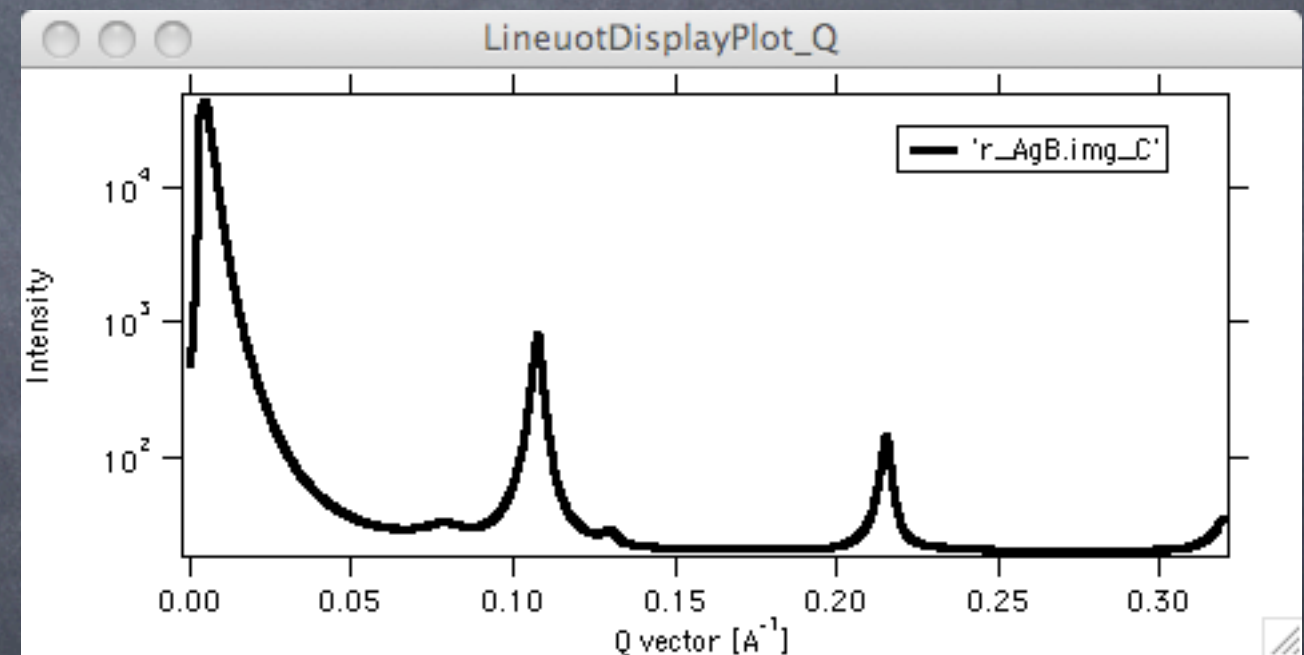
Ave & Display sel. file(s) Ave & Convert N files N =

Convert sel. files 1 at time ☐ Skip bad files?

Ave & Convert sel. files

Colors

☐ Display beam center? ☐ Display sectors? ☒ Log Int display?



why does it take a long time for the first image?

Radial Integration

Select "LUT method"



Main 2D to 1D conversion panel

2D to 1D data conversion panel

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Kirsten:Users:haxemer:Desktop:radmilovic:

Select input data here ☐ Invert 0, 0 corner?

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- samples@T2_X=-84.210.img
- samples@T3_X=-76.980.img
- samples@T4_X=-71.098.img

Start: End:

Select contiguous range:

Buttons: Refresh, Save/Load Config, Export image, Store image

Geometry Calibration Mask Processing **Processing** Sector graph

☒ Q space? ☐ d space? ☐ 2 Theta space?

Min Q (0 = automatic): Max Q (0 = automatic):

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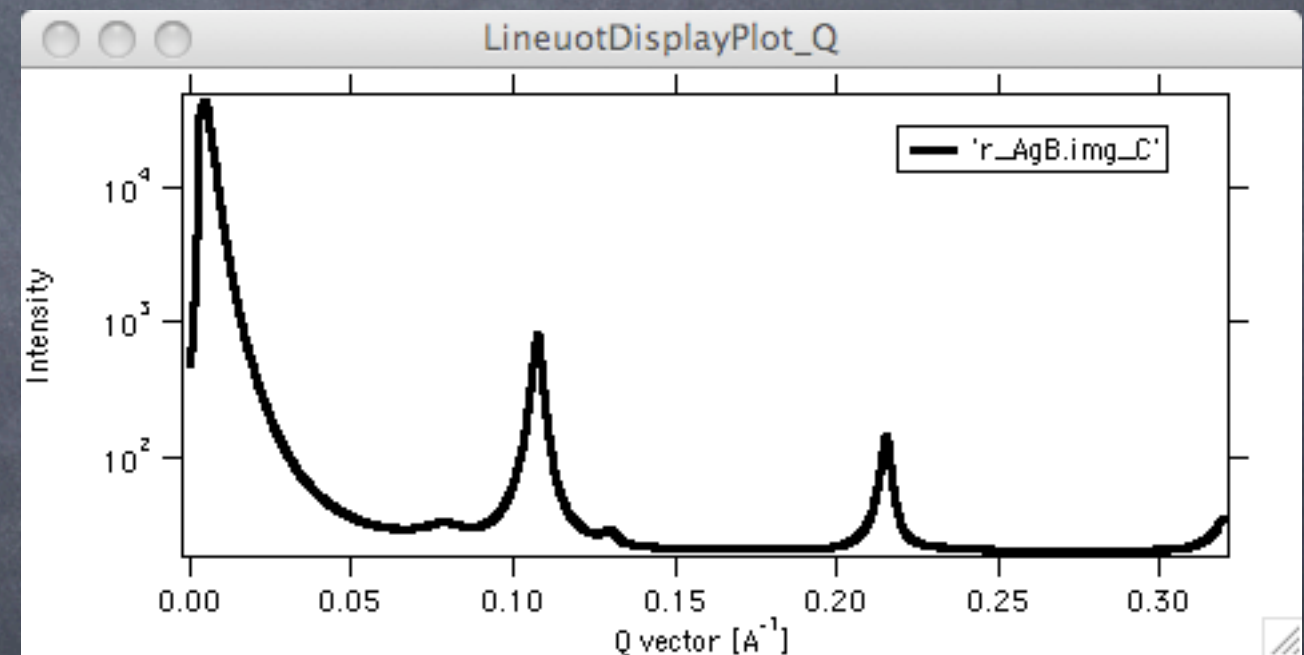
Ave & Display sel. file(s) Ave & Convert N files N =

Convert sel. files 1 at time ☐ Skip bad files?

Ave & Convert sel. files

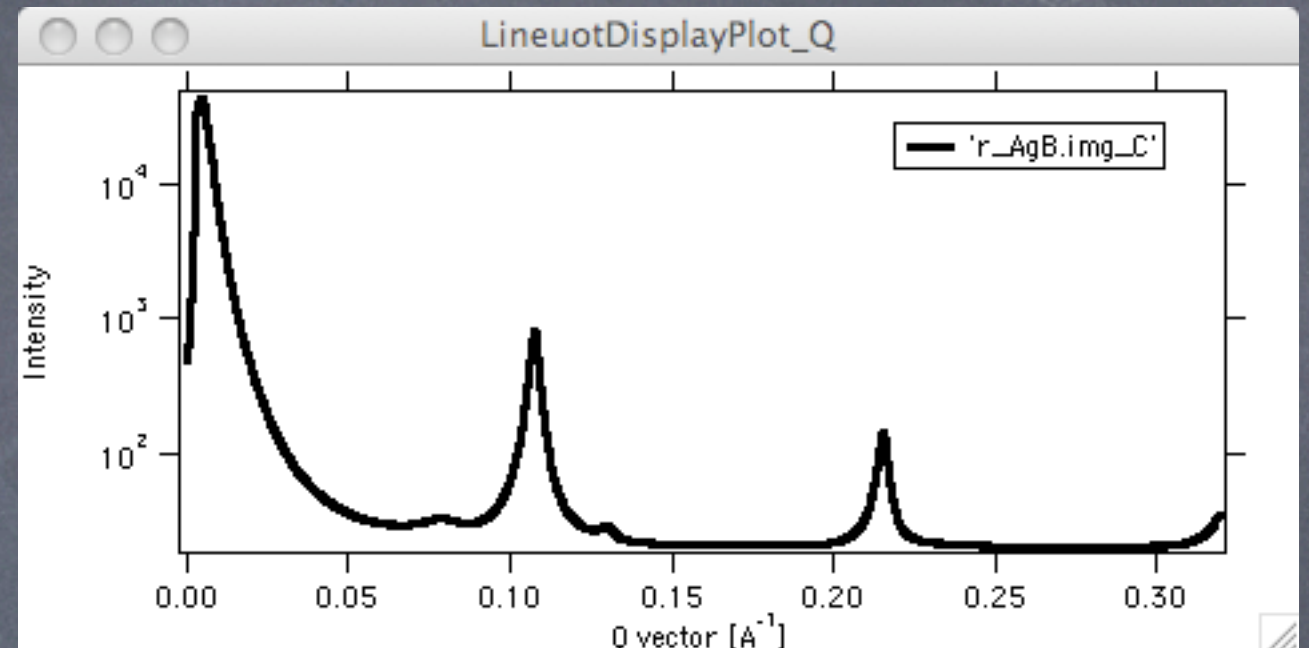
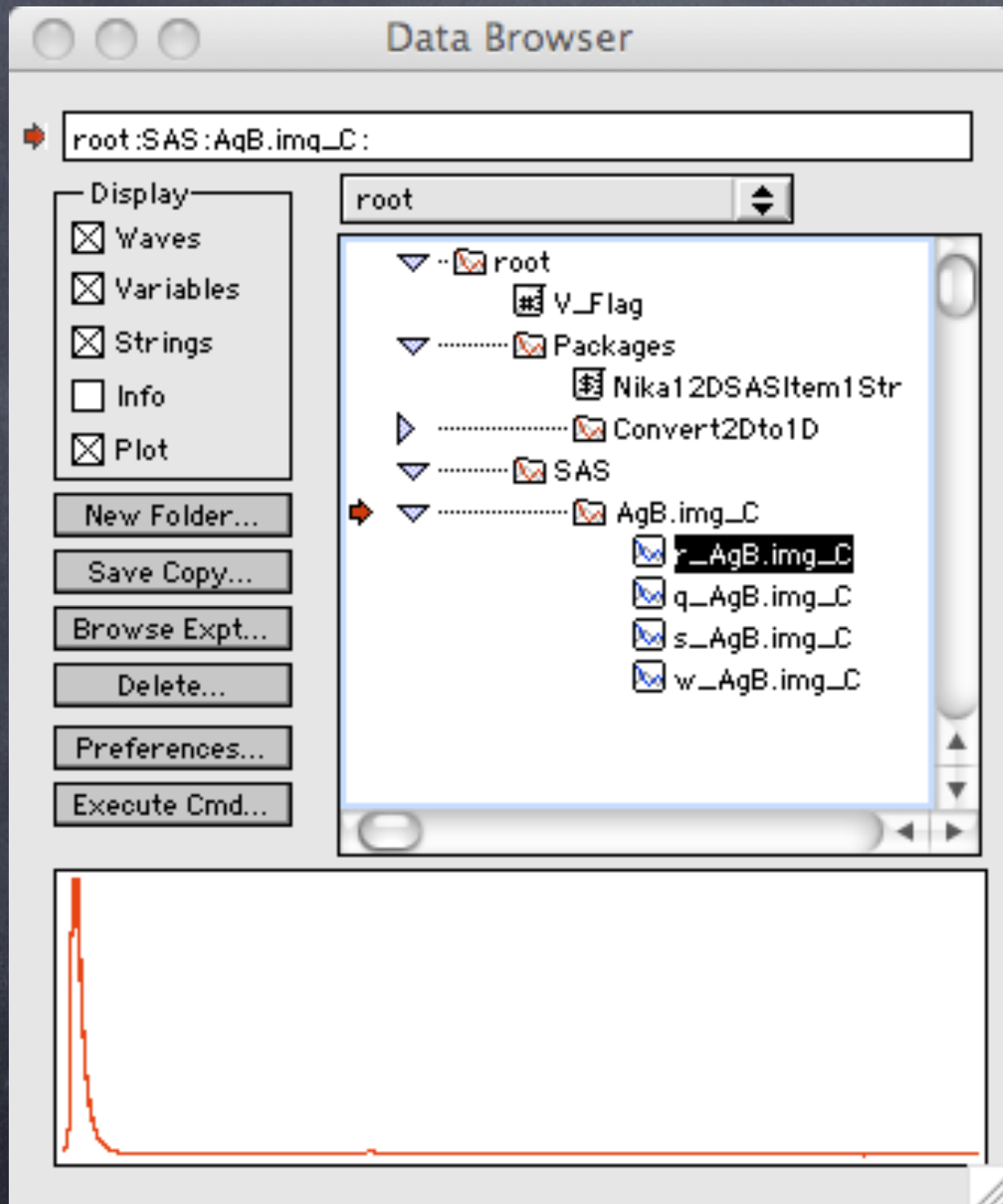
Colors:

☐ Display beam center? ☐ Display sectors? ☒ Log Int display?



why does it take a long time for the first image?

Where is the data?

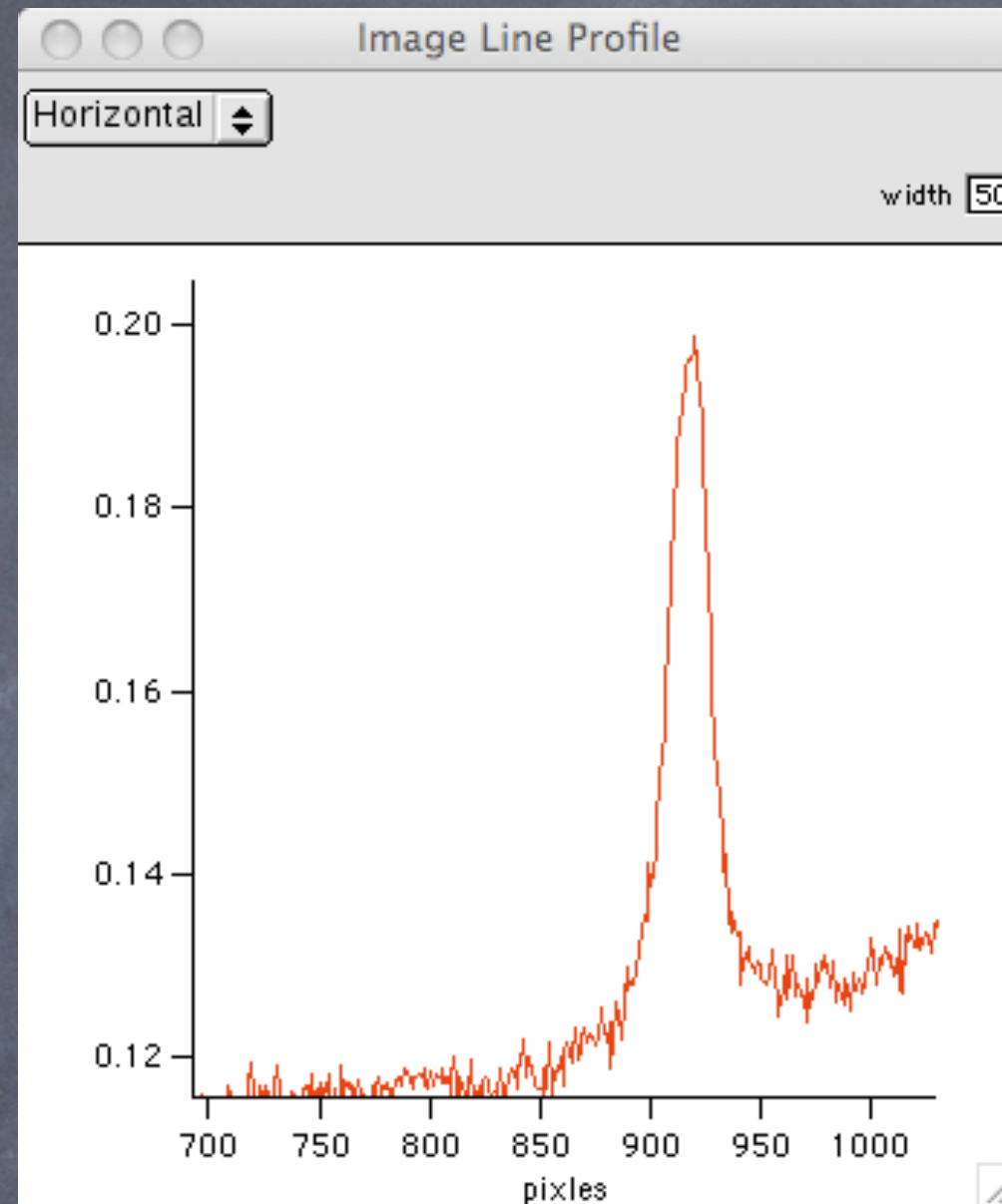
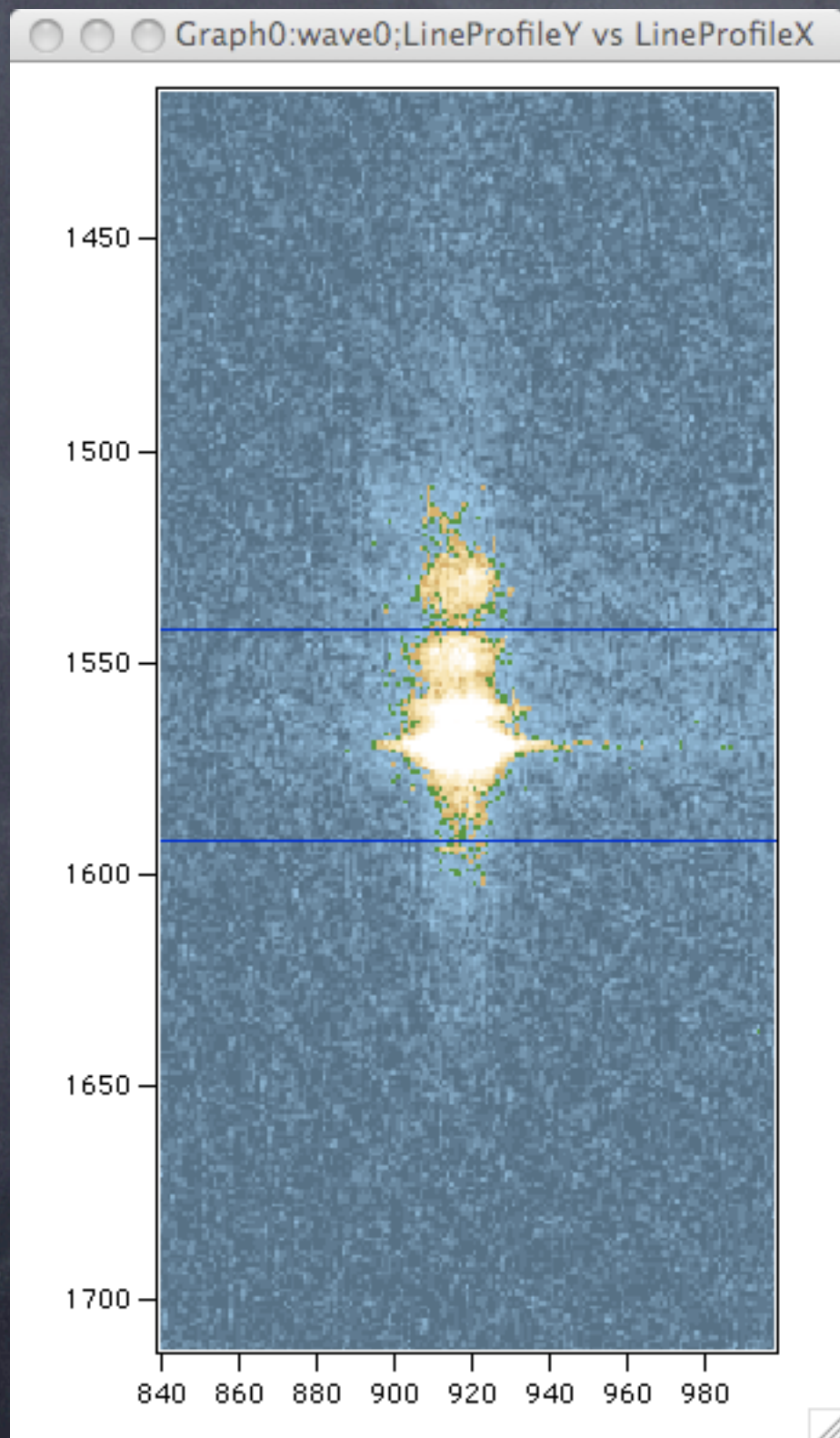


r = Radial intensity

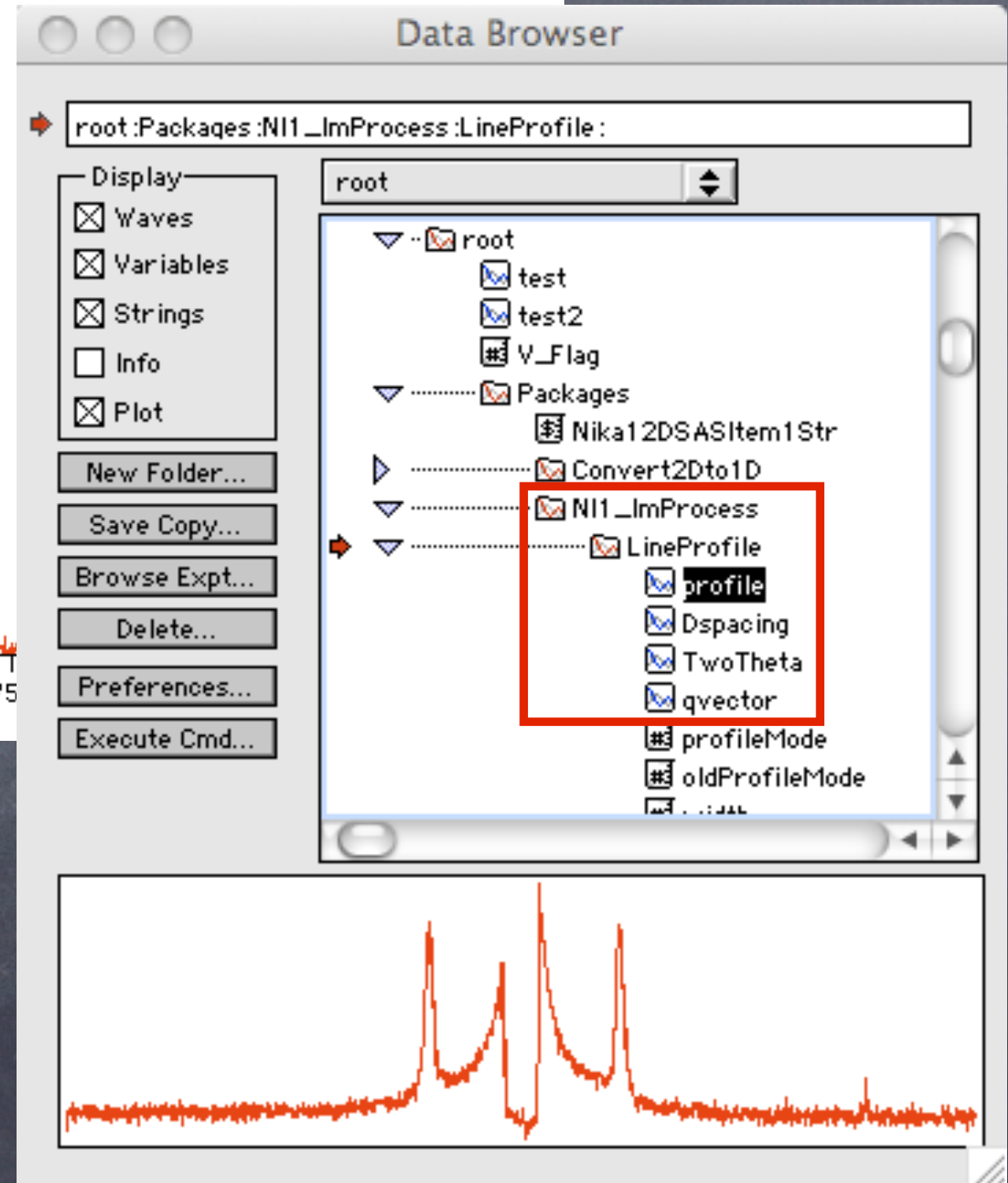
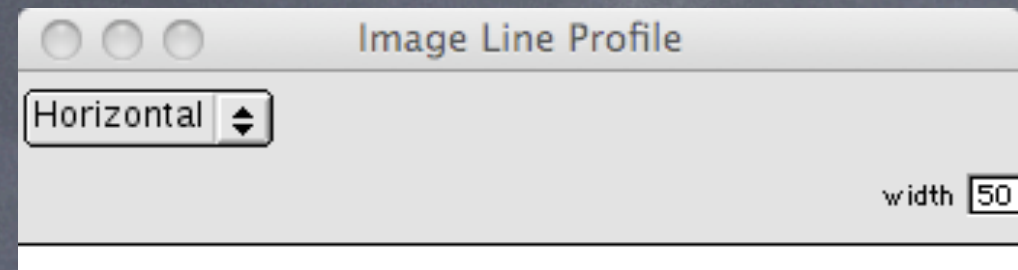
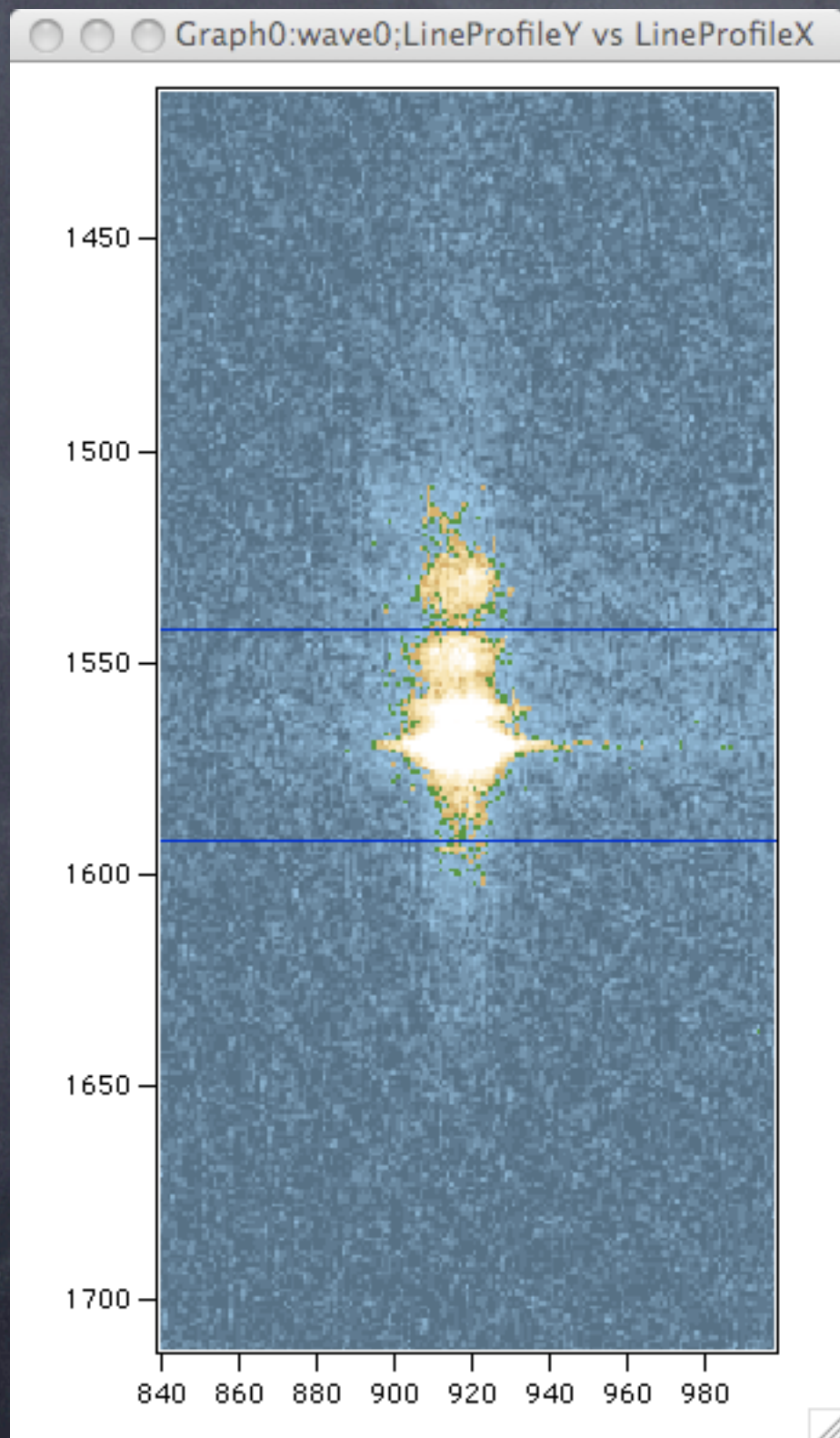
q = q_value

s = error (\sqrt{r})

Line integration



Line integration



Before you Leave

- Clean up preparation area and remove your samples
- Close helium/other gasses
- Tell us when you are done collecting data
- Report Errors
- Suggest Improvements
- Getting your data through sftp password: