

The Data Acquisition System of the Liquids Reflectometer

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Ensure that CSS control is opened on the OPI computer. If not, click the CSS control icon on the desktop.

The view below shows the Dashboard, where you can monitor your sample data collection, change motor positions, change chopper settings, monitor beam power and observe the status of the various components of the instrument. Liquids Reflectometer User Experiment tabs

Liquids Reflectometer - Dashboard Two

Run Status
 Last Run Number: 150152
 Current Status: Idle
 Run Time: 20671 s
 Neutron Counts: 11813 Events
 Neutron Rate: 0 n/s
 Proton Charge: 1561.0390 mC
 Center Wavelength: 4.25 Å
 Frequency: 60 Hz

Proposal Information
 Proposal #: IPTS-16276
 Proposal Title: Determining the Electrochemical Response Mechanism of Nanostructured Ionic Block Copolymers
 Team Members: (XCAMS/UCAMS) 3V3,EWD,JFB,MVT

Instrument Status
 Beam Power: 0
 Primary Shutter: Idle
 Secondary: Idle
 Motors: Scan Server, Auto Align, Run Control, Chopper Gbl
 Direct Beam, Nested Scan, Instrument Mode

Control Shortcuts
 Open Manual Align/Quoted Align
 Open Dashboard Full
 Start Diagnostic / Stop Diagnostic
 Choppers / Motors (User)
 Table Scan / Manual
 Open "User Experiment"
 Open "Plan New Experiment"

Multi-Environment Chamber
 HV Pulser and Vacuum
 Setpoint: 0 V
 Ramp Rate (V/sec): 5
 Meter Reading: 67 V
 Soft Interlock: 2.000E-4 mBar
 Pressure: 1.7400E-6 mBar, 4.5400E-7 mBar
 Low Limit: 0.000 mBar, 0.000 mBar
 High Limit: 0.000 mBar, 0.000 mBar
 Vac OK/low V: *** Interlock is active or HV is off ***

Motors
 tth: 2.34300 degre, 2.34251 degre
 zt: 156.51574 mm, 156.53700 mm
 tthd: 4.68600 degre, 4.68380 degre
 chis: 0.64362 degre, -0.64774 degre
 s1 X Gap: 20.0000, 20.0000
 s1 Y Gap: 1.5380, 1.5390
 s1 X Center: 0.0000, -0.0000
 s1 Y Center: 0.0000, 0.0000
 s1 X Center: 0.0000, 0.0000
 s1 Y Center: 0.0000, -0.0005
 Center Position: OK, OK, OK, OK
 Centers Disabled

Chopper
 4.25 60 :Set
 4.250 A 60 Hz

Attenuator
 A0 A0

Current Experiment
 Primary Run Number: 150152 Use Latest
 Comparison Run Number: 150110 Show
 Reflectivity vs Q (1/Å) plot showing Primary Reflectivity + Err and Comparison Reflectivity + Err.

Instrument Operating Mode
 Reflect Up - zt, Beam-Centered, Multi-Environment Chamber, Reflectivity, Sample_Data

Sample Data Collecting Details
 hv_voltage: total number of steps 8 1
 Total number of runs in csv file: 7

Scan Monitor

| ID | Created | Name | State | % | Runtime | Finish | Command | Error |
|-------|--------------------|---|---------------|---|----------|----------|---------|---------|
| 26215 | 2016-12-08 17:35:0 | hv_voltage @-4000.0 Multi-Environment Chamber, MC2-71-1-B | Aborted | | 0 ms | 7 | | |
| 26214 | 2016-12-08 17:34:5 | hv_voltage @4000.0 Multi-Environment Chamber, MC2-71-1-B | Aborted | | 0 ms | 7 | | |
| 26213 | 2016-12-08 17:34:5 | hv_voltage @-3000.0 Multi-Environment Chamber, MC2-71-1-B | Aborted | | 0 ms | 7 | | |
| 26212 | 2016-12-08 17:34:4 | hv_voltage @3000.0 Multi-Environment Chamber, MC2-71-1-B | Aborted | | 07:35:33 | 10:46:50 | -end- | Aborted |
| 26211 | 2016-12-08 17:34:4 | hv_voltage @-2000.0 Multi-Environment Chamber, MC2-71-1-B | Finished - OK | | 02:42:16 | 03:11:17 | -end- | |

Scan Server Memory: Heap: 605.5 / 810.5 MB (66.5 %), Non-Heap: 320.1 MB

Click the “User Experiment” button in the Controls Shortcuts area of the screen to run your sample. You will then be presented with the view shown below.

Liquids Reflectometer User Experiment

1. Proposal/Operating Mode2. Prepare for Direct Beam3. Collect Direct Beam4. Align Sample5. Collect DataDashboard

1.1 Proposal Information

Proposal #: IPTS-18486 Switch

Proposal Title: Instrument Calibration

Team Members: CSG;CEH;EWD;JFB;MOP;PZI;VUK (Name:XCAMS/UCAMS:Role, where 'P' indicates Primary Investigator, 'E' is Editor, and 'V' is Viewer.)

Run Cycle: SNS 2016-A

1.2 Sample Environment Device and Operating Mode

Special SE Devices Reflect Up - hs Reflect Down - hs Reflect Up - zs Reflect Down - zs Earth-Centered Beam-Centered

Robot

Liquid/Solid Cell

Electrochemical Cell

Rheometer

Multi-Environment Chamber

Langmuir Trough

Flow/Shear Cell

1.3 Align sample BEFORE collecting direct beam data?

Yes No

Substrate thickness: 5.00 mm

Change Mode Only:ReflectivityDirect Beam

Instrument Status

| | | | | | |
|-----------------------|-------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Choppers Phase Locked | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Motors Status | <input type="checkbox"/> | OK | <input type="checkbox"/> | Busy? | <input type="checkbox"/> |
| SE Device | Multi-Environment Chamber | | | | |
| Operating Mode | Reflect Up - zs | | | | |
| Motor Positions | 0 (0: Sample; 1: Direct Beam) | | | | |

Selected Proposal: IPTS- 18486

Selected SE Device: Special SE Devices

Selected Operating Mode: Reflect Up - hs

Pre-Config ExperimentsReset

Next

*** NOTICE *** the current instrument operating mode and sample environment device does not match the selection. Be aware that when you navigate away from this screen, the elements on the other screens will be presented according to the current instrument operating mode and sample environment context.

If you want to change modes or devices, please press one of the two mode buttons to the left.

1. Proposal/Operating Mode

This tab is where the current experiment, users, run-cycle sample environments, and operating modes are set.

1.1 Proposal Information

1.1.1 Users and staff can change the IPTS numbers for the experiment, by clicking the “Switch” button, type in the IPTS number that has been approved for your experiment into the blue box, Proposal ID, and press enter to ensure that the number is entered into the system.

Beamline: Run State: Proposal ID:

| ID | Title | Start | Members | ID | Name | Description | Mass | Container | Na |
|-------|---|------------|------------------------------|-------|-------------------|----------------------|---------|---------------|----|
| 18486 | Instrument Calibration | 2017-02-24 | C5G;C5G;CEH;CEH;EWD;JFB;JFB | -1 | No sample | N/A | N/A | N/A | N/ |
| 16012 | Instrument Commissioning and Calibration at the Liqui | 2016-02-11 | 6OV;CEH;EWD;HANYU;HJK;JFB;P | 45848 | Silicon Substrate | Silicon wafer | 50 g | Fluroware | Nc |
| 13550 | Neutron Reflectivity Study of a P3HT-b-P3TEGT Monola | 2015-02-04 | CEH;HIA;JFB;KH7;KPj;VUK | 52008 | Moly standard | Thin Moly film on Si | 200 Åµg | Fluroware | Th |
| 13536 | Investigating detector options at the Liquids Reflectom | 2015-04-01 | 8LS;ATREMSIN;CEH;H2B;JFB | 52474 | Phospholipids | DPPC/ d-DPPC, DPPG | 0.001 g | Glass Contair | Nc |
| 11021 | Instrument Commissioning and Calibration at the Liqui | 2014-02-09 | 6OV;6OV;CEH;CEH;GLAVIC;JFB;J | 52475 | Phospholipids | DPPC/ d-DPPC, DPPG | 0.001 g | Glass Contair | Nc |
| 11020 | Integration and Commissioning of a Gas Environment i | 2014-06-04 | CEH;JFB;VUK;ZMA | 52494 | Silicon Substrate | Silicon wafer | 50 g | Fluroware | Nc |
| 8090 | Upgrades and Calibration at the Liquids Reflectometer | 2013-04-27 | CEH;FEIYU1986;JFB;KPj;VUK | 52693 | Phospholipids | DPPC/ d-DPPC, DPPG | 0.001 g | Glass Contair | Nc |
| 7053 | Calibration and Commissioning at Beam Line 4B | 2012-02-14 | CEH;GS2;JFB;VUK | | | | | | |

Proposal ID: Start: Sample ID: Name:

Title: Mass: g Container:

Members: Formula: Nature:

Description:

Comments:

SMS Update:

1.1.2 One can also double click their proposal number if it is listed on the page. Click the “Return to” button to exit from this view. This will take you back to the Liquids Reflectometer Dashboard. Click the Open “User Experiment” button in the Controls Shortcuts area of the screen to go to back to the Liquids Reflectometer User Experiment tabs view

1.2 Sample Environment Device and Operating Mode

1.2.1 This is where the sample environment that will be used for your experiment selected.

- 1.2.2 Click the environment you are using and this click whether reflectivity is up or down.
- 1.2.3 If you have an environment that is not listed, select Special SE Device.

1.3 Align sample BEFORE collecting direct beam data?

- 1.3.1 You can setup to align your sample before collecting direct beam, for samples that have to do data collection thru media beside air, by selecting yes in this step; change the motor position for the instrument based on pre-settings for the sample environment selected, and change modes without changing motors.
- 1.3.2 To Change Mode Only: this will change the mode of the experiment that will affect the operating state of the instrument.
 - 1.3.2.1 In order for the mode to change you will have to click the **Reflectivity** or **Direct Beam** buttons
 - 1.3.2.1.1 **Reflectivity** is when you are collecting data on your sample. This is needed so that the auto-reduce works.
 - 1.3.2.1.2 **Direct Beam** should be selected when collecting direct beam scans. This will make all buttons live in tab 3.
 - 1.3.2.1.2.1 This is important to select correctly so that the auto-reduce know which files to use to normalize the reflectivity data.
 - 1.3.2.2 If you click the Change Mode Only button it will turn into a HOME button, which will move motors of the instrument to pre-sets for the selected sample environment.
 - 1.3.2.3 Click

Click **Next** to move on to the next step. You can click on any of the tabs at the top of the page when every you like to gain access that step.

2. Prepare for Direct Beam

This tab is used to change the height of the sample, if a sample is on the goniostat, so that we can run direct beams through air or sample media.

2.1 If no is selected on step 1.3 then tab 2 will load a preset height value based on the sample environment selected. Click **Next**.

Liquids Reflectometer User Experiment

1. Proposal/Operating Mode | **2. Prepare for Direct Beam** | 3. Collect Direct Beam | 4. Align Sample | 5. Collect Data | Dashboard

2. Prepare for Direct Beam: Lower Down Sample Height

Current SE Device: Robot

Current Operating Mode: Reflect Up - hs

Sample at Target: 0 (if "0": empty; if "-1": "manual" mode OR error)

Sample Height h_s : 14.89000 mm

Lower down Sample Height h_s by: 10 mm

Lower Down Sample Height for Direct Beam

Motors Status: 

Using Robot and NO sample at target

Next

2.2 If yes was selected on step 1.3, then tab 2 will display a view for auto or manual (assisted) alignment

Liquids Reflectometer User Experiment

1. Proposal/Operating Mode
2. Prepare for Direct Beam
3. Collect Direct Beam
4. Align Sample
5. Collect Data
Dashboard

2. Prepare for Direct Beam: Align Sample First

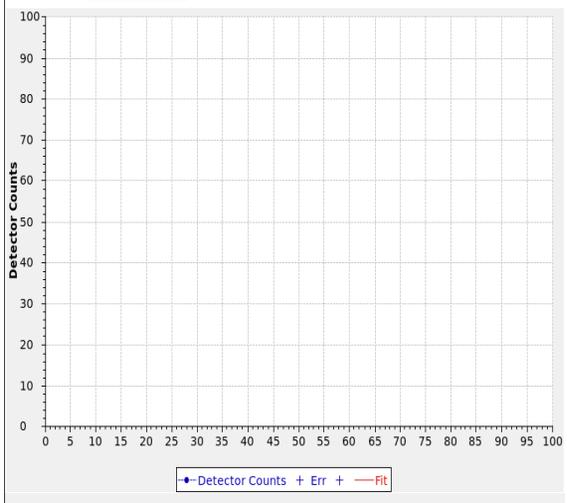
Auto Align
Manual Align

Beam Power:

Device: Start: End: Step: 0.007 Num:

Condition Unit: For per step

Fit Method: Normalize by step condition Go back after scan



+ Detector Counts + Err + — Fit

Fitted position: Status: ●

Guided Alignment Steps

Prev
Current Step 1
Next

Step 1 (Move Some Motors & Choppers)

- Set choppers to
- Move tthd to
- Move ths to
- Move S1 and Si Y:Gap to
- Move S1 and Si X:Gap to
- Move S3 and S4 Y:Gap to
- Set Condition Increment to

Stop All

Current SE Device:

Current Operating Mode:

Sample Height h_s :

Adjust Sample Height h_s by

Adjust Sample Height for Direct Beam

Motors Status: ●

3. Collect Direct Beam Runs

This step is mostly done by instrument staff and experienced users.

3.1 Please follow step 1.3.2 by ensuring that the instrument is in the Direct Beam motor positions.

1.3 Align sample **BEFORE** collecting direct beam data?

Yes No

Substrate thickness: 5.00 mm

Change Mode Only: **Reflectivity** **Direct Beam**

| Instrument Status | |
|-----------------------|---|
| Choppers Phase Locked | <input checked="" type="checkbox"/> OK <input type="checkbox"/> Busy? |
| Motors Status | <input checked="" type="checkbox"/> |
| SE Device | Robot |
| Operating Mode | Reflect Up - hs |
| Motor Positions | 1 (0: Sample; 1: Direct Beam) |

Data collection mode indicator

Once this has been changed, click the **#3 Collect Direct Beam** button at the top of the page

3.2 Direct beam runs collection plan:

3.2.1 Click the folder on the collected direct beam runs using .csv file line to select the direct beam sequence you want to run.

3.2.1.1 The run files are located in the /home/controls/var/tmp/ folder in either the 30Hz_Scans, 60Hz_Scans or Liquid Scans folders

3.3 Select the "Incident Medium"

3.4 Enter email address you'd like notifications to be sent to in the "Send email notifications to:" box and press ENTER after you input the information.

3.5 Ensure that the sample is at the correct height before starting the direct beams if one is on the goniometer.

3.6 Click **Start Collecting** to collect the direct beams

Liquids Reflectometer User Experiment



3. Collect Direct Beam Runs

Auto Reduction Information

Data Type:

- Sample_Data
- Direct_Beam
- Zero-att_Direct_Beam
- Other

Scaling Factor File:

Zero Attenuator Direct Beam Runs:

Direct beam runs collection plan:

Collect direct beam runs using .csv file: (Total number of runs: 0)

Incident Medium:

- Air
- Quartz
- Si
- Other:

(Full title for direct beam runs will be:
'Direct Beam thru ' + Incident Medium + '-' + sequence_number+'.')

Send email notifications to:

Current SE Device:

Current Operating Mode:

Busy?

(Check Dashboard) Last Status: Started @2018-01-10 09:45:32

Please ensure that the Direct Beam collection has completed BEFORE moving on to the

3.7 Once the direct beam scan is completed, return to step 1.3.2 and change the data collection mode to **Reflectivity**.

4. Align Sample

In step number 4 we have 2 options: **Auto Align** a sample or assisted **Manual Align** a sample.

4.1 **Auto Align**

4.2 Click the **Auto Align** button

4.2.1 Click **Run** to start the alignment

Prepare for Direct Beam | Table Scan | Potentiostat

Liquids Reflectometer User Experiment

1. Proposal/Operating Mode | **2. Prepare for Direct Beam** | 3. Collect Direct Beam | 4. Align Sample | 5. Collect Data | Dashboard

2. Prepare for Direct Beam: Align Sample First

Auto Align | **Manual Align** | Beam Power: 0

Mode: inverted | 5.00 mC Per step | Status: Run

The graph shows a grid with the y-axis labeled 'Detector Counts' ranging from 0 to 100 and the x-axis labeled 'Motor Position' ranging from 0 to 100. A legend at the bottom indicates: Detector Counts, Err, Fit.

Next | Stop

Motors

ths -4.24997 degr

hs 14.89000 mm

chis -1.00000 degr

Current SE Device: Electrochemical Cell

Current Operating Mode: Reflect Down - hs

Sample Height h_s : 14.89000 mm

Adjust Sample Height h_s by: 2.500 mm

Adjust Sample Height for Direct Beam

Motors Status:

Next

4.3 **Manual Align:** This is assisted manual alignment if needed.

4.3.1 Click the **Manual Align** button

4.3.2 Step through each step in the **Guided Alignment Steps** if this needed

Liquids Reflectometer User Experiment

1. Proposal/Operating Mode 2. Prepare for Direct Beam 3. Collect Direct Beam 4. Align Sample 5. Collect Data Dashboard

4. Align Sample Start Diagnostic Stop Diagnostic

Beam Power: 803.65 Rate: 0 e/s

Device: hs 9.800 mm Start: 4.801 End: 14.801 Step: 0.100 Num: 100

Condition Unit: pcharge 8.77E-1 mC For 0.80 mC per step

Fit Method: Normalize by step condition Go back after scan

Detector Counts vs hs plot showing a dip. Values: 310.29, 140.9, 129.52, 118.14.

Guided Alignment Steps Step 2 (Scan hs)

Scan hs from 4.80 mm to 14.80 mm in 100.00 steps Run

Find the mid-point of the dip seen on the plot on the left. For example:

Detector Counts vs Motor Position plot showing a dip. Value: 443.34. Pick this position.

If required, do another scan from 7.80 mm to 11.80 mm in 40.00 steps Run

Or, if no dip found, widen from -0.20 mm to 19.80 mm in 200.00 steps Run

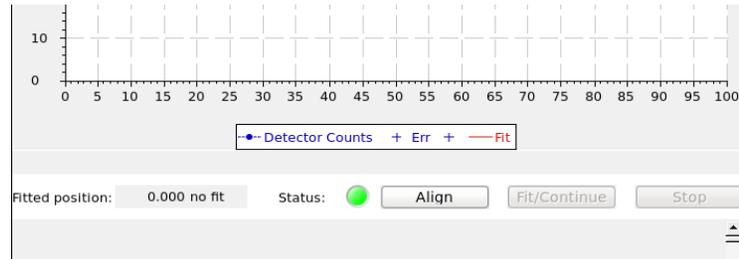
Untitled scan... (Aborted)

Fitted position: 0.003 degree Status: ● Align Fit/Continue Stop

2017-04-05 14:58:06 INFO --- using logfile=/home/controls/var/tmp/IPTS-16861/2017 Data/April/2017/170405/sc170405_008.txt
 2017-04-05 14:58:06 INFO --- Performing Manual Alignment on axis 'hs' ---
 2017-04-05 14:58:06 INFO [4.801,14.801] in 100 steps, count pcharge for 8.000e-01 mC per step

4.3.3 One can also manually enter in values into the blue boxes on the screen, ensuring to press the **ENTER** button on the keyboard to input the values.

4.3.4 To start the scans, click the **Align** button located below the graph.



5. Collect Data

This tab is used to collect Reflectivity. The view will change based on the sample environment that is selected in tab 1, step 1.2.

Liquids Reflectometer User Experiment

Dashboard

5. Collect Data

Auto Reduction Information

Data Type: Sample_Data
 Direct_Beam
 Zero-att_Direct_Beam
 Other

Scaling Factor File:

Zero Attenuator Direct Beam Runs:

*** NOTICE *** Automatic Alignment is enabled for the Data collection plan. Are you certain you wish to align each time you take data?

If you do not want to do this, just un-check this box: Auto Align

Data collection plan:

layers of loops (including the scan file).

For each (selected: SampleTemp) **Start:** **Stop:** **Step Number:**

free input: **Step Size:**

Soak For:

Collecting data using scan file: (Total number of runs: 0)

Sample Name: (Please type to overwrite.)

(Full title for data runs will be:
Sample Name + '-' + sequence_id + '-' + sequence_number + '-',
where sequence_id is the run number when sequence_number = 1.)

Send email notifications to:

Current SE Device:

Current Operating Mode:

Busy? **Start Coll**

(Check Dashboard) Last Status: Started @2018-01-

5.1 Multi-Environment Chamber

5.1.1 When this tab is opened, you may have to change the **Data collection plan:** to 2 layers from the “**layers of loops**” dropdown menu.

5.1.1.1 This will change the display so that the correct sample environment can be selected to run along with the neutrons.

5.1.2 If this box is checked, then there will be an auto-alignment run between each temperature change. If this is not desired, then uncheck the box.

***** NOTICE *** Automatic Alignment is enabled for the Data collection plan. Are you certain you wish to align each time you take data?**

If you do not want to do this, just un-check this box: Auto Align

5.1.3 Select **SampleTemp** from the dropdown so that the reflectivity and run per temperature needed.

5.1.3.1 You can either set a **start, stop, and step number** for the temperature or list the temperatures need in the **free input** box. Press ENTER after each entry.

5.1.3.1.1 Values are listed in the **free input** box override start/stop inputs.

5.1.4 **Soak for** is the equilibrium time needed at each temperature before neutron reflectivity starts.

5.1.4.1 Enter the time in seconds and press ENTER.

5.1.5 **Collecting data using scan file** is where one would select the set of reflectivity setting to run.

5.1.5.1 Click the folder on the collected direct beam runs using .csv file line to select the direct beam sequence you want to run.

5.1.5.1.1 They are located in the /home/controls/var/tmp/ folder either in the 30Hz_Scans, 60Hz_Scans or Liquid Scans folders and have refl at the front of the file.

5.1.6 **Sample Name** is where the name of the sample is entered. Press ENTER to ensure the name is changed after it is inputted.

5.1.7 **Send email notifications to:** Enter email address you'd like notifications to be sent to and press ENTER after you input the information.

5.1.8 Click **Start Collecting** to collect the reflectivity

5.2 Robot

5.2.1 Follow the **Robot Magazine Operation** guide for loading the sample magazine before performing this

step.

5.2.2 This view is accessed by clicking the **5. Collect Data** tab and is present when robot is selected in step 1.2.

Liquids Reflectometer User Experiment

1. Proposal/Operating Mode 2. Prepare for Direct Beam 3. Collect Direct Beam 4. Align Sample 5. Collect Data

Dashboard

5. Collect Data with Robot Sample Changer

Auto Reduction Information

Data Type:

- Sample_Data
- Direct_Beam
- Zero-att_Direct_Beam
- Other

Scaling Factor File:
sf_Air_aaaaahhh_38_21_3.5_0.3_0316.cfg

Zero Attenuator Direct Beam Runs:

*** NOTICE *** You can choose to make an adjustment to the 'ys' motor prior to alignment.
If you want this, provide a value: Adjust Y 0.000 mm

Data collection plan:

For each sample at sample changer slots: [] e.g. 1-3, 6, 7, 11-13 Number of slots: 0 Expanded list: []

Collecting data using scan file: /home/controls/var/tmp/30Hz_Scans/refl-22-11_30Hz.csv (Total number of runs: 0)

Robot Sample Changer Slots Information

| # | Description | hs (mm) | # | Description | hs (mm) | # | Description | hs (mm) |
|-----|-----------------|---------|-----|--------------------|---------|-----|------------------|---------|
| 1. | Sn Ni Si 110117 | 29.7 | 2. | Mo Si 110217.pg252 | 29.7 | 3. | Fe2O3 100917 C | 29.7 |
| 4. | Fe2O3 101017 B | 29.7 | 5. | Fe2O3 101017 D | 29.7 | 6. | Fe2O3 100317 A | 29.7 |
| 7. | | 28.9 | 8. | CINT Ir | 29.7 | 9. | UAB 1017 01 | 29.7 |
| 10. | UAB 1017 02 | 29.7 | 11. | UAB 1017 03 | 29.7 | 12. | UAB 1017 04 | 29.7 |
| 13. | quartz | 24.7 | 14. | MC2-170-1 1.25wt | 29.7 | 15. | MC2-170-2 1.25wt | 29.7 |
| 16. | MC2-168 1.25wt | 29.7 | 17. | UAB 1017 05 | 29.7 | 18. | UAB 1017 06 | 29.7 |

Sample at Target: 0 (If "0": empty; If "-1": "manual" mode OR error)

Send email notifications to: []

Current SE Device: Robot

Current Operating Mode: Reflect Up - hs

Busy? **Start Collecting**

(Check Dashboard) Last Status: Started @2018-01-10 09:45:32

5.2.3 Data collection plan:

5.2.3.1 Enter the range and/or sequence of samples you'd like run in the **For each sample at sample changer slots** box, press ENTER.

5.2.3.2 **Collecting data using scan file** is where one would select the set of reflectivity setting to run.

5.2.3.2.1 Click the folder on the collected direct beam runs using .csv file line to select the direct beam sequence you want to run.

5.2.3.2.2 They are located in the /home/controls/var/tmp/ folder either in the 30Hz_Scans, 60Hz_Scans or Liquid Scans folders and have refl at the front of the file.

5.2.3.3 Robot Sample Changer Slots Information

5.2.3.3.1 The slot will turn blue when there is a sample in that slot.

5.2.3.3.2 Enter the name of the sample in the **Description** from the sample magazine log sheet in accordance with the slot number. Press ENTER to ensure the name is changed after it is inputted.

5.2.3.3.3 Type the hs value into the **hs (mm)**. This is when you have different thickness of substrates. The standard substrate size is 2" diameter with a 5 mm thickness.

5.2.3.3.3.1 We can run, 2", 3", and 4" diameter samples.

5.2.3.4 **Send email notifications to:** Enter email address you'd like notifications to be sent to and press ENTER after you input the information.

5.2.4 Click **Start Collecting** to collect the reflectivity for each sample

5.2.5 Dashboard view with Robot Status:

Sample Data Collecting Details - Robot

Total number of used sample: 0 / 0

Total number of runs in csv: 54 / 0

Sample at: 0

Sample changer slots: Not used, Queued, Collecting, Done, Error

Sample changer: 1-18 slots (radio buttons)

CSV: /home/controls/var/tmp/IPTS-18486/2017 Data/November 2017/171127/ts171127_001.csv

| Total | Num | thi | tthd | zi | zd | s1YGa | s1XGa | siYGa | siXGa | s3YGa | s4YGa | For | Value |
|-------|-----|-------|-------|--------|--------|-------|-------|-------|-------|-------|-------|--------|-------|
| 54 | 1 | -2.5 | -2.5 | 17.675 | 34.02 | 0.26 | 3 | 0.26 | 3 | 30 | 30 | BL4B:D | 0.1 |
| | 2 | -2.55 | -2.55 | 17.232 | 32.645 | 0.26 | 3 | 0.26 | 3 | 30 | 30 | BL4B:D | 0.1 |
| | 3 | -2.6 | -2.6 | 16.79 | 31.27 | 0.26 | 3 | 0.26 | 3 | 30 | 30 | BL4B:D | 0.1 |
| | 4 | -2.65 | -2.65 | 16.347 | 29.895 | 0.26 | 3 | 0.26 | 3 | 30 | 30 | BL4B:D | 0.1 |
| | 5 | -2.7 | -2.7 | 15.905 | 28.52 | 0.26 | 3 | 0.26 | 3 | 30 | 30 | BL4B:D | 0.1 |
| | 6 | -2.75 | -2.75 | 15.462 | 27.145 | 0.26 | 3 | 0.26 | 3 | 30 | 30 | BL4B:D | 0.1 |
| | 7 | -2.8 | -2.8 | 15.02 | 25.77 | 0.26 | 3 | 0.26 | 3 | 30 | 30 | BL4B:D | 0.1 |
| | 8 | -2.85 | -2.85 | 14.577 | 24.395 | 0.26 | 3 | 0.26 | 3 | 30 | 30 | BL4B:D | 0.1 |

Centers Disabled

Stop All

Motors Status: All Enabled

Chopper: 4.25, 60 Hz, 4.250 A, 0 Hz

Attenuator: A0

Instrument Operating Mode: Reflect Up - hs, Beam-Centered, Robot, Reflectivity

Frame Skipping Mode: Set Mode: 30Hz 6A thm=0.0, 60Hz 4.25A thm=-3.88

Lakeshore: Setpoint 0.000 K, Range, Scan Tolerance 1.0, Temperature 0.000 K

5.2.5.1 A color change will appear by the sample number ran.

5.2.5.2 If the auto alignment fails on a sample, a red dot will appear next to the number and the robot will put

the sample back into the sample magazine and move on to the next sample in the sequence.

- 5.3 Special SE Devices
- 5.4 Liquids/Solid Cell
- 5.5 Electrochemical Cell
- 5.6 Langmuir Trough
- 5.7 Flow/Shear Cell

6. Dashboard

After launching your data collection, return to **Dashboard** and watch it roll in.

The screenshot displays the BL4B Dashboard software interface, which is used for controlling the Liquid Reflectometer. The interface is divided into several sections:

- Run Status:** Shows the last run number (150152), current status (Idle), run time (20671 s), and various counts (Neutron, Proton, Center Wavelength, Frequency).
- Proposal Information:** Includes the proposal number (IPTS- 16276), title, and team members (3V3:EWDJFB,MVT).
- Instrument Status:** Displays the beam power (0), primary shutter (Secondary), and operating status (Idle).
- Control Shortcuts:** A red box highlights this section, which contains buttons for "Open Dashboard Full", "Start Diagnostic", "Choppers", "Motors (User)", "Table Scan", "Manual", "Open 'User Experiment'", and "Open 'Plan New Experiment'".
- Current Experiment:** Shows the primary run number (150152) and comparison run number (150110), along with buttons for "Start Diagnostic", "Stop Diagnostic", "Choppers", "Motors (User)", "Table Scan", "Manual", "Open 'User Experiment'", and "Open 'Plan New Experiment'".
- Multi-Environment Chamber:** Displays the HV Pulser and Vacuum status, including setpoint (0 V), ramp rate (5 V/sec), meter reading (67 V), and soft interlock (2.000E-4 mBar).
- Motors:** Lists the positions for various motors (tthd, zs, tthd, chis, s1 Y Gap, s1 X Gap, s1 Y Gap, s3 Y Gap, s4 Y Gap, s1 X Center, s1 Y Center, s1 X Center, s1 Y Center) and their status (Ok).
- Motors Status:** Shows "All Enabled" and "Centers Disabled".
- Chopper:** Displays the chopper settings (4.25 A, 60 Hz) and "Set" button.
- Attenuator:** Shows the attenuator settings (A0, A0) and "Set" button.
- Graph:** A plot of Reflectivity vs Q (1/Å) showing Primary Reflectivity (blue) and Comparison Reflectivity (green).
- Instrument Operating Mode:** Shows the current mode (Reflect Up - zs) and other modes (Beam-Centered, Multi-Environment Chamber, Reflectivity, Sample_Data).
- CSV File:** Displays the file path and a table of data points.
- Sample Data Collecting Details:** Shows the hv_voltage (4.25) and total number of steps (1).
- Scan Monitor:** A table showing the status of various scans.

| Total | Num | ths | tthd | S1YGaj | S1XGaj | S1YGaj | S1XGaj | S1YGaj | S1XGaj | lambda | Comm | For | Value |
|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|------|--------|-------|
| 7 | 1 | 0.6 | 1.2 | 0.394 | 20 | 0.208 | 20 | 20 | 20 | 15 | | BL4B-D | 6000 |
| 2 | 0.6 | 1.2 | 0.394 | 20 | 0.208 | 20 | 20 | 20 | 20 | 12.386 | | BL4B-D | 6000 |
| 3 | 0.6 | 1.2 | 0.394 | 20 | 0.208 | 20 | 20 | 20 | 20 | 9.74 | | BL4B-D | 6000 |
| 4 | 0.6 | 1.2 | 0.394 | 20 | 0.208 | 20 | 20 | 20 | 20 | 7.043 | | BL4B-D | 6000 |
| 5 | 0.6 | 1.2 | 0.394 | 20 | 0.208 | 20 | 20 | 20 | 20 | 4.261 | | BL4B-D | 18000 |
| 6 | 1.183 | 2.366 | 0.777 | 20 | 0.411 | 20 | 20 | 20 | 20 | 4.25 | | BL4B-D | 18000 |
| 7 | 2.343 | 4.686 | 1.538 | 20 | 0.813 | 20 | 30 | 30 | 30 | 4.25 | | BL4B-D | 36000 |

| ID | Created | Name | State | % | Runtime | Finish | Command | Error |
|-------|--------------------|--|---------------|---|----------|----------|---------|---------|
| 26215 | 2016-12-08 17:35:0 | hv_voltage @4000.0 Multi-Environment Chamber, MC2-71-1-B | Aborted | | 0 ms | 7 | | |
| 26214 | 2016-12-08 17:34:5 | hv_voltage @4000.0 Multi-Environment Chamber, MC2-71-1-B | Aborted | | 0 ms | 7 | | |
| 26213 | 2016-12-08 17:34:5 | hv_voltage @3000.0 Multi-Environment Chamber, MC2-71-1-B | Aborted | | 0 ms | 7 | | |
| 26212 | 2016-12-08 17:34:4 | hv_voltage @3000.0 Multi-Environment Chamber, MC2-71-1-B | Aborted | | 07:35:33 | 10:46:50 | -end - | Aborted |
| 26211 | 2016-12-08 17:34:4 | hv_voltage @2000.0 Multi-Environment Chamber, MC2-71-1-B | Finished - OK | | 02:42:16 | 03:11:17 | -end - | |