

# FIP-BM30A

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Beamline Status



Y. Sallaz-Damaz  
MXCuBE Meeting - January 2017



# FIP-BM30A : Staff

## Administration

**J.-L. Ferrer**  
FIP responsible

**P. Israel-Gouy**  
secretary

## FIP technical Staff

**Y. Sallaz-Damaz**  
Instrumentation & Software - 100%

**M. Pirocchi**  
Samples & Vaccum & Cryo - 20%

**P. Jacquet**  
Mechanics & CAD - 50%

**C. Berzin**  
PLC & Electronics - 100%

## Local contact

**F. Borel**

**D. Cobessi**

**M. Pirocchi**

**J.-L. Ferrer**

# FIP-BM30A : hardware

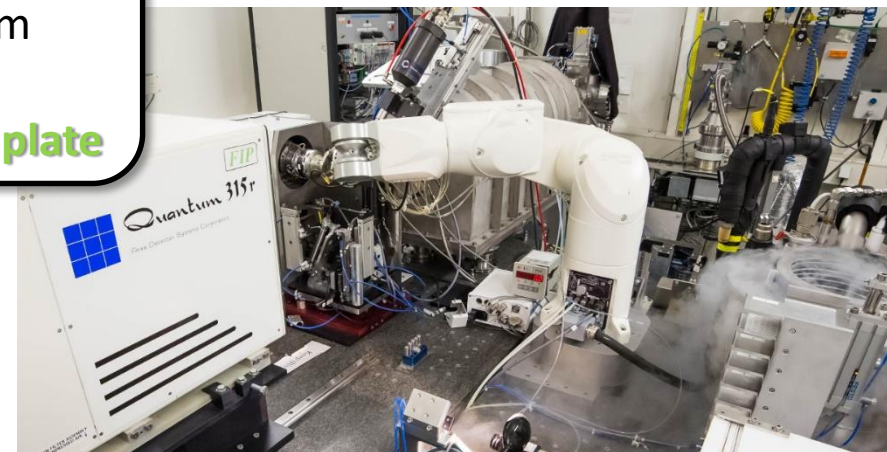
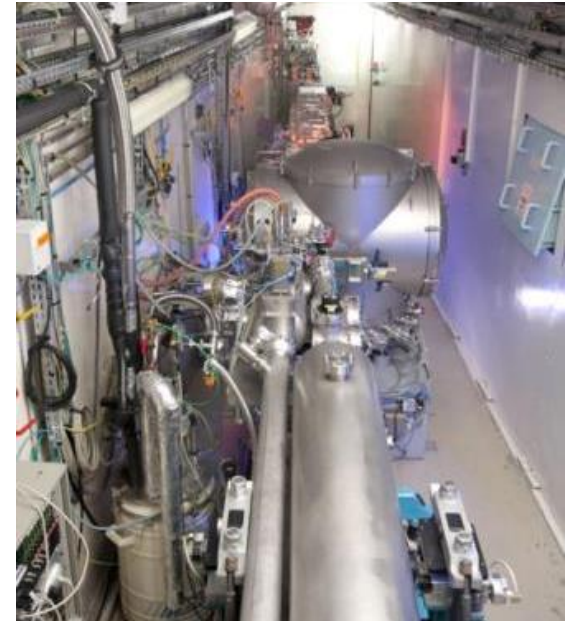
FIP is optimized for the anomalous diffraction (SAD/MAD) from 0.7 to 1.75Å

## Optical elements :

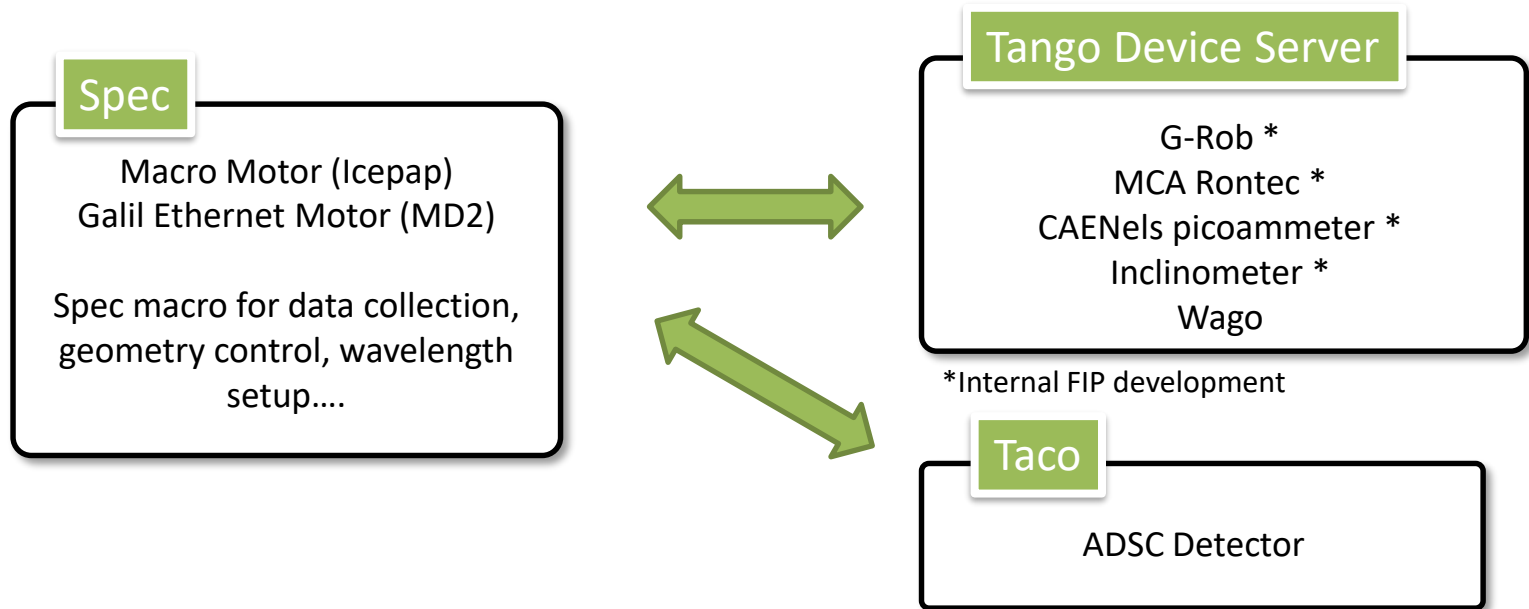
- 2 parabolic mirrors
- a double monochromator cooled with LN2 + sagittal focalization

## Sample environment :

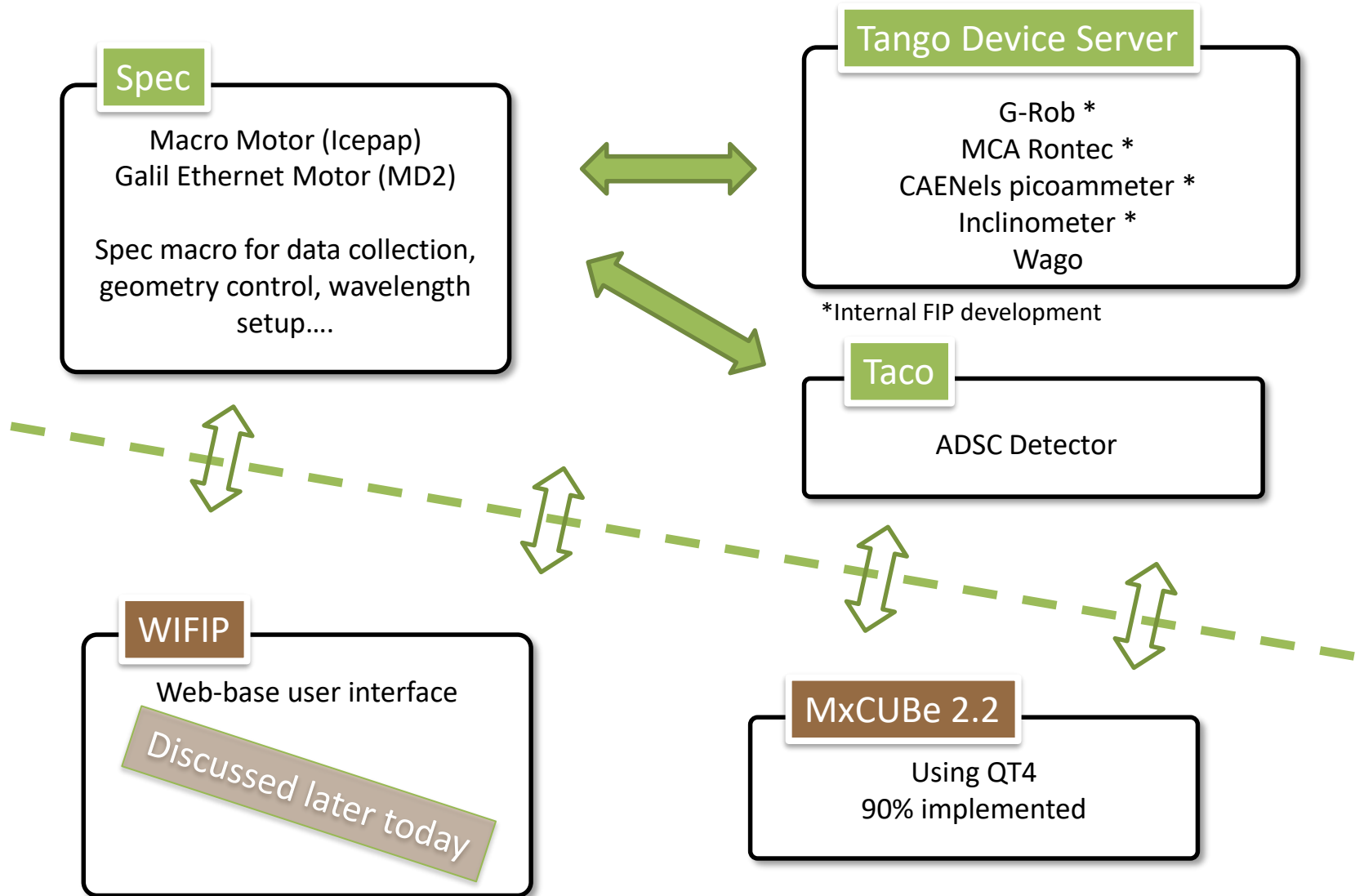
- MD2 goniometer driven by a Galil controller and ICEPAP
- a CCD detector ADSC 315R
- A drilled on axis sample microscope
- a sample beam size around 200-300µm
- **a Custom G-Rob to change sample**
- **and to mount and expose diffraction plate**



# FIP-BM30A : main software



# FIP-BM30A : main software



# FIP-BM30A : MxCUBE

MXCuBE Qt4

File View Graphics tools Help

Collect Log Chat Test

Sample centring

Omega: 0.00 90.0 Phi: 0.00 10.0 Kappa: 0.00 10.0

Zoom 6x Light: 0.00 1.0 Focus: 0.00 1.0

Sample video

Centre Save Line Grid Focus Snapshot Refresh Align Select all Clear all Auto

Collection method

Standard Collection

Acquisition

Oscillation start: 0.0 Oscillation range: 0.0

Number of images: 0 First image: 0

Exposure time (s): 0.00000 Detector mode:

Kappa: 0.0 Phi: 0.0

Energy (keV): 0.0 MAD ip: -

Resolution (Å): 0.0

Transmission (%): 0.0

Shutterless

Inverse beam Subwedge size:

Data location

Folder:

File name:

Prefix:

Run number: 0

Processing parameters

N.o. residues: 200.0 Space group:

Unit cell:

Characterisation

Helical Collection

Energy Scan

XRF Spectrum

Advanced

Sample list

Code: opd - 30 Password: Logout Group: Set

Mode: Sample changer

Centring: Manual

Filter: No filter

Machine Status

???.? mA

Storage disc space

Energy

Current: 12.5820 keV

Wavelength: 0.985 Å

Set to: keV

Transmission

Current: 100.00%

Set to:

Resolution

Current: 2.824 Å

429.00 mm

Set to: A

Door interlock

unknown

Unlock

Safety shutter

disabled

Set in Set out

Current users

Selecting gives control

Allow timeout control

Ask for control

My name: d30control

Add to queue Collect Queue Pause

FIPCONTROL WIFIP INTMAX

# FIP-BM30A : MxCUBE

File View Graphics tools Help

Collect Log Chat Test

Sample centring

Omega: 0.00 Phi: 0.00 Kappa: 0.00

Zoom 6x Light: 0.00 Focus: 0.00

Sample video

Centre Save Line Grid Focus Snapshot Refresh Align Select all Clear all Auto

Collection method

Standard Collection

Acquisition

Oscillation start: 0.0 Oscillation range: 0.0

Number of images: 0 First image: 0

Exposure time (s): 0.00000 Detector mode:

Kappa: 0.0 Phi: 0.0

Energy (keV): 0.0 MAD ip: -

Resolution (Å): 0.0

Transmission (%): 0.0

Shutterless

Inverse beam Subwedge size:

Data location

Folder:

File name:

Prefix:

Run number: 0

Processing parameters

N.o. residues: 200.0 Space group:

Unit cell:

Characterisation

Helical Collection

Energy Scan

XRF Spectrum

Advanced

Sample list

Code: opd Password: Logout Group: Set

Mode: Sample changer

Centring: Manual

Filter: No filter

Machine Status

????.? mA

Storage disc space

Energy

Current: 12.5820 keV

Wavelength: 0.985 Å

Set to: keV

Transmission

Current: 100.00%

Set to:

Resolution

Current: 2.824 Å

429.00 mm

Set to: A

Door interlock

unknown

Unlock

Safety shutter

disabled

Set in Set out

Current users

Selecting gives control

Allow timeout control

Ask for control

My name: d30control

Beams size Slits Aperture

Horizontal: 300 µm Horizontal: 150 µm 300.00

Vertical: Vertical: 140 µm 299.00

Aperture: Default

Phase

Add to queue Collect Queue

BM30A\_Qt4\_Diffractometer

Inherit of GenericDiffractometer  
With CenteringMath HWO



# FIP-BM30A : MxCUBE

The screenshot displays the MxCUBE Qt4 software interface. The main window is titled "MXCuBE Qt4" and features a menu bar (File, View, Graphics tools, Help) and a toolbar (Collect, Log, Chat, Test). The interface is divided into several sections:

- Sample centring:** Includes controls for Omega (0.00), Phi (0.00), Kappa (0.00), and Focus (0.00).
- Sample video:** A large window showing a video feed of the sample. A green arrow points to a video player window titled "BM30A\_Qt4\_MjpgVideo" which is overlaid on the video feed. Below the video player, there are controls for "Beam size" (Horizontal: 300, Vertical: 300) and "Phase".
- Collection method:** A central panel with tabs for "Standard Collection", "Helical Collection", "Energy Scan", "XRF Spectrum", and "Advanced". The "Standard Collection" tab is active, showing acquisition parameters like "Oscillation start: 0.0", "Oscillation range: 0.0", "Number of images: 0", "Exposure time (s): 0.00000", "Kappa: 0.0", "Energy (keV): 0.0", "Resolution (Å): 0.0", and "Transmission (%): 0.0".
- Sample list:** A tree view showing a list of sample positions (Puck 1, Puck 2, Puck 3) with sub-positions like 1.1, 1.2, 1.3, etc.
- Machine Status:** A panel on the right showing "Machine Status" (??? mA), "Storage disc space", "Energy" (Current: 12.5820 keV, Wavelength: 0.985 Å), "Transmission" (Current: 100.00%), and "Resolution" (Current: 2.824 Å, 429.00 mm).

At the bottom of the interface, there is a taskbar with icons for "FIPCONTROL", "WIFIP", and "INTMAX".

**BM30A\_Qt4\_MjpgVideo**

Parse and display a HTTP motion jpeg video flux  
-> URLLib + Qtimage

# FIP-BM30A : MxCUBE

**BM30A\_Aperture**  
Inherit of MinidiffAperture

The screenshot displays the MxCUBE Qt4 software interface. The top menu bar includes 'File', 'View', 'Graphics tools', and 'Help'. Below the menu is a toolbar with 'Collect', 'Log', 'Chat', and 'Test' buttons. The main interface is divided into several sections:

- Sample centring:** Includes input fields for Omega (0.00), Phi (0.00), Kappa (0.00), and Focus (0.00).
- Sample video:** A large window showing a grayscale image of a sample with a red crosshair and a blue square region. A green arrow points from the text box below to this region.
- Collection method (Standard Collection):** Contains acquisition parameters such as Oscillation start, Number of images, Exposure time (s), Kappa, Energy (keV), Resolution (Å), and Transmission (%).
- Sample list:** A tree view showing a list of samples (Puck 1, Puck 2, Puck 3) with their respective IDs.
- Machine Status:** Displays current machine parameters including Energy (12.5820 keV), Wavelength (0.985 Å), Transmission (100.00%), and Resolution (2.824 Å).

The bottom of the interface features a taskbar with icons for 'FIPCONTROL', 'WIFIP', and 'INTMAX'.

# FIP-BM30A : MxCUBE

File View Graphics tools Help

Collect Log Chat Test

Sample centring

Omega: 0.00 Phi: 0.00 Kappa: 0.00

Zoom 6x Light: 0.00 Focus: 0.00

Sample video

Centre Save Line Grid Focus Snapshot Refresh Align Select all Clear all Auto

Collection method

Oscillation start:

Number of images

Exposure time (s): 0.00000 Detector mode:

Kappa: 0.0 Phi: 0.0

Energy (keV): 0.0 MAD ip: -

Resolution (Å): 0.0

Transmission (%): 0.0

Shutterless

Inverse beam Subwedge size:

Data location

Folder:

File name:

Prefix:

Run number: 0

Processing parameters

N.o. residues: 200.0 Space group:

Unit cell:

Characterisation

Helical Collection

Energy Scan

XRF Spectrum

Advanced

Add to queue Collect Queue

Machine Status

??? mA

Storage disc space

Show SC-Details

Energy

Current: 12.5820 keV

Wavelength: 0.985 Å

Set to: keV

Transmission

Current: 100.00%

Set to:

Resolution

Current: 2.824 Å

429.00 mm

Set to: A

Door interlock

unknown

Unlock

Safety shutter

disabled

Set in Set out

Current users

Selecting gives control

Allow timeout control

Ask for control

My name: d30control

FIPCONTROL WIFIP INTMAX

# FIP-BM30A : MxCUBE

File View Graphics tools Help

Collect Log Chat Test

Sample centring

Omega: 0.00 Phi: 0.00 Kappa: 0.00

Zoom 6x Light: 0.00 Focus: 0.00

Sample video

Centre Save Line Grid Focus Snapshot Refresh Align Select all Clear all Auto

Collection method

Standard Collection

Acquisition

Oscillation start: 0.0 Oscillation range: 0.0

Number of images: 0 First image: 0

Exposure time (s): 0.00000 Detector mode:

Kappa: 0.0 Phi: 0.0

Energy (keV): 0.0 MAD ip: -

Resolution (Å): 0.0

Transmission (%): 0.0

Shutterless

Inverse beam Subwedge size:

Data location

Folder:

File name:

Prefix:

Run number: 0

Processing parameters

N.o. residues: 200.0

Unit cell:

Characterisation

Helical Collection

Sample list

Mode: Sample changer

Centring: Manual

Filter:

Machine Status

Current: 12.5820 keV

Wavelength: 0.985 Å

Transmission

Current: 100.00%

Resolution

Current: 2.824 Å

429.00 mm

Door interlock: unknown

Safety shutter: disabled

Current users

Selecting gives control

Allow timeout control

Ask for control

My name: d30control

BM30A\_MultiCollect

Inherit of ESRFMultiCollect

# FIP-BM30A : MxCUBE

File View Graphics tools Help

Collect Log Chat Test

Sample centring

Omega: 0.00 Phi: 0.00 Kappa: 0.00

Zoom 6x Light: 0.00 Focus: 0.00

Sample video

Centre Save Line Grid Focus Snapshot Refresh Align Select all Clear all Auto

Collection method

Standard Collection

Acquisition

Oscillation start: 0.0 Oscillation range: 0.0

Number of images: 0 First image: 0

Exposure time (s): 0.00000 Detector mode:

Kappa: 0.0 Phi: 0.0

Energy (keV): 0.0 MAD ip: -

Resolution (Å): 0.0

Transmission (%): 0.0

Shutterless

Inverse beam Subwedge size:

Data location

Folder:

File name:

Prefix:

Run number: 0

Processing parameters

N.o. residues: 200.0 Space group:

Unit cell:

Characterisation

Helical Collection

Energy Scan

XRF Spectrum

Advanced

Code: opd Password: Logout Group: Set

Sample list

Mode: Sample changer

Centring: Manual

Filter:

Puck 1: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.10

Puck 2: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 3.10

Puck 3: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 3.10

Machine Status

???.? mA

Storage disc space

Energy

Current: 12.5820 keV

Wavelength: 0.985 Å

Set to: keV

Transmission

Current: 100.00%

Set to:

Resolution

Current: 2.824 Å

429.00 mm

Set to: A

Door interlock: unknown

Unlock

Safety shutter: disabled

Set in Set out

Current users

Control

Control

BM30A\_SampleChanger

Based of the work from ESRF SC3

# FIP-BM30A : MxCUBE

The screenshot displays the MxCUBE Qt4 software interface. The top menu bar includes 'File', 'View', 'Graphics tools', and 'Help'. Below the menu bar are tabs for 'Collect', 'Log', 'Chat', and 'Test'. The main interface is divided into several sections:

- Sample centring:** Includes fields for Omega (0.00), Phi (0.00), Kappa (0.00), and Focus (0.00).
- Sample video:** A large window showing a grayscale image of a sample with a blue square region of interest and a red crosshair. Below it are coordinates (X: 638 Y: 393) and a 'Graphics items' checkbox.
- Beam size:** Fields for Horizontal (300 µm) and Vertical (300 µm) beam sizes.
- Slits:** Fields for Horizontal (150 µm, 300.00) and Vertical (149 µm, 299.00) slit sizes.
- Aperture:** A dropdown menu set to 'Default'.
- Phase:** A dropdown menu.
- Collection method:** A section for 'Standard Collection' with various parameters like Oscillation start, Number of images, Exposure time, Kappa, Energy, Resolution, and Transmission.
- Sample list:** A table showing sample details like Puck 1, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7.
- Machine Status:** A panel on the right showing 'Machine Status' (????.? mA), 'Storage disc: space', 'Current' (12.5820 keV), and 'Resolution' (2.824 Å).
- Processing parameters:** Fields for 'N.o. residues' (200.0) and 'Space group'.
- Characterisation:** A section for 'Helical Collection', 'Energy Scan', and 'XRF Spectrum'.
- Advanced:** A section for 'Advanced' parameters.

A green arrow points to the 'Machine Status' panel. A green box with white text is overlaid on the interface, containing the following text:

Qt4\_MachineInfoLightBrick

A light version with only :

- Machine Status and Intensity
- Data storage space left

# FIP-BM30A : MxCUBE

**BM30A\_Transmission**

To control a Tango Device Server for WAGO  
-> The transmission is computed to be the closest possibility from what it asked

# FIP-BM30A : MxCuBe

MXCuBe Qt4

File View Graphics tools Help

Collect Log Chat Test

Sample centring

Omega: 0.00 Phi: 0.00 Kappa: 0.00

Zoom 6x Light: 0.00 Focus: 0.00

Sample video

Centre Save Line Grid Focus Snapshot Refresh Align Select all Clear all Auto

Collection method

Standard Collection

Acquisition

Oscillation start: 0.0 Oscillation range: 0.0

Number of images: 0 First image: 0

Exposure time (s): 0.00000 Detector mode:

Kappa: 0.0 Phi: 0.0

Energy (keV): 0.0 MAD

Resolution (Å): 0.0

Transmission (%): 0.0

Shutterless

Inverse beam Subwedge size:

Data location

Folder:

File name:

Prefix:

Run number: 0

Processing parameters

N.o. residues: 200

Unit cell:

Characterisation

Helical Collection

Energy Scan

XRF Spectrum

Advanced

Sample list

Code: opd Password: Logout Group: Set

Mode: Sample changer

Centring: Manual

Filter: No filter

Machine Status

???.? mA

Storage disc space

Energy

Current: 12.5820 keV

Wavelength: 0.985 Å

Transmission

Current: 100.00%

Resolution

Current: 2.824 Å

429.00 mm

Door interlock

unknown

Safety shutter

disabled

Current users

My name: d30control

BM30A\_HutchTrigger

Return the hutch interlock status :  
which door need to be locked...



# FIP-BM30A : Current Status

## Working

### Almost all basic functionalities :

- Goniometer
- Manual Centering
- Monochromatic data collection (at the FIP fashion w/o icepyb)
- Screening
- Energy setup

## Almost working

- Sample changer for frozen sample

## Not implement

- Sample changer in plate mode
- Auto processing
- Auto centering
- MCA
- ...

# FIP-BM30A

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WIFIP



Y. Sallaz-Damaz  
MXCuBE Meeting - January 2017

# FIP-BM30A : WUI

WIFIP

Web-based user Interface for FIP

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# FIP-BM30A : WUI

WIFIP

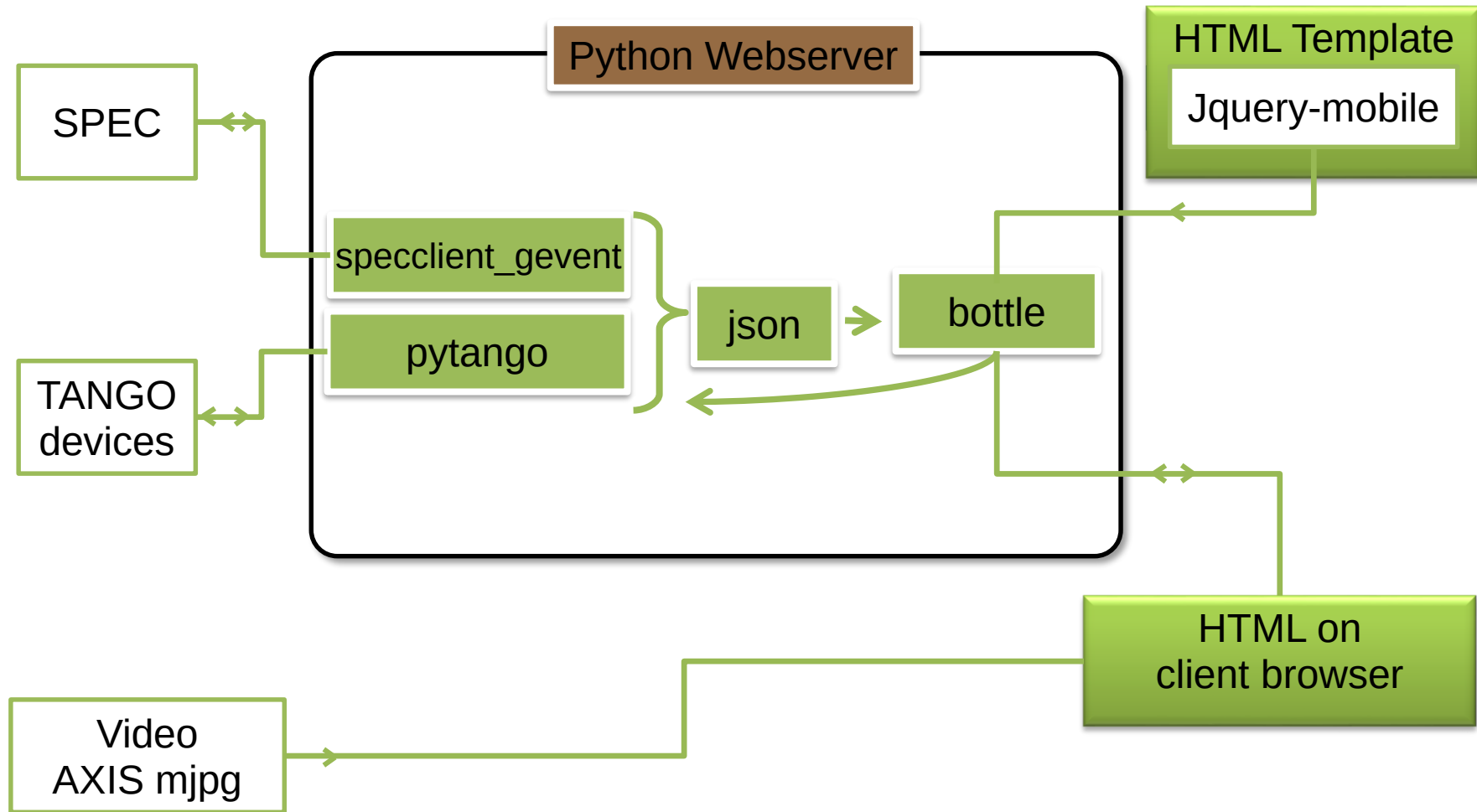
Web-based user Interface for FIP

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- Use the beamline **easily** from a browser from **anywhere**
- Allow local contact to help the user remotely

WIFIP is in function since September 2015

# FIP-BM30A : principle



# FIP-BM30A : Sample changer

BM30A - WIFIP
BM30A - WIFIP - Mozilla Firefox

d30server:9000
Search

Show/hide Scale
Zoom 6X
Focus

MD2 - Sampl...
Plate - In situ
Energy
Collection

A

B

C

Currently mounted : **None**

Matrix Code : **n/a**

Angle : 39.8°     -

**Spec Status**

```
97.FIPCONTROL> print $USER
print $USER
^
Syntax error on "$".
```

**Robot G-Rob**

Waiting

Accessories	Current State	Action	Current State	Action
Beam stop 1	IN	↓	Cryo short	IN ↓
Beam stop 2	OUT	↑	Cryo long	OUT ↑
Diode	OUT	↑	Hori. slits (µm)	300 ↑ 300
MCA	OUT	↑	Vert. slits (µm)	300 ↑ 300

**EH Camera**

**Lights (%)**

Front

Back  OUT ↑

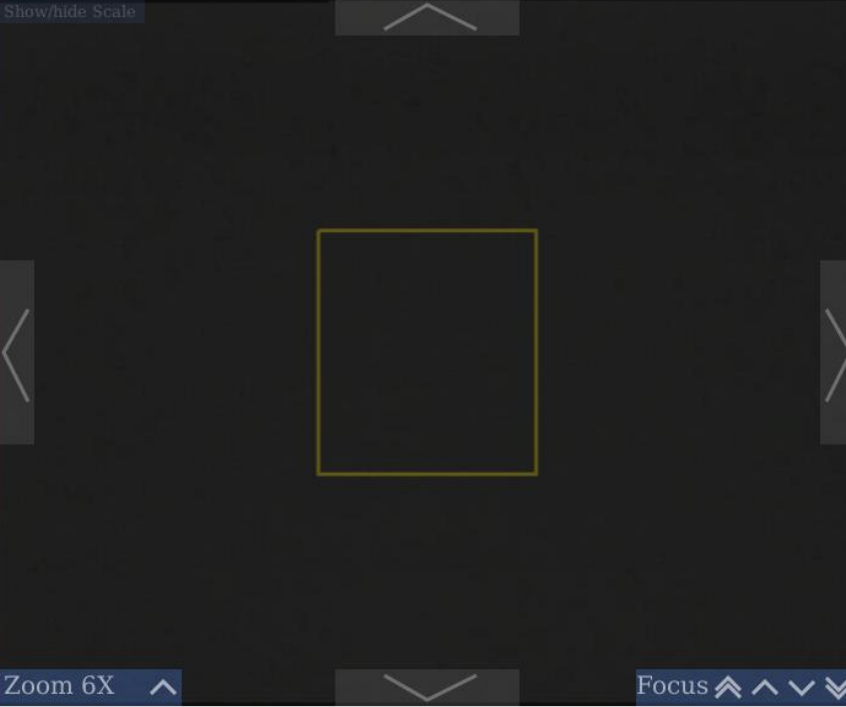
Local contact tool :  **Oxford is too hot : your frozen cristal can be in danger**

# FIP-BM30A : Plate changer

BM30A - WIFIP
BM30A - WIFIP - Mozilla Firefox

d30server:9000
Search

Show/hide Scale



Zoom 6X

Focus

MD2 - Sampl... **Plate - In situ** Energy Collection

Type: Greiner 'CrystalQuick X' (96x2)

	1	2	3	4	5	6	7	8	9	10	11	12
A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No plate mounted

Crystal list :  + - Move to Send

Angle : 39.8°  -35 -30 -15 0 15 30 35 -  ok

**Spec Status**

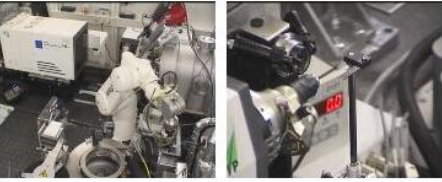
```
97.FIPCONTROL> print $USER
print $USER
^
Syntax error on "$".
```

**Robot G-Rob**

Waiting

Home Stop

**EH Camera**



**Lights (%)**

Front

Back OUT

**Accessories**

	Current State	Action		Current State	Action
Beam stop 1	IN	<input type="button" value="↓"/>	Cryo short	IN	<input type="button" value="↓"/>
Beam stop 2	OUT	<input type="button" value="↑"/>	Cryo long	OUT	<input type="button" value="↑"/>
Diode	OUT	<input type="button" value="↑"/>	Hori. slits (μm)	300	<input type="text" value="300"/>
MCA	OUT	<input type="button" value="↑"/>	Vert. slits (μm)	300	<input type="text" value="300"/>

Local contact tool : Locked Oxford is too hot : your frozen cristal can be in danger

# FIP-BM30A : Feedback

After 16 month what is the user feedback ?



Multi users simultaneously  
(student at the beamline, the researcher away)

Using every where

Session persistency

Easy to use remotely

UI easy to learn

Camera feedback



It's not MxCuBe

No IcepyB connection

No MCA in the first version