



MXCuBE at LNLS/Sirius

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Beamline Software Group (SOL)

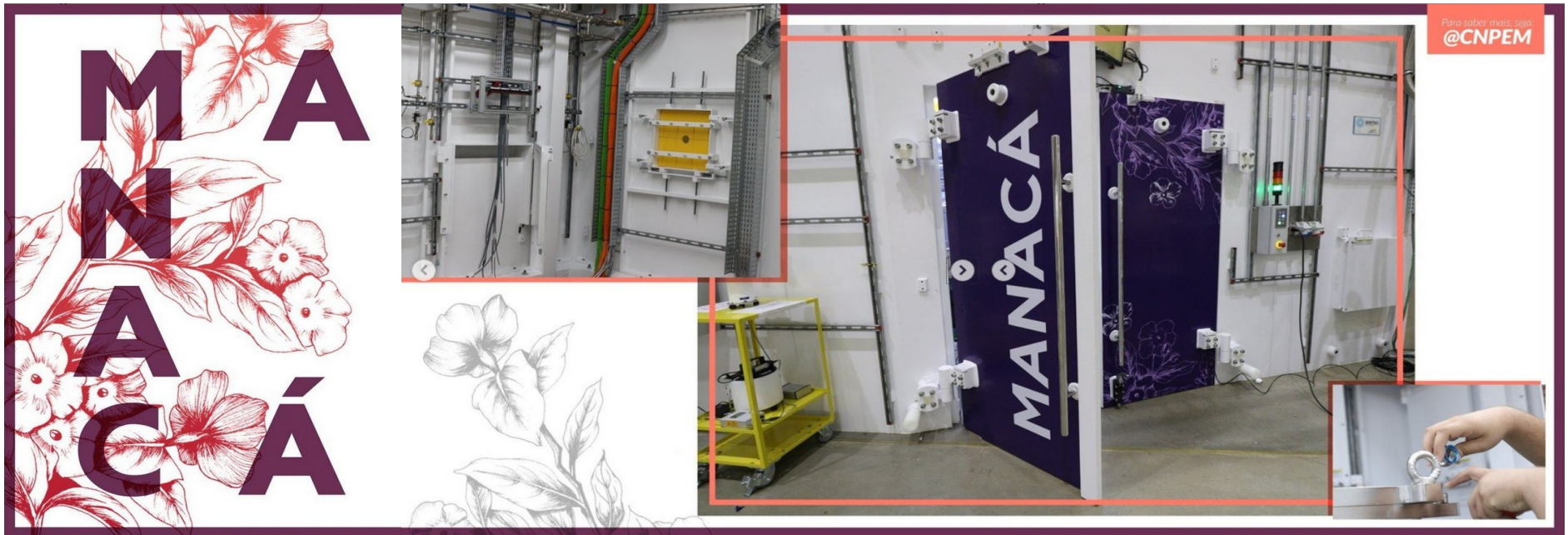
Brazilian Synchrotron Light Source (LNLS / Sirius)

Virtual MXCuBE & ISPyB Meeting at ALBA

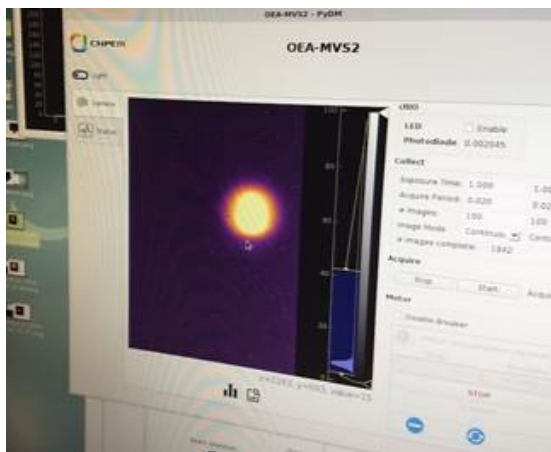
29 - 30 June, 2020

MANACÁ (MX Beamline)

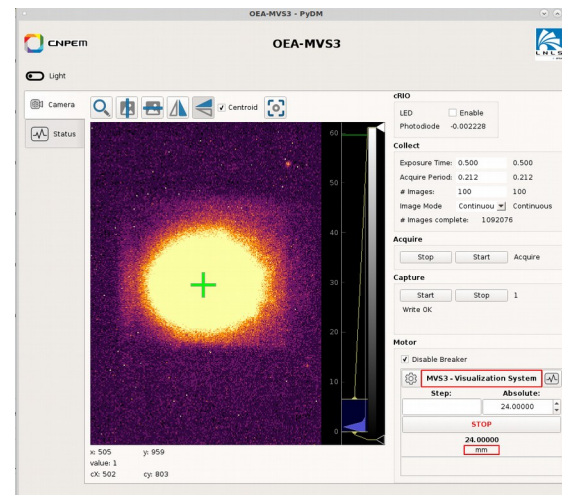
- Beam commissioning



- June – week 1
 - ✓ 03 - Ondulator, DCM and mirrors operational
 - ✓ 04 - Beam through **Optical Hutch**

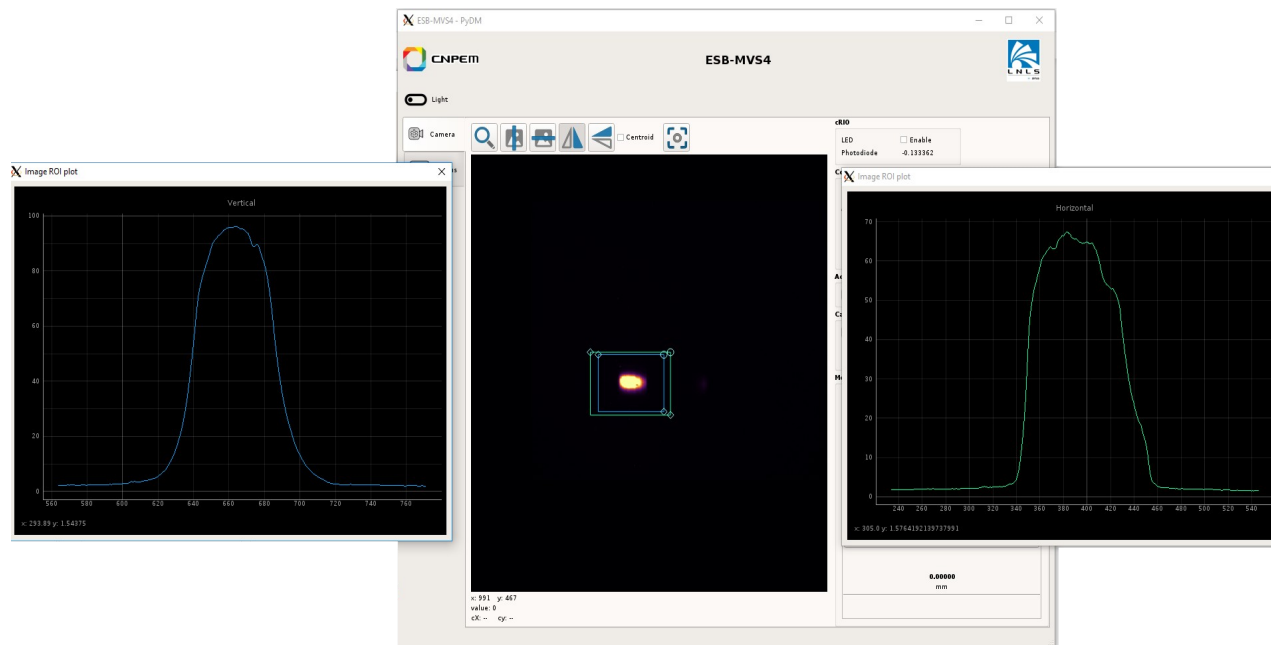


Beam after DCM



Beam after M1

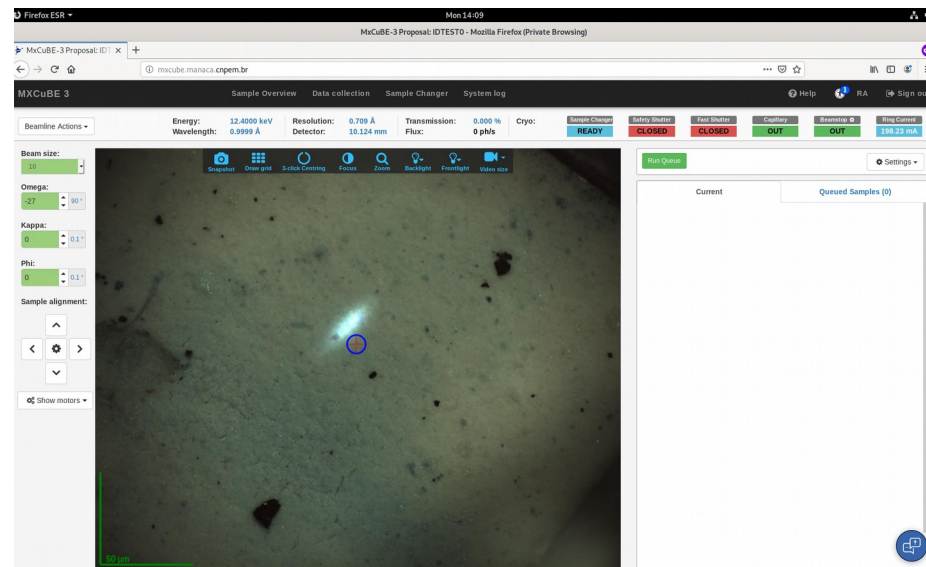
- June – week 2
 - ✓ 10 - **Beam at Experimental Hutch!**



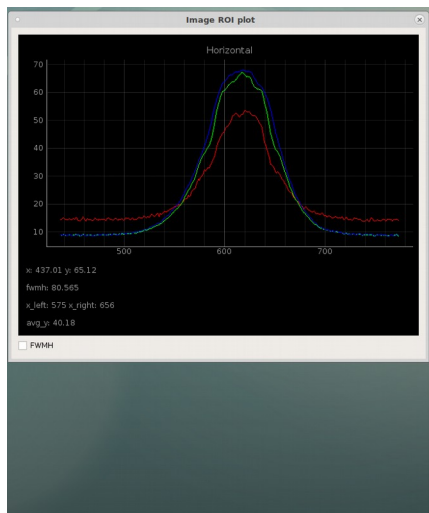
Beam after M2

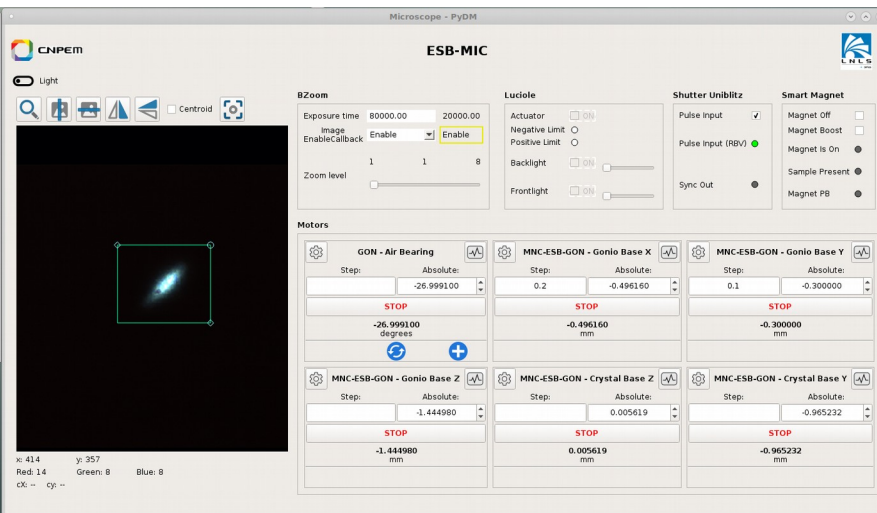
MANACÁ

- June – week 3
 - ✓ 22 - **Beam at sample station!**



MXCuBE3



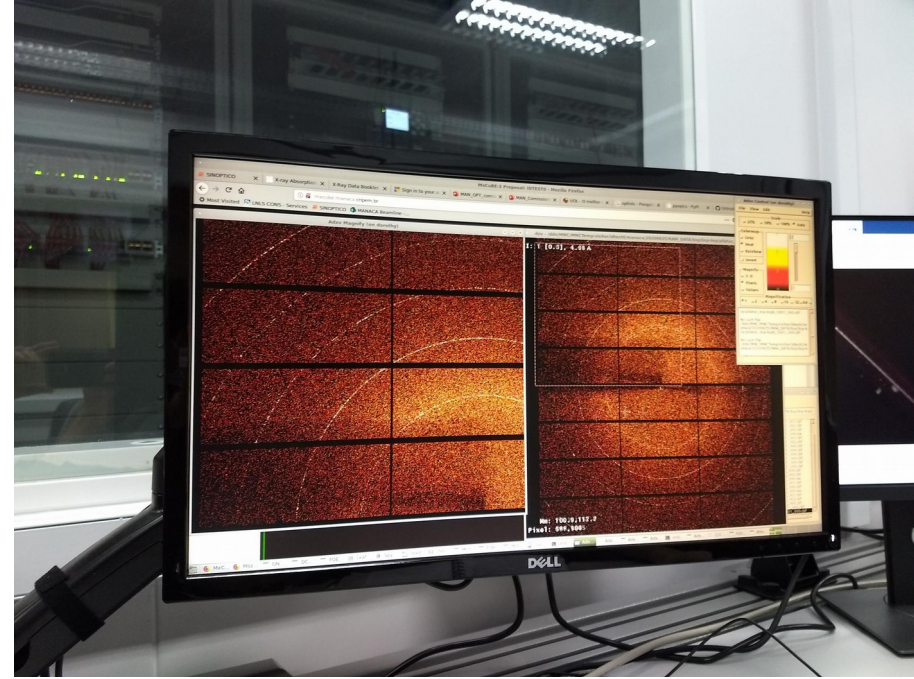


Motor	Step	Absolute
GON - Air Bearing	-26.999100	-26.999100 degrees
MNC-ESB-GON - Gonio Base X	0.2	-0.496160 mm
MNC-ESB-GON - Gonio Base Y	0.1	-0.300000 mm
MNC-ESB-GON - Gonio Base Z	-1.444980	-1.444980 mm
MNC-ESB-GON - Crystal Base Z	0.005619	0.005619 mm
MNC-ESB-GON - Crystal Base Y	-0.965232	-0.965232 mm

PyDM Microscope GUI

MANACÁ

- June – week 3
 - ✓ 22 - **Beam at sample station!**
 - ✓ 24 - First collections with **MXCuBE3**:
Beamstopper check
Det-to-sample distance check



*LaB6
100 ms, 9 keV, 3 mA
100 x 100 μ m Beam
No attenuation*

MANACÁ

- June – week 3
 - ✓ 22 - Beam at sample station!
 - ✓ 24 - First collections with MXCuBE3:
 - Beamstopper check
 - Det-to-sample distance check
 - ✓ 25 – WIP: **Flyscan tests and Initial Experiment**

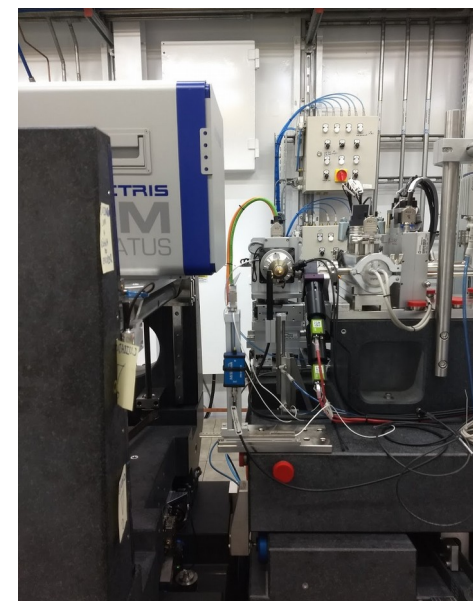
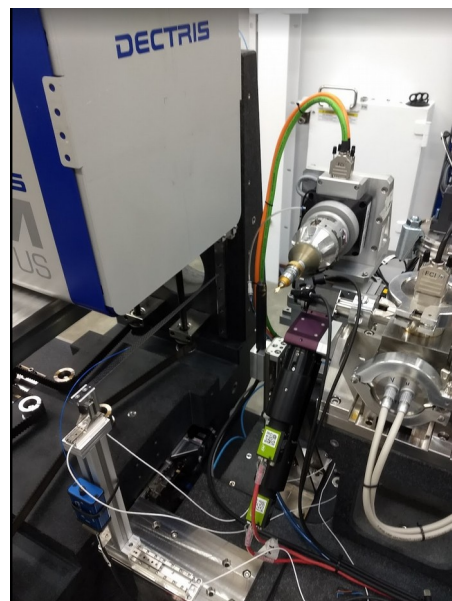


Lysozyme data acquisition

MANACÁ

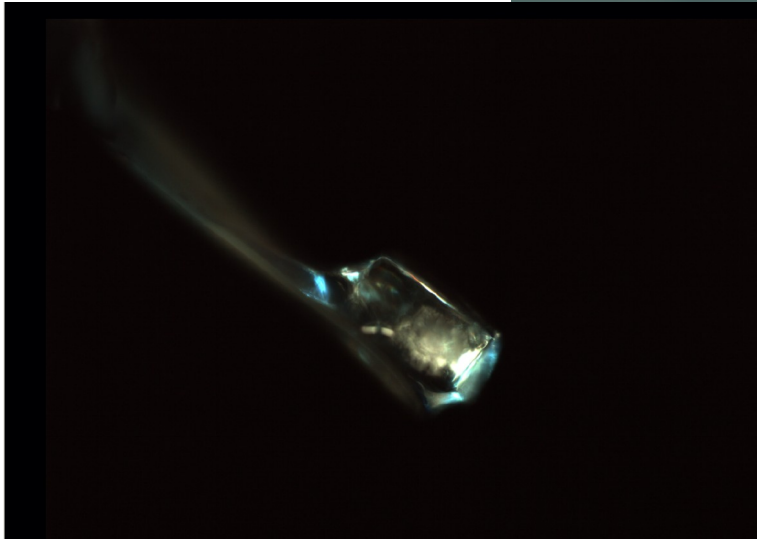
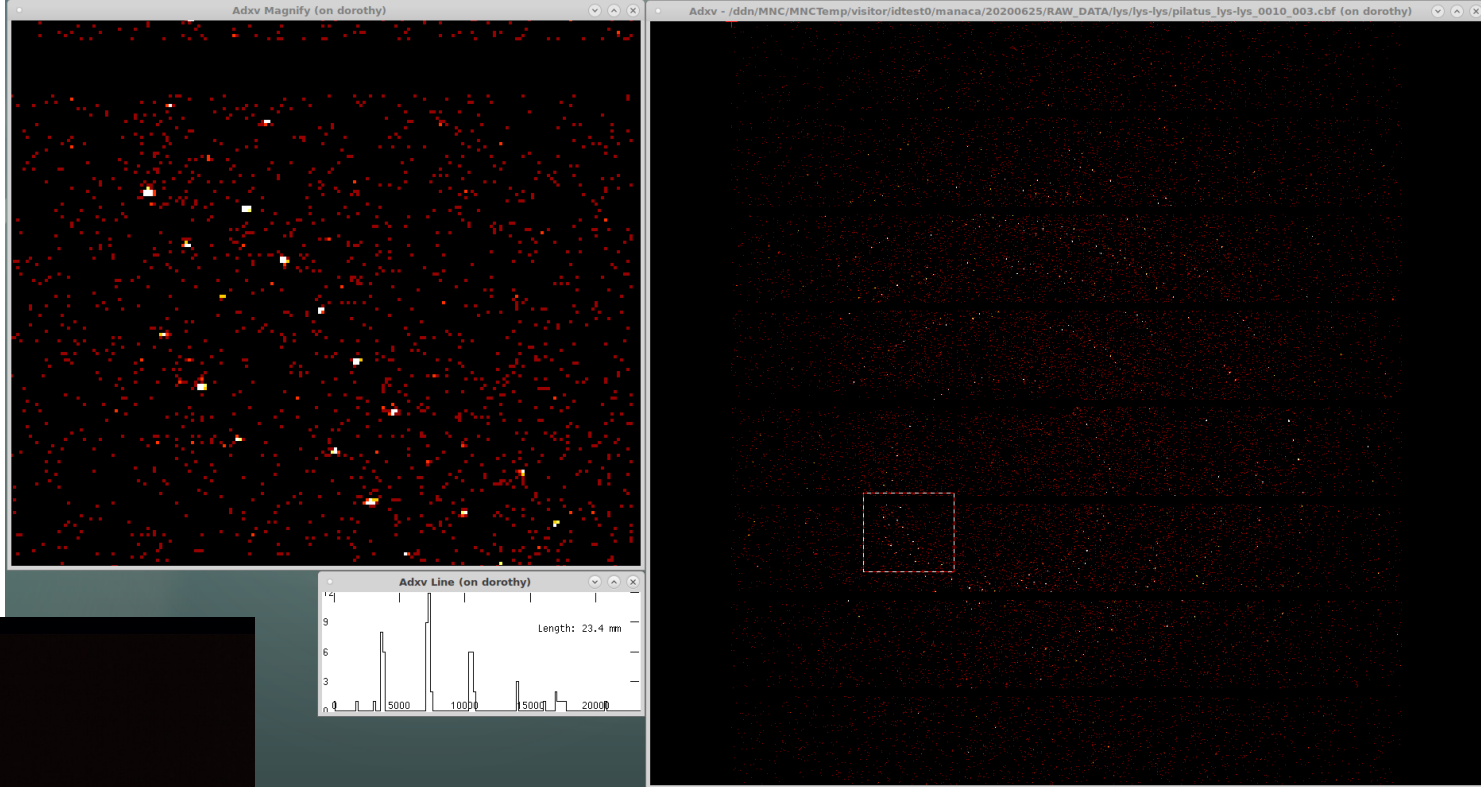
- **Flyscan**
 - Delta Tau Goniometer (master)
 - NI CRIO (slave, trigger manager)
 - Pilatus 2M detector
 - Uniblitz Fast Shutter

Testing	
Exposure	50, 75, 100 ms
Images	3600 – 7200



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- Initial Experiment



Lysozyme data acquisition (WIP)

← To Be Continued III

Next?

- Centring routine
- Beam of 10 μm
- Increase current
- Upgrade to PiMega (under commissioning, 2KHz)
- Open for users on the 2th semester



CATERETÊ (SAXS Beamline)

Coherent And Time RESolved scattERing

- Imaging and dynamics of biological and nano materials



www.lnls.cnpem.br/facilities/caterete/

CATERETÊ (SAXS Beamline)

Techniques

- Coherent X-ray Diffraction Imaging (**CXDI**)
- X-ray Photon Correlation Spectroscopy (**XPCS**)
- Small-Angle X-ray Scattering (**SAXS**)
- Wide-angle X-ray Scattering (**WAXS**)

Setup includes

- 4 crystal monochromator (4CM)
- Delta Tau, Smaract and Symétrie motor controllers
- PiMega Detector
- Arinax BZoom Camera

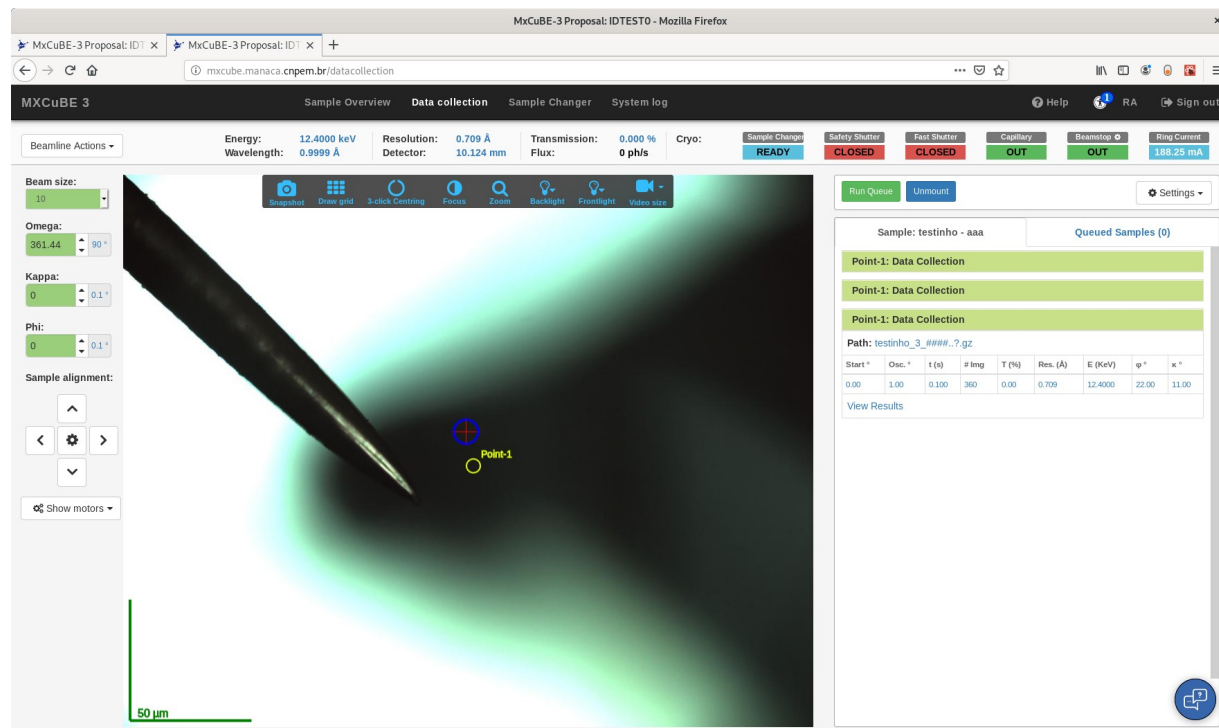
Status

- July: Beam commissioning



Done:

- Updated base (after Code Camp)
- Classes
 - EPICSActuator (PV setter/getter)
 - LNLSMotor (EPICSMotor?)
 - LNLSInOut
 - LNLSZoom
 - LNLSCamera (improvements)

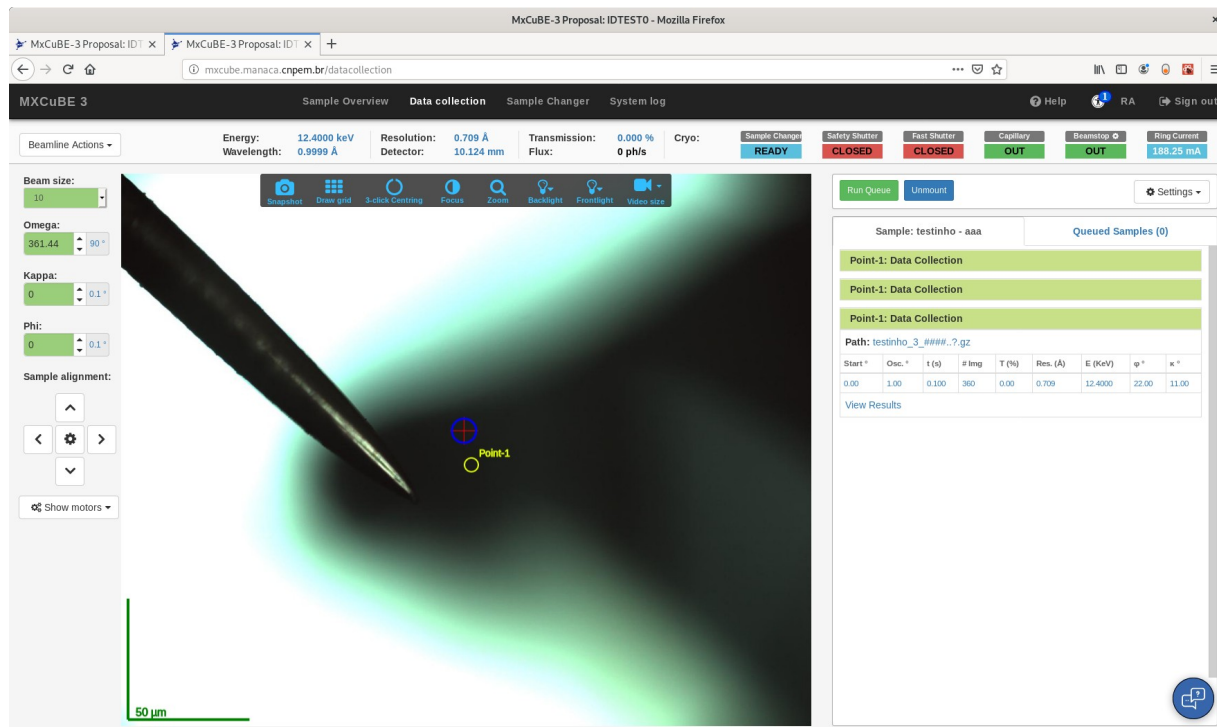


MXCuBE3 at Manacá

WIP:

- LNLSCollect (reusing **py4syn***)
- Status Pvs, Shutters
- User login

*github.com/lnls-sol/py4syn



The screenshot shows the MXCuBE-3 web interface in Mozilla Firefox. The browser address bar shows `mxcube.manaca.cnpem.br/datacollection`. The interface includes a top navigation bar with tabs for 'Sample Overview', 'Data collection', 'Sample Changer', and 'System log'. Below this is a status bar with various indicators: Energy (12.4000 keV), Wavelength (0.9999 Å), Resolution (0.709 Å), Detector (10.124 mm), Transmission (0.000 %), Flux (0 ph/s), Cryo (READY), Safety Shutter (CLOSED), Fast Shutter (CLOSED), Capillary (OUT), Beamstop (OUT), and Ring Current (188.25 mA).

The main area displays a diffraction pattern with a central spot labeled 'Point-1'. On the left, there are control panels for 'Beamline Actions', 'Beam size' (10), 'Omega' (361.44), 'Kappa' (0), and 'Phi' (0). Below these are 'Sample alignment' controls and a 'Show motors' button. On the right, there is a 'Run Queue' and 'Unmount' button, and a 'Settings' button. A table of data collection points is visible, showing parameters like Start, Osc., t (s), # img, T (%), Res. (Å), E (keV), ϕ^* , and κ^* .

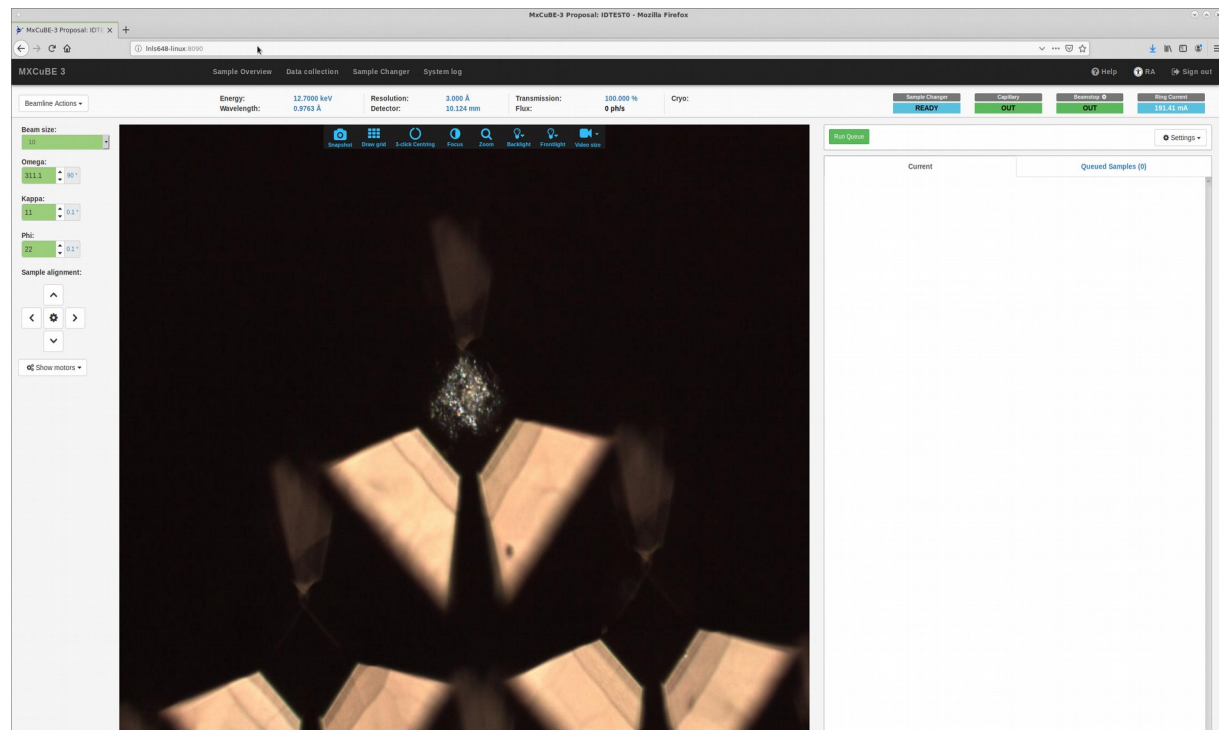
Start	Osc. #	t (s)	# img	T (%)	Res. (Å)	E (keV)	ϕ^*	κ^*
0.00	1.00	0.100	360	0.00	0.709	12.4000	22.00	11.00

MXCuBE3 at Manacá

WIP:

- LNLSCollect (reusing **py4syn***)
- Status Pvs, Shutters
- User login

*github.com/lnls-sol/py4syn



Experimenting MXCuBE3 at Cateretê

MXCuBE

Repositories?

- github.com/lnls-sol/mxcube3
- github.com/lnls-sol/HardwareRepository
- github.com/lnls-sol/mx3docker



See branch: **lnls**

Acknowledgments

- Beamline Operation Software Group (SOL)
- MANACÁ Group
- CATERETÊ Group
- MXCuBE & ISPyB community



Thank you!

Questions? :)