

HC 6209 Logbook

2025.04.08 - 2025.04.14

<u>Proposal Title:</u>	<u>Temperature dependence of the non-ergodicity factor of vitreous GeO₂</u>
<u>Experimental Team:</u>	
<u>Local Contact:</u>	<u>FZ</u>
<u>Filling mode and emittance:</u>	7/8 + 1
<u>X-ray mode:</u>	
<u>Detectors:</u>	Eiger 4M V2
<u>Sample to Detector Distance:</u>	<u>7.05 m</u>

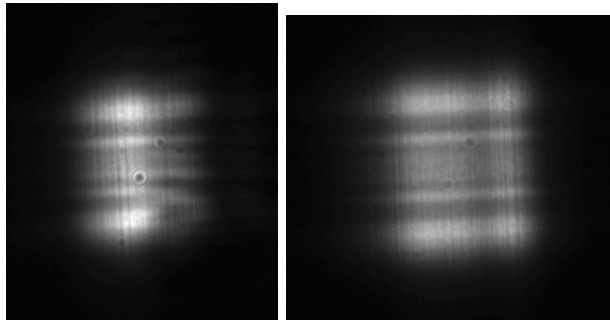
2025.04.08

- 8:10, Beamline alignment. The machine group informed us that the beam might have moved a bit yesterday
- Tasks:
 - Check if beam moved
 - Scan #4, Psvo

```
EH2_EXP [88]: goto_cen()
Moving psvo from 0.38596 to 0.40493
```
 - Scan #5, psho

```
EH2_EXP [93]: goto_cen()
Moving psho from 0.15421 to 0.19108
```
 - Align undulators
 - Check contrast with Vycor
 - Pilatus calibration
- Data saved in **eh2_exp_0001**
- Mirror initial position
 - Wmy = 0.041, wmt1 = -88.24
- Mirror final position

```
EH2_EXP [43]: m.wbdlm
Out [43]: Motors group wbdm
wmz @ (user,dial) = (-9.8898,-9.8898) None
wmrz @ (user,dial) = (2.6,2.61) mrad
wmy @ (user,dial) = (-0.309,-0.432) None
wm1th @ (user,dial) = (-83.2417,-83.2417) None
wbdm currently at preset hc6209_9.3keV
```



- Left: initial position, right: final position; screenshots taken using only primary at 0.2x0.2
- Quick sample alignment
 - To be sure we cleanly go through the center

```
EH2_EXP [63]: m.sample
Out [63]: Motors group sample
xs @ (user,dial) = (0.0,0.0) mm
ys @ (user,dial) = (0.0,-0.6876) mm
zs @ (user,dial) = (0.0,16.9968) mm
sample currently at preset hc5512_omega
```

- Finish beam alignment
 - Tab4 in z and y done with cs at 100um

```
EH2_EXP [75]: m.tab4
Out [75]: Motors group tab4
tab4y @ (user,dial) = (3.6399,4.1342) None
tab4z @ (user,dial) = (1.8701,5.8701) None
tab4 currently at preset hc6209_9.7keV
```

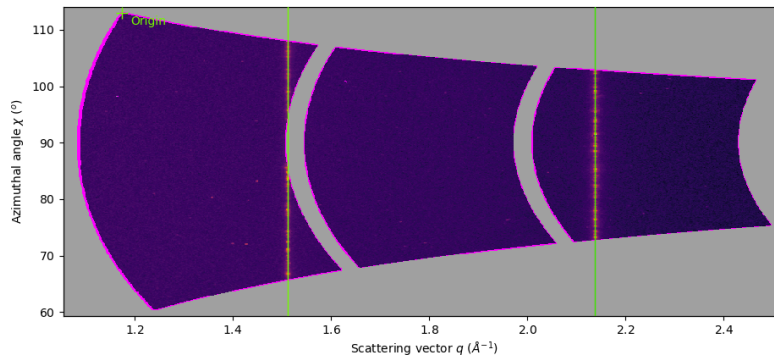
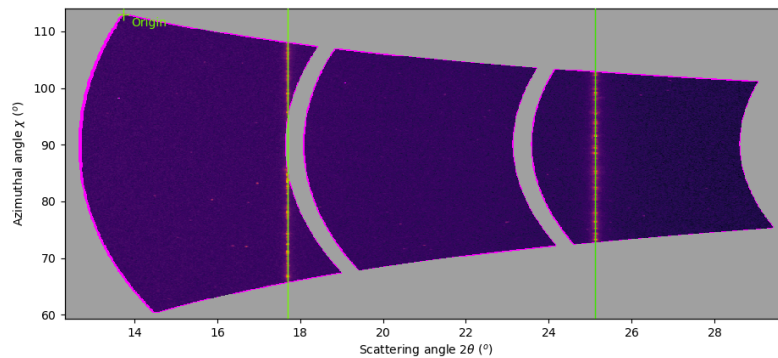
- TS slits centered
- Undulators (**Energy of work E=9.69999KeV**)

```
EH2_EXP [103]: m.und_gaps.save_positions("hc6209_9.7keV")
EH2_EXP [104]: m.und_gaps
Out [104]: Motors group undulators gaps
u35a @ (user,dial) = (13.04,13.04) None
u27b @ (user,dial) = (16.13,16.13) None
u35b @ (user,dial) = (nan,nan) None
u27c @ (user,dial) = (15.9,15.9) None
undulators gaps currently not at a saved preset position
```

- Written user.restore_undulators()
- Lenses

```
EH2_EXP [120]: m.crl3
Out [120]: Motors group crl3
           ycr13 @ (user,dial) = (0.0259,3.1213) mm
           zcr13 @ (user,dial) = (-43.835,15.3781) mm
           crl3 currently at preset hc6209_9.7keV_30um_beam
```

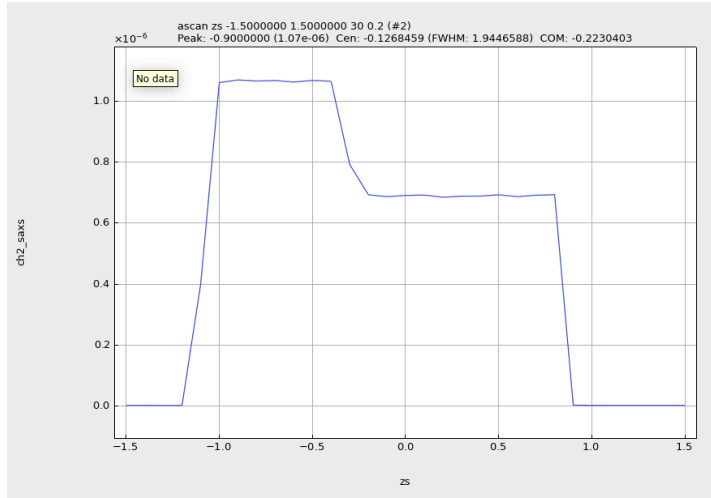
- Mounted Lab6 to calibrate Pilatus
- Scan 27



- Poni file saved:
 - Lab6_eh2_exp_0001_scan0027.poni

newsample("vycor")

- 12:47, mounted vycor sample to check contrast
- Data in vycor_0001
- Sample covers half of the hole. Will do scan to find edges (scan #2)



- Scan done with 1e-3 transmission. Full beam is more than 1.07mA
- Full beam intensity (focused): 1.68e12ph/s (@ 193mA)

```
EH2_EXP [146]: import sr
EH2_EXP [147]: mylar_transmission=sr.materials.transmission(material="mylar",thickness=320e-6,energy=9.7)
EH2_EXP [148]: user_script_load('/data/visitor/hc5971/id10/20250205/SCRIPTS/hc5971_bliss.py')
EH2_EXP [148]: id10.xray.diode_current_to_photons_per_s(1.16e-3/mylar_transmission)
Out [148]: '1.685065e+12'
```

- Alignment of Eige4m

ROI Statistics		
Name	Parameters	State
db	<1359,1351> <1 x 1>	Enabled

- Scan #4 and #5

```
EH2_EXP [164]: m.det1
Out [164]: Motors group Eiger4m detector stage
ydet @ (user,dial) = (-803.85,111.1475) mm
zccd @ (user,dial) = (24.0428,24.0428) mm
Eiger4m detector stage currently at preset hc6209_eiger4m_pos1
```

```
EH2_EXP [1]: slits
Out [1]: *** Slits ***
PS slit, (+0.100,+0.200) @ (+0.191,+0.405)
SS slit, (+1.000,+1.000) @ (+3.309,+0.075)
TS slit, (+0.200,+0.200) @ (+3.475,-0.134)
CS slit, (+0.200,+0.200) @ (-0.000,+0.000)
RG slit, (+0.300,+0.300) @ (+0.000,+0.000)
```

Activate delcoup

```
EH2_EXP [7]: delcoup.controller
  Out [7]: DELTACOUPI deltacoup:
          .deloffset = 0 deg
          .samptopipe = 5925 mm
          .samptodet = 7050 mm
```

Optimize RG

```
EH2_EXP [74]: slits
  Out [74]: *** Slits ***
           PS slit, (+0.100,+0.200) @ (+0.191,+0.405)
           SS slit, (+1.000,+1.000) @ (+3.309,+0.075)
           TS slit, (+0.200,+0.200) @ (+3.475,-0.134)
           CS slit, (+0.200,+0.200) @ (-0.000,+0.000)
           RG slit, (+0.400,+0.400) @ (-0.004,+0.018)
```

EH2_EXP [72]:

user_script_load("/data/visitor/hc6209/id10-coh/20250408/SCRIPTS/hc6209.py")

Dense XPCS:

EH2_EXP [73]: user.take_data_and_move(2_000,dz=0.03)

ast detectors:

scanning mode	= TIME
acquisition time	= 0.01 sec
acquisition period	= 0.0101006 sec
acq/slow points	= 100
number of points	= 2000 (requested 2000)

Scan 12 Tue Apr 8 15:01:08 2025 Saving in

/data/visitor/hc6209/id10-coh/20250408/RAW_DATA/vycor/vycor_0001/vycor_0001.h5

EH2_EXP [82]: user.take_data_and_move(2_000,dt=0.01,dz=0.03)

Scan 13 Tue Apr 8 15:07:54 2025 Saving in

/data/visitor/hc6209/id10-coh/20250408/RAW_DATA/vycor/vycor_0001/vycor_0001.h5

XPCS saving

EH2_EXP [93]: eiger4m_v2.processing.saving_sparse.nb_frames_per_file=5000

EH2_EXP [94]: eiger4m_v2.processing.saving_dense.nb_frames_per_file=2000

DELCOUP testing vs background

EH2_EXP [101]: delcoup.limits=(-0.5,10)

EH2_EXP [106]: delta.limits=(-0.5,10)

EH2_EXP [102]: ydet.position=0

'ydet' position reset from -803.8499999999999 to 0.0 ; offset changed from -914.9975 to -111.1475 (sign:1)

EH2_EXP [103]: ypipe.position=0

'ypipe' position reset from -681.156 to 0.0 ; offset changed from -753.72700 to -72.57100 (sign:1)

Test background (zs=-0.75)

eh2_att(1)

Delcoup = 0.5

Roi1_avg =0.50 cps/pixel

Delcoup = 1 (some diffuse rings)

Roi1_avg =2.81 cps/pixel

sct(1) scan 15

Delcoup = 1.5

Roi1_avg =0.00 cps/pixel

sct(1) scan 16

Delcoup = 1.75 (q=0.15 A-1)

Roi1_avg =0.00025 cps/pixel !!! zs = -0.75 - Vycor OUT

sct(1) scan 18

Delcoup = 1.75 (q=0.15 A-1)

Roi1_avg =15.75 cps/pixel !!! zs = 0.50 - Vycor IN

sct(1) scan 19

Delcoup = 2.33 (q=0.2 A-1)

Roi1_avg =0.0035 cps/pixel

sct(1) scan 17

At delcoup=1.75 (q=0.15 A-1) the background is in the 10^{-4} cps/px range !

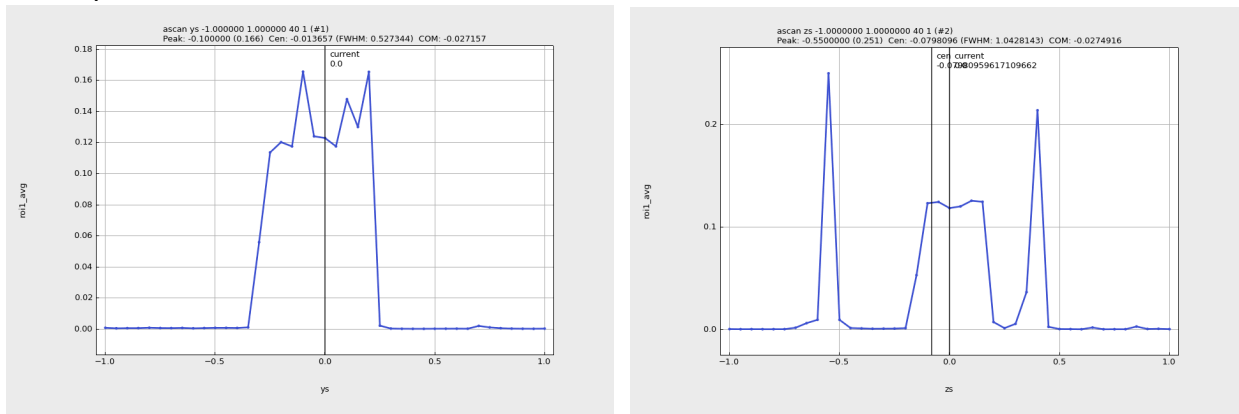
GeO2_6

EH2_EXP [168]: newsample("GeO2_6")

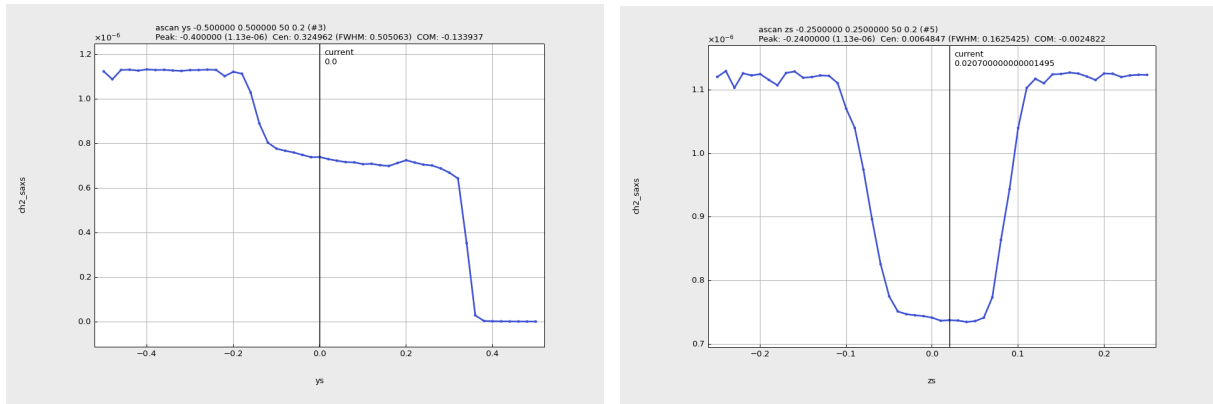
Dataset collection set to 'GeO2_6'

Data path: /data/visitor/hc6209/id10-coh/20250408/RAW_DATA/GeO2_6/GeO2_6_0001

Sample is mounted horizontally towards the machine
It seems to scatter !
Delcoup = 1.75



Sample transmission with saxs_diode
Delcoup = 0
endcode_saxs()
eh2_att(0.001)



disdiode_saxs()

We move the sample to a virgin point
EH2_EXP [253]: wm(ys,zs)

	ys[mm]	zs[mm]
-----	-----	-----
User		
High	14.687563	19.6876200
Current	0.100000	0.0207000
Low	-13.312437	-16.8123800
Offset	0.687562	-16.9967600
Dial		
High	14.000000	36.6843800
Current	-0.587562	17.0174600
Low	-14.000000	0.1843800

Beam size

```
EH2_EXP [259]: umv(delcoup,0)
EH2_EXP [260]: user.switch_to_diode()
EH2_EXP [264]: endiode_saxs()
EH2_EXP [266]: eh2_att(0.001)
```

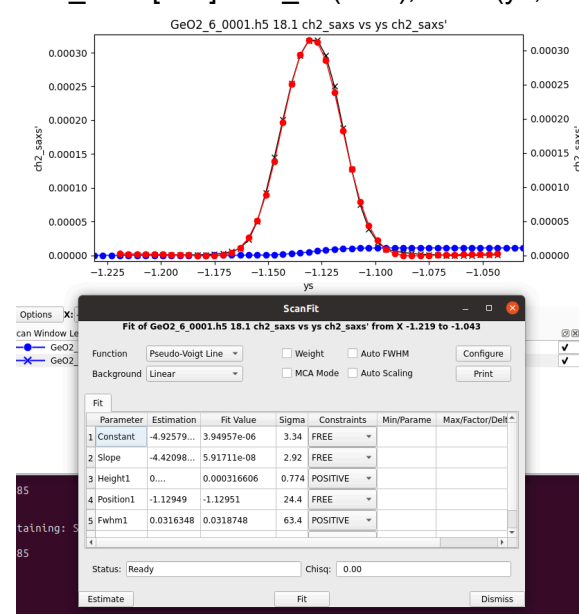
Try to use the edge of the sample holder for making the edge scans

H size:

ys = -1.13

zs = -0.061 (centered)

```
EH2_EXP [277]: eh2_att(0.01);dscan(ys, -.1, .1, 50, 0.3); eh2_att(0.001) - Scan #18
```

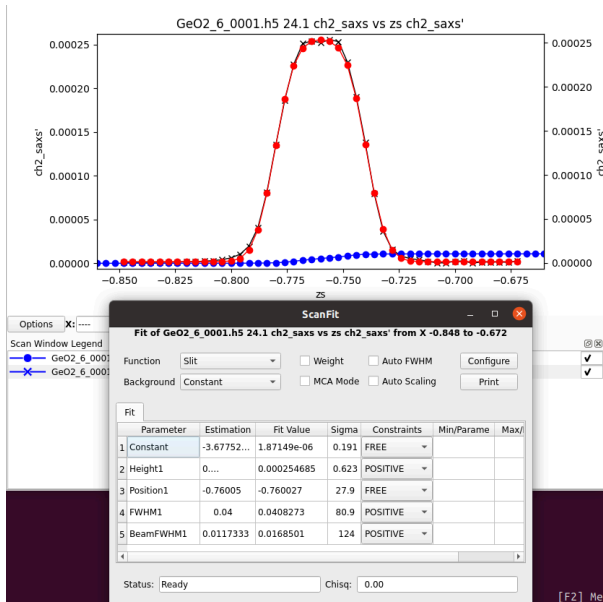


V size:

ys = -0.361 (centered)

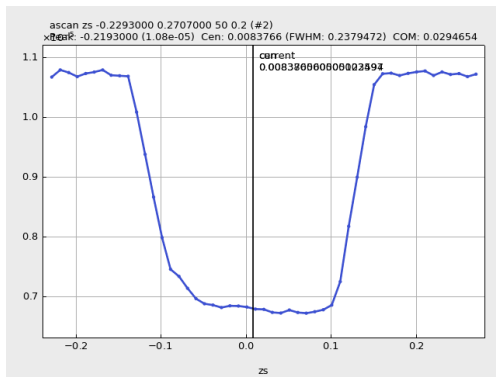
zs = -0.76

```
EH2_EXP [296]: eh2_att(0.01);dscan(zs,-.1,.1,50,0.3);eh2_att(0.001) - Scan #24
```

Beam FWHM: 31.8 μm x 40.8 μm (HxV)

GeO2_6_100_C



ys[mm] zs[mm]

Current 0.102750 0.0083800

MACRO FOR THE NIGHT

```
def GeO2_6_macro():
    temperatures = 170,240,310,380,450,520,590,660,730
    rate = 5,5,5,3,3,3,3,3,3
```

```

i = 1
for temperature in temperatures:
    print(f"set temperature = {temperature}C")
    user.set_nanodac_temp(temperature,rate[i-1],wait=True)
    time.sleep(20*60)
    print(f"reached temperature = {temperature}C")
    newsample(f"GeO2_6_{temperature}C")
    if i%2:
        user.switch_to_transmission()
        att(0.01)
        dscan(ys,-0.5,0.5,50,0.2)
        att(0.001)
        att(0.01)
        dscan(zs,-0.25,0.25,50,0.2)
        goto_cen()
        att(0.001)
        user.switch_to_eiger()
    mtimescan(0.02,60_000,1)
    i = i + 1

```

Setting up the Q measurements

The last measure were at

ys[mm] zs[mm]

User

High 14.687563 19.6876200

Current 0.102750 -0.0704300

Low -13.312437 -16.8123800

Offset 0.687562 -16.9967600

delcoup	theta	Sample	bkg	Q	time
1	2.0	0.120	0.0030	0.0858	1 h @ 1 ms
1.75	2.0	0-0.7	0.00192	0.150	1 h @ 1 ms

1.75	0	0.121	0.00085	0.150	
3	1.5	0.160	0.00235	0.257	1 h @ 1 ms
4	2.0	0.279	0.000106	0.343	1 h @ 1 ms
5	2.4	0.321	0.000114	0.429	1 h @ 1 ms

We take some measurement at the highlighted angles in order to obtain the dependence of the contrast on the Q

```

DevFailed: DevFailed[
DevError[
  desc = /users/blissadm/local/lima2/include/lima/hw/acquisition_fsm.hpp(223): Throw in function void lima::hw::acquisition_fsm::Derived, Config::process_event(const Event&) [with Event = lima::hw::acquisition_fsm::detectors::detctris::acquisition_impl, lima::detectors::detctris::config::prepare_evt; Derived = lima::detectors::detctris::acquisition_impl; Config = lima::detectors::detctris::config] Dynamic exception type: boost::wrapexcept<lima::runtime_error>
  std::exception::what: Processing event failed
  [boost::tag_stacktrace*] = 0# 0x00007FE37E8563A6 in /users/blissadm/conda/miniconda/envs/lima2/lib/liblima_dectris_recv.so.1.0
  1# lima::detectors::detctris::acquisition::prepare_acq(lima::detectors::detctris::acq_params const&) in /users/blissadm/conda/miniconda/envs/lima2/lib/liblima_dectris_recv.so.1.0
  2# 0x00007FE37E8DE3C4 in /opt/bliss/conda/miniconda/envs/lima2/lib/plugins/liblima2_dectris_recv_tango.so.0.1.0
  3# Tango::DeviceClass::command_handler(Tango::DeviceImpl*, std::__cxx11::basic_string<char, std::char_traits<char>, std::allocator<char>> const&, CORBA::Any const&) in /users/blissadm/conda/miniconda/envs/lima2/lib/libtango.so.10.0
  4# Tango::DeviceImpl::command_inout(char const*, CORBA::Any const&) in /users/blissadm/conda/miniconda/envs/lima2/lib/libtango.so.10.0
  5# Tango::Device_2Impl::command_inout_2(char const*, CORBA::Any const&, Tango::DevSource) in /users/blissadm/conda/miniconda/envs/lima2/lib/libtango.so.10.0
  6# Tango::Device_4Impl::command_inout_4(char const*, CORBA::Any const&, Tango::DevSource, Tango::CIntIdent const&) in /users/blissadm/conda/miniconda/envs/lima2/lib/libtango.so.10.0
  7# 0x00007FE3952C9401 in /users/blissadm/conda/miniconda/envs/lima2/lib/libtango.so.10.0
  8# Tango::client_call_interceptor(omniCallDescriptor*, omniServant*) in /users/blissadm/conda/miniconda/envs/lima2/lib/libtango.so.10.0
  9# omniCallHandle::upcall(omniServant*, omniCallDescriptor&) in /users/blissadm/conda/miniconda/envs/lima2/lib/libomniORB4.so.3
  10# Tango::impl_Device_4::dispatch(omniCallHandle&) in /users/blissadm/conda/miniconda/envs/lima2/lib/libtango.so.10.0
  11# omni::omniOrbPOA::dispatch(omniCallHandle&, omniLocalIdentity*) in /users/blissadm/conda/miniconda/envs/lima2/lib/libomniORB4.so.3
  12# omni::omniLocalIdentity::dispatch(omniCallHandle&) in /users/blissadm/conda/miniconda/envs/lima2/lib/libomniORB4.so.3
  13# omni::GIOP_S::handleRequest() in /users/blissadm/conda/miniconda/envs/lima2/lib/libomniORB4.so.3
  14# omni::GIOP_S::dispatcher() in /users/blissadm/conda/miniconda/envs/lima2/lib/libomniORB4.so.3
  15# omni::giopWorker::execute() in /users/blissadm/conda/miniconda/envs/lima2/lib/libomniORB4.so.3
  16# omni::AsyncWorker::real_run() in /users/blissadm/conda/miniconda/envs/lima2/lib/libomniORB4.so.3
  17# 0x00007FE395DA7EE in /users/blissadm/conda/miniconda/envs/lima2/lib/libomniORB4.so.3
  18# omni::AsyncWorker::mid_run() in /users/blissadm/conda/miniconda/envs/lima2/lib/libomniORB4.so.3
  19# 0x00007FE3957DA254 in /users/blissadm/conda/miniconda/envs/lima2/lib/libomniORB4.so.3
  20# omni_thread_wrapper in /users/blissadm/conda/miniconda/envs/lima2/lib/libomniThread.so.4
  21# 0x00007FE393EAB609 in /lib/x86_64-linux-gnu/libpthread.so.0
  22# clone in /lib/x86_64-linux-gnu/libc.so.6

  [boost::errinfo_fsm_event_*] = prepare

  origin = receiver::prepare
  reason = LIMA_Exception
  severity = ERR]
DevError[
  desc = Failed to execute command_inout on device id10/linareceiver/eiger4m, command Prepare
  origin = virtual Tango::DeviceData Tango::Connection::command_inout(const string&, const Tango::DeviceData&) at (/src/cppTango/cppapi/client/devapi_base.cpp:1338)
  reason = API_CommandFailed
  severity = ERR]

```

GeO2_7 macro

```

205 def GeO2_7_macro():
206     temperature = 30, 100, 170, 240, 310, 345, 380, 415, 450, 485, 520, 555, 590, 625, 660, 695, 730
207     rate = 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5
208     measure_time = 30, 30, 30, 30, 30, 60, 60, 60, 60, 60, 120, 120, 120, 150, 150, 150, 150
209
210     # SE STOPPI CAMBIA RANGE IN RANGE(START,LEN(TEMP))
211     for ii in range(len(temperature)):
212         print(f"Set temperature = {temperature[ii]}C")
213         set_nanodac_temp(temperature[ii], ramprate=rate[ii], wait=True)
214         if temperature[ii]!=30: time.sleep(5*60)
215         print(f"Reached temperature = {temperature[ii]}C")
216         newsample(f"GeO2_7_{temperature[ii]}C")
217         print(f"new measure")
218         switch_to_transmission()
219         eh2_att(0.01)
220         dscan(ys, -0.5, 0.5, 50, 0.2)
221         eh2_att(0.001)
222         eh2_att(0.01)

```

```

223     dscan(zs, -0.5, 0.5, 50, 0.2)
224     eh2_att(0.001)
228     switch_to_eiger()
229     mtimescan(0.001, measure_time[ii]*60*1000, 1)
230     switch_to_transmission()
231     eh2_att(0.01)
232     dscan(ys, -0.5, 0.5, 200, 0.2)
233     eh2_att(0.001)
234     eh2_att(0.01)
235     dscan(zs, -0.5, 0.5, 200, 0.2)
236     eh2_att(0.001)

```

Le misure a 450 e 485 danno un tau strano

Muoviamo il campione per cambiare punto irraggiato e prendiamo la misura a 520C

EH2_EXP [191]: umv(zs, 0)

Per sicurezza ci spostiamo ancora prima della misura a 555C

EH2_EXP [191]: umv(zs, 0.15)

EH2_EXP [192]: umv(ys, -0.52)

Il campione sembra avere un effetto di aging vicino a T_g (gobba su tau) combinato con effetti termici locali quando cambiamo spot
Facciamo alcune misure di test per capire

Mi muovo

EH2_EXP [211]: umv(ys, -0.52, zs, 0)

EH2_EXP [212]: dmesh(ys, -0.05, 0.05, 20, zs, -0.05, 0.05, 20, 0.2)

EH2_EXP [213]: mtimescan(0.001, 30*60*1000, 1)

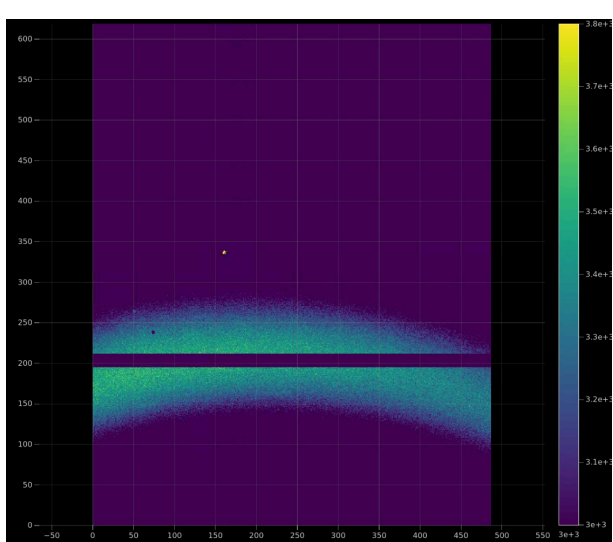
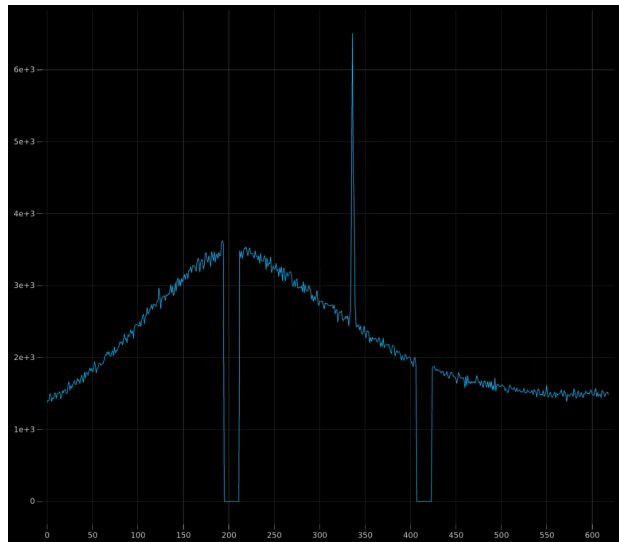
Mi muovo

EH2_EXP [215]: umv(ys, -0.32, zs, 0.15)

EH2_EXP [212]: dmesh(ys, -0.05, 0.05, 20, zs, -0.05, 0.05, 20, 0.2)

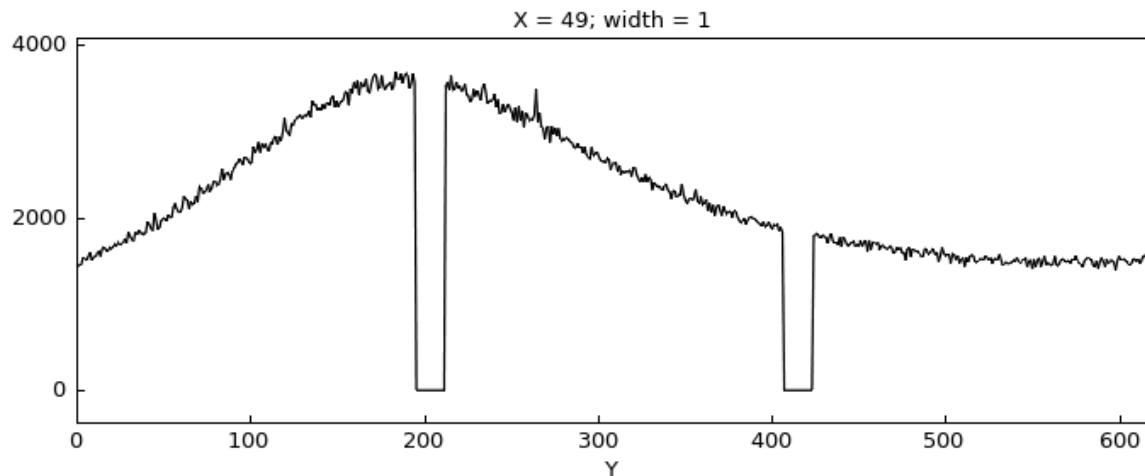
EH2_EXP [213]: mtimescan(0.001, 30*60*1000, 1)

Il campione ha iniziato a cristallizzare alla temperatura di 695 C, abbiamo interrotto la misura verso la fine, cambiamo posizione per poter proseguire la rampa.



Saliamo a 730 C controllando il pilatus di tanto in tanto. Non si vedono picchi nella nuova posizione salendo in temperature.

Dopo circa 15 minuti ha iniziato a ricomparire il picco, misurando in giro per il campione lo vediamo ovunque

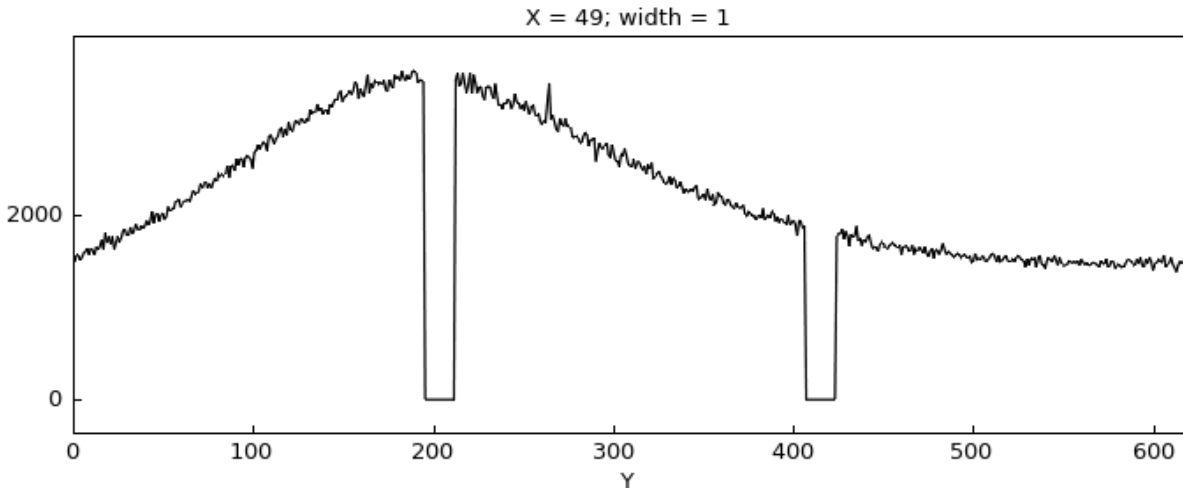


Decidiamo di scappare. Scendiamo a 660C

Proviamo a guardare il tau in cooling, non siamo interessati al contrasto almeno per le temperature sopra Tg.

Facciamo una misura da 60 minuti a 660C

Ad inizio misura il pilatus e' cosi`



Probabilmente si e' cristallizzato solo il punto che abbiamo irraggiato a lungo a 695C, il picco piu' basso che vediamo negli altri casi e' solamente un pixel danneggiato del Pilatus.

Cambiamo campione perche' cristallizzato

11/04 **GeO2_3**

```
def GeO2_3_macro():
    temperature = 30, 100, 170, 240, 310, 380, 415, 450, 485, 520, 555, 590, 625, 660,
695, 730, 730, 660, 590, 520, 450, 380, 310, 240, 170, 100, 30, 30
    rate = 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10,
10, 10, 10, 10, 10, 10, 10, 10, 10
    measure_time = 25, 25, 25, 25, 25, 50, 50, 50, 50, 100, 100, 100, 150, 150, 150,
180, 180, 20, 20, 20, 10, 10, 10, 10, 10, 10, 10, 10
    umv(ys, 0.1, zs, 0)
    for ii in range(len(temperature)):
        if (ii!=16) or (ii!=len(temperature)-1):
            print(f"Set temperature = {temperature[ii]}C")
            set_nanodac_temp(temperature[ii], ramprate=rate[ii], wait=True)
            print(f"Reached temperature = {temperature[ii]}C")

            newsample(f"GeO2_3_{temperature[ii]}C")
    print(f"new measure")

    switch to transmission()
```

```

dscan(ys, -0.5, 0.5, 50, 0.2)
dscan(zs, -0.5, 0.5, 50, 0.2)
dmesh(ys, -0.05, 0.05, 20, zs, -0.05, 0.05, 20, 0.2)

eh2_att(0.001)

if ii == 16: eh2_att(0.1)
if ii == len(temperature)-1: eh2_att(0.5)

switch_to_eiger()

mtimescan(0.001, measure_time[ii]*60*1000, 1)

```

Macro per la notte

```

def GeO2_3_macro2():
    temperature = 660, 695, 730
    rate = 10, 10, 10
    measure_time = 40, 40, 30
    num_rep = 4, 4, 5
    yss = .0, .05, .1, .15, .2
    zss = .1, .05, .0, -.05, -.01

    #umv(ys, 0.1, zs, 0) working point
    for ii in range(3):

        print(f"Set temperature = {temperature[ii]}C")
        set_nanodac_temp(temperature[ii], ramprate=rate[ii], wait=True)
        print(f"Reached temperature = {temperature[ii]}C")

        newsample(f"GeO2_3_{temperature[ii]}C")
        print(f"new measure")

        umv(ys, yss[ii], zs, zss[2])

        switch_to_transmission()
        dscan(ys, -0.5, 0.5, 100, 0.2)
        dscan(zs, -0.5, 0.5, 100, 0.2)
        dmesh(ys, -0.05, 0.05, 10, zs, -0.15, 0.15, 30, 0.2)

        eh2_att(0.001)

```

```
switch_to_eiger()
```

```
for jj in range(num_rep[ii]):  
    umv(zs, zss[jj])  
    mtimescan(0.001, measure_time[ii]*60*1000, 1)
```

```
delcoups      = 1, 3, 4, 5  
ths           = 2, 1.5, 2, 2.4  
measure_time = 30, 30, 20, 20
```

```
print("Q measure")  
newsample(f"GeO2_3_730C_Q")
```

```
umv(ys, yss[3], zs, zss[2])
```

```
switch_to_transmission()  
dscan(ys, -0.5, 0.5, 100, 0.2)  
dscan(zs, -0.5, 0.5, 100, 0.2)  
dmesh(ys, -0.05, 0.05, 10, zs, -0.15, 0.15, 30, 0.2)
```

```
eh2_att(0.001)
```

```
switch_to_eiger()
```

```
for ii in range(len(delcoups)):  
    umv(zs, zss[ii])  
    umv(delcoup, delcoups[ii])  
    umv(th, ths[ii])  
  
    mtimescan(0.001, measure_time[ii]*60*1000, 1)
```

```
print("Attenuator 0.5 measure @ T = 730 C")  
newsample(f"GeO2_3_730C_att2")
```

```
umv(ys, yss[4], zs, zss[2])
```

```
switch_to_transmission()  
dscan(ys, -0.5, 0.5, 100, 0.2)  
dscan(zs, -0.5, 0.5, 100, 0.2)  
dmesh(ys, -0.05, 0.05, 10, zs, -0.15, 0.15, 30, 0.2)
```

```
eh2_att(0.001)
```



```

switch_to_eiger()

eh2_att(0.5)

for ii in range(4):
    umv(zs, zss[ii])

mtimescan(0.001, 30*60*1000, 1)

```

```

Def GeO2_4_macro():
    print("Set temperature = 30 C")
    set_nanodac_temp(30, ramprate=30, wait=True)
    time.sleep(10*60)
    print("Reached temperature = 30 C")

    newsample("GeO2_3_30C")
    print("new measure")

    umv(ys, yss[3], zs, zss[4])

    switch_to_transmission()
    dscan(ys, -0.5, 0.5, 100, 0.2)
    dmesh(ys, -0.05, 0.05, 20, zs, -0.05, 0.05, 20, 0.2)

    eh2_att(0.001)

    switch_to_eiger()

    mtimescan(0.001, 20*60*1000,1)

    print("Attenuator 0.5 measure @ T = 30 C")

    eh2_att(0.5)
    mtimescan(0.001, 40*60*1000,1)

```

Roller blades mounted in the Ω furnace to measure beam size
 Saxs_diode in

H beam size: Scan(number=8, name=dscan,
path=/data/visitor/hc6209/id10-coh/20250408/RAW_DATA/GeO2_4_30C/GeO2_4_30C_0002/G
eO2_4_30C_0002.h5)

V beam size: Scan(number=9, name=dscan,
path=/data/visitor/hc6209/id10-coh/20250408/RAW_DATA/GeO2_4_30C/GeO2_4_30C_0002/G
eO2_4_30C_0002.h5)

Beam size: 28.8 x 39.6 μm (HxV, FWHM, Pseudo-Voigt x Slit) - Same as before

Flux measurement with eh2_att(1)

sct(1) : Scan(number=10, name=ct,
path=/data/visitor/hc6209/id10-coh/20250408/RAW_DATA/GeO2_4_30C/GeO2_4_30C_0002/G
eO2_4_30C_0002.h5)

ch2_saxs = 0.00110669 A

Focussed beam at 10.25 keV

Saxs_diode in
umv(monoe, 10.15)

U27b only

CRL3 out and check TS, CS, RG (basically aligned)
RG=CS=1
CRL3 slot#2 in

fshutopen() (needed if working only with tetramms)

EH2_EXP [521]: newsample("eh2_exp")
Dataset collection set to 'eh2_exp'
Data path: /data/visitor/hc6209/id10-coh/20250408/RAW_DATA/eh2_exp/eh2_exp_0002

V beam size vs energy

10.15 keV - 3.6 μm (FWHM, Pseudo-Voigt) - Scan 4
10.25 keV - 3.1 μm (FWHM, Pseudo-Voigt) - Scan 6
10.35 keV - 3.2 μm (FWHM, Pseudo-Voigt) - Scan 9
10.45 keV - 4.3 μm (FWHM, Pseudo-Voigt) - Scan 11

Back to 10.25 keV

10.25 keV - 3.1 μm (FWHM, Pseudo-Voigt) - Scan 13
10.25 keV - 2.5 μm (FWHM, Pseudo-Voigt with single-point derivative) - Scan 13

EH2_EXP [574]: slits

Out [574]: *** Slits ***

PS slit, (+0.100,+0.200) @ (+0.191,+0.405)

SS slit, (+1.000,+1.000) @ (+3.309,+0.075)

TS slit, (+0.200,+0.200) @ (+3.478,-0.116)

CS slit, (+0.200,+0.200) @ (+0.016,-0.001)

RG slit, (+0.400,+0.400) @ (+0.009,+0.004)

10.25 keV - 3.2 μm (FWHM, Pseudo-Voigt) - Scan 15 - V edge scan

10.25 keV - 7.6 μm (FWHM, Pseudo-Voigt) - Scan 17 - H edge scan

Beam size: 7.6 x 3.2 μm (HxV, FWHM, Pseudo-Voigt - 3 points derivative) - U27b only

Flux

sct() - Scan 18

ch2_saxs = 0.000341861A Undulator not all in !!!

All IDs in

Flux

sct() - Scan 21

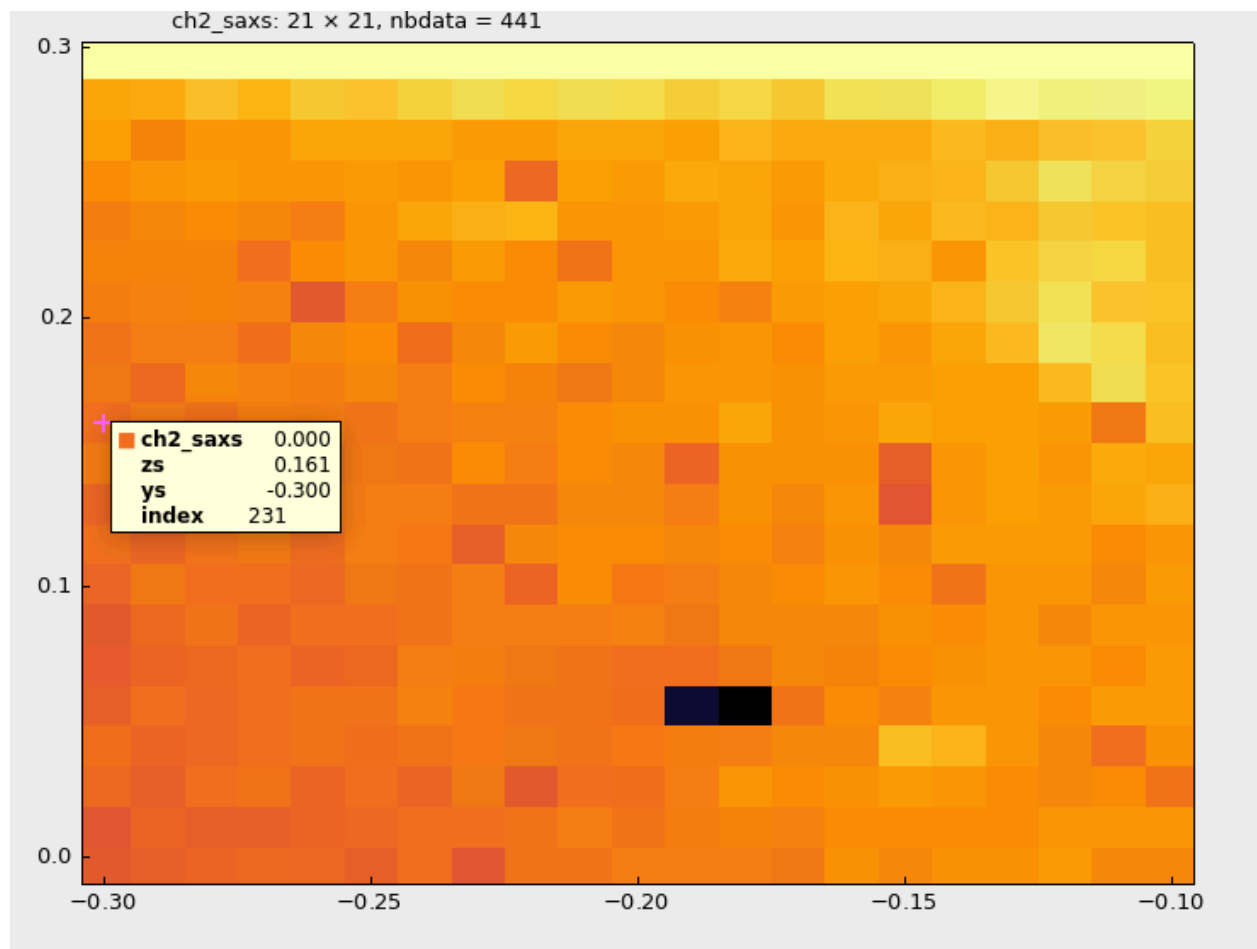
ch2_saxs = 0.00122320 A

Beam size: 7.7 x 3.3 μm (HxV, FWHM, Pseudo-Voigt - 3 points derivative) - Scans 22 - 23

EH2_EXP [625]: eiger4m_v2.detector.acquisition.threshold1_energy=5100

eh2_att(0.001)

GeO2_4_10p25



umv(ys,-0.29,zs,0.206)

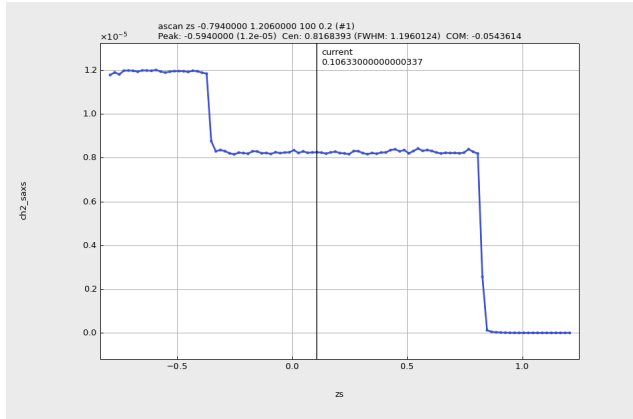
C about 13% !!!

Vycor in

Dataset collection set to 'Vycor_10p25'

Data path:

/data/visitor/hc6209/id10-coh/20250408/RAW_DATA/Vycor_10p25/Vycor_10p25_0001



EH2_EXP [699]: wm(ys,zs)

	ys[mm]	zs[mm]
-----	-----	-----
User		
High	14.687563	19.6876200
Current	-0.140000	0.1063300
Low	-13.312437	-16.8123800
Offset	0.687562	-16.9967600

umv(delcoup,0)

EH2_EXP [736]: user.take_data_and_move(2_000,dt=0.01,dz=0.003)

Fast detectors:

scanning mode	= TIME
acquisition time	= 0.01 sec
acquisition period	= 0.0101006 sec
acq/slow points	= 100
number of points	= 2000 (requested 2000)

Slow detectors:

acquisition time	= 1 sec
acquisition period	= 1.01006 sec (requested 1.00305 sec)
number of points	= 20

Start delay = 0.001 sec

Total time = 20.202 sec

Scan 4 Sun Apr 13 17:40:49 2025 Saving in

/data/visitor/hc6209/id10-coh/20250408/RAW_DATA/Vycor_10p25/Vycor_10p25_0001/Vycor_1

EH2_EXP [738]: eiger4m_v2.processing.saving_dense.enabled=True

EH2_EXP [739]: user.take_data_and_move(2_000,dt=0.01,dz=0.003,n_moves=6)

Fast detectors:

scanning mode	= TIME
acquisition time	= 0.01 sec

acquisition period = 0.0101006 sec
acq/slow points = 100
number of points = 2000 (requested 2000)

Slow detectors:

acquisition time = 1 sec
acquisition period = 1.01006 sec (requested 1.00305 sec)
number of points = 20

Start delay = 0.001 sec
Total time = 20.202 sec

Scan 5 Sun Apr 13 18:05:08 2025 Saving in
/data/visitor/hc6209/id10-coh/20250408/RAW_DATA/Vycor_10p25/Vycor_10p25_0001/Vycor_10p25_0001.h5

Scan 6 with dispilatus300k()

Scan 7 with fasttimescan(2_000, 0.01) acquisition hangs !

Restart device server

Scan 8 with fasttimescan(2_000, 0.01) acquisition hangs ! Too much signal ?

Scan 9 with fasttimescan(1_000, 0.01) works !

Focussed beam at 8.67 keV

Crl3 out

Switch_to_transmission

Det flight path has been put in air by mistake...

Go to 8.67 keV with u27b

Align TS (changes in the 10 μm range)

Realign y3 and rgvo, csvo (minor adjustments in the 10 μm range)

Roller blades on

eh2_att(1e-3)

CRL3 Slot 3 in

Align slot in ycr13 and zcr13

EH2_EXP [167]: newsample("eh2_exp")

Dataset collection set to 'eh2_exp'

Data path: /data/visitor/hc6209/id10-coh/20250408/RAW_DATA/eh2_exp/eh2_exp_0003

Beam size with eh2_att(0.1)

CS = RG = 1

8.67 keV - 3.4 μm (FWHM, Pseudo-Voigt, 3-point derivative) - Scan 3 - Vertical edge scan

8.67 keV - 7.9 μm (FWHM, Pseudo-Voigt, 3-point derivative) - Scan 4 - Horizontal edge scan -
Bad fit !!!

Note: Scans with quite a lot of glitches

EH2_EXP [201]: slits

Out [201]: *** Slits ***

PS slit, (+0.100,+0.200) @ (+0.191,+0.405)

SS slit, (+1.000,+1.000) @ (+3.309,+0.075)

TS slit, (+0.200,+0.200) @ (+3.490,-0.147)

CS slit, (+0.200,+0.200) @ (+0.016,-0.018)

RG slit, (+0.400,+0.400) @ (+0.009,-0.015)

Put all IDs

fshutopen()

Beam size with eh2_att(0.001)

8.67 keV - 7.2 μm (FWHM, Pseudo-Voigt, 3-point derivative) - Scan 9 - Horizontal edge scan

8.67 keV - 3.4 μm (FWHM, Pseudo-Voigt, 3-point derivative) - Scan 10 - Vertical edge scan

Note: much smoother scans. Very nice derivative profiles

fshutclose()

Beam size: 7.2 x 3.4 μm (HxV, FWHM, Pseudo-Voigt - 3 points derivative) - Nice profiles !

Flux with eh2_att(1)

EH2_EXP [220]: sct()

INFO: starting Scan(number=11, name=ct,

path=/data/visitor/hc6209/id10-coh/20250408/RAW_DATA/eh2_exp/eh2_exp_0003/eh2_exp_0003.h5)

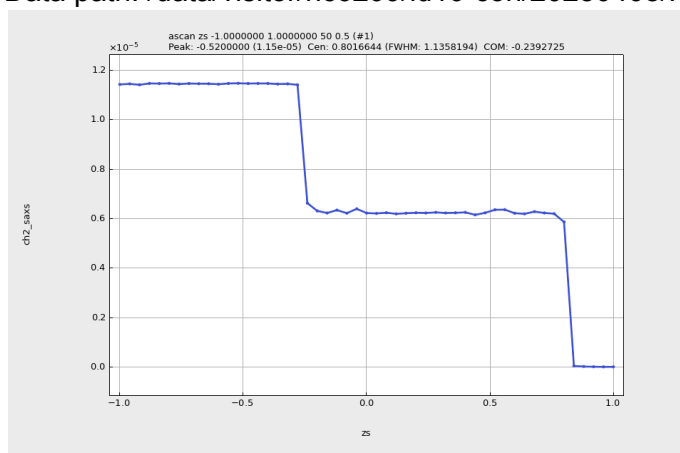
ch2_saxs = 0.000964052 A

Vycor in

EH2_EXP [226]: newsample("Vycor_8p67")

Dataset collection set to 'Vycor_8p67'

Data path: /data/visitor/hc6209/id10-coh/20250408/RAW_DATA/Vycor_8p67/Vycor_8p67_0001



EH2_EXP [280]: wm(ys,zs)

	ys[mm]	zs[mm]
-----	-----	-----
User		
High	14.687563	19.6876200
Current	0.000000	0.2000000
Low	-13.312437	-16.8123800
Offset	0.687562	-16.9967600

eh2_att(0.01)

Fast detectors:

scanning mode	= TIME
acquisition time	= 0.01 sec
acquisition period	= 0.0101006 sec
acq/slow points	= 100
number of points	= 2000 (requested 2000)

Slow detectors:

acquisition time	= 1 sec
acquisition period	= 1.01006 sec (requested 1.00016 sec)
number of points	= 20

Start delay = 0.001 sec

Total time = 20.202 sec

Scan 5 Sun Apr 13 21:12:45 2025 Saving in
/data/visitor/hc6209/id10-coh/20250408/RAW_DATA/Vycor_8p67/Vycor_8p67_0001/Vycor_8p67_0001.h5

Acquisition stocks again !!!

EH2_EXP [288]: eiger4m_v2.processing.saving_dense.enabled=False

Try "sparse" acquisition with vycor and eh2_att(1e-3)

EH2_EXP [292]: fasttimescan(2_000,0.01)

Acquisiton = 0.01 sec
Period = 0.0101006 sec
NPoints = 2000

Scan mode = TIME
Camera mode = SINGLE
Start delay = 0.100 sec

Total Time = 20.301 sec

Scan 6 Sun Apr 13 21:20:07 2025 Saving in
/data/visitor/hc6209/id10-coh/20250408/RAW_DATA/Vycor_8p67/Vycor_8p67_0001/Vycor_8p67_0001.h5

EH2_EXP [294]: ACTIVE_MG.disable("tetramm_diodes**")

EH2_EXP [296]: fasttimescan(2_000,0.01)

Out [296]: Scan(number=7, name=ftimescan,
path=/data/visitor/hc6209/id10-coh/20250408/RAW_DATA/Vycor_8p67/Vycor_8p67_0001/Vycor_8p67_0001.h5)

EH2_EXP [297]: eiger4m_v2.detector.acquisition.threshold1_energy=4500

EH2_EXP [301]: fasttimescan(2_000,0.01)

Out [301]: Scan(number=9, name=ftimescan,
path=/data/visitor/hc6209/id10-coh/20250408/RAW_DATA/Vycor_8p67/Vycor_8p67_0001/Vycor_8p67_0001.h5)

EH2_EXP [302]: **user.take_data_and_move(2_000,dt=0.01,dz=0.003,n_moves=5)**

Fast detectors:

scanning mode	= TIME
acquisition time	= 0.01 sec
acquisition period	= 0.0101006 sec
acq/slow points	= 100
number of points	= 2000 (requested 2000)

Slow detectors:

acquisition time	= 1 sec
acquisition period	= 1.01006 sec (requested 1.00016 sec)
number of points	= 20

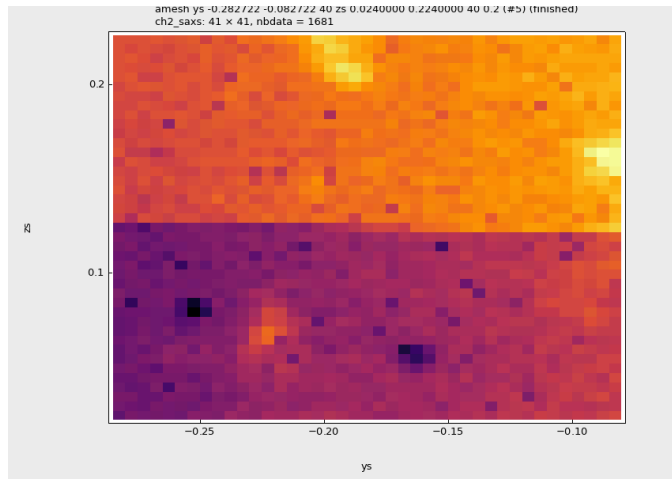
Start delay = 0.001 sec

Total time = 20.202 sec

Scan 10 Sun Apr 13 21:28:04 2025 Saving in
/data/visitor/hc6209/id10-coh/20250408/RAW_DATA/Vycor_8p67/Vycor_8p67_0001/Vycor_8p67_0001.h5

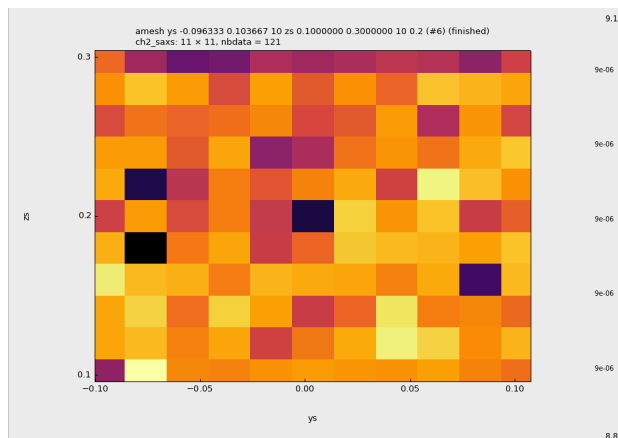
C about 19%

GeO2_4_8p76



Cambiato il delcoup a 0.2 per avere lo stesso q all'interno dell'eiger
Controllato i background e sembra pulito

14/04: montata **Tantala**



Beamline notes/how-to

- Chemistry lab code
 - A2601
- Accessing analysis machine
 - `ssh opid10@lid10dynamix`

- Password
- Type `exp`
- Type `source hc6209_venv/bin/activate`
- `user_script_load("/data/visitor/hc6209/id10-coh/20250408/SCRIPTS/hc6209.py")`

-

- Programs for scan visualization
 - `flint()`
 - `pymca()`

- Transmission measurements

`ACTIVE_MG.enable("tetramm_diodes**")`

The diode `ch2_saxs` will become active for sample transmission measurements

To disable the diode during the “mtimescan”:

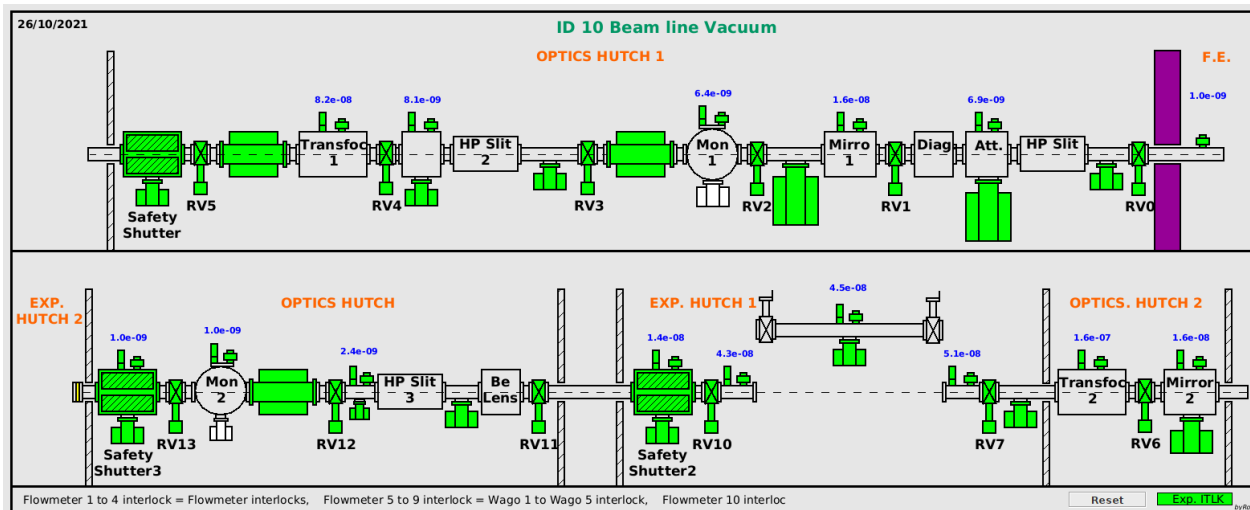
`ACTIVE_MG.disable("tetramm_diodes**")`

To see enabled (active) detectors:

`ACTIVE_MG`

- Changing attenuators
 - `eh2_att(0.01)`
- Screenshot
 - `Alt+s`
- Open shutter(s)
 - `shopen()`
- Bliss hangs
 - Open another terminal and type `kill_bliss eh2_exp`
 - Restart typing `eh2_exp`
- Move undulators back in place
 - `user.restore_undulators()`
- Detector problems
 - Open browser tab and go to <http://tina.esrf.fr:22000/>
 - Find “Eiger4M_V2”
 - Restart process (using recycle arrow)
 - Go to `eh2_exp`, type `eiger4m_v2._det.sync_hard()`
- Analysis
 - Open terminal
 - `ssh -Y opid10@lidl10dynamix`
 - (optional)
 - Type `exp`
 - To change directory
 - Type `id10dynamix`
 - To load environment

- Edit input file
 - May use gedit as program
- Run analysis
 - `xpcs input_filename`
- Output files are in PROCESSED_DATA
- Go home procedure
 - `user.change_T(20)`
 - `shclose()`
- Vacuum
 - Command `jvacuum`
 -



EH2_EXP [484]: ACTIVE_MG

Out [484]: MeasurementGroup: measurement_eh2_exp (state='default')

- Existing states : 'default'

Enabled

Disabled

eiger4m_v2:frame	p201_eh2_1:ct2_counters_controller:apd
eiger4m_v2:humidity	p201_eh2_1:ct2_counters_controller:det
eiger4m_v2:others:fill_factor	p201_eh2_1:ct2_counters_controller:mon
eiger4m_v2:roi_counters:db_avg	
p201_eh2_1:ct2_counters_controller:sec	
eiger4m_v2:roi_counters:db_max	eiger4m_v2:input_frame
eiger4m_v2:roi_counters:db_min	eiger4m_v2:raw_frame
eiger4m_v2:roi_counters:db_std	eiger4m_v2:temperature
eiger4m_v2:roi_counters:db_sum	pilatus300k:image
eiger4m_v2:roi_counters:roi1_avg	pilatus300k:roi_counters:roi1_avg
eiger4m_v2:roi_counters:roi1_max	pilatus300k:roi_counters:roi1_max

eiger4m_v2:roi_counters:roi1_min	pilatus300k:roi_counters:roi1_min
eiger4m_v2:roi_counters:roi1_std	pilatus300k:roi_counters:roi1_std
eiger4m_v2:roi_counters:roi1_sum	pilatus300k:roi_counters:roi1_sum
eiger4m_v2:roi_counters:roi2_avg	pilatus300k:roi_counters:roi2_avg
eiger4m_v2:roi_counters:roi2_max	pilatus300k:roi_counters:roi2_max
eiger4m_v2:roi_counters:roi2_min	pilatus300k:roi_counters:roi2_min
eiger4m_v2:roi_counters:roi2_std	pilatus300k:roi_counters:roi2_std
eiger4m_v2:roi_counters:roi2_sum	pilatus300k:roi_counters:roi2_sum
eiger4m_v2:roi_counters:roi_h_avg	machinfo:current
eiger4m_v2:roi_counters:roi_h_max	machinfo:lifetime
eiger4m_v2:roi_counters:roi_h_min	tetramm_diag:ch1_diag
eiger4m_v2:roi_counters:roi_h_std	tetramm_diag:ch2_diag
eiger4m_v2:roi_counters:roi_h_sum	tetramm_diag:ch3_diag
eiger4m_v2:roi_counters:roi_v_avg	tetramm_diag:ch4_diag
eiger4m_v2:roi_counters:roi_v_max	tetramm_diag_calc:diag_intensity
eiger4m_v2:roi_counters:roi_v_min	tetramm_diag_calc:diag_y
eiger4m_v2:roi_counters:roi_v_std	tetramm_diag_calc:diag_z
eiger4m_v2:roi_counters:roi_v_sum	wcid10a:twbm_1
eiger4m_v2:roi_counters:transmission_avg	wcid10a:twbm_2
eiger4m_v2:roi_counters:transmission_max	wcid10a:twbm_3
eiger4m_v2:roi_counters:transmission_min	wcid10a:twbm_4
eiger4m_v2:roi_counters:transmission_std	wcid10a:twbm_5
eiger4m_v2:roi_counters:transmission_sum	wcid10a:twbm_6
eiger4m_v2:sparse_frame	wcid10a:twbm_7
tetramm_diodes:ch1_sample	wcid10a:twbm_8
tetramm_diodes:ch2_saxs	wcid10b:t_oh1_1
tetramm_diodes:ch3_user1	wcid10i:t_eh2_1
tetramm_diodes:ch4_user2	wcid10i:t_eh2_2
omega_sample:omega_sample	sens4_eh2:DiaphragmPressure
omega_body:omega_body	sens4_eh2:PiraniPressure
	sens4_eh2:Pressure
	sens4_eh2:Temperature