Example

June 4, 2020

Contents

1 Experimental setup

SIRIUS Beamline : Experiment 1234

Confined at home

- Type: Proposal
- Safety: Yellow
- Date: 13/03/2020 - 11/05/2020

- Main proposer: Hemmerle
- Local contact: Arnaud
- Users (on site): Person A; Person B
- Recording directory: Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/recording/

- Machine:
  - Current: 450 mA
  - Mode: Top-up

- Optics:
  - DCM: Si111
  - MGM: Not used
  - M1: M1-A Pt Track
  - M2: M2 Pt Track
  - M3: No M3
  - M4: M4 Pt Track

- Beam:
  - Fixed/Variable energy: Fixed
  - Energy (keV): 8
  - Wavelength (nm): 0.155
  - Harmonic: 19
  - Polarisation: LH
  - Phase (deg): 0
  - Horizontal focalisation: False
  - Vertical focalisation: True
  - Horizontal beamsize (mm): 2
  - Vertical beamsize (mm): 0.1

- Monitors and XBPM:
  - mon1:
  - mon2: thick diamond
  - mon3:
  - mon4:
  - Detectors: Pilatus

- Remarks: This is a nice experiment.

2 Beamline alignment

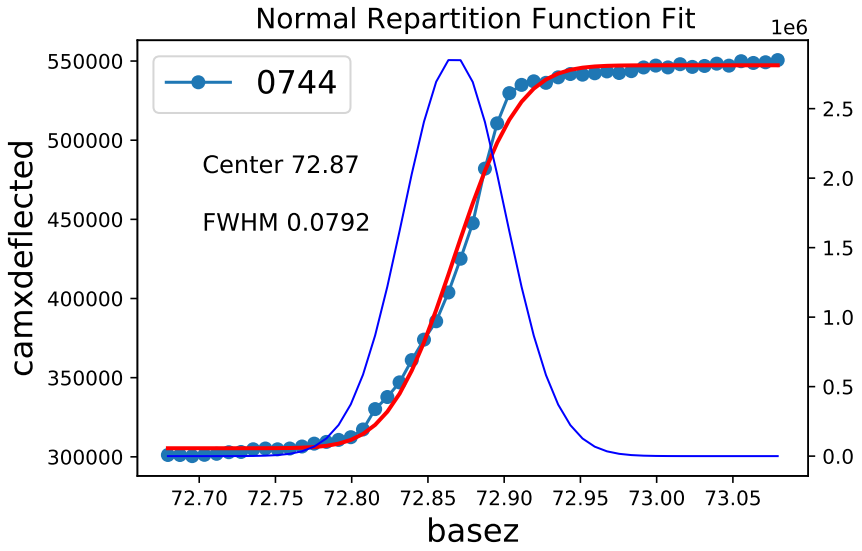
2.1 Scan 654 -> 680 : DCM Alignment 8keV + HU36 + M1 + M2

-Incidence:

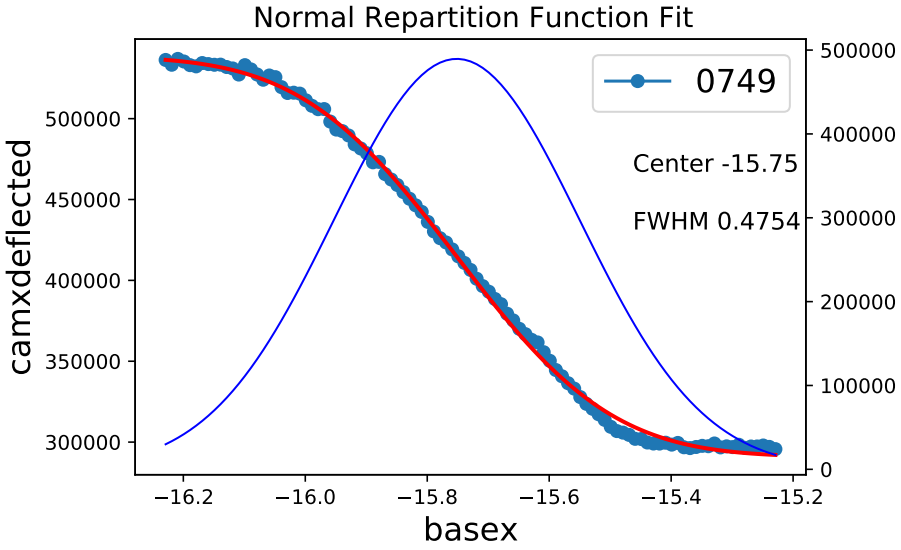
$$\frac{786-558}{2\times 2069}\times 0.0355 = 1.9mrad$$

2.2 Alignment diffracto

2.2.1 (Vertical) SIRIUS_2020_03_11_0744: dscan basez -.2 .2 50 .1

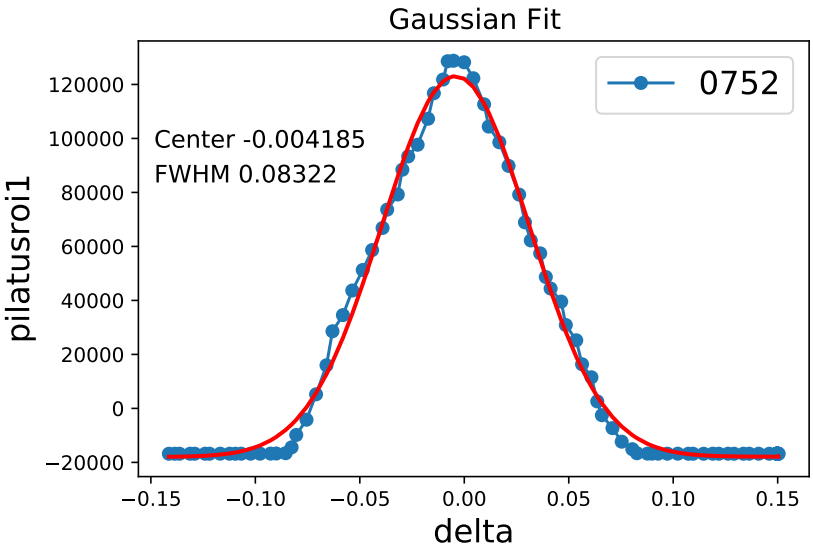


2.2.2 (Horizontal) SIRIUS_2020_03_11_0749: %sigmoid_dscan basex -.5 .5 100 .1

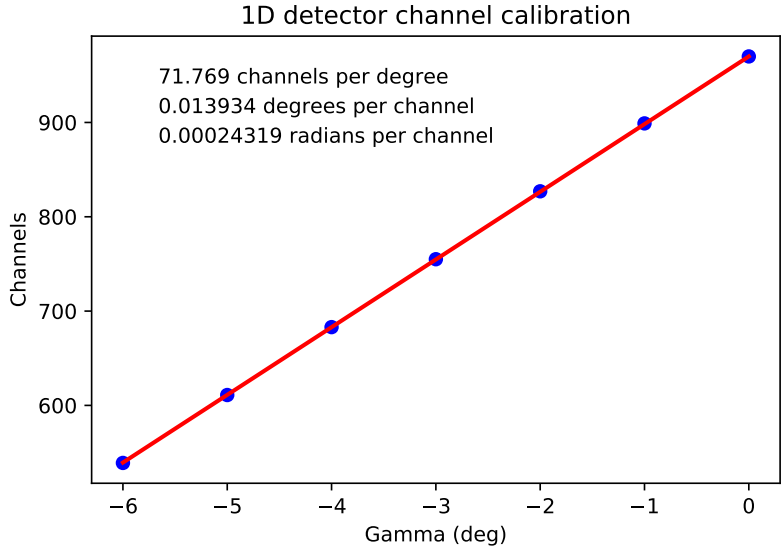


2.2.3 SIRIUS_2020_03_11_0752: continuous_ascan delta -.15 .15 100 1

scans 750 -> 752 : Alignment delta angle (Pilatus+Soller)



2.3 Calibration thetaz

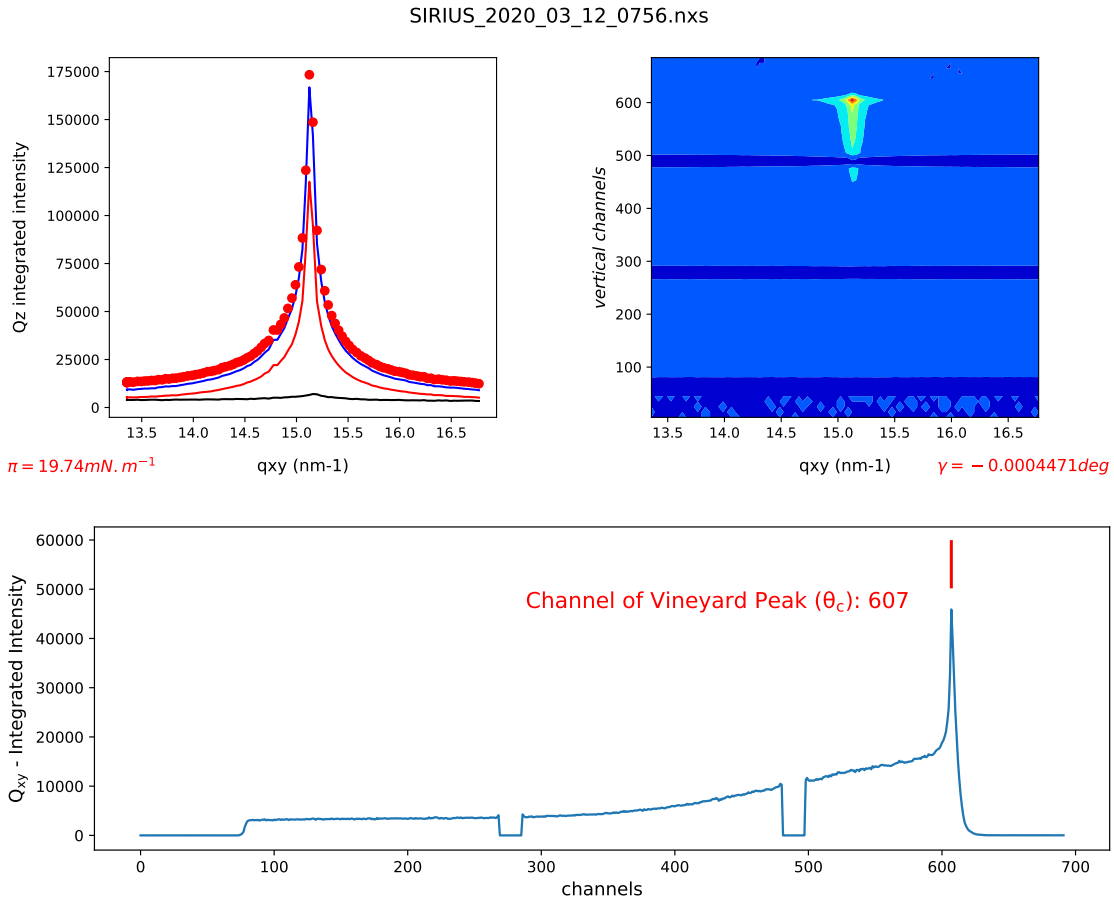


3 Calibration with Octadecanol

3.0.1 SIRIUS_2020_03_12_0756: continuous_ascan delta -24 -19 100 5

```
 - Open Nexus Data File :
        /Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/recording
/SIRIUS_2020_03_12_0756.nxs
        . Number of data points:  101
        . Available Counters:
                0  -------->  delta
                1  -------->  zs
                2  -------->  gamma
```

```
                3  -------->  hu36energy
                4  -------->  xs
                5  -------->  energydcm
                6  -------->  current
                7  -------->  mon2
                8  -------->  surfacepressure
                9  -------->  areapermolecule
                10  -------->  qxy
                11  -------->  pilatus
                12  -------->  pilatusroi1
                13  -------->  integration_time
                14  -------->  sensorsRelTimestamps
                15  -------->  sensorsTimestamps
        . Pilatus data found, (column 11, alias pilatus)
        . qxy data found, (column 10, alias qxy)
        . Surface pressure data found, mean value 19.74 ± 0.006119 mN/m
        . Area per molecule data found, mean value 0.3557 ± 3.944e-05 nm2 per
molecule
        . Gamma motor data found, mean value -0.0004471 deg
```

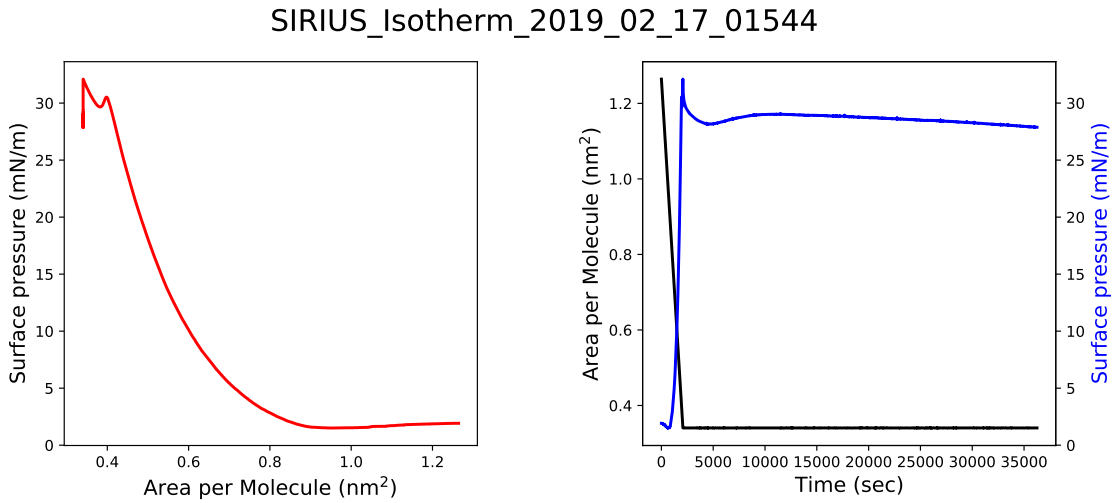



```
Data not saved. To save data, run a GIXD on the scan.
Channel0: 607
```

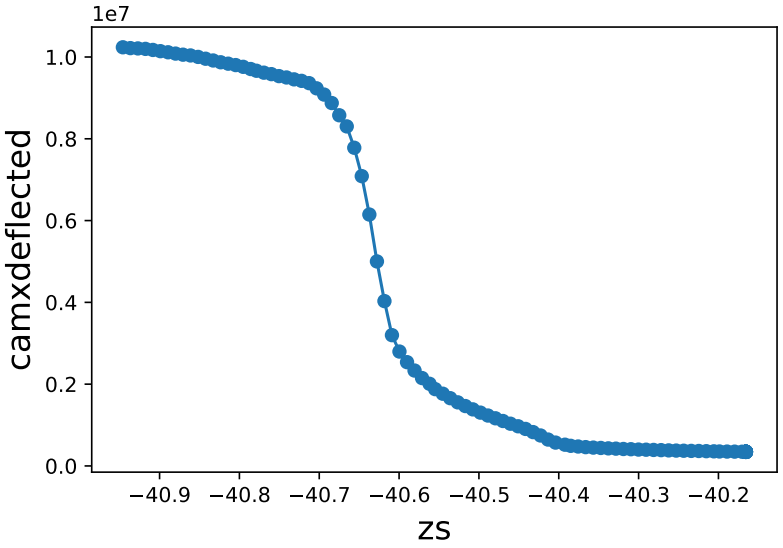
4 Experiment GIXD+Langmuir

4.1 Sample A

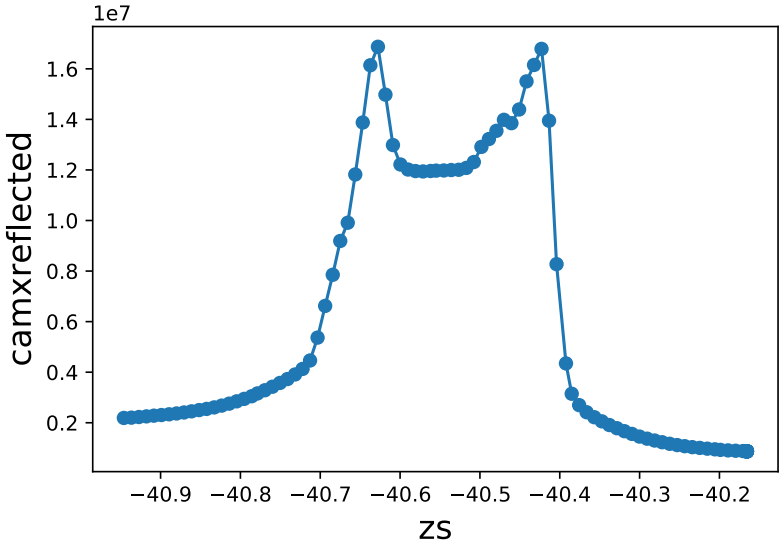
4.1.1 SIRIUS_Isotherm_2019_02_17_01544: isotherm 1.97 46 35000 1



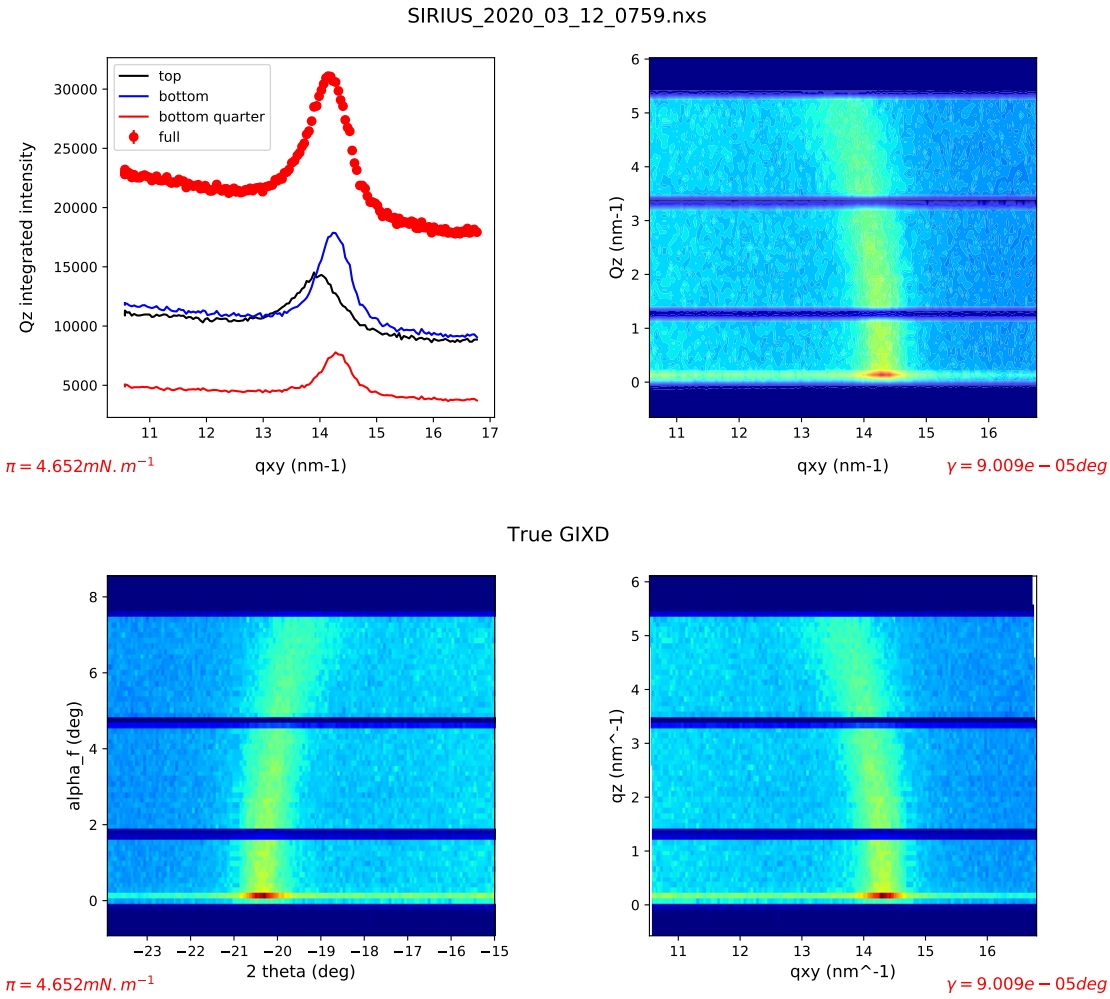
4.1.2 SIRIUS_2020_03_12_0760: run cont_regh.ipy



4.1.3 SIRIUS_2020_03_12_0760: run cont_regh.ipy



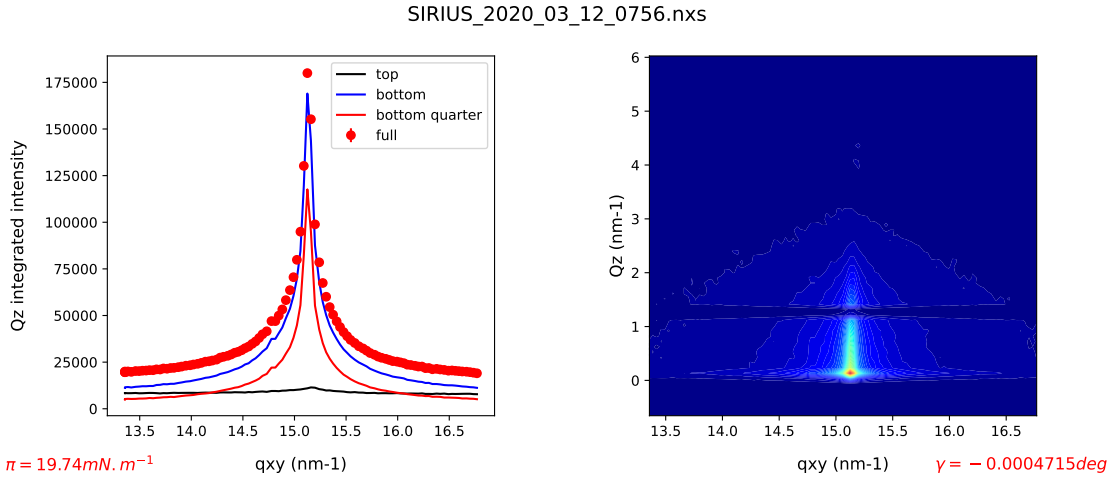
4.1.4 SIRIUS_2020_03_12_0759: continuous_ascan delta -24 -15 150 5



4.1.5 SIRIUS_2020_03_12_0756: continuous_ascan delta -24 -19 100 5

```
 - Open Nexus Data File :
        /Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/recording
/SIRIUS_2020_03_12_0756.nxs
        . Number of data points:  101
        . Available Counters:
                0  -------->  delta
                1  -------->  zs
                2  -------->  gamma
                3  -------->  hu36energy
                4  -------->  xs
                5  -------->  energydcm
                6  -------->  current
                7  -------->  mon2
                8  -------->  surfacepressure
                9  -------->  areapermolecule
                10  -------->  qxy
                11  -------->  pilatus
                12  -------->  pilatusroi1
                13  -------->  integration_time
                14  -------->  sensorsRelTimestamps
                15  -------->  sensorsTimestamps
        . Pilatus data found, (column 11, alias pilatus)
        . qxy data found, (column 10, alias qxy)
        . Valid data between points 0 and 100
        . Surface pressure data found, mean value 19.74 ± 0.006163 mN/m
        . Area per molecule data found, mean value 0.3557 ± 3.866e-05 nm2 per
molecule
        . Gamma motor data found, mean value -0.0004715 deg
        . Original, non binned matrix saved in:
         /Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/
SIRIUS_2020_03_12_0756_1D.mat
        . Scalar data saved in:
         /Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/
SIRIUS_2020_03_12_0756_1D.dat
        . Qz values saved in:
        /Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/S
IRIUS_2020_03_12_0756_1D_qz10.dat
        . Binned matrix saved in:
         /Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/
SIRIUS_2020_03_12_0756_1D.mat10
        . XYZ    data saved in:
         /Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/
SIRIUS_2020_03_12_0756_1D.moy10
        . Qz values saved in:
        /Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/S
IRIUS_2020_03_12_0756_1D_qz20.dat
        . Binned matrix saved in:
```

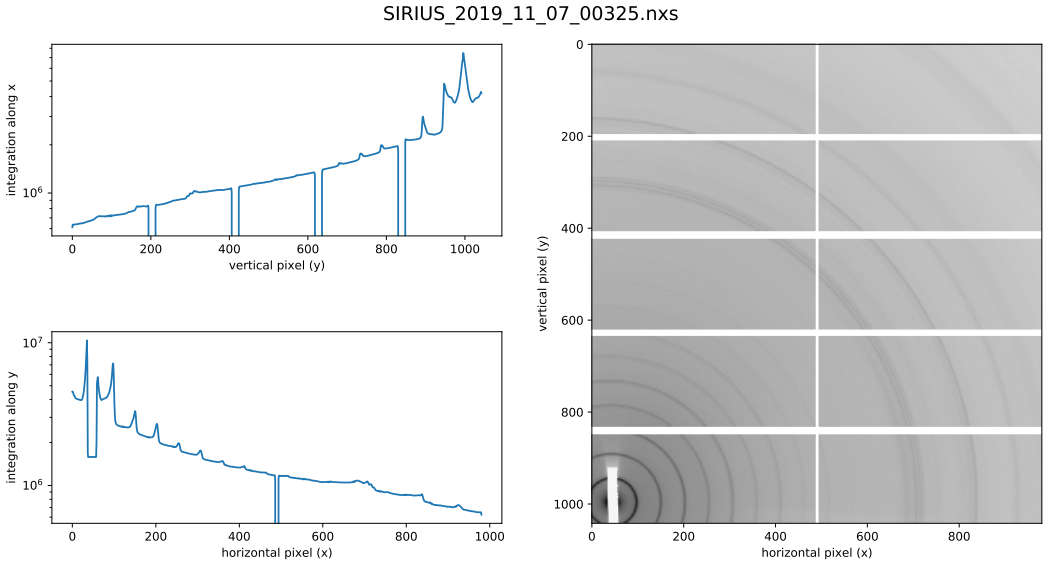
/Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/SIRIUS_2020_03_12_0756_1D.mat20
. XYZ data saved in:
/Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/SIRIUS_2020_03_12_0756_1D.moy20
. Qz values saved in:
/Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/SIRIUS_2020_03_12_0756_1D_qz40.dat
. Binned matrix saved in:
/Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/SIRIUS_2020_03_12_0756_1D.mat40
. XYZ data saved in:
/Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/SIRIUS_2020_03_12_0756_1D.moy40



5 Experiment GIXS

5.0.1 SIRIUS_2019_11_07_00325: No command found

- Open Nexus Data File :
/Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/recording/SIRIUS_2019_11_07_00325.nxs
. Number of data points: 11
. Available Counters:
0 -------> hu36energy
1 -------> current
2 -------> mon2
3 -------> mon4
4 -------> camxdirect
5 -------> pilatus
6 -------> pilatusroi1
7 -------> integration_time
8 -------> sensorsRelTimestamps
9 -------> sensorsTimestamps
. Pilatus data found, (column 5, alias pilatus)



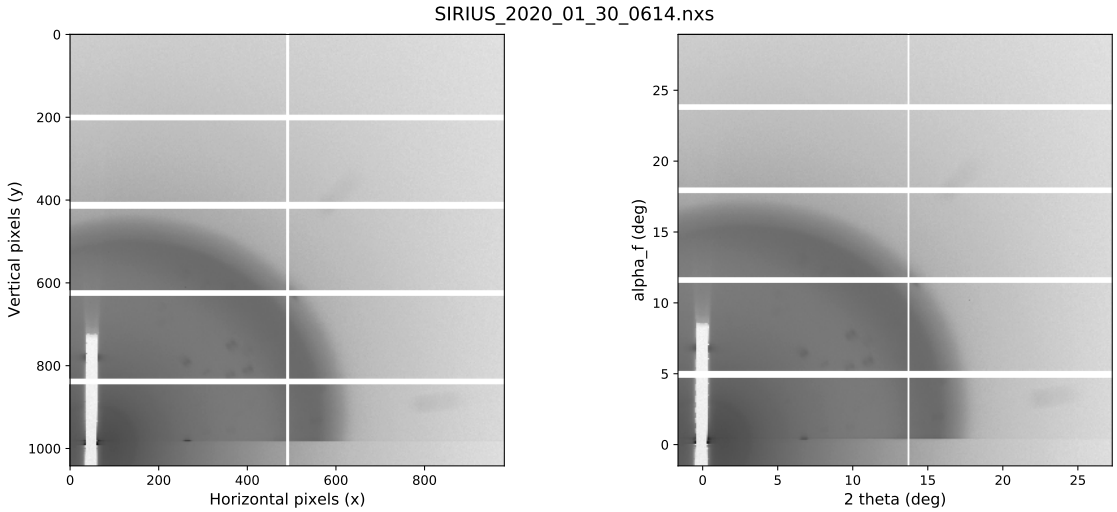
. Original matrix saved in:
/Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/SIRIUS_2019_11_07_00325.mat

. Tiff saved in:
/Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/SIRIUS_2019_11_07_00325.tiff

5.0.2 SIRIUS_2020_01_30_0614: tscan 10 1

- Open Nexus Data File :
/Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/recording/SIRIUS_2020_01_30_0614.nxs
. Number of data points: 11
. Available Counters:
0 -------> delta
1 -------> ys
2 -------> shg
3 -------> zs
4 -------> alphax
5 -------> gamma
6 -------> xs
7 -------> energydcm
8 -------> alphay
9 -------> mon2
10 -------> qxy
11 -------> mon4
12 -------> pilatus
13 -------> pilatusroi1
14 -------> integration_time
15 -------> sensorsRelTimestamps

```
                16  ------->  sensorsTimestamps
        . Pilatus data found, (column 12, alias pilatus)
        . Gamma motor data found, mean value 0.001297 deg
        . Delta motor data found, mean value 16.13 deg
        . For more details on the geometry, see:
                -Fig.2 in doi:10.1107/S0909049512022017
                -Slide 4 in http://gisaxs.com/files/Strzalka.pdf
```



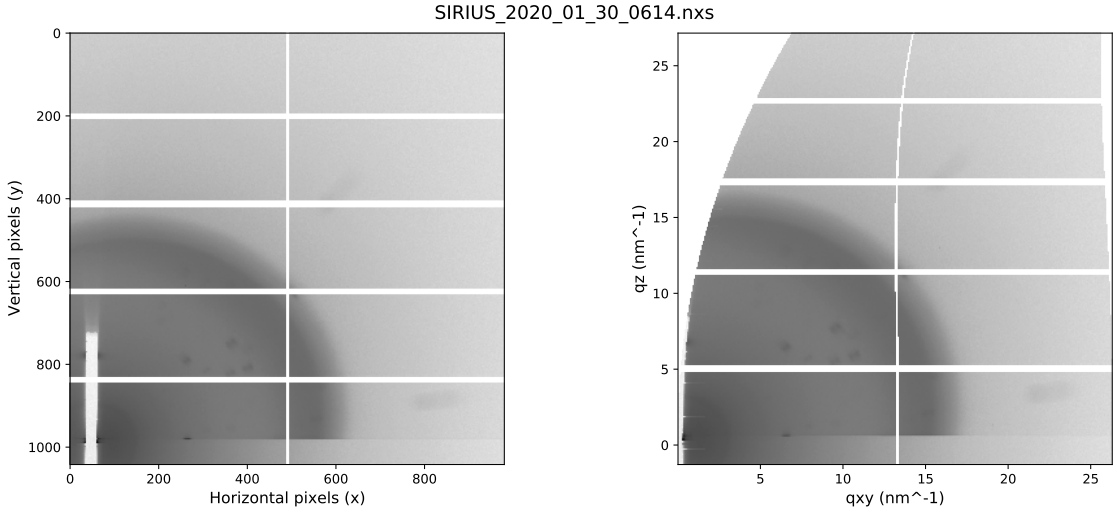

```
        . Original matrix saved in:
         /Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/
SIRIUS_2020_01_30_0614.mat

        . Tiff saved in:
         /Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/
SIRIUS_2020_01_30_0614.tiff
```

5.0.3 SIRIUS_2020_01_30_0614: tscan 10 1

```
 - Open Nexus Data File :
        /Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/recording
/SIRIUS_2020_01_30_0614.nxs
        . Number of data points:  11
        . Available Counters:
                0  ------->  delta
                1  ------->  ys
                2  ------->  shg
                3  ------->  zs
                4  ------->  alphax
                5  ------->  gamma
                6  ------->  xs
                7  ------->  energydcm
                8  ------->  alphay
                9  ------->  mon2
                10  ------->  qxy
```

```
            11  ------->  mon4
            12  ------->  pilatus
            13  ------->  pilatusroi1
            14  ------->  integration_time
            15  ------->  sensorsRelTimestamps
            16  ------->  sensorsTimestamps
      . Pilatus data found, (column 12, alias pilatus)
      . Gamma motor data found, mean value 0.001297 deg
      . Delta motor data found, mean value 16.13 deg
      . For more details on the geometry, see:
            -Fig.2 in doi:10.1107/S0909049512022017
            -Slide 4 in http://gisaxs.com/files/Strzalka.pdf
```

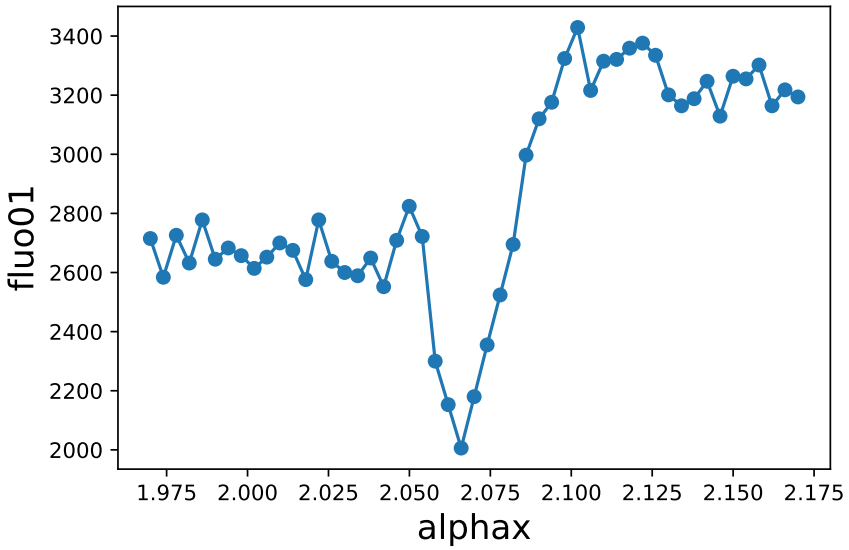



```
      . Original matrix saved in:
       /Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/
SIRIUS_2020_01_30_0614.mat

      . Tiff saved in:
       /Users/arnaudhemmerle/Documents/Recherche/Analysis/JupyLabBook/working/
SIRIUS_2020_01_30_0614.tiff
```

6 Experiment XRF

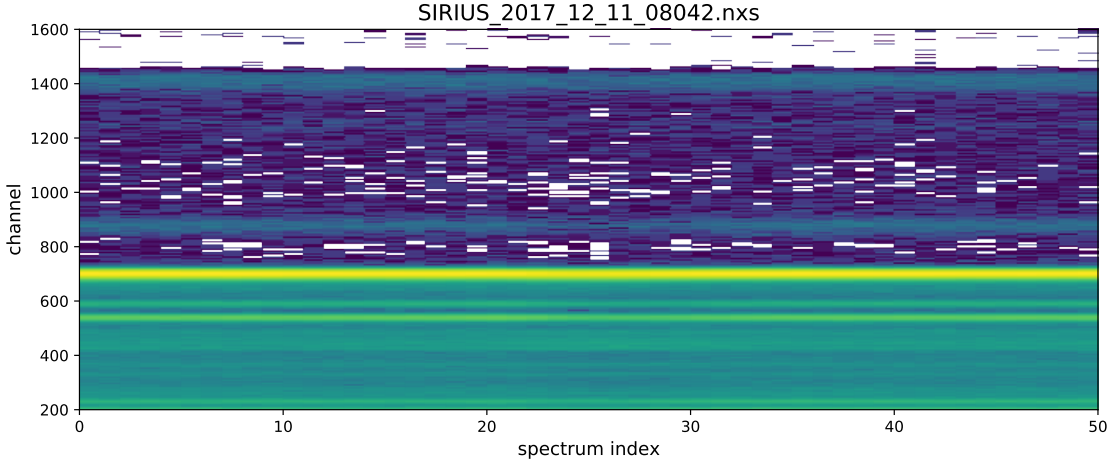
6.0.1 SIRIUS_2017_12_11_08042: run xsw7.ipy

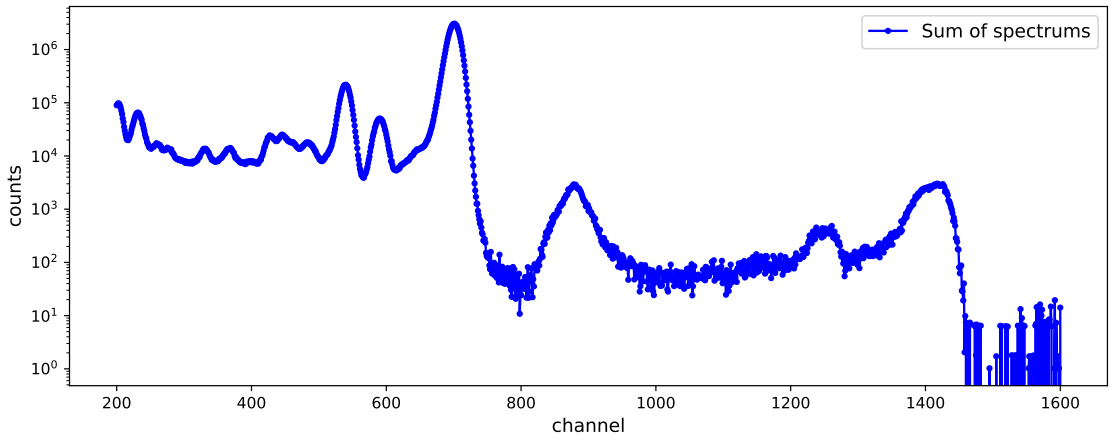


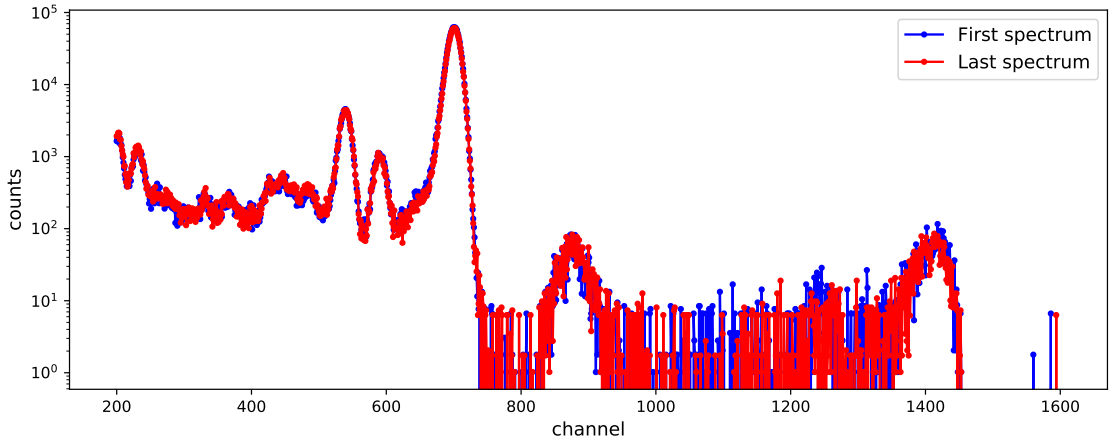
6.0.2 SIRIUS_2017_12_11_08042: run xsw7.ipy

```
. Available Counters:
          0  -------->  alphax
          1  -------->  gamma
          2  -------->  delta
          3  -------->  ys
          4  -------->  ds1hg
          5  -------->  os2hg
          6  -------->  zs
          7  -------->  alphax
          8  -------->  gamma
          9  -------->  hu36energy
          10  -------->  xs
          11  -------->  thetah
          12  -------->  ds2hg
          13  -------->  ss1hg
          14  -------->  current
          15  -------->  mon2
          16  -------->  dioderefl
          17  -------->  fluo00
          18  -------->  fluo01
          19  -------->  fluo02
          20  -------->  fluo03
          21  -------->  fluoicr00
          22  -------->  fluoicr01
          23  -------->  fluoicr02
          24  -------->  fluoicr03
          25  -------->  fluoocr01
```

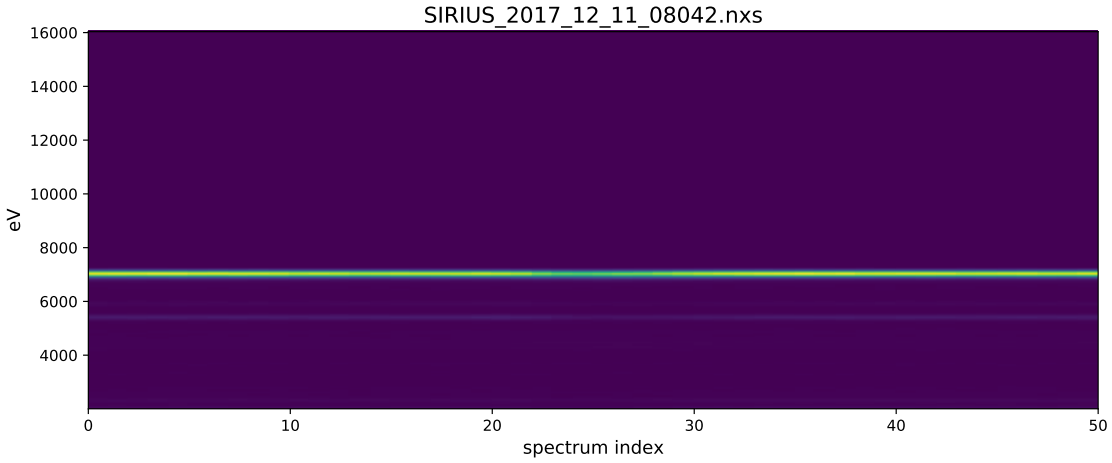
```
26  ------->  fluoocr02
27  ------->  fluoocr03
28  ------->  fluospectrum00
29  ------->  fluospectrum01
30  ------->  fluospectrum02
31  ------->  fluospectrum03
32  ------->  fluoocr00
33  ------->  mon4
34  ------->  gainfemtodioderefl
35  ------->  integration_time
36  ------->  sensors_rel_timestamps
37  ------->  sensorsTimestamps
38  ------->  i15-c-cx1/ex/v2_grp_alphax.rot/rot
39  ------->  i15-c-cx1/ex/v2_grp_gamma.rot/rot
```

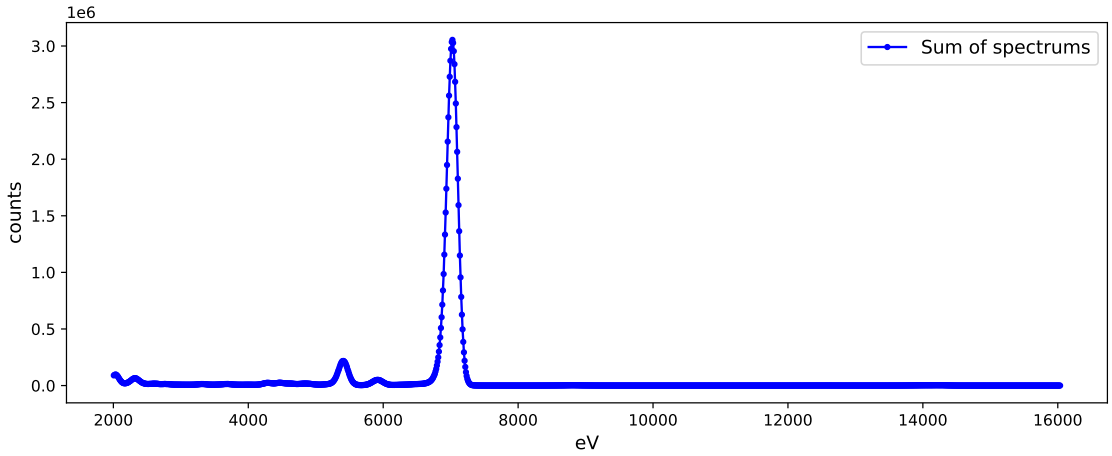


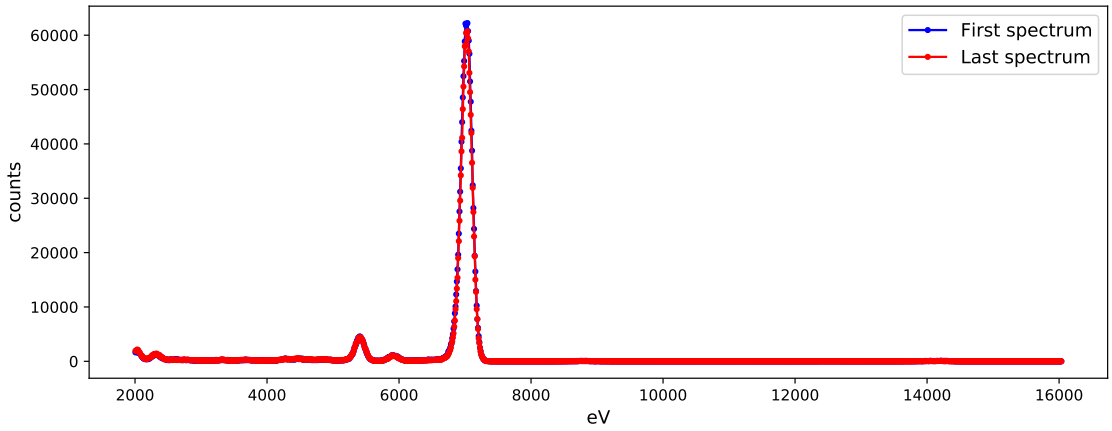




6.0.3 SIRIUS_2017_12_11_08042: run xsw7.ipy







7 Add a script

7.0.1 full_scan.ipy

```
%shopen
%amove delta -40
#%continuous_ascan delta -40 -35 125 5
%run reset_motors.ipy
%amove delta -35
%continuous_ascan delta -35 -25 250 5
%run reset_motors.ipy
%amove delta -25
%continuous_ascan delta -25 -15 250 5
%run reset_motors.ipy
%amove delta -15
%continuous_ascan delta -15 -10 125 5
%run reset_motors.ipy
%amove delta -10
%continuous_ascan delta -10 -3 175 5

%shclose
```