

PShell – User experience

For commissioning of the PINK beamline
at BESSY II

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PINK beamline

- Control system based on EPICS
- CSS / Phoebus for control screens
- Python scripts for experiment automation
- Tool that links scientist/user to automated actions

PShell

- DAQ scripting tool develop at PSI
- Commissioning and operation of the SwissFEL machine
- Current on version 1.14.0
- Strong EPICS integration and more
- Github link - <https://github.com/paulscherrerinstitute/pshell>



Overview

The screenshot displays the PShell Workbench (on PDesk02) interface. The top menu includes File, Edit, Shell, Devices, Versioning, View, and Help. The console window shows the following text:

```
..
PShell v1.14
Scripts using Electro SEC
[1]
[1]
```

The main area is divided into three sections:

- Console / Script Editor:** The top section where the script execution output is displayed.
- Devices / Scripts / Data:** The middle section, which contains a file browser on the left and a data table on the right. The file browser shows a tree structure for the file `20200318_180911_mythen.h5`, with `spectrum` and `spectrum_sum` selected. The data table below it has columns 0 through 4, with the row for `spectrum_sum` highlighted.
- Plots:** The right section displays a plot of the data. The y-axis ranges from 0 to 6,000, and the x-axis ranges from 0 to 1,300. A sharp peak is visible at approximately x=850, reaching a height of about 5,800.

	0	1	2	3	4
0	2.0	0.0	2.0	0.0	0.0
1	1.0	0.0	2.0	4.0	4.0
2	2.0	1.0	0.0	2.0	1.0
3	0.0	2.0	1.0	1.0	1.0
4	2.0	1.0	0.0	0.0	2.0
8	1.0	2.0	1.0	3.0	1.0
9	0.0	3.0	3.0	1.0	2.0
10	1.0	1.0	1.0	3.0	2.0
11	0.0	1.0	1.0	1.0	0.0
12	1.0	2.0	0.0	3.0	2.0
13	1.0	1.0	1.0	3.0	3.0
14	0.0	0.0	2.0	1.0	0.0
15	1.0	0.0	1.0	1.0	2.0
16	1.0	4.0	3.0	2.0	3.0
17	1.0	1.0	2.0	1.0	1.0
18	1.0	0.0	2.0	1.0	1.0
19	0.0	0.0	0.0	1.0	2.0
20	3.0	1.0	1.0	1.0	1.0

Devices

The screenshot displays a software interface with a console window, a device pool definition table, and a device control panel.

Console Window:

```
..
PShell v1.14
Scripts using Electro SEC
[1] elab.put(time.asctime())
[2] pink.bl_snapshot_save()
Saving beamline snapshot...
Pink beamline snapshot saved
[3]
[3]
[3]
```

Device Pool Definition Table:

Enabled	Name	Class	Parameters	Polling	Moni...	Readonly	Simulated
<input checked="" type="checkbox"/>	sample_Y	ch.psi.pshell.epics.Positioner	PINK:SMA01:m9 PINK:SMA01:m9....	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	sample_X	ch.psi.pshell.epics.Positioner	PINK:SMA01:m10 PINK:SMA01:m...	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

sample_X Control Panel:

sample_X

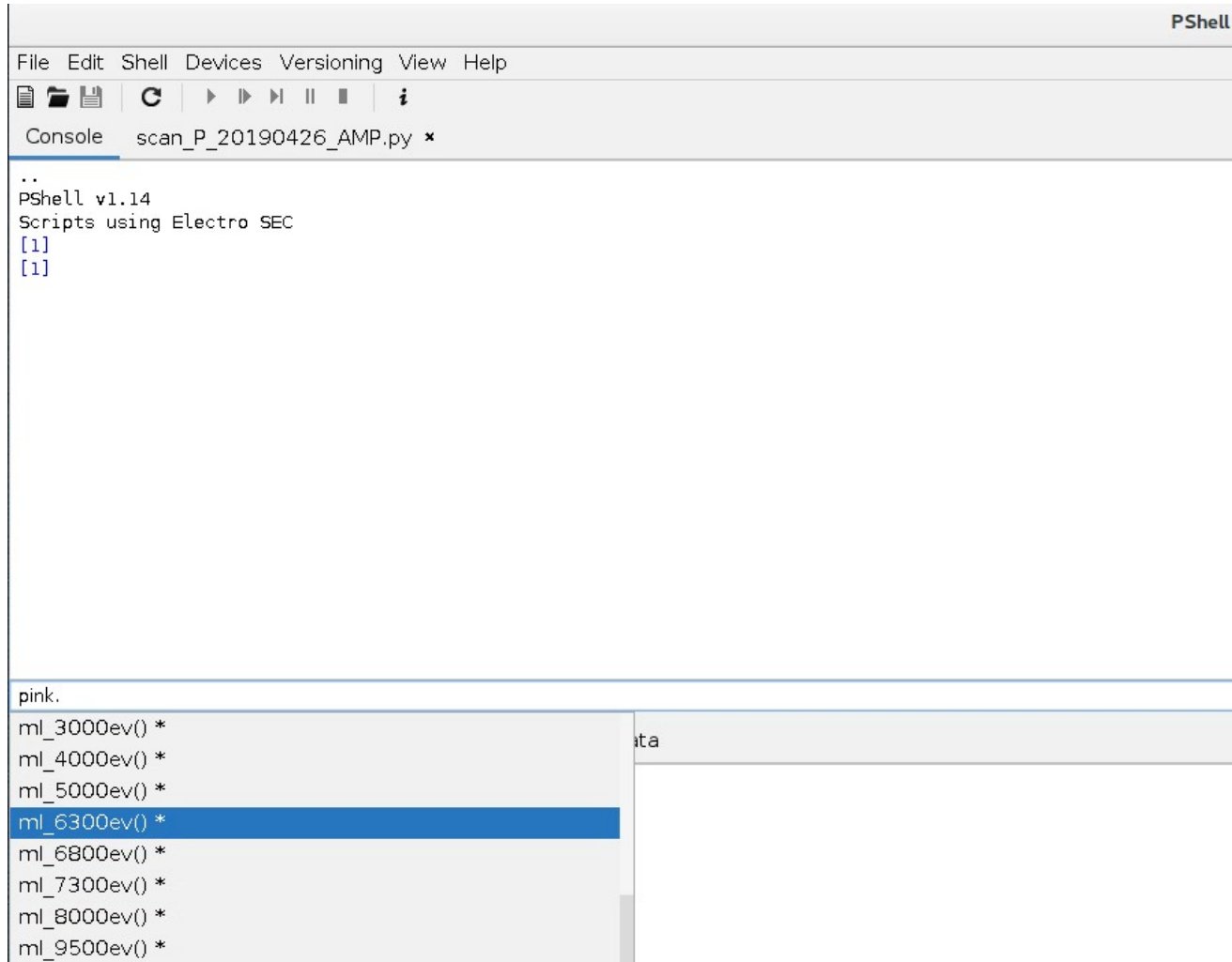
|< < 0.0 > >|

0.1 Stop Step: 1,000

Devices Table:

Device	Type	State	Value	Age
sample_Y	Positioner	Ready	0.0 um	03:02:15
sample_X	Positioner	Ready	0.1 um	03:02:15

Console



The screenshot shows a PShell console window with a menu bar (File, Edit, Shell, Devices, Versioning, View, Help) and a toolbar with icons for file operations. The active window is titled 'Console scan_P_20190426_AMP.py *'. The main area displays the following text:

```
..  
PShell v1.14  
Scripts using Electro SEC  
[1]  
[1]
```

Below this, a file explorer view is shown with a search bar containing 'pink.'. A list of files is displayed:

- ml_3000ev() *
- ml_4000ev() *
- ml_5000ev() *
- ml_6300ev() *
- ml_6800ev() *
- ml_7300ev() *
- ml_8000ev() *
- ml_9500ev() *

The file 'ml_6300ev() *' is currently selected and highlighted in blue.

Script editor

PShell Workbench (on PDesk02)

File Edit Shell Devices Versioning View Help

Console scan_P_20190426_AMP.py* *

```
1 pink.ge_SEC_EL_continuous_exposure_speed(10, 20200, 800, 4, -8100, 8100, 200, passes=5, sample='ZP15 AMP')
2 pink.ge_SEC_EL_continuous_exposure_speed(10, 37400, 900, 2, -8100, 8100, 200, passes=1, sample='ZP26 NaH2PO4')
3 pink.ge_SEC_EL_continuous_exposure_speed(10, -14800, 900, 2, -8100, 8100, 200, passes=1, sample='ZP25 Na2HP04')
4
5 scan.
6
  continuous(detector, det_exposure=1, sample_exposure=1, X0=0, X1=1000, dX=500, Y0=0, Y1=1000, passes=1, sample="", linedelay=0) *
  filter_scan(filters, start=0, end=0, step=0, exposure=1) *
  gap(source, start=0, end=0, step=0, exposure=1) *
  line(detector, exposure=1, Y0=0, dY=100, Ypoints=1, passes=1, sample=") *
  sample_scan(axis, detector, start=0, end=0, step=0, exposure=1) *
  spot(detector, exposure=1, images=1, sample=") *
  zigzag(detector, exposure=1, X0=0, dX=100, Xpoints=1, Y0=0, dY=100, Ypoints=1, passes=1, sample="", linedelay=0) *
```

/home/nll/apps/PShell/pink-pshell/script/scan_P_20190426_AMP.py 5:6

Logs Devices Imaging Scan Output **Scripts** Data

Name	Modified
scan_P_20190414.py	20/10/21 17:29:14
Ru_Lb_20191012.py	20/10/21 17:29:14
Co_20200123_Mythen.py	20/10/21 17:29:14
aperture_area_scan.py	20/10/21 17:29:14
scan_20190324.py	20/10/21 17:29:14
Co_20200123_Eiger.py	20/10/21 17:29:14
Co_Olaf_20200620.py	20/10/21 17:29:14
scan_P_20190426_4.py	20/10/21 17:29:14
scan_P_20190426_ATP.py	20/10/21 17:29:14
scan_P_20190427_AMP.py	20/10/21 17:29:14
scan_P_20190427_ADP.py	20/10/21 17:29:14
Co_Olaf_20200620_3.py	20/10/21 17:29:14
test_20200604.py	20/10/21 17:29:14
Ru_Lb_20191011.py	20/10/21 17:29:14
scan_20190322.py	20/10/21 17:29:14
au1_beamprofile_20200604.py	20/10/21 17:29:14
au1_gap_202005.py	20/10/21 17:29:14
au1_beamprofile_20200605.py	20/10/21 17:29:14
Ru_gamma_20190517.py	20/10/21 17:29:14
scan_K_20190524_1.py	20/10/21 17:29:14
scan_20190323.py	20/10/21 17:29:14
Ti Kb 20191213 2.py	20/10/21 17:29:14

Ready

Script folder

Data / Plot

PShell Workbench (on PDesk02)

File Edit Shell Devices Versioning View Help

Console scan_P_20190426_AMP.py* *

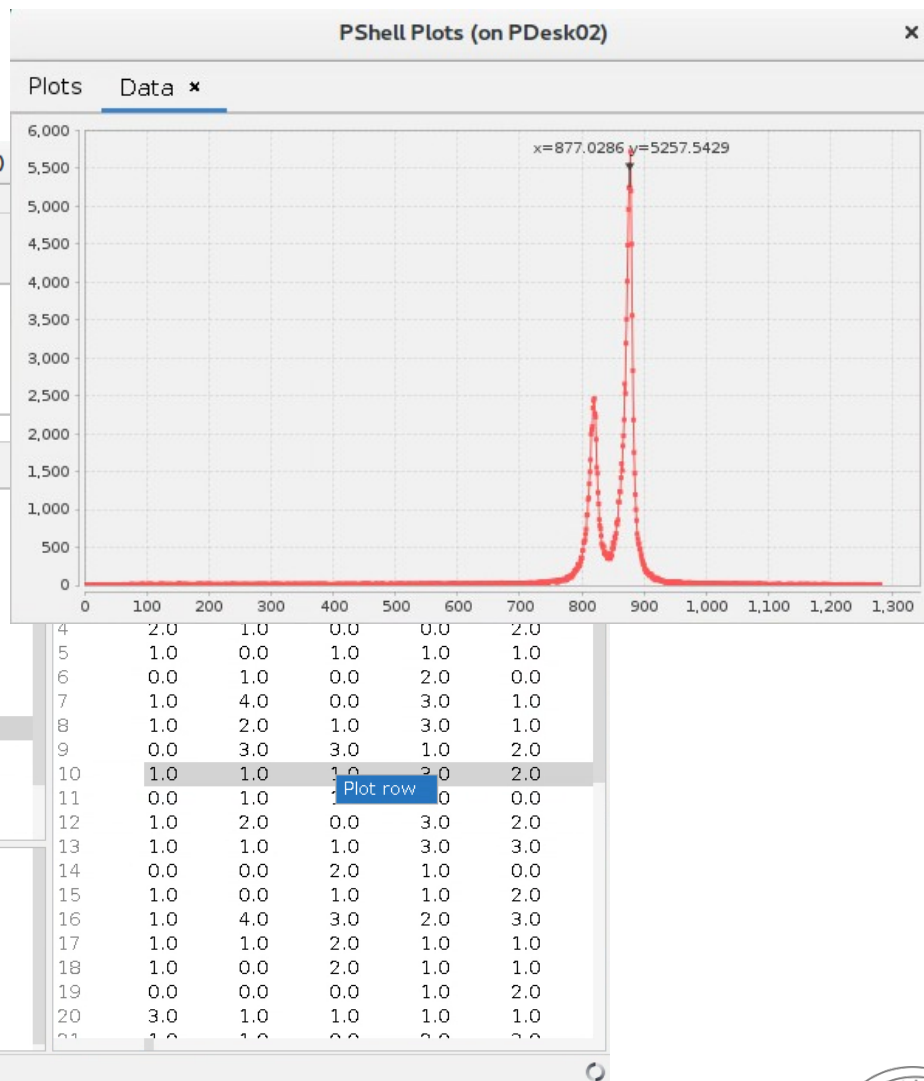
```
..
PShell v1.14
Scripts using Electro SEC
[1]
[1]
```

Logs Devices Imaging Scan Output Scripts **Data**

- 20200318_143029_bpm2_ver.h5
- 20200318_143041_bpm4_ver.h5
- 20200318_143803_slit.h5
- 20200318_144501_bpm2_ver.h5
- 20200318_144514_bpm3_ver.h5
- 20200318_144520_bpm4_ver.h5
- 20200318_161948_bpm4_ver.h5
- 20200318_162147_slit.h5
- 20200318_172611_eiger.h5
- 20200318_172909_eiger.h5
- 20200318_173534_eiger.h5
- 20200318_173623_eiger.h5
- 20200318_173657_eiger.h5
- 20200318_173932_eiger.h5
- 20200318_180521_mythen.h5
- 20200318_180911_mythen.h5**
- 20200318_184623_mythen.h5
- 20200318_184710_eiger.h5
- 20200318_184953_eiger.h5
- 20200318_185634_mythen.h5
- 20200318_185917_mythen.h5
- 20200318_193608_eiger.h5
- 20200318_193754_eiger.h5

detector
logs
passes
 pass01
 timestamps
 timestamps_ps
 detector
 mythen
 processed
 spectrum
 spectrum_sum
 raw
 positioners
 station

Type = DATASET
Data Type = FLOAT
Creation = 18/03/20 18:10:34
Layout = CHUNKED
Size = 409600
Signed = true
Dimensions = [40, 1280]
Rank = 2
Elements = 51200
Chunk Sizes = [1, 1280]
Element Size = 8



Questions