

# PShell: from SLS Beamlines to the SwissFEL Control Room

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## Introduction

PShell is a DAQ scripting tool developed at PSI. Besides being deployed at SLS beamlines since 2015, it is used by various groups for creating tools for the commissioning and operation of the SwissFEL machine.

## Main Features

- Java 8 application with scripting in Python (Jython 2.7) or JavaScript.
- Workbench: script editor, interactive console, plotting, data browser.
- Build-in functions for scanning, plotting and data manipulation (.h5 & .txt).
- Out of the box support to EPICS, Modbus, serial devices, PSI detectors...
- Data analysis: Apache Commons Math, ImageJ and NumPy (through JEP).
- GIT-based automatic versioning and publishing.
- Extensible: static (.jar) or dynamically compiled (.java) plugins.
- Web interface & remote access: embedded web server & REST interface.

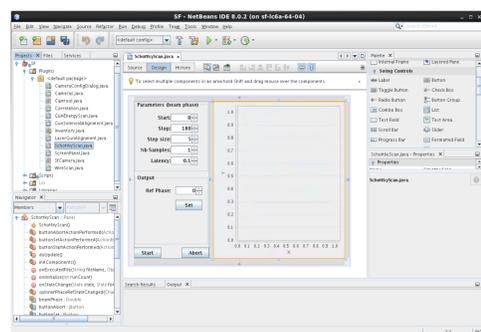
## SwissFEL Features

- Beam-synchronous data (over ZMQ).
- Streaming cameras.
- Operator panels:
  - Triggered by the “Launcher” menu.

## User Interfaces

### GUI Development by Users

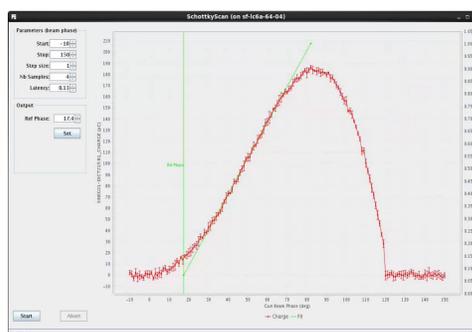
- Custom GUIs are desired for:
  - Inputting & checking parameters.
  - Presenting results.
  - Hiding scripts from operators.
  - Improving user experience.
- Users easily learn coding scripts.
- GUI creation can be equally easy:
  - Using “Panels Plugins”.



Panel plugin edition with Netbeans

### Panel Plugins

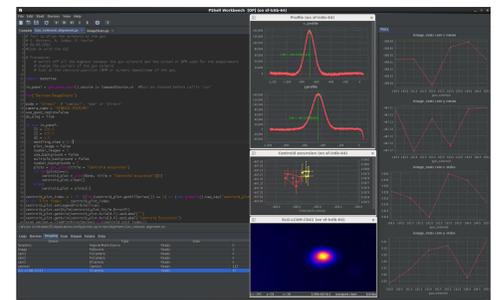
- Control the execution of a script.
  - Dynamically compiled Java file.
  - Created and loaded in the workbench.
  - Reloadable: facilitate development.
- Visually edited with *NetBeans IDE*.
  - Widgets for plotting, imaging & control.
- Can be executed in “detached mode”:
  - Perceived as a standalone application.



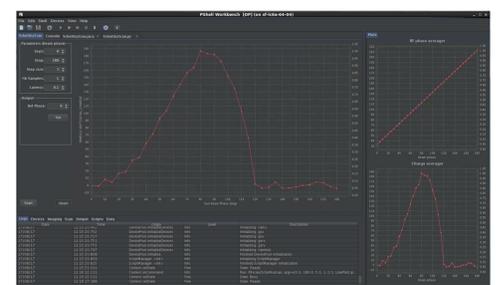
Panel plugin in use

## Next Steps

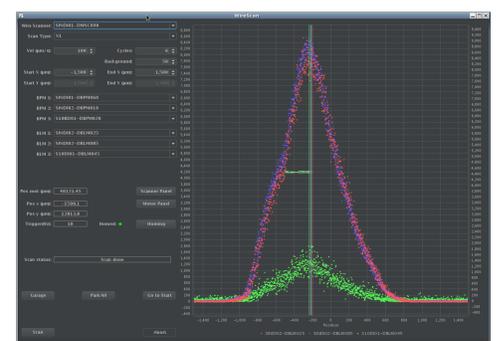
Improving the web interface, facilitating configuration and providing seamless use of NumPy and SciPy.



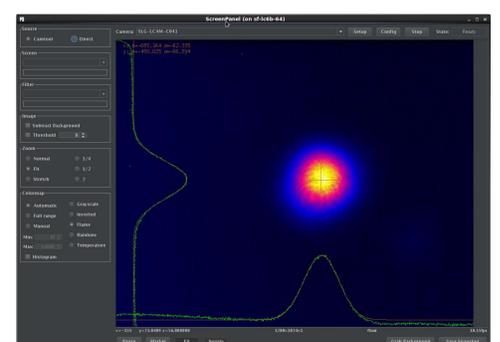
DAQ script in development within the workbench.



Panel plugin loaded in the workbench



Detached panel plugin triggering a DAQ script



Detached panel plugin interfacing to cameras



Detached panel plugin: correlation utility

The distribution contains a set of demonstration scripts using simulated devices. It can be downloaded from:



<https://github.com/paulscherrerinstitut/pshell/releases/>