

# PShell: The New PSI Experiment Scripting Environment

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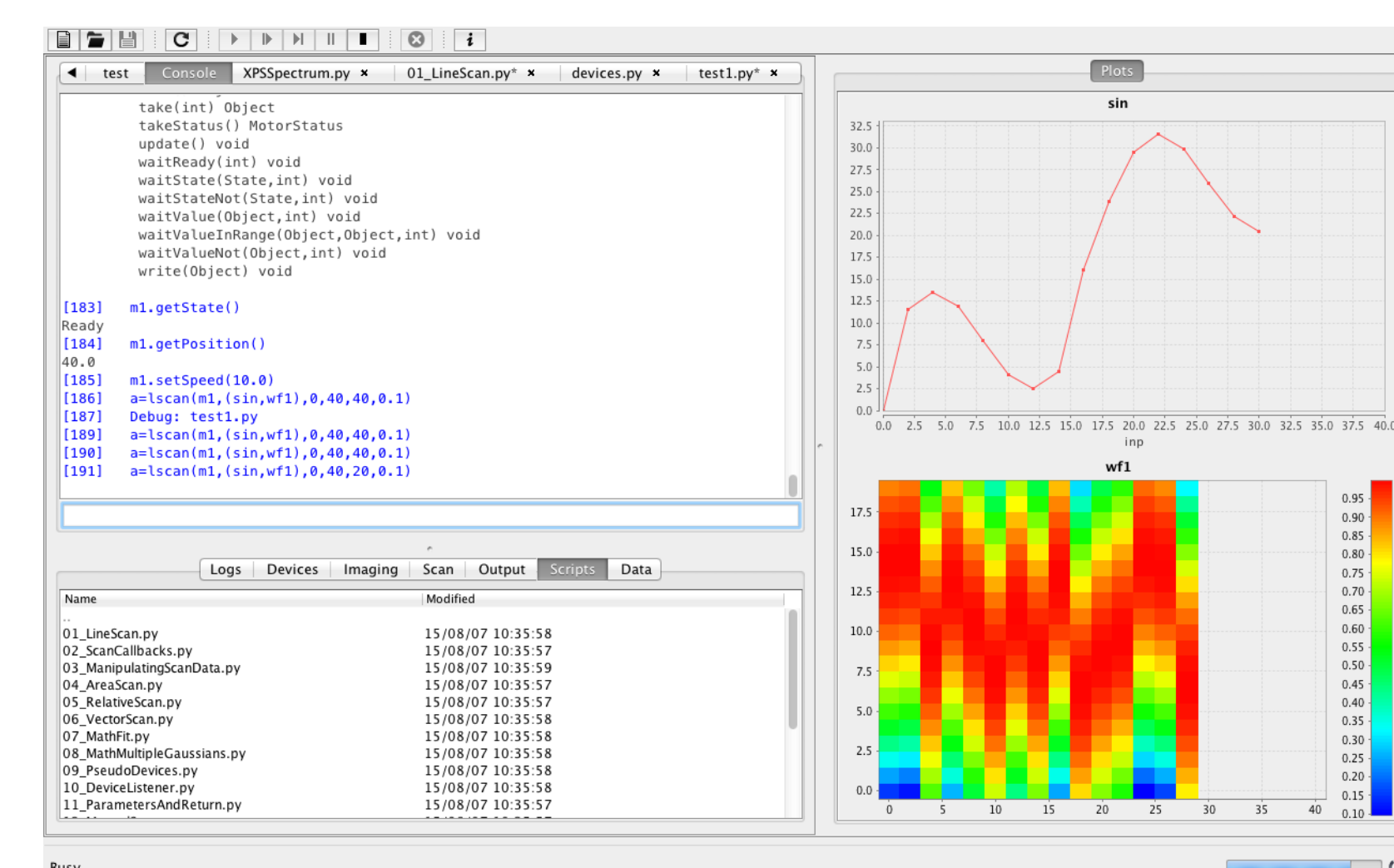
## Introduction

PShell is a new scripting platform for experiments intended to equip the emerging SwissFEL beamlines and other PSI facilities as a standard tool for data acquisition:

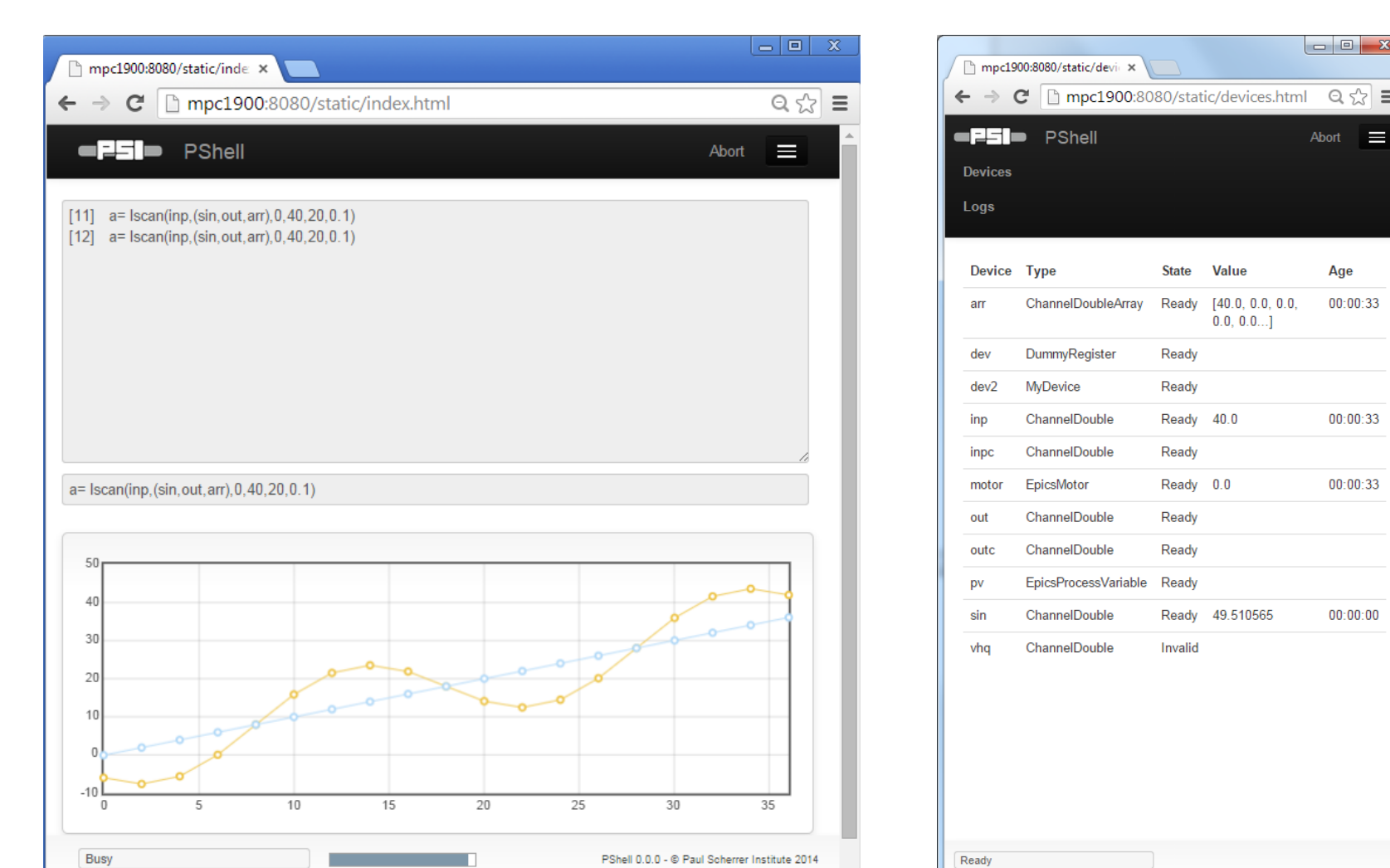
**Modern:** The project targets Java 8 using in vogue protocols and libraries. A REST interface, an embedded web server and a component library facilitate the development of web clients.

**Simple:** Immediate, single-jar deployment of a multi-platform, customizable yet lightweight GUI workbench.

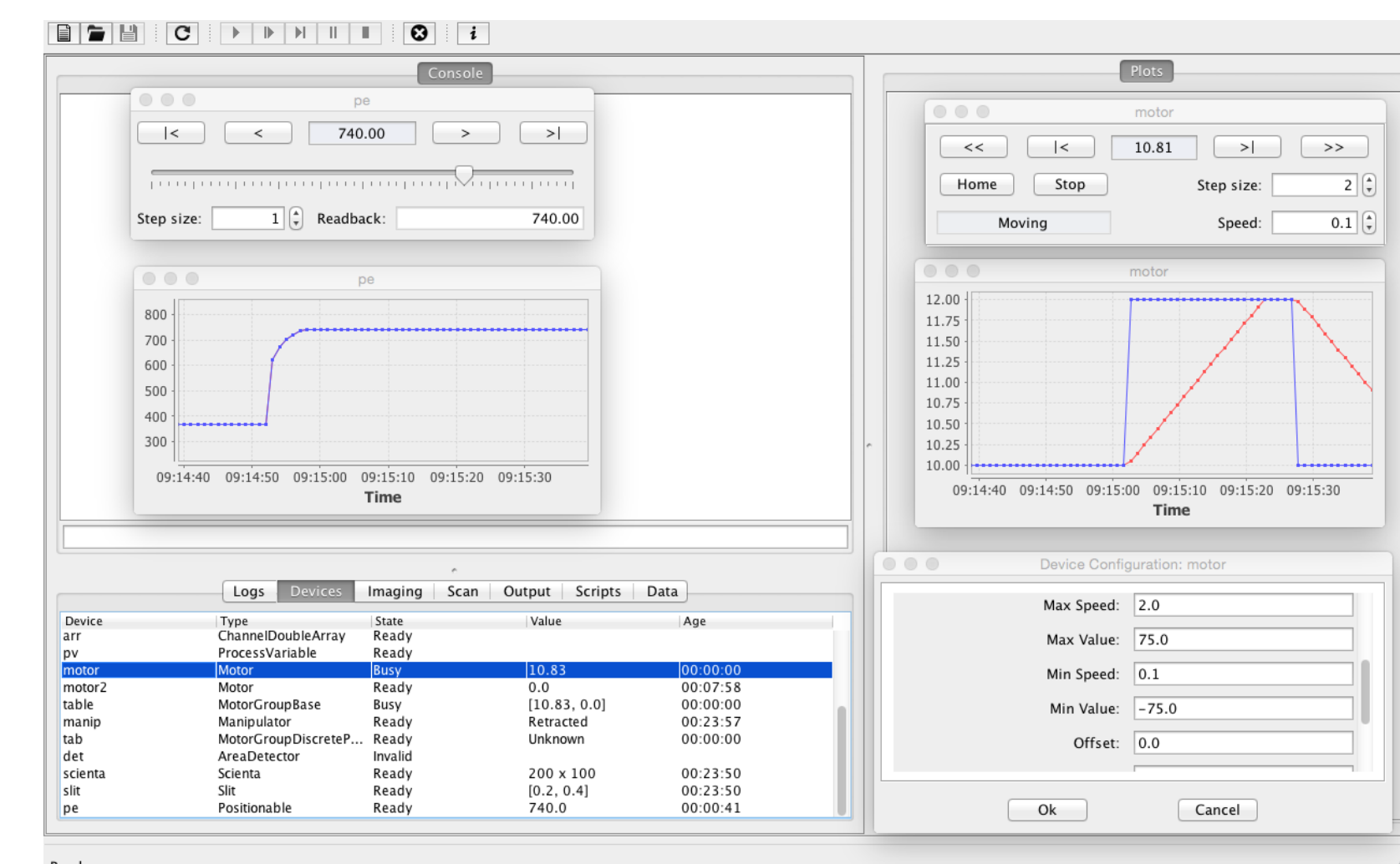
**Flexible:** Architectural freedom. Interfaces can be CLI, GUI, web or mixed. Easy GUI customization using dynamic plugins, visually edited. Scripting in any language compliant with Java Scripting API (Jython 2.7 at PSI).



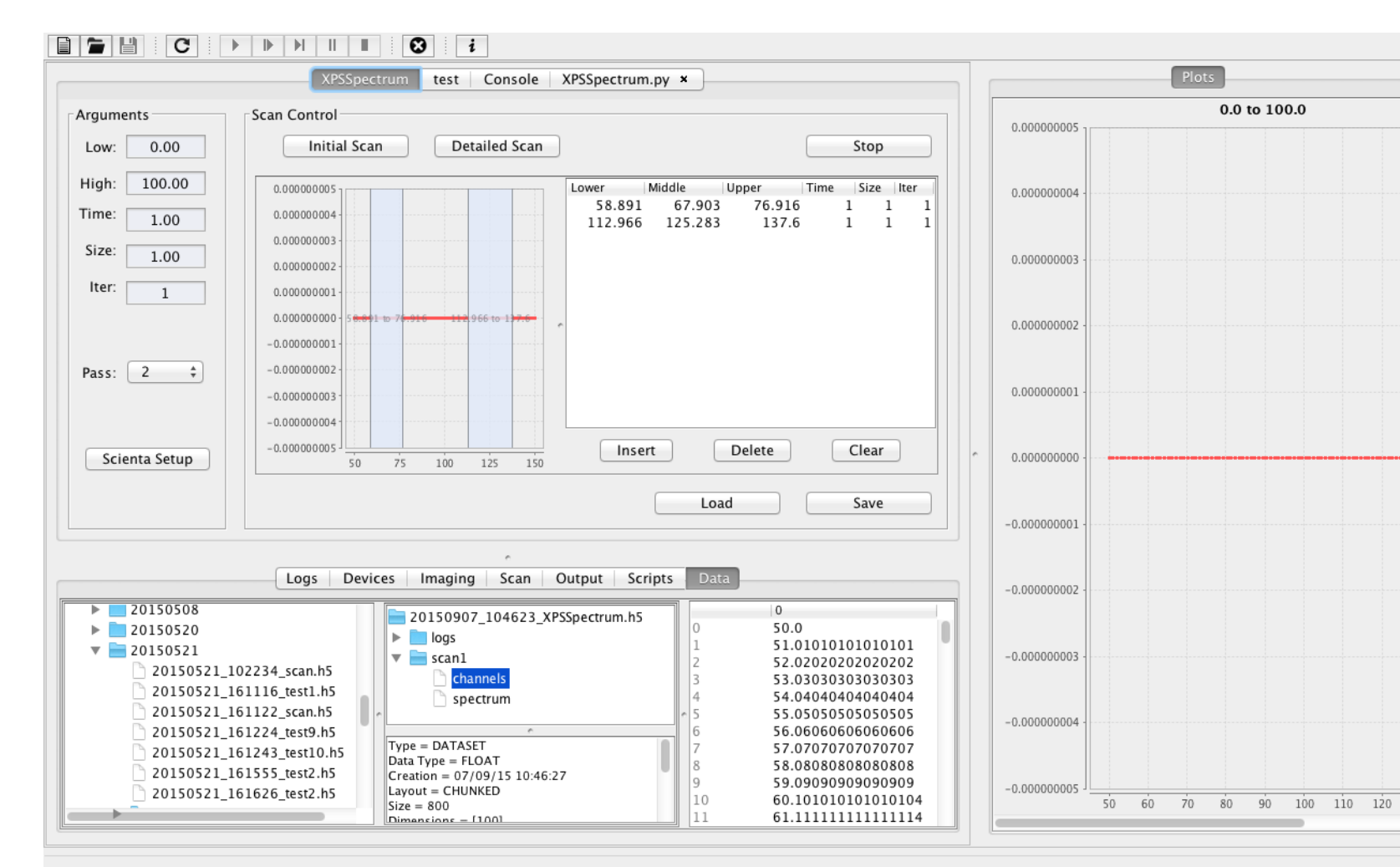
A simple scan within the workbench.



The standard web client.



Device commissioning tools.



A dynamic plugin loaded on the workbench.

## Main Features

### Device configuration:

- Hardware can be accessed from the scripts, the GUI and the console.
- EPICS typical devices and PSI detectors are built-in.
- New device types may be added as Java extensions or in scripts.

### Data acquisition:

- Script editor and interactive console featuring history and auto-completion.
- Built-in functions supporting scans, plotting, data access and more.
- High level API to access data using any hierarchical storage.
- Primary data format is HDF5. Text files support is also available.

### Data analysis:

- Imaging and plotting components.
- Fitting and peak search (apache.commons.math3).
- Access to external data analysis services is foreseen.

### Versioning and user control:

- Automatic GIT-based versioning and publishing system.
- Improved collaboration and change process.
- User rights and GUI setup can be adjusted using profiles.

## Project Status & Roadmap

In use at SLS beamlines X03DA, X07SA and at Proscan. Other SLS and SwissFEL beamlines are scheduled. Future developments concentrate on improving the web client library, integrating features from ImageJ2 and supporting on-the-fly scans.

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



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