

# FDP-notebook-v01

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## 1 This is a Jupyter "notebook"

In NoMachine or other X-window session:

```
% module show /u/drsmith/fdp.module
% module load /u/drsmith/fdp.module
% jupyter notebook /u/drsmith/fdp/examples/FDP-notebook-v01.ipynb
```

To execute cells: shift+enter

PDF copy: /u/drsmith/fdp/examples/FDP-notebook-v01.pdf

## 2 Python environment

Verify executable, version, and module search path (\$PYTHONPATH)

```
In [ ]: # version and executable
import sys
print('Python executable and version:')
print(sys.executable)
print(sys.version)
print('')

# module search path
print('Module search path:')
for path in sys.path:
    print(path)
print('')

# $PYTHONPATH environment variable
import os
print('$PYTHONPATH environment variable:')
print(os.environ['PYTHONPATH'])
```

## 3 Load FDP and create a machine

nstx is a flexible data object that: \* ties together multiple data sources \* MDSplus, logbook, TRANSP, results databases \* eliminates need to know trees/node names \* introspective for shot,

XP, date, diagnostic, signals, axes, and data methods \* retrieves data 'just in time' at first data usage \* regularizes data \* e.g. all profile data is [time, radius] and explicitly labeled as such \* pre- and post-processing hooks are available \* like surveying EFIT/LRDFIT trees and de-spiking

```
In [ ]: import fdp

        nstx = fdp.nstx()
```

## 4 Load shots, XPs, or dates

Shots loaded by reference (no need to "get" shots)

```
In [ ]: # load shot by reference
        nstx.s204590

        # load and assign
        myshot = nstx.s204620

        # load shot list
        nstx.addshot([204650, 204651, 204652])

        # load an XP/XMP
        nstx.addxp(1506)

        # load shots by date (YYYYMMDD)
        nstx.adddate(20160627)

        # list loaded shots
        nstx.listshot()
```

## 5 Logbook integration

```
In [ ]: nstx.s141000.logbook()
```

## 6 Introspection

```
In [ ]: nstx.s141000.listContainers()

In [ ]: nstx.s141000.equilibria.listContainers()

In [ ]: nstx.s141000.bes.listSignals()

In [ ]: nstx.s141000.mpts.listSignals()
        nstx.s141000.mpts.listContainers()
        nstx.s141000.mpts.spline.listSignals()

In [ ]:
```