

Accessing Jupyter Notebook via Quakeworx Gateway and Plotting Tandem outputs

By Jeena Yun

1. Launch Jupyter Notebook Expanse App

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All apps → Jupyter Notebook Expanse → Launch app

All apps

List of apps available on this site.
About Apps and Jobs: Apps are software applications that are configured to be executed on a predefined compute system. Launching a

App type

- Any -

Search

Apply



WEB APP / DOCKER

Jupyter Notebook

ver. 0.1.0
system. AWS System (EC2)

Jupyter Notebook running on AWS (EC2) instance.




WEB APP / SINGULARITY

Jupyter Notebook Expanse

ver. 0.1.0
system. Expanse service

Jupyter Notebook running on Expanse

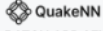


BATCH APP / EXECUTABLE

Moose-FARMS

ver. 0.0.3
system. Expanse service


Moose simulator



BATCH APP / EXECUTABLE

QuakeNN

ver. 0.0.1
system. Expanse service




BATCH APP / EXECUTABLE

SeisSol

ver. 0.0.2
system. Expanse service



BATCH APP / EXECUTABLE



BATCH APP / EXECUTABLE

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Jupyter Notebook Expanse



WEB - INTERACTIVE WEB APPLICATION E.G. JUPYTER NOTEBOOK

Summary: Jupyter Notebook running on Expanse

App ID: qwx1.apps.jupyter_notebook.expanse | Version 0.1.0

Status: Enabled

Owner: choonhan

Description

This environment is built on Anaconda 3 and integrates several specialized packages:

- **vtk:** For advanced visualization.
- **pyvista:** For 3D plotting and robust mesh handling, accommodating both structured and unstructured meshes.
- **GMSH:** For efficient mesh creation and modification.
- **Lupa:** For integration between Python and Lua.
- **cmcrameri:** For refined color mapping.

Launch app

1. Launch Jupyter Notebook Expanse App

Launch

Job name *

visualization

Specify a name for this job

Password *

Whatever password you want (remember it!)

▼ Job resources

Specify the job resources for this app

Max runtime (minutes) *

30

The maximum amount of time to run this app.

System *

Expanseservice

The system to run this app on.

Batch Logical Queue *

shared

The batch logical queue on which to run this application.

Save Draft

Submit

Wait until the job status becomes 'Running' and the 'Open app session' button activates

Home / visualization

visualization

Last message: Setting job status to running.

Remote job ID: 36370362

Remote job submitted: 2025-01-19T22:19:42

Remote job started: 2025-01-19T22:19:44

Job usage details

Resource details

Processing unit: CPU

Node count: 1

Cores per node: 1

Memory: 4000 MB

App: Jupyter Notebook Expanse

System: Expanseservice

Owner: jeena

Created: Jan 19, 2025

Tapis UUID: 247066da-ed7e-4bcf-8b3c-def5ffa90dd6-007

Open app session

Terminate Job

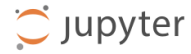
Running

Queued

Staging job

Processing inputs

2. Open Jupyter Notebook App Session



Password or token: **The password you set**

Token authentication is enabled

If no password has been configured, you need to open the server with its login token in the URL, or paste it above. This requirement will be lifted if you [enable a password](#).

The command:

```
jupyter server list
```

will show you the URLs of running servers with their tokens, which you can copy and paste into your browser. For example:

```
Currently running servers:  
http://localhost:8888/?token=c8de56fa... :: /Users/you/notebooks
```

or you can paste just the token value into the password field on this page.

See [the documentation on how to enable a password](#) in place of token authentication, if you would like to avoid dealing with random tokens.

Cookies are required for authenticated access to the Jupyter server.

Setup a Password

You can also setup a password by entering your token and a new password on the fields below:

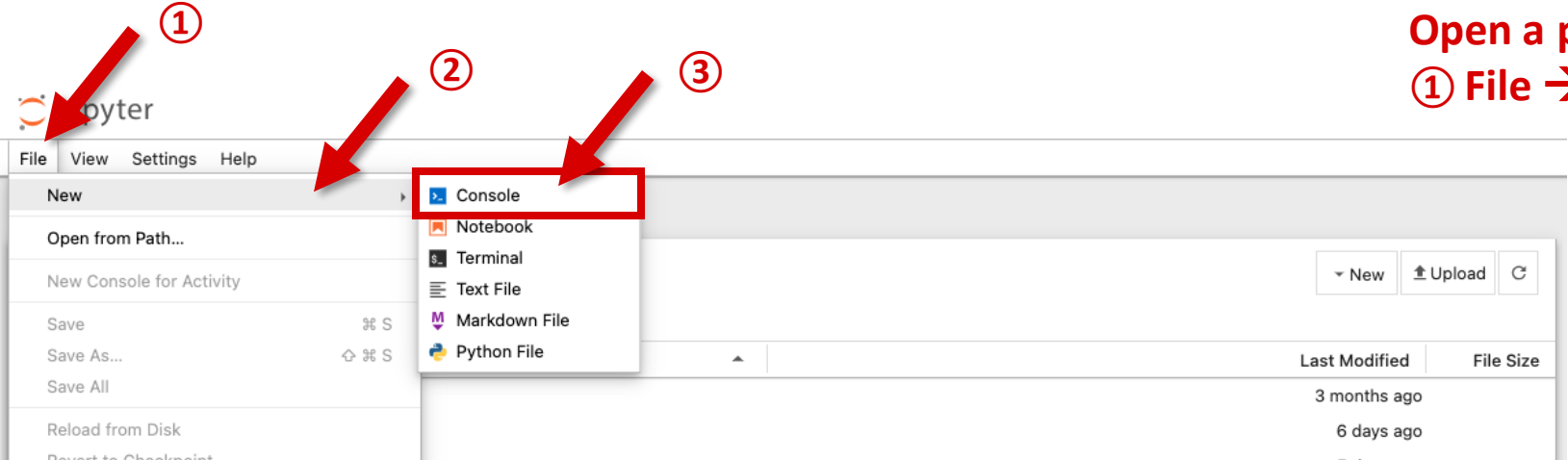


The screenshot shows the Jupyter Notebook interface with a list of running servers. A red box highlights the list of servers, and a red arrow points to the 'Log in' button in the previous image.

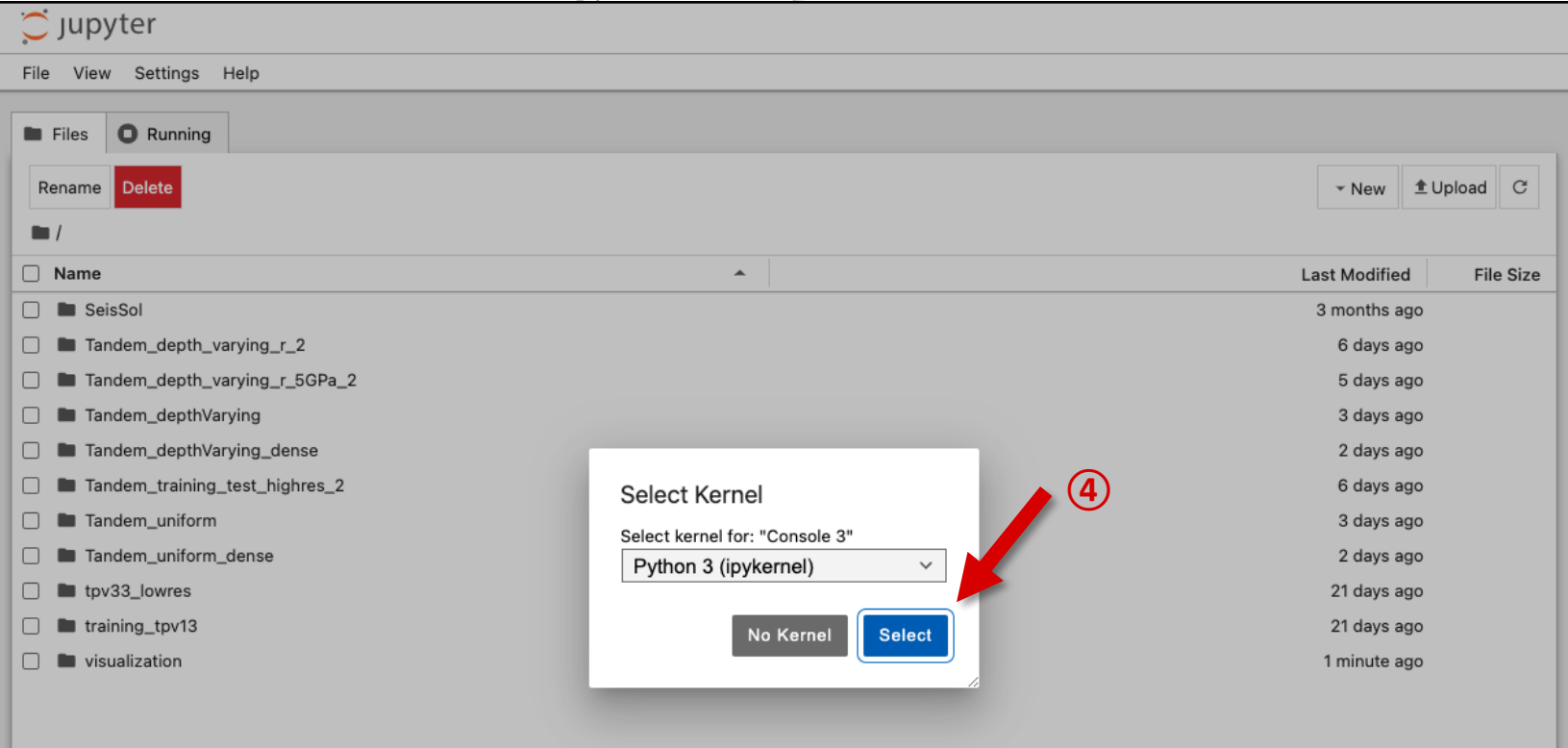
Name	Last Modified	File Size
SeisSol	3 months ago	
Tandem_depth_varying_r_2	6 days ago	
Tandem_depth_varying_r_5GPa_2	5 days ago	
Tandem_depthVarying	3 days ago	
Tandem_depthVarying_dense	2 days ago	
Tandem_training_test_highres_2	6 days ago	
Tandem_uniform	3 days ago	
Tandem_uniform_dense	2 days ago	
tpv33_lowres	21 days ago	
training_tpv13	21 days ago	
visualization	52 seconds ago	

All the jobs you ran via gateway

3. Clone the git repository containing plotting scripts



Open a python console by:
① File → ② New → ③ Console → ④ Select



3. Clone the git repository containing plotting scripts



File View Settings Help

```
Python 3.12.2 | packaged by conda-forge | (main, Feb 16 2024, 20:50:58) [GCC 12.3.0]
Type 'copyright', 'credits' or 'license' for more information
IPython 8.27.0 -- An enhanced Interactive Python. Type '?' for help.
```

```
[1]: !ls

SeisSol                Tandem_depth_varying_r_5GPa_2  tpv33_lowres
Tandem_depthVarying     Tandem_training_test_highres_2  training_tpv13
Tandem_depthVarying_dense Tandem_uniform                  visualization
Tandem_depth_varying_r_2 Tandem_uniform_dense
```

```
[2]: !git clone https://github.com/TEAR-ERC/tandem-training.git
```

```
Cloning into 'tandem-training'...
remote: Enumerating objects: 43, done.
remote: Counting objects: 100% (43/43), done.
remote: Compressing objects: 100% (32/32), done.
remote: Total 43 (delta 16), reused 31 (delta 7), pack-reused 0 (from 0)
Receiving objects: 100% (43/43), 6.36 MiB | 7.75 MiB/s, done.
Resolving deltas: 100% (16/16), done.
```

```
[3]: !ls

SeisSol                Tandem_depth_varying_r_5GPa_2  tandem-training
Tandem_depthVarying     Tandem_training_test_highres_2  tpv33_lowres
Tandem_depthVarying_dense Tandem_uniform                  training_tpv13
Tandem_depth_varying_r_2 Tandem_uniform_dense           visualization
```

```
[ ]:
```

In the console, type (with the exclamation mark):

!git clone https://github.com/TEAR-ERC/tandem-training.git

**** To run a command, use shift + enter**



File View Settings Help

Files Running

Rename Delete

/

<input type="checkbox"/>	Name	Last Modified	File Size
<input type="checkbox"/>	SeisSol	3 months ago	
<input type="checkbox"/>	Tandem_depth_varying_r_2	6 days ago	
<input type="checkbox"/>	Tandem_depth_varying_r_5GPa_2	5 days ago	
<input type="checkbox"/>	Tandem_depthVarying	3 days ago	
<input type="checkbox"/>	Tandem_depthVarying_dense	2 days ago	
<input type="checkbox"/>	Tandem_training_test_highres_2	6 days ago	
<input type="checkbox"/>	Tandem_uniform	3 days ago	
<input type="checkbox"/>	Tandem_uniform_dense	2 days ago	
<input type="checkbox"/>	tandem-training	9 seconds ago	
<input type="checkbox"/>	tpv33_lowres	21 days ago	
<input type="checkbox"/>	training_tpv13	21 days ago	
<input type="checkbox"/>	visualization	2 minutes ago	

Check if the 'tandem-training' directory is created

Name: tandem-training
Created: 1/19/25, 2:25 PM
Modified: 1/19/25, 2:25 PM
Writable: true

(if not, try the refresh button)

New Upload

4. Open the Jupyter Notebook for plotting scripts

Under the 'tandem-training' get into...
quakeworx-jan-2025/visualization

jupyter

File View Settings Help

FilesRunning

RenameDelete

NewUploadRefresh

/ tandem-training /

Name	Last Modified	File Size
✓ quakeworx-jan-2025	1 minute ago	
☐ LICENSE	1 minute ago	1.5 KB
☐ README.md	1 minute ago	17 B

jupyter

File View Settings Help

FilesRunning

RenameDelete

NewUploadRefresh

/ tandem-training / quakeworx-jan-2025 /

Name	Last Modified	File Size
✓ visualization	1 minute ago	
☐ jobs.zip	1 minute ago	5 MB

jupyter

File View Settings Help

FilesRunning

OpenDownloadRenameDuplicateDelete

NewUploadRefresh

/ tandem-training / quakeworx-jan-2025 / visualization /

Name	Last Modified	File Size
✓ plot_tandem_results.ipynb	1 minute ago	878.5 KB
☐ cmap_for_sliprate.py	1 minute ago	4.7 KB
☐ cumslip_plot.py	1 minute ago	5.2 KB

... and open
plot_tandem_results.ipynb

Now, let's make some cool plots!

Tandem visualization and post-processing

Author: Jeena Yun (j4yun@ucsd.edu)

Did you successfully run Tandem? Now, we will learn about how to process Tandem outputs such that we can produce useful plots showing different aspects of rupture history.

Learning objectives

- Learn about output formats of Tandem
- Learn about how to visualize outputs at different time and depth
- Learn about the effects of changing material properties on the rupture characteristics

Contents

- Understand fault probe outputs
- Prepare for plotting: load packages and define path to the outputs
- Plot time series of a variable on an individual fault probe
- Plot spatiotemporal evolution of slip rate
- Compare two models
 - Compare shear moduli (μ)
 - Compare spatiotemporal evolution of slip rates
 - Compare peak slip rates
- (Bonus) Plot spatiotemporal evolution of cumulative slip