

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


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About Apps and Jobs: Apps are software applications that are configured to be executed on a predefined compute system. Launching an

App type

- Any -

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BATCH APP / EXECUTABLE

Calculator AWS

ver. 0.1.0
system. AWS System (EC2)

Simple calculator with few operands



BATCH APP / EXECUTABLE

Calculator Expanse

ver. 0.1.0
system. Expanse service


Simple calculator with few operands

BATCH APP / EXECUTABLE

Calculator Ln

ver. 1.0.0
system. AWS System (EC2)

Simple calculator app




WEB APP / DOCKER

Jupyter Notebook AWS

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

Kn cal


ver. 1.0.0
system. AWS System (EC2)

example

Apps → All apps → Jupyter Notebook Expanse → Launch app

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Jupyter Notebook Expanse



APP LOGO

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.

Linux Desktop AWS

ver. 0.1.0
system. AWS System (EC2)

A VNC app for accessing a Linux Desktop.

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 *

Exppanse service ▼

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: Exppanse service

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**

Log in

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:



File View Settings Help

Files Running

Rename

Delete

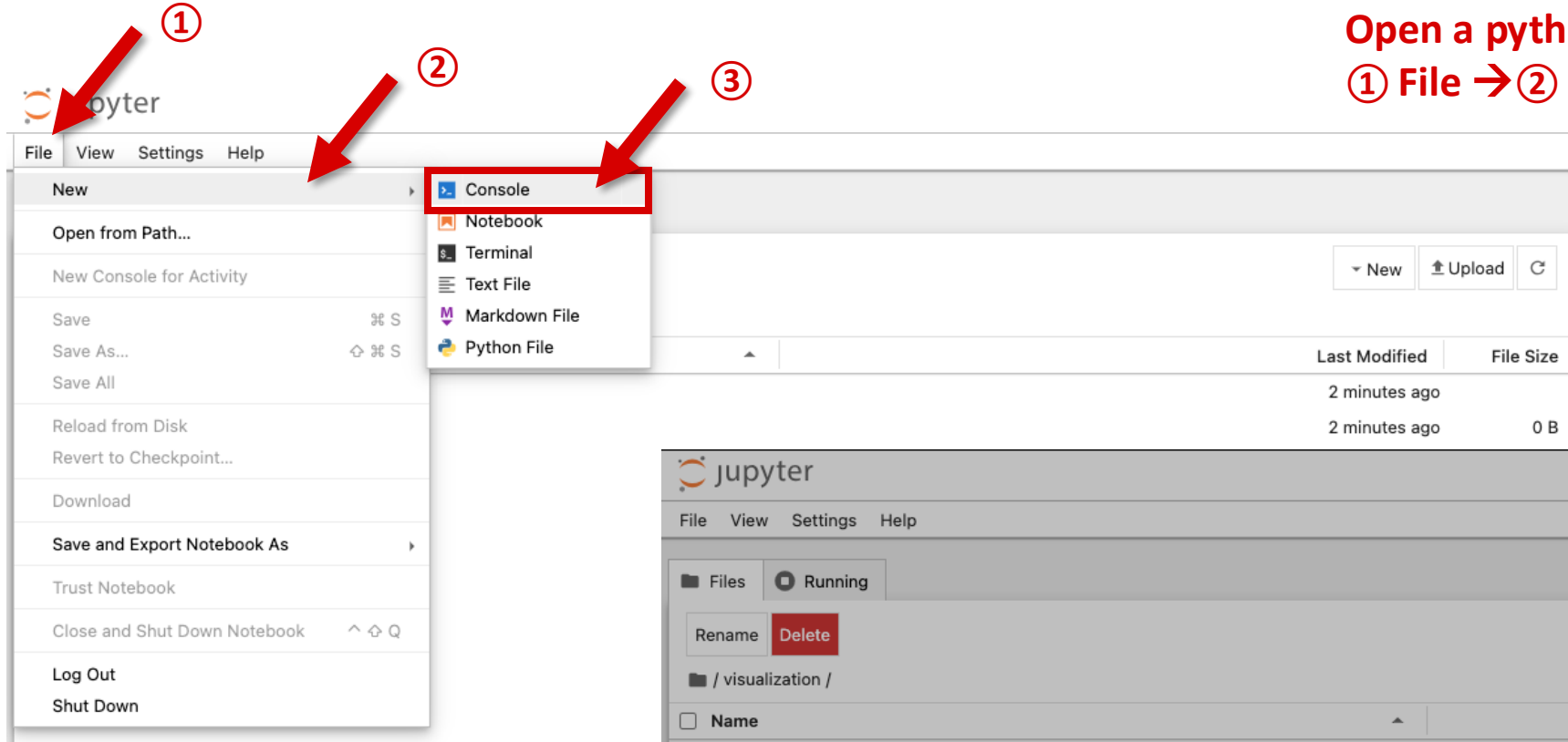


☐ Name **All the jobs you ran via gateway**

- ☐ SeisSol
- ☐ Tandem_depth_varying_r_2
- ☐ Tandem_depth_varying_r_5GPa_2
- ☐ Tandem_depthVarying
- ☐ Tandem_depthVarying_dense
- ☐ Tandem_training_test_highres_2
- ☐ Tandem_uniform
- ☐ Tandem_uniform_dense
- ☐ tpv33_lowres
- ☐ training_tpv13
- ☐ visualization

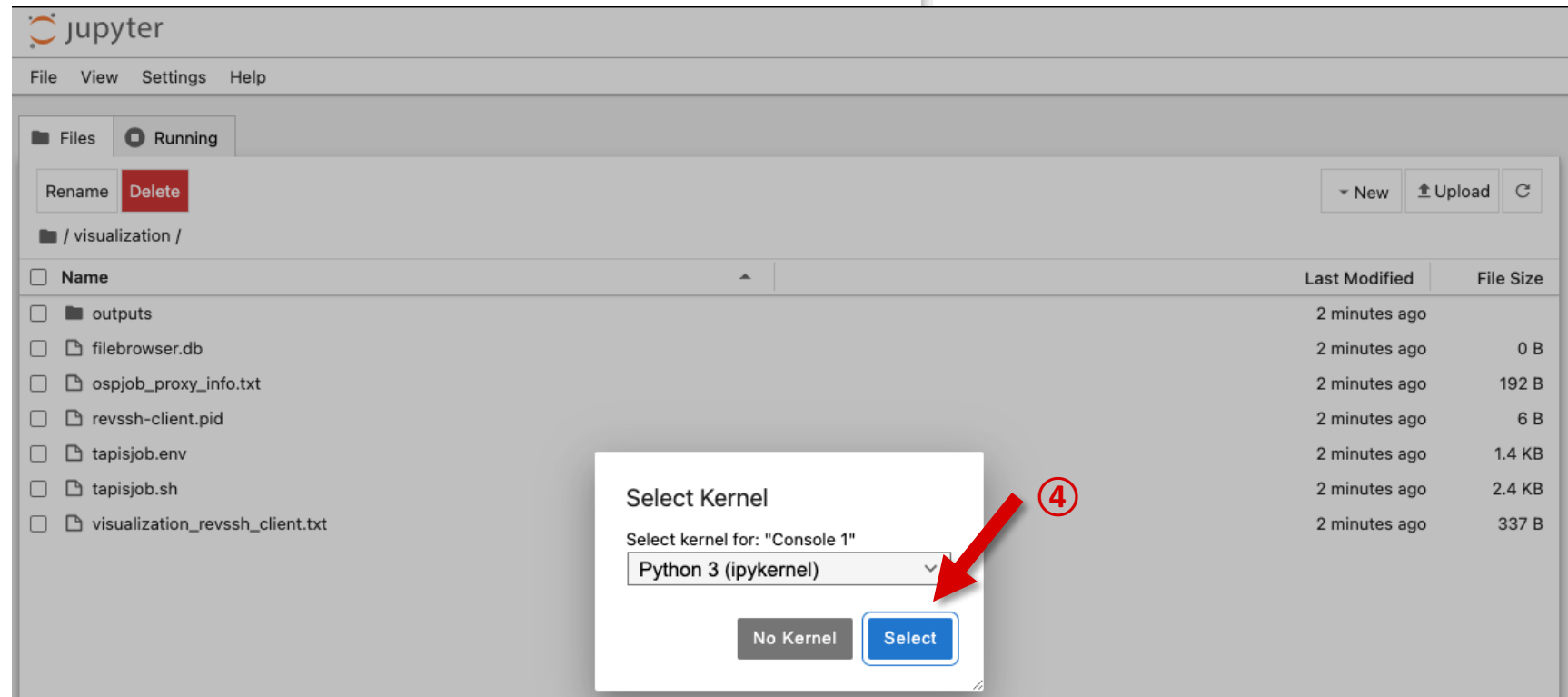
Now, get into the job folder, e.g., 'visualization'

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
filebrowser.db      revssh-client.pid  visualization_revssh_client.txt
ospjob_proxy_info.txt  tapisjob.env
outputs            tapisjob.sh

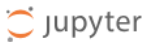
[2]: !git clone https://github.com/TEAR-ERC/tandem-training.git
Cloning into 'tandem-training'...
remote: Enumerating objects: 61, done.
remote: Counting objects: 100% (61/61), done.
remote: Compressing objects: 100% (47/47), done.
remote: Total 61 (delta 26), reused 42 (delta 10), pack-reused 0 (from 0)
Receiving objects: 100% (61/61), 7.29 MiB | 23.33 MiB/s, done.
Resolving deltas: 100% (26/26), done.

[3]: !ls
filebrowser.db      revssh-client.pid  tapisjob.sh
ospjob_proxy_info.txt  tandem-training    visualization_revssh_client.txt
outputs            tapisjob.env
```

[1]: |

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

/ visualization /

<input type="checkbox"/>	Name	Last Modified	File Size
<input type="checkbox"/>	outputs	5 minutes ago	
<input type="checkbox"/>	tandem-training	1 minute ago	
<input type="checkbox"/>	filebrowser.db	5 minutes ago	0 B
<input type="checkbox"/>	ospjob_proxy_info.txt	5 minutes ago	192 B
<input type="checkbox"/>	revssh-client.pid	5 minutes ago	6 B
<input type="checkbox"/>	tapisjob.env	5 minutes ago	1.4 KB
<input type="checkbox"/>	tapisjob.sh	5 minutes ago	2.4 KB
<input type="checkbox"/>	visualization_revssh_client.txt	5 minutes ago	337 B

Check if the 'tandem -training' directory is created

(if not, try the refresh button)



Name: tandem-training
Path: visualization
Created: 1/22/25, 11:22 AM
Modified: 1/22/25, 11:22 AM
Writable: true

4. Open the Jupyter Notebook for plotting scripts

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

jupyter

File View Settings Help

FilesRunning

RenameDeleteNewUploadRefresh

/ visualization / tandem-training /

Name	Last Modified	File Size
✓ quakeworx-jan-2025	1 minute ago	
<input type="checkbox"/> LICENSE	1 minute ago	1.5 KB
<input type="checkbox"/> README.md	1 minute ago	17 B

jupyter

File View Settings Help

FilesRunning

RenameDeleteNewUploadRefresh

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

Name	Last Modified	File Size
✓ visualization	1 minute ago	
<input type="checkbox"/> jobs.zip	1 minute ago	5 MB
<input type="checkbox"/> tandem_visualization.pdf	1 minute ago	1 MB

jupyter

File View Settings Help

FilesRunning

OpenDownloadRenameDuplicateDeleteNewUploadRefresh

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

Name	Last Modified	File Size
✓ plot_tandem_results.ipynb	1 minute ago	878.5 KB
<input type="checkbox"/> cmap_for_sliprate.py	1 minute ago	4.7 KB
<input type="checkbox"/> cumslip_plot.py	1 minute ago	5.2 KB

... and open
plot_tandem_results.ipynb

Now, let's make some cool plots!

jupyter plot_tandem_results Last Checkpoint: 2 minutes ago



File Edit View Run Kernel Settings Help

Not Trusted

📁 + ✂ 📄 ▶ ■ ↺ ⏩ Markdown ▾

JupyterLab 🗨 ⚙ Python 3 (ipykernel) ○ ☰

▼ Tandem visualization and post-processing



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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 \(\$\mu\$ \)](#)
 - [Compare spatiotemporal evolution of slip rates](#)
 - [Compare peak slip rates](#)
- [\(Bonus\) Plot spatiotemporal evolution of cumulative slip](#)