ENHANCING NEUROSCIENCE RESEARCH WITH INTUITIVE GUI WIDGETS IN EBRAINS-LAB

Lia Domide[1], Sandra Diaz-Pier[2], Jan Fousek[3], Paula Prodan[1], Romina-Ioana Băilă[1], David Bacter[1], Rareș-Liviu Horge[1], Maria-Teodora Mișan[1], Jochen Mersmann[1]

science@codemart.ro

[1] CODEMART, Cluj-Napoca, Romania
[2] Simulation and Data Lab Neuroscience - Jülich Supercomputing Centre, Jülich, Germany
[3] Institut de Neurosciences des Systèmes (INS), Inserm, Aix-Marseille University, Marseille, France

Human Brain Project

INTRODUCTION

The HBP showcases illustrate the potential and scientific capabilities offered by EBRAINS, but using them is not a straight-forward task for people who do not have a specific programming background.

To help users easily explore and benefit from the showcases, we developed and deployed in the Collaboratory within the JupyterLab a set of graphic components, which offer an intuitive way of manipulating data and operations inside the EBRAINS infrastructure.

DATA CENTERED ARCHITECTURE

- data is annotated and hierarchically represented
- modular satelite operational tools communicate through datatypes
- flexible types are designed for current and future usages
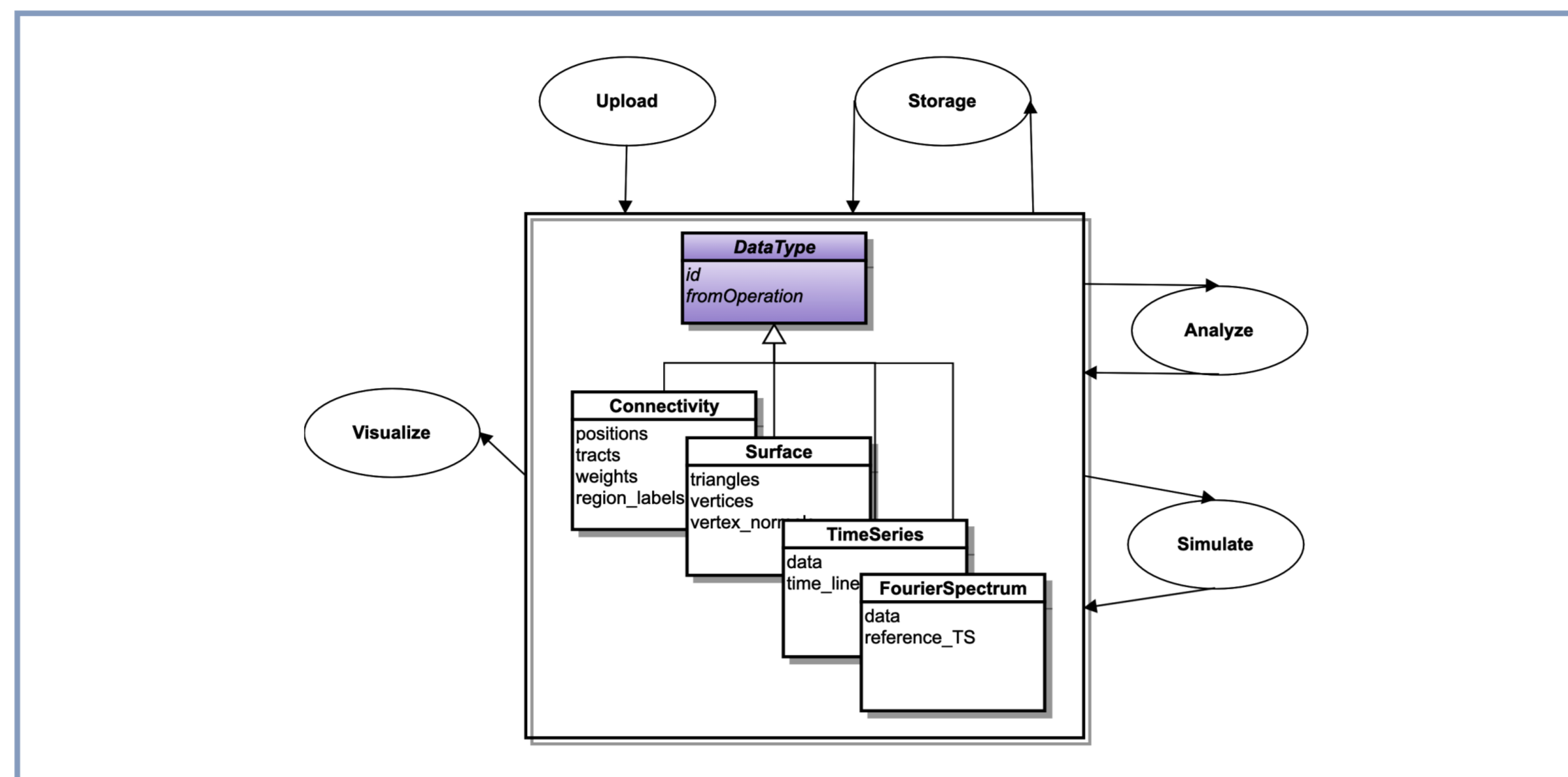
PROGRAM BY GUI COMPONENTS

tvb-ext-xircuits

- design workflows of operations graphically
- support for machine learning and brain network modelling (TVB) workflows
- execute locally or HPC
- integrate with widgets for detailed configurations
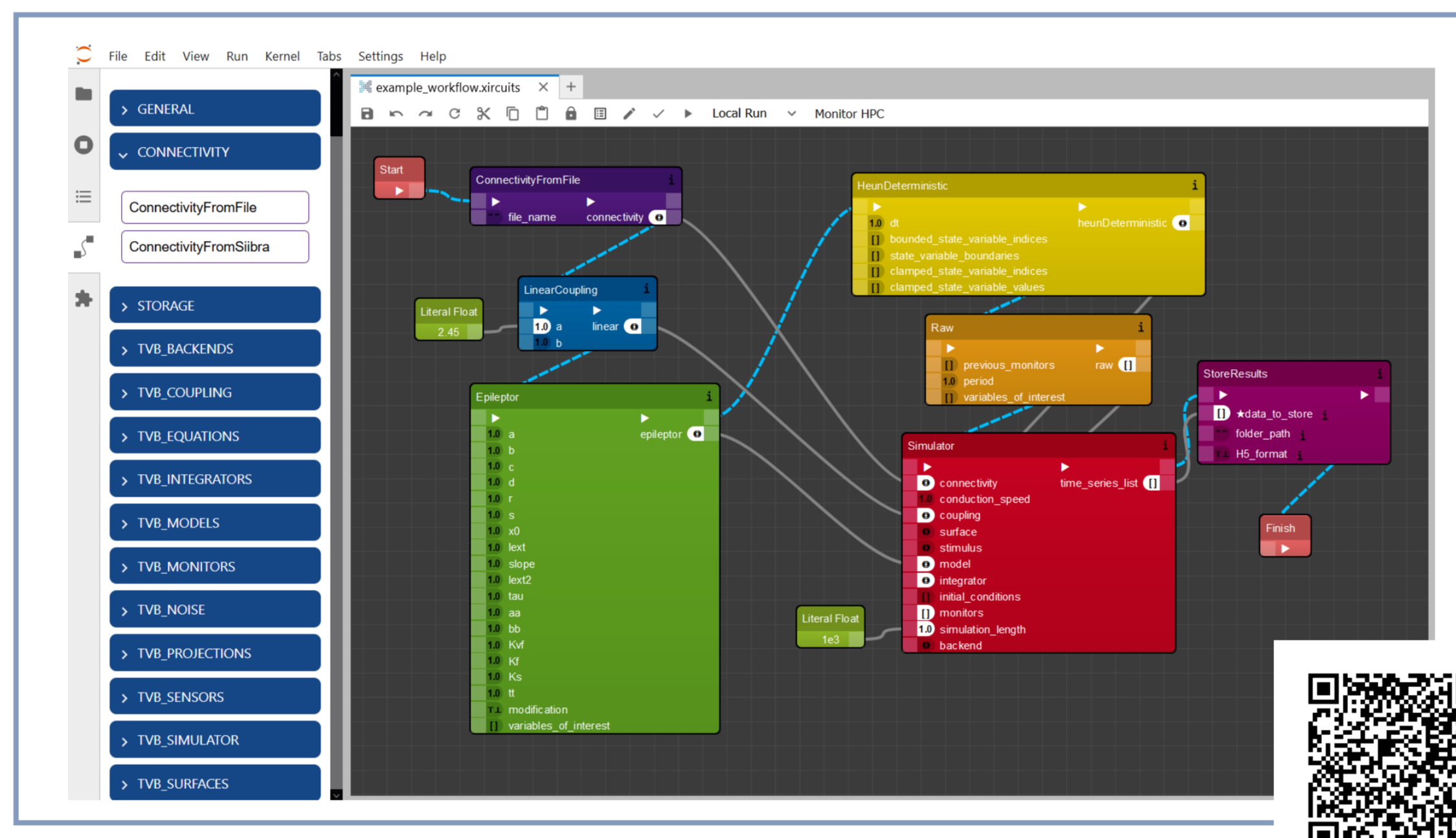
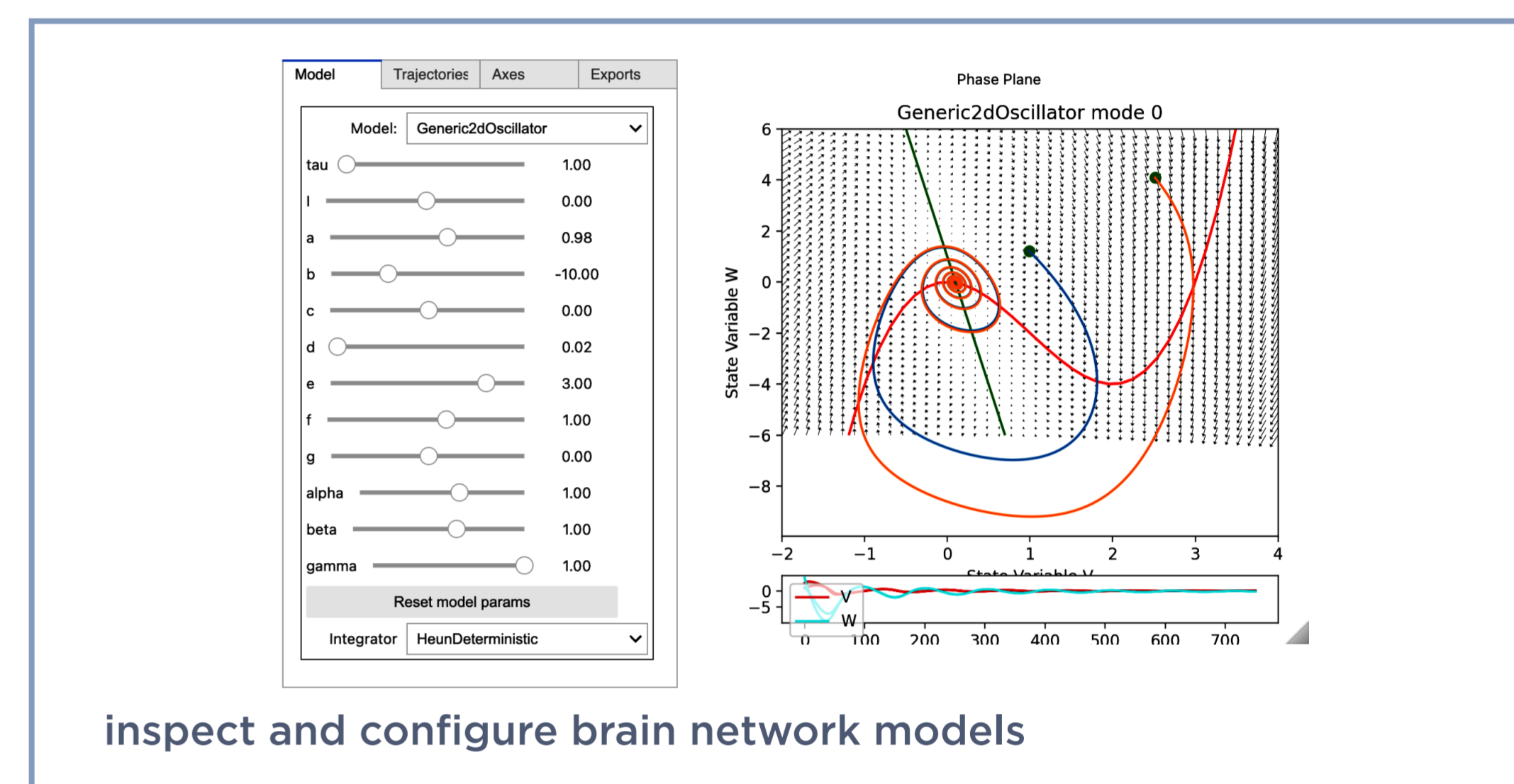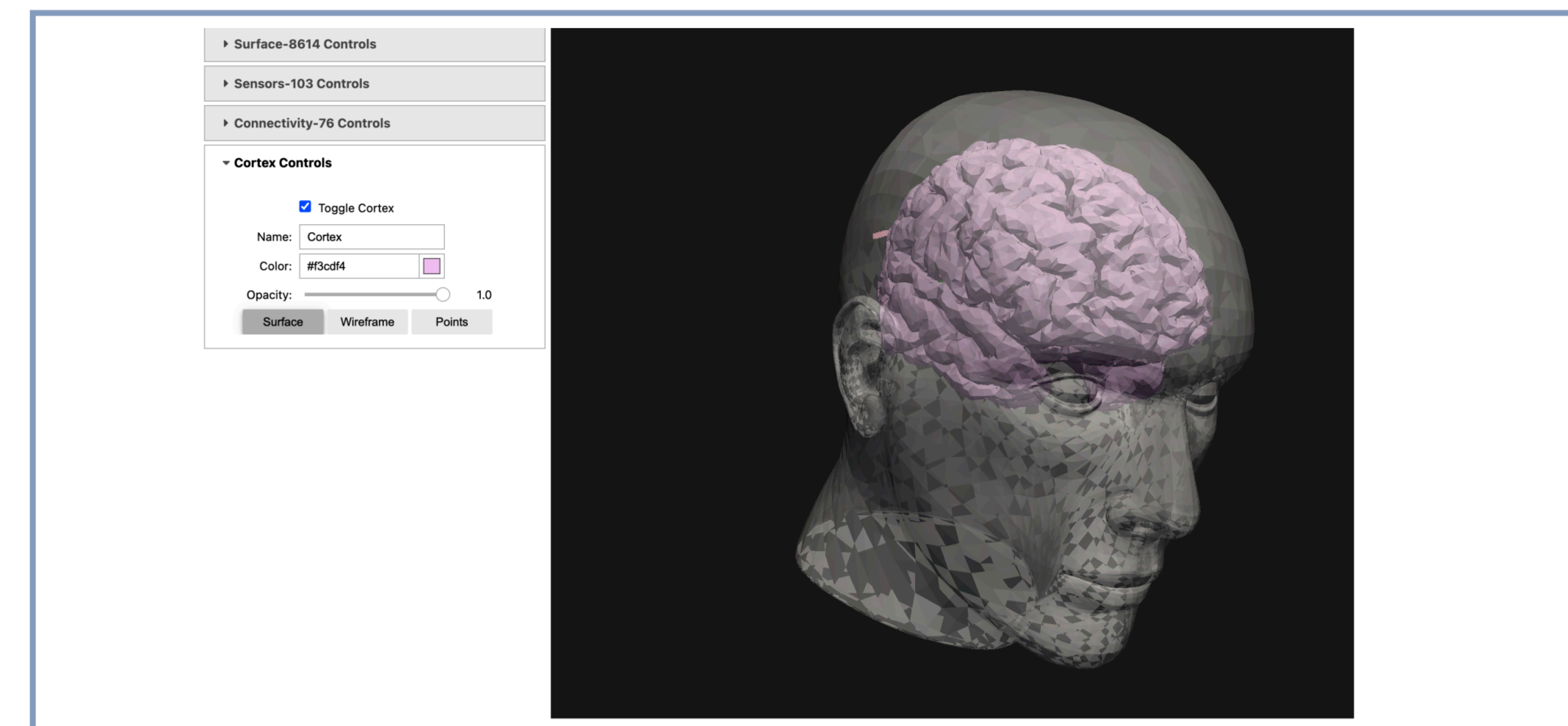## MONITOR JOBS DIRECTLY IN LAB

tvb-ext-unicore

- jupyter-lab extension
- open-source
- over py-unicore API
- browse multiple HPC sites
- monitor jobs status
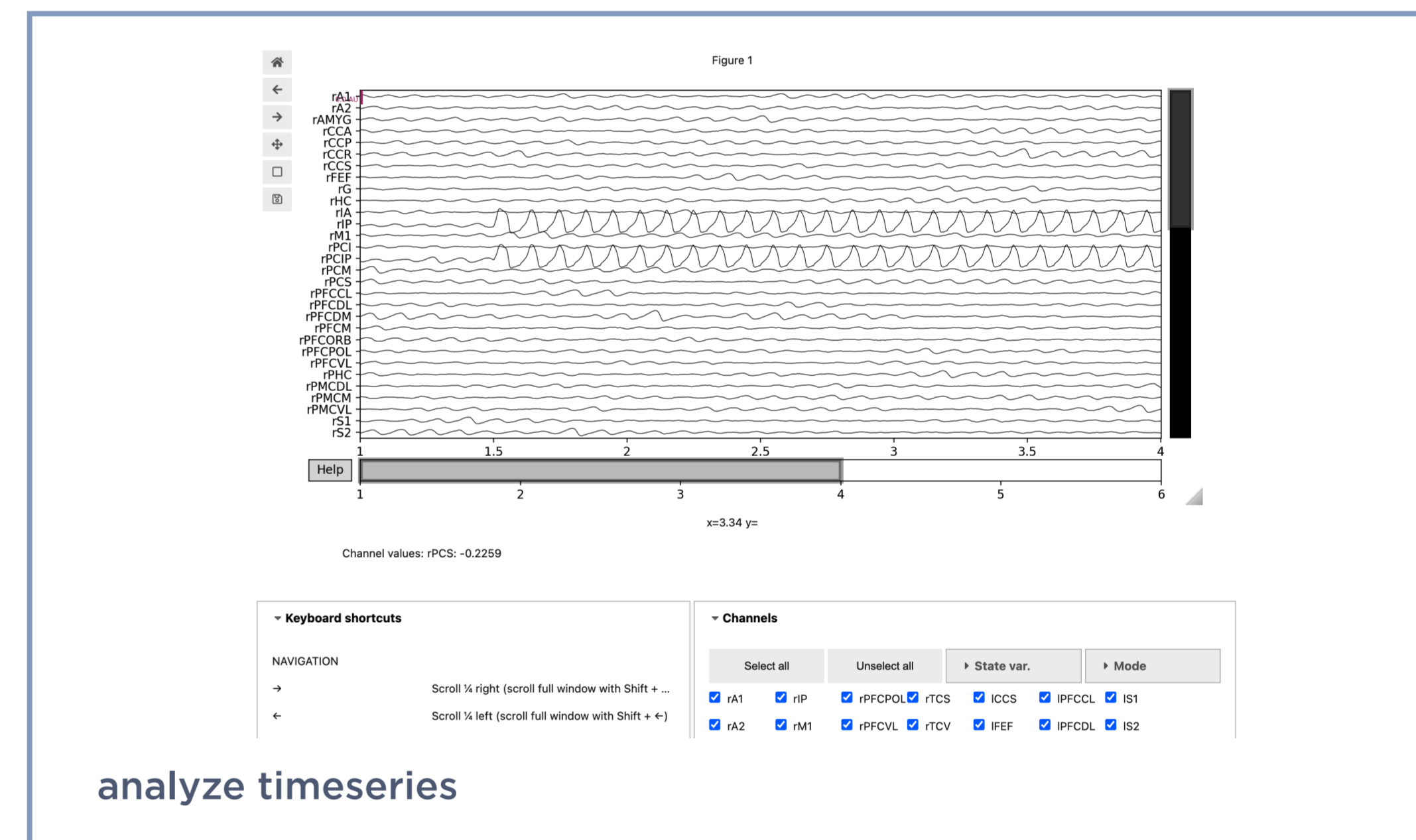- download results from HPC
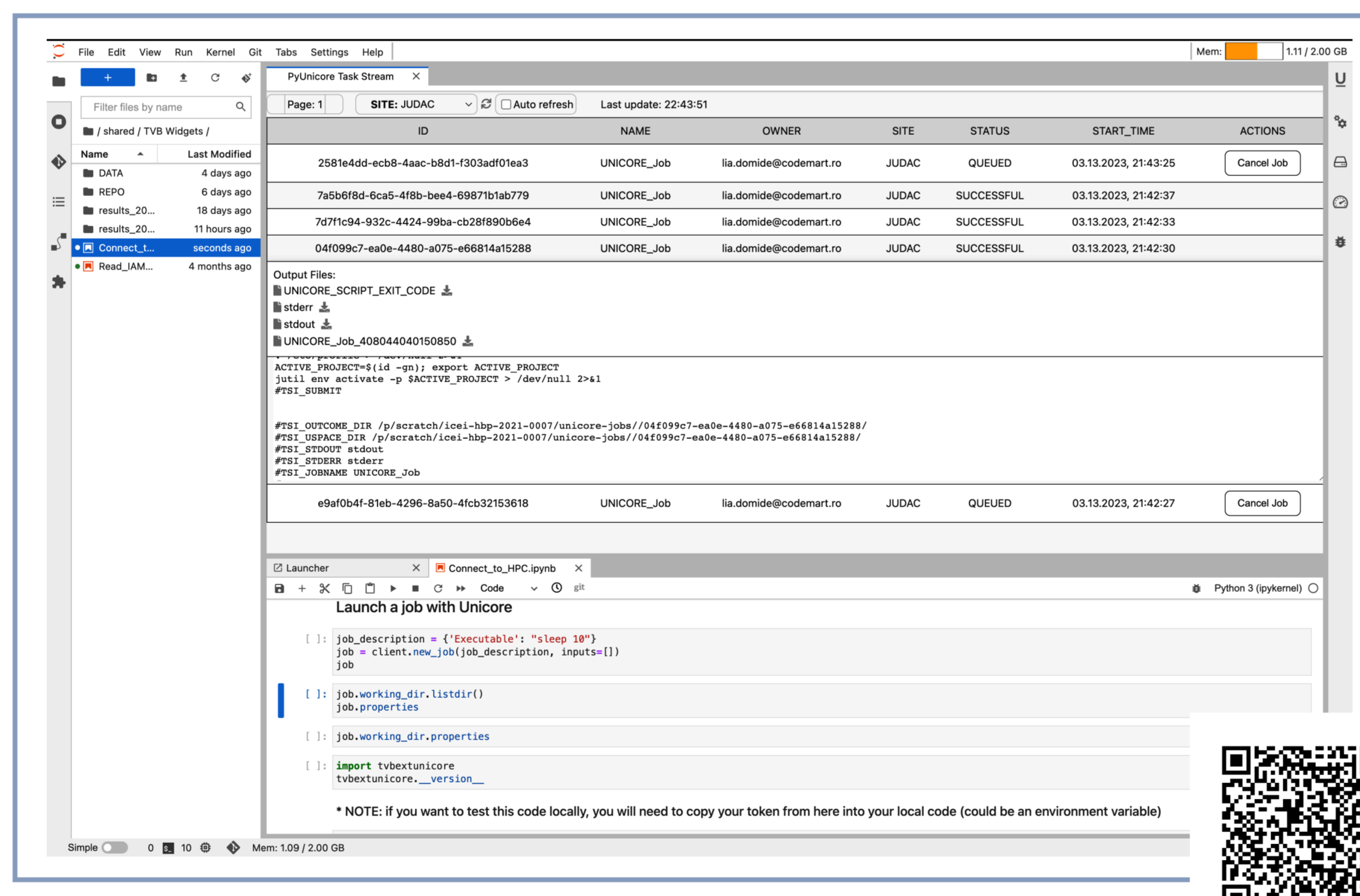
VIEW DATATYPES

tvb-widgets

- small reusable graphical components
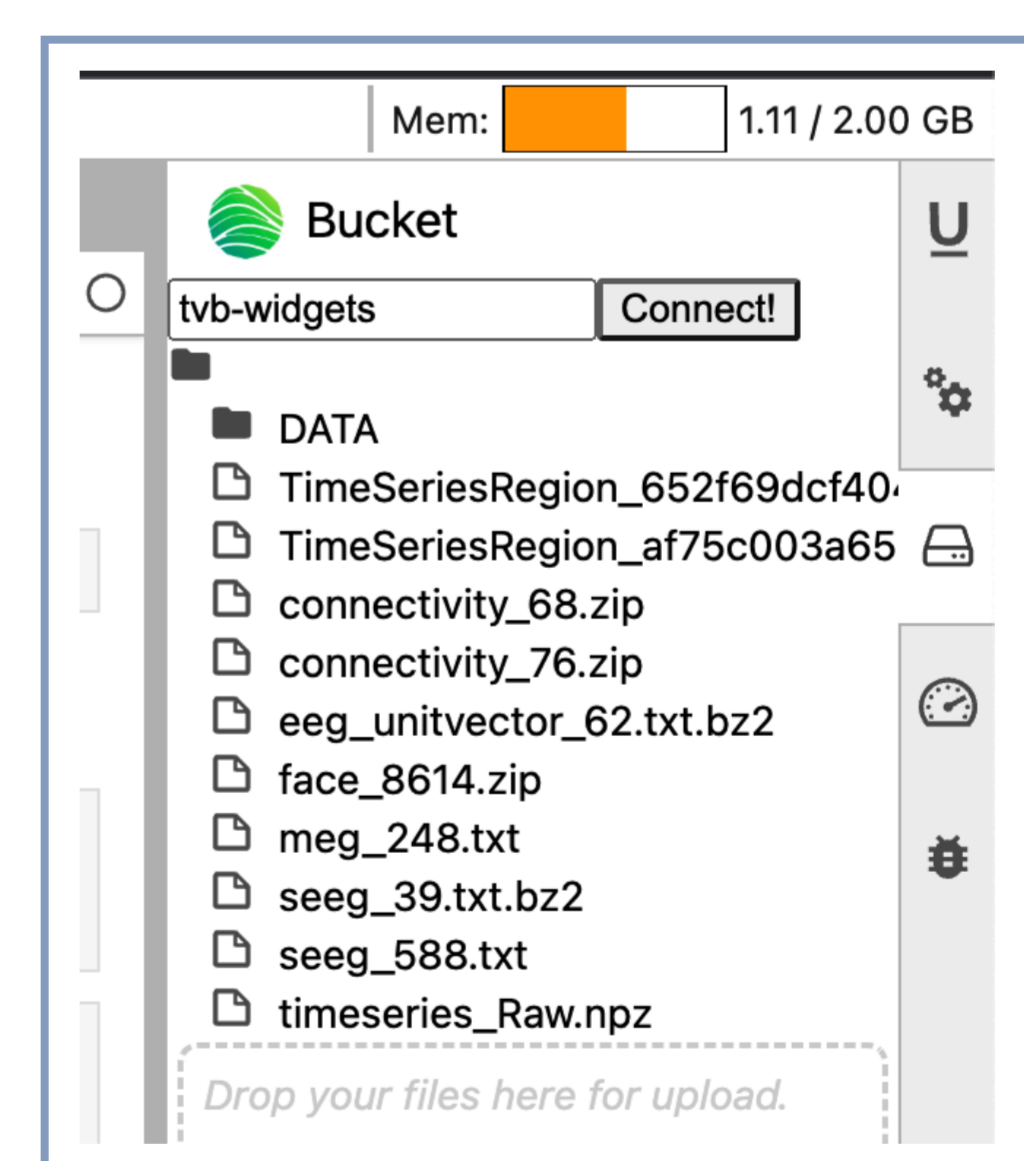- available in EBRAINS lab directly

inspect and configure brain network models

analyze timeseries

MANAGE DATA

tvb-ext-bucket

- EBRAINS data proxy GUI browser
- drag & drop resources from and to Drive or local storage
- integrated with the other extensions

SUMMARY & DISCUSSION

tvb-widgets supports the neuroscience community by simplifying the interaction with EBRAINS capabilities.

Tasks like: setup of models for region specific or cohort simulations, selection of data sources and their links to models, querying the Knowledge Graph or deploying and monitoring jobs on HPC resources become much more accessible, thus increasing the cooperation between researchers and the EBRAINS infrastructure.

We consider the current widgets merely examples, given to set a trend and to solve immediate needs. We trust the same architecture and API can be replicated for more of your research tools.

CODEMART

INSTITUT DE NEUROSCIENCES DES SYSTÈMES

JÜLICH Forschungszentrum

THEVIRTUALBRAIN.

EBRAINS

Co-funded by the European Union