

Le Dashboard ReproVIP

Visualiser la reproductibilité en
imagerie médicale

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Outline

- I. ReproVIP overview
- II. Dashboard objectives
- III. Dashboard features

I. Souviens toi l'automne dernier?

ReproVIP in detail

[\(lien video\)](#)



Chaines / Journées calcul et données / JCAD 2022 - Dijon / JCAD 2022

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Sommaire

- Intro. VIP – the Virtual Imaging Platform
 - I. Variabilité des Résultats en Imagerie Médicale
 - II. Critères de Reproductibilité
 - III. Projet ReproVIP

Geel VILA – Journée Calcul et Données – 10/10/2022

1:01 / 26:28

Geel VILA – Journée Calcul et Données – 10/10/2022

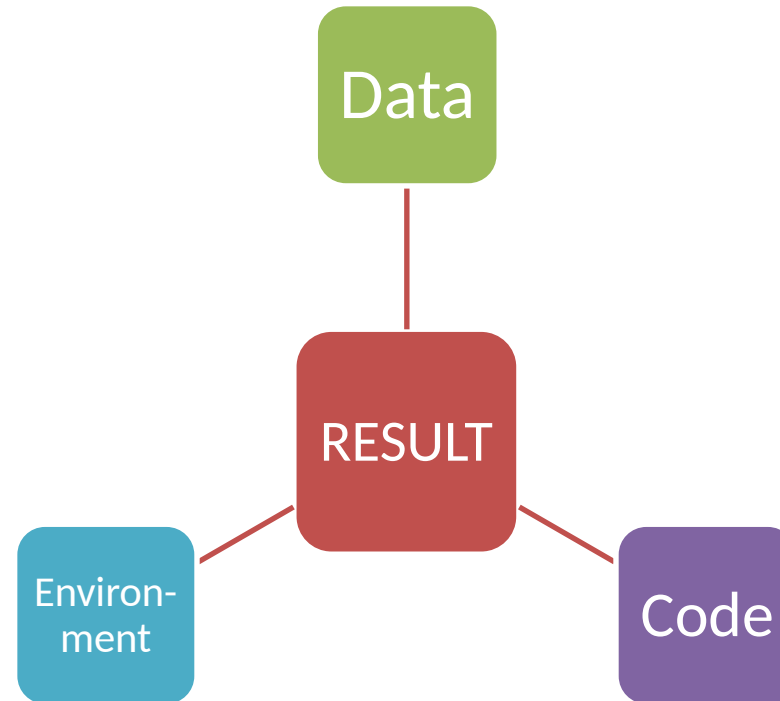
Conférence

Version audio

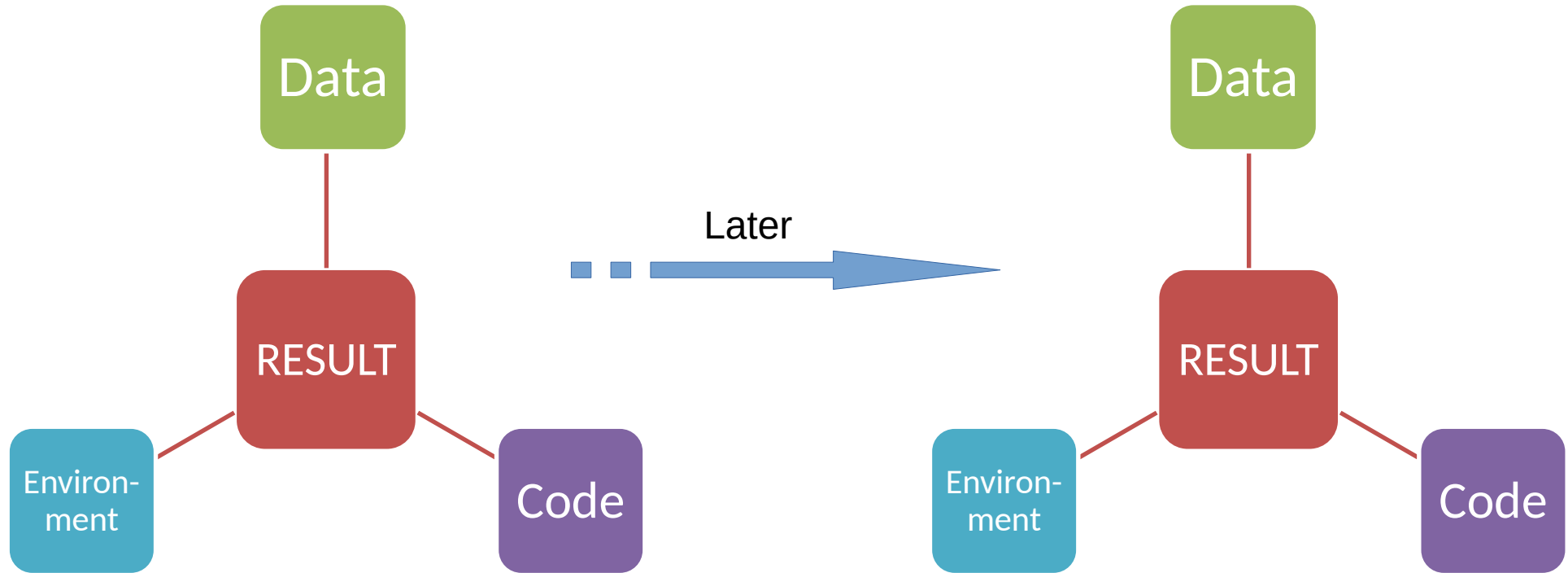
PROJET REPROVIP : VERS DES RÉSULTATS REPRODUCTIBLES EN IMAGERIE MÉDICALE

Durée : 00:26:27 - Mise en ligne : 15 novembre 2022

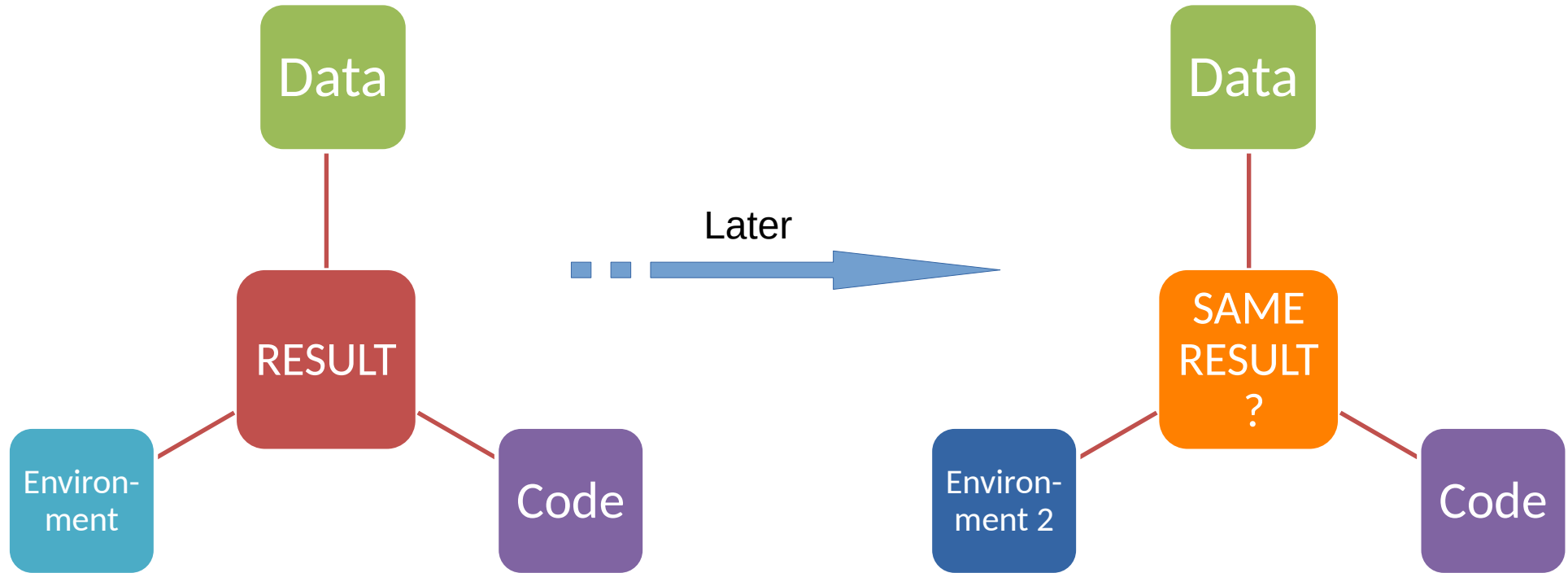
I. ReproVIP overview



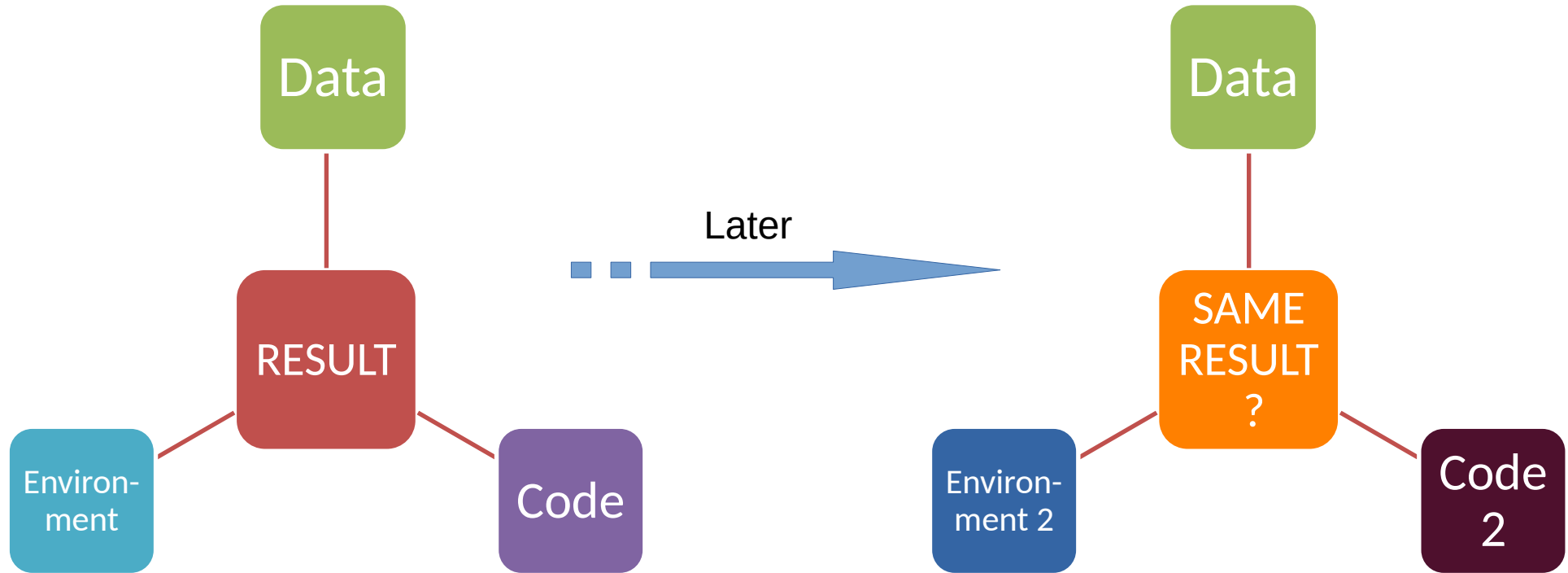
I. ReproVIP overview



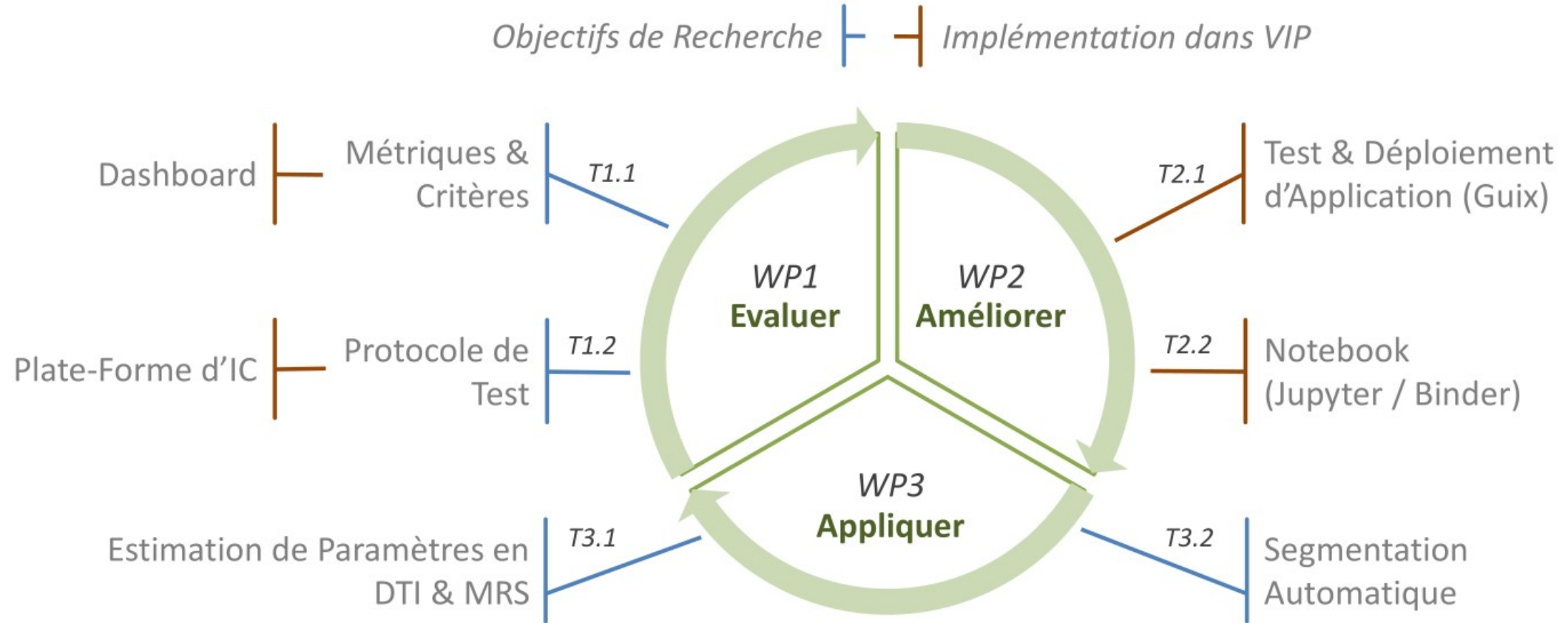
I. ReproVIP overview



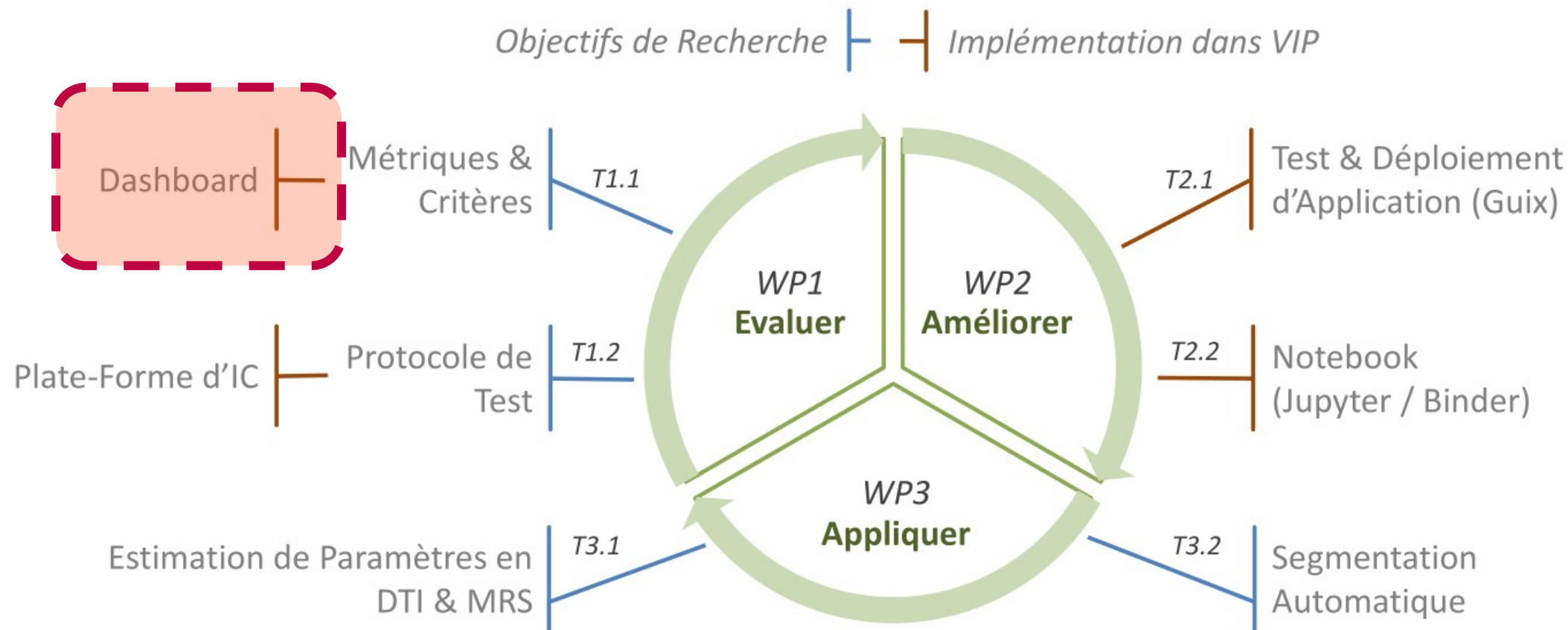
I. ReproVIP overview



I. ReproVIP Overview



I. ReproVIP Overview



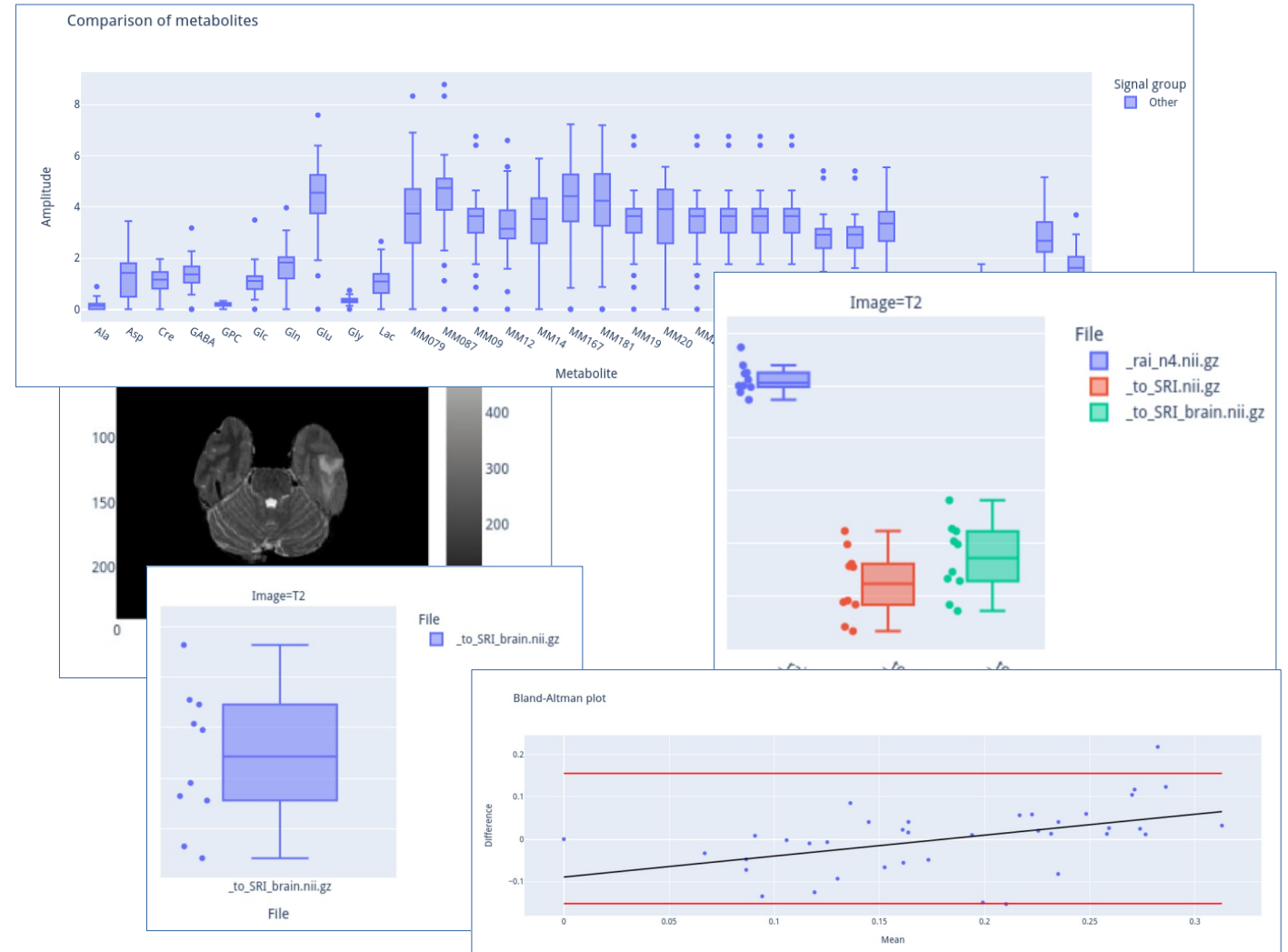
Outline

- I. ReproVIP overview
- II. Dashboard objectives
- III. Dashboard features

II. Dashboard objectives

It is **visualization** dashboard

- Graphic display of the differences



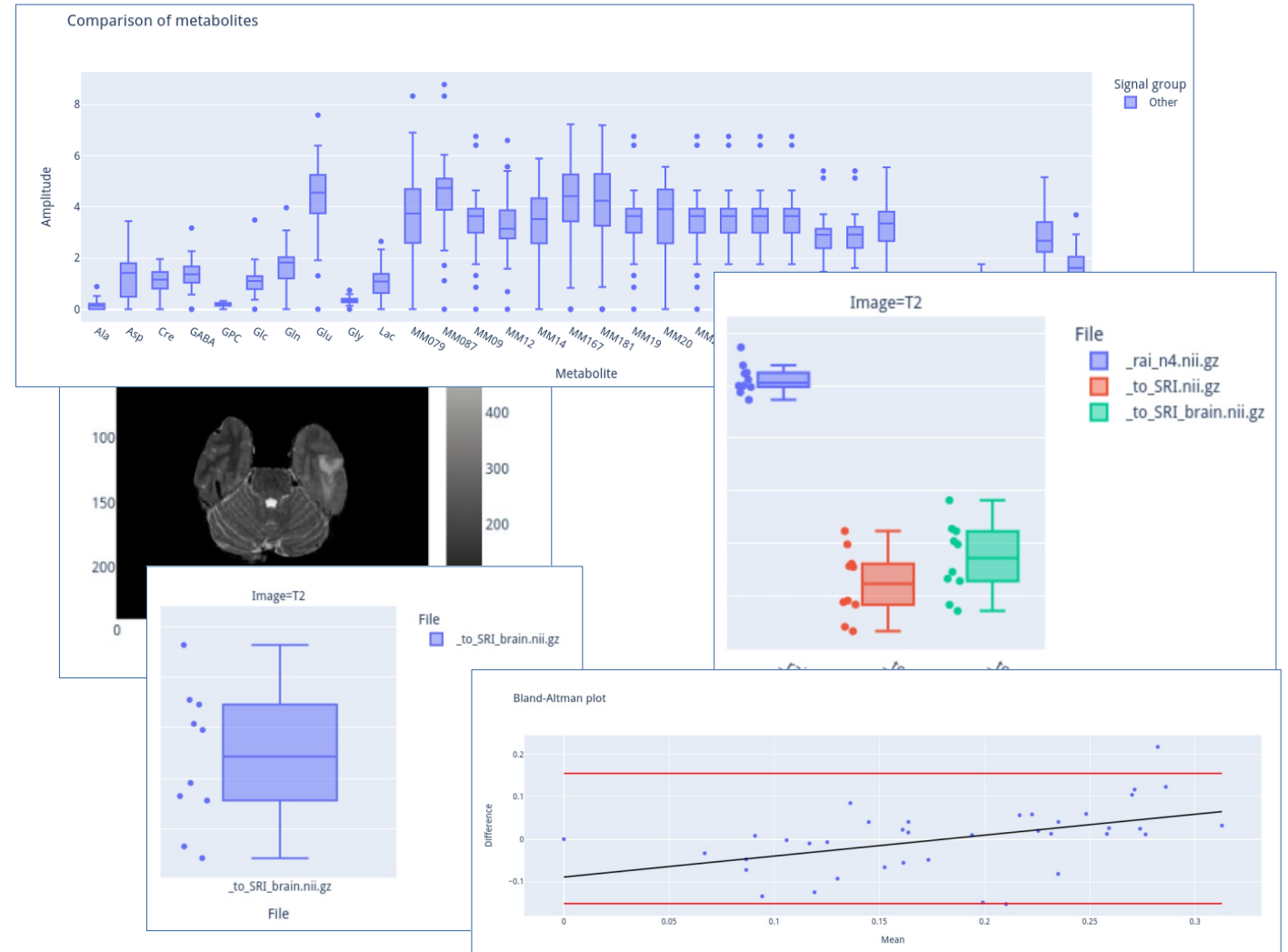
II. Dashboard objectives

It is **visualization** dashboard

- Graphic display of the differences

Different usages

- A reviewer (2 results)
- A publisher (2+ results)
- A developer (2 results)
- A reproducibility researcher (many results)



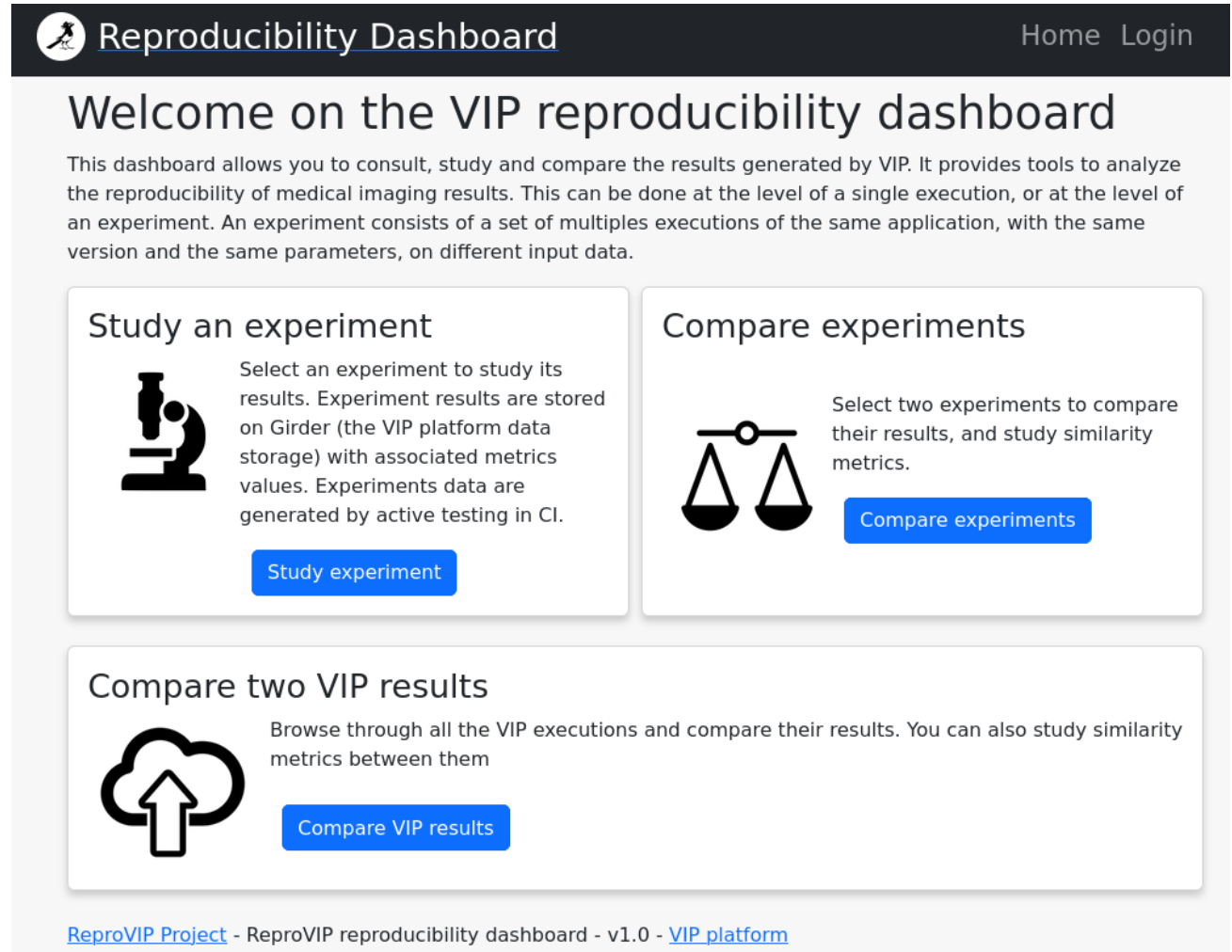
Outline

- I. ReproVIP overview
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- III. Dashboard features**

III. Dashboard features

Web dashboard

- Python
- Dash / plotly



The screenshot shows the 'Reproducibility Dashboard' interface. At the top, there is a navigation bar with a home icon, the text 'Reproducibility Dashboard', and links for 'Home' and 'Login'. Below the navigation bar is a main heading 'Welcome on the VIP reproducibility dashboard' followed by a paragraph explaining the dashboard's purpose: 'This dashboard allows you to consult, study and compare the results generated by VIP. It provides tools to analyze the reproducibility of medical imaging results. This can be done at the level of a single execution, or at the level of an experiment. An experiment consists of a set of multiples executions of the same application, with the same version and the same parameters, on different input data.'

The dashboard features three main interactive cards:

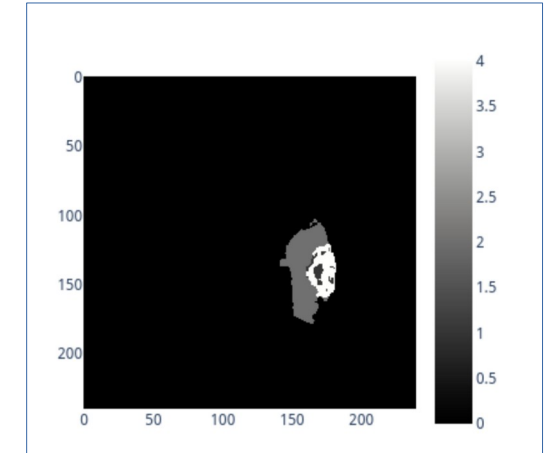
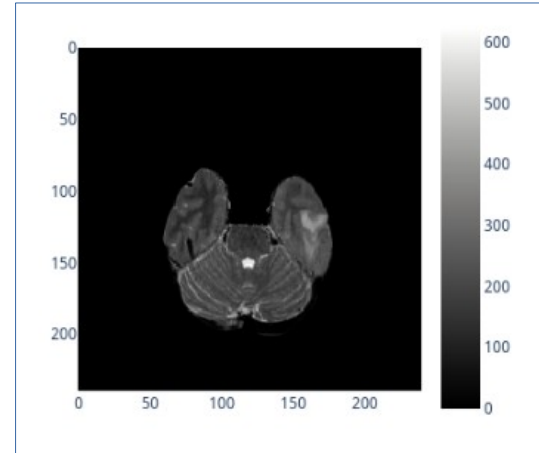
- Study an experiment:** Includes a microscope icon and a 'Study experiment' button. The text describes selecting an experiment to study its results, noting that data is stored on Girder and generated by active testing in CI.
- Compare experiments:** Includes a scales icon and a 'Compare experiments' button. The text describes selecting two experiments to compare their results and study similarity metrics.
- Compare two VIP results:** Includes a cloud with an upward arrow icon and a 'Compare VIP results' button. The text describes browsing through all VIP executions and comparing their results, including similarity metrics.

At the bottom of the dashboard, there is a footer with the text: [ReproVIP Project](#) - [ReproVIP reproducibility dashboard - v1.0](#) - [VIP platform](#)

III. Dashboard features

First metrics : WP3 use cases

- MRI preprocessing and segmentation



III. Dashboard features

2 images comparison

- Slice selector for 3D image
- PSNR metrics

Axes

Z

Mode

Compare each pixel

PSNR for the whole image: 27.7729

PSNR for this slice: 27.2562

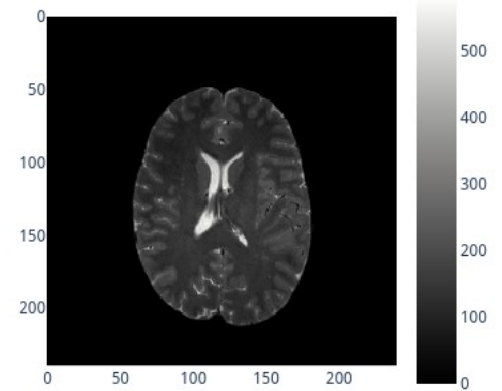
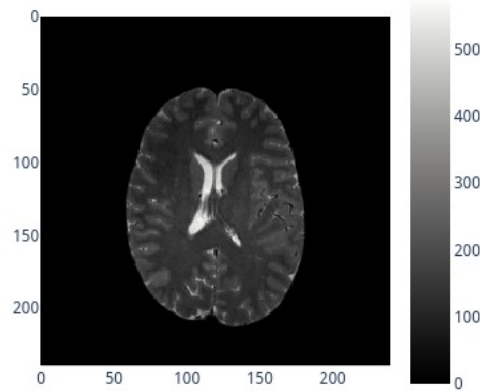


Chart description

Pixel-wise difference between the two images

Slice selector



[ReproVIP Project](#) - [ReproVIP reproducibility dashboard - v1.0](#) - [VIP platform](#)

III. Dashboard features

2 images comparison

- Slice selector for 3D image
- PSNR metrics
- Visual display

Axes

Z

Mode

Compare each pixel

PSNR for the whole image: 27.7729

PSNR for this slice: 27.2562

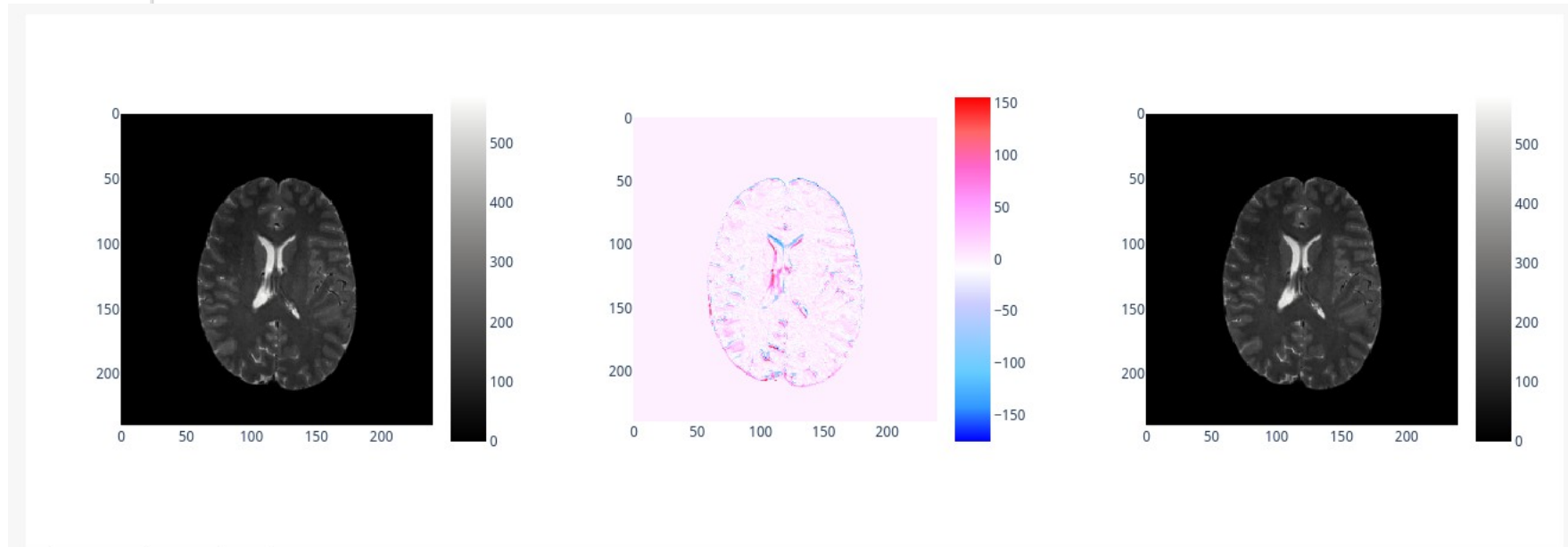


Chart description

Pixel-wise difference between the two images

Slice selector

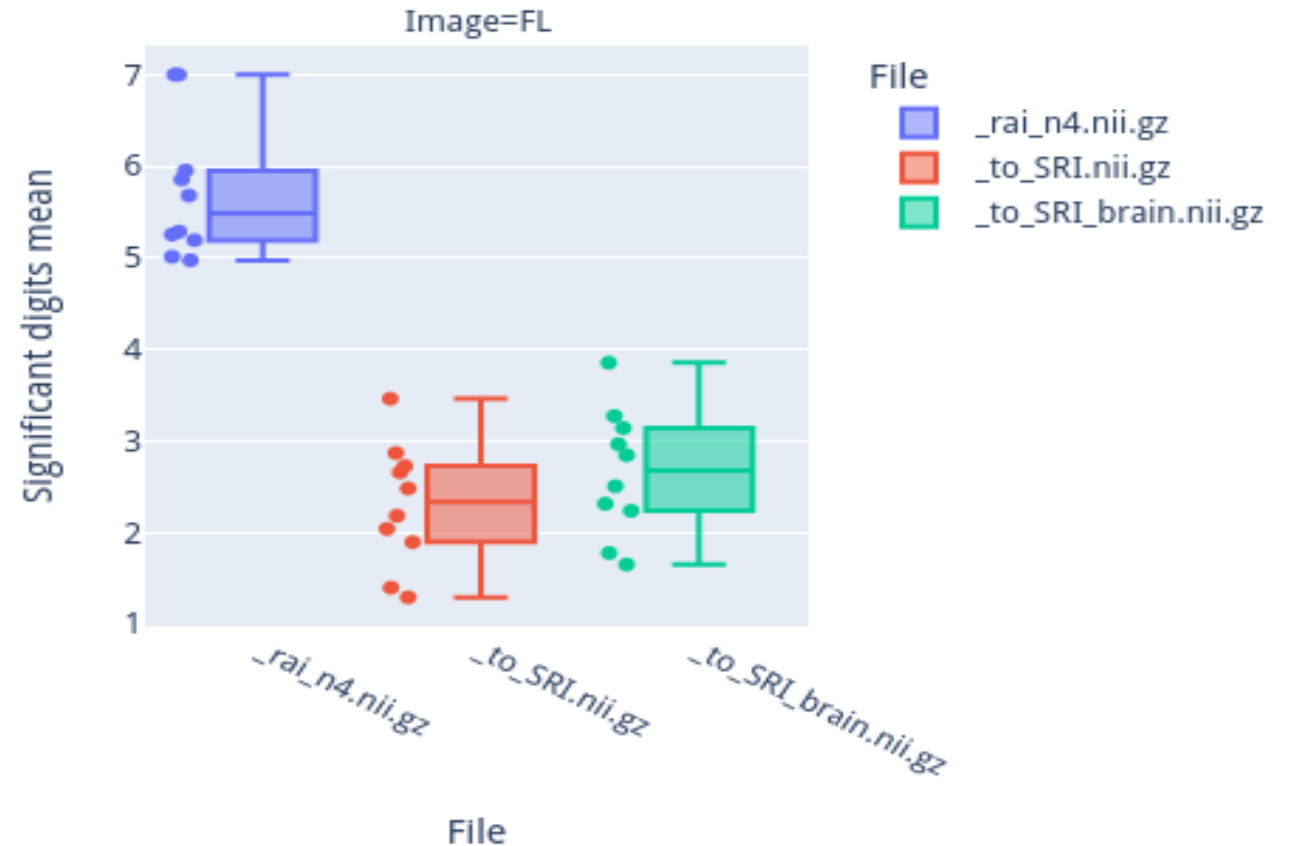


[ReproVIP Project](#) - ReproVIP reproducibility dashboard - v1.0 - [VIP platform](#)

III. Dashboard features

Many images comparison

- Many inputs
- Several results for each input
- Significant digits metric
- Use of CI



IV. Dashboard difficulties

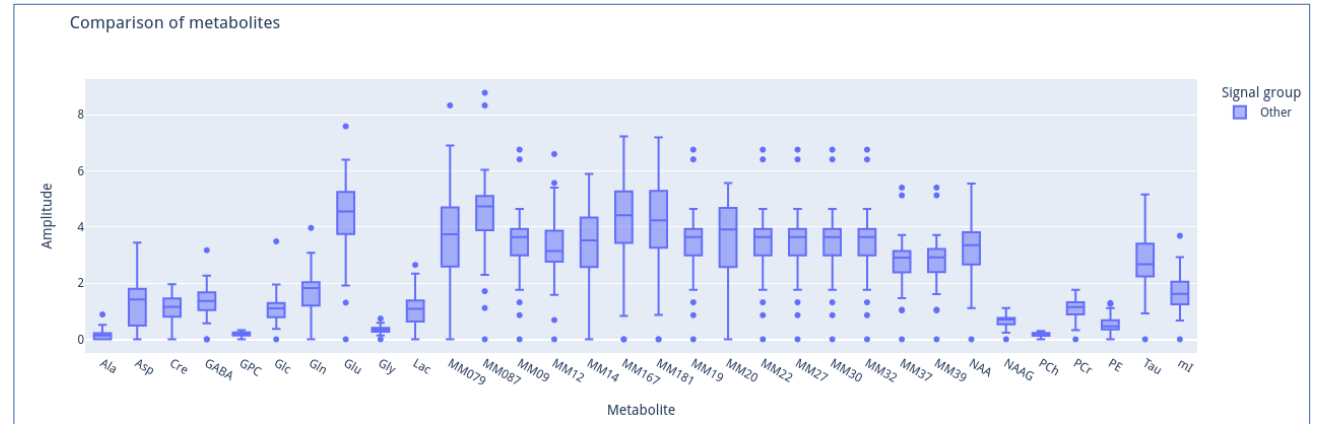
Main difficulty

- How to represent the difference ?

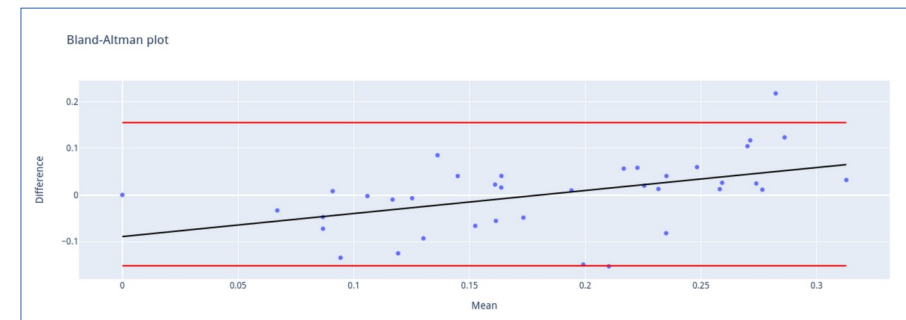
Many many cases :

- 2 or more data (comparison, similarity, dispersion)
- Many data formats
- Many applications

Metrics selection specific for each case



Some graphics from the other reproVIP use case



Conclusion / Perspectives

Extensible

- “Bring your own metric”

Access VIP execution history

- Use VIP provenance
- Production version

Interoperability with other platforms

- Not only VIP

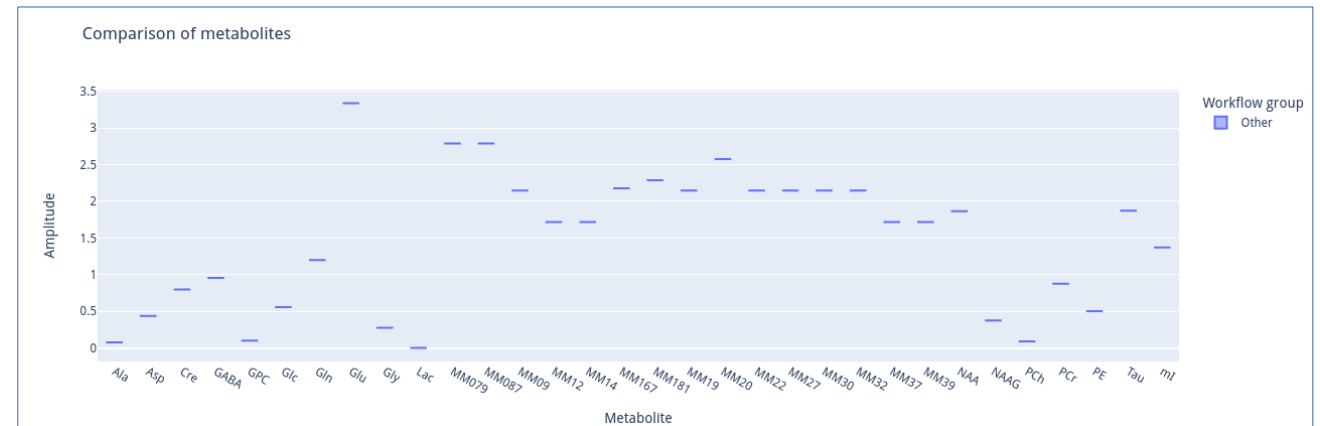
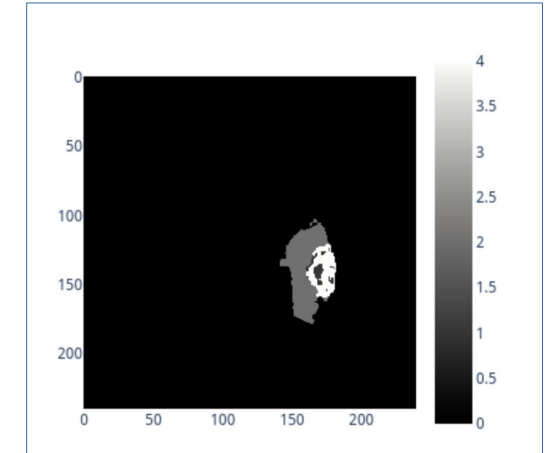
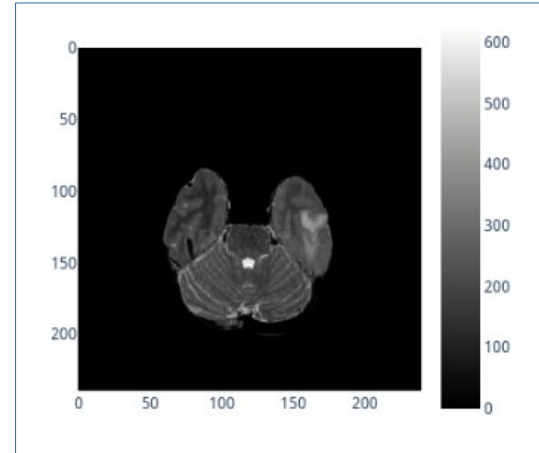
Thank You



III. Additional dashboard features

First metrics : WP3 use cases

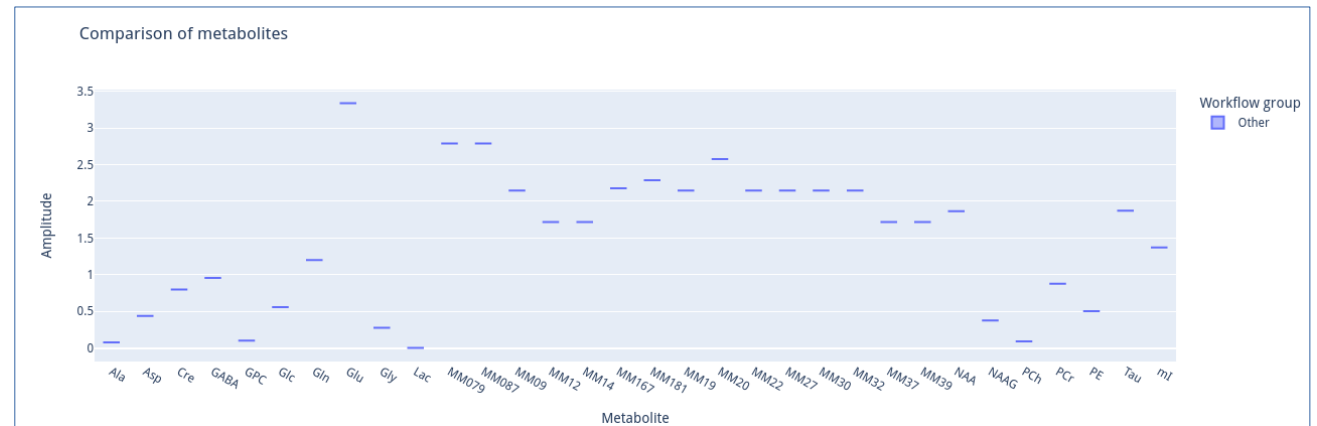
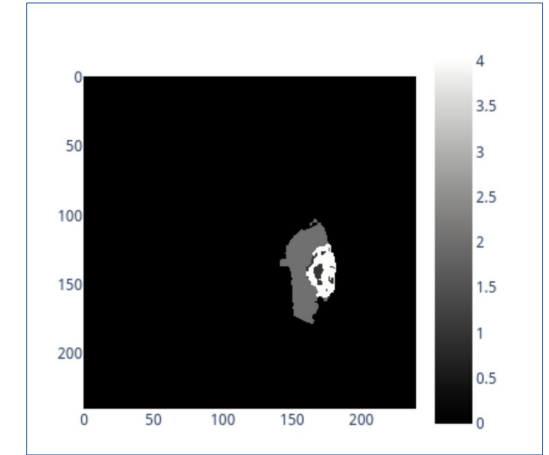
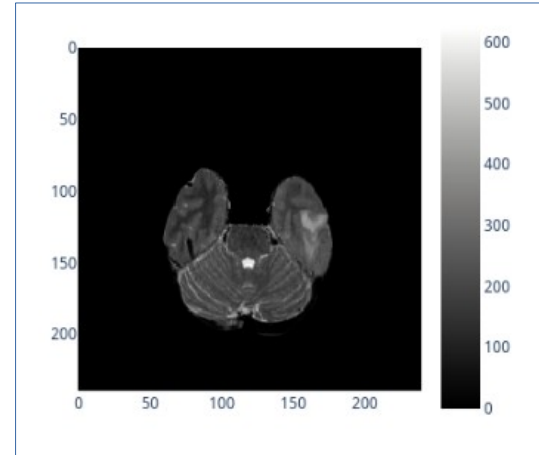
- MRI preprocessing and segmentation
- **MRI spectroscopy**



III. Additional dashboard features

First metrics : WP3 use cases

- MRI preprocessing and segmentation
- **MRI spectroscopy**



III. Additional dashboard features

Many input data

- Variability easily visible for each metabolite
- Signal highlighting

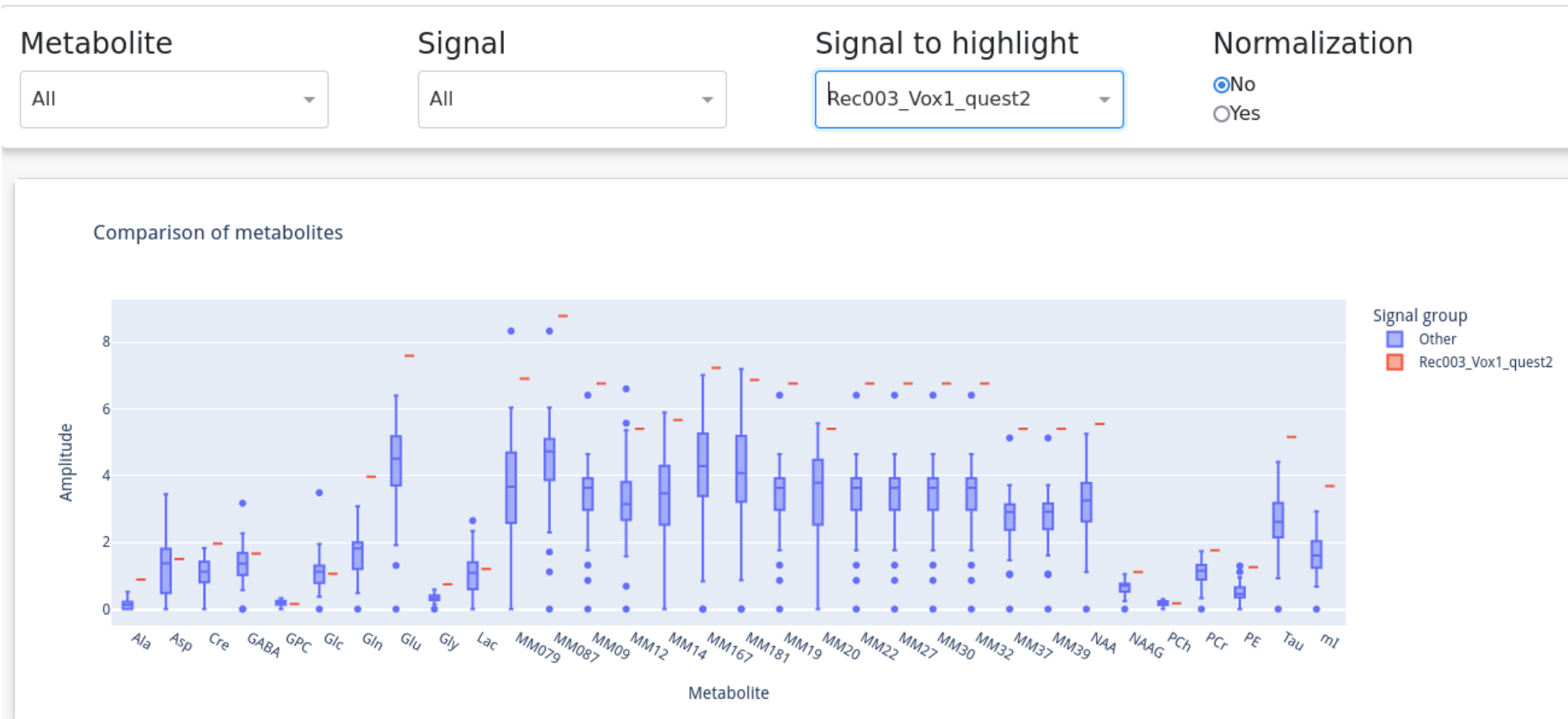


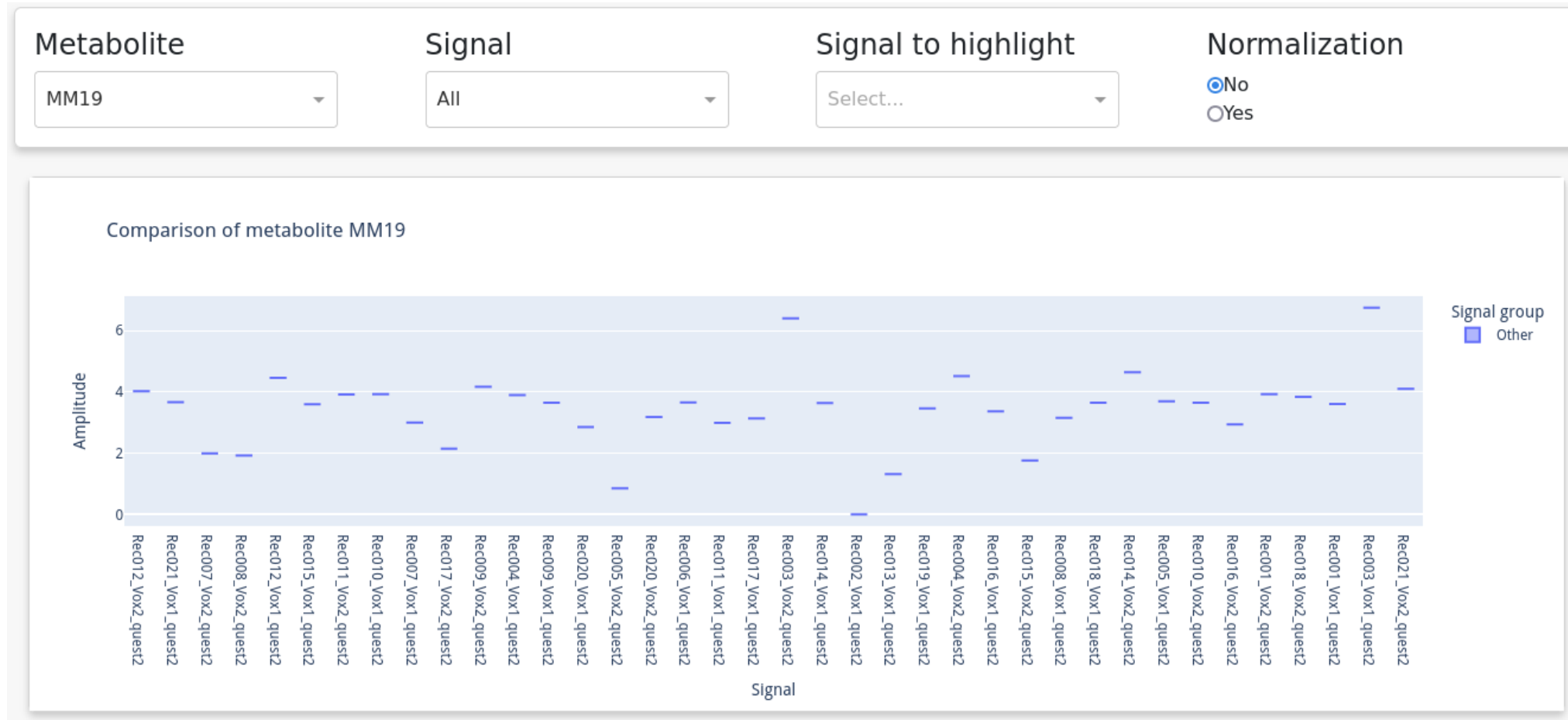
Chart description

This chart shows the amplitude of each signal for each metabolite. Results are computed by cQUEST and their provenance is shown in the table below.

III. Additional dashboard features

Zoom on a metabolite

➤ All values visible



III. Additional dashboard features

Comparison between experiments

Compare experiments : [quest_param_117T_A](#) and [quest_param_117T_B](#)

Metabolite:
 Signal:
 Normalization: No Yes
 Graph type: General Bland-Altman

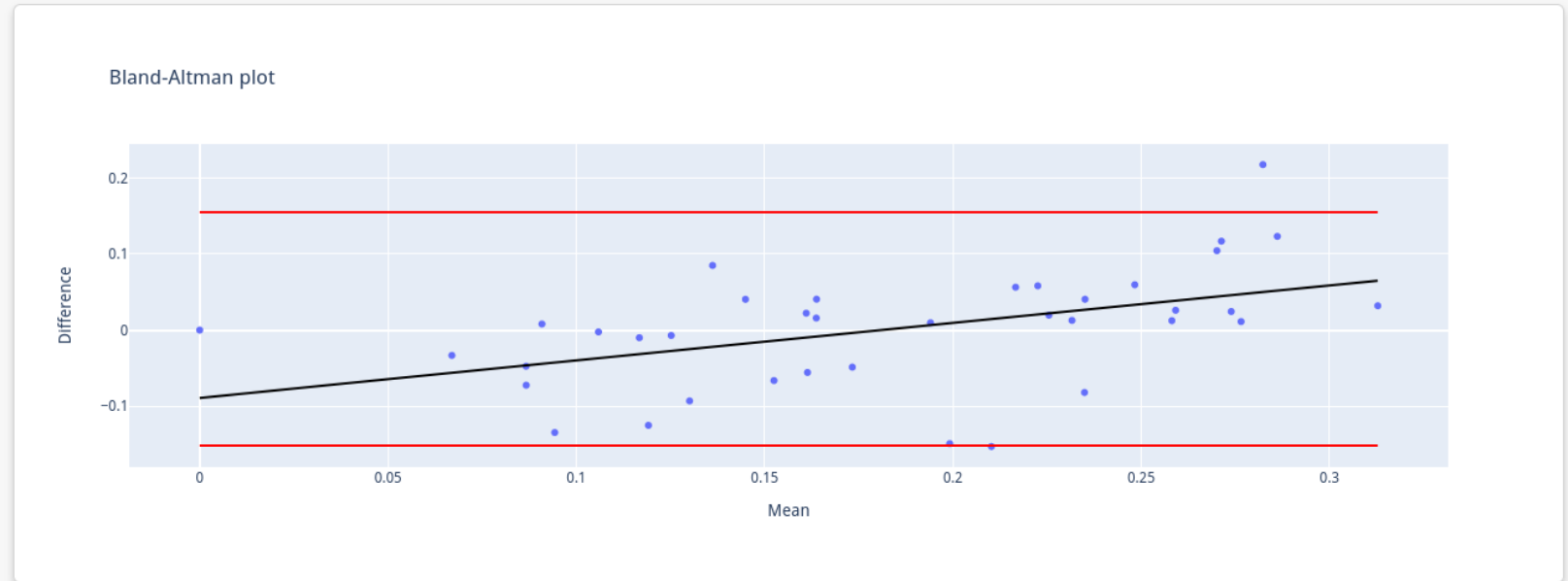


Chart description

Bland-Altman plot of the two experiments. First, the mean of each value (a metabolite for a signal) is computed for each workflow of an experiment. Then, the mean of the two experiments is computed. Finally, the difference between the two experiments is plotted against the mean of the two experiments. The red lines represent the 95% confidence interval of the difference.