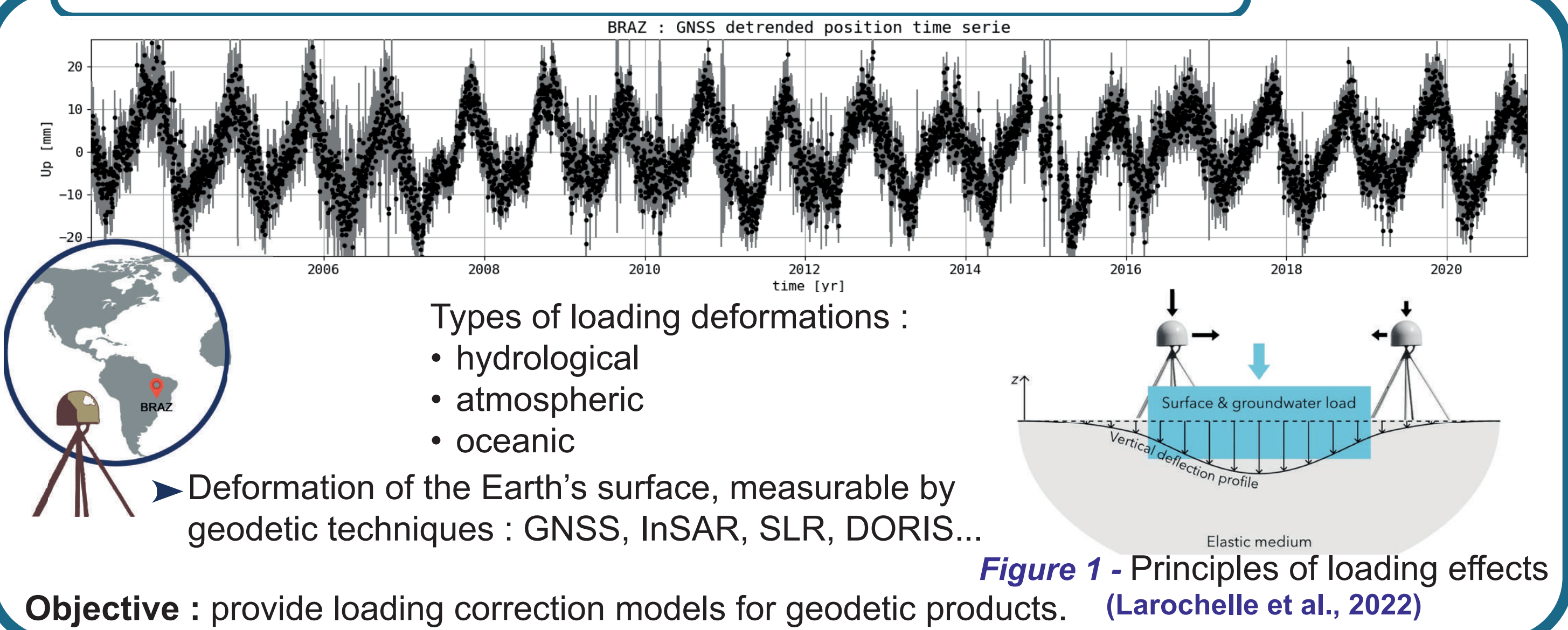


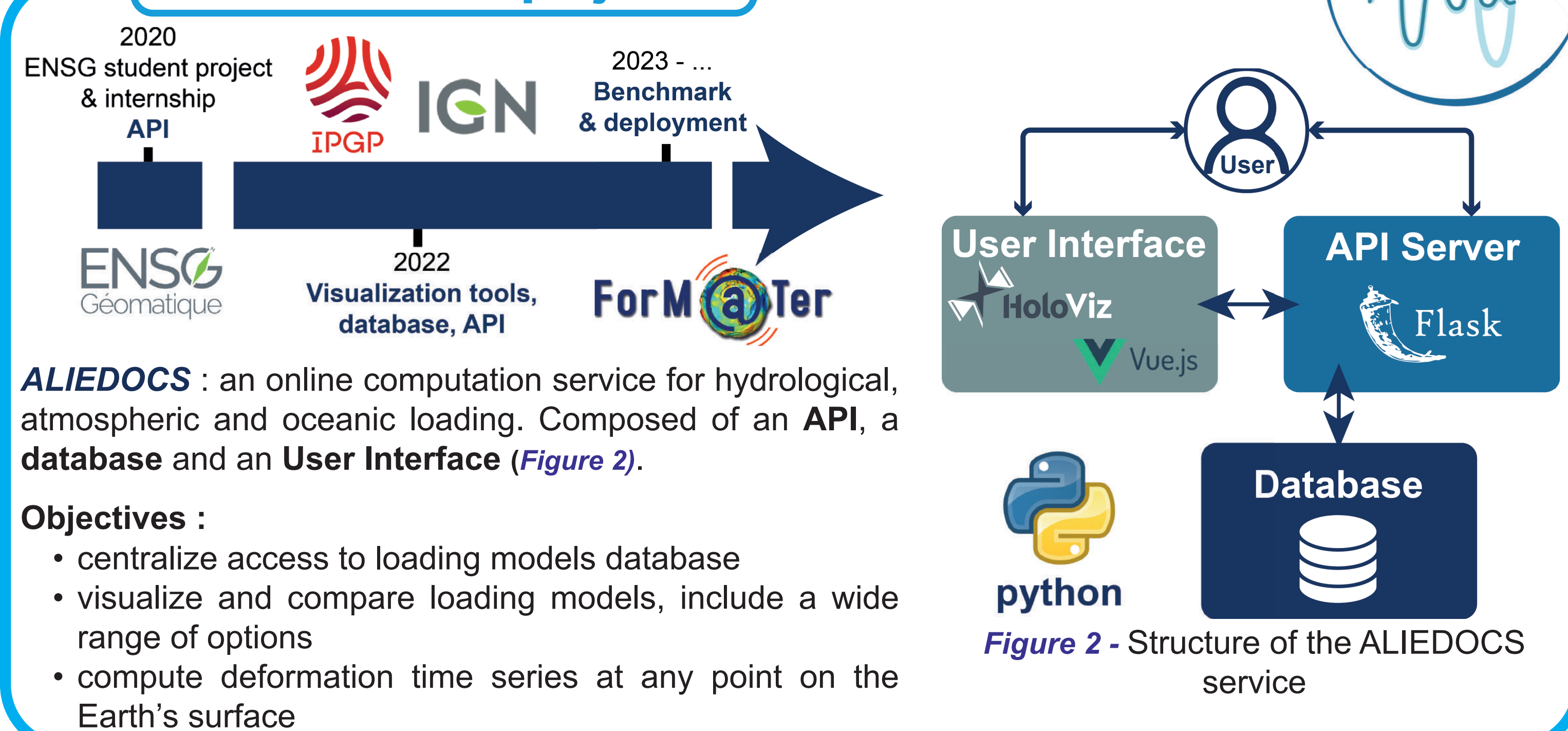
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1 - How do surface loads deform the Earth ?



2 - ALIEDOCS project



3 - Models database

On the computing server, automatic download and update of models (spherical harmonics form). Available models for now :

- 17 hydrological models
- 2 atmospheric models
- 2 oceanic models
- 13 GRACE/GRACE-FO models

Easy to add more models, thanks to ALIEDOCS flexible programming.

Figure 3 - Available models on ALIEDOCS website

5 - Deformation computation

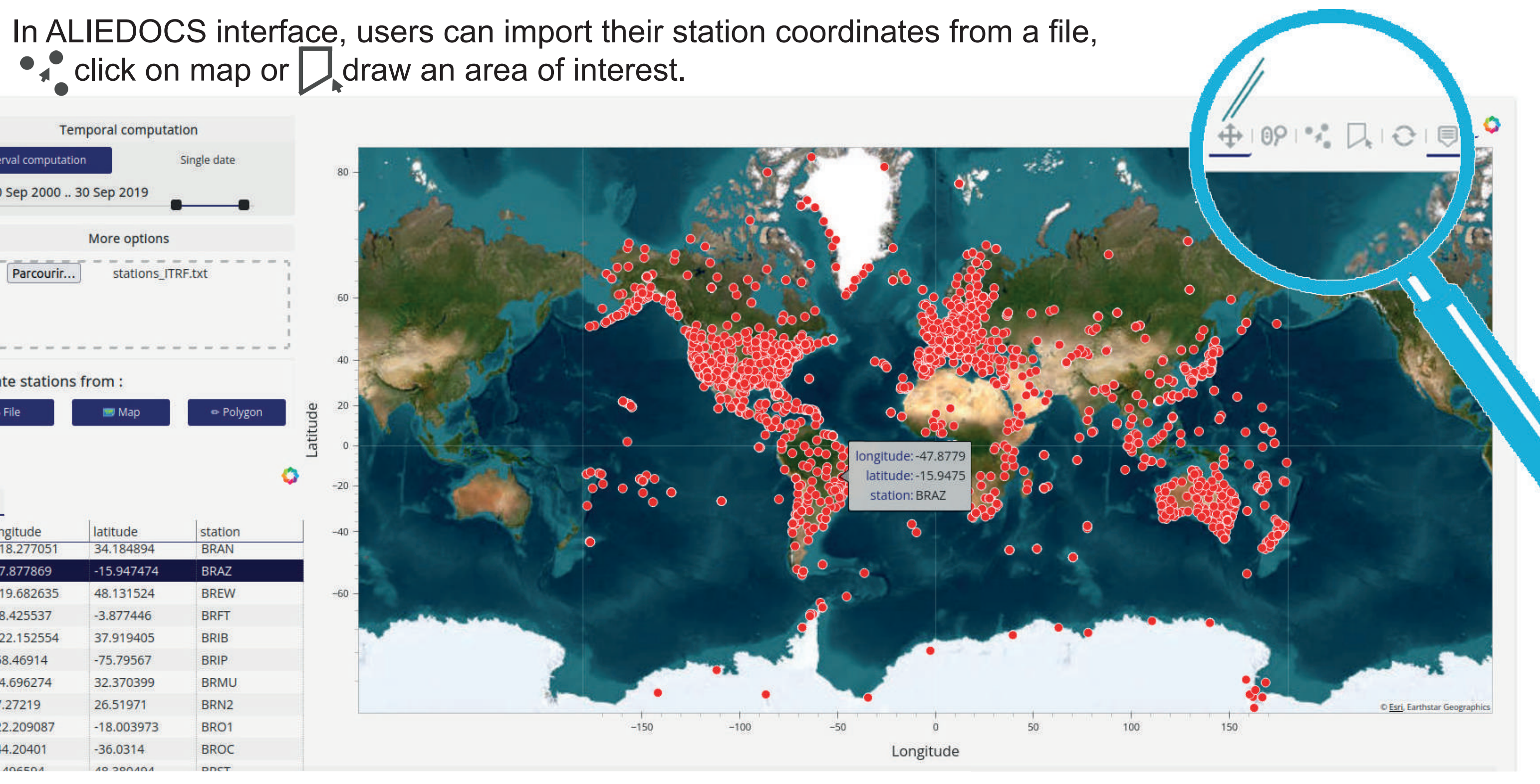


Figure 5.1 - ALIEDOCS website interface for the deformation computation. The entry of stations is interactive using the map, as well as the model choice and the pipeline parameters.

4 - Load visualization

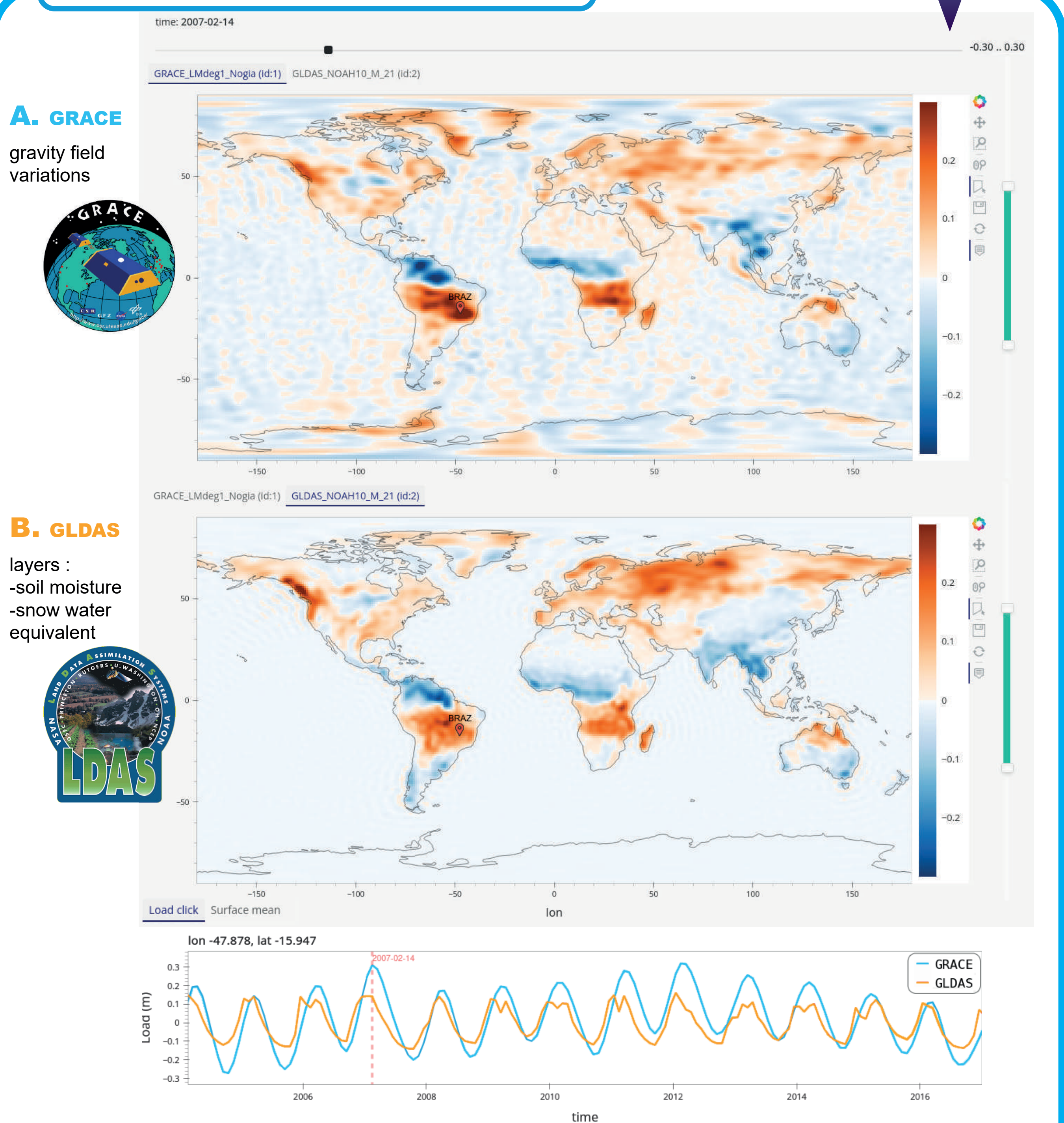


Figure 4 - Maps of loading models generated by ALIEDOCS service : example of GRACE (Gauer et al., 2022) and GLDAS (Beaudoing et al., 2020). BRAZ station is clicked : we can visualize its loading series, expressed in Equivalent Water Height (EWH).

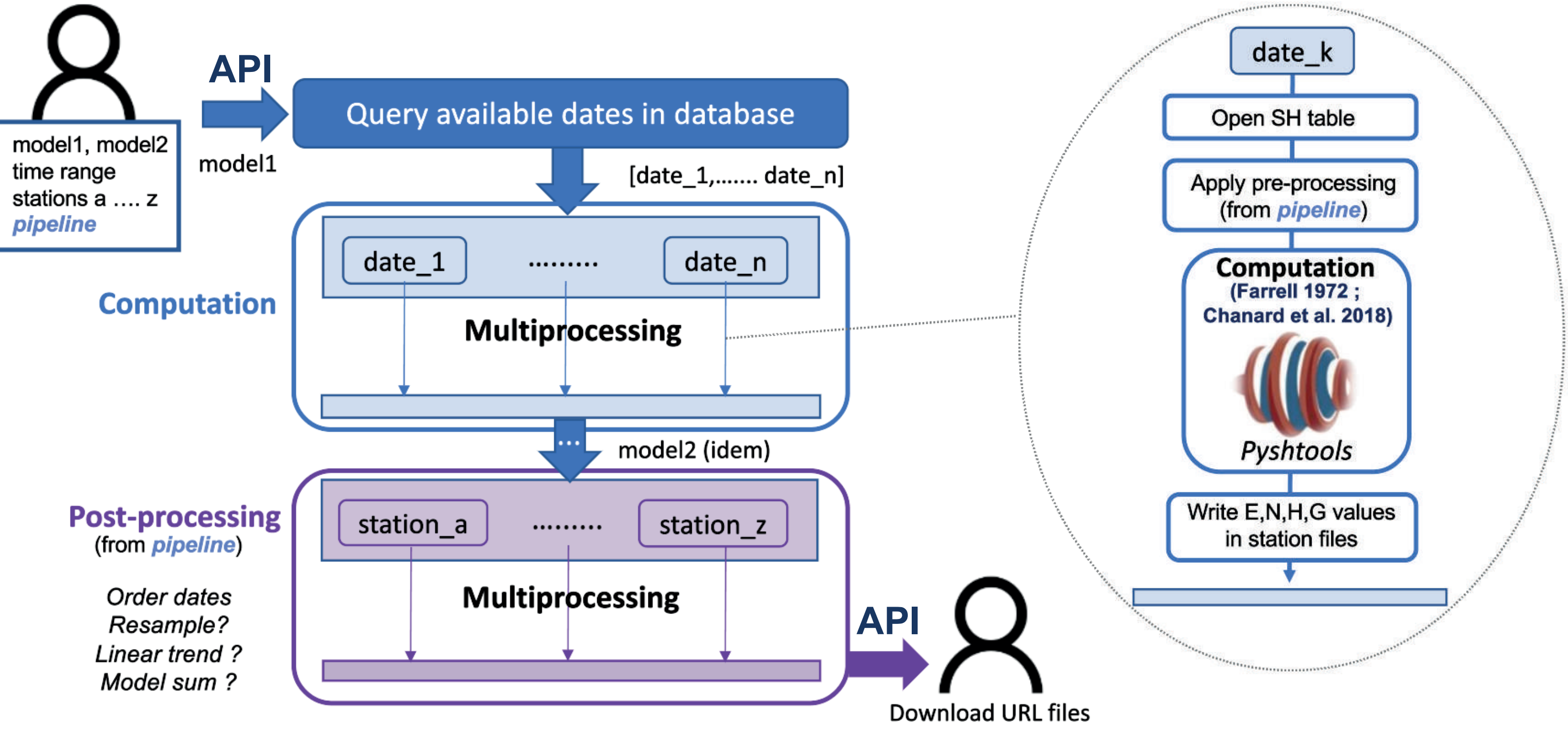


Figure 5.2 - Principle of the deformation computation, when the user sends a request to the ALIEDOCS API. pyshtool library is used for spherical harmonics treatments.

6 - Results

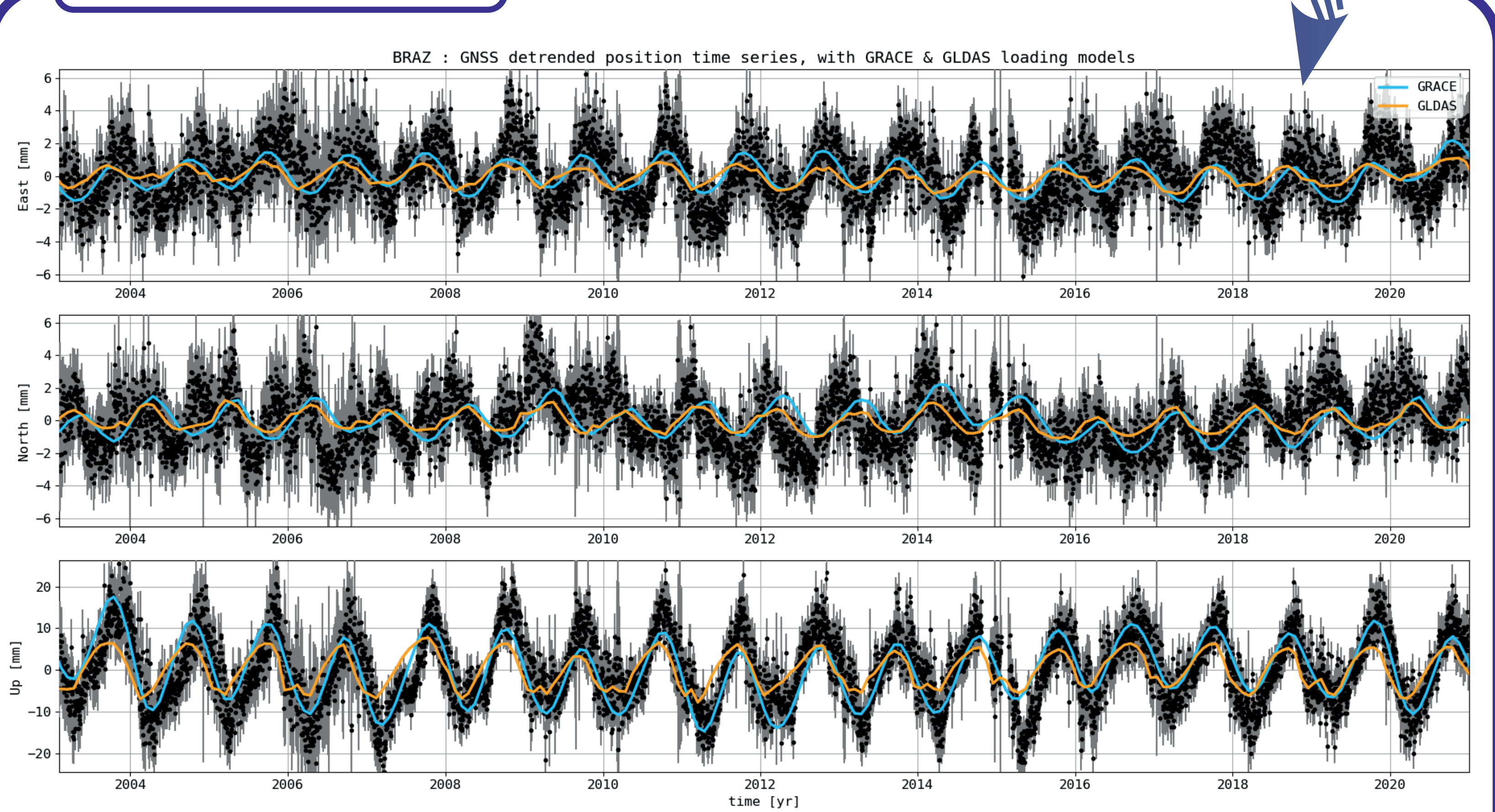


Figure 6 - BRAZ station : comparison between GNSS time series and two deformation models computed by ALIEDOCS service (GRACE (Gauer et al., 2022) and GLDAS (Beaudoing et al., 2020)). Our results are in agreement with previous published studies (Davis et al., 2004; Fu et al., 2013).

7 - What's next ?

Deployment of ALIEDOCS on Form@ter platform (summer 2023)

Research applications :

- Global comparison : GNSS repro3 IGS vs loading models
- Which model best explains GNSS observations ?
- Can station metadata (elevation, antenna type ...) help explain differences between GNSS observations and loading models ?

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