

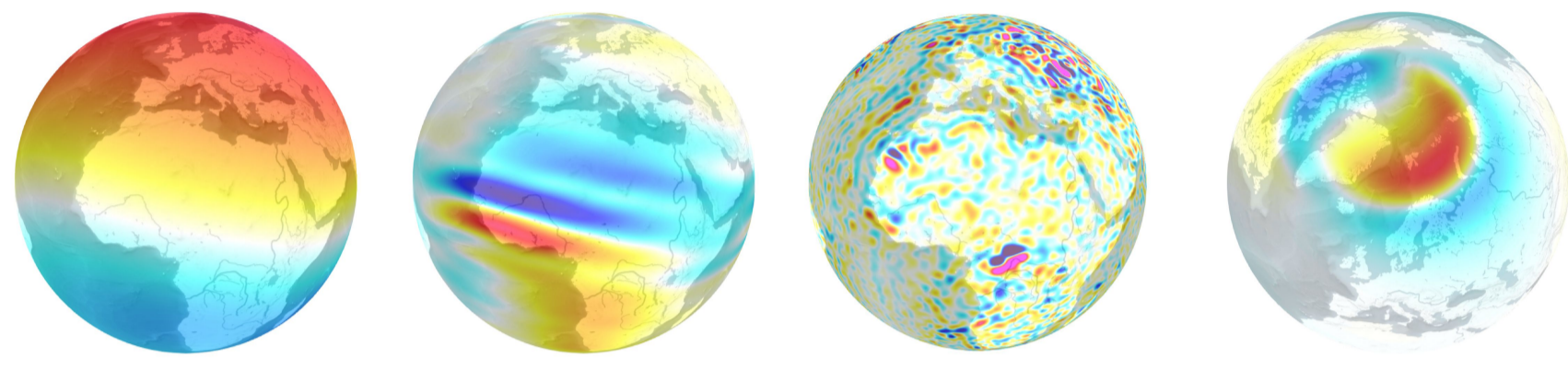
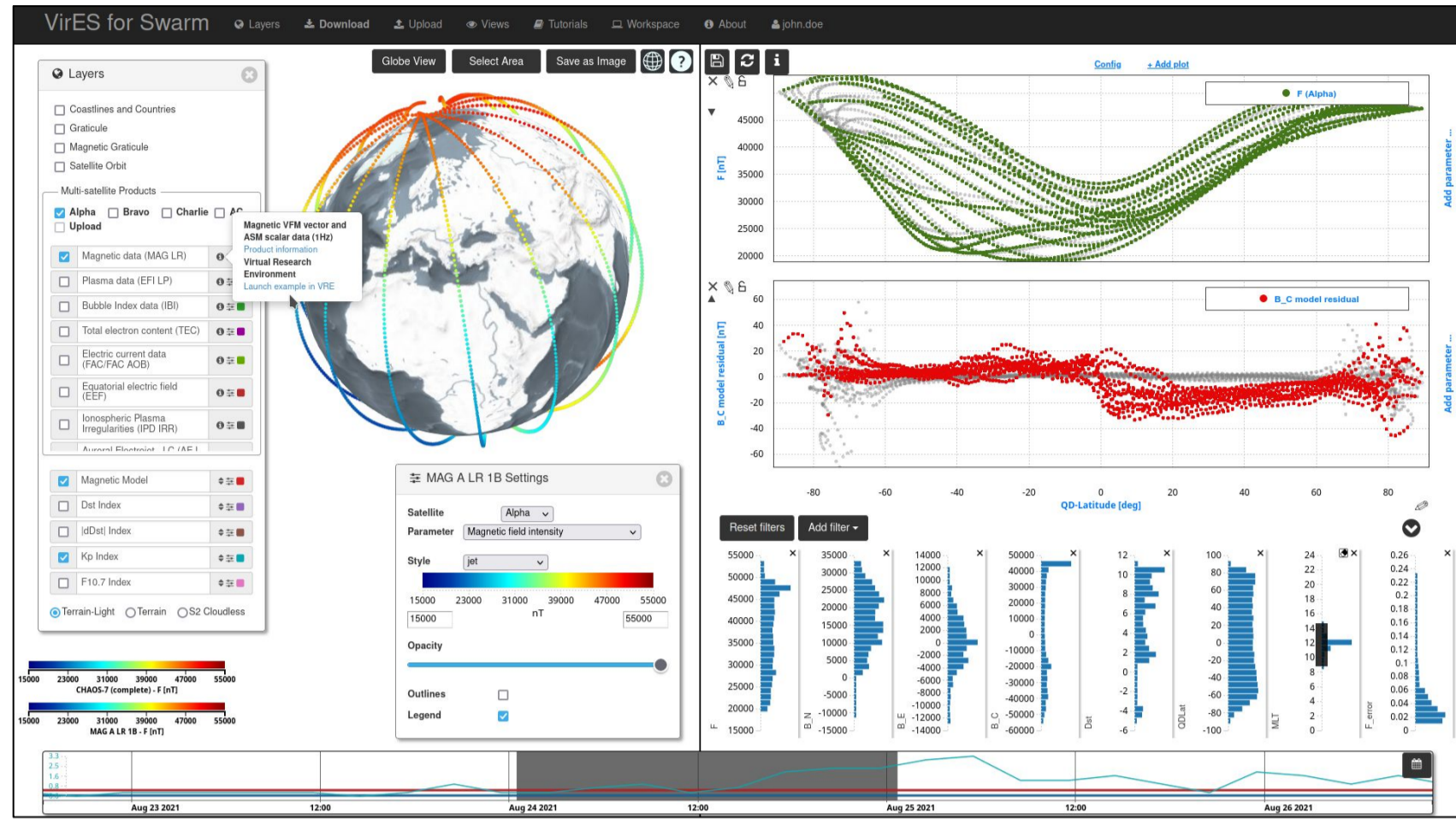
# Developing & disseminating data, software, and services to support the Swarm mission

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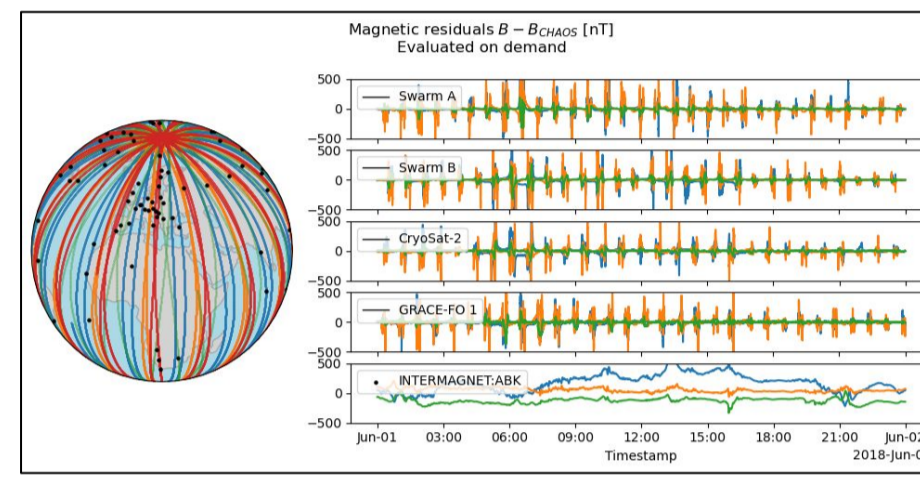
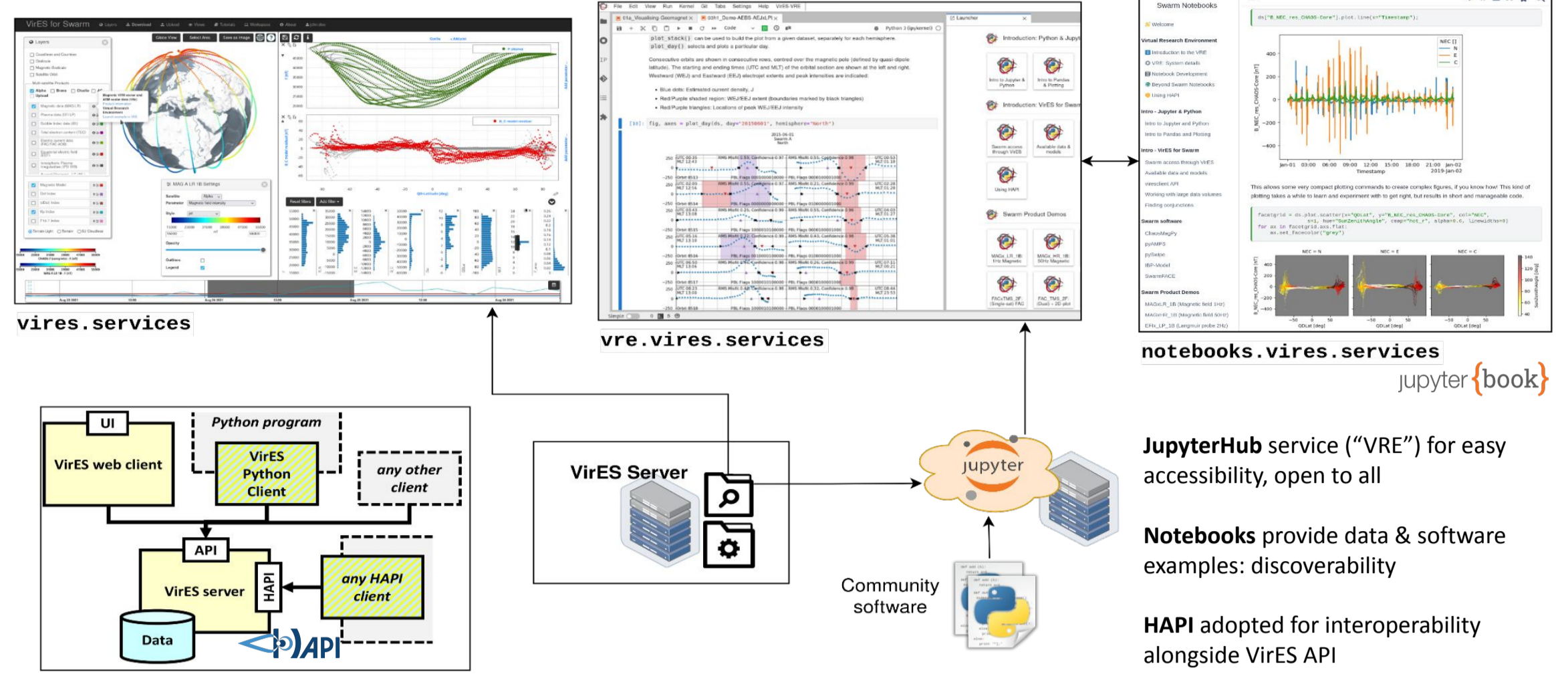


## VirES rationalises access to Swarm products

<https://vires.services>



VirES provides access to Swarm (and other) data, as well as models and other auxiliary information



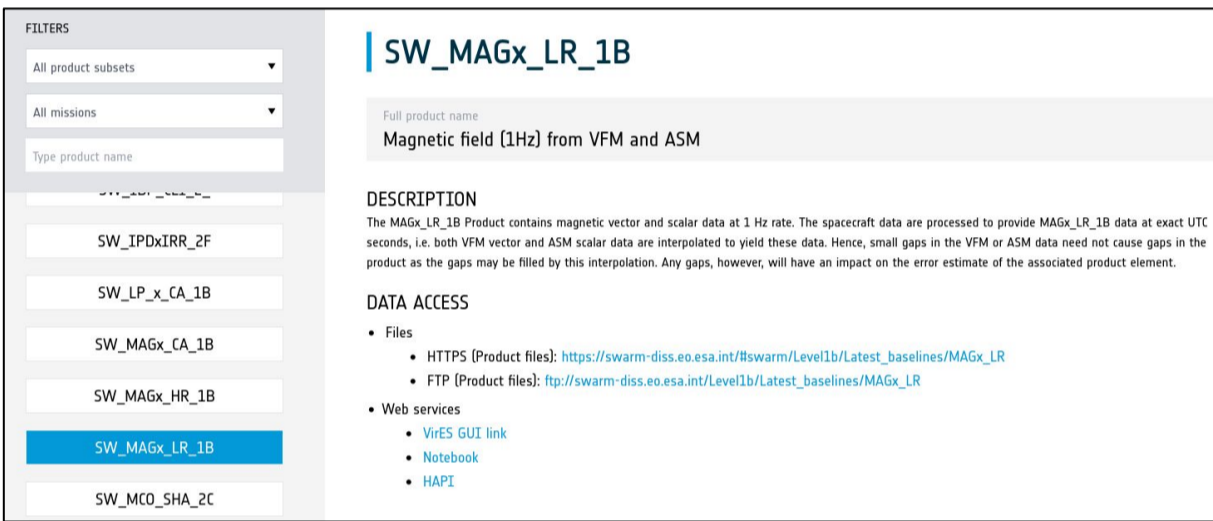
## The Swarm mission is broader than the Swarm spacecraft

VirES is a platform for using LEO & ground magnetometry, as well as other Swarm products (e.g. thermosphere)

VRE (JupyterHub) is actively used for teaching & quick looks; Notebooks are maintained in tandem with VRE as a cookbook

Providing different levels of accessibility improves utility (GUIs, Python/Notebook, API)

## swarmhandbook.earth.esa.int



## Product metadata

"Handbook" provides navigation of scientific metadata, and available access mechanisms

DOIs coming soon

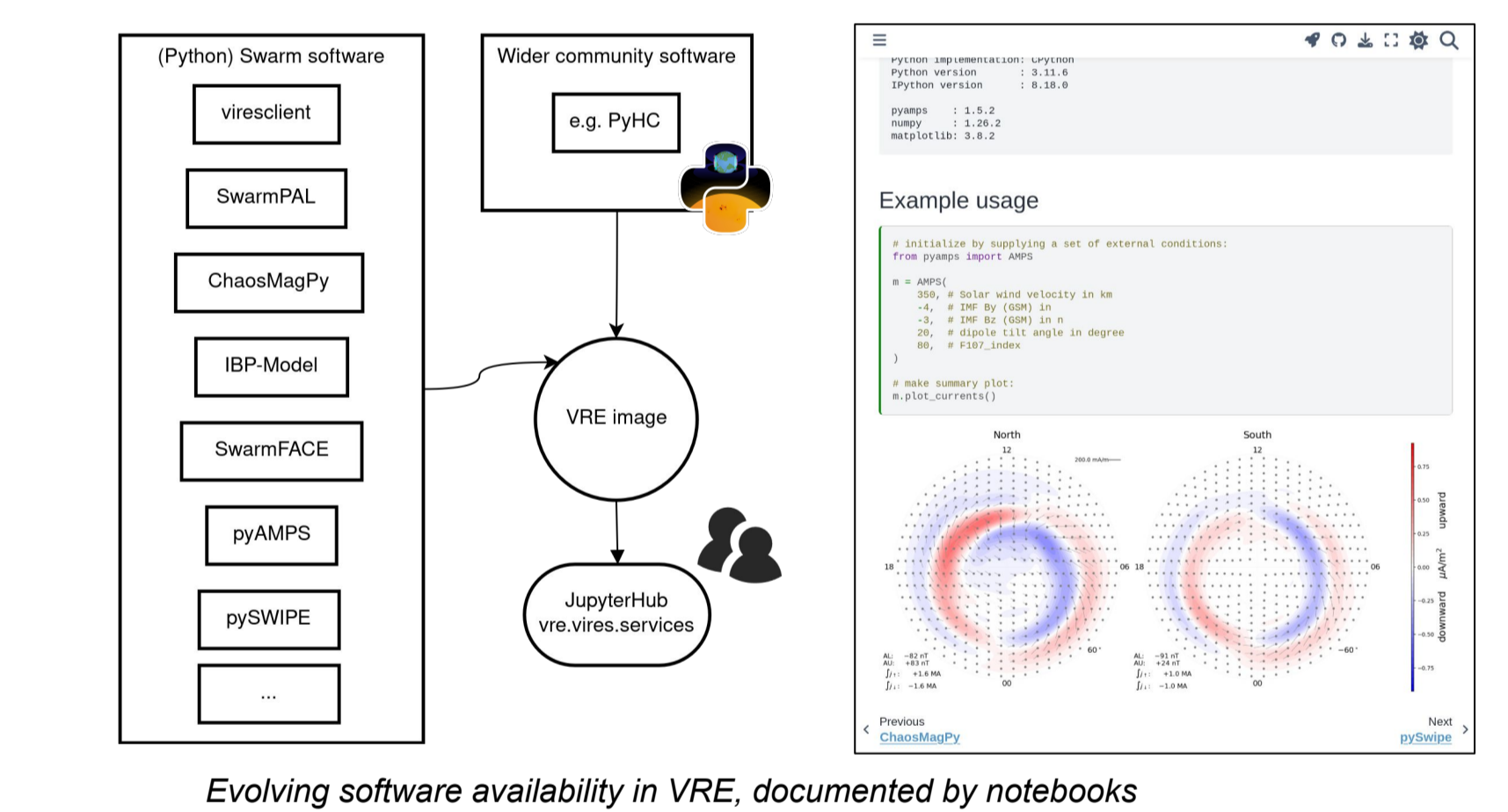
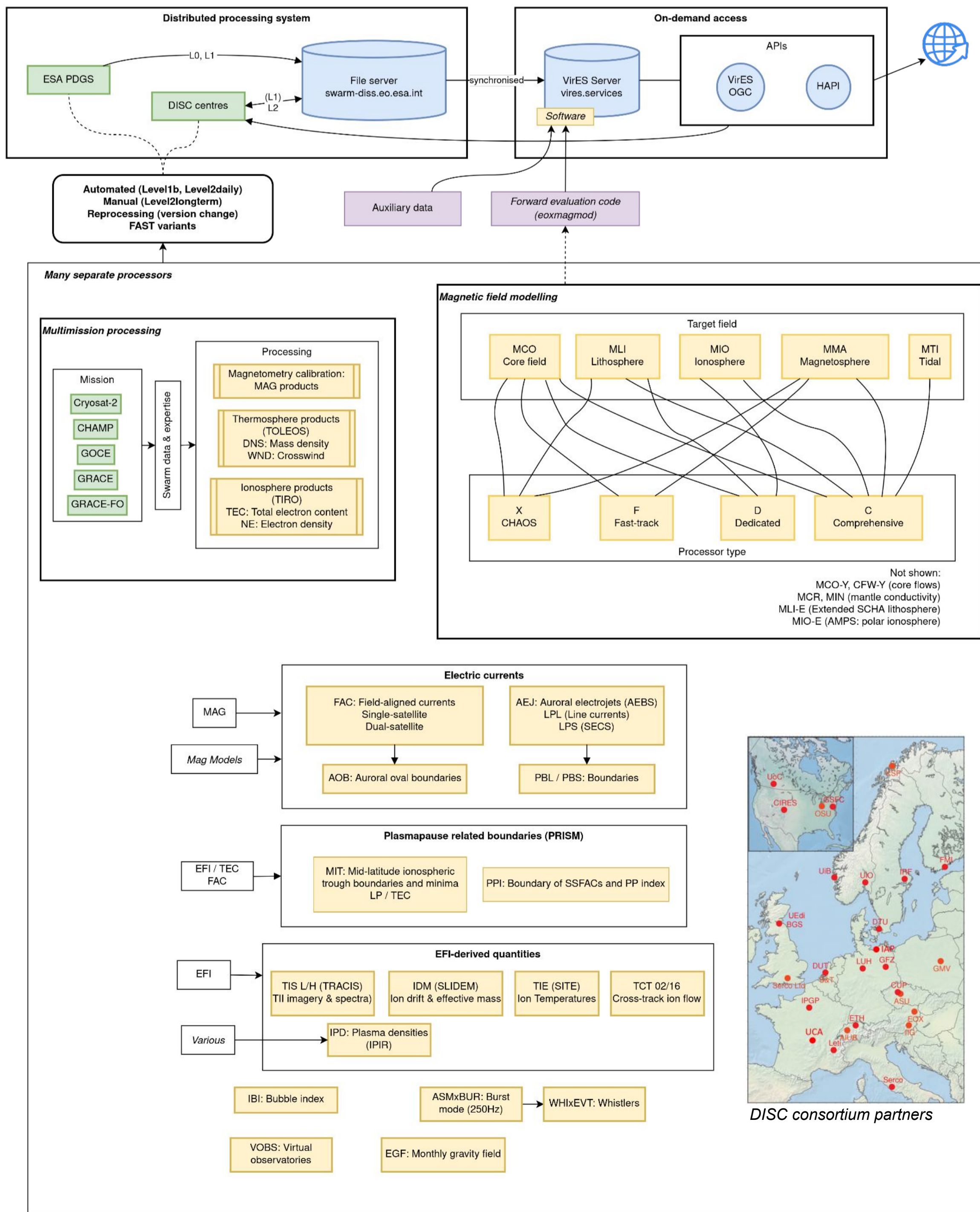
Possibility to create SPASE records?

## Community software development

DISC activities have recently shifted towards tools & services instead of only delivering products:

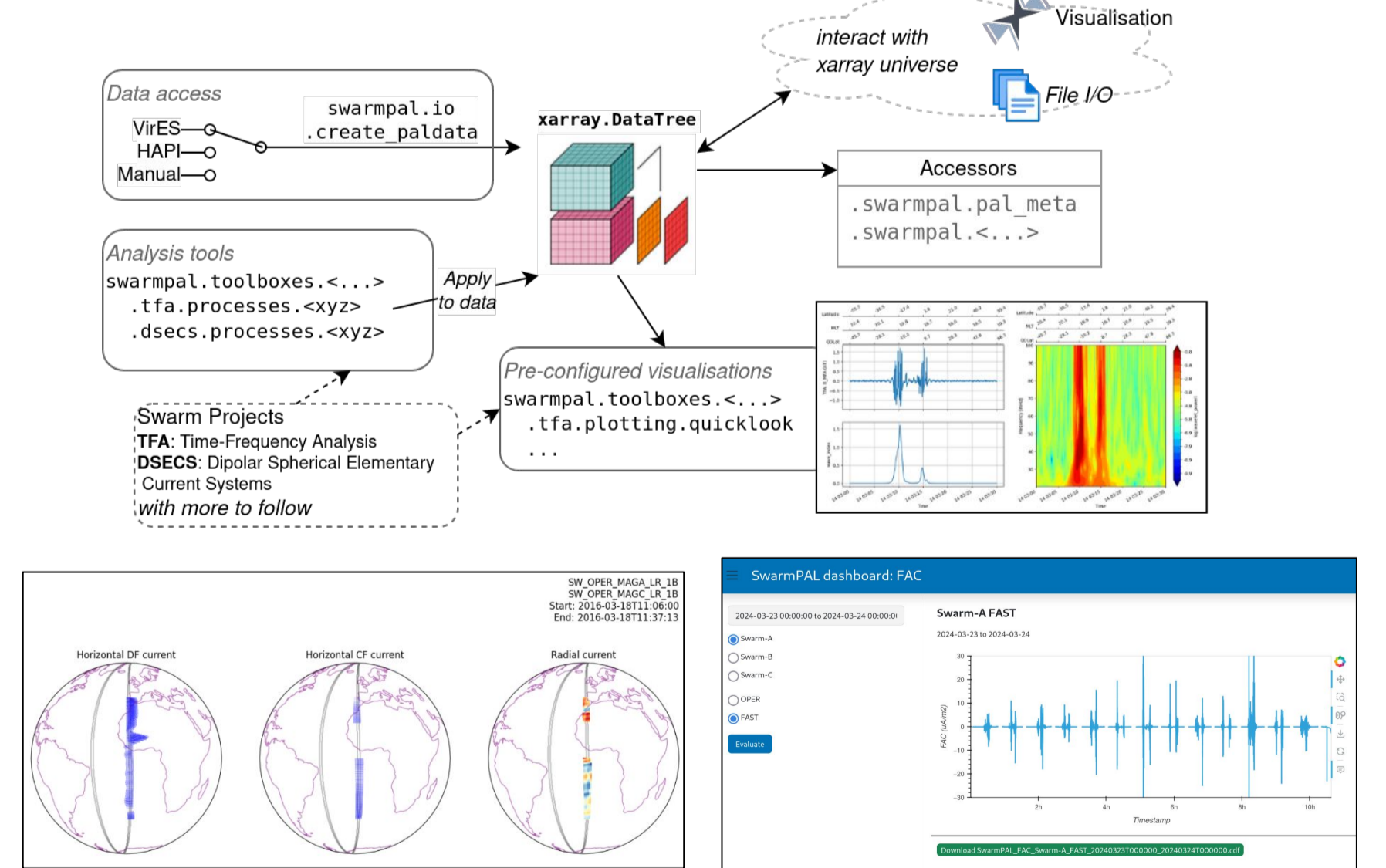
- more focus on on-demand / web-service access to data & models through VirES and elsewhere
- support to related services e.g. AuroraX, KNMI space weather timeline viewer
- development of Python-based tools for interactive use (augmenting VRE) - independent, or as part of SwarmPAL

## Swarm DISC (Data, Innovation, and Science Cluster) comprises many processing chains from different groups



## SwarmPAL

A Python package as a home for L2+ code (PAL: Product Algorithm Laboratory) Products "on-demand" together with analysis and visualisation tools Provides flexibility to apply to different datasets, in different ways



## Industry Team (EOX)

- Martin Pačes
- Daniel Santillan
- Christian Schiller
- Tyna Doležalová
- Anna Romanova

## Collaboration across ESA, industry, and academia

### Swarm DISC Team

- Klaus Nielsen
- Nils Olsen
- Poul Erik Holmdahl Olsen

### SwarmPAL Contributors

- Sebastian Käki
- Theresa Hoppe
- Heikki Vanhamäki
- Constantinos Papadimitriou
- Georgios Balas

### ESA Team

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- Luca Mariani
- Danilo Parente