

Web based Insight-HXMT data analysis platform

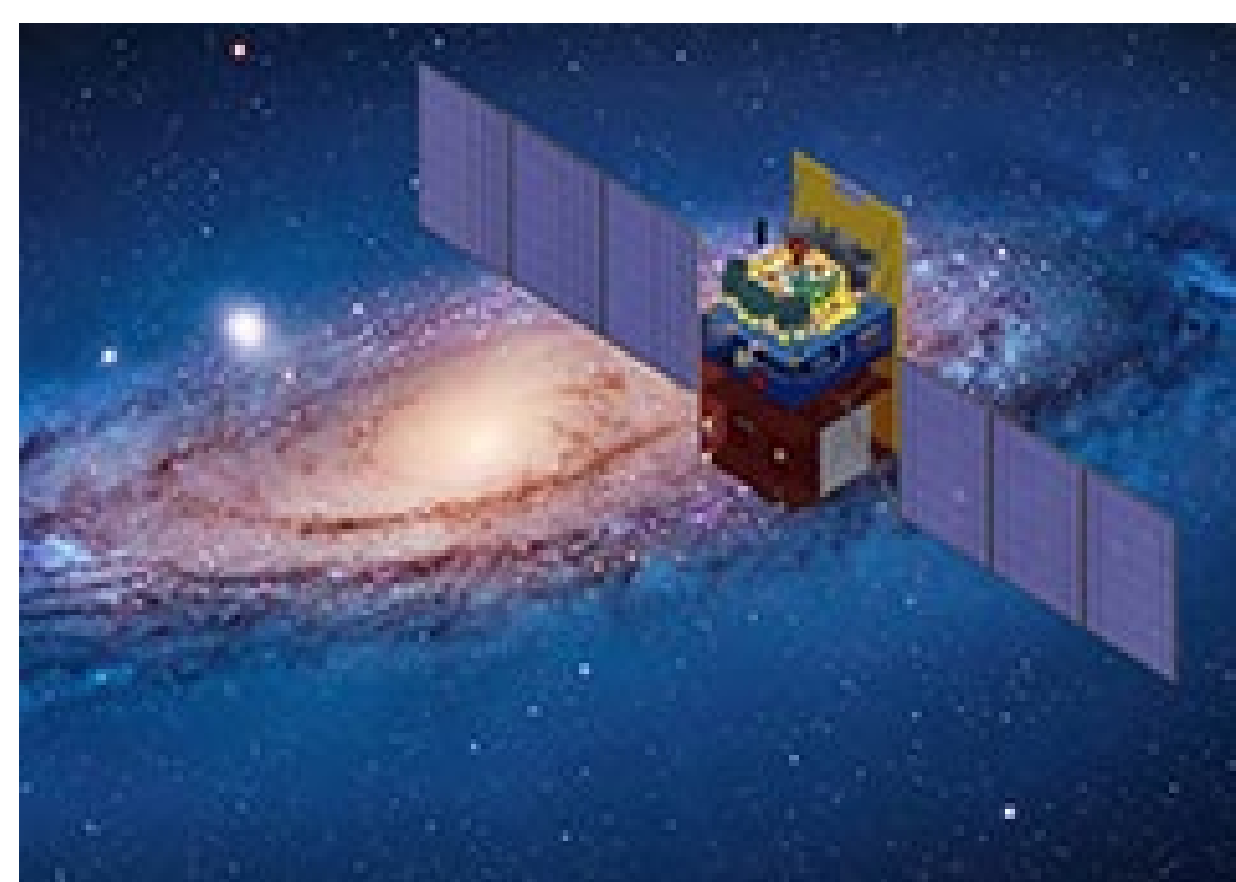
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Introduction

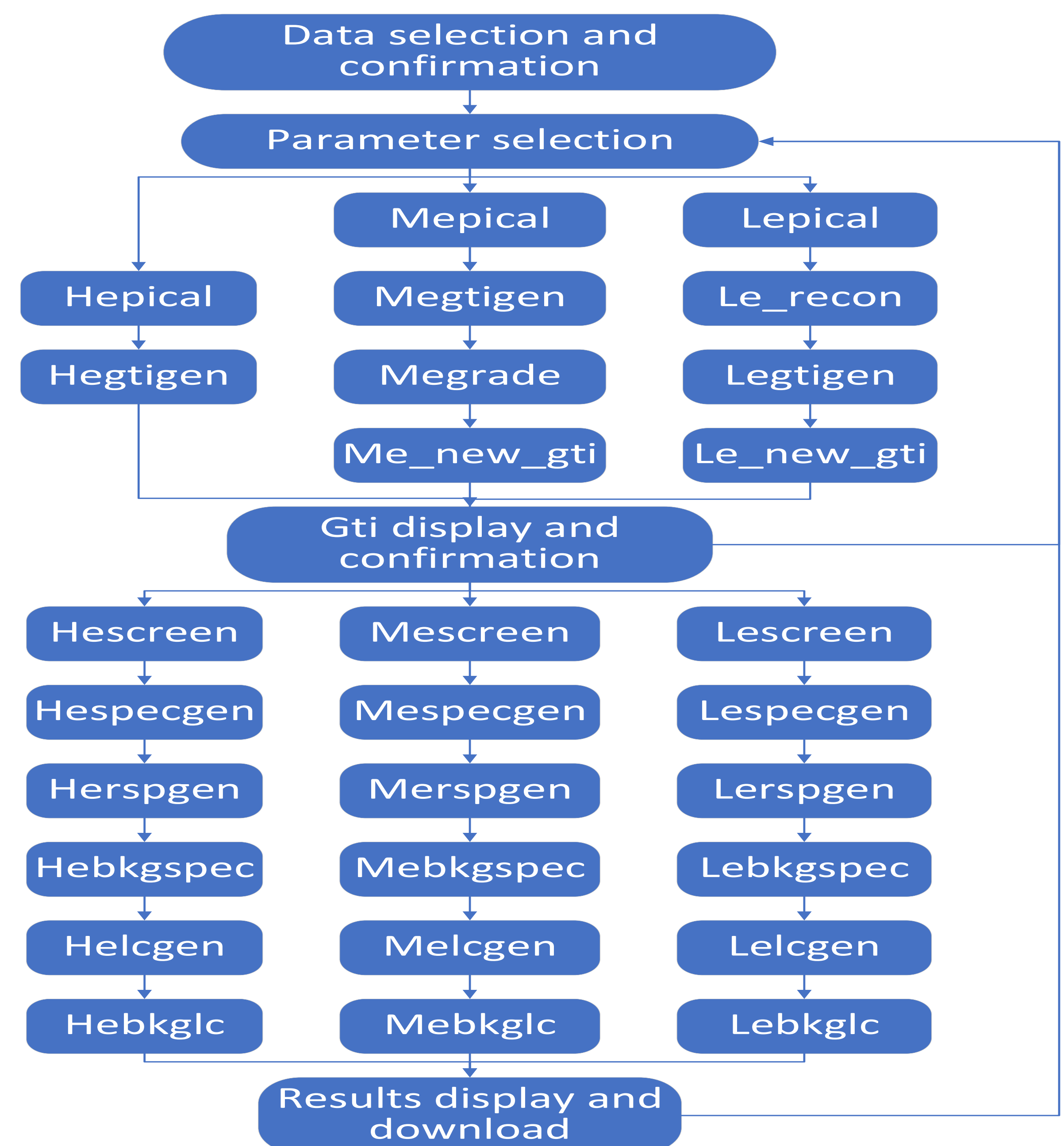
- **Web-based** interactive data analysis platform.
- **Authentication** by IHEPSSO (IHEP single sign on interface) and Jupyterhub.
- The computing environment of the application is encapsulated in the **container**. Application software managed by CVMFS.
- Kubernetes orchestrate the container to **scalable resources**.
- Integrates the Insight-HXMT Data Analysis Software package (HXMTDAS).
- Its **purpose** is to **achieve scientific products**: energy spectra, light curves, Ancillary Response Files, Redistribution Matrix Files and background files.

Insight-HXMT

- The Hard X-ray Modulation Telescope (HXMT), named "Insight", China's first X-ray astronomy satellite.
- Three main payloads: the high energy X-ray telescope, the medium energy X-ray telescope, and the low energy X-ray telescope.
- Main scientific objectives: 1. find new transient sources and monitor the known variable sources, 2. observe X-ray binaries, 3. monitor and study GRBs and GWEM

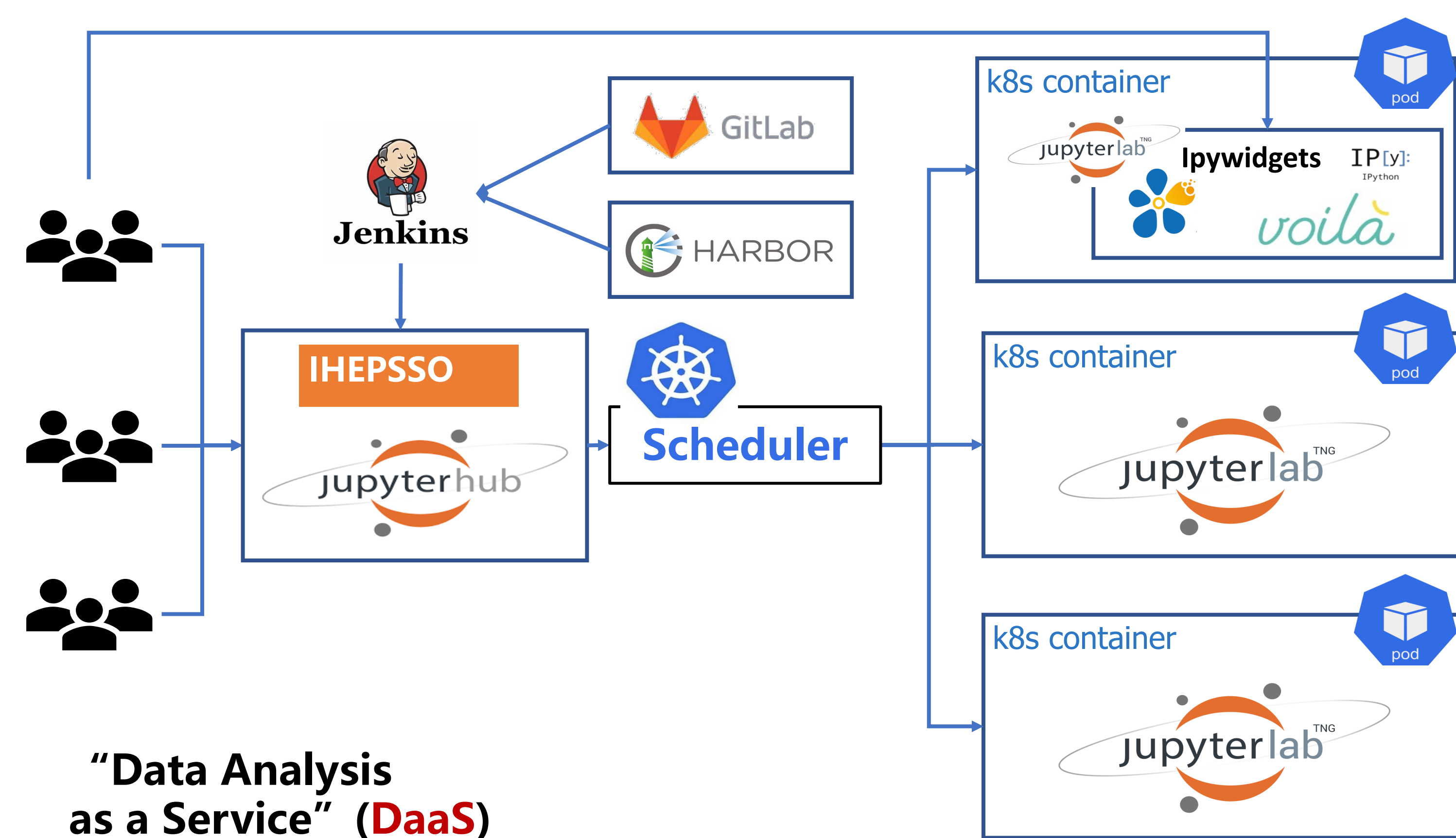


Analysis workflow



- **Step 1:** Search for data according to specific criteria using requests.
- **Step 2:** Set the parameters for data reduction.
- **Step 3:** Confirm Good Time Intervals and perform data reduction.
- **Step 4:** Show and download the results.

Method



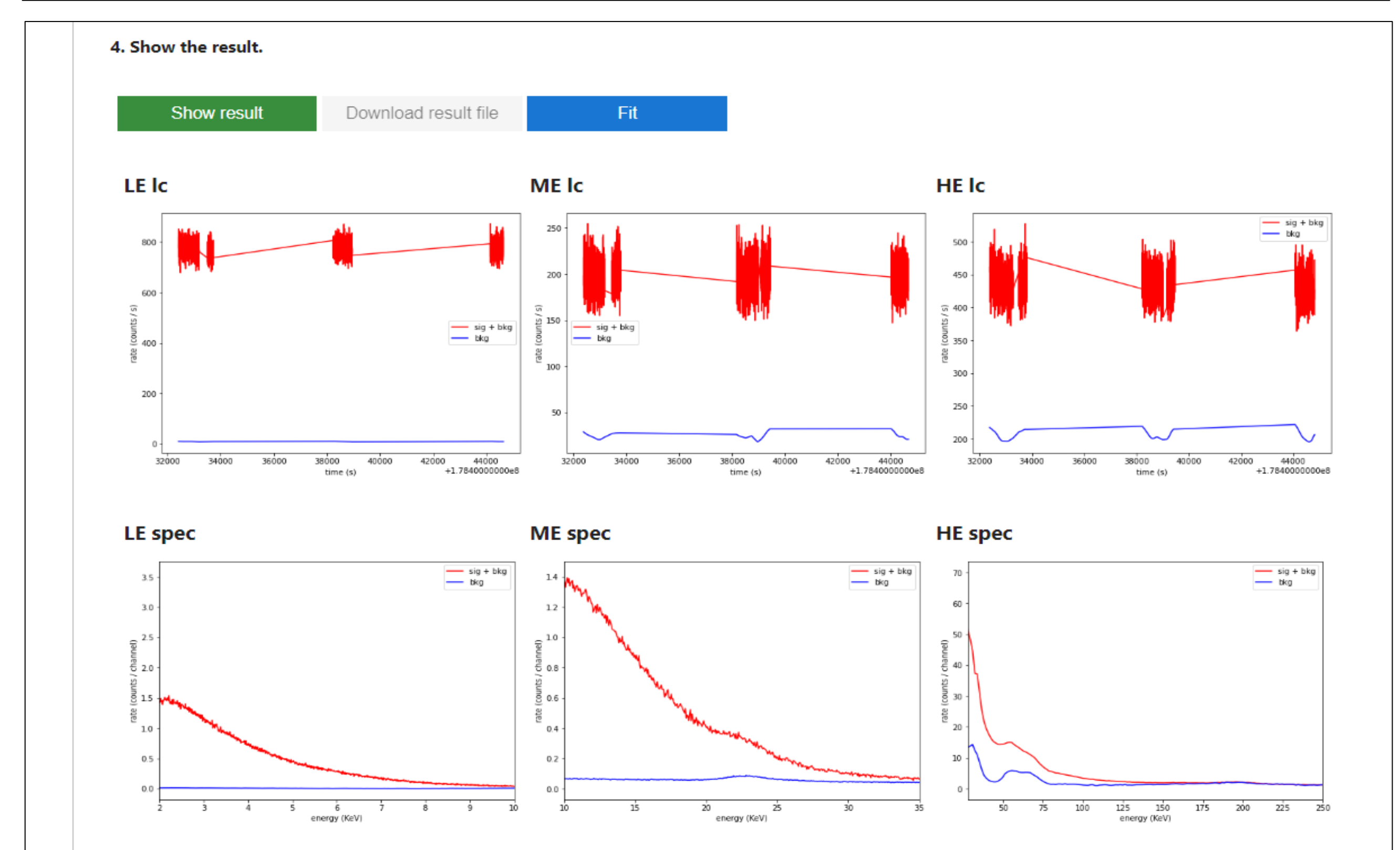
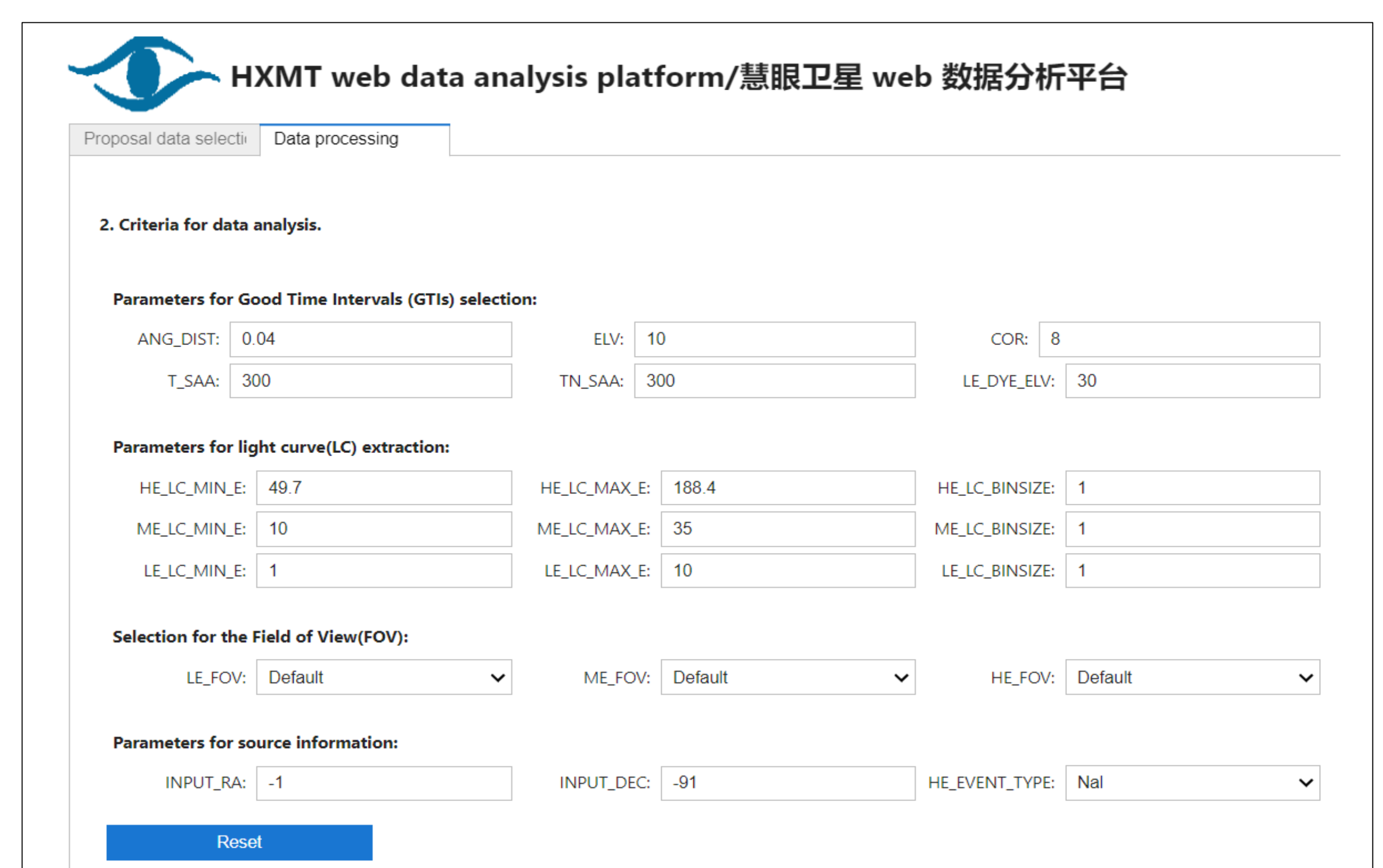
"Data Analysis as a Service" (DaaS)

Graphical User interface

- Based on **IPywidget**. Render by **Voila**. Each parameter is displayed as a **widget** set on a grid.
- Includes two panels: Data Search, Parameter Selection and Data Reduction. Simple power-law fitting is also supported.
- **MVC** architecture is introduced for handling data objects, analysis workflow and presentation.

Conclusion

- User-friendly web interface for data reduction.
- Local or remote use with JupyterHub.
- Computing resource are scalable.



Future development

- Use distributed and parallel processing when relevant.
- Support more fitting method.

