SOFIA Data Reduction Pipeline Status

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SOFIA
Stratospheric Observatory for Infrared Astronomy

NASA DLR USRA DSI

DPS Software

The DPS software team produces and maintains:

- data reduction pipelines for all facility class instruments
- infrastructure tools to facilitate automated data reduction, storage, and transfer to the IRSA archive
- data QA support tools for updating metadata, creating reports, and analyzing data products.

The team:

- 5 software engineers, 1 part-time systems engineer
- in coordination with the data systems science lead.

Facility Class Pipelines

- DPS supported instruments:
  FORCAST, FIFI-LS, FLITECAM, HAWC+, and EXES (in transition).

- Pipelines were originally developed in a variety of languages:
  IDL, Python, Java, C, and FORTRAN.

- For consistency, maintainability, interoperability, and modernization, we are working toward reimplementing them all in Python with standard scientific libraries in a single, integrated package.

Facility Class Pipelines: Status

- ☑ FORCAST: Fully reimplemented in Python.
- ☑ FIFI-LS: Fully reimplemented in Python.
- ❑ FLITECAM: First Python version complete; release expected in September 2021.
- ❑ HAWC+: One remaining component to reimplement; release expected before 2022.
- ❑ EXES: IDL pipeline received July 2021; reimplementation will commence in 2022.

Public Release

Python pipelines are now available to the SOFIA community as an open-source package, called SOFIA Redux.

This public release enables the user community to better understand SOFIA data reduction, customize their own reductions, and provide feedback to the pipeline team.

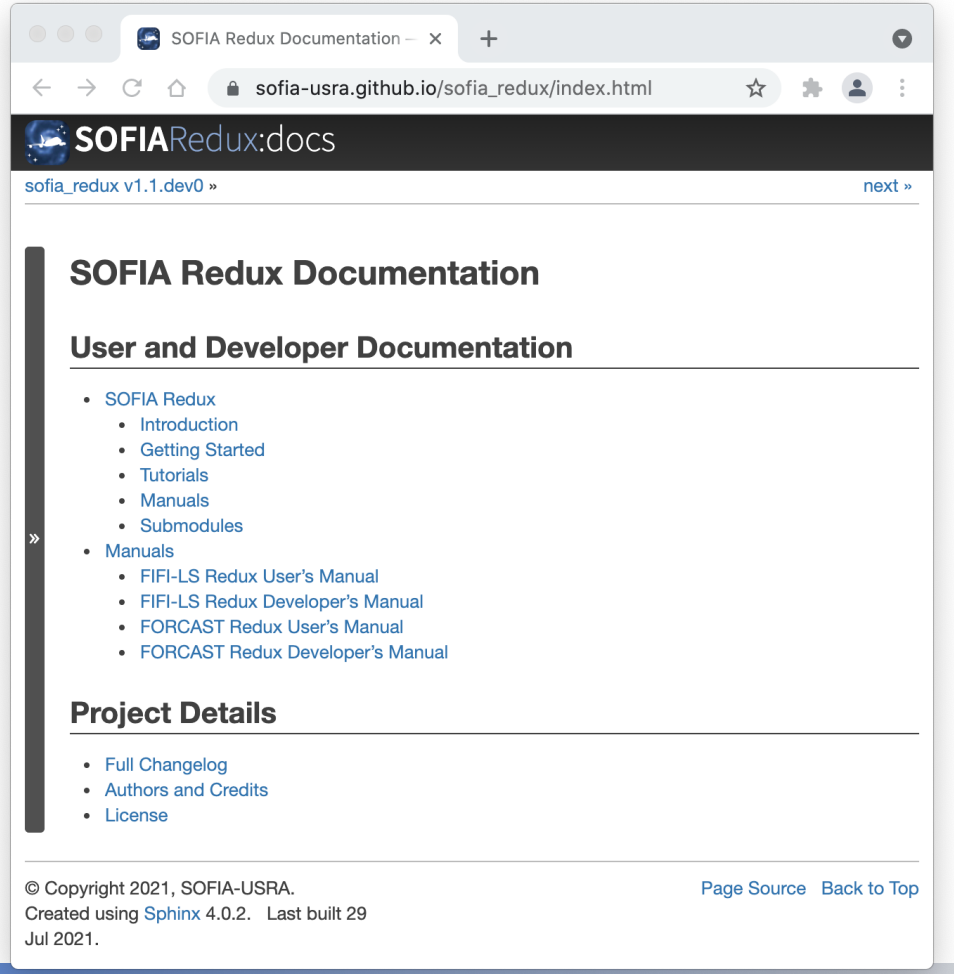
- First release: v1.0.0, July 15, 2021, including FORCAST and FIFI-LS support.
- Source code is available via the SOFIA-USRA GitHub repository .
- Installation via standard Python distribution tools is available:

```
pip install sofia_redux
```

Public Release: Features

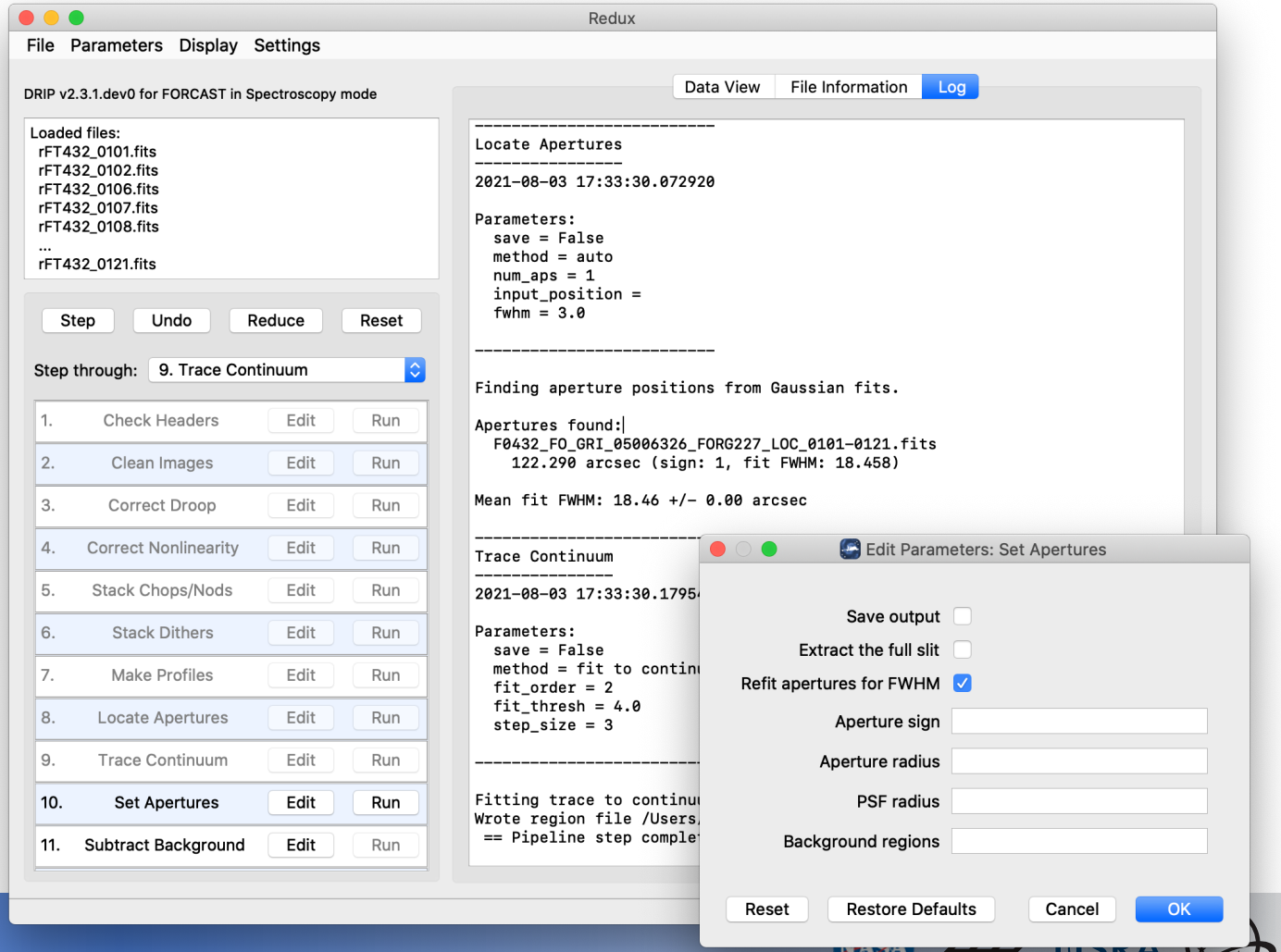
- Extensive software documentation is available online, including user manuals for every pipeline.

- Tutorials for introductory pipeline usage with sample data sets are also available, via the SOFIA website.



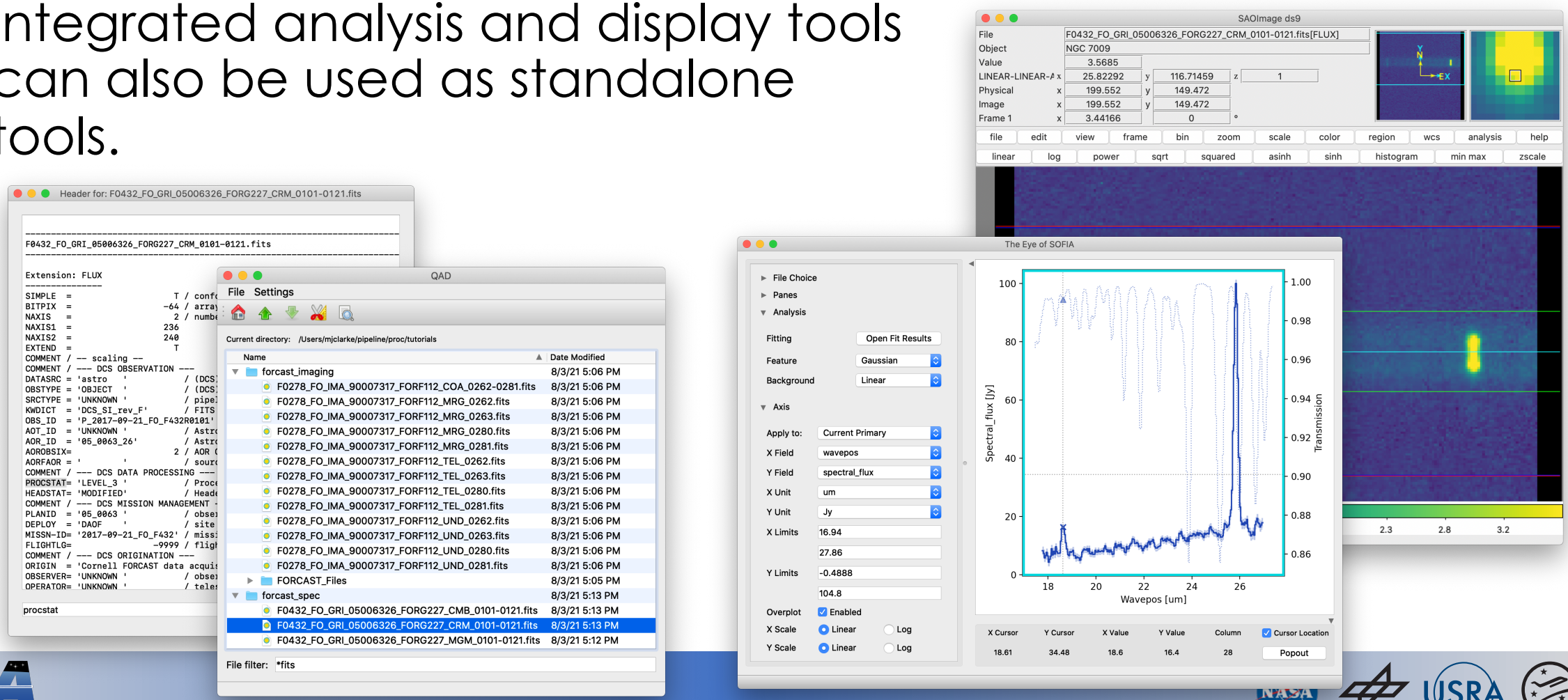
Public Release: Features

- Full-featured interactive pipeline interface.
- Batch-mode interface also available.



Public Release: Features

- Integrated analysis and display tools can also be used as standalone tools.



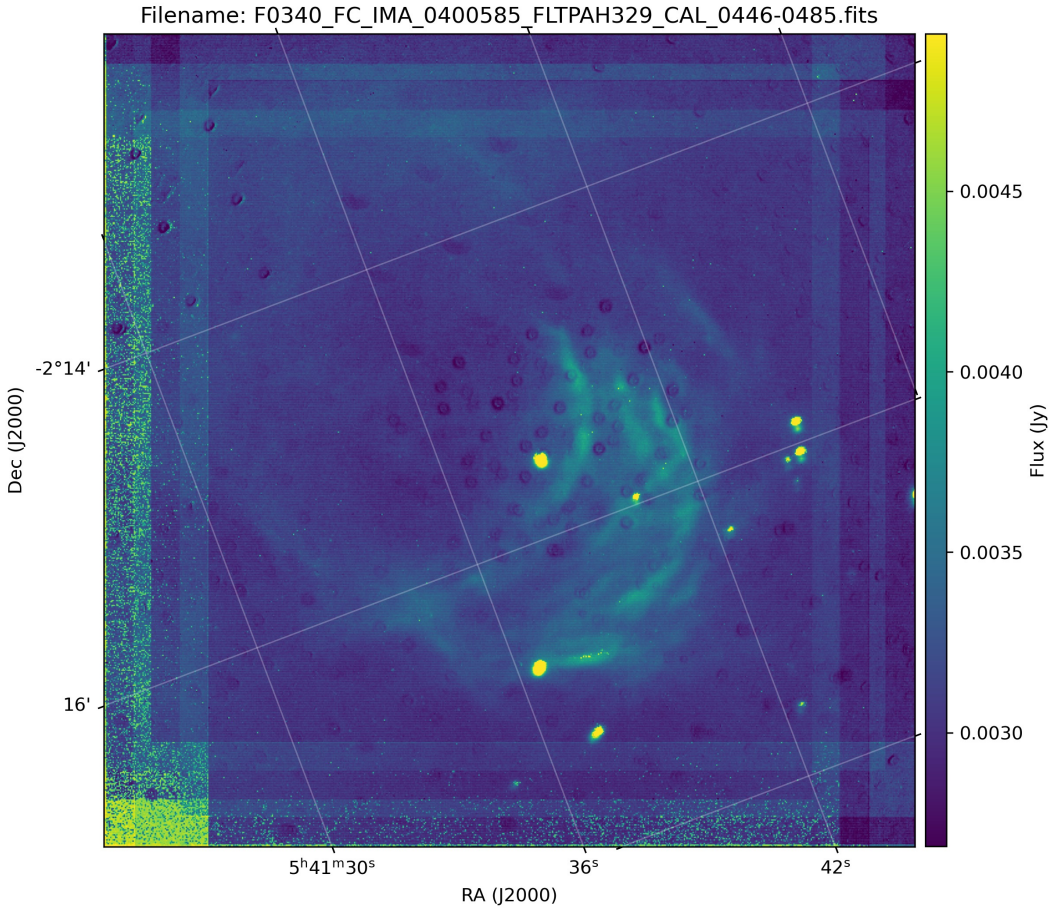
Public Release: Coming Soon

The FLITECAM pipeline will be released publicly immediately following internal release of the Python version.

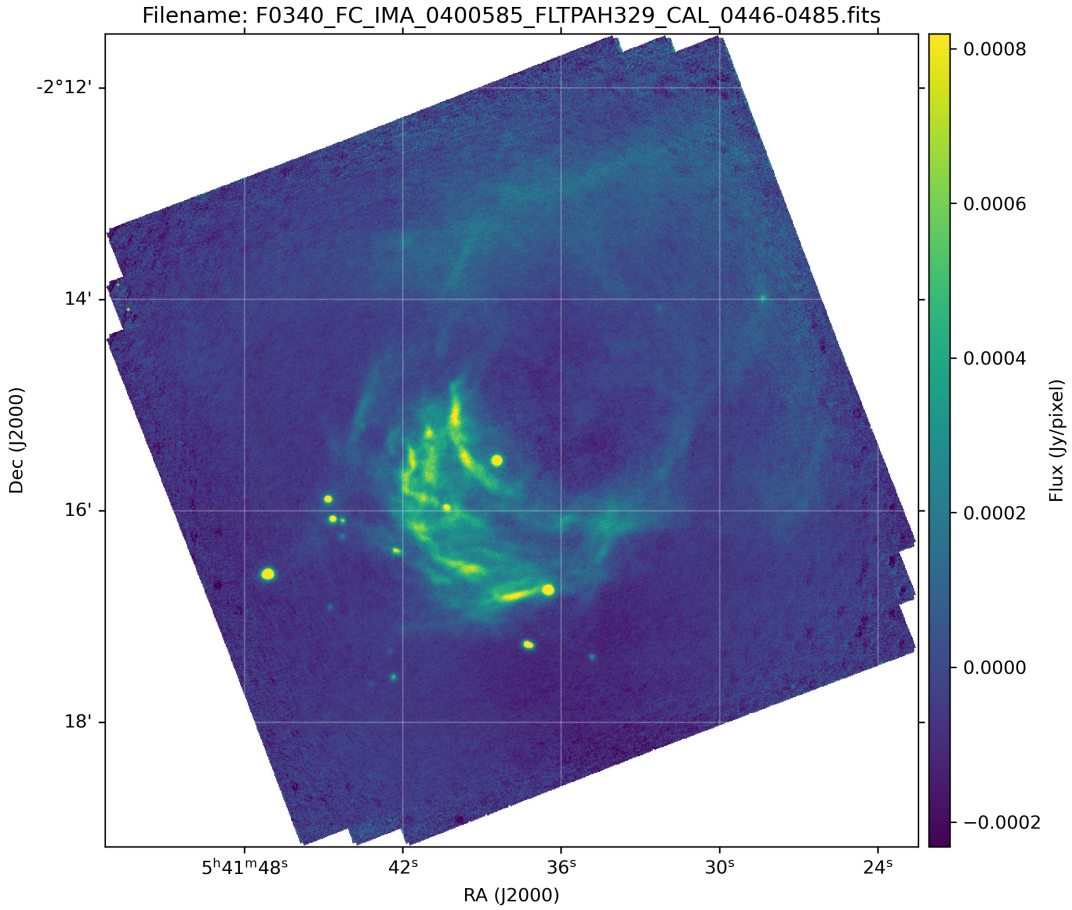
- New FLITECAM data products are more consistent with FORCAST, easier to understand.

- New pipeline algorithms implement several improvements, particularly for imaging products.

Public Release: Coming Soon



IDL: FLITECAM Redux v1.2.0



Python: FLITECAM Redux v2.0.0dev0

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Public Release: Feedback

Questions? Feedback? Contributions?

- File a ticket on the GitHub project:
  https://github.com/SOFIA-USRA/sofia_redux

- Send a message to the SOFIA helpdesk:
  sofia_help@sofia.usra.edu