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# **GSP Live User Manual**

***Release 0.1***

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**Mar 25, 2021**



## USER MANUAL:

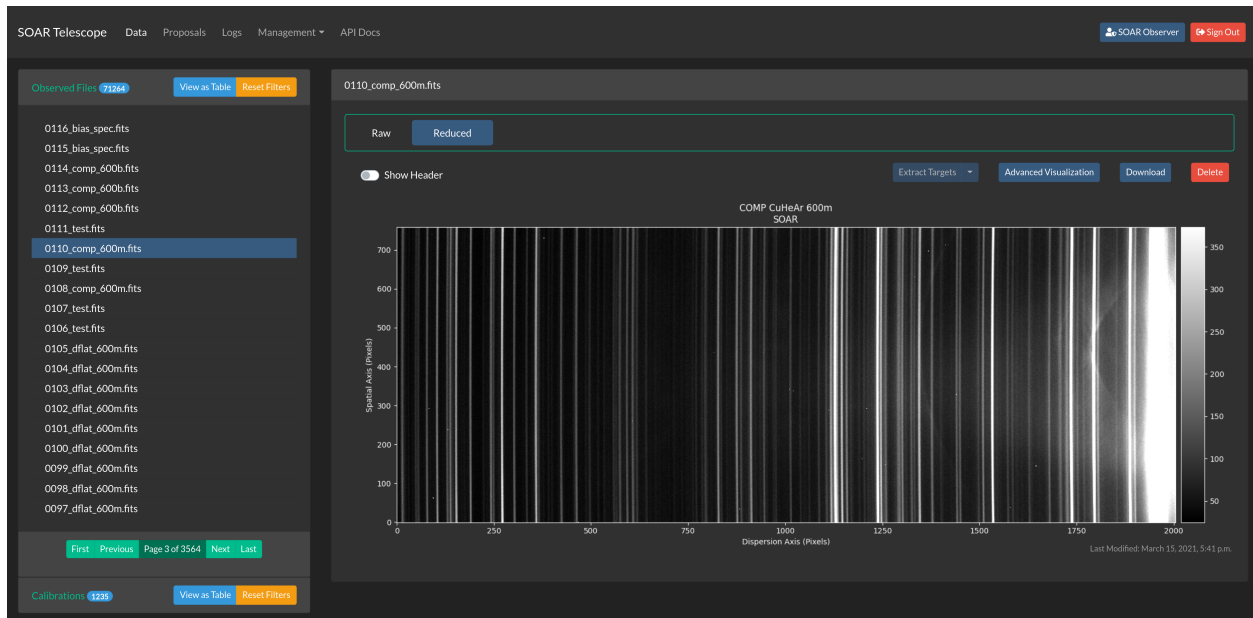
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The Goodman Spectroscopic Pipeline Live is a web implementation of the [Goodman Spectroscopic Pipeline](#) package. In summary the reduction process has been broken in several parts that might include more than one step of the full process. Each of these parts has a correspondent web API end point.

All this is nicely presented to the user as a web page where the user can visualize fully reduced spectra just seconds after it was obtained. Also the user has the option of manually triggering certain process blocks.

**Note:** The user get access permission by proposal association. We ask our users not to share their credentials. We make it very easy for PIs to add new collaborators.





## OVERVIEW

We use Django and Django Rest Framework for build our backend API.

The *goodman-pipeline* package processes are very *granulated* as it should be. But for a web application such as ours we found out that the best option was to group many of the processes in blocks as described below. But in an observing run there are many types of files. We have *calibration* and *science* files.

### 1.1 File Types

**Calibration files:** Calibration files are `BIAS` and `FLAT` files. They need to be combined into *master BIAS* and *master FLATs*. Each proposal has also associated a dedicated *data reduction settings* and there can be defined, among other things, what are the minimum number of calibration files required to trigger a combination of a *master BIAS* or *FLAT*.

**Science files:** Science files are `EXPOSE SPECTRUM` and `ARC` though one can argue that `ARC` are calibration files, in a general sense they are treated as science files in this case.

### 1.2 Process Blocks

**Reduce** Identifies suitable master flats and master bias and applies the *basic* data reduction process. For spectroscopic data it also trims the non-illuminated areas which produce artifacts. In general the process looks like this:

An `EXPOSE` files, which is the type given to *imaging data* can have the following process.

**Image Trim Bias Subtract Flatfielding Cosmic Ray Removal**

An `SPECTRUM` file will have the following:

**Image Trim Slit Trim Bias Subtract Flatfielding Cosmic Ray Removal**

**Extract** Identifies targets in a `SPECTRUM` file and finds a suitable and compatible `ARC` lamps and performs fractional pixel extractions.

**Identify Trace Extract**

**Wavelength Calibration** Using the extracted lamps it performs the wavelength calibration process using a template lamp from a library and series of cross correlations, then fits a mathematical model, resamples the spectrum to a linear dispersion axis and saves the file.

**Flux Calibration** This is not implemented yet but it will.

**Astrometric Solution** This functionality is under development.





## GETTING ACCESS

**Warning:** We allow everyone to have an account. Please don't share your credentials with anyone.

Any astronomer with an observing proposal can have access. Principal Investigators (PIs) can also create users to be added as collaborators to their respective proposals.

The server is protected under a VPN connection that you can get from your Instrument Scientist or by any trusted contact you have at SOAR Telescope.

At the beginning of the semester all PIs are registered with their respective proposals. And they will receive an email that contains a link to set a safe password. Our backend does not allow simple or too common password. In fact you will get the following messages.

- Your password can't be too similar to your other personal information.
- Your password must contain at least 8 characters.
- Your password can't be a commonly used password.
- Your password can't be entirely numeric.

## Password change

Please enter your old password, for security's sake, and then enter your new password twice so we can verify you typed it in correctly.

Old password:

- Your password can't be too similar to your other personal information.
- Your password must contain at least 8 characters.
- Your password can't be a commonly used password.
- Your password can't be entirely numeric.

New password:

New password confirmation:

Change my password

## DATA VISUALIZATION

One of the greatest benefits from having a web user interface (UI) is the great flexibility it provides without having to install any special software and the data is downloaded through channels we use in our everyday life.

### 3.1 Understanding the UI

We will go into details later but for now this is what you see most of the time. It is meant to be simple to understand but we will go into explaining every part.

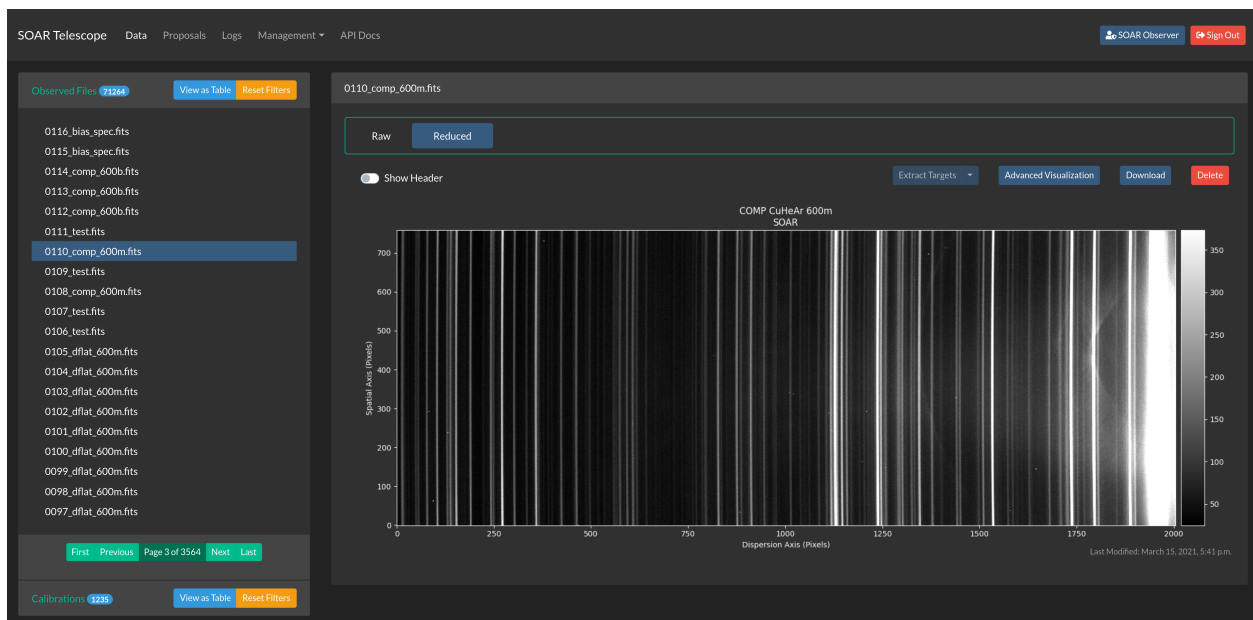


Fig. 1: Data detailed view.

For a detailed exploration we will divide the view in several subsections, for their global position please consider the following image.

SOAR Telescope Data Proposals Logs Management API Docs SOAR Observer Sign Out

Table View  
Showing 100 of 101752 results

File Name	Proposal ID	Obstype	Wavemode	Filter	Filter 2	Grating	Slit	ROI	Date	Type
norm_master_flat_IMAGING_VR.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Calibration
master_flat_IMAGING_VR.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Calibration
0120_GHTS_R_Img-VR_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0119_GHTS_R_Img-VR_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0118_GHTS_R_Img-VR_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0117_GHTS_R_Img-VR_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0116_GHTS_R_Img-VR_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0115_GHTS_R_Img-VR_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0114_GHTS_R_Img-VR_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0113_GHTS_R_Img-VR_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0112_GHTS_R_Img-VR_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0111_GHTS_R_Img-VR_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0110_GHTS_R_Img-VR_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0109_GHTS_R_Img-VR_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0108_GHTS_R_Img-VR_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0107_GHTS_R_Img-VR_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0106_GHTS_R_Img-VR_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	VR	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
norm_master_flat_IMAGING_I-SDSS.fits	calibrate	LAMPFLAT	IMAGING	I-SDSS	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Calibration
master_flat_IMAGING_I-SDSS.fits	calibrate	LAMPFLAT	IMAGING	I-SDSS	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Calibration
0105_GHTS_R_Img-I_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	I-SDSS	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0104_GHTS_R_Img-I_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	I-SDSS	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw
0103_GHTS_R_Img-I_2x2_23-03-2021.fits	calibrate	LAMPFLAT	IMAGING	I-SDSS	NO_FILTER	NO_GRATING	NO_MASK	Imaging 2x2	March 23, 2021	Raw

Filters

Actions

☐ Hide Raw Calibrations

Reset All Filters

By Proposal\_id

All

calibrate

SOAR2020B-008

SOAR2019B-003

SOAR2020A-004

TOM2020A-003

SOAR2021A-002

SOAR2019B-005

TOM2020A-005

SOAR2019B-002

SOAR2021A-000

SOAR2020A-002

SOAR2021A-001

SOAR2020B-003

SOAR2019B-008

TOM2020A-002

SOAR2020B-001

SOAR

SOAR2021A-004

Fig. 2: Table view, better for filtering data.

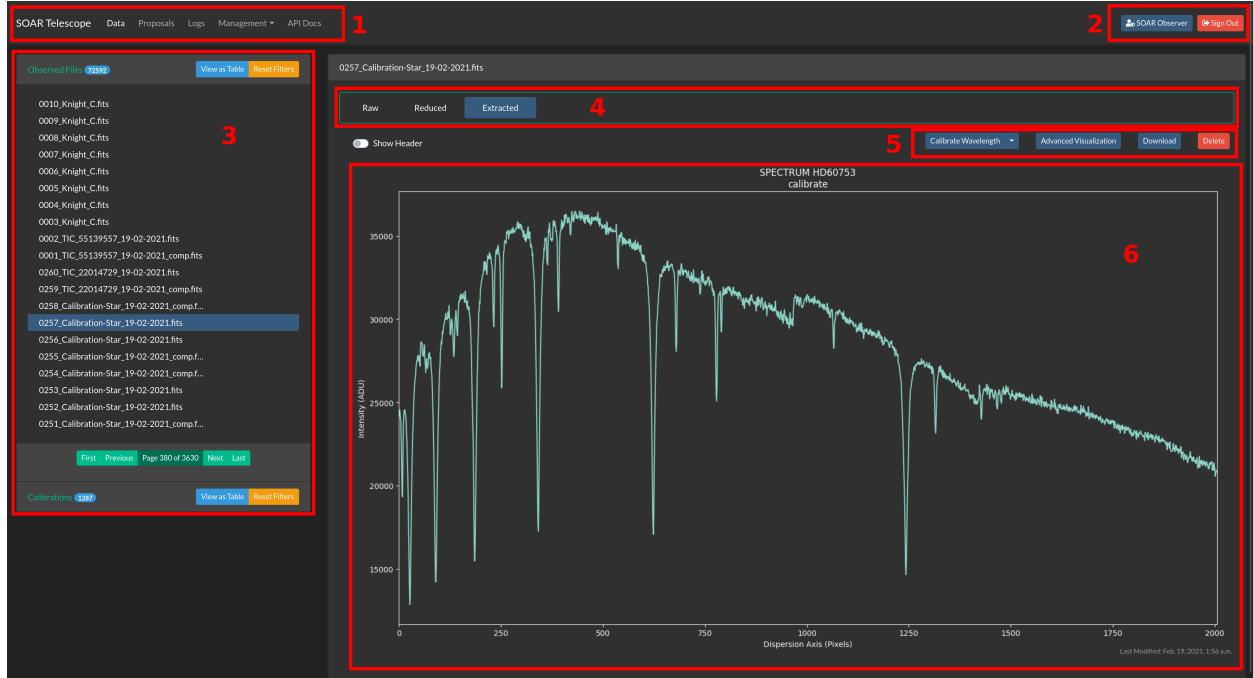
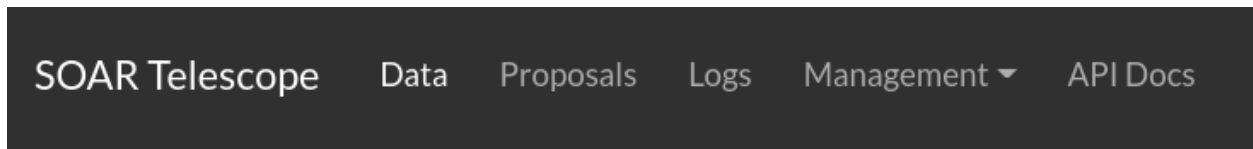


Fig. 3: Detail: 1. Main navigation bar. 2. Access to user controls and information. 3. Quick access to files. 4. Related or child files. 5. Contextual actions 6. Visualization area.

### 3.1.1 Main Navigation Bar



An always present navigation bar allows you to access:

**Data Visualization** The view where you can visualize data as it arrives as well as trigger actions.

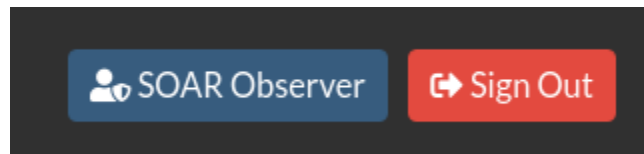
**Proposals** Where you can see the proposals details, such as *Title*, *Abstract*, *Principal Investigator* and *Collaborators*. Also you can add or delete collaborators and edit the *Data Reduction Settings*.

**Logs** Important log messages, not very detailed but the most relevant.

**Management Menu** This is for staff users only and will be explained in the staff chapter.

**API Docs** Contains the documentation of the Public API in case you want to develop your own tools.

### 3.1.2 User Controls



By clicking the blue button you get access to some user details and settings. Also you can change some preferences.

### 3.1.3 File Index

This area allows you to navigate the files, they are ordered from newest to oldest, if you want to filter the data you should go to table mode by clicking **View as Table**.

In this area you can also see only combined calibration files such as, master BIAS and master FLAT, those are visible to everyone.

### 3.1.4 Related Files

All files are indexed by its raw parent file. Every file that was derived from that parent it is treated as child and are listed along this section. The buttons are tab handles.


### 3.1.5 Contextual Actions

This area is where you can trigger actions.


**Show Header** Will make the header visible in a searchable table.

**Calibrate Wavelength** It's an action that changes according the type of file that is no display. For instance for a raw file will be **Reduce Raw File**. The drop down menu will take you to another view where you can select which comparison lamp you want to use for target extraction or wavelength calibration.


User Information

 Username


observer

 Name


SOAR Observer

 E-Mail

goodman-pipeline@ctio.noao.edu

 Partner

OTHER

 API Token

eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJ1eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9

Change Password

Visual Options

Theme\*

Dark

Color map\*

Gray

Format\*

Static

☒ Show Saturated

**Observed Files** 72592 [View as Table](#) [Reset Filters](#)

0010\_Knight\_C.fits

0009\_Knight\_C.fits

0008\_Knight\_C.fits

0007\_Knight\_C.fits

0006\_Knight\_C.fits

0005\_Knight\_C.fits

0004\_Knight\_C.fits

0003\_Knight\_C.fits

0002\_TIC\_55139557\_19-02-2021.fits

0001\_TIC\_55139557\_19-02-2021\_comp.fits

0260\_TIC\_22014729\_19-02-2021.fits

0259\_TIC\_22014729\_19-02-2021\_comp.fits

0258\_Calibration-Star\_19-02-2021\_comp.f...

0257\_Calibration-Star\_19-02-2021.fits

0256\_Calibration-Star\_19-02-2021.fits

0255\_Calibration-Star\_19-02-2021\_comp.f...

0254\_Calibration-Star\_19-02-2021\_comp.f...

0253\_Calibration-Star\_19-02-2021.fits

0252\_Calibration-Star\_19-02-2021.fits

0251\_Calibration-Star\_19-02-2021\_comp.f...

First

Previous

Page 380 of 3630

Next

Last

**Calibrations** 1287 [View as Table](#) [Reset Filters](#)

Raw

Reduced

Extracted

☐ Show Header

Calibrate Wavelength ▾

Advanced Visualization

Download

Delete

**Advanced Visualization** Takes you to another view where you can adjust the sampling limits for images. Or change the color map.

**Download** For download the FITS file.

**Delete** Only possible for processed files. Raw files can't be deleted.

### 3.1.6 Visualization Area

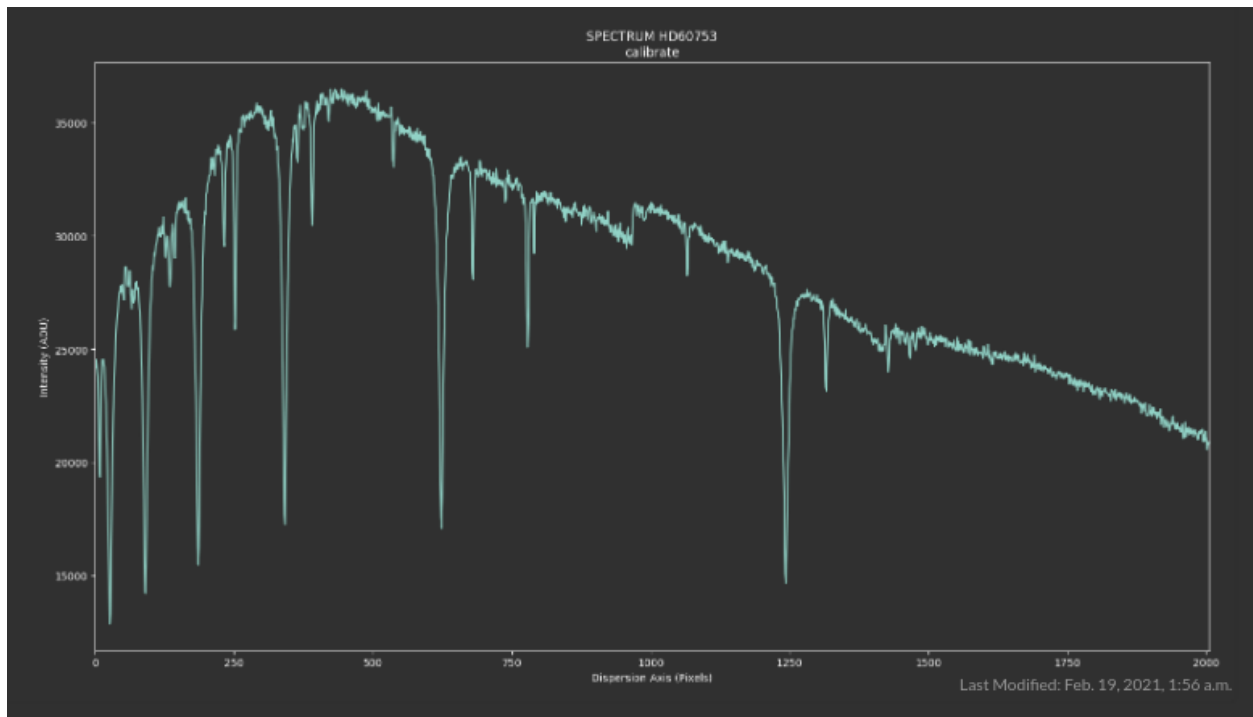


Fig. 4: Example of a static data visualization.

In this area you see the plots or the images. There is an interactive way that uses [Bokeh](#) but is slower. and for now it only allows you to zoom in or out.



## DATA REDUCTION SETTINGS

In your navigation bar click in **Proposals** then the cogs icon.



Now you can change the settings that will be used for this particular proposal in all reduction steps and in every new file.

A screenshot of the 'Data Reduction Settings' form. The title 'Data Reduction Settings' is at the top left, and 'GHTS\_ENGINEERING - SOAR Observer' is at the top right. The form is divided into several sections: 'General Settings' with fields for 'Saturation Threshold' (1), 'Cosmic ray rejection' (Default), and 'Technique' (Spectroscopy); 'Calibrations' with checkboxes for 'Ignore bias' and 'Ignore flats'; 'Flat Normalization' with 'Flat normalization' (Simple Fit) and 'Flat Normalization Order' (15); and 'Spectroscopic Targets' with 'Extraction type' (Fractional Extraction), 'Target fit model' (Moffat), and 'Maximum Number of Targets' (3). Each field has a description below it.



## COLLABORATORS

Click in **Proposals** and then the *Person +* icon.



Now you can add or remove collaborators for all the proposals you have permissions to do so. If you are a collaborator you can't add or remove other collaborators.

### Proposal List

SCAR-2021A-001	1
SCAR-2021A-002	1
SCAR-2021A-003	1
SCAR-2021A-004	1
SCAR-2021A-005	1
SCAR-2021A-006	1
SCAR-2021A-007	1
SCAR-2021A-008	1
SCAR-2021A-009	1
SCAR-2021A-010	2
SCAR-2021A-011	1
SCAR-2021A-012	1
SCAR-2021A-013	1
GHTS_ENGINEERING	1
SCAR-2021B-001	0
SCAR-2021B-002	2
SCAR-2021B-003	1
SCAR-2021B-004	1
SCAR-2021B-005	1
SCAR-2021B-006	1
SCAR-2021B-007	1
SCAR-2021B-008	1

### GHTS\_ENGINEERING Collaborators

+ Add Collaborator

Name	E-mail	Actions
Steven Thomas	stthomas@goodman.com	Remove



## API DOCUMENTATION

More on this can be found on *Developer's Guide* chapter. You can get here from clicking **API Docs** in the navigation bar.

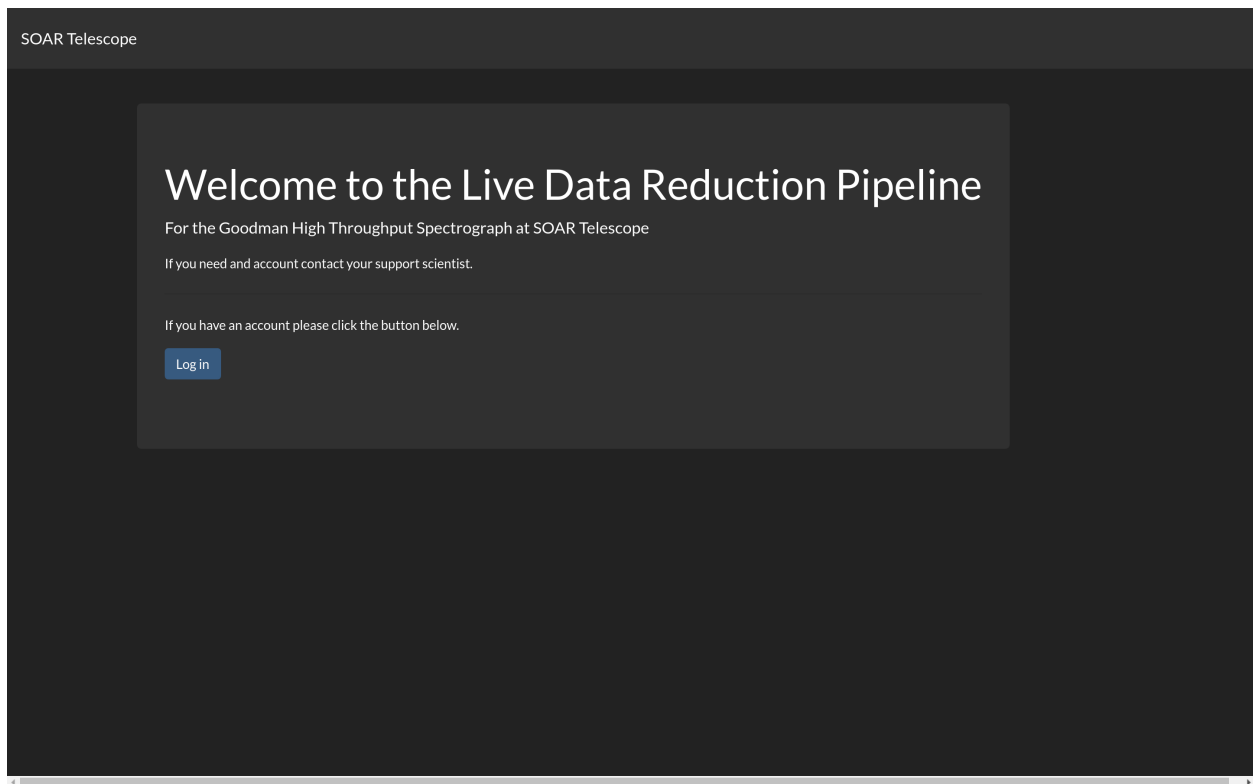
In this section you can even try the API if you are authenticated.

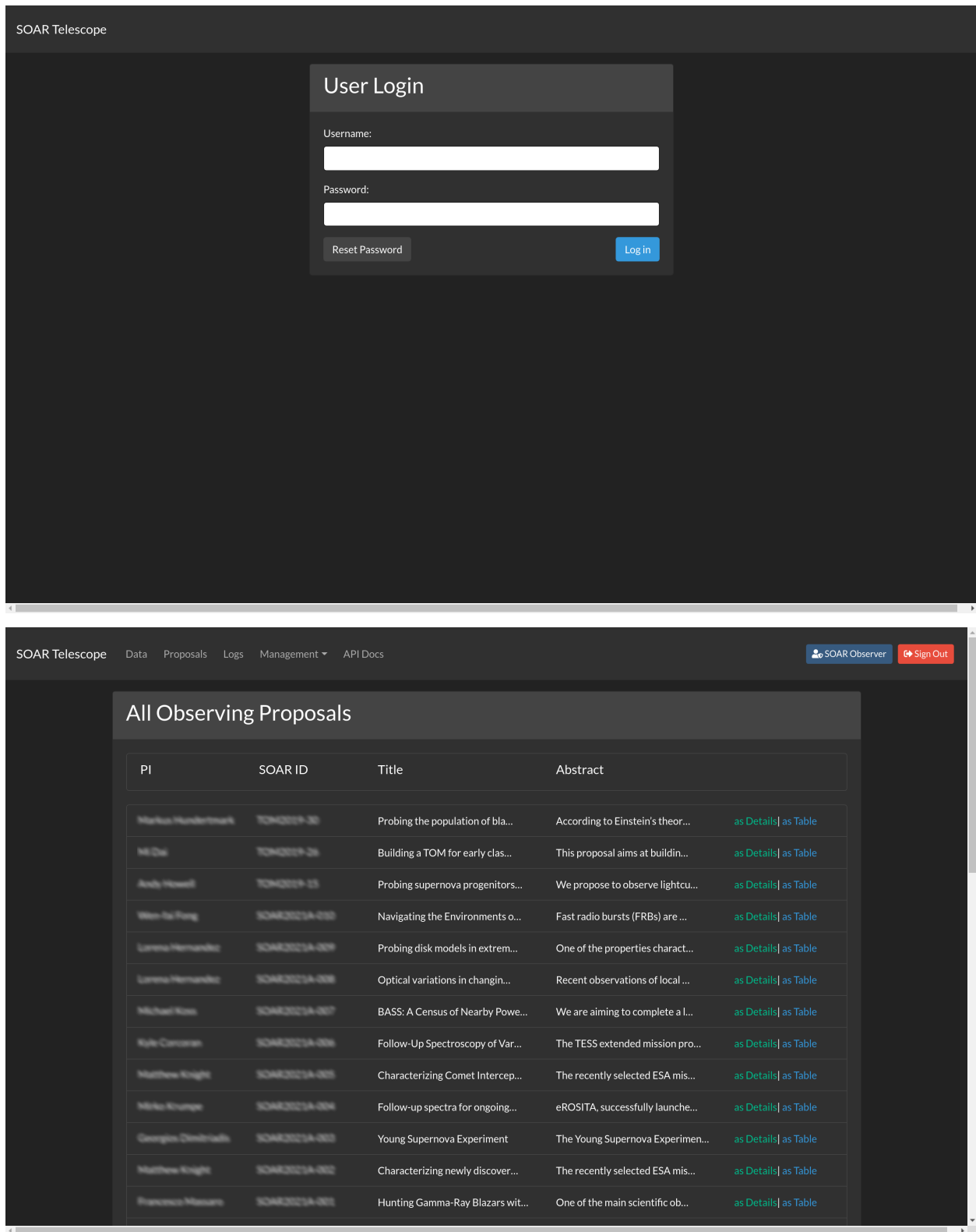
The screenshot displays the 'Public API documentation' interface. At the top, there's a 'Schemes' dropdown menu set to 'HTTP'. To the right, there are two buttons: 'Django Login' and 'Authorize' with a lock icon. Below these is a search bar labeled 'Filter by tag'. The main content area is titled 'api' with a dropdown arrow. It lists 12 API endpoints, each with a method (GET, POST, DELETE), a description, and a name with a lock icon. The endpoints are: 1. GET /api/ (Get API status) - api\_list; 2. POST /api/email/ (Sends e-mail notifications) - api\_email\_create; 3. GET /api/files/ (Get a list of files.) - api\_files\_list; 4. POST /api/files/ (Adds a new file to the database) - api\_files\_create; 5. DELETE /api/files/ (Deletes files, it can't be a raw data.) - api\_files\_delete; 6. POST /api/files/calibrations/ - api\_files\_calibrations\_create; 7. GET /api/files/header/ (Obtains the header of a FITS file) - api\_files\_header\_list; 8. POST /api/files/reclassify/ (Re identify observed technique) - api\_files\_reclassify\_create; 9. POST /api/files/reduce/ (Runs default reduction procedure using reduction settings) - api\_files\_reduce\_create; 10. POST /api/files/spectrum/calibrate/wavelength/ - api\_files\_spectrum\_calibrate\_wavelength\_create; 11. POST /api/files/spectrum/extract/ - api\_files\_spectrum\_extract\_create; 12. GET /api/files/visualize/ (Creates visualizations for fits files.) - api\_files\_visualize\_list.

Fig. 1: Public API documentation.

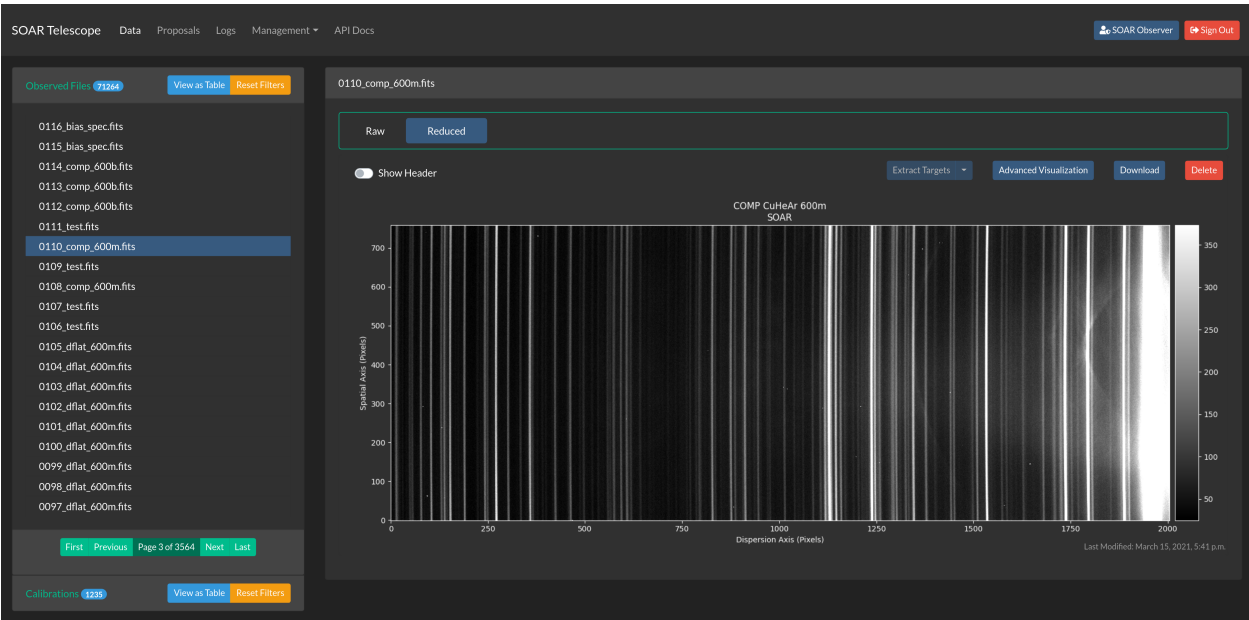


## SCREENSHOTS









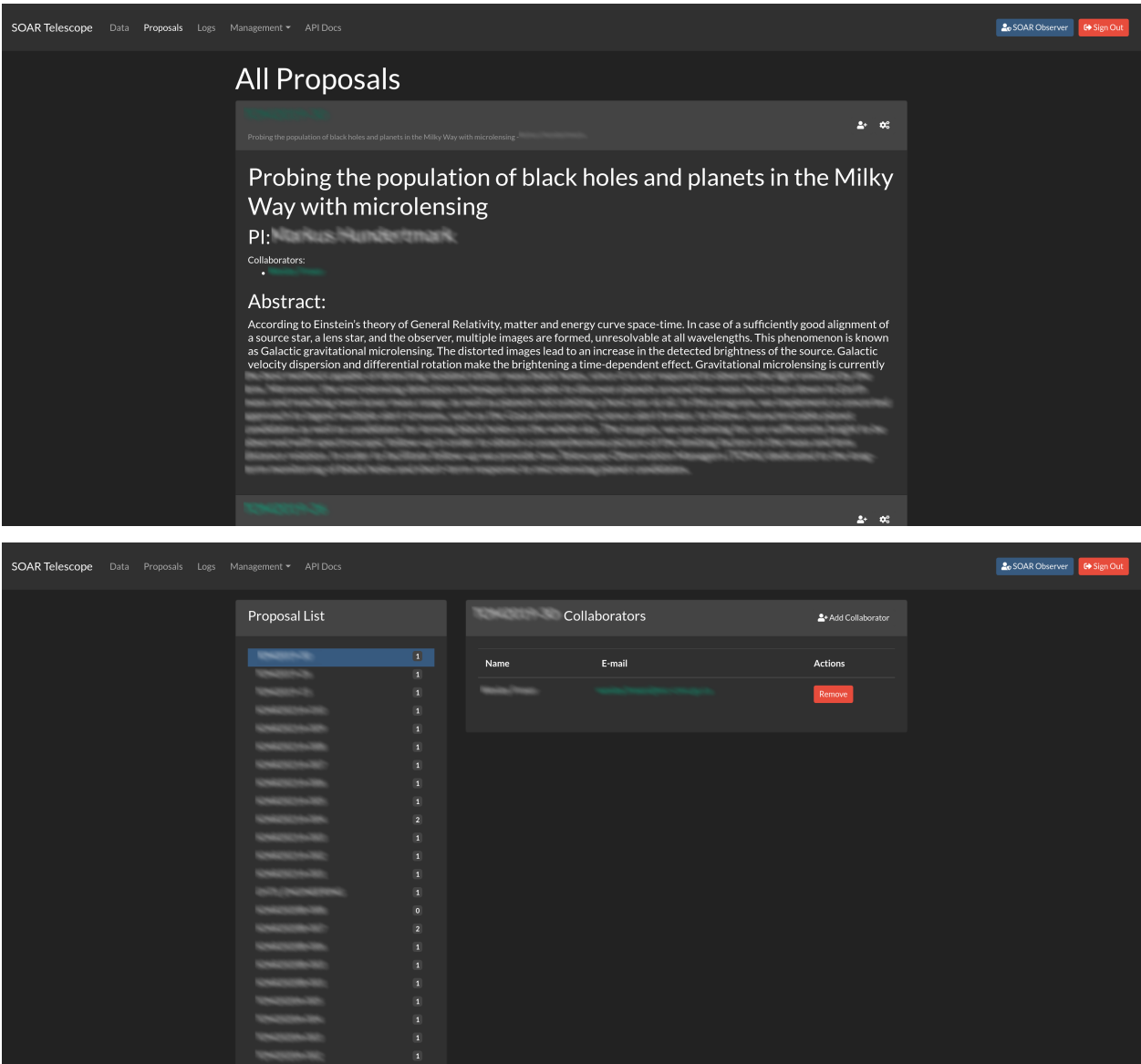
SOAR Telescope

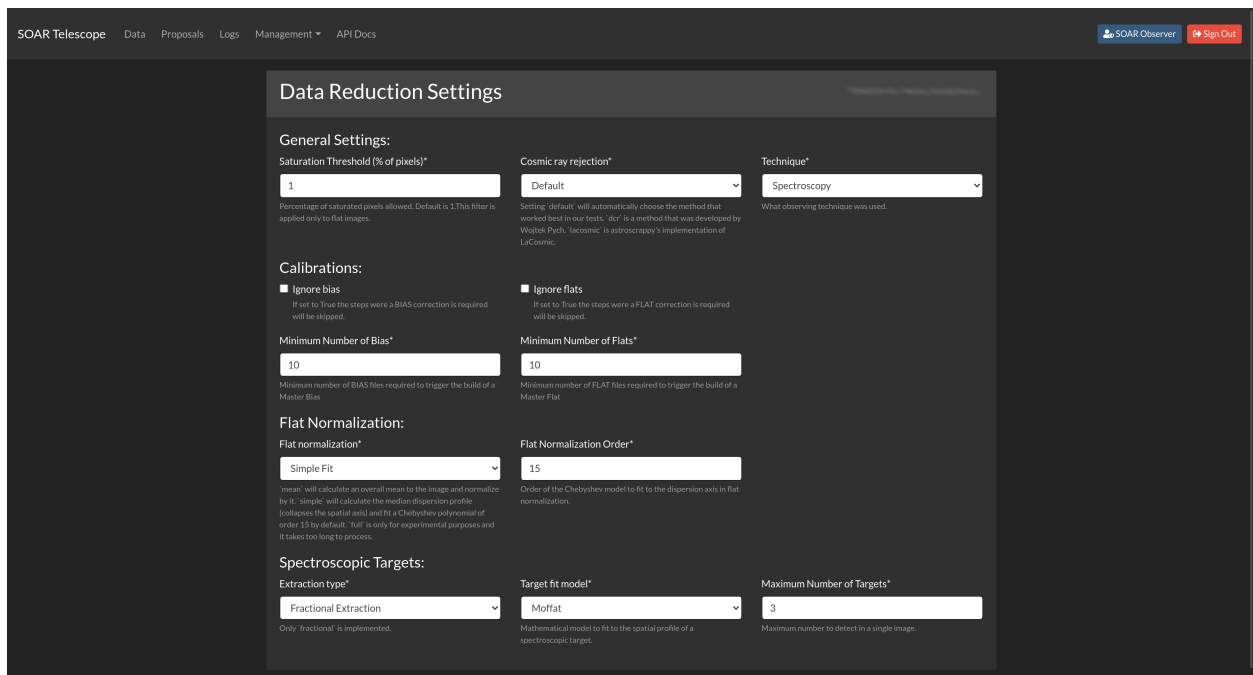
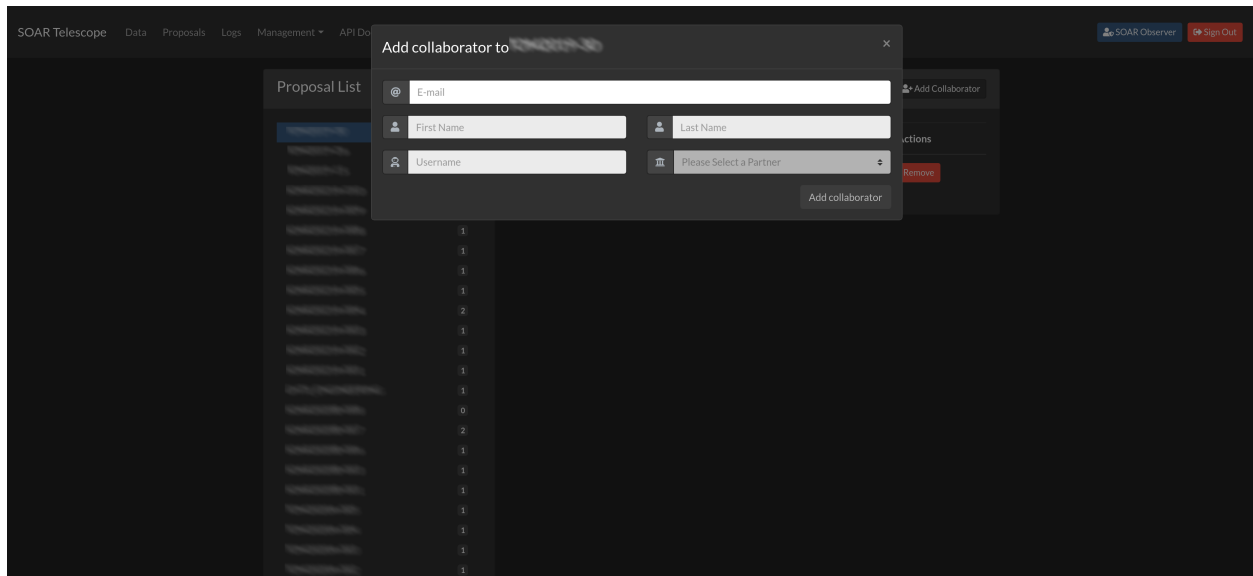
DataProposalsLogsManagementAPI Docs

SOAR ObserverSign Out

All Proposals

<div>0110 Comp 600m</div> <div>Probing the population of black holes and planets in the Milky Way with microlensing</div> <div>SOAR</div> <div>00</div>
<div>0109 Test</div> <div>Building a TOM for early classification of type Ia supernovae and managing follow-up</div> <div>SOAR</div> <div>00</div>
<div>0108 Comp 600m</div> <div>Probing supernova progenitors with rapid TOM-enabled observations</div> <div>SOAR</div> <div>00</div>
<div>0107 Test</div> <div>Navigating the Environments of Fast Radio Burst Host Galaxies with SOAR</div> <div>SOAR</div> <div>00</div>
<div>0106 Test</div> <div>Probing disk models in extremely variable AGN</div> <div>SOAR</div> <div>00</div>
<div>0105 Dflat 600m</div> <div>Optical variations in changing-look AGNs selected at X-rays</div> <div>SOAR</div> <div>00</div>
<div>0104 Dflat 600m</div> <div>BASS: A Census of Nearby Powerful AGN</div> <div>SOAR</div> <div>00</div>
<div>0103 Dflat 600m</div> <div>Follow-Up Spectroscopy of Variable sdB Candidates Observed in TESS Cycle 3</div> <div>SOAR</div> <div>00</div>
<div>0102 Dflat 600m</div> <div></div> <div>SOAR</div> <div>00</div>







## ADDING NEW USERS

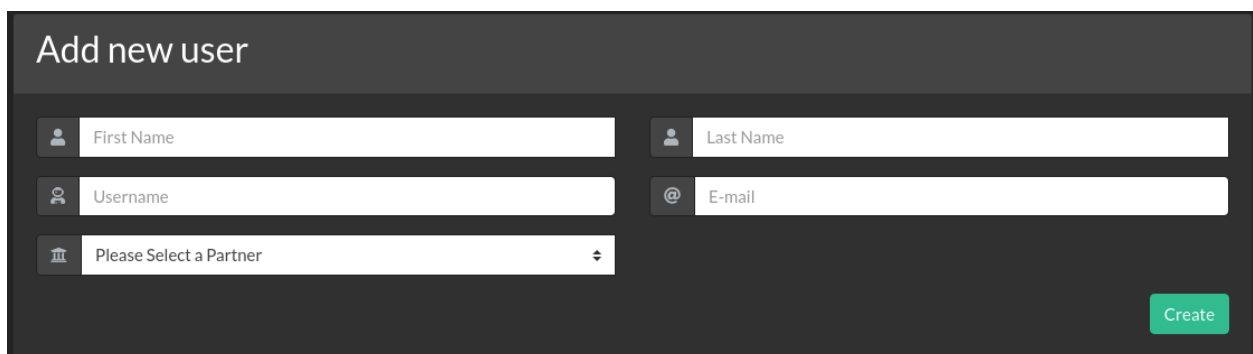
**Warning:** This section is meant for **staff** users only

There are several ways you can access the user creation form. The faster would be:

**Management Add User**

Another way that will take you to the same form is:

**Management Manage Users** click **Add new**



The screenshot shows a web form titled "Add new user" with a dark background. The form contains five input fields: "First Name", "Last Name", "Username", "E-mail", and a dropdown menu labeled "Please Select a Partner". A green "Create" button is positioned at the bottom right of the form.

Fig. 1: Add new user form

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**Note:** Staff users can only be added from a super user account for now.

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And the last one would be through Proposals's Collaborators



## ADDING NEW OBSERVING PROPOSALS

**Warning:** This section is meant for **staff** users only

If you created a user as described in [Adding new Users](#) you will be redirected to the *proposal creation form*. However, there are other ways too.

**Management Add Proposal**

and

**Management Manage Proposals** click **Add new**

New Proposal

PI  Semester

Soar id

Title

Abstract

Create

Fig. 1: Add new proposal form

Make sure the SOAR ID is correct or PI or collaborators will not be able to see their data. The *Soar id* default value is set automatically depending on current semester and count.





## OVERVIEW

The Public API is thoroughly documented using swagger.

The screenshot displays the Swagger UI for the Public API. At the top, there is a 'Schemes' dropdown menu set to 'HTTP'. To the right are two buttons: 'Django Login' and 'Authorize' with a lock icon. Below these is a 'Filter by tag' input field. The main content area is titled 'api' with a dropdown arrow. It lists 12 API endpoints, each with a method (GET, POST, DELETE), a URL, a description, and a name with a lock icon. The endpoints are: 1. GET /api/ (Get API status, api\_list), 2. POST /api/email/ (Sends e-mail notifications, api\_email\_create), 3. GET /api/files/ (Get a list of files, api\_files\_list), 4. POST /api/files/ (Adds a new file to the database, api\_files\_create), 5. DELETE /api/files/ (Deletes files, it can't be a raw data, api\_files\_delete), 6. POST /api/files/calibrations/ (api\_files\_calibrations\_create), 7. GET /api/files/header/ (Obtains the header of a FITS file, api\_files\_header\_list), 8. POST /api/files/reclassify/ (Re identify observed technique, api\_files\_reclassify\_create), 9. POST /api/files/reduce/ (Runs default reduction procedure using reduction settings, api\_files\_reduce\_create), 10. POST /api/files/spectrum/calibrate/wavelength/ (api\_files\_spectrum\_calibrate\_wavelength\_create), 11. POST /api/files/spectrum/extract/ (api\_files\_spectrum\_extract\_create), 12. GET /api/files/visualize/ (Creates visualizations for fits files, api\_files\_visualize\_list).

Method	URL	Description	Name
GET	/api/	Get API status	api_list
POST	/api/email/	Sends e-mail notifications	api_email_create
GET	/api/files/	Get a list of files.	api_files_list
POST	/api/files/	Adds a new file to the database	api_files_create
DELETE	/api/files/	Deletes files, it can't be a raw data.	api_files_delete
POST	/api/files/calibrations/		api_files_calibrations_create
GET	/api/files/header/	Obtains the header of a FITS file	api_files_header_list
POST	/api/files/reclassify/	Re identify observed technique	api_files_reclassify_create
POST	/api/files/reduce/	Runs default reduction procedure using reduction settings	api_files_reduce_create
POST	/api/files/spectrum/calibrate/wavelength/		api_files_spectrum_calibrate_wavelength_create
POST	/api/files/spectrum/extract/		api_files_spectrum_extract_create
GET	/api/files/visualize/	Creates visualizations for fits files.	api_files_visualize_list

Fig. 1: Public API documentation.



## API EXAMPLES

**Warning:** Always trust the API docs page instead because it is updated along the API itself.

### 11.1 Get the list of raw files

```
import requests

api_key = 'some-fake-api-key-that-does-not-work'

# define request headers
headers = {'Authorization': f"Token {api_key}",
          'Content-Type': 'application/json'}

# define parameters
# 0: Raw files
# 1: Calibration Files (Master flats or bias)
# 2: Reduced files
# 3: Extracted 1D spectrum
# 4: Wavelength calibrated
# 5: Flux Calibrated
parameters = {"data_type": "0"}

# remotehost should be replaced with the actual host
# also the url can be composed as http://remotehost/api/files/?data_type=0
# in that case you don't need to pass the params argument.
response = requests.get(
    url='http://remotehost/api/files/',
    params=parameters,
    headers=headers)

if response.status_code == 200:
    json_response = response.json()

# alternatively you can use response.raise_for_status() and catch any exception

from request.exceptions import HTTPError

try:
    response.raise_for_status()
except HTTPError as http_error:
    log.exception(http_error)
```

Will produce a response like this. In this particular case the results have been truncated to just a couple of results.

```
{
  "count": 545,
  "next": "http://remothost/gsp/api/files/?data_type=0&page=2",
  "previous": null,
  "results": [
    {
      "id": 952,
      "created": "2021-02-18T10:22:10.340053-03:00",
      "last_modified": "2021-02-18T10:22:13.470928-03:00",
      "original_file": "0001_GHTS_B_400m1_2x2_18-02-2021.fits",
      "original_file_id": 952,
      "parent_file": "0001_GHTS_B_400m1_2x2_18-02-2021.fits",
      "parent_file_id": 952,
      "file_name": "0001_GHTS_B_400m1_2x2_18-02-2021.fits",
      "directory_name": "/pipeline/data/20210218/RAW",
      "full_path": "/pipeline/data/20210218/RAW/0001_GHTS_B_400m1_2x2_18-02-
↪2021.fits",
      "obstype": "LAMPFLAT",
      "object": "DFLAT",
      "filter": "NO_FILTER",
      "filter_2": "NO_FILTER",
      "grating": "400_SYZY",
      "slit": "1.0_LONG_SLIT",
      "cam_targ": "11.6",
      "grt_targ": "5.8",
      "obsra": "17:38:33.320",
      "obsdec": "-48:23:59.899",
      "gain": "1.4",
      "rdnoise": "4.74",
      "roi": "Spectroscopic 2x2",
      "wavmode": "400_M1",
      "proposal_id": "calibrate",
      "observation_id": null,
      "configuration_id": null,
      "block_id": null,
      "image_id": 1,
      "date": "2021-02-18",
      "data_type": "0",
      "normalized": false,
      "technique": "Spectroscopy",
      "saturation_value": 49928
    },
    {
      "id": 900,
      "created": "2020-11-26T21:30:52.692308-03:00",
      "last_modified": "2020-11-26T21:30:55.204647-03:00",
      "original_file": "0354_Orion-Burst_26-11-2020_comp.fits",
      "original_file_id": 900,
      "parent_file": "0354_Orion-Burst_26-11-2020_comp.fits",
      "parent_file_id": 900,
      "file_name": "0354_Orion-Burst_26-11-2020_comp.fits",
      "directory_name": "/pipeline/data/20201126/RAW",
      "full_path": "/pipeline/data/20201126/RAW/0354_Orion-Burst_26-11-2020_
↪comp.fits",
      "obstype": "ARC",
      "object": "ZTF20actqfpc",
    }
  ]
}
```

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```

    "filter": "NO_FILTER",
    "filter_2": "GG455",
    "grating": "400_SYZY",
    "slit": "1.0_LONG_SLIT",
    "cam_targ": "16.1",
    "grt_targ": "7.5",
    "obsra": "05:34:22.372",
    "obsdec": "-5:24:52.448",
    "gain": "1.48",
    "rdnoise": "3.89",
    "roi": "Spectroscopic 2x2",
    "wavmode": "400_M2",
    "proposal_id": "SOAR2020B-008",
    "observation_id": 1,
    "configuration_id": 1,
    "block_id": 0,
    "image_id": 34304,
    "date": "2020-11-26",
    "data_type": "0",
    "normalized": false,
    "technique": "Spectroscopy",
    "saturation_value": 69257
  },
  {
    "id": 895,
    "created": "2020-11-26T19:37:53.519510-03:00",
    "last_modified": "2020-11-26T19:37:55.892156-03:00",
    "original_file": "0353_Orion-Burst_26-11-2020_comp.fits",
    "original_file_id": 895,
    "parent_file": "0353_Orion-Burst_26-11-2020_comp.fits",
    "parent_file_id": 895,
    "file_name": "0353_Orion-Burst_26-11-2020_comp.fits",
    "directory_name": "/pipeline/data/20201126/RAW",
    "full_path": "/pipeline/data/20201126/RAW/0353_Orion-Burst_26-11-2020_
↪comp.fits",
    "obstype": "ARC",
    "object": "ZTF20actqfpc",
    "filter": "NO_FILTER",
    "filter_2": "GG455",
    "grating": "400_SYZY",
    "slit": "1.0_LONG_SLIT",
    "cam_targ": "16.1",
    "grt_targ": "7.5",
    "obsra": "05:34:22.372",
    "obsdec": "-5:24:52.448",
    "gain": "1.48",
    "rdnoise": "3.89",
    "roi": "Spectroscopic 2x2",
    "wavmode": "400_M2",
    "proposal_id": "SOAR2020B-008",
    "observation_id": 1,
    "configuration_id": 1,
    "block_id": 0,
    "image_id": 34304,
    "date": "2020-11-26",
    "data_type": "0",
    "normalized": false,

```

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```

        "technique": "Spectroscopy",
        "saturation_value": 69257
    }
]
}

```

## 11.2 Add Collaborator to Proposal

```

import requests

api_key = 'some-fake-api-key-that-does-not-work'

# define request headers
headers = {'Authorization': f'Token {api_key}',
           'Content-Type': 'application/json'}

#define payload
payload = {
    "email": "user@server.net",
    "action": "add"
}

# remotehost should be replaced with the actual host
response = requests.get(
    url='http://remotehost/api/proposals/collaborators/5/',
    data=payload,
    headers=headers)

if response.status_code == 200:
    json_response = response.json()

```

You get a serialized version of the proposal database instance.

```

{
  "id": 5,
  "soar_id": "calibrate",
  "semester": "2020A",
  "title": "Calibrations",
  "abstract": "How calibrations will be handled.",
  "user": {
    "id": 3,
    "username": "observer",
    "last_login": "2020-10-24T18:56:45.976000-03:00",
    "first_name": "Observer",
    "last_name": "Observer",
    "email": "observer@observatory.cl",
    "is_staff": true,
    "is_active": true,
    "date_joined": "2019-11-13T10:26:23-03:00"
  },
  "collaborators": [
    {
      "id": 41,

```

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```
    "username": "user",
    "last_login": null,
    "first_name": "",
    "last_name": "",
    "email": "user@server.net",
    "is_staff": false,
    "is_active": true,
    "date_joined": "2021-03-24T15:32:23.329399-03:00"
  }
]
```

Since the user did not exist a new user was created.