How to add a spectrum in AOTS

1 Login

When navigating to `http://a15.astro.physik.uni-potsdam.de`, you will end on the landing page where the publicly available projects are displayed. From there you can login by clicking on “LOG IN” in the top right corner.

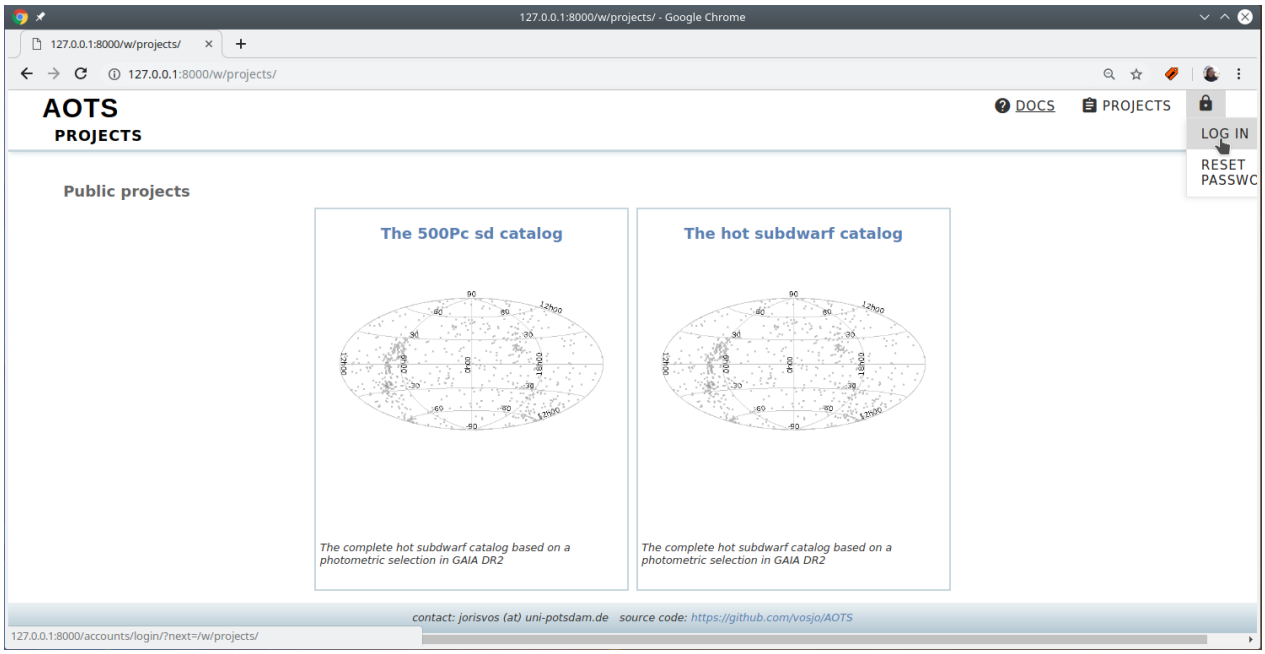


Figure 1: Landing page

This will bring you to the login page where you can log in with the user name and password you received.

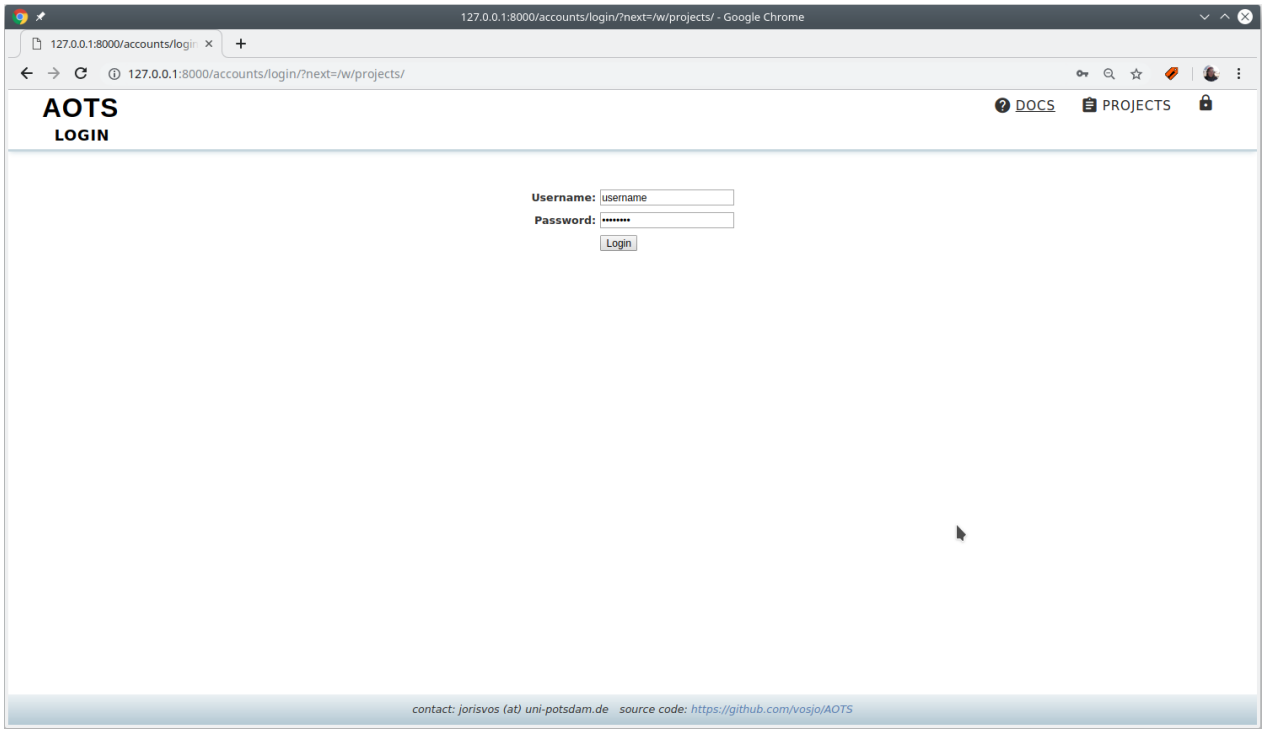


Figure 2: Login page

Note: By hovering over “LOG IN” you also can reset or change your password by selecting ”RESET PASSWORD” or ”CHANGE PASSWORD”, respectively.

2 Uploading spectra

After login you will be redirected to the AOTS landing page. Here you can now select the project that you want to work on by clicking on the name of the project. For example we want to add a spectrum to the “The hot subdwarf catalog”.

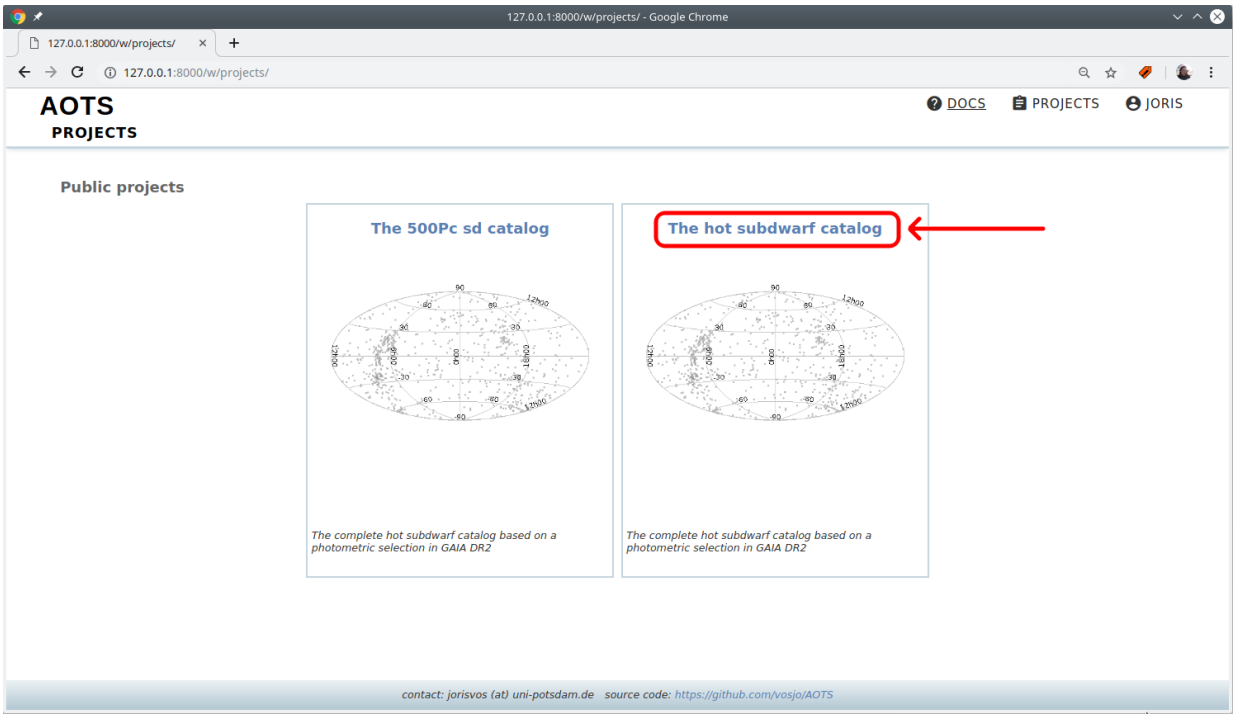


Figure 3: Landing page after login

2.1 Uploading reduced spectra

You will end up on the systems index page that lists all systems that are part of this project. To add a spectrum, navigate to “OBSERVATIONS” → “SPECTRA” → “UPLOAD” in the top navigation bar:

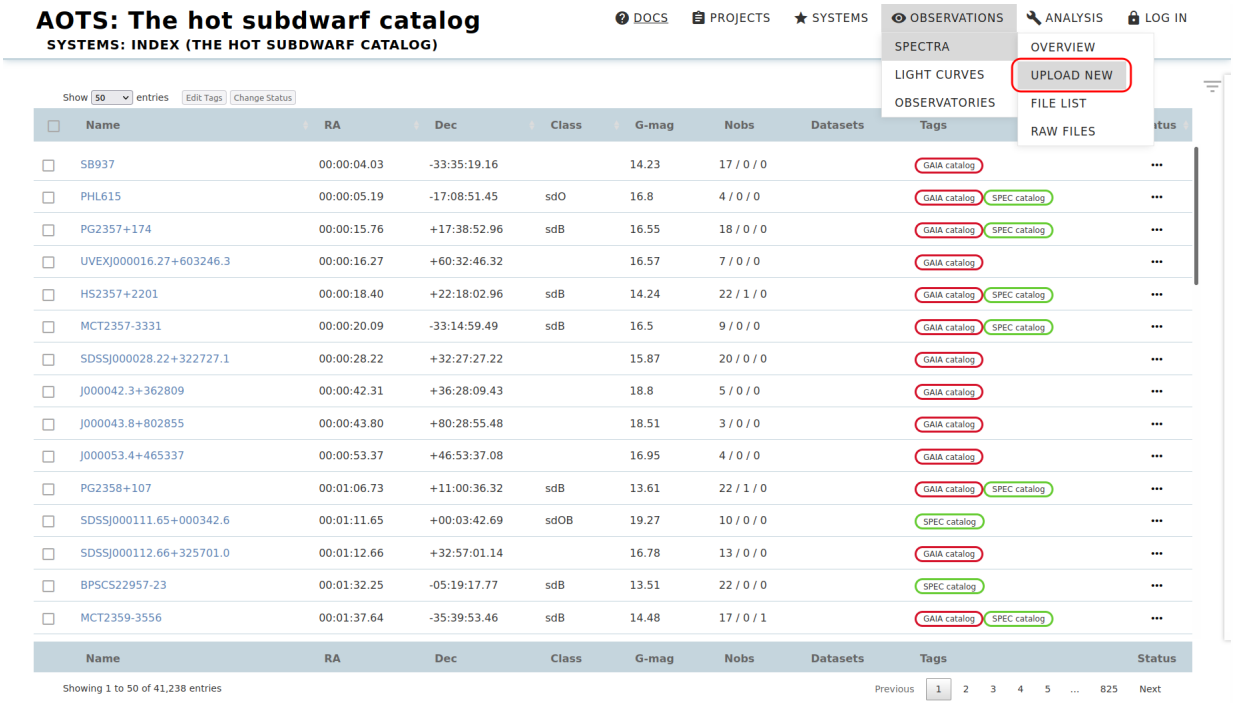


Figure 4: System page

At the top of this page is an upload form where you can select one or more spectra in fits format or as simple txt files to upload them to the database.

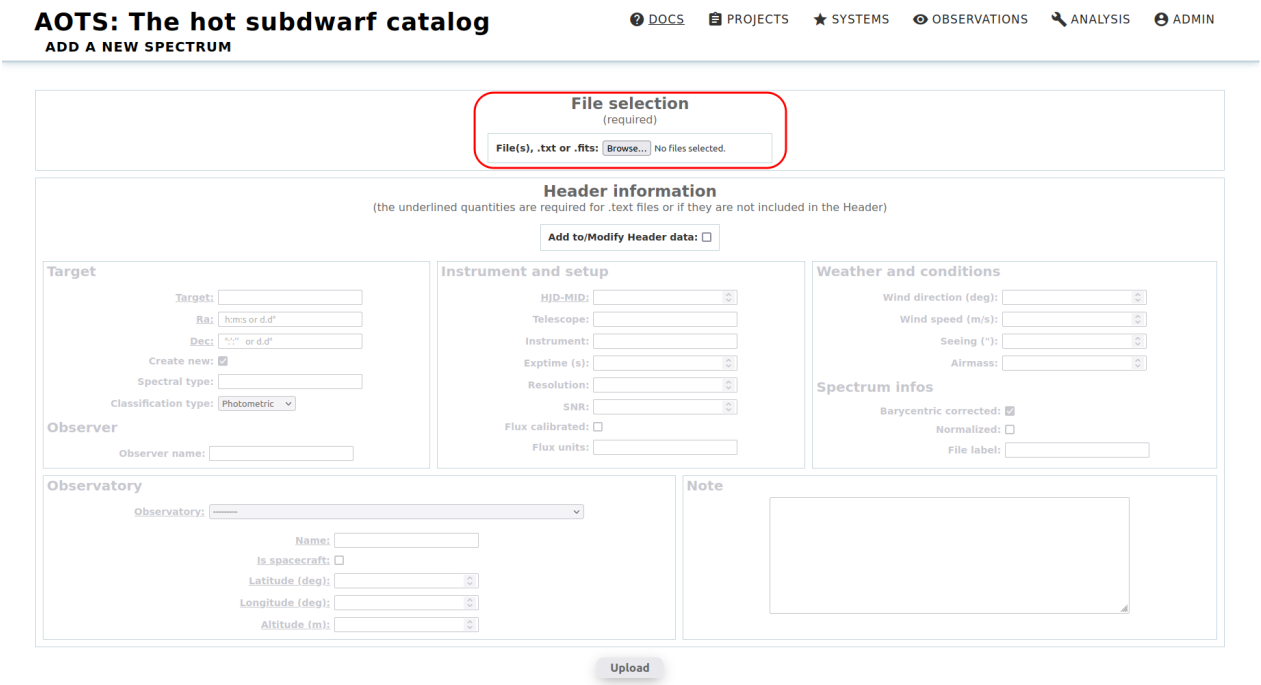


Figure 5: Spectrum upload page

AOTS tries to extract all necessary data automatically from the fits headers. See Sect. 2.2 for a list of all fully supported file types and the recognized keywords.

The extracted header information can be completed or overwritten by the form in the “Header information” section. To activate this form select “Add to/Modify Header data”. Most of the parameters are optional. The underlined quantities: “Target”, “Ra”, “Dec”, “HJD-MID” are required, if they are not included in the fits header. In addition, an “Observatory” must be selected or the necessary information (“Name”, “Is spacecraft”, “Latitude (deg)”, “Longitude (deg)”, “Altitude (m)”) to create a new observatory must be provided. However, in most cases the observatory can be identified or newly created based on the fits header information.

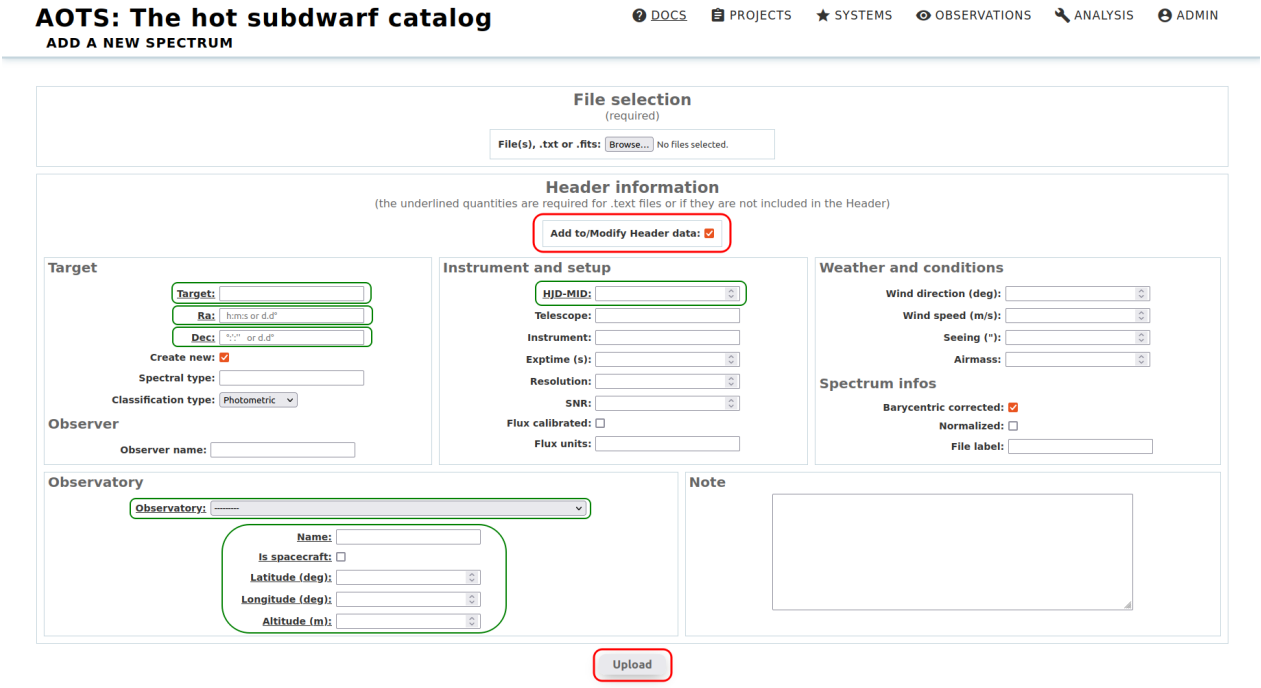


Figure 6: Spectrum upload page with activated form

txt files are expected to be a simple two-column table with the wavelength in the first column and the flux in the

second column. For txt files, filling in the header information form is mandatory. Required are, as described above, the underlined quantities. However, as many fields as possible should be filled in.

After pressing the upload button the spectra will be processed by AOTS and you will be redirected to the spectrum files page, which can also be reached from the top navigation bar via "OBSERVATIONS" → "SPECTRA" → "FILE LIST". A confirmation notice for the upload is displayed at the top of this page to confirm that everything went well. The newly uploaded spectrum will be added to the list of "Uploaded files". (You might have to sort on "Added on" to find the spectrum).

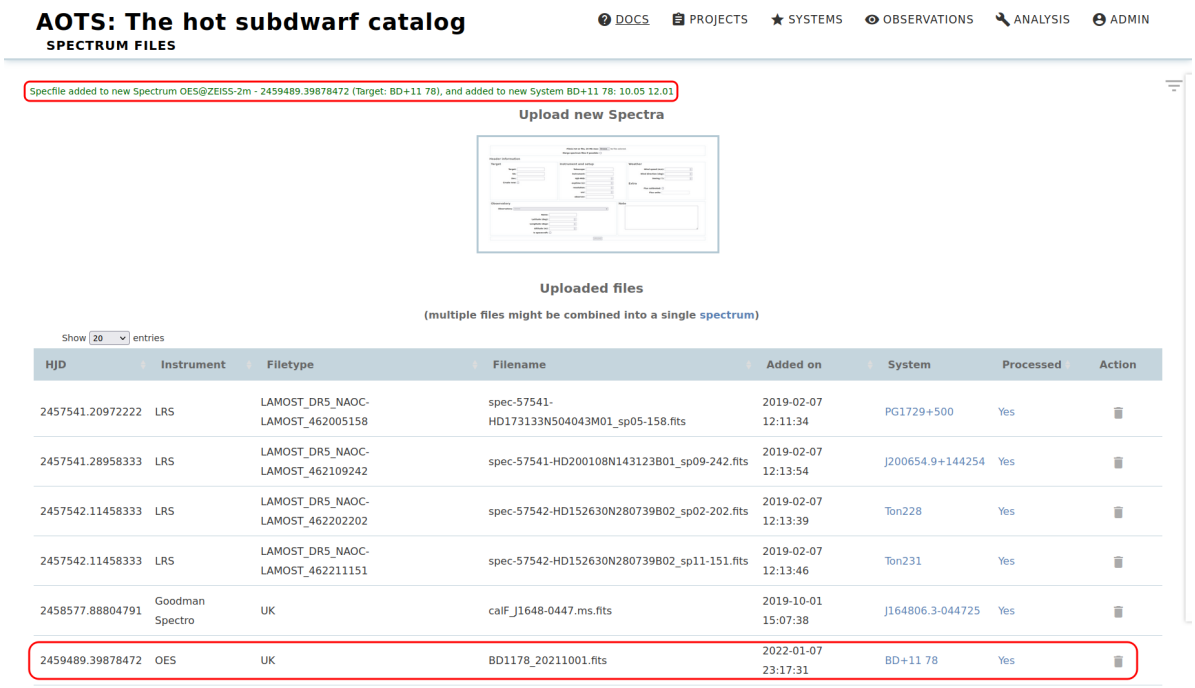


Figure 7: Spectral file list - after upload - In this example a OES spectrum (taken with the ZEISS 2m telescope in Ondrejov) of BD+11 78 was uploaded

To add further spectra files click on the large button below "Upload new Spectra", which will take you again to the spectrum upload page.

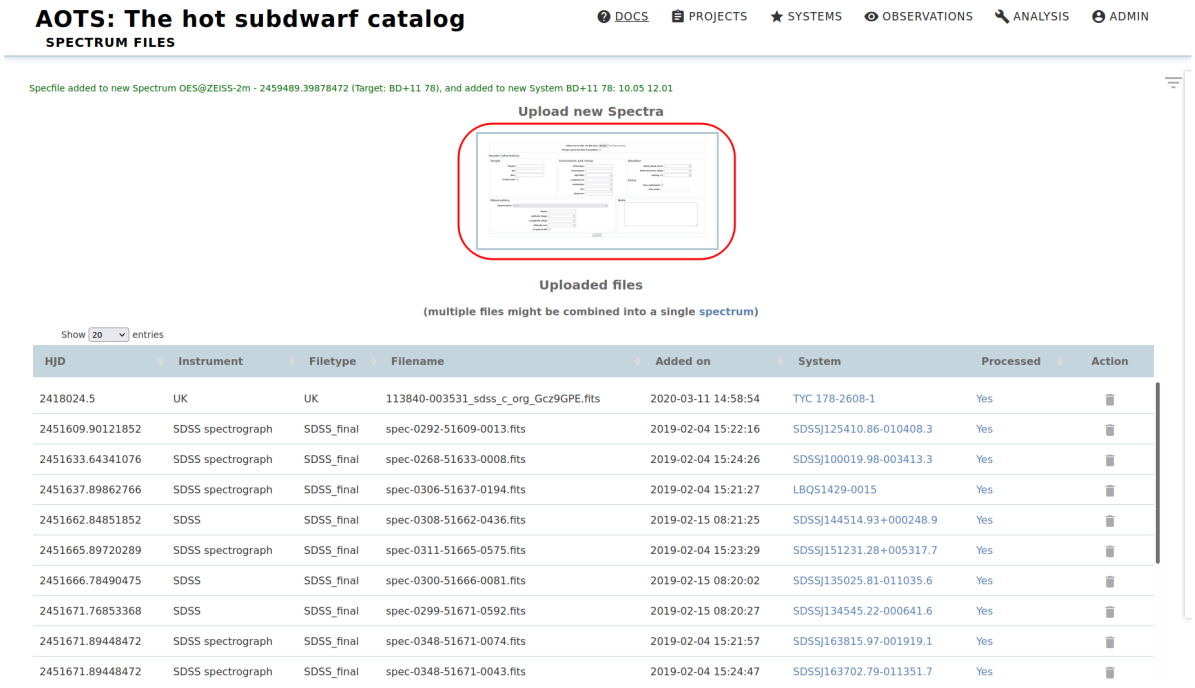


Figure 8: Spectral file list - Upload button

Multiple uploaded files might be automatically combined into a single spectrum, if they belong to the same system (measured based on the right ascension and declination) and are taken at approximately the same time with the same instrument. If you click on "spectrum" be taken to the main spectrum page, which you can also access from the top

navigation bar by clicking on “OBSERVATIONS” → “SPECTRA” → “OVERVIEW”.

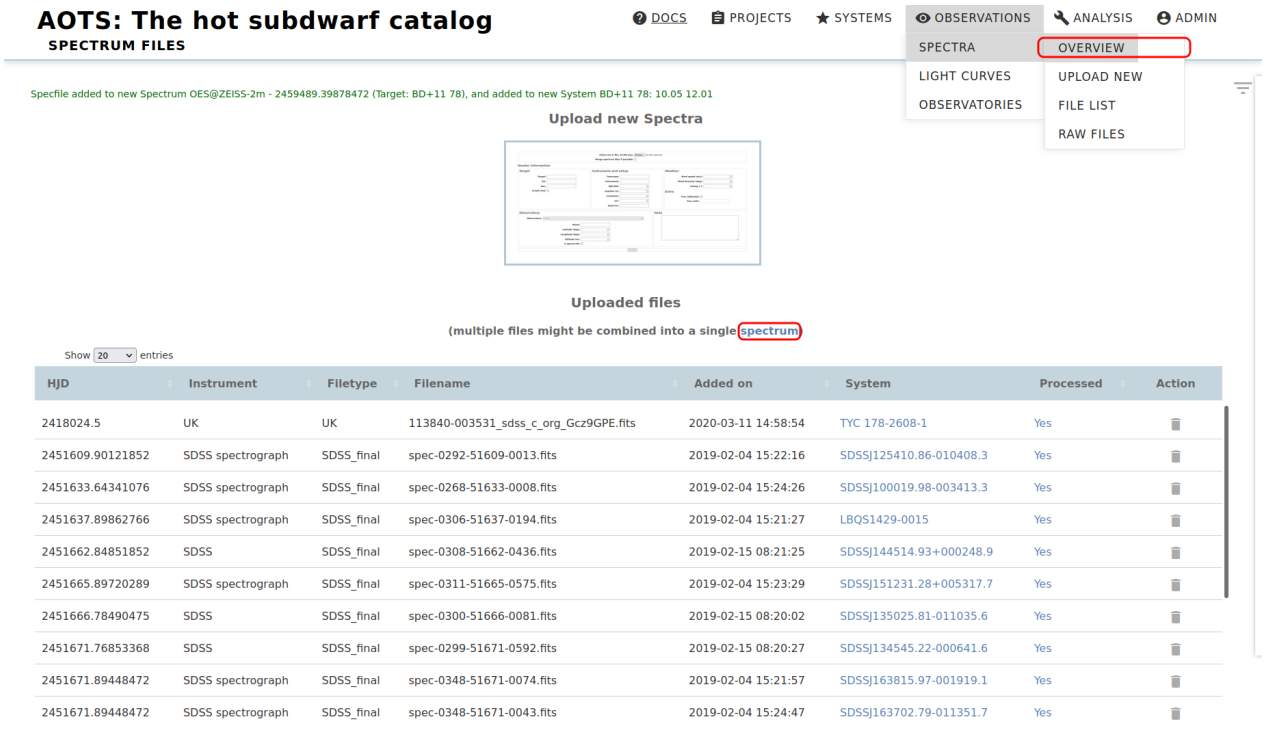


Figure 9: Spectral file list - Link to spectra overview page

If you click on the “Yes” in the “Processed” column, you will be taken to the spectrum details page where you can check the added spectrum. You can check the associated system by clicking on the system name in the “System” column.

Figure 10: Spectrum detail page

2.2 Recognized header keywords (reduced spectra)

Multiple types of fits files are recognized by AOTS:

- ESO phase 3
- ESO Reflex fits files

- FEROS fits files from the CERES pipeline
- HERMES fits files
- SDSS fits files
- LAMOST fits files
- MODS fits files

For all other spectra in fits format the following header keywords are recognized:

Keyword	explanation
HJD, BJD, MJD, DATE-OBS	time at mid observation
OBJECT	object name
RA	right ascention in decimal degrees or in hours (hexadecimal)
DEC	declination in degrees, decimal of hexadecimal
INSTRUME	instrument
TELESCOP	telescope
EXPTIME	exposure time in seconds
OBSERVER	name of the observer
SPEC_RES	spectral resolution
SNR	signal to noise ratio
SEEING	seeing during the observation

2.3 Uploading raw data

To add raw data to reduced spectrum files, navigate to "OBSERVATIONS" → "SPECTRA" → "RAW FILES" in the top navigation bar:

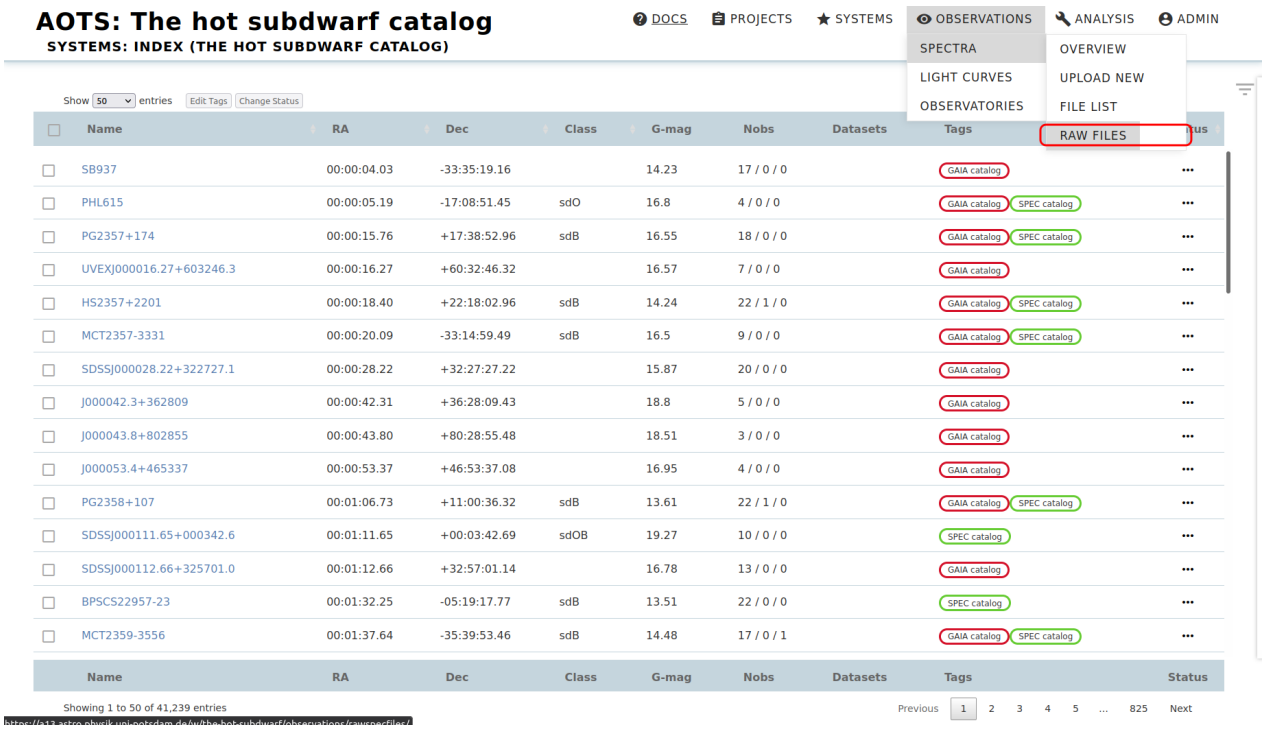


Figure 11: System page

The page that opens shows a table with the already existing raw datasets. In the toolbar of this table the button “Add Raw spectra” has to be clicked next.

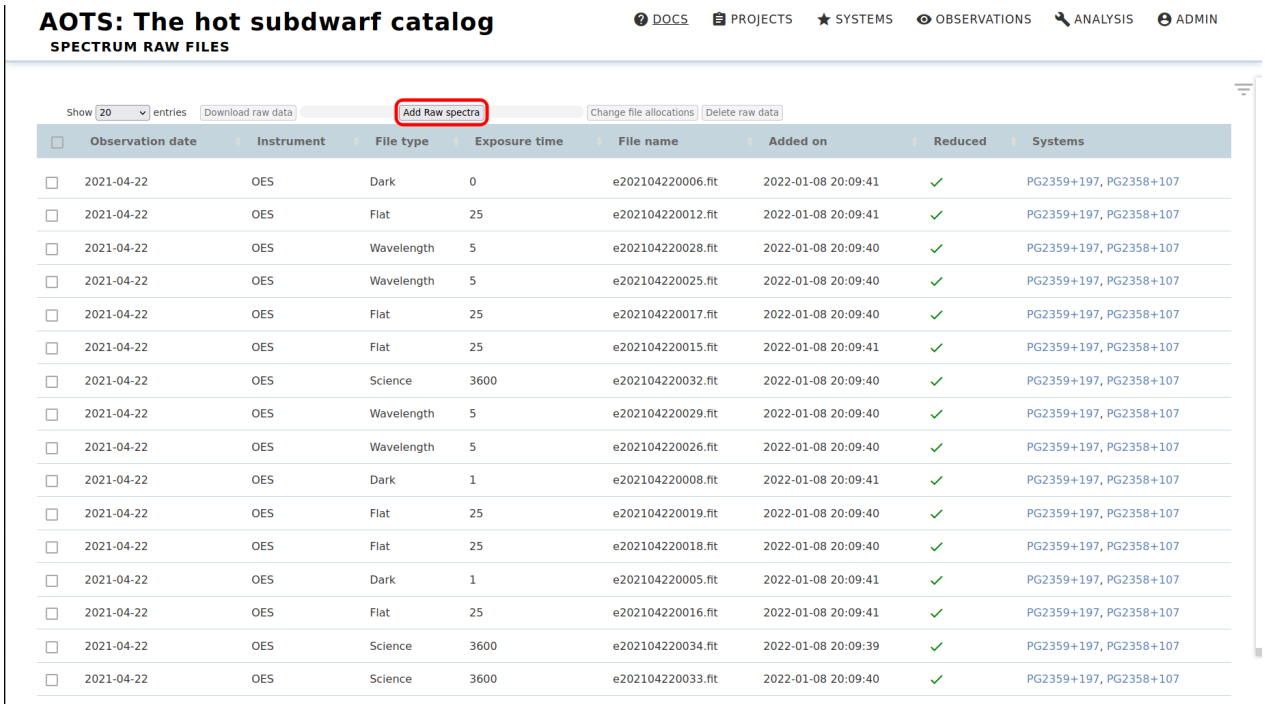


Figure 12: Raw file page

A popup opens, which shows the systems and reduced spectra available in the database in the middle area. If one or more reduced spectra already exist for the raw data to be uploaded, the raw data must be assigned to these spectra. For this purpose, these spectra must be selected in “Reduced spectra”.

If the raw data are not yet reduced, they can be assigned to the systems for which they were acquired. Hence, the respective systems must be marked in this case. If the systems do not exist in the database yet, they have to be created beforehand via the system page.

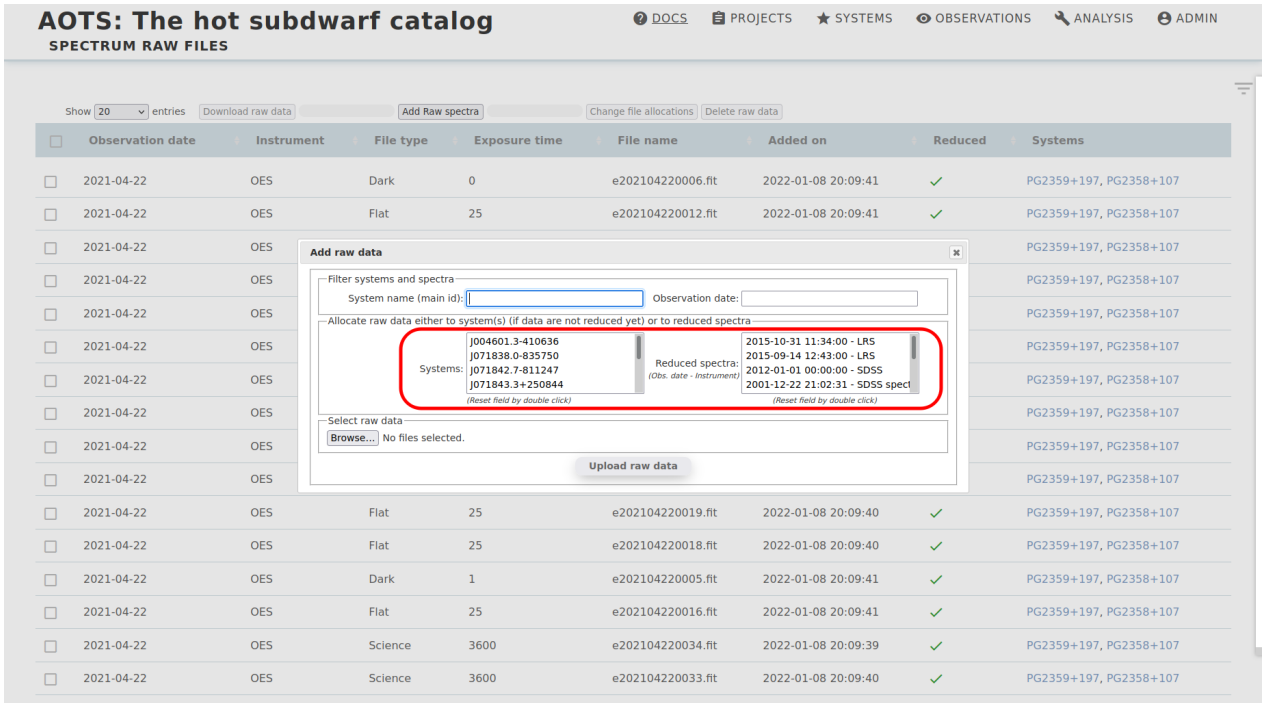


Figure 13: Raw file page with upload popup

To simplify the selection of the correct spectra or systems, the “System name” and “Observation date” fields can be used to filter the “Ststems” and “Reduced spectra”. Simply enter the name of the system and/or the observation date in the corresponding field.

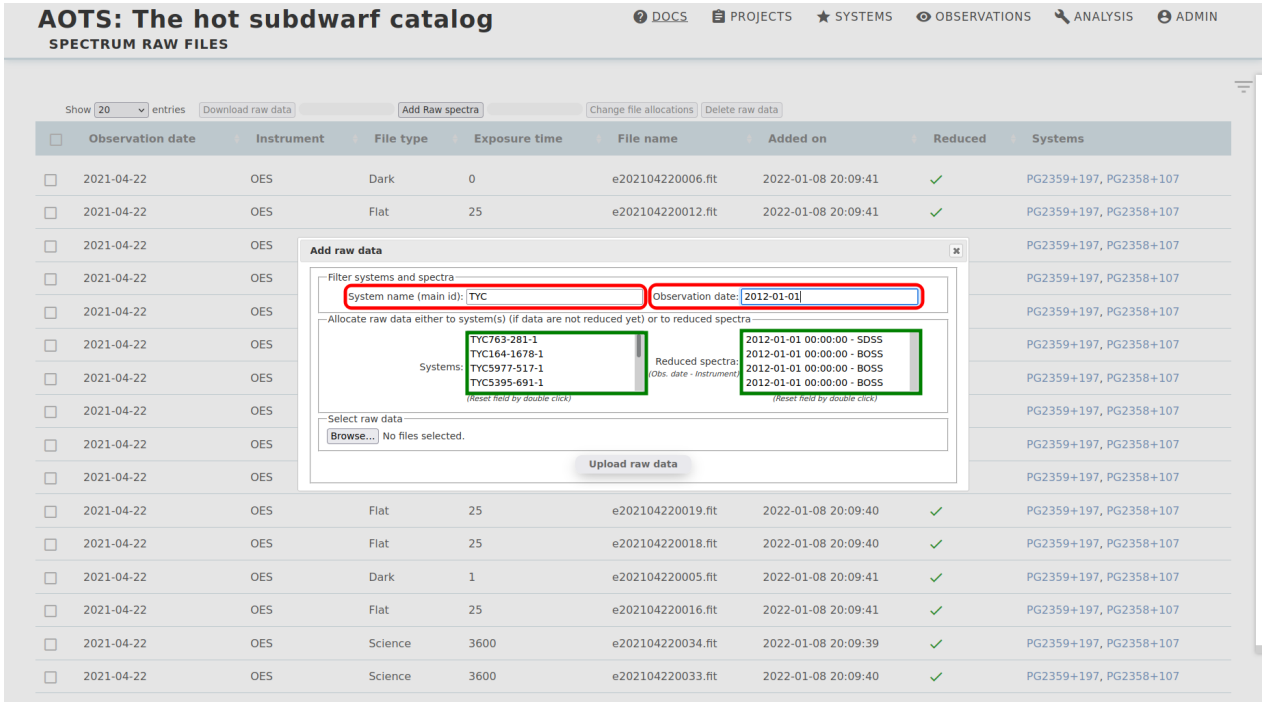


Figure 14: Raw file page with “System name” and “Observation date” filter applied

In addition, by selecting one or more systems in the “Systems” field, it is possible to limit the selection of displayed spectra to those belonging to the selected systems. Multiple selections are possible, so that e.g. flats, darks, and biases for all targets of a night can be uploaded at once.

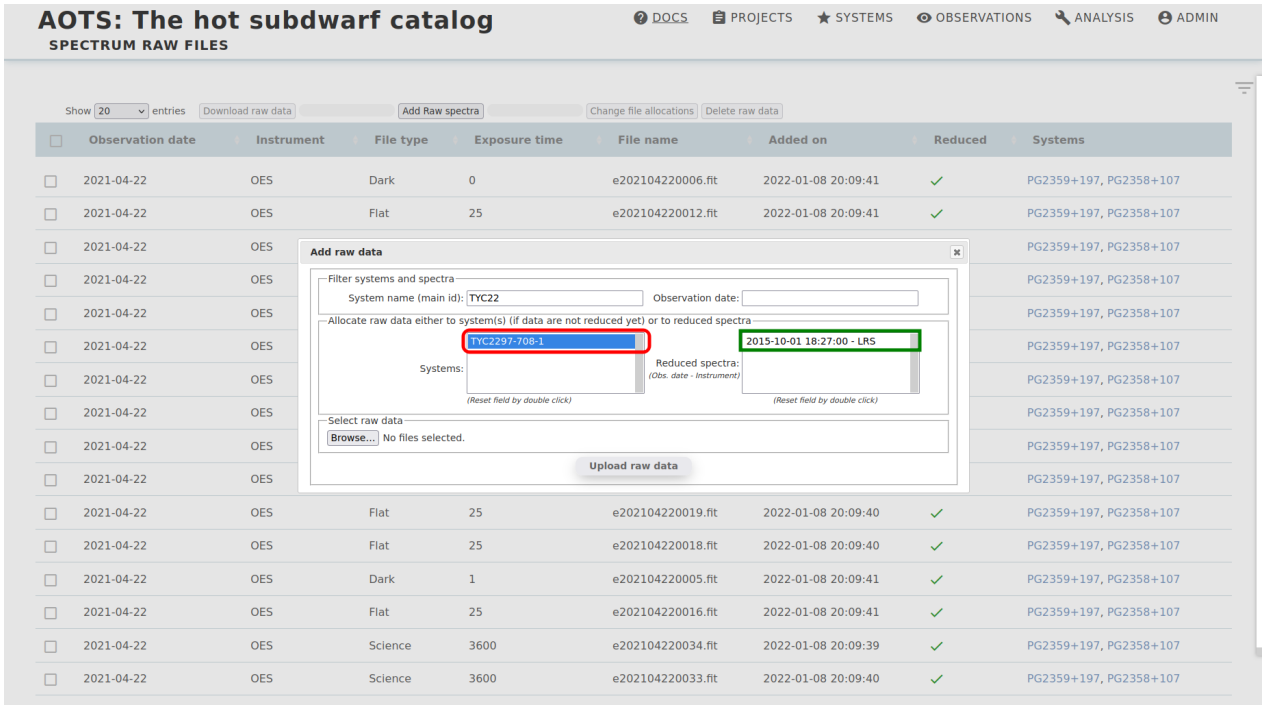


Figure 15: Raw file page with filtered spectra based on “System” selection

Finally, the files to be uploaded must be selected. Multiple raw files can be uploaded at once. In the example below, the four files to be uploaded are not yet reduced. Therefore, a system (TCY763-281-1) was selected for which, as can be seen, no reduced spectrum exists in the database yet. Files to be uploaded must be in FITS format.

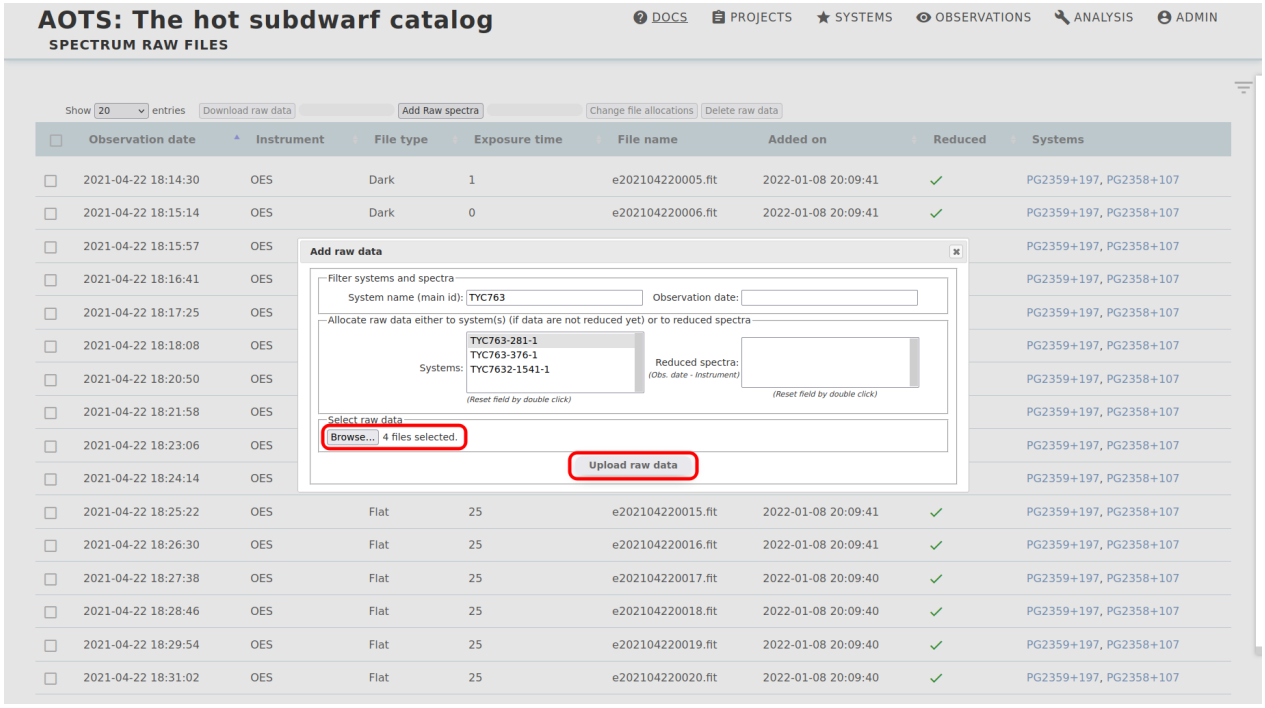


Figure 16: Raw file page with files to be uploaded selected

After pressing the upload button, a progress bar is displayed to illustrate the progress of the upload. Since raw data is usually quite large, the upload process can take a considerable amount of time.

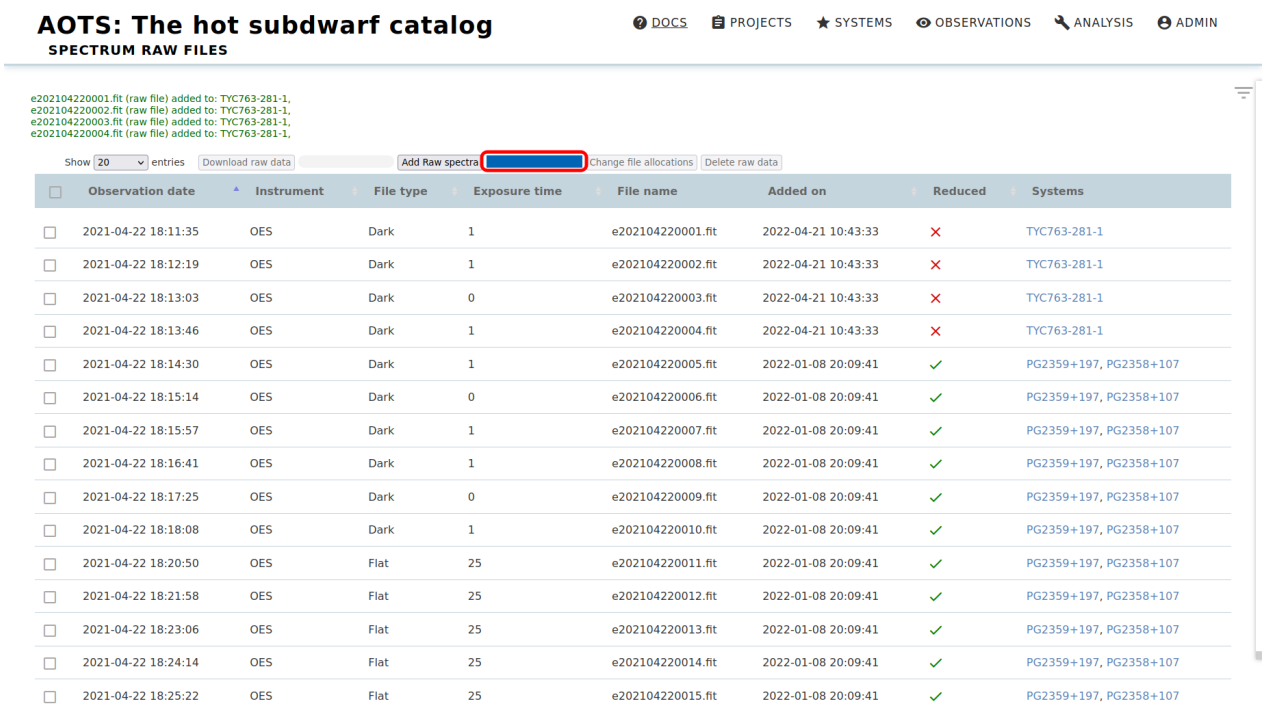


Figure 17: Raw file page with upload progress bar

AOTS will process the files and display a confirmation notice for the upload at the top of the page to confirm that everything went well. The newly uploaded spectrum will be added to the table. In this table, the “Reduced” column now also shows whether the raw data is already reduced or not. In accordance with our upload, four new unreduced spectra have now appeared in the table.

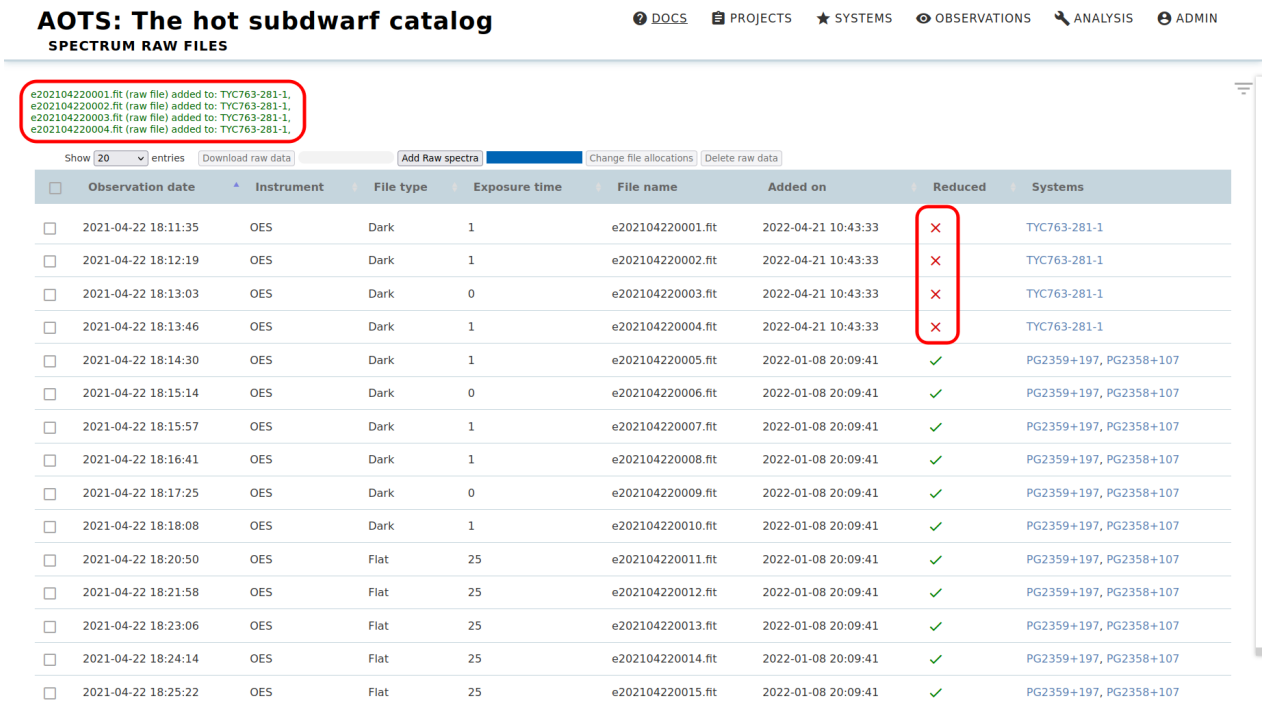


Figure 18: Raw file page - Upload complete

This table also lists the “File type” that is derived from the “IMAGETYP” fits header keyword. All recognized fits header keywords are listed in the Table in Sect. 2.4. You can check the systems associated with the raw data by clicking on the system name in the “Systems” column.

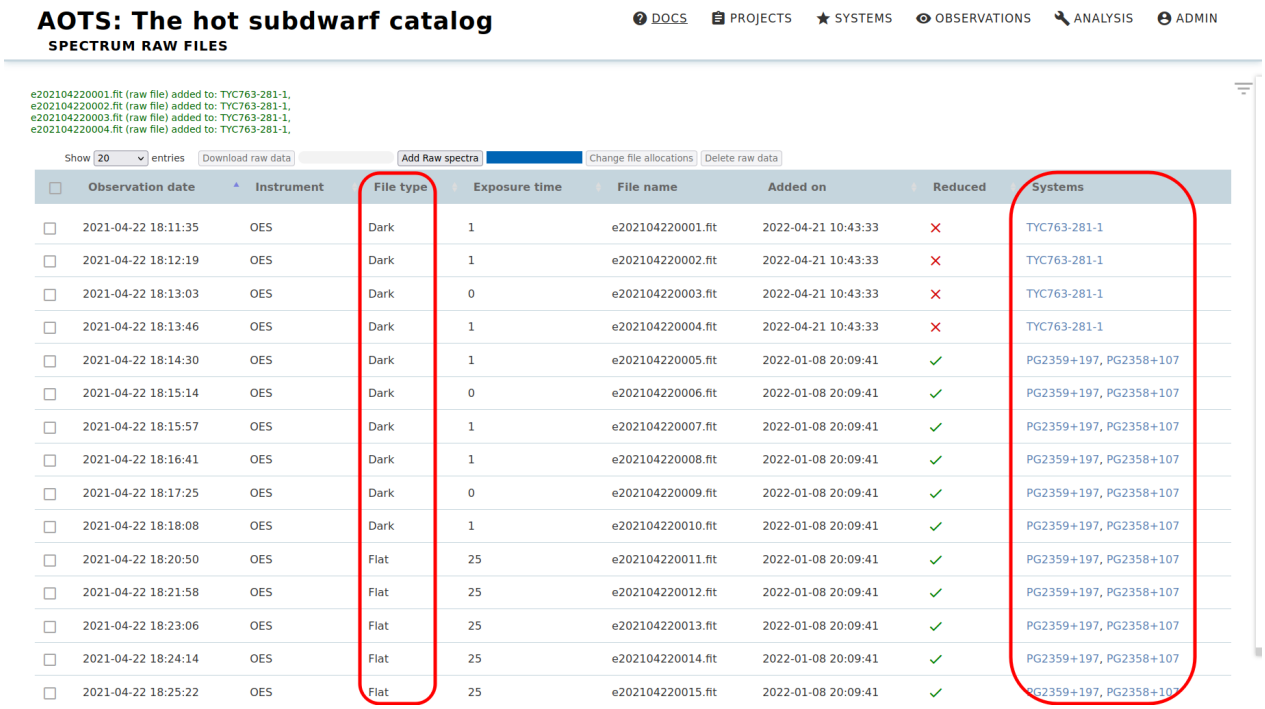


Figure 19: Raw file page - Popup

2.4 Recognized header keywords (raw data)

For all raw files the following header keywords are recognized:

Keyword	explanation
HJD, BJD, MJD, DATE-OBS	time at mid observation
OBJECT	object name
RA	right ascention in decimal degrees or in hours (hexadecimal)
DEC	declination in degrees, decimal of hexadecimal
INSTRUME	instrument
TELESCOP	telescope
EXPTIME	exposure time in seconds
OBSERVER	name of the observer
IMAGETYP	file type

2.5 Change file allocations

Besides the upload function, there is also the possibility to adjust the allocations between raw data and the respective reduced spectra. This may be necessary if a mistake was made during the raw data upload or if a reduced spectrum is now available in the database for previously unreduced data.

To achieve this, the raw data for which the allocation is to be changed must first be marked in the table. Then the corresponding menu can be opened via the button “Change file allocations”.

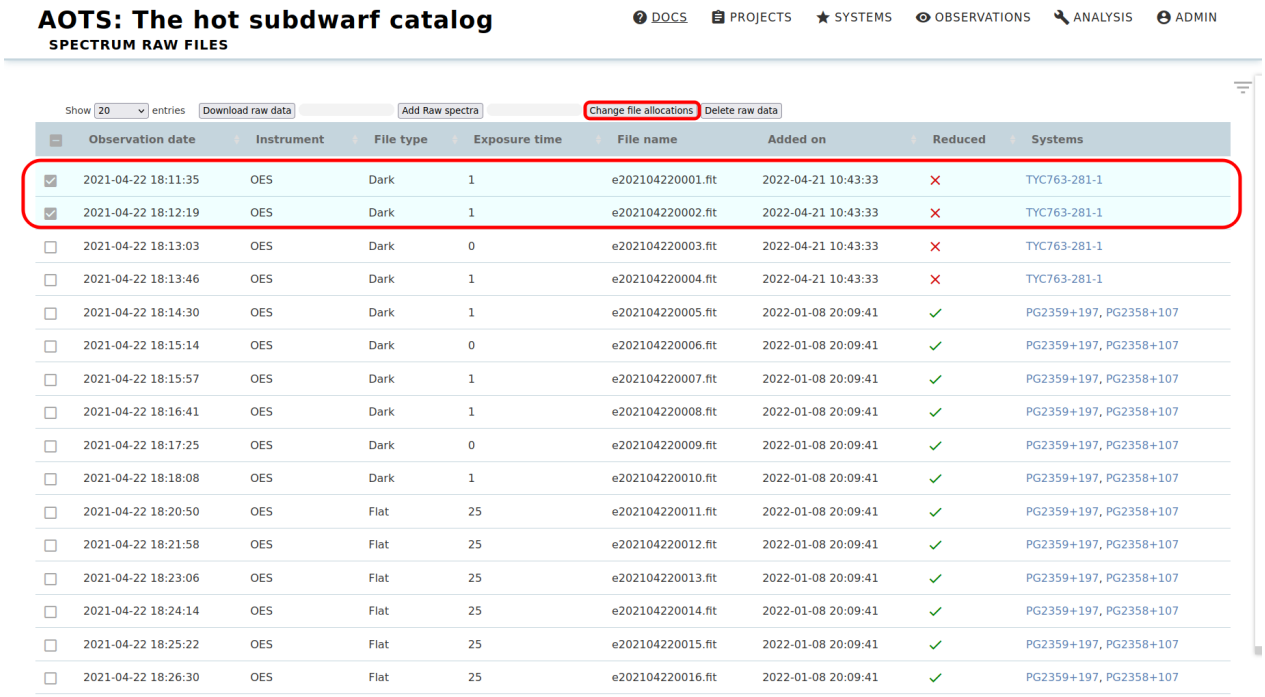


Figure 20: Change file allocations - Open menu

The form fields in this popup are basically the same as in the raw data upload dialog we described above. The only thing missing here is the menu item that allows you to select new files and the “Upload” button is replaced by an “Update” button.

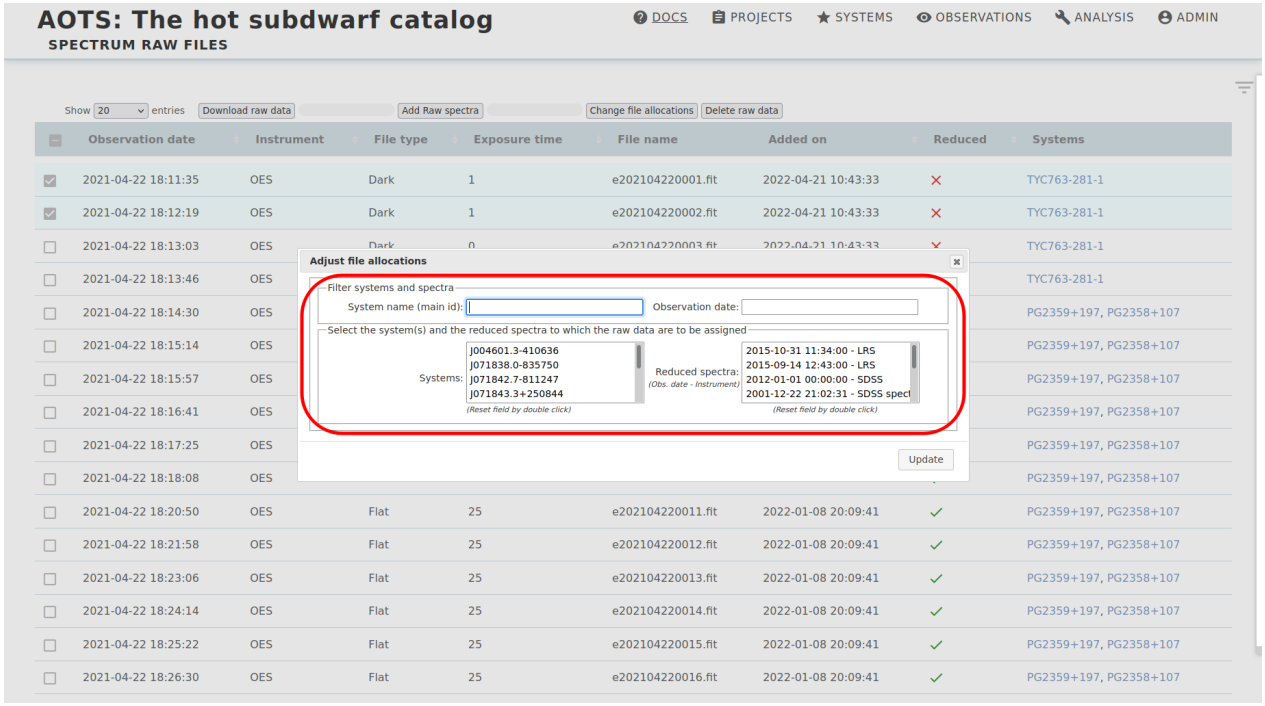


Figure 21: Change file allocations - Open menu

In our case here, we want to assign two of the files previously uploaded in Sect. 2.3 to another system or, more precisely, to the corresponding reduced spectrum. To do this, first filter the systems as described above and then select the corresponding system so that only the spectrum we are interested in is displayed under “Reduced Spectra”. After we have marked this spectrum, we can press the “Update” button.

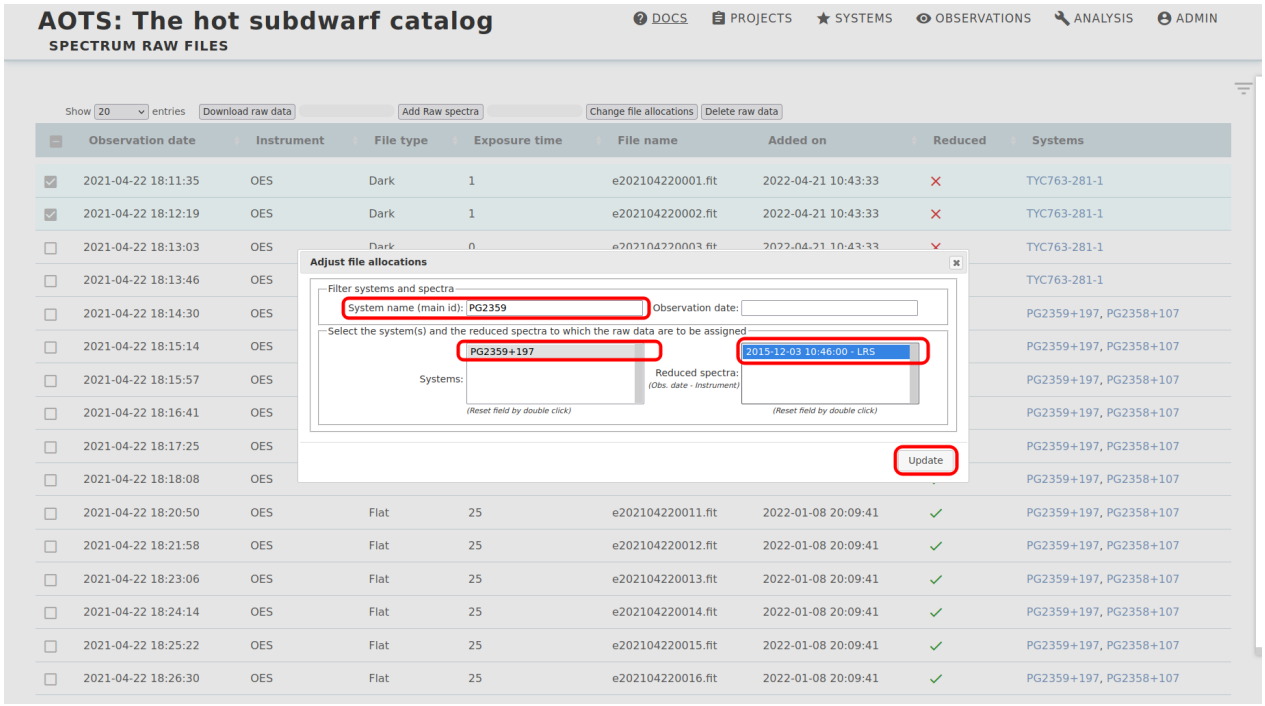
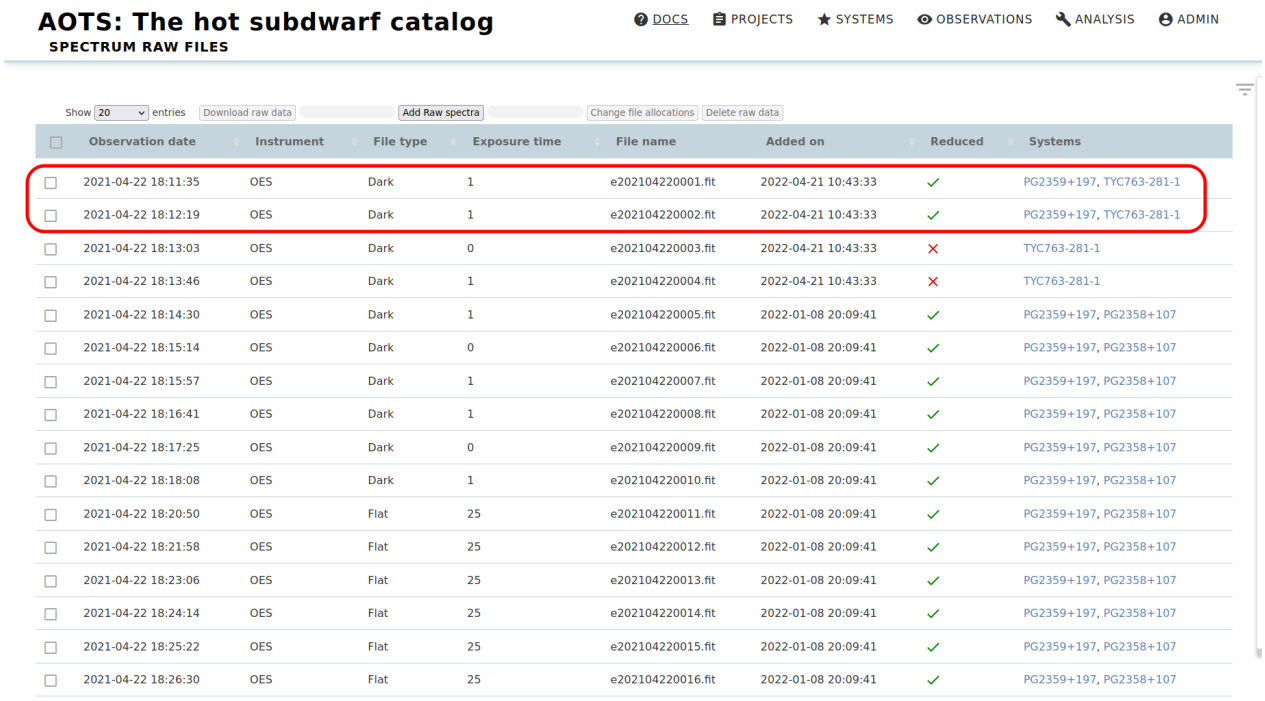


Figure 22: Change file allocations - Select the right spectrum

Subsequently, you can see in the table that, as you might expect, both the “Systems” and “Reduced” columns have changed. The raw data is now assigned to the new system and the status has changed to “reduced”.



Observation date	Instrument	File type	Exposure time	File name	Added on	Reduced	Systems
2021-04-22 18:11:35	OES	Dark	1	e202104220001.fit	2022-04-21 10:43:33	✓	PG2359+197, TYC763-281-1
2021-04-22 18:12:19	OES	Dark	1	e202104220002.fit	2022-04-21 10:43:33	✓	PG2359+197, TYC763-281-1
2021-04-22 18:13:03	OES	Dark	0	e202104220003.fit	2022-04-21 10:43:33	✗	TYC763-281-1
2021-04-22 18:13:46	OES	Dark	1	e202104220004.fit	2022-04-21 10:43:33	✗	TYC763-281-1
2021-04-22 18:14:30	OES	Dark	1	e202104220005.fit	2022-01-08 20:09:41	✓	PG2359+197, PG2358+107
2021-04-22 18:15:14	OES	Dark	0	e202104220006.fit	2022-01-08 20:09:41	✓	PG2359+197, PG2358+107
2021-04-22 18:15:57	OES	Dark	1	e202104220007.fit	2022-01-08 20:09:41	✓	PG2359+197, PG2358+107
2021-04-22 18:16:41	OES	Dark	1	e202104220008.fit	2022-01-08 20:09:41	✓	PG2359+197, PG2358+107
2021-04-22 18:17:25	OES	Dark	0	e202104220009.fit	2022-01-08 20:09:41	✓	PG2359+197, PG2358+107
2021-04-22 18:18:08	OES	Dark	1	e202104220010.fit	2022-01-08 20:09:41	✓	PG2359+197, PG2358+107
2021-04-22 18:20:50	OES	Flat	25	e202104220011.fit	2022-01-08 20:09:41	✓	PG2359+197, PG2358+107
2021-04-22 18:21:58	OES	Flat	25	e202104220012.fit	2022-01-08 20:09:41	✓	PG2359+197, PG2358+107
2021-04-22 18:23:06	OES	Flat	25	e202104220013.fit	2022-01-08 20:09:41	✓	PG2359+197, PG2358+107
2021-04-22 18:24:14	OES	Flat	25	e202104220014.fit	2022-01-08 20:09:41	✓	PG2359+197, PG2358+107
2021-04-22 18:25:22	OES	Flat	25	e202104220015.fit	2022-01-08 20:09:41	✓	PG2359+197, PG2358+107
2021-04-22 18:26:30	OES	Flat	25	e202104220016.fit	2022-01-08 20:09:41	✓	PG2359+197, PG2358+107

Figure 23: Change file allocations - Success