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EDPS-GUI manual

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Contents

1 Introduction

1.1 Scope

This document describes in details the `edps-gui` dashboard (Graphic User Interface), the recommended infrastructure to reduce data from the ESO telescope, using the ESO Data Processing System (`EDPS`). Each instrument has a dedicated tutorial that guides the user through the data reduction for that specific instrument.

Note: this manual refers to:

- `EDPS` version 1.5.7.
- `edps-gui` version 1.0.

1.2 What is `EDPS`?

The ESO Data Processing System (`EDPS`) is a framework to run ESO's data processing pipelines and it is meant to eventually replace the previous ESOReflex environment. The general principles of `EDPS` have been described by Freudling, Zampieri, Coccato et al. [2024, A&A, 681, A93]. Please refer to that paper if you have used `EDPS` for research resulting in a scientific publication.

Each of ESO's data processing pipeline consist of a series of standalone programs called *recipes*. Each recipe is designed to process certain type(s) of input data. The processing of these input data typically requires a range of auxiliary files such as calibration files. `EDPS` is designed to select appropriate input data for the different recipes of a pipeline, and execute them in sequence. This is done by specifying for each pipeline the workflow for organizing data and executing the recipes. This workflow can the used to process a set of data fully automatically.

1.3 Main concepts

`EDPS` is an environment designed to execute the recipes of an instrument pipeline according to a series of instructions. The main concepts in `EDPS` are:

- **Workflow** and **reduction cascades**. A workflow is a series of instructions designed to reduce data with an instrument pipeline in potentially multiple ways, by carrying on a sequence of tasks. Each workflow can define multiple reduction cascades, depending on the scientific needs. For example, the same workflow can be used to process data following different strategies that trigger different reduction steps (e.g. in one strategy flux calibration can be omitted) or different end-points (e.g., combine different science exposures, or stop after the reduction of individual exposures without combining them). Each of these "strategies" defines a "reduction cascade".
- **Task**, **jobs**, and **recipes**. A task is an element in the workflow that performs a given step of the data reduction cascade. Tasks are often associated to a recipe of the underlying instrument pipeline. A jobs is a work unit in a processing environment, that runs a recipe on a set of input data with a set of recipe parameters. A single task can generate several jobs: for example, a "bias" task, can generate multiple jobs, each of the running the bias recipe on a different set of input files.

- **Dataset**. A dataset is a collection of files, that are needed to perform the data reduction as specified by the workflow. It consists, for example, of one or more science files plus the calibrations needed to process them. In EDPS, datasets have an hierarchical structure, which highlights the connections between the various files and tasks (e.g., task A is an input to task B).
- **Target** and **Target category**. The "target", or the "target task" is the end point of the reduction cascade. When specifying a target, EDPS will process all and only the files needed to execute it. For example, if my target is "science", and the science files need the bias files, EDPS will process only the biases that have been selected to process those science files; then it processes the science using the product of the bias reduction. However, if my target is bias, then EDPS will process all and only the bias files, regardless they are not used by any science. In this case, EDPS does not processes the science, as it has already reached the end reduction point (e.g., process all biases). The "Target category" is a group of targets that have similar purposes. For example, the target category "science", includes all the tasks that deliver final scientific products, the target category "qc1calib" includes all and only the tasks that processes calibrations (e.g., bias, flat fields, standard stars).

2 `edps-gui`: the EDPS dashboard

To install the `EDPS` dashboard (a.k.a. `edps-gui`), please follow the instructions given in the quick-guide;

To launch the dashboard, type:

```
. <path-to-environment>/bin/activate
edps-gui
```

The `<path-to-environment>` is the full-path-name of the virtual environment defined during the installation procedure.

The `edps-gui` is then loaded on a browser window (see Figure 1). To start `EDPS`, press the `Start EDPS` green button at the top of the window. To stop `EDPS`, press the `Stop EDPS` red button and press 'Ctrl-c' on the terminal where the `edps-gui` command was launched.

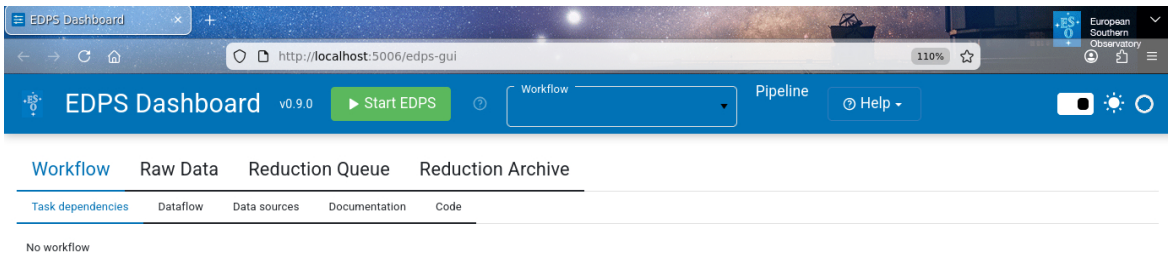


Figure 1: The `edps-gui` dashboard (Graphic User Interface). At this stage, `EDPS` has not been started yet and no workflow has been selected.

At the top of the Dashboard, near the `Start/Stop EDPS` buttons there is the **Workflow** selection menu, which allows to load the desired workflow. The available workflows depend on the pipelines installed in your system.

The `Help` drop-down menu contains version information, reference, and the **Settings** menu, which allows to configure several `EDPS` behaviours, such as links to data-storage directories, and the parallelization. It is described in detail in Section 2.1. Note that it is possible to change the settings only if `EDPS` has not been started yet.

There are 4 tabs in the main dashboard window, they are:

- **Workflow**. It gives information on the workflow, the graphic layout, a description of the type of data and access to the workflow code. It is described in detail in Section 2.2.
- **Raw Data**. It allows to specify the input data, the preferences for association calibrations, and to create datasets to be reduced. It is described in Section 2.3.
- **Reduction Queue**. It starts the data reduction. It is described in Section 2.4.
- **Reduction Archive**. It gives access to previously archived data reduction and final products. It is described in Section 2.5.

At the bottom of the dashboard, the graphic representation of the selected workflow is visible (e.g. Figure 3).

2.1 Settings

Several options in EDPS can be specified in a configuration file, named application.properties. This file is located in the .edps/ directory in your HOME directory. It is possible to modify the file directly through the EDPS-GUI, by selecting the menu "Settings" in the drop-down menu "Help" at the top of the GUI (Figure 2).

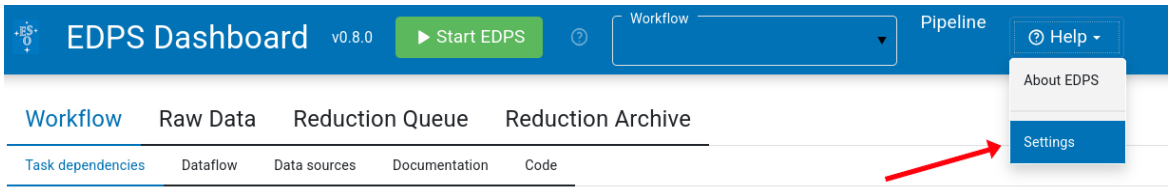


Figure 2: Location of the "Settings" menu. Settings have to be changed while EDPS is not running.

Note, the file can be edited only if EDPS is not running; press the Stop EDPS red button if necessary. In the following, we describe the most important configuration variables. After the settings are changed, press the SAVE button to save. They new values will be used when pressing Start EDPS the next time.

- **Location of products and database**: The base_dir and path variables.

  This is the folder where EDPS saves all the products of all the executed jobs (specified via base_dir), as well as it keeps a database with the information of the various reductions (specified via path). These are specified at the first execution of the edps-gui, but it might be convenient to change it, e.g. if the selected location has no more space. Obviously, if new values are specified, all the information stored in the previous location is no longer visible. It is recommended to specify full paths, otherwise a new directory will be created every time on the path the edps-gui is launched from.

- **Association preference**: RAW vs MASTER calibrations.

  Note: it is recommended to specify this variable via the GUI, before creating the datasets (see Section 2.3) and not by editing the application.properties *file.*

  If the input directory contain both MASTER (e.g., pre-reduced calibrations) and RAW calibrations, it could happen that both of them fulfil the matching criteria and quality level for a certain task. In this case, one can specify to which type of calibration to give priority by setting the variable association_preference in the configuration file. Possible values of association_preference are:

  - **raw**. First, EDPS checks if there are raw calibrations ensuring the first quality level of the products (see Section 3.1). If found, they are associated. If not found, raw calibrations ensuring the second quality level of the products are searched. If not found, the next level is searched until the last quality level is reached. If no raw calibrations are found for none of the quality levels, then EDPS searches for master calibrations, starting from those ensuring the first quality level. If none are found, the second level is searched, and so forth. If no calibrations are found, the association is not done.
  - **master**. Same as raw, but first master calibrations are looked for all the products quality levels permitted by the workflow parameter quality_threshold. Then, if master calibrations are not found, the system looks for raw calibrations.

  - **raw_per_quality_level** (default). First, the system will check if there are raw calibrations ensuring the first quality level of the products. If not found, MASTER calibrations ensuring this level are searched for. If not found, RAW calibrations ensuring the second quality level are searched for, if not found MASTER calibrations matching the second quality level are searched for. The sequence goes on until the last level permitted by the workflow parameter quality_threshold.
  - **master_per_quality_level**. Same as raw_per_quality_level, but with inverted roles for MASTER and RAW calibrations. If a combination of RAW and MASTER calibrations are present, the value of association_preference might have an impact on the performances and the quality of the results. Typically. association_ preference = raw_per_quality_level delivers the best quality products, at the price of speed. On the other hand, association_preference = master ensures faster performances, at cost of quality (e.g., a very old master calibration could be used instead a more recent raw calibration). If only RAW or MASTER calibrations are present in the input directories, then the value of association_preference has no impact.

- **Parallelization** One of the advantages of `EDPS` is that it can exploit powerful hardware. The following variables in the `application.properties` file determine the parallelization of EDPS reduction.

  - **processes** (default: 1). It specifies the maximum number of jobs to run in parallel (e.g. `esorex` parallel executions).
  - **cores** (default: 1). It specifies the maximum numbers of computers cores to use, considering all the parallel jobs.
  - **default_omp_threads** (default: 1). The number of cores to use for each job. This can be overridden by specifying a recipe parameter `OMP_NUM_THREAD` for a given task when configuring the reduction.

  The optimal configuration depends on the system and on the instrument pipeline (e.g., whether it is parallelized or not).

  In case of parallelized pipelines, we recommend to reserve to `EDPS` the full number of cores (minus 1). Set 2 processes in parallel, and default_omp_threads to about 1/2 of cores.

  In case of non parallelized pipelines, we recommend to reserve to `EDPS` the full number of cores (minus 1). Set the number of parallel processes as the number of allocated cores, and default_omp_threads to 1.

- **Order of executions**. The variable ordering in the `application.properties` file specifies the priority to give to the reduction jobs. The most important values are:

  - **dfs**. depth-first, gives preference to reaching final reduction target quicker. In other words, it finish the reduction of a dataset before moving to the next dataset. This choice is less efficient in time but it gives priority to the reduction of individual datasets.
  - **type**. It gives preference to following the reduction cascade level by level making sure to process same type of data together (eg. first all biases).
  - **dynamic**. Immediately runs whichever job is ready (has all needed inputs), no stalling but the order is unpredictable. This is the most time efficient execution order.

2.2 The Workflow tab

This tab gives information about the workflow, that can be accessed by clicking on the available sub-tabs:

- **Task dependencies**. It shows the connection between each task and sub-workflows. The tasks are the individual processing steps that run a specific pipeline recipe. A sub-workflow groups tasks of similar purposes to simplify the overall data flow structure. Each sub-workflow is also illustrated with the relations between the tasks within it.

  The tasks descriptor indicates the name of the task, the recipe, the main input and the associated inputs. The descriptor also indicates whether an associated input has to satisfy a certain condition to be associated (e.g., a calibration X is associated only if the user specifies it in the preferences, or if the main input is obtained with a certain instrument setup). Descriptor for the sub-workflows indicates the tasks within it, and the corresponding main inputs and recipes.

  The colour of the lines connecting tasks and sub-workflows mirror the colour they have inside the descriptors. Figure 3 shows an example of this tab.

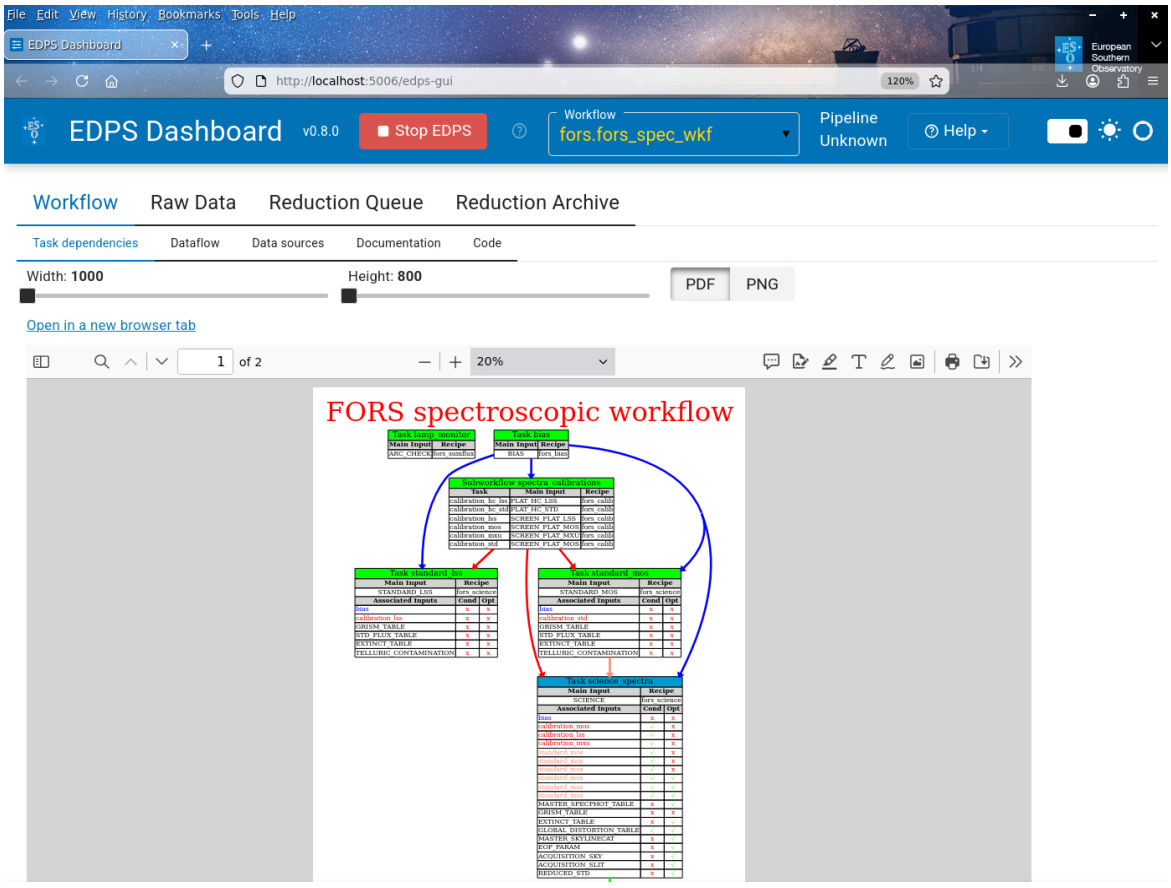


Figure 3: The EDPS dashboard, showing part of the task dependencies within the FORS2 spectroscopic workflow.

- **Dataflow**. It is a simpler representation of the workflow. It shows the categories of the data sources of the raw data, the individual tasks (in green) and the sub-workflows (in orange). It provides a global view of the data reduction chain. Figure 4 shows an example of this tab.

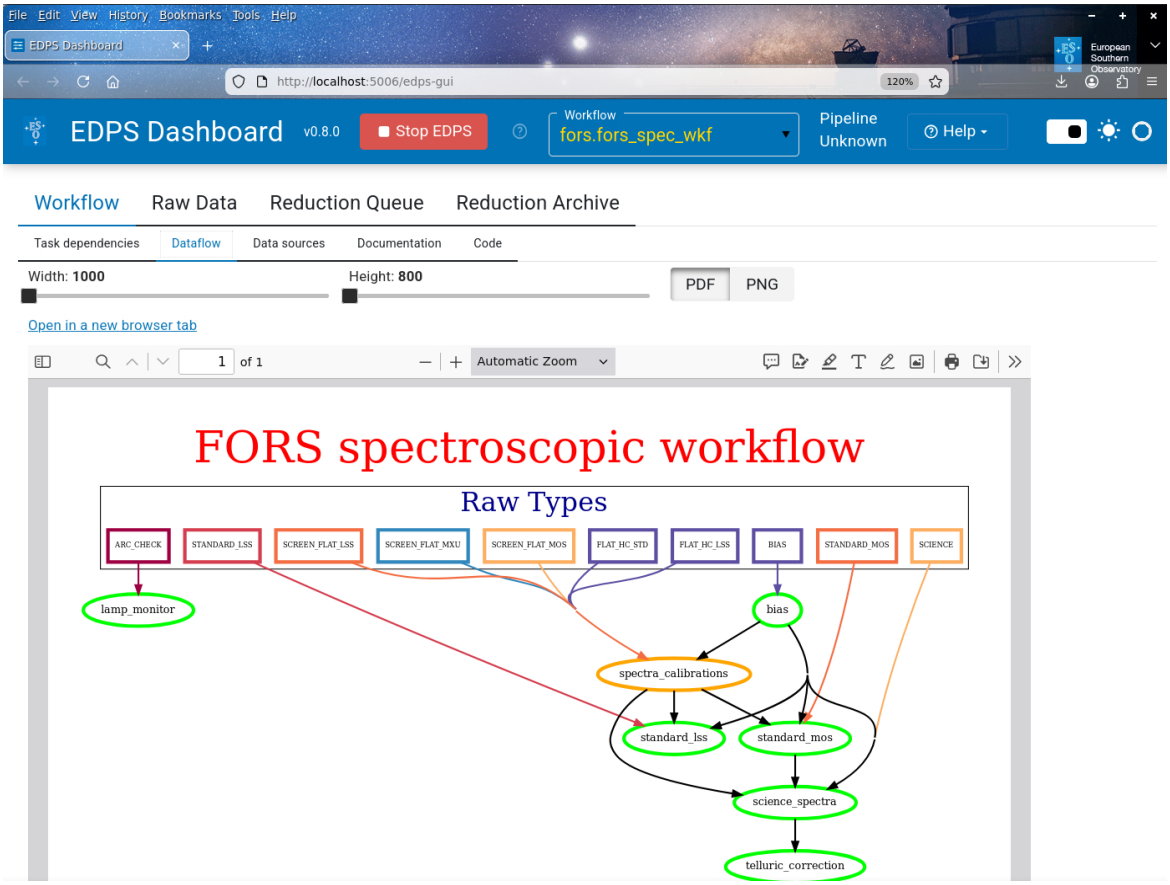


Figure 4: The EDPS dashboard, showing the top-level data flow structure of the FORS2 spectroscopic workflow.

- **Data sources**. It shows the association map, with the definition of the various data-sources, their properties such as
  - **Classification**. The types of files that belong to this data-source. The classification is the tag assigned to the file used by the processing recipe. Note that a single data-source (e.g. SCIENCE) can include files with different classifications (e.g., SCIENCE_LSS, SCIENCE_MOS, SCIENCE_MXU), as they are processed by different algorithms by the pipeline recipe (fors_science).
  - **setup**. The list of header keywords used to recognize the instrumental setup used to obtain those observations.
  - **grouping**. The list of header keywords used to group the files within the same classification. Files of the same group (e.g. that have the same value of the header keywords in this list) are input to the same recipe execution.
  - **Task**. The name of the task that have that data-source as main input. Note that a data-source can be the main input of more than one task.

  - **Recipe**. The name of the recipe executed to process that data-source. Because a data-source can be the main input of more than one task, it can be processed by more than one recipe.
  - **Static calibrations**. Association map between static calibrations, data-sources, and tasks. An ‘x‘ indicates that that static calibration is needed by a given task to process a given data-source.

- **Documentation**. Links to the relevant documentation files for that pipeline.
- **Code**. It shows the Python code of each file in the workflow. The drop-down menu ‘Select file‘ allows to select the file to inspect. Files cannot be edited from the GUI. If changes are needed, edit the file with an external editor, close and reopen the EDP-GUI for the modification to have an effect.

2.3 The Raw Data tab

This tab allows to specify and inspect the input data, to specify how deep into the reduction cascade to go (reduction target), to configure the association preference, and, finally, to create the dataset to reduce.

There are 5 main buttons:

- **Select the input data**. The button "Select Inputs" opens a window that allows to specify the directory where the input data are located (Figure 5).
- **Inspect the input data**. The button "Inspect Inputs" allows to inspect the input files. Press this button and a table with the the list of input files appears. The first part of the table (Figure 6) shows the list of the input files, grouped by category. Click on the arrow of each category to show the files within. Buttons on the left side of each file allows to visualize it either with `fv` or ‘`ds9` (if present in your system). The second part of the table (Figure 7) allows to inspect the headers of the various extensions, and also it allows to inspect the data extension with interactive Python tools.
- **Select reduction target**. This window (Figure 8) allows to specify the final steps of the reduction cascade, the so-called "target tasks". The tasks, i.e. the various steps of the reduction flow, are grouped by categories, which can be selected from the drop-down menu "Target Category".

  `EDPS` processes all the data until the specified target tasks, and triggers all the tasks down in the reduction cascade that are needed to trigger the target task. For example, if the target task is "science", and the reduction cascade foresees that also the "bias" and "flat_field" tasks are needed to provide the necessary calibrations, then EDPS will process all and only the biases and the flat fields that are needed to reduce the science data. If there are other biases or flat fields that are not needed for the specified science exposure, they are not reduced. On the other hand, if the specified target task is "flat_field", then EDPS will reduce all the flat field exposures, plus all and only the biases that are needed for those flat fields.

  Individual tasks within that category are listed in the "Targets" bar. In Fig. 8, the "Science" category is shown, that contains the tasks called science_spectra and telluric_correction. The categories and the tasks depends on the loaded workflow. The category "science" is specified by default. The category "all" shows all the tasks in that workflow. Tasks that are not desired, can be removed from the list. The category "qc1calib" triggers all the calibration and instrument monitoring tasks, but it does not process scientific images. Other target categories are specific for Paranal operations, and are not needed for the general user.

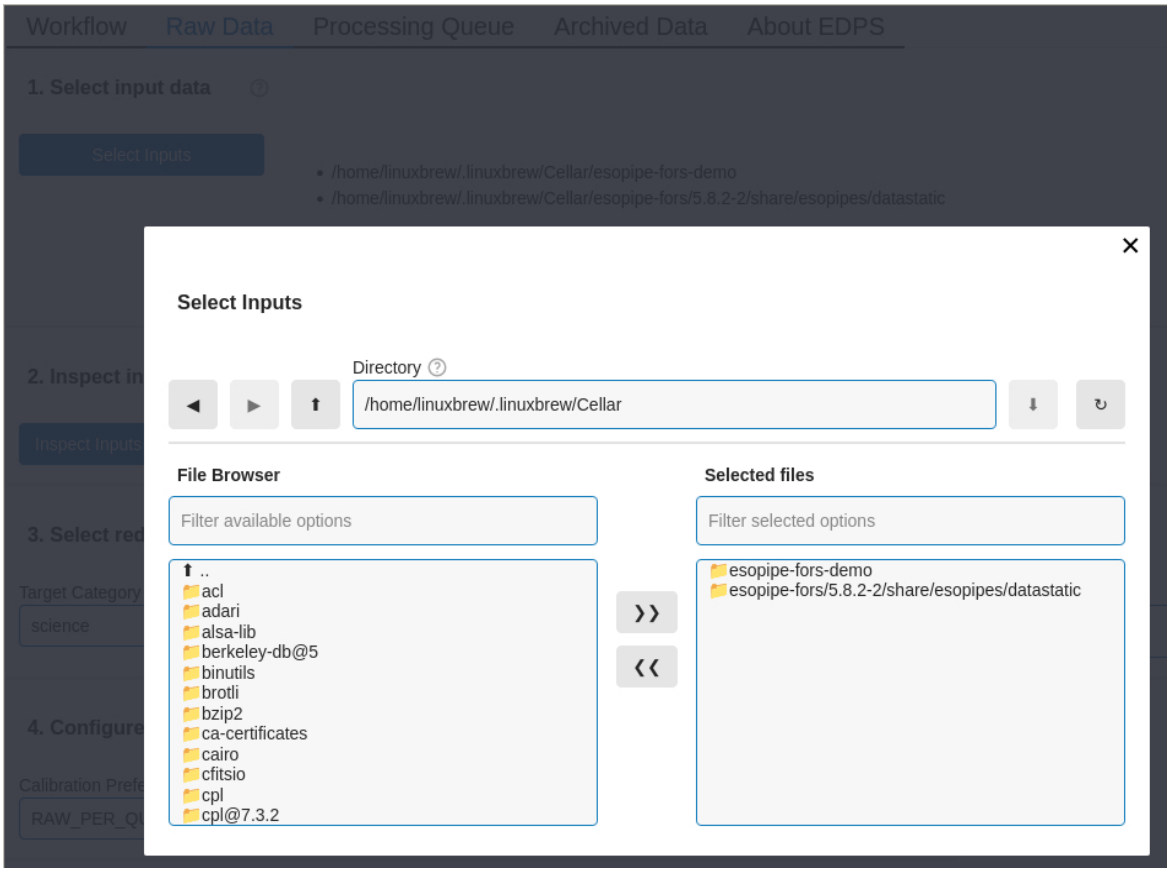


Figure 5: The Select Inputs dialogue box.

- **Select the workflow parameters** This windows allows to specify the so called "workflow parameters", e.g. parameters that define the strategy of the reduction or, as in case of FORS (see Figure 9), the criteria on how to group files to combine. Workflow parameters can influence which files enter a dataset. Click on the parameter name to visualize a short description. Every workflow has a different list of workflow parameters.

  There are several "Parameter sets" that can be selected, e.g. sets whose parameter values are predefined according to specific use cases. By default, the "science" parameter set is loaded, which contains the settings for the most science use cases. This is the recommended parameter set to use or, eventually modify. Other parameters sets are qc0_parameters (for quick inspection at Paranal), idp_parameters (the set used by ESO to populate the science archive), default_parameters (to automatically process calibrations in Chile). Other workflows might contain additional parameters sets, depending on the use case. Note that the parameters shown in this window are only the workflow parameters, e.g. those that can determine the content of the dataset. Other parameters (e.g. recipe parameters) can be configured in the Reduction Queue individually for each dataset (Section 3.2).

- **Create Dataset**. This steps creates the datasets to be reduced until the specified reduction target.

  The menu "Calibration preference" allows to specify the preferences in associating calibrations (e.g., raw or master calibrations). The various preferences are described in Section 2.1.

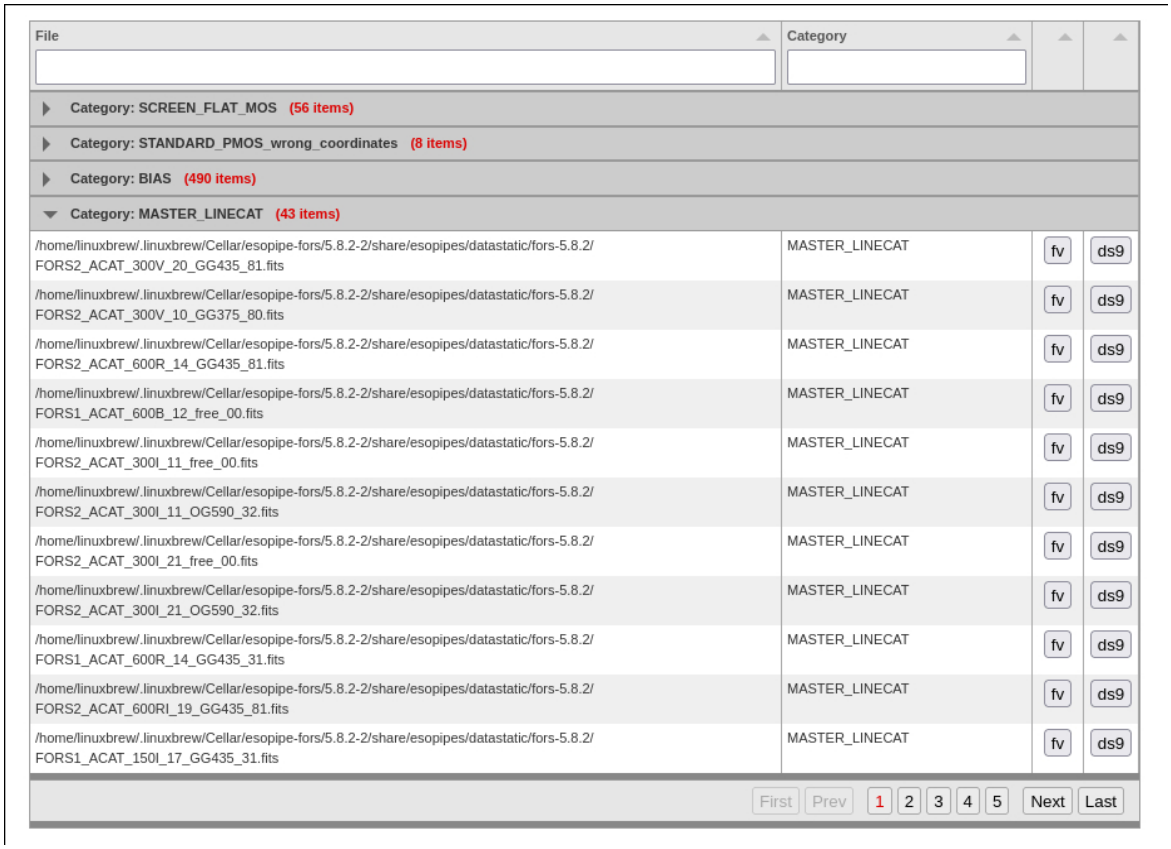


Figure 6: The Inspect Inputs dialogue box: list of categories.

For regular science reduction the options raw_per_quality_level (default) or master_per_quality_level are recommended.

Press the "Create Dataset" blue button to create the datasets. Datasets, together with all the calibrations needed to process them, are listed in a table. Selected datasets can be sent to the processing queue by pressing the "Submit to Reduction Queue" blue button.

Important notes:

- When submitting a dataset, the reduction 'does not start automatically'. To process a dataset, please, go the the Reduction Queue tab.
- You cannot submit to the Reduction queue datasets that are already submitted.
- If datasets are already generated, the "Create dataset" button is not active. Because a dataset is defined by the reduction target and the files it contains, to generate new datasets, one has either to specify new input files, change workflow parameters that change the way files are included (e.g., different combination strategy) or change the association preference.

The table shows information about the number of jobs, of files, if a dataset is complete, if it has been submitted to the reduction queue, of whether the final products have been archived. It also indicates the **CalibLevel**, i.e. a number indicating the quality of the associations for that datasets. If CalibLevel is 0,

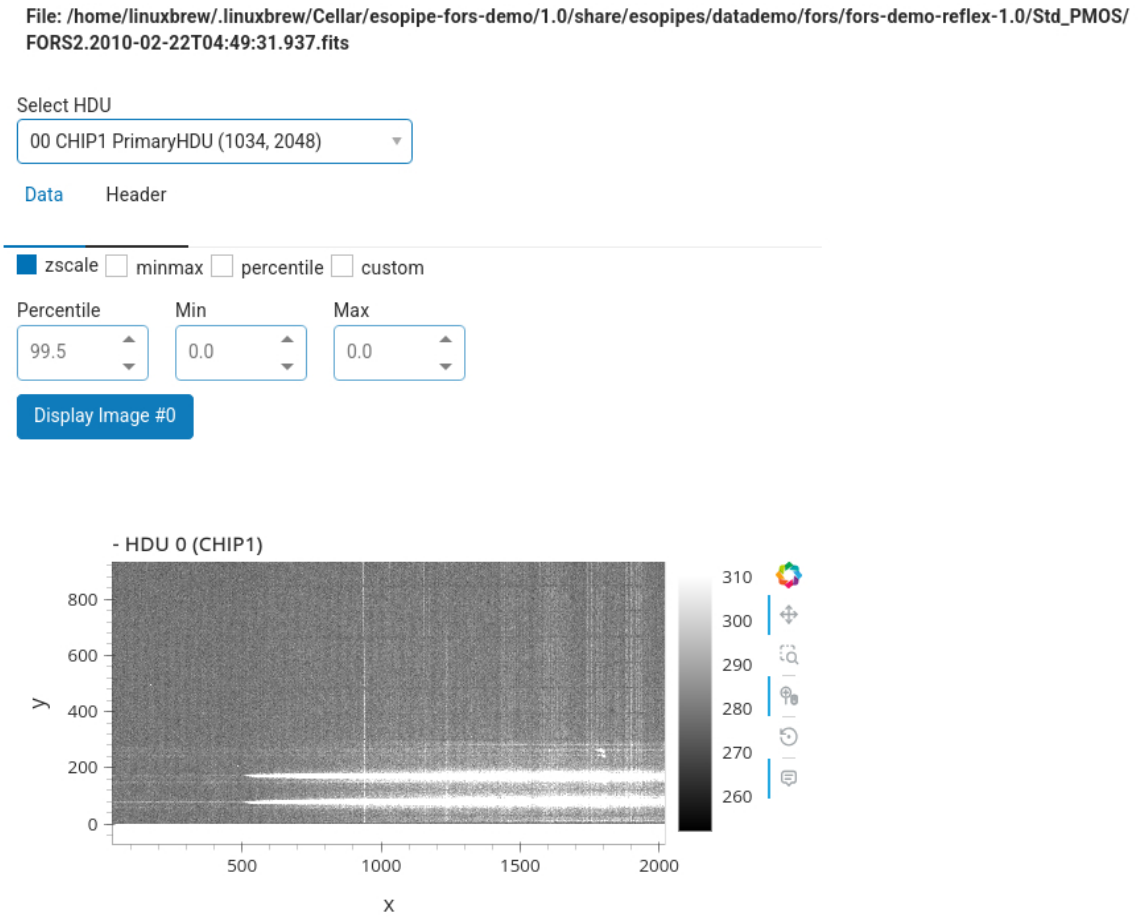


Figure 7: The Inspect Inputs dialogue box, inspection of extensions.

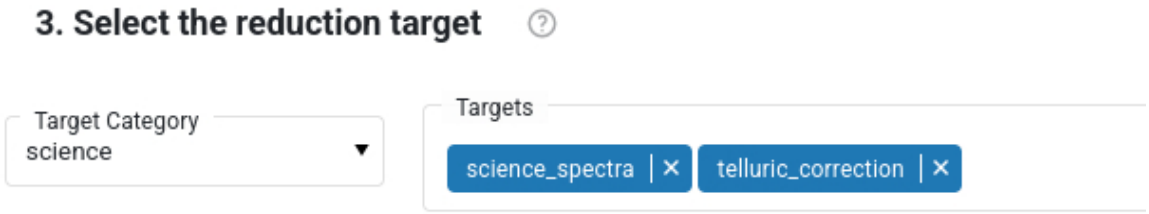


Figure 8: The Select Reduction Target box.

it means that all the associations are within a "safe" time interval foreseen by the calibration plan of that instruments. Higher numbers indicate associations of lower quality. More information on the levels of associated calibrations can be found in Section 3.1.

The content and the file association within a dataset can be inspected by pressing the button  at the end of each dataset row. This shows the association tree as in Figure 11. Incomplete datasets are marked

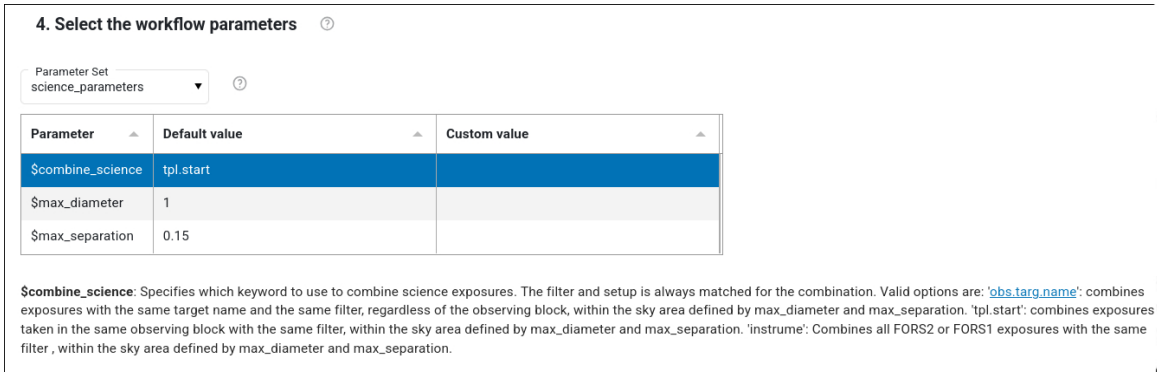


Figure 9: The Select Workflow parameters window. Click on a parameter to display the description.

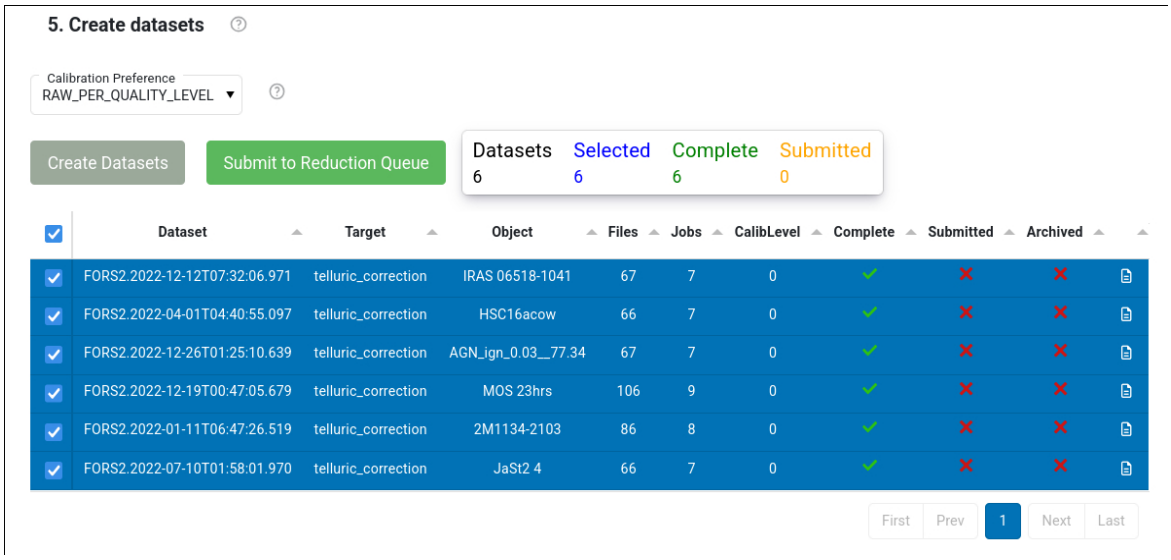


Figure 10: The Create Dataset section. The table shows the available datasets, with some information on the content, and allows to mark datasets for reduction.

in red, with the indication of what is missing.

2.4 The Reduction Queue tab

The **Reduction Queue** main page is shown in Figure 12. The main table shown in this page lists all the datasets that are in the queue. Each dataset has a list of "configurations", e.g. the individual reductions of that same dataset with different parameters. Each dataset configuration has a status, that could be either:

- "NEW": the configuration has never been processed yet.
- "COMPLETED": the reduction of that dataset with that configuration has been sucessfully executed.
- "PENDING": the reduction is scheduled but no jobs has been executed yet

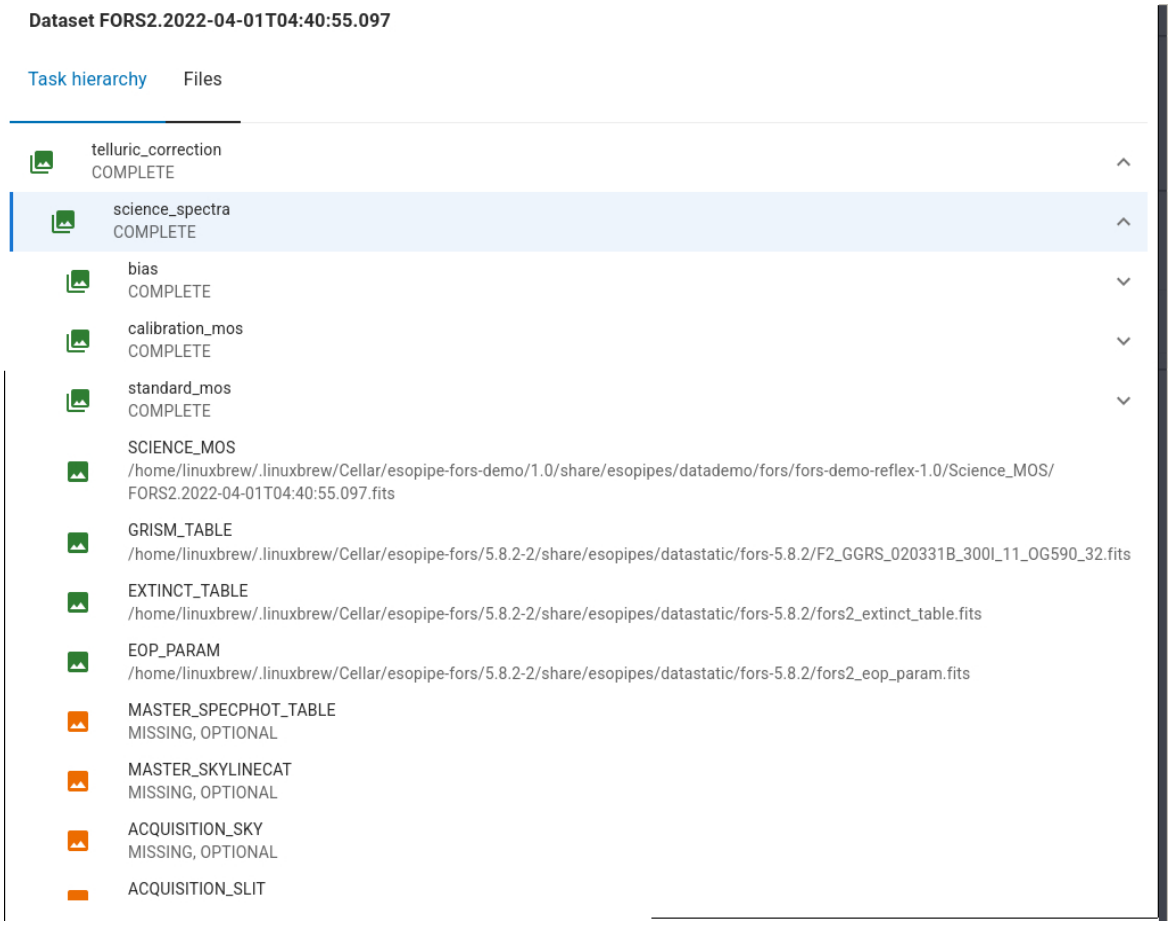
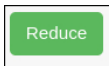


Figure 11: The tree-structure of a dataset, illustrating the calibration cascade. Orange and Red symbols show the optional and mandatory calibrations that are missing, respectively

- "RUNNING": the reduction has started, some jobs have been completed, some jobs are running and other pending.
- "FAILED": the reduction terminated but some jobs have failed.
- "ABORTED": the reduction was aborted.

Only "NEW", "ABORTED" or "FAILED" configurations can be reduced. "COMPLETED" configurations can be modified: in this way a new configuration is created and can be processed.

At the end of the raw of each configuration, the button  allows to specify the data reduction parameters for a given dataset, and therefore it allows to create a different configuration for the same dataset. See Section 3 for more details on how to configure the reduction.

After creating a new configuration, press the button 

to start the reduction of all the selected datasets.

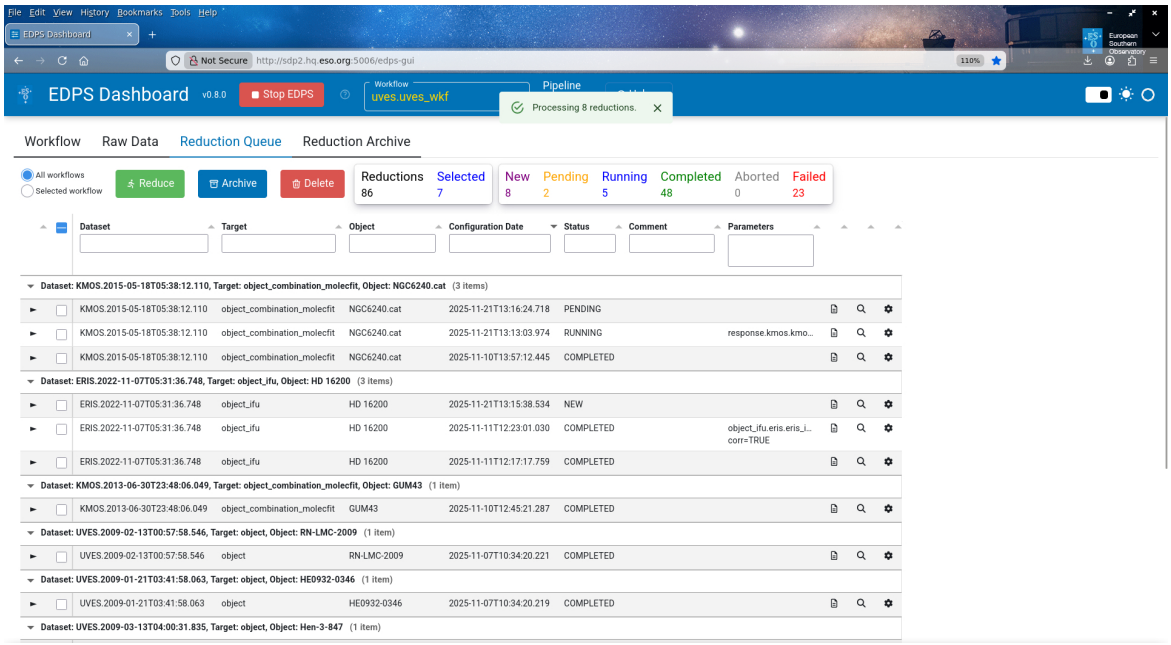
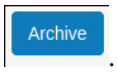


Figure 12: The Processing Queue main tab. The top part shows the datasets and their configuration listed for processing and the main command buttons. The configuration status is reported. The lower part indicates the reduction progress.

The expand button  next to each configuration, allows to see the list of the tasks and their status. The button with the magnifying lens  next to each task, shows the graphic report associated to that specific reduction step. On the other hand, the same button next to the dataset, shows the graphic report of the last step of the data reduction.

The button  next to each dataset allows to inspect the various products of the reduction, as done for the input data (see Section 2.3).

The results of a reduction can be stored in a desired location by pressing the button 

. See 2.5 for further information).

2.5 The Reduction Archive tab

All the products (final and intermediate) of all reduced configuration for all datasets are saved into the `EDPS_data` directory. In addition, `EDPS` offers the possibility to "archive" a desired reduction (e.g., the one that gives the best results) by "exporting" only the final reduction products into another location.

Select the desired reduced configurations and press the "Archive button". This configuration disappears from the Reduction Queue and appear in the tab "Reduction Archive".

The content of the "Reduction Archive", e.g. the list of archived reductions, can be inspected by pressing the **Reduction Archive** tab (Figure 13).

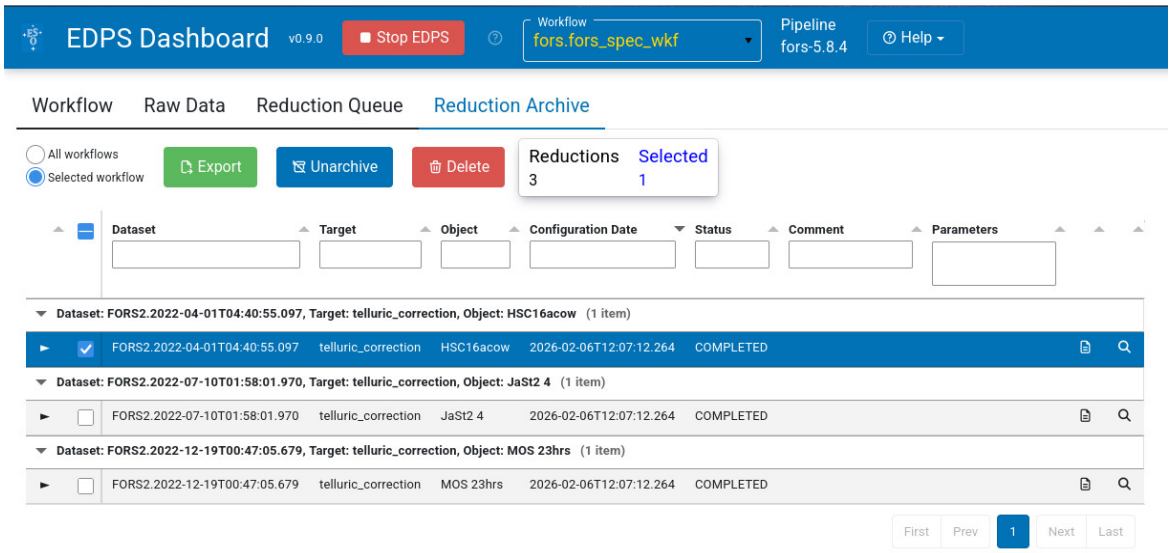


Figure 13: The reduction archive tab. This table contains all the different configurations of datasets that are declared "finished" and removed from the Reduction Queue. From this page, the user can export the most important files into a desired local directory.

Each configuration and its jobs can be inspected, unarchived and eventually deleted. In order to copy the final products into a desired location, press the Export button. A window will appear as in Figure 14, allowing:

- to select all or just the last configuration for the selected datasets
- to specify a directory where to save the files. A check is done

Press **Export** to save the files.

The types of files to copy depend on each workflow. Typically, only most important files of the scientific tasks are saved. Other files can be found in the EDPS_data directory. The operation can take several minutes, depending on the sizes of the files. The default structure is:

`<dataset_name>/<reduction_time_stamp>/<category>.fits.`

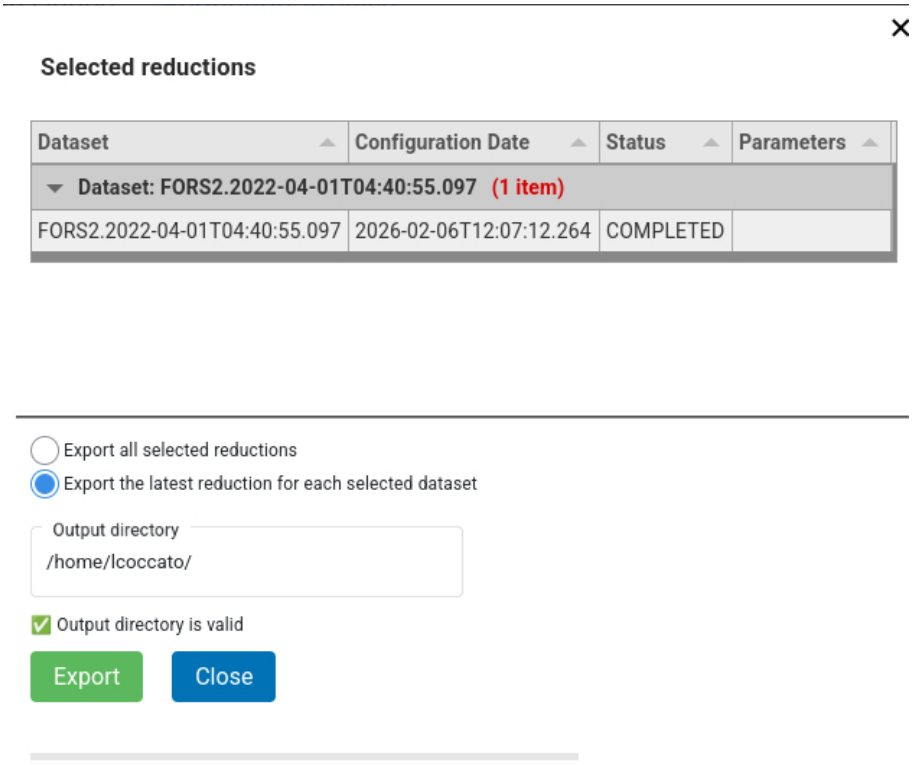


Figure 14: The EXPORT dialogue window, where the user can decide which reduced configuration to save and where.

3 How to configure a reduction

3.1 Association levels

Processing a given type of data (e.g., science frame) requires certain calibrations (e.g., flat field) that match similar properties (e.g., taken with the same filter). The rules on how to associate a given calibration to a given file requiring it are encoded within the workflow. There could obviously be many calibrations that matches the association criteria (e.g., many flat fields taken with the same filter). In this case, EDPS associates the closest in time. However, having found a calibration does not mean that that calibration delivers a trustful reduction (e.g., the flat could be 5 years old). Therefore, in EDPS there is the concept of "association level", or "quality level of the association", typically a quality level is associated to a validity time range that can differ for different types of calibrations and instruments. EDPS first looks for calibrations that satisfy the first quality level (e.g., 24 hours), associated to the instrument calibration plan (labelled, for convention, as level=0). If a calibration in that validity range is not found, then calibrations within the second validity range are searched (e.g., 2 days), and so forth until the last validity time range (e.g. 3 months) encoded for that calibration (labelled, for convention, to quality level=3). Calibrations outside the last validity period are not associated. It is possible to see the quality level of each association in the dataset description. One can therefore decide whether the level of association is enough, or to look for other calibrations in the archive. The convention of the association levels is the following, the time range of the different levels obviously depend on the instrument and on the calibration itself:

- **level $<$ 0**. Calibrations more restrictive than the calibration plan are selected.
- **level = 0**. Calibrations that follow the rules of the instrument calibration plans are selected.
- **level = 1**. The selected calibrations are sufficient to ensure good quality science results.
- **level = 2**. The selected calibrations "probably" produce results of still "acceptable" quality.
- **level = 3**. Significant risk of bad quality results or recipe failure.

3.2 Configuration editor

The data reduction of each dataset can be configured according to the scientific needs using an appropriate configuration editor.

The `EDPS` workflows contain two types of parameters and they both have default values that can be modified to improve the data reduction.

- **Workflow parameters** (for some workflows only) are global and they are applied to the entire workflow. They are accessible both in the ‘Raw Data‘ tab, prior to the creation og a dataset, and in the ‘Reduction Configuration‘ editor, in the ‘Reduction queue‘ tab. Note: some workflow parameters were already configured before creating the dataset and sending it to the reduction queue. Here, they can be changed again. Please, note that the parameters have an effect only on the files that are already in the dataset. If one specifies a parameter that should include extra files in the dataset (e.g., the inclusion of more calibrations), files are not added and the reduction might fail. If you need to change a parameter that modifies the dataset content, please go back to the Raw data tab and create a new dataset.

- **Recipe parameters** are specific to the individual recipes and can be configured per task. They are accessible in the ‘Reduction Configuration‘ editor, in the ‘Reduction queue‘ tab.

This editor allows to configure the data reduction for a given dataset by specifying workflow and recipe parameters.

Note: some workflow parameters were already configured before creating the dataset and sending it to the reduction queue. Here, they can be changed again. Please, note that the parameters have an effect only on the files that are already in the dataset. If one specifies a parameter that should include extra files in the dataset (e.g., the inclusion of more calibrations), files are not added and the reduction might fail. If you need to change a parameter that modifies the dataset content, please go back to the Raw data tab and create a new dataset.

To open the editor, click on the wheel button  next to the dataset you desire to configure the reduction for. A window with the configuration editor appears as shown Figure 15.

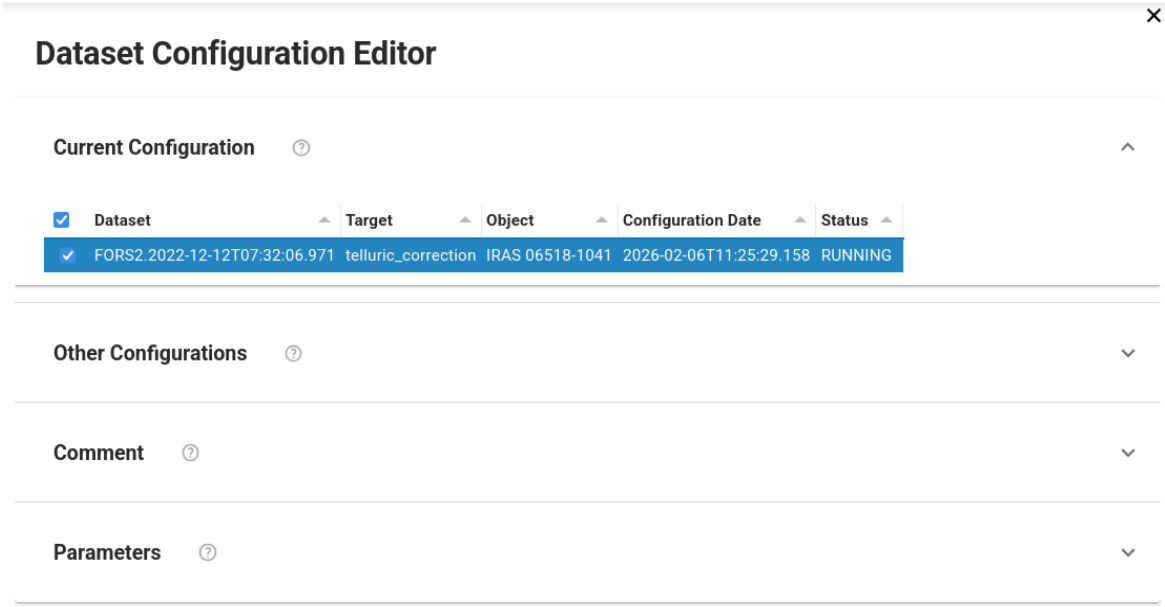


Figure 15: The Reduction Configuration editor. It contains 4 sections, that indicate the current configuration, list of other configurations to set, comments to insert, and the parameters to modify.

The editor is divided into 4 parts, which can be accessed pressing the corresponding expansion arrow.

- **Current configuration.** It indicates the name of the selected configuration for a given dataset (Figure 16).
- **Other configurations.** It allows to specify other configurations, to which the changes shall be copied to (Figure 17.
- **Comment** It allows to specify a comment to describe the configuration. It is possible to append or replace a comment (Figure 18). Comments can be changed on all configurations. It is possible to save the comment for the current configuration only, or for all the selected configurations.

- **Parameters.** A window as in Figure 19 appears.

  The window allows to:

  – Select the parameter set. A pre-determined list of workflow parameters and recipe parameters for a given use case. For the majority of the cases, the "science" parameter set can be used.

  – Edit the workflow parameters. These are parameters that regulates the reduction strategy, e.g. whether to use a given calibration or not, or to trigger a certain reduction step. Note that if the changes imply that some files not in the dataset are needed, the reduction might fail. In case, go back to the raw data tab, edit the workflow parameters there, and recreate the datasets.

  – Edit the recipe parameters. These are parameters associated to the recipe of a given task. Note: the same recipe parameters can be configured differently for the tasks that run the same recipe. Default parameters are shown (albeit some parameters can be dynamic, e.g. 'EDPS' changes their value depending on the type of input data).

  Change the values according to the needs and then select whether to save it to the current or the selected configurations. Note, complete configurations cannot be modified, new configurations will be automatically created instead.

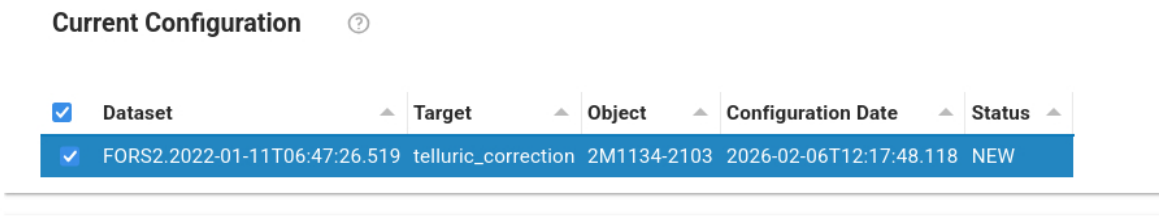


Figure 16: The first part of the Reduction Configuration Editor, that indicates the selected configuration.

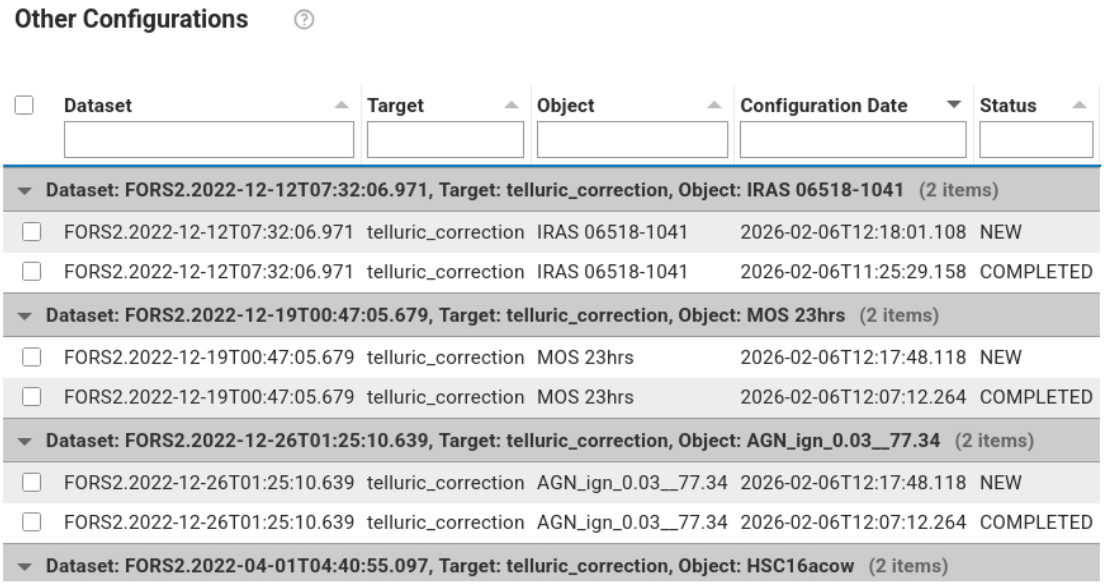


Figure 17: The second part of the Reduction Configuration Editor, that indicates other configurations for which we'd like to apply the changes.

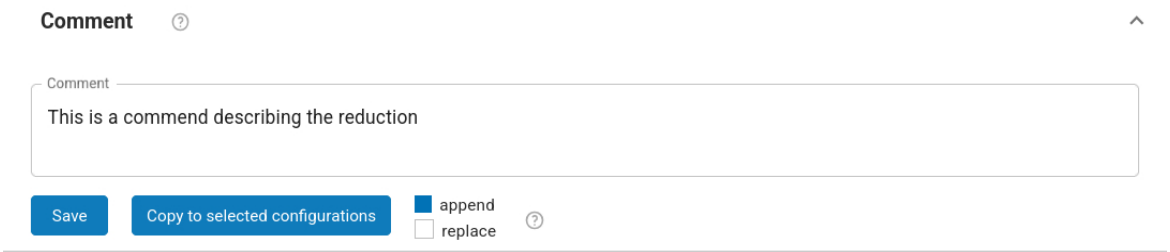


Figure 18: The third part of the Reduction Configuration Editor, that allows to specify a comment to the selected configurations.

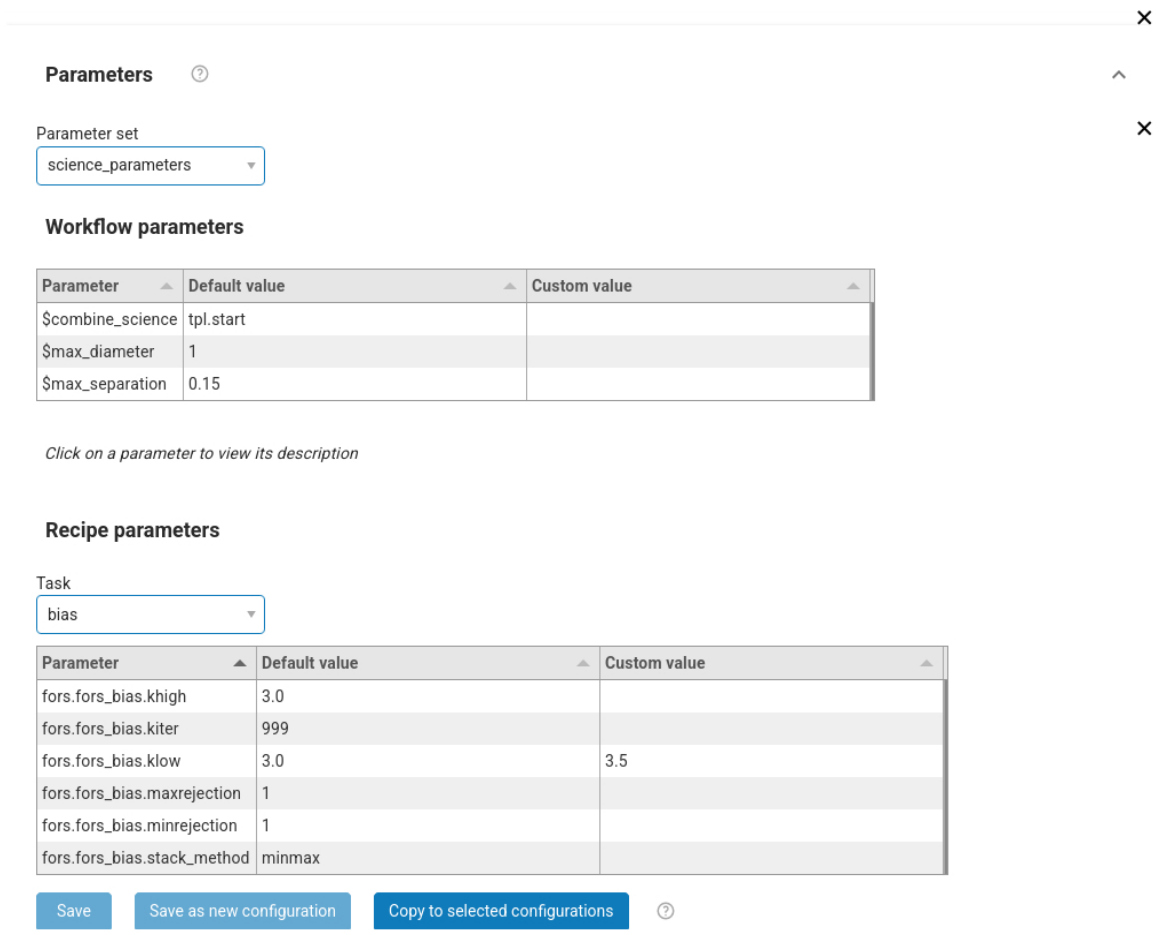


Figure 19: The fourth part of the Reduction Configuration Editor, that allows to specify the parameters sets and the recipe parameter per task. These settings can be applied to the "Selected Configuration" (Fig. 16) or to the "Other Configurations (Fig. 17).

4 Frequently Asked Questions

- **Q1) Where can I find the final reduced data?**

  Answer: all the products of all the datasets and the reductions are saved into the EDPS_data directory, specified when executing the `edps-gui` for the first time. One can decide to export only the final products for selected datasets and only for the desired reduction attempts into another location for further analysis. See Section **??** for further instructions.

- **Q2) How do I stop the application?**

  Answer: Proceed as follows:

  1. Press "Stop EDPS" in the Dashboard.
  2. Type Ctrl-C in the terminal where the application is running. If the application doesn't terminate, type Ctrl-C again.
  3. Alternatively, kill the 'panel serve' process on your system, for example:

     ```
     ps -e | grep panel # get the process ID of the gui (<pid>).
     kill -9 <pid>
     ```

- **Q3) I have closed the browser window where the application is running. How can I reopen the application?**

  Answer: Point your browser to: `http://localhost:5006/edps-gui`

- **Q4) Where can I find some data that I can use to test the application?**

  Answer: Install the 'datademo' package provided with the pipeline installation or download the "Demo Data" package from https://www.eso.org/sci/software/pipe_aem_table.html.

  Please note that the demo data can be large (tens of Gigabytes).

  A convenient script to download demo data for any pipeline is also available and can be used from the command line:

  ```
  curl -O https://eso.org/sci/software/apptainer/eso_download_demodata.sh
  bash ./eso_download_demodata.sh
  ```

- **Q5) How can I start the edps-gui if the following message appears?**

  ```
  Cannot start Bokeh server, port 5006 is already in use
  ```

  Answer: The panel server was not closed properly. Kill it by typing:

  ```
  ps -e | grep panel # get the process ID of the gui (<pid>).
  kill -9 <pid>
  ```

- **Q6) How do I get additional support on EDPS or data reduction in general?**

  Answer: For suggestions, questions, or feedback in general, please open a ticket with the EDPS Support team. This https://support.eso.org/new-ticket?ticket%5Bticket_field_13%5D%5Bdata%5D=227 should take you directly to a webpage for creating and `EDPS` feedback ticket, but in case you want to navigate there 'manually', go to https://support.eso.org, login, click on "Submit Helpdesk Ticket", and specify the Help topic: "Post Observations", "ESO Data Processing System [EDPS]".

- **Q7) I have a lot of disk space, but when I install `EDPS` with `pip` or an ESO pipeline with `Homebrew` I get the error message: `Cannot mkdir: No space left on device`. How do I fix it?**

  Answer: This depends on how much disk space is allocated to the `/home`, `/var`, and `/tmp` directories. The final solution would be to resize the space allocated to the in the organization of the filesystem. However, we list here few tricks that might do the job.

  – Clearing the pip .cache to make space for new packages. Type the command:

    ```
    pip cache purge
    ```

    before installing `EDPS`.

  – Redirect the cache, `Homebrew` temporary build directories into a partition with enough space. Set some of the following environmental variables in your `.bashrc` file:

    ```
    export HOMEBREW_CACHE=<path_to_new_cache_directory>
    export XDG_CACHE_HOME=<path_to_new_cache_directory>
    export HOMEBREW_TEMP=<path_to_new_temporary_directory>
    export TMPDIR=<path_to_new_temporary_directory>
    ```

    The first moves only the location of `Homebrew` cache, the second the cache of most applications (instead of the default `/home/username/.cache`), the third moves the directory where `Homebrew` builds, extracts, and saves temporary files (instead of the defaults `/tmp` and `/var/tmp`). The last changes the global system temporary directory and affects most of the linux commands.

  – As extreme measure, one can move the `/home/linuxbrew/.linuxbrew` directory somewhere else, and create a symbolic link in `/home/linuxbrew`. For example:

    ```
    cd /home/linuxbrew
    mv -f .linuxbrew <path_to_new_directory>
    ln -s <path_to_new_directory> .linuxbrew
    ```

    Important note: this operation might break some internal links. Recipes requiring external packages such as `telluriccorr` might not work (impacts on KMOS, XSHOOTER, FORS2, and MOLECFIT pipelines).