Manual

Spec INTI Editor V3

SpecINTI editor lets you launch specINTI from a graphical interface. It includes a text editor for editing and saving configuration files, an observation file generator, image fits and spectral profile display, and a thumbnail presentation of results in png format. Also included are an interactive tool to help calculate instrument response and a search criteria help function.

Installation

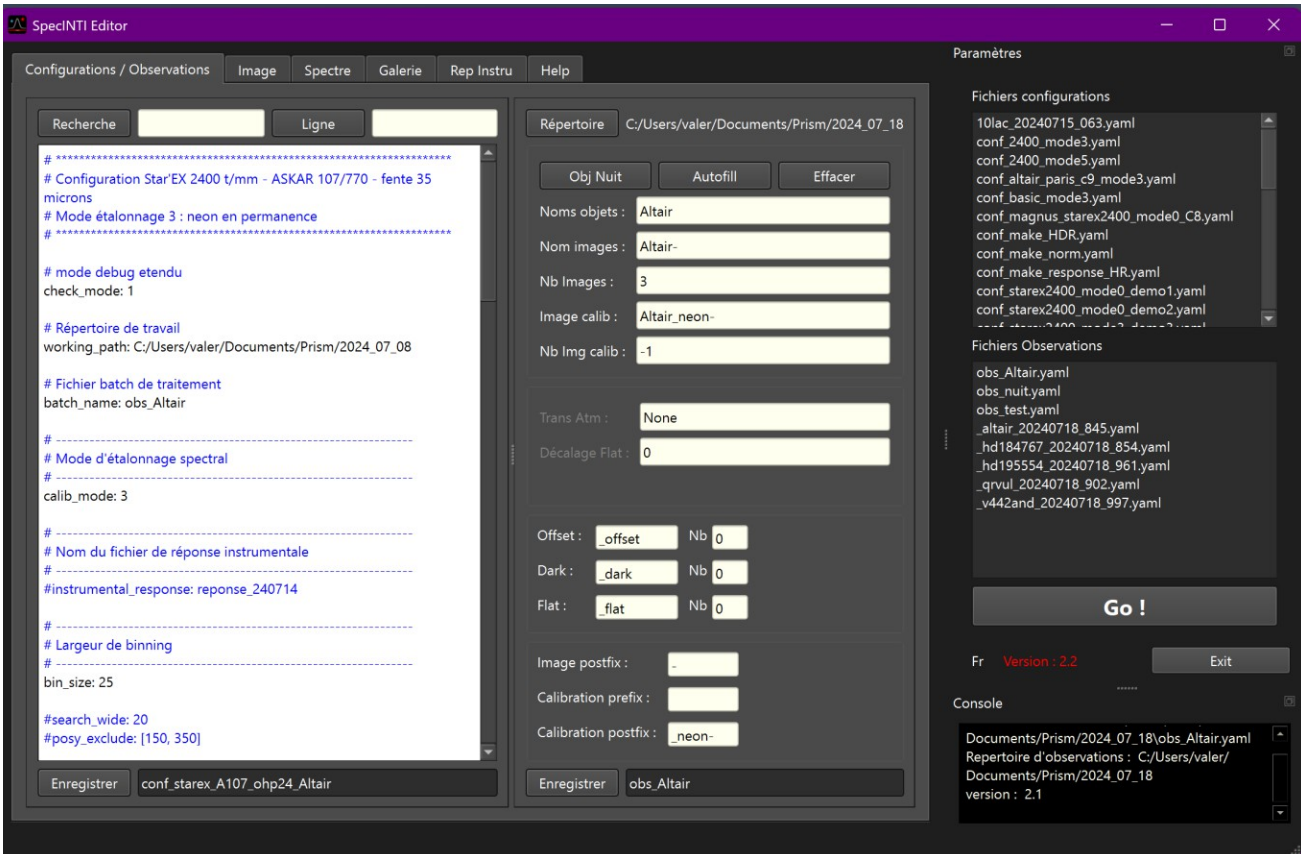
Unzip the specinti_editor file.

For MacOs, see the procedure at the end of this document for authorizing execution of an unsigned application.
signed application.

!! Copy your _configuration folder instead of the default _configuration folder - make sure you don't overwrite it.

General presentation

On launch, the window below appears. It consists of an area of tabs and a panel on the right with two blocks (docks), Parameters and Console.



```
# ******************************************************************
# Configuration Star'EX 2400 t/mm - ASKAR 107/770 - fente 35
microns
# Mode étalonnage 3 : neon en permanence
# ******************************************************************

# mode debug etendu
check_mode: 1

# Répertoire de travail
working_path: C:/Users/valer/Documents/Prism/2024_07_08

# Fichier batch de traitement
batch_name: obs_Altair

# ------------------------------------------------------------
# Mode d'étalonnage spectral
# ------------------------------------------------------------
calib_mode: 3

# ------------------------------------------------------------
# Nom du fichier de réponse instrumentale
# ------------------------------------------------------------
#instrumental_response: reponse_240714

# ------------------------------------------------------------
# Largeur de binning
# ------------------------------------------------------------
bin_size: 25

#search_wide: 20
#posy_exclude: [150, 350]
```

Enregistrer: conf_starex_A107_ohp24_Altair

Répertoire: C:/Users/valer/Documents/Prism/2024_07_18

Noms objets : Altair
Nom images : Altair-
Nb Images : 3
Image calib : Altair_neon-
Nb Img calib : -1
Trans Atm : None
Décalage Flat : 0
Offset : _offset Nb 0
Dark : _dark Nb 0
Flat : _flat Nb 0
Image postfix : -
Calibration prefix :
Calibration postfix : _neon-

Enregistrer: obs_Altair

Fichiers configurations
10lac_20240715_063.yaml
conf_2400_mode3.yaml
conf_2400_mode5.yaml
conf_altair_paris_c9_mode3.yaml
conf_basic_mode3.yaml
conf_magnus_starex2400_mode0_C8.yaml
conf_make_HDR.yaml
conf_make_norm.yaml
conf_make_response_HR.yaml
conf_starex2400_mode0_demo1.yaml
conf_starex2400_mode0_demo2.yaml

Fichiers Observations
obs_Altair.yaml
obs_nuit.yaml
obs_test.yaml
_altair_20240718_845.yaml
_hd184767_20240718_854.yaml
_hd195554_20240718_961.yaml
_qrvul_20240718_902.yaml
_v442and_20240718_997.yaml

Fr Version : 2.2

```
Documents/Prism/2024_07_18\obs_Altair.yaml
Repertoire d'observations :  C:/Users/valer/
Documents/Prism/2024_07_18
version :  2.1
```

The window can be enlarged. The two docks can be independently enlarged, placed on the left, at the bottom.

The console can be detached as an independent window. To dock floating panels, double-click on their title bar.

The interface style depends on the system interface style. In the case below, Windows11 Dark mode.

The application remembers your interface layout for the next launch.

Language management

To change the default language from French to English, click on the 'Fr' button, then restart the application.

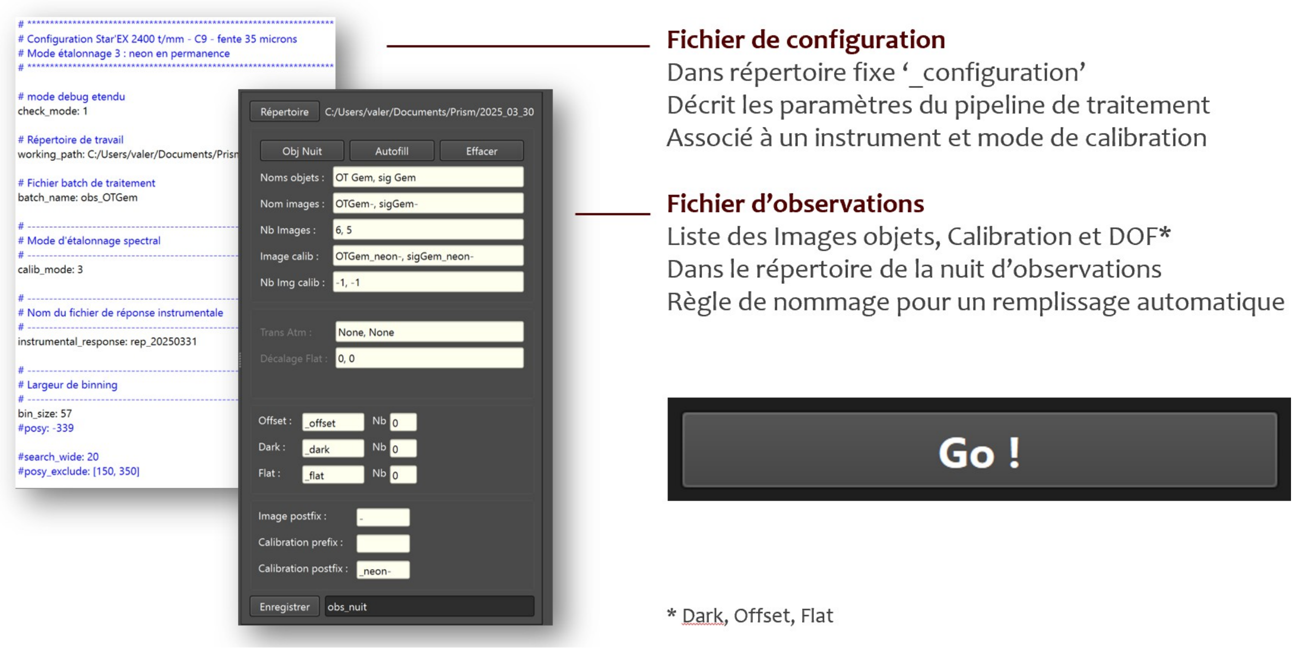
Version check

If you have an Internet connection, the application checks the current version number on the website. If the version is different, the version color changes to red.

Principle of specinti

The specinti processing pipeline is based on two files: the configuration file, which describes the processing parameters, and the observations file, which allows you to batch process one or more objects from your night.

Specinti_editor is the interface that facilitates the writing of these two files.



```
# ***************************************************************
# Configuration Star'EX 2400 t/mm - C9 - fente 35 microns
# Mode étalonnage 3 : neon en permanence
# ***************************************************************

# mode debug etendu
check_mode: 1

# Répertoire de travail
working_path: C:/Users/valer/Documents/Prism

# Fichier batch de traitement
batch_name: obs_OTGem

# ---------------------------------------------
# Mode d'étalonnage spectral
# ---------------------------------------------
calib_mode: 3

# ---------------------------------------------
# Nom du fichier de réponse instrumentale
# ---------------------------------------------
instrumental_response: rep_20250331

# ---------------------------------------------
# Largeur de binning
# ---------------------------------------------
bin_size: 57
#posy: -339

#search_wide: 20
#posy_exclude: [150, 350]
```

Répertoire C:/Users/valer/Documents/Prism/2025_03_30

Noms objets : OT Gem, sig Gem

Nom images : OTGem-, sigGem-

Nb Images : 6, 5

Image calib : OTGem_neon-, sigGem_neon-

Nb Img calib : -1, -1

Trans Atm : None, None

Décalage Flat : 0, 0

Offset : _offset Nb 0

Dark : _dark Nb 0

Flat : _flat Nb 0

Image postfix : -

Calibration prefix :

Calibration postfix : _neon-

Enregistrer obs_nuit

Fichier de configuration
Dans répertoire fixe '_configuration'
Décrit les paramètres du pipeline de traitement
Associé à un instrument et mode de calibration

Fichier d'observations
Liste des Images objets, Calibration et DOF*
Dans le répertoire de la nuit d'observations
Règle de nommage pour un remplissage automatique

* Dark, Offset, Flat

Configuration / Observations

The size of the Configuration and Observations zones is adjustable. Move your mouse between the Configuration and Observations areas, in the region of the three dots, to see the cursor change.

On the left panel :

- Access to configuration files in the _*configuration* directory for simple text editing.
- Access to observation files if you've entered a directory in the observations tab.

To start processing, click on Go !

The *Go!* button launches the configuration script selected in the Configuration tab.

Please note: the "Go!" button saves changes to the Observations file. It is currently not possible to manually modify the name of the observation file in the configuration file; it will be automatically replaced by the current observation file.

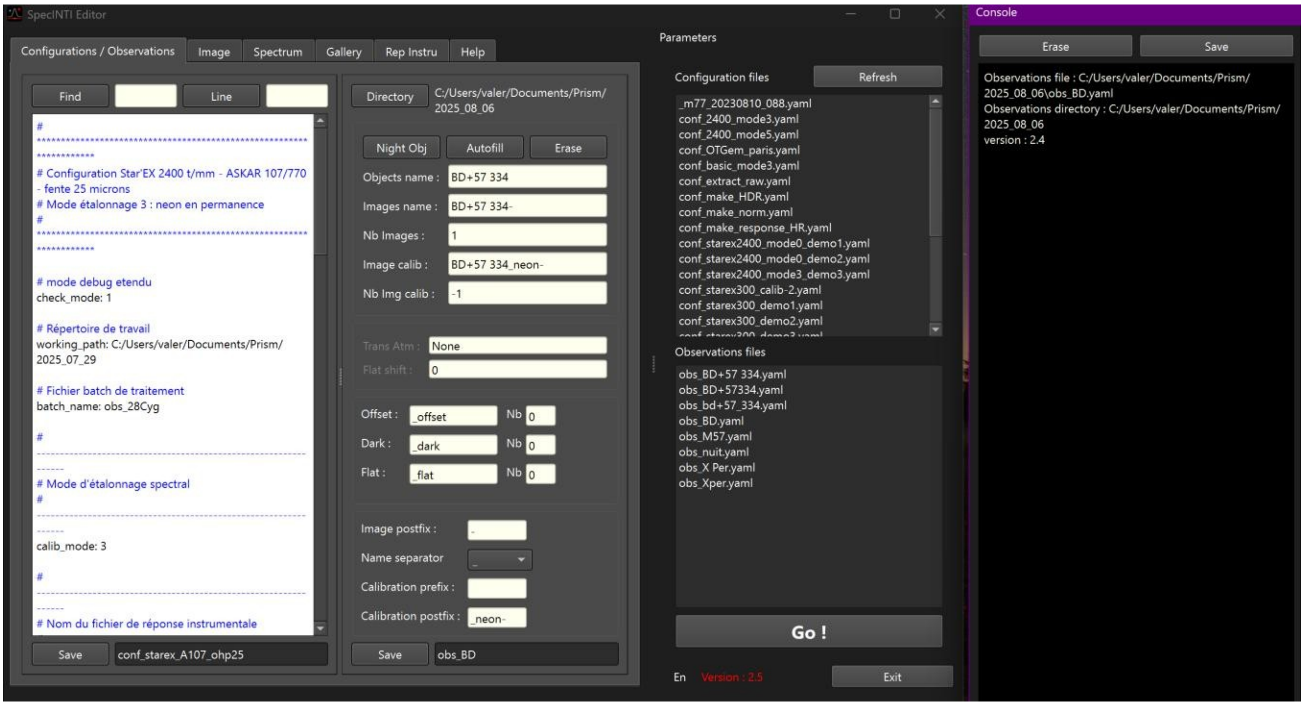
> If you wish to change the default autosave behavior of the observation file, for example to use an observation file from another program, you will need to manually edit the specinti_ini.yaml file by changing the 'autosave_obs' parameter from True to False.

The *Exit* button is used to terminate the application, saving the application parameters.

The console displays real-time information during processing.

You can save the contents of the console by clicking on the "Save" button. The "console.txt" file will be saved in the observations directory or the application directory if the observation directory is not defined.

To delete the contents of the console, click on "Delete".



```
#
************************************************************
************
# Configuration Star'EX 2400 t/mm - ASKAR 107/770
- fente 25 microns
# Mode étalonnage 3 : neon en permanence
#
************************************************************
************

# mode debug etendu
check_mode: 1

# Répertoire de travail
working_path: C:/Users/valer/Documents/Prism/
2025_07_29

# Fichier batch de traitement
batch_name: obs_28Cyg

#
------------------------------------------------------------
------
# Mode d'étalonnage spectral
#
------------------------------------------------------------
------
calib_mode: 3

#
------------------------------------------------------------
------
# Nom du fichier de réponse instrumentale
```

Save: conf_starex_A107_ohp25

Directory: C:/Users/valer/Documents/Prism/2025_08_06

Objects name : BD+57 334
Images name : BD+57 334-
Nb Images : 1
Image calib : BD+57 334_neon-
Nb Img calib : -1
Trans Atm : None
Flat shift : 0
Offset : _offset Nb 0
Dark : _dark Nb 0
Flat : _flat Nb 0
Image postfix : -
Name separator : _
Calibration prefix :
Calibration postfix : _neon-

Save: obs_BD

Configuration files:
_m77_20230810_088.yaml
conf_2400_mode3.yaml
conf_2400_mode5.yaml
conf_OTGem_paris.yaml
conf_basic_mode3.yaml
conf_extract_raw.yaml
conf_make_HDR.yaml
conf_make_norm.yaml
conf_make_response_HR.yaml
conf_starex2400_mode0_demo1.yaml
conf_starex2400_mode0_demo2.yaml
conf_starex2400_mode3_demo3.yaml
conf_starex300_calib-2.yaml
conf_starex300_demo1.yaml
conf_starex300_demo2.yaml

Observations files:
obs_BD+57 334.yaml
obs_BD+57334.yaml
obs_bd+57_334.yaml
obs_BD.yaml
obs_M57.yaml
obs_nuit.yaml
obs_X Per.yaml
obs_Xper.yaml

```
Observations file : C:/Users/valer/Documents/Prism/
2025_08_06\obs_BD.yaml
Observations directory : C:/Users/valer/Documents/Prism/
2025_08_06
version : 2.4
```

Configurations

The list of configuration files in the "_configuration" folder in the application directory is displayed at top right, in alphabetical order.

If you wish to add a file to this directory, without exiting the application, click on the "Refresh" button to update the file list.

Click on the desired configuration file. The file is displayed as text in the area on the right. It can be edited simply as a text file. Comments begin with a "#".

When the software itself updates certain keywords, their color changes to green.

To save a modified file, simply enter its new name and click on the "Save" button.

Configuration tips

You can search for a word in the text of the configuration file using the "Search" button and the associated text box.

You can also navigate to a specific line number using the "Line" button and the associated text box.

Remarks

This section is a wizard for reading and generating an observation file. - The *yaml* file will be saved in the observations directory.

Select the observations directory with the *Browse* button. It is important to not a file.

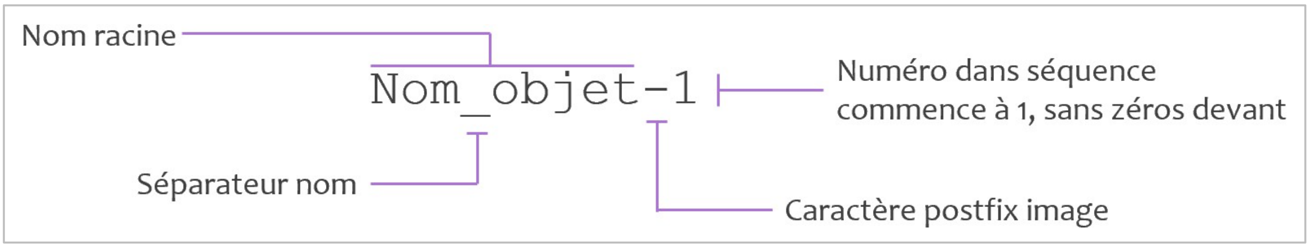
The list of files with *.yaml* extension present in this directory is displayed on the right, with the exception of yaml files beginning with '_', which are in fact configuration files linked to an object generated by specinti after processing.

Please note: SpecINTI generates *.yaml* files which copy the configuration used during processing. These files begin with the prefix "_" and should not be confused with observation files.

All fields can be edited manually. You can start from an existing file.

The power of the generator lies in the "Autofill" function - this function automatically fills in the fields, filling in only the list of objects and the names of the offset, dark and flat master images.

To achieve this, we recommend following a naming rule, the various elements of which are defined below:



Simply fill in the prefixes and postfixes of your image names, as well as the separator character from the object name to the image file name.

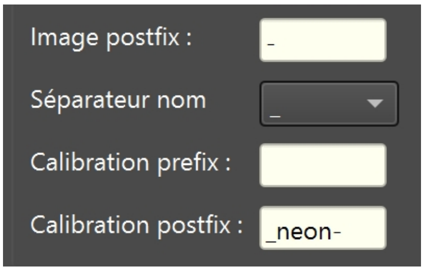


Image postfix : -
Séparateur nom _
Calibration prefix :
Calibration postfix : _neon-

- Image file postfix : indicates the separating character(s) between the root name and the image number in the sequence. For example "-" for sequences of type "etoile-1 ", "etoile-2 "... "etoile n".
- Name separator: transforms the object name into your image file name. image file name. Options are :
  - None: no spaces, EW Lac becomes EWLac
  - '_' underscore, EW Lac becomes EW_Lac, example image above
  - Space: EW Lac becomes... EW Lac - however, it is not recommended to have spaces names, files or directories.
- Calibration file prefix: indicates the character(s) before the root name of the calibration file. For example, "a" for "aetoile-1". This field remains empty if the prefix is not used in your standard.
- Calibration file postfix : indicates the character(s) after the root name of the calibration file. file. For example, "_neon-" for "etoile_neon-1".

Enter the list of object names in a **format compatible with Simbad**.

`Example: "EW Lac", "Altair", "HD 6226".`

Spaces must be respected. Names must be separated by commas, followed or not by a blank.

`Example: Altair, EW Lac, 60 Cyg, omi Cas`

Enter the names of offset, black and flat images WITH their postfixes.

```
Example: "o-", "n300-", "f-"

            or
            "_offset", "_dark", "_flat".
```

The master images must be present in the observation directory.

At this point you can click on **"Autofill"** if your file naming standard complies with the convention described. The fields Image List, Number of images per object, Calibration List, number of calibration images, as well as the number of images for offset, black and flat images will be automatically filled in.

images will be automatically filled in. The operations performed are as follows:

- Deletes spaces in object identifiers and replaces them with the "Name separator" field to create the root name with its postfix.
- For each object, counts the number of images in the object sequence with the root name image.
- Add prefixes and postfixes to root names to create calibration file names, for each object.
- Counts the number of offset, black and flat images, or retains "0" if only one image is found to be compatible with the specINTI standard. If the number of images is "0", specINTI uses the image name as a master image already generated.

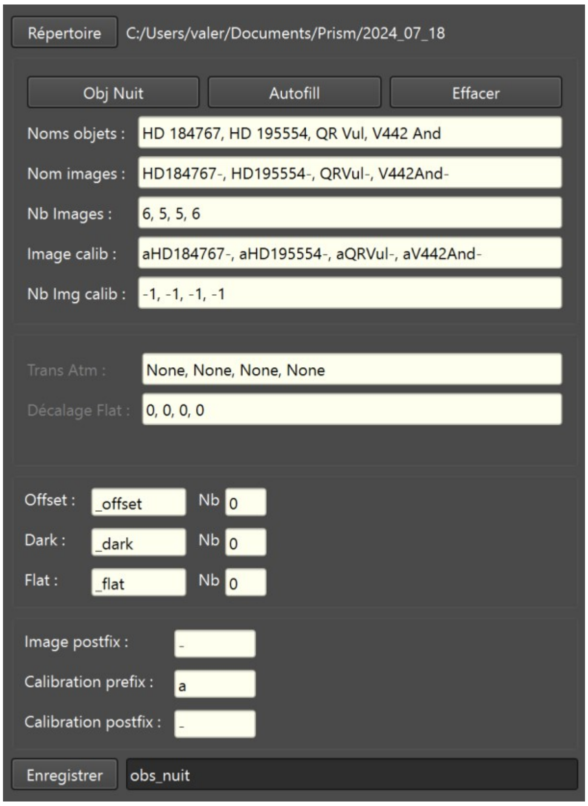
It is therefore important to name images at acquisition according to this convention, so that the auto-fill function fills in all fields with a single click.

Example of acquisition names for stars:
`gamcas-1, v442_and-1, HD 192685-1`

Example of acquisition names for calibration images:
`gamcas_neon-1, v442_and_neon-1, hd1 9265_neon-1`

or with a prefix:
`agamcas-1, av442and-1, ahd192685-1`

Example of automatic filling after manually filling the list of object names (and master images):



C:/Users/valer/Documents/Prism/2024_07_18

Noms objets : HD 184767, HD 195554, QR Vul, V442 And
Nom images : HD184767-, HD195554-, QRVul-, V442And-
Nb Images : 6, 5, 5, 6
Image calib : aHD184767-, aHD195554-, aQRVul-, aV442And-
Nb Img calib : -1, -1, -1, -1

Trans Atm : None, None, None, None
Décalage Flat : 0, 0, 0, 0

Offset : _offset Nb 0
Dark : _dark Nb 0
Flat : _flat Nb 0

Image postfix : -
Calibration prefix : a
Calibration postfix : -

obs_nuit

If you are not using a naming standard, or if you wish to modify the name(s) or number, you can of course edit each field manually. For example, if a calibration image has not been made for an object, you can edit it to replace it with the name of another calibration file closest in time.

You can also start from an existing observation file. To do this, click on one of the files in the list on the right. This can be useful for correcting an error or modifying a parameter.

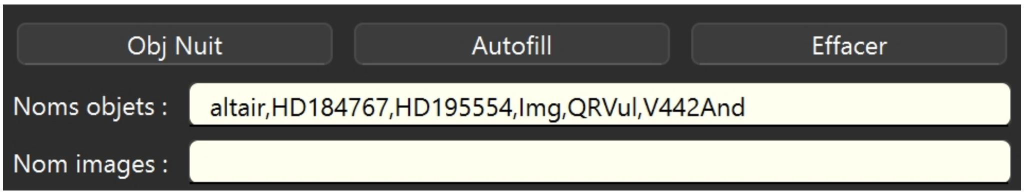
Finish by entering the name of the "observations" file and click on Save to save it. It will be automatically saved when you start processing.

Observations tip

If changes are made to any of the fields in the observations section, the profile file name turns red. This indicates that the observations file will be saved with these modifications.
If this is not desirable, change the name of the file, and the name will change back to white.

Obj Nuit" button is an additional tool to help list all night objects. Its algorithm is as follows: identify all file names with sequence number -1 and place these file names in the object list. You then need to do a little tidying up to remove irrelevant file names and add a space so that the object name conforms to Simbad's rules as seen above.

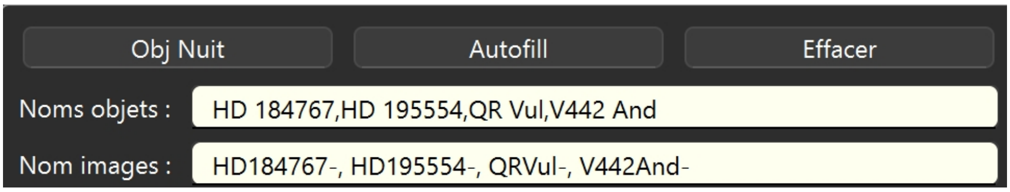
Example on an observation folder - the algorithm finds the following names.



Noms objets : altair,HD184767,HD195554,Img,QRVul,V442And

Nom images :

We eliminate Altair because it has already been processed, then Img, which was a test image, and we add the blanks to name the Simbad objects. Finally, we click on "Autofill".



Noms objets : HD 184767,HD 195554,QR Vul,V442 And

Nom images : HD184767-, HD195554-, QRVul-, V442And-

Advanced mode

- Trans atm file list: list of atmospheric transmission files by object
- Flat offset list: flat offset in pixels for correction by object See specINTI

documentation for use.

By default, the lists are initialized to : None. If image files are not found, their number is -1

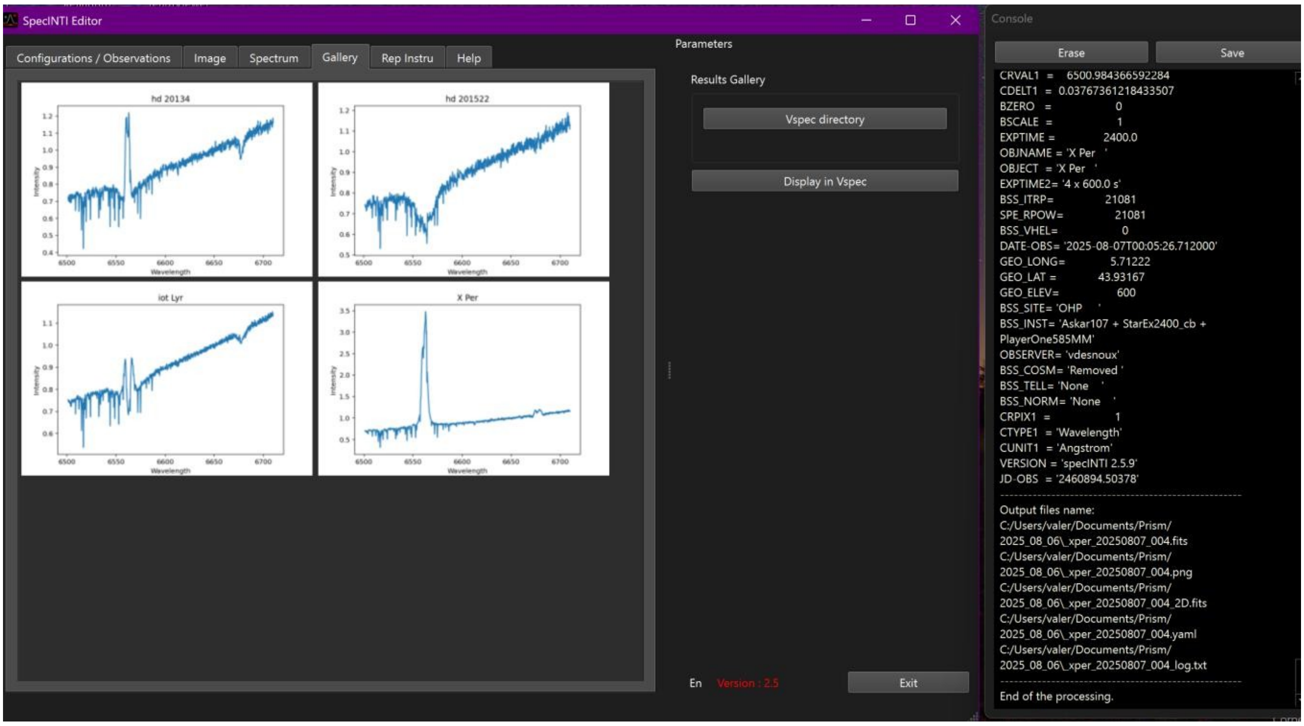
GO !

To start processing, click on the GO! button.

The software saves the observation file and the configuration file automatically, under the names indicated in their respective fields.

Console messages are displayed in the console panel. Messages are displayed throughout specinti processing and, since version 2.5, are displayed in real time rather than in the console or terminal of your PC.

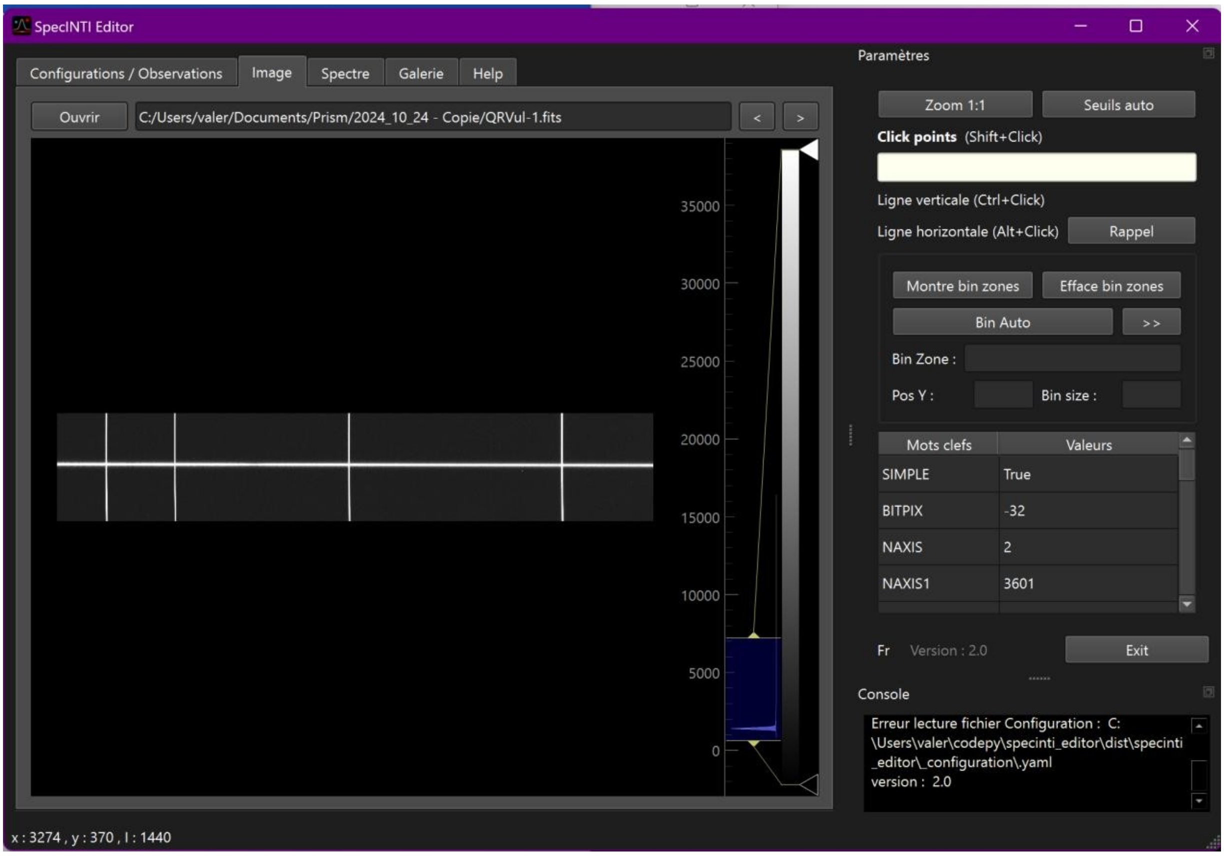
At the end of processing, the processed spectra are displayed in the Gallery. You can then double-click to open the chosen spectrum in the Spectrum tab, or display all spectra in Visual Spec.



```
CRVAL1  =   6500.984366592284
CDELT1  =  0.03767361218433507
BZERO   =                    0
BSCALE  =                    1
EXPTIME =               2400.0
OBJNAME = 'X Per   '
OBJECT  = 'X Per   '
EXPTIME2= '4 x 600.0 s'
BSS_ITRP=                21081
SPE_RPOW=                21081
BSS_VHEL=                    0
DATE-OBS= '2025-08-07T00:05:26.712000'
GEO_LONG=              5.71222
GEO_LAT =             43.93167
GEO_ELEV=                  600
BSS_SITE= 'OHP     '
BSS_INST= 'Askar107 + StarEx2400_cb +
PlayerOne585MM'
OBSERVER= 'vdesnoux'
BSS_COSM= 'Removed '
BSS_TELL= 'None    '
BSS_NORM= 'None    '
CRPIX1  =                    1
CTYPE1  = 'Wavelength'
CUNIT1  = 'Angstrom'
VERSION = 'specINTI 2.5.9'
JD-OBS  = '2460894.50378'
-------------------------------------------------------
Output files name:
C:/Users/valer/Documents/Prism/
2025_08_06\_xper_20250807_004.fits
C:/Users/valer/Documents/Prism/
2025_08_06\_xper_20250807_004.png
C:/Users/valer/Documents/Prism/
2025_08_06\_xper_20250807_004_2D.fits
C:/Users/valer/Documents/Prism/
2025_08_06\_xper_20250807_004.yaml
C:/Users/valer/Documents/Prism/
2025_08_06\_xper_20250807_004_log.txt
-------------------------------------------------------
End of the processing.
```

Image

Displays *2D fits* images. Use this tab to view the quality of individual images, calculate binning zones automatically or view them manually, find calibration line positions and other image functions.



C:/Users/valer/Documents/Prism/2024_10_24 - Copie/QRVul-1.fits

Mots clefs	Valeurs
SIMPLE	True
BITPIX	-32
NAXIS	2
NAXIS1	3601

```
Erreur lecture fichier Configuration : C:
\Users\valer\codepy\specinti_editor\dist\specinti
_editor\_configuration\.yaml
version : 2.0
```

x : 3274 , y : 370 , I : 1440

Image tips

You can zoom and move the image with the mouse and its scroll wheel. The "zoom 1:1" buttons force an image display without zoom factor - if you have zoomed out too far or moved the image in the viewing area, right-clicking "View all" brings the image back to center.

Contrast and brightness are controlled by two thresholds, high and low, which can be adjusted with the mouse in the histogram area to the right of the image.

The x,y and intensity values of the pixel are displayed in the bottom left-hand area of the window when the mouse is hovered over.

A right mouse click brings up a context-sensitive menu in the PyQtGraph library, which lets you, for example
export the image as a png file.

If the image is part of a numbered sequence such as name-1, name-2 ... name-n, clicking on the <> buttons will automatically display the next or previous image in the sequence. The image name field is also editable. To accept changes to the name, confirm with "enter".

Display vertical yellow lines with Ctrl+click (or "command" for Mac) in the image, horizontal red lines with Alt+click (or Option for Mac). To delete them, click again on the line with Ctrl or Alt, depending on the type of line.

Recall the position of the last horizontal line on another image with the "Recall horizontal line" button.

Shift+click records x-positions of spectral lines by moving the mouse over the position. The x-positions are added one after the other in the 'Click Points' text box. This area can be edited.

To copy an entire text zone, press Ctrl+A, then Ctrl+C - you can then go to the configuration tab to paste the line positions behind the appropriate keyword.

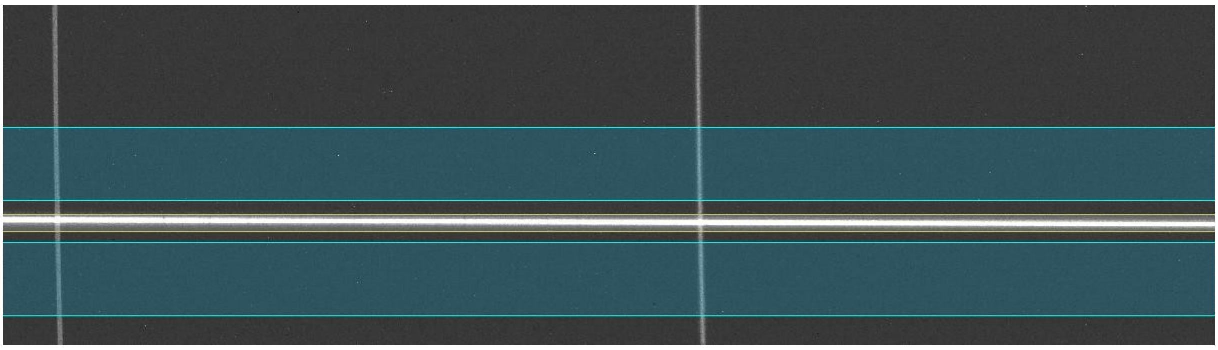
The automatic binning function is now operational. It uses specINTI's internal functions to find the position of the spectrum, possibly straightening the trace to a central zone by calculating the local tilt angle. A complementary algorithm estimates the spectrum boundaries and adjusts the sky binning zones on either side of the binning zone. The 'posY' values of the spectrum trace, the 'bin_size' binning zone size and the 'bin_zone' sky binning zone are updated.

The "**>>** " button transfers the bin_size and sky values to the configuration file.
For security reasons, the y-position of the spectrum is not updated.

It is also possible to edit and graphically check their dimensions and positions with the "show bin zone" button.

These zones can be adjusted with the mouse. Sky binning zones are shown in blue, while spectrum binning zones are shown in red. Click on a zone to move it. Move the mouse over one of the lines bordering the zones; this line turns red, then click and drag with the mouse. Values are updated in the corresponding fields.

Click on the Clear bin zone button to make the image display disappear.



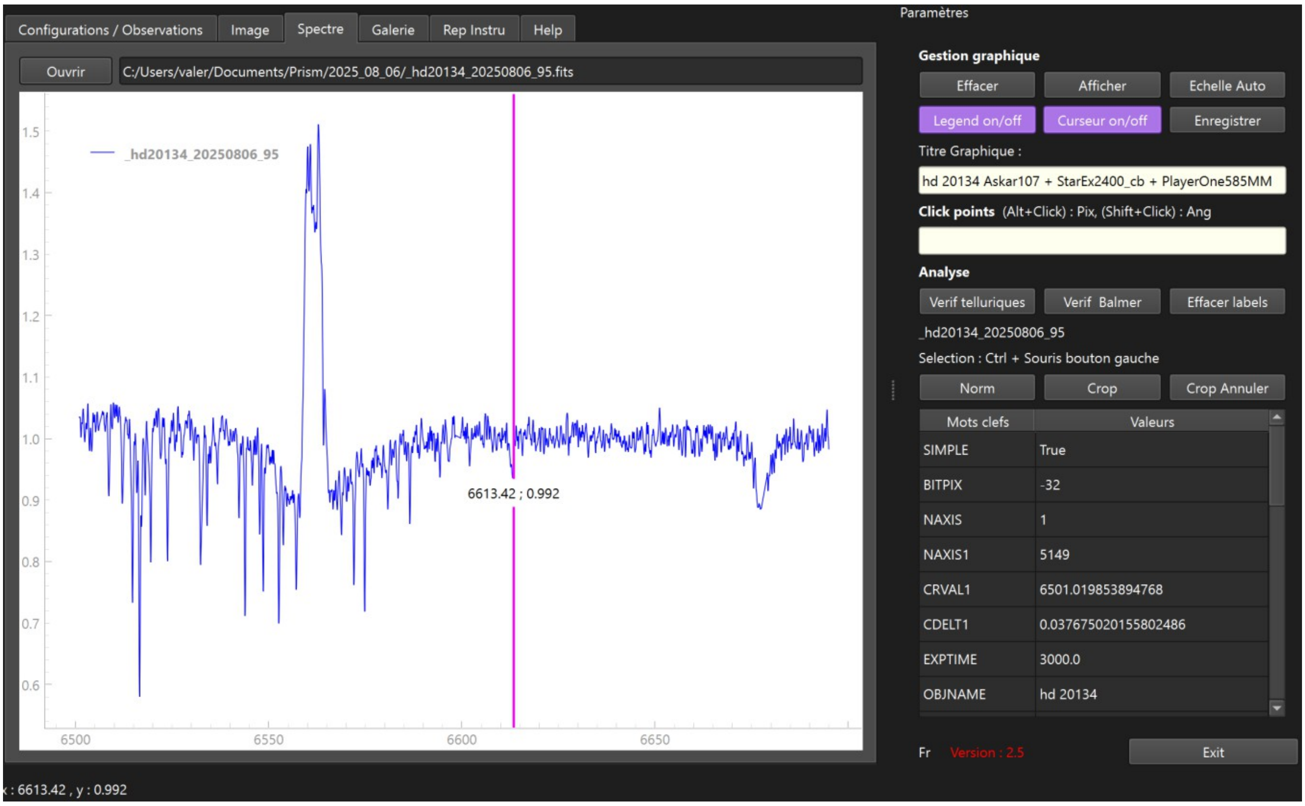
The image file header is displayed but cannot be edited.

Spectrum

Displays spectral profiles, *fits* 1D file Open the *fits* file

with the *Open* button.

If by mistake a 2D image fits file is selected, a message will be displayed in the console. The *fits* file header is also displayed on the right.



C:/Users/valer/Documents/Prism/2025_08_06/_hd20134_20250806_95.fits

Titre Graphique : hd 20134 Askar107 + StarEx2400_cb + PlayerOne585MM

Mots clefs	Valeurs
SIMPLE	True
BITPIX	-32
NAXIS	1
NAXIS1	5149
CRVAL1	6501.019853894768
CDELT1	0.037675020155802486
EXPTIME	3000.0
OBJNAME	hd 20134

: 6613.42 , y : 0.992

Use the mouse wheel to zoom in and out.

To zoom in on one axis only, use the right mouse click: move to horizontally for x-axis zooming, and vertically for y-axis zooming.

You can return to automatic scaling at any time by clicking on the "Auto scale" button, or by clicking on the small "A" icon in the bottom left-hand corner of the graph.

The legend and a vertical cursor are displayed by default. They can be hidden with the "legend on/off" and "cursor on/off" buttons.

Legend can be moved with mouse

The cursor can be moved with the mouse along the profile, displaying wavelength and intensity values. and intensity values

When a file is opened, a chart title is formed with the header information. Changes can be made in the text zone. To validate changes, don't forget to press 'enter'.

Right-click in the graph area to export to png or to axis values.

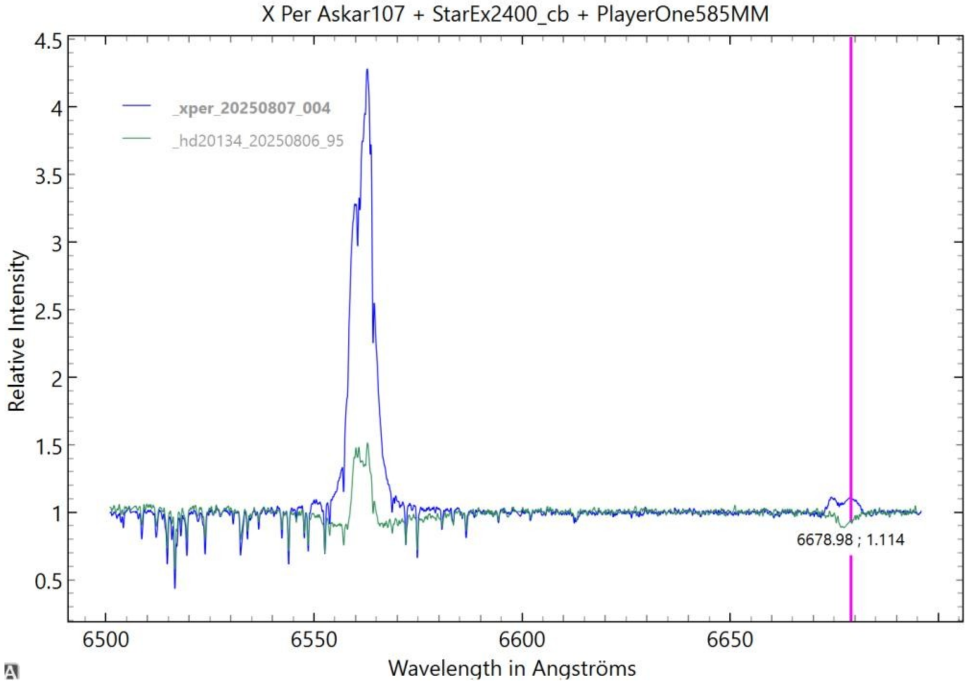
To delete labels and/or selected zones, click on the "Delete labels" button.

The "Save" button allows you to save the profile under a different name, before re with different parameters for comparison.

It is possible to manually enter a file name or to modify it; press "enter" to validate modifications.

Some fields in the FITS header can be edited in the grid on the right. Only the following text fields are editable: 'OBJECT', 'OBJNAME', 'BSS_SITE', 'BSS_INST', 'OBSERVER', 'BSS_TELL', 'BSS_NORM' and you can save the file with these modifications.
save the file with these modifications using the "Save" button.

If several spectral profiles are displayed, you can select the profile on which you wish to take action. To do this, click on the desired profile. The curve will flash briefly and the profile name will be bolded in the legend.



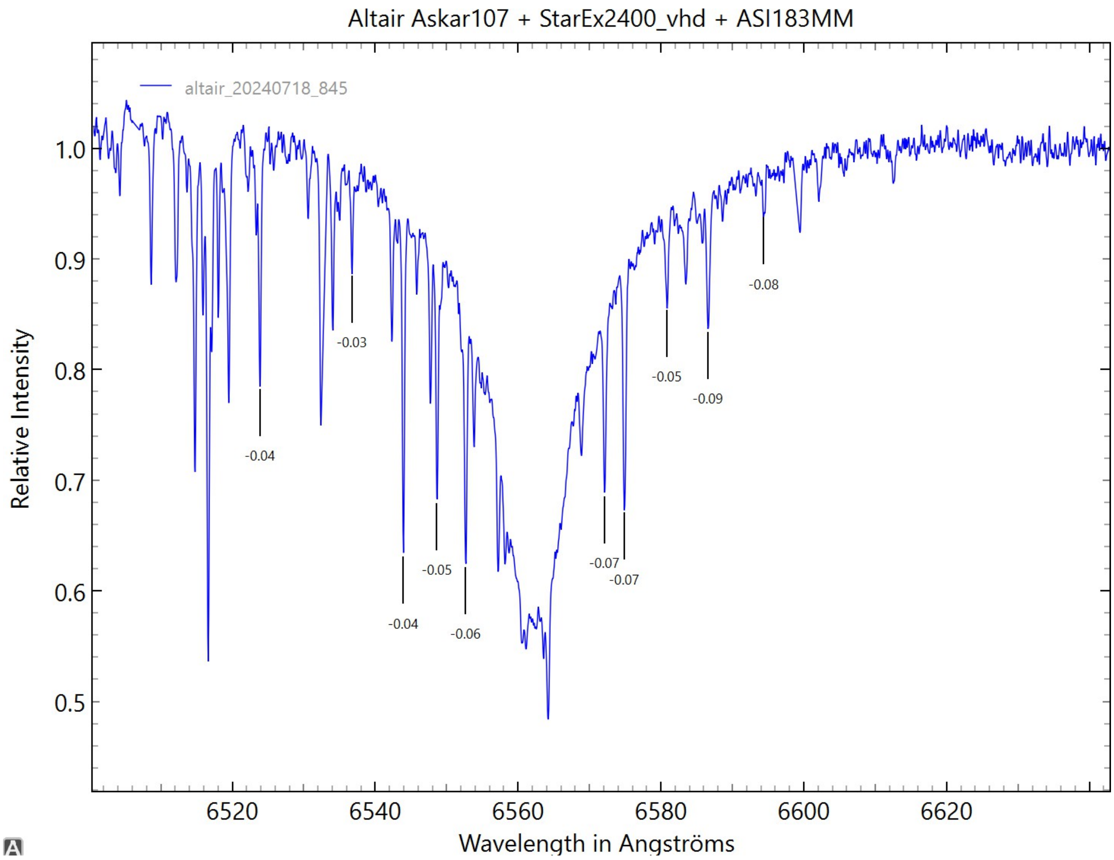
The X Per profile is selected, its name is in grad in the legend and the values of the vertical cursor on the Helium line show a line value above the continuum, the line is in emission.

Analysis section

This section allows you to check wavelength calibration using the "verif telluriques" tool for high-resolution spectra and the "verif balmer" tool for medium- and low-resolution spectra.

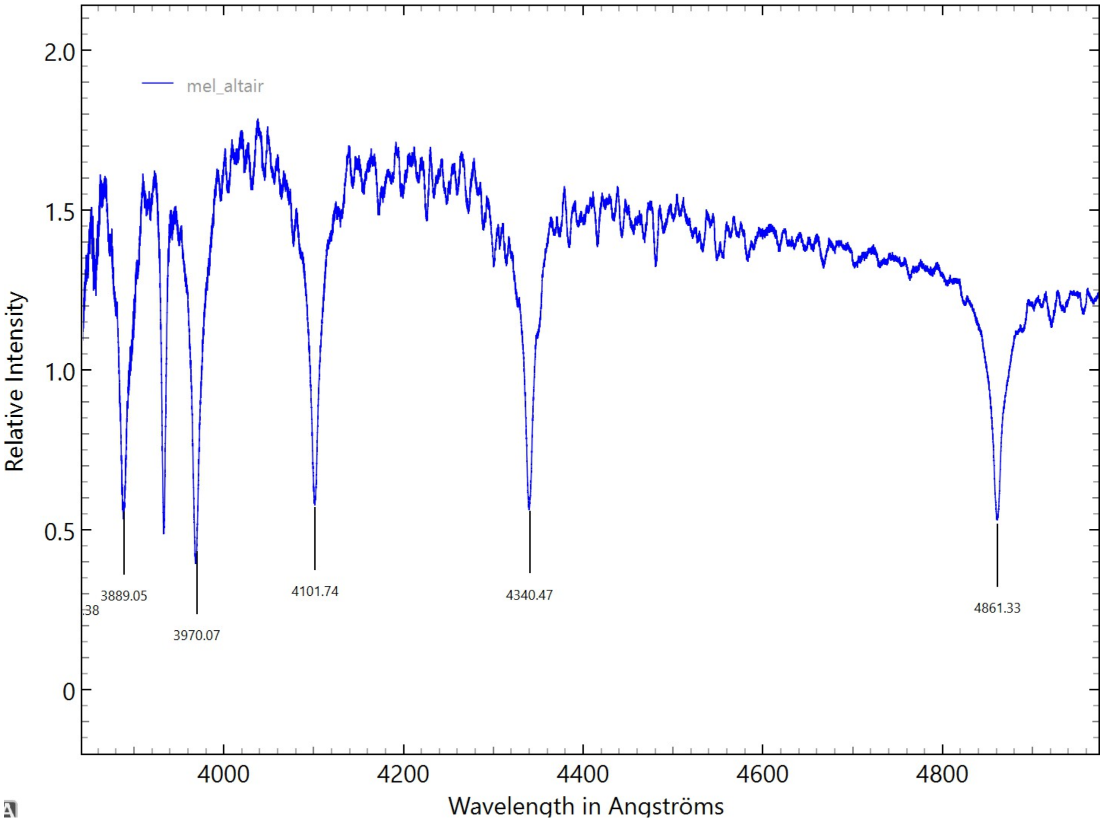
Verif Telluriques

Displays the position of telluric lines - useful for checking the wavelength calibration of a of a high-resolution spectrum.



Check Balmer

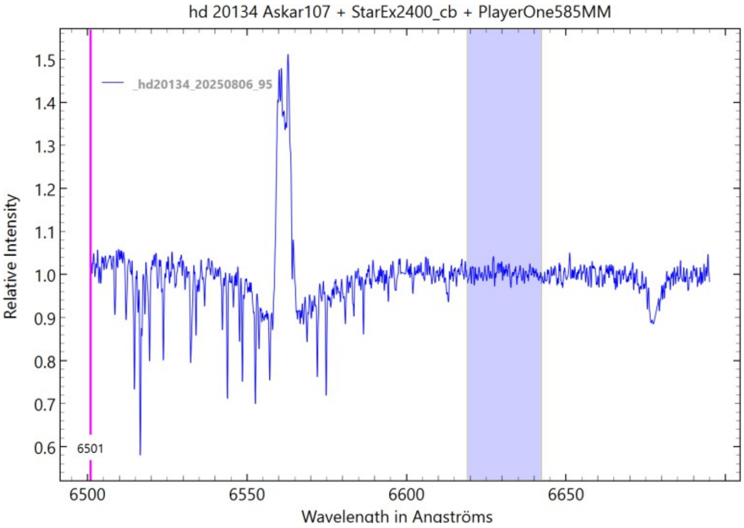
Display the position of balmer lines - this function is useful for verifying the wavelength wavelength calibration of low-resolution spectra.



Norm and Crop sections

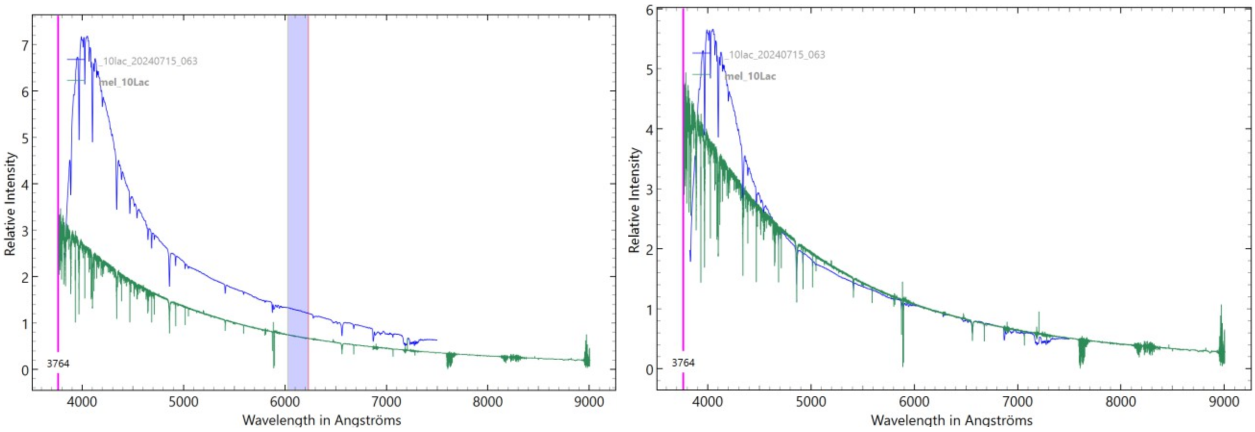
Although these functions are provided directly in the configuration file, they can be performed interactively by selecting a region of the spectrum with the mouse.

To select the region, press the Ctrl+left mouse click button and move the mouse, holding the button down, to the end of the desired region. You can then click on the selection area and adjust the boundaries.



Norm

This operation takes the area selected by the mouse, calculates the average and divides the entire profile by this value. The selected area is then positioned around the unit value. This function is particularly useful (and visible) if several profiles are displayed and are not necessarily at the same scale.

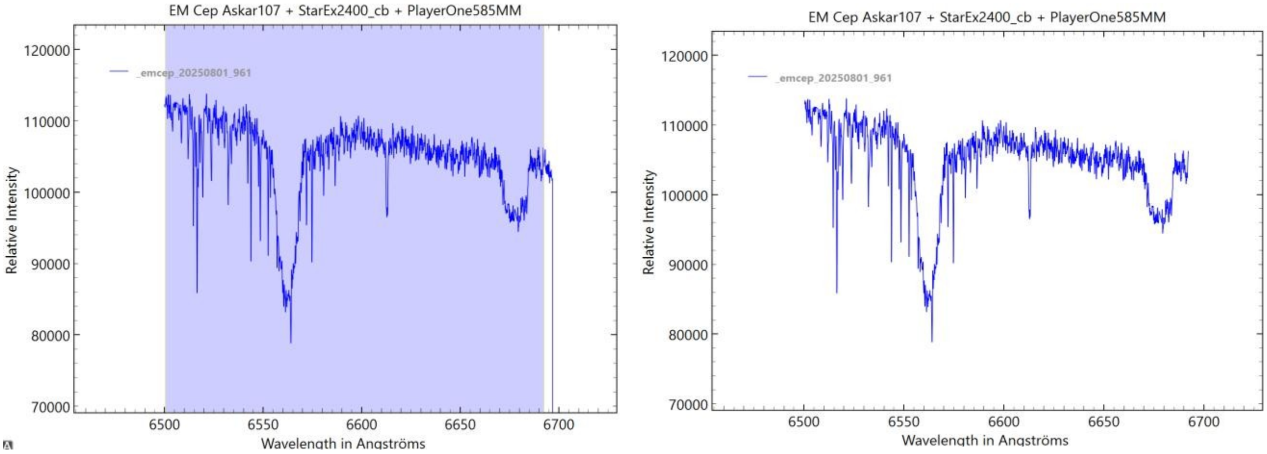


Before and after normalization on selected area

Crop

The Crop function allows you to quickly eliminate zero pixels at the edge of the profile, a processing artifact.

Select the area to be preserved, then click on the "Crop" button. To preserve this operation, it is important to remember to save the profile with the "Save" button.



Before and after Crop to eliminate pixels at zero right

If two spectra are displayed, the Crop operates on the selected profile.

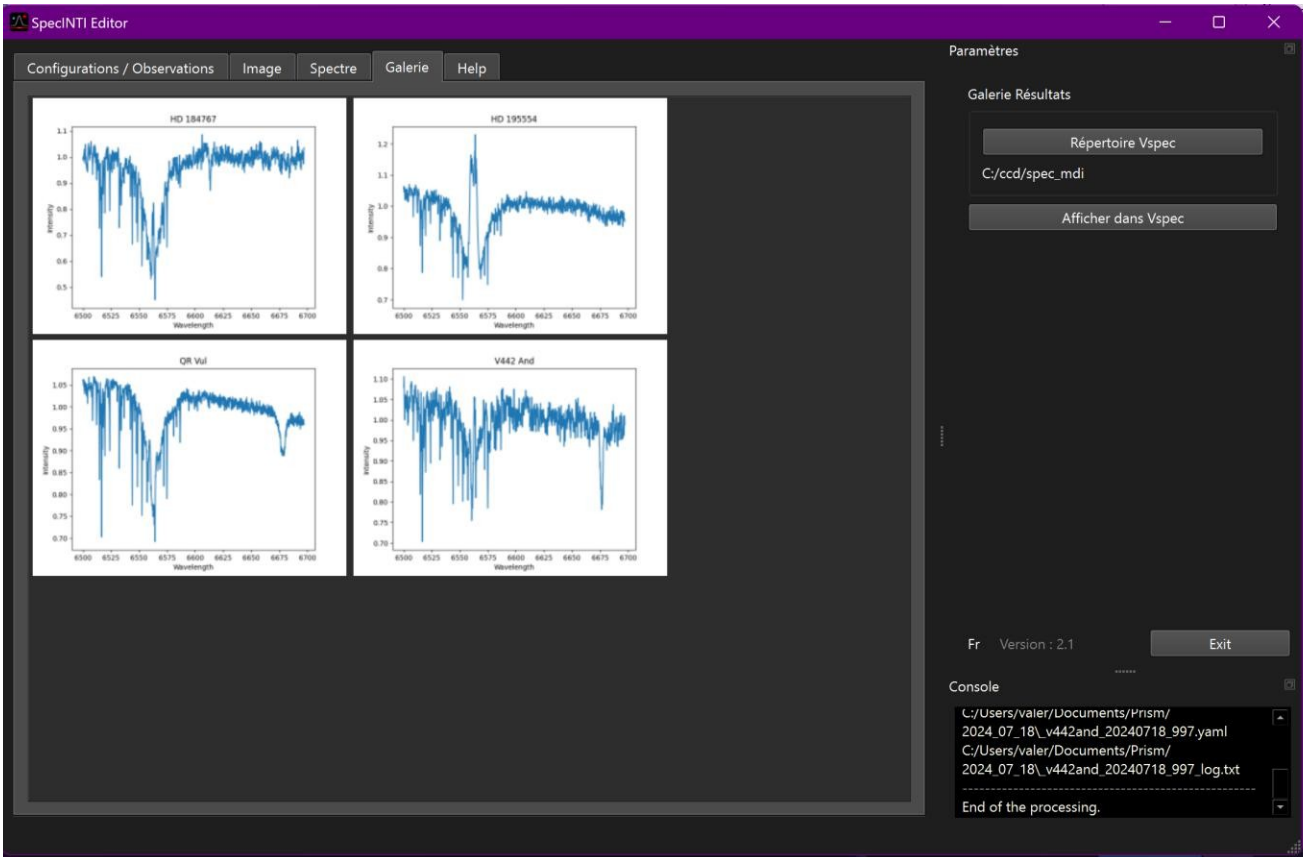
It is possible to undo the last Crop operation.

Gallery

Displays specINTI treatment results in thumbnail format

You can double-click a thumbnail to view it automatically in the Spectrum tab

You must select the Vspec.exe directory to activate the option to open files processed files processed in Visual Spec. This function is not active under Mac OS.

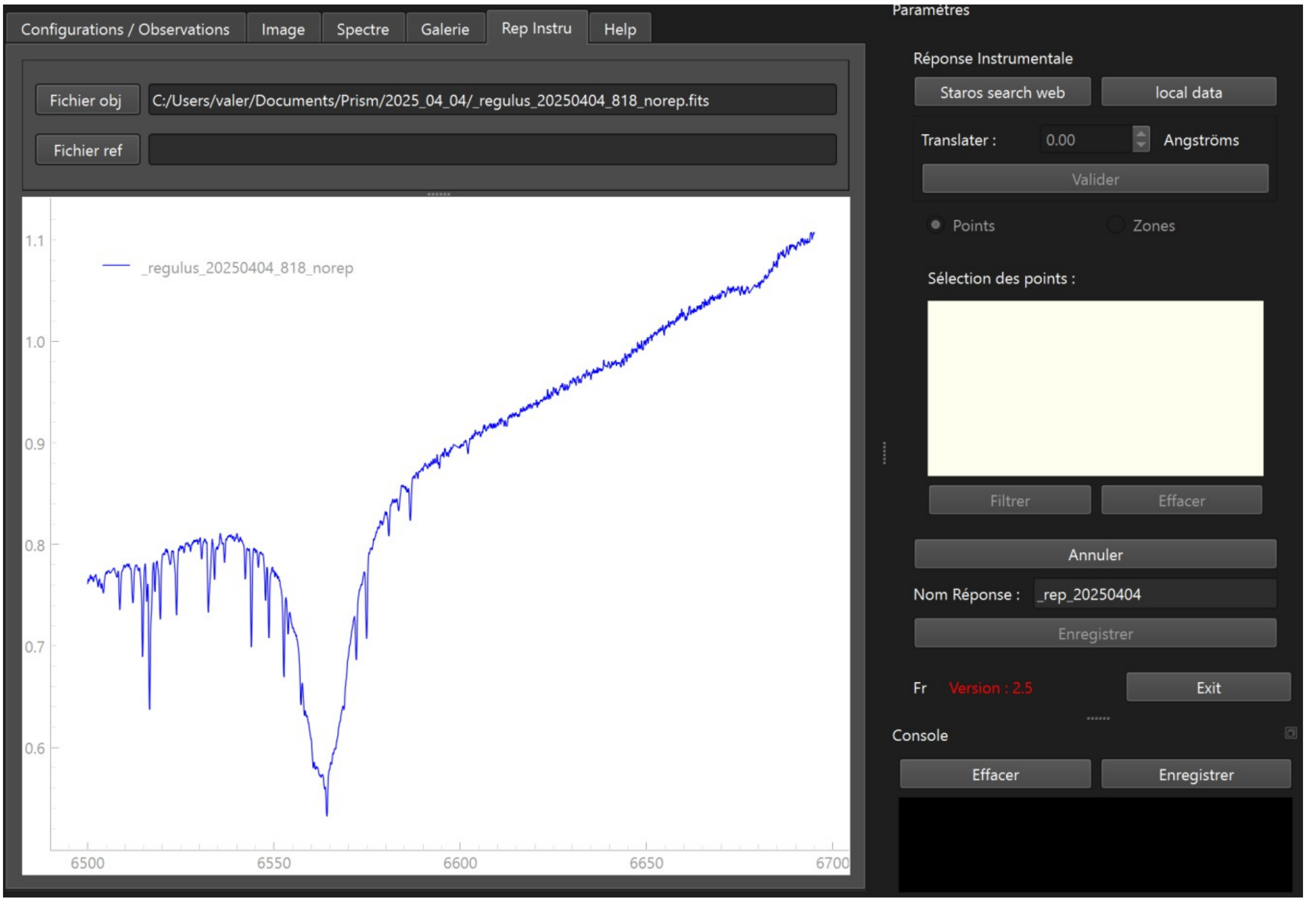


C:/ccd/spec_mdi

```
C:/Users/valer/Documents/Prism/
2024_07_18\_v442and_20240718_997.yaml
C:/Users/valer/Documents/Prism/
2024_07_18\_v442and_20240718_997_log.txt
----------------------------------------------------------------
End of the processing.
```

Rep Instru

This tab allows you to calculate the instrumental response in a more graphical form than with specinti scripts.



Fichier obj: C:/Users/valer/Documents/Prism/2025_04_04/_regulus_20250404_818_norep.fits

Translater : 0.00 Angströms

● Points ○ Zones

Nom Réponse : _rep_20250404

Version : 2.5

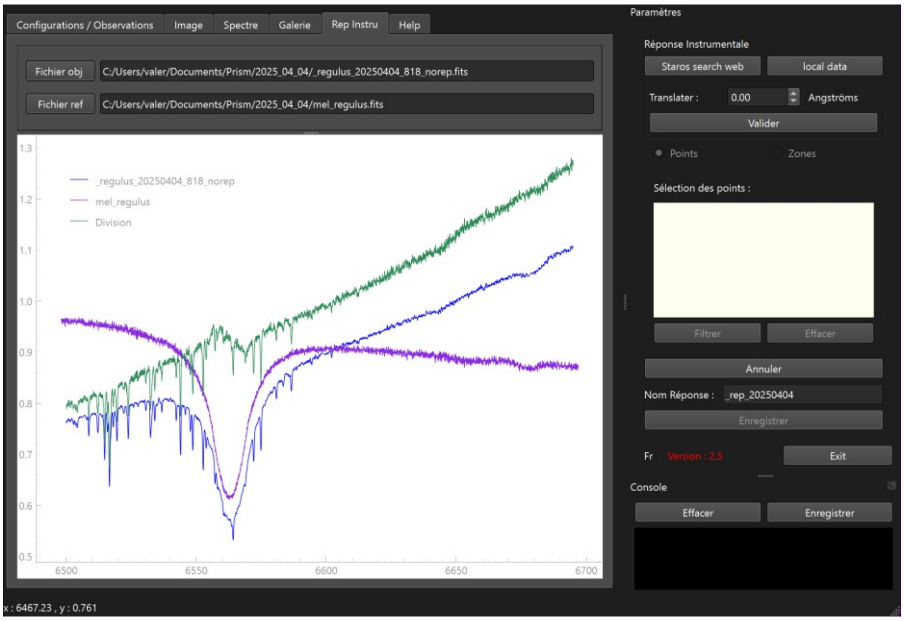
Load the profile of the observed object using the "Obj file" button.

Load the theoretical profile of the same object, which you may have retrieved from the staros-search.org website, directly accessible via the "Staros search web" button. You only need to be registered to download the fits file.

The reference file must be placed in the observation directory, the same directory as the object profile. Personally, I call it the object's 'mel_name' to help me find it quickly.

You can also access a local reference spectrum base, for which see the "Local Data" button at the end of this section.

The interface automatically displays the division of the observed object profile by the theoretical profile.



Fichier obj: C:/Users/valer/Documents/Prism/2025_04_04/_regulus_20250404_818_norep.fits

Fichier ref: C:/Users/valer/Documents/Prism/2025_04_04/mel_regulus.fits

Translater : 0.00 Angströms

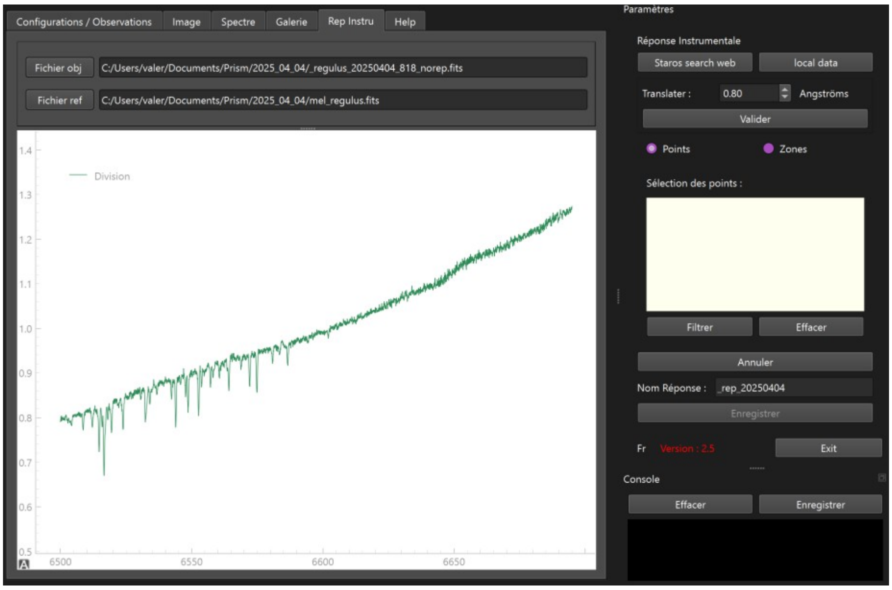
Nom Réponse : _rep_20250404

Version : 2.5

x : 6467.23 , y : 0.761

In the panel on the right, adjust any wavelength offset. Either in increments of 0.1 with the arrows or by editing the value and then "enter".

Once you've found the right value, **click on "validate"** to keep only the result of the and activate the filter modes to obtain the instrumental response.
response.



Fichier obj: C:/Users/valer/Documents/Prism/2025_04_04/_regulus_20250404_818_norep.fits

Fichier ref: C:/Users/valer/Documents/Prism/2025_04_04/mel_regulus.fits

Translater : 0.80 Angströms

Nom Réponse : _rep_20250404

Version : 2.5

To construct the response curve, telluric lines and noise variations must be eliminated.

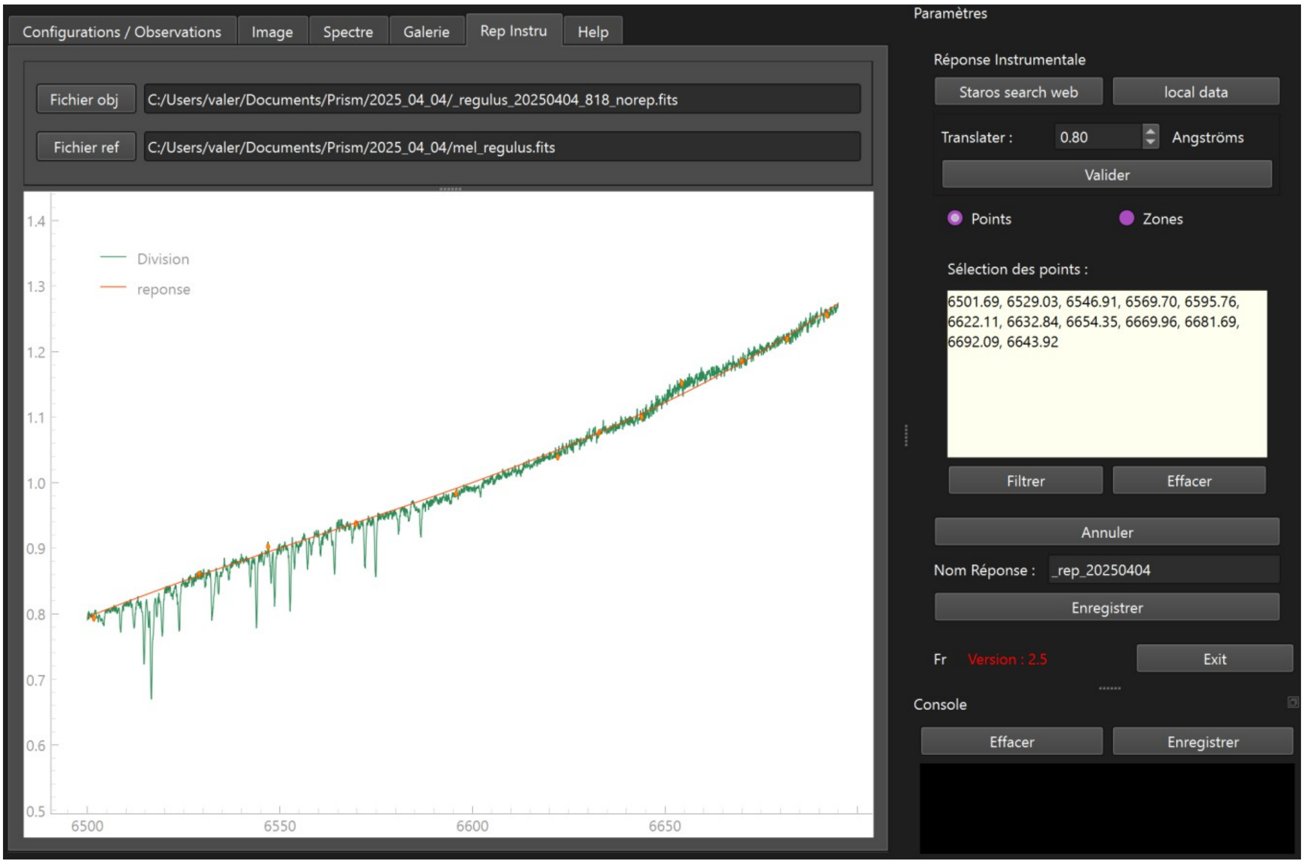
Two modes are available:

- the "Points" mode, recommended for high-resolution spectra
- Zones" mode for low-resolution spectra.

The difference lies in the method used to construct the response. This is done either by fitting a curve to points, or by filtering the profile after removing areas disturbed by spectral lines.

Point mode

Using the mouse, place points on the dividing curve, avoiding areas with spectral lines. Once the points have been placed, click on the "filter" button to display the instrumental response curve in orange.



Fichier obj: C:/Users/valer/Documents/Prism/2025_04_04/_regulus_20250404_818_norep.fits

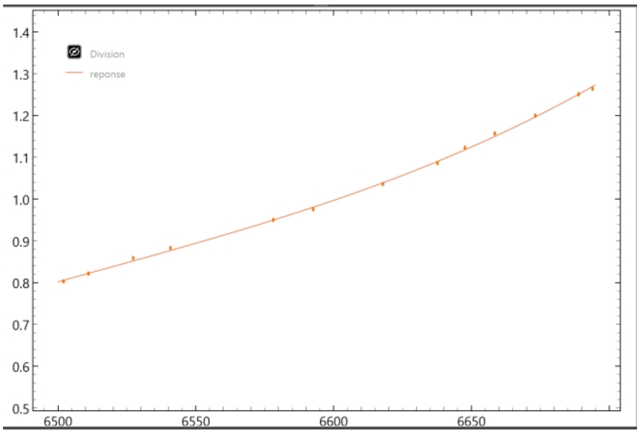
Fichier ref: C:/Users/valer/Documents/Prism/2025_04_04/mel_regulus.fits

Translater : 0.80 Angströms

Sélection des points : 6501.69, 6529.03, 6546.91, 6569.70, 6595.76, 6622.11, 6632.84, 6654.35, 6669.96, 6681.69, 6692.09, 6643.92

Nom Réponse : _rep_20250404

If you click on the little green line in front of the name "division" in the legend, you can hide the division display.
the green curve and thus better see the orange response curve.

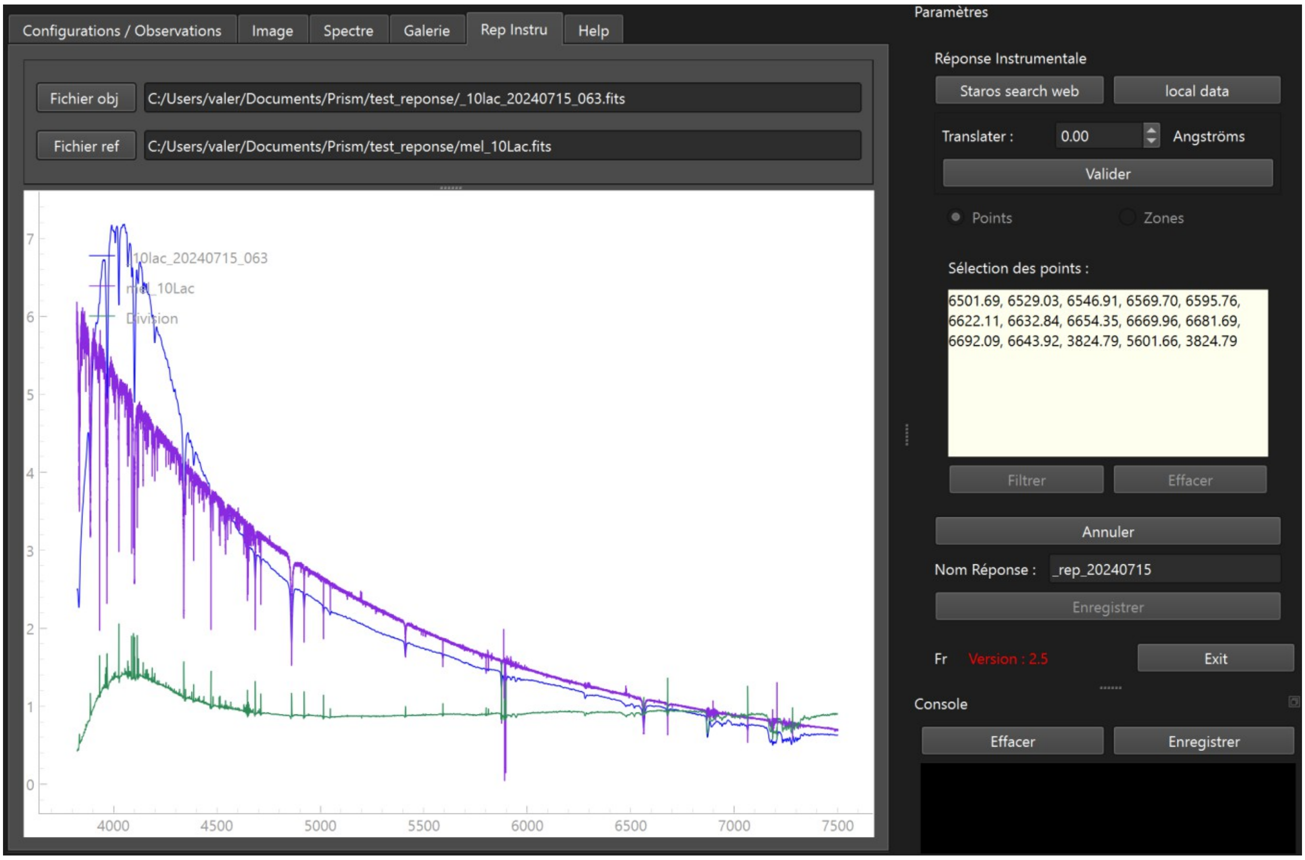


You can delete the stitches and start placing them again using the
"button.

You can cancel and return to the pre-validation stage with the "Cancel" button.

By default, the application proposes a name consisting of the prefix rep_ followed by the observation date of the observed object - click on the "Save" button to save your instrumental response.

Zone mode



Fichier obj: C:/Users/valer/Documents/Prism/test_reponse/_10lac_20240715_063.fits

Fichier ref: C:/Users/valer/Documents/Prism/test_reponse/mel_10Lac.fits

Translater : 0.00 Angströms

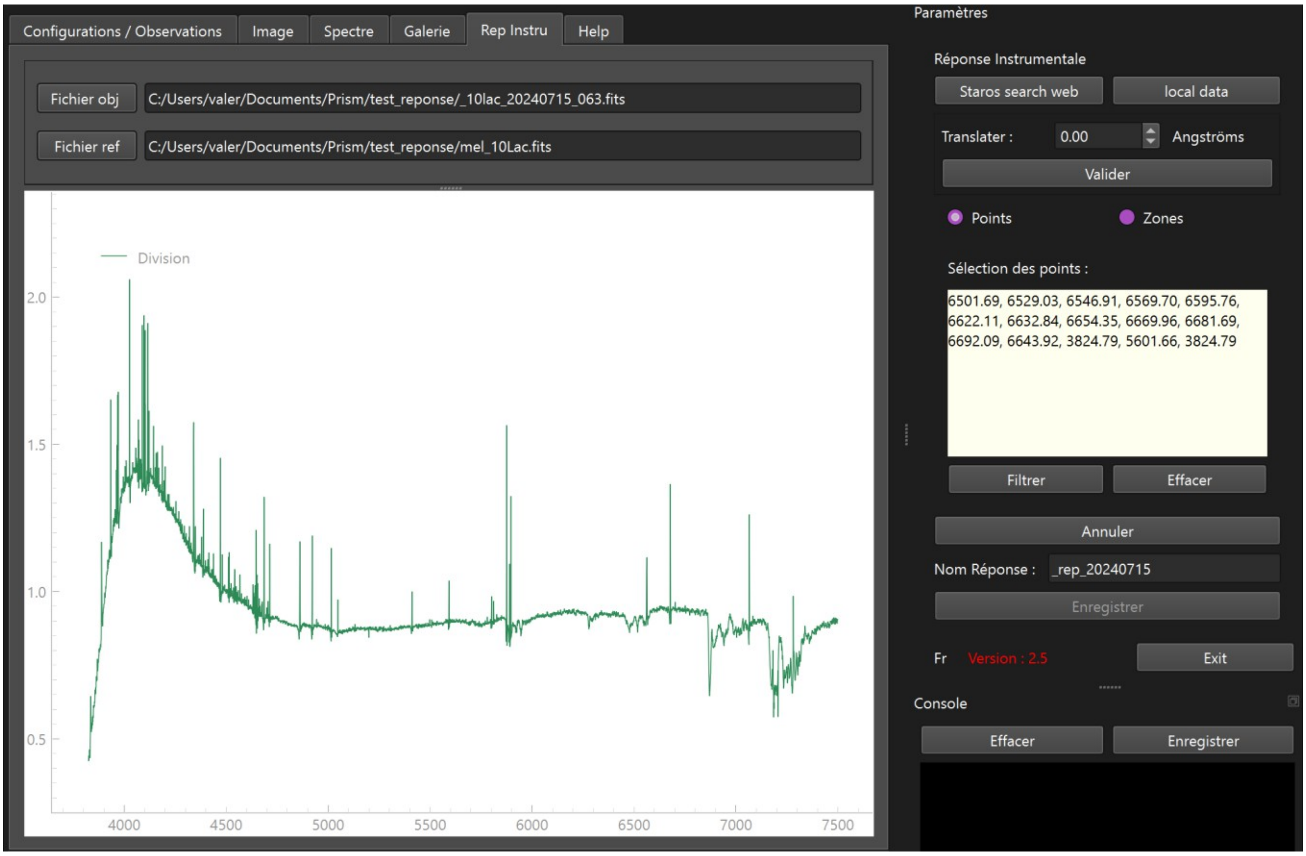
Sélection des points :

6501.69, 6529.03, 6546.91, 6569.70, 6595.76, 6622.11, 6632.84, 6654.35, 6669.96, 6681.69, 6692.09, 6643.92, 3824.79, 5601.66, 3824.79

Nom Réponse : _rep_20240715

You can zoom in to check if any wavelength adjustment is required.

Click on the "Validate" button to validate the division.



Fichier obj: C:/Users/valer/Documents/Prism/test_reponse/_10lac_20240715_063.fits

Fichier ref: C:/Users/valer/Documents/Prism/test_reponse/mel_10Lac.fits

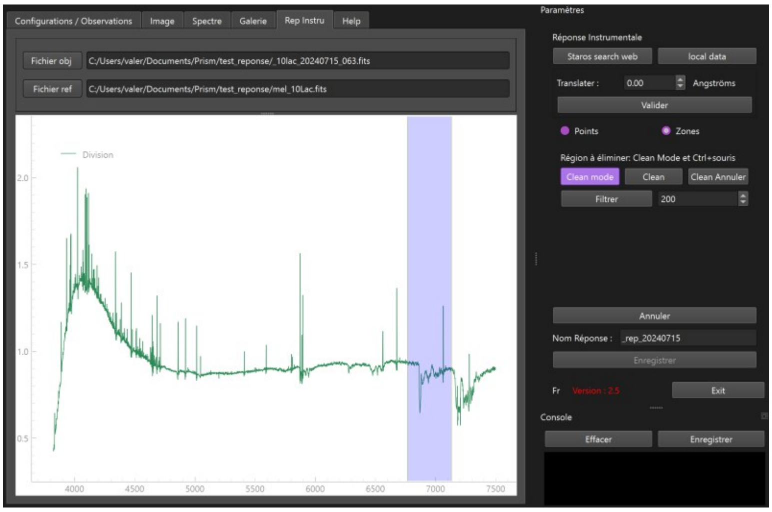
Translater : 0.00 Angströms

Sélection des points :

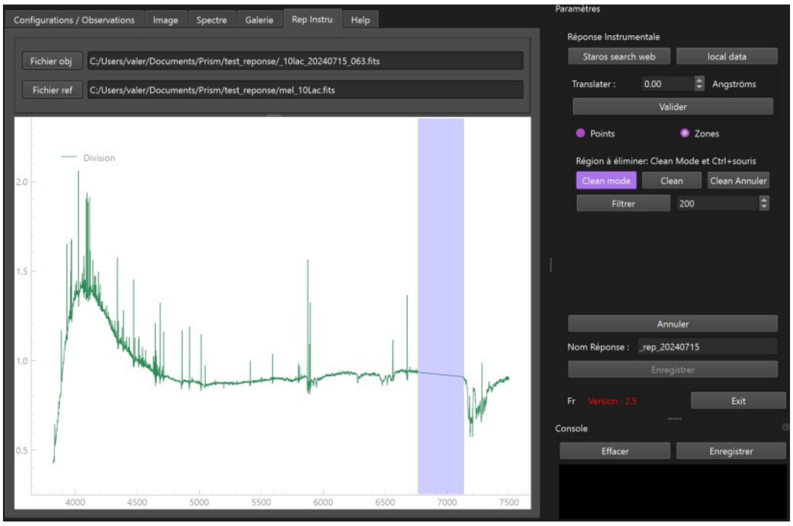
6501.69, 6529.03, 6546.91, 6569.70, 6595.76, 6622.11, 6632.84, 6654.35, 6669.96, 6681.69, 6692.09, 6643.92, 3824.79, 5601.66, 3824.79

Nom Réponse : _rep_20240715

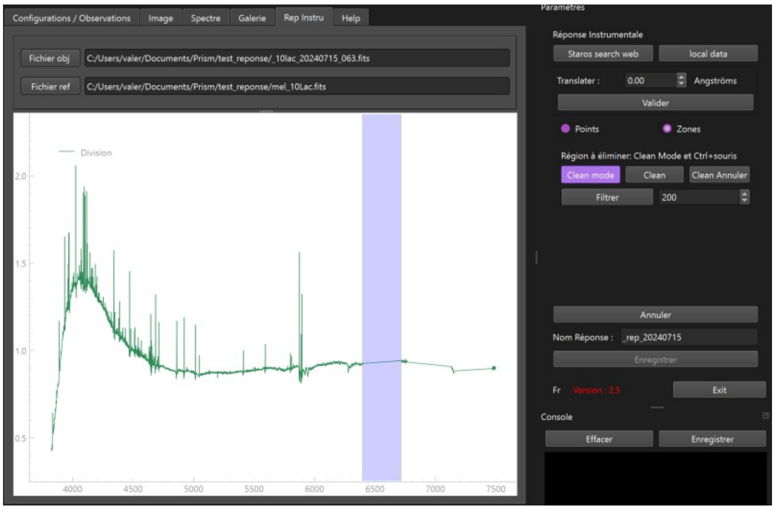
The "Zones" mode gives access to a "clean" mode - click on the "Clean mode" button to display a region whose limits can be adjusted with the mouse and moved.


Fichier obj C:/Users/valer/Documents/Prism/test_reponse/_10lac_20240715_063.fits
Fichier ref C:/Users/valer/Documents/Prism/test_reponse/mel_10Lac.fits
Translater : 0.00 Angströms
Nom Réponse : _rep_20240715
Filtrer 200

Once positioned on a region to be eliminated, click on the "Clean" button.
as for the spectrum tab, make a selection with the mouse using Ctrl left mouse click.

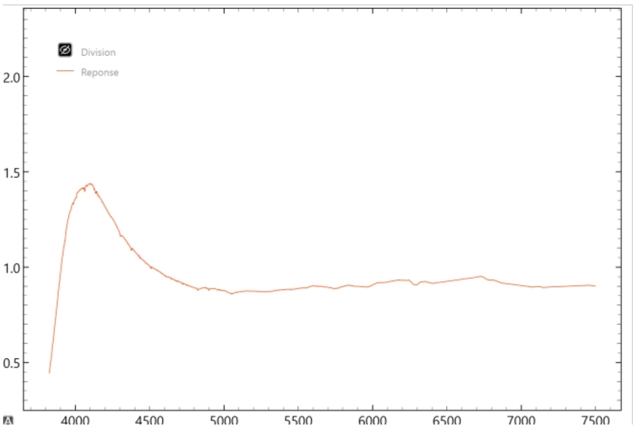

Fichier obj C:/Users/valer/Documents/Prism/test_reponse/_10lac_20240715_063.fits
Fichier ref C:/Users/valer/Documents/Prism/test_reponse/mel_10Lac.fits
Translater : 0.00 Angströms
Nom Réponse : _rep_20240715
Filtrer 200

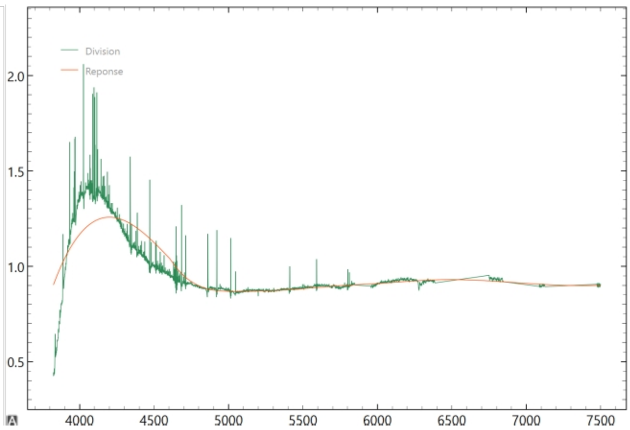
Move the area, adjusting its boundaries to eliminate other problematic regions. Once this "cleaning" work is complete, move on to the filtering stage.


Fichier obj C:/Users/valer/Documents/Prism/test_reponse/_10lac_20240715_063.fits
Fichier ref C:/Users/valer/Documents/Prism/test_reponse/mel_10Lac.fits
Translater : 0.00 Angströms
Nom Réponse : _rep_20240715
Filtrer 200

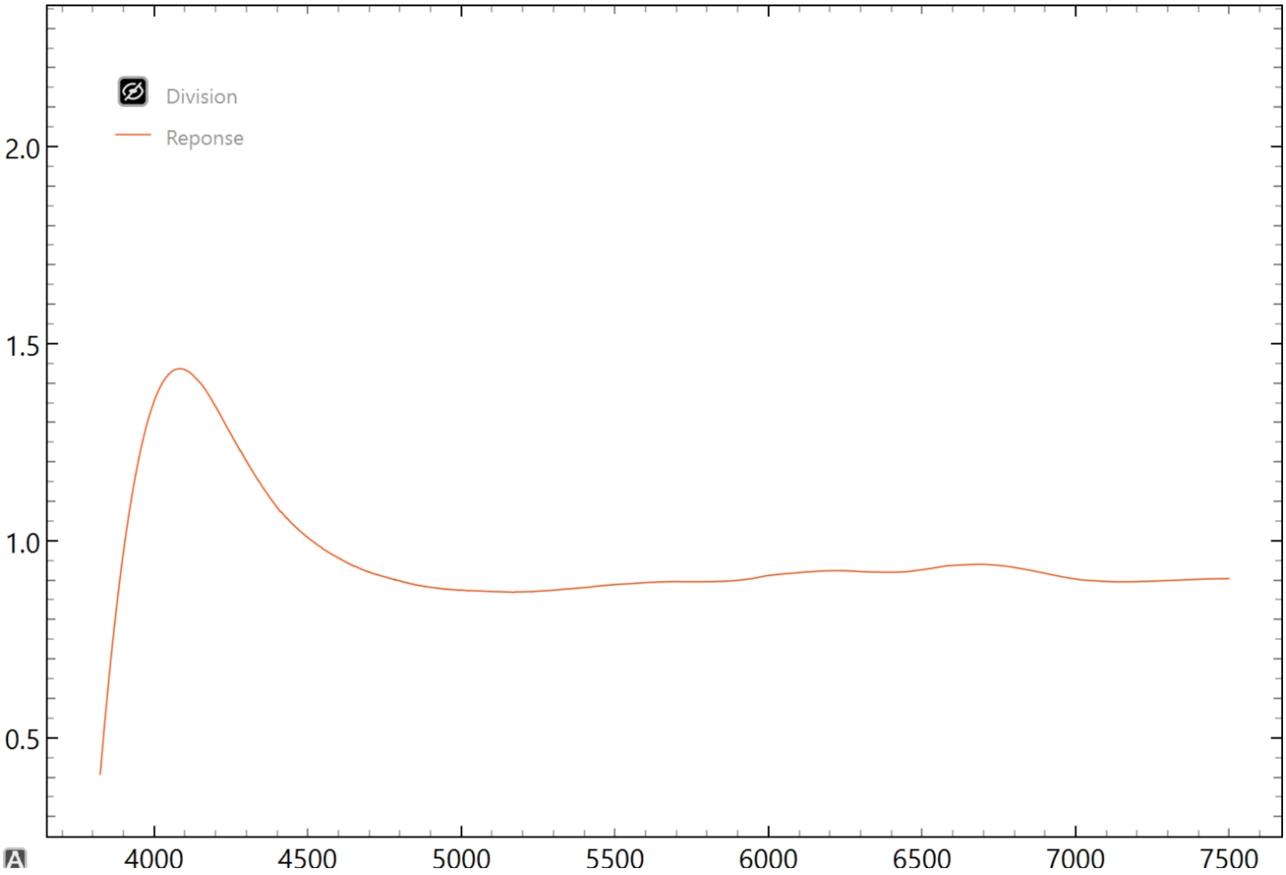
Use the "Crop undo" button to undo the last (and only the last) Crop operation.
Crop operation.

Choose a filter value that is neither too low nor too high. Too low and it won't eliminate large variations in small areas, too high and it will move the top of the profile, for example. On the left, a filter value of 100, on the right, a filter value of 2000.





In our example, a value of 400 seems a good compromise.



To change the filtering value, enter a new value or adjust the value with the arrows and click on the "filter" button again.

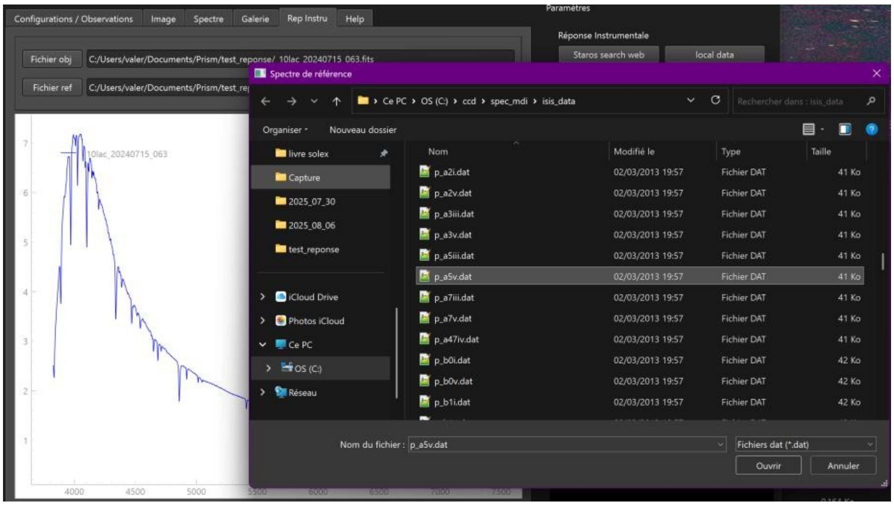
Local base selection

In some cases, the reference spectra in the Melchiors database are not suitable. For example, for work in the blue and near-UV range, their spectral coverage is not sufficient. In such cases, you may need to use a local database.

For example, you can download the ISIS database, which includes the "Pickles" files: http://www.astrosurf.com/buil/isis/download/isis_database_v9.zip (attention http link)

Install the local database in the directory of your choice.

When opening a reference file, do not click on the "Open" button, but click on the "Local data" button. Browse the directory tree to the local database directory.



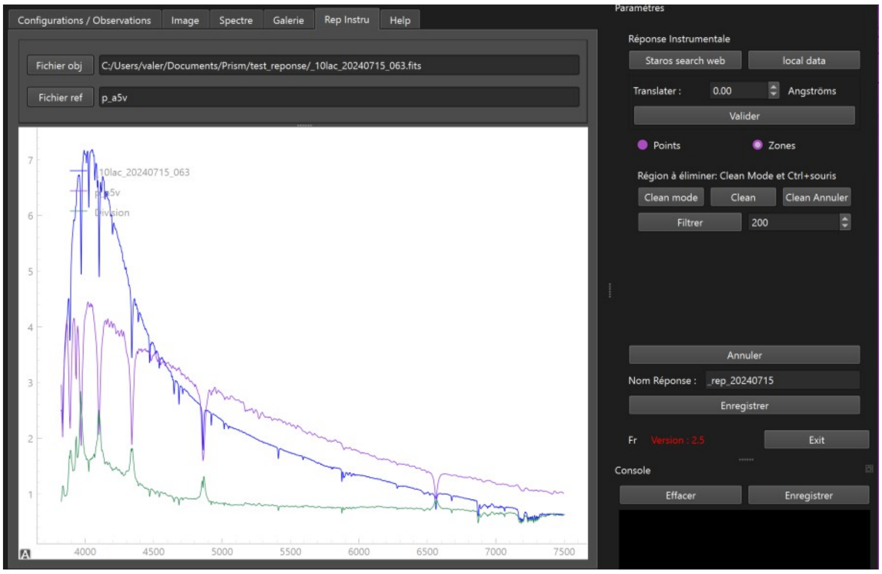
Fichier obj: C:/Users/valer/Documents/Prism/test_reponse/_10lac_20240715_063.fits

Nom du fichier : p_a5v.dat

Fichiers dat (*.dat)

Nom	Modifié le	Type	Taille
p_a2i.dat	02/03/2013 19:57	Fichier DAT	41 Ko
p_a2v.dat	02/03/2013 19:57	Fichier DAT	41 Ko
p_a3iii.dat	02/03/2013 19:57	Fichier DAT	41 Ko
p_a3v.dat	02/03/2013 19:57	Fichier DAT	41 Ko
p_a5iii.dat	02/03/2013 19:57	Fichier DAT	41 Ko
p_a5v.dat	02/03/2013 19:57	Fichier DAT	41 Ko
p_a7iii.dat	02/03/2013 19:57	Fichier DAT	41 Ko
p_a7v.dat	02/03/2013 19:57	Fichier DAT	41 Ko
p_a47iv.dat	02/03/2013 19:57	Fichier DAT	41 Ko
p_b0i.dat	02/03/2013 19:57	Fichier DAT	42 Ko
p_b0v.dat	02/03/2013 19:57	Fichier DAT	42 Ko
p_b1i.dat	02/03/2013 19:57	Fichier DAT	42 Ko

Select the desired file. It may be in .fits or .dat format.



Fichier obj: C:/Users/valer/Documents/Prism/test_reponse/_10lac_20240715_063.fits

Fichier ref: p_a5v

Translater : 0.00 Angströms

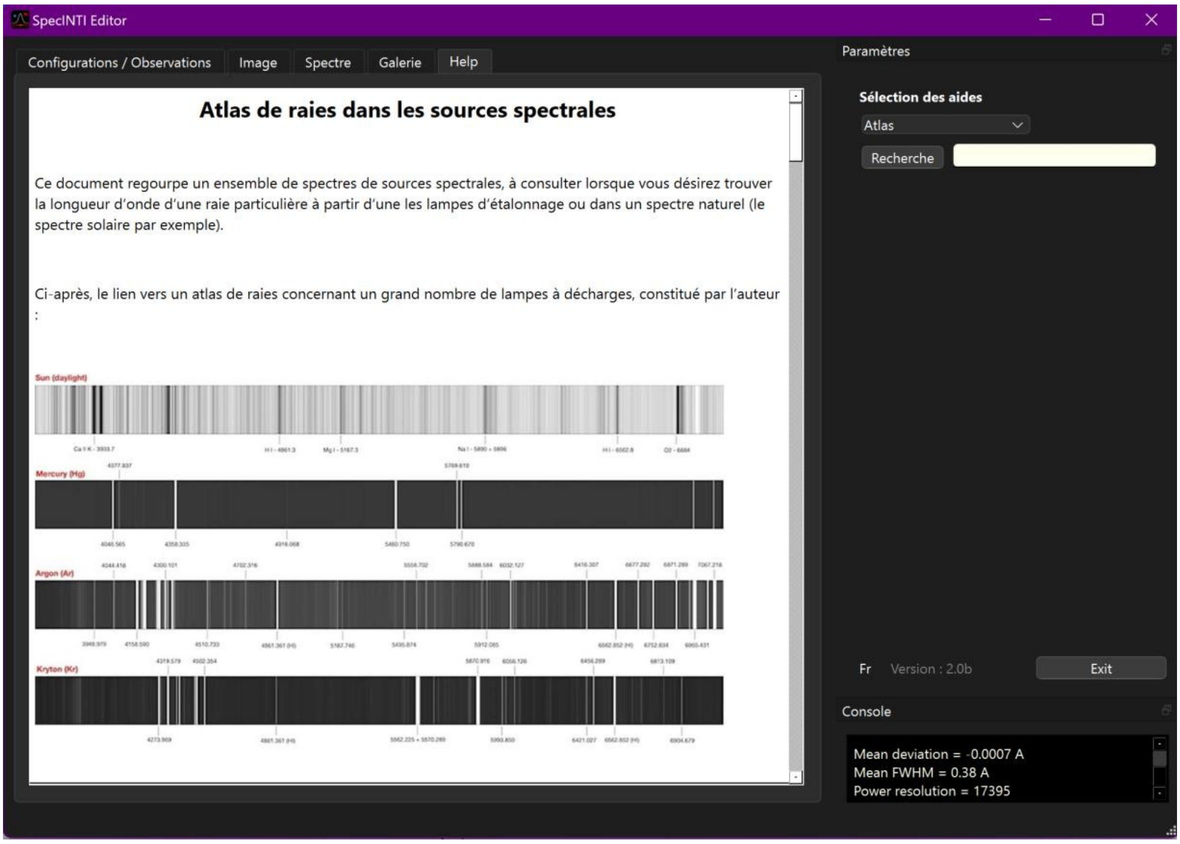
Filtrer: 200

Nom Réponse : _rep_20240715

Continue the process as described above.

Help

The Help tab gives access to four files extracted from the specinti website - select the help file from the drop-down list on the right. A text search is also available with the "search" button and its associated text box.



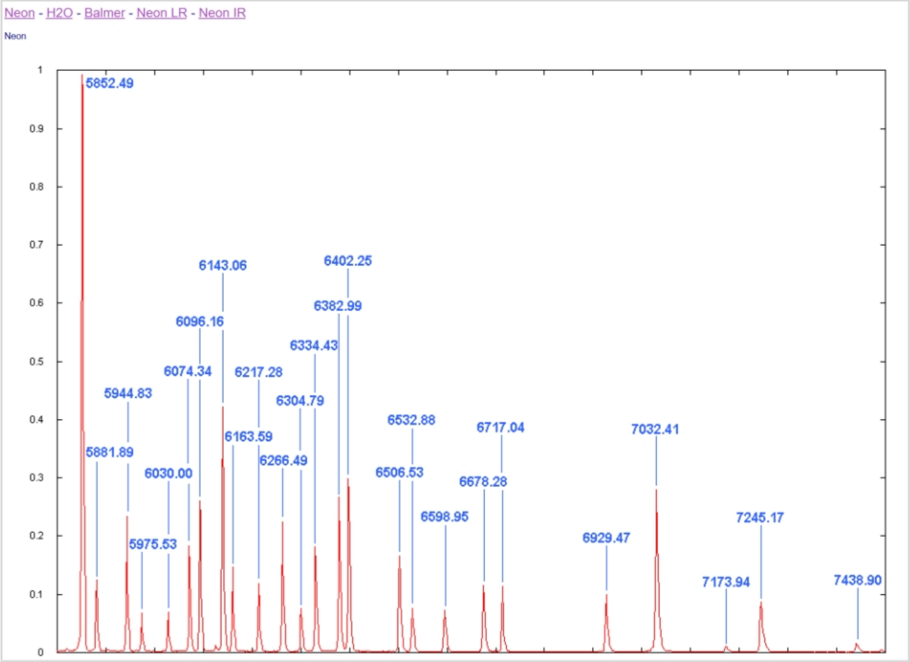
Atlas de raies dans les sources spectrales

Ce document regourpe un ensemble de spectres de sources spectrales, à consulter lorsque vous désirez trouver la longueur d'onde d'une raie particulière à partir d'une les lampes d'étalonnage ou dans un spectre naturel (le spectre solaire par exemple).

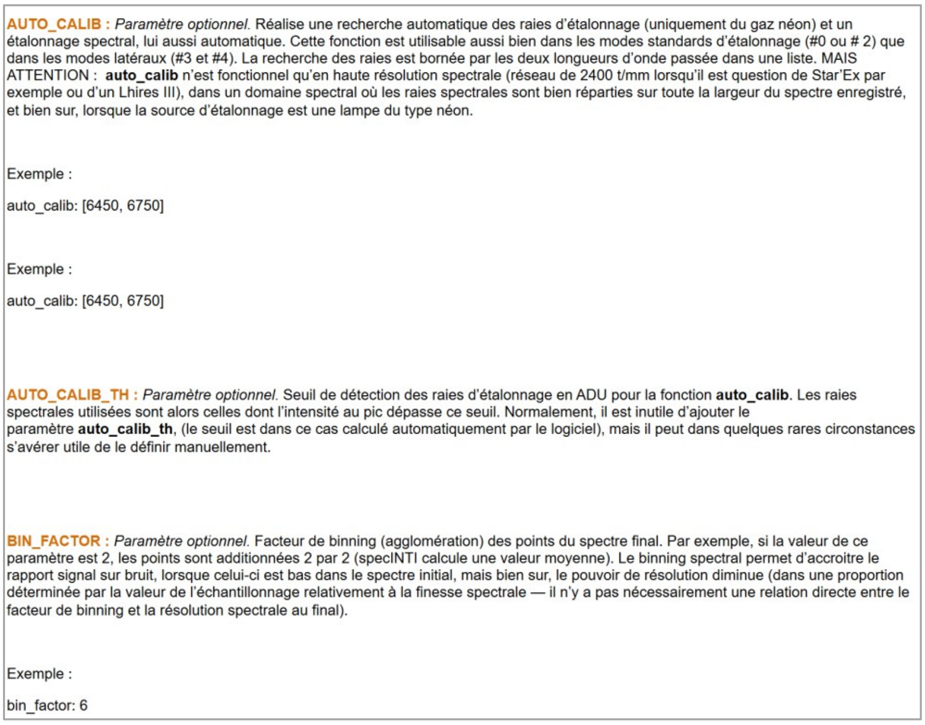
Ci-après, le lien vers un atlas de raies concernant un grand nombre de lampes à décharges, constitué par l'auteur :

```
Mean deviation = -0.0007 A
Mean FWHM = 0.38 A
Power resolution = 17395
```

Diagram - series of annotated spectra



Param manual - list of Specinti keywords



AUTO_CALIB : *Paramètre optionnel.* Réalise une recherche automatique des raies d'étalonnage (uniquement du gaz néon) et un étalonnage spectral, lui aussi automatique. Cette fonction est utilisable aussi bien dans les modes standards d'étalonnage (#0 ou # 2) que dans les modes latéraux (#3 et #4). La recherche des raies est bornée par les deux longueurs d'onde passée dans une liste. MAIS ATTENTION : **auto_calib** n'est fonctionnel qu'en haute résolution spectrale (réseau de 2400 t/mm lorsqu'il est question de Star'Ex par exemple ou d'un Lhires III), dans un domaine spectral où les raies spectrales sont bien réparties sur toute la largeur du spectre enregistré, et bien sur, lorsque la source d'étalonnage est une lampe du type néon.

Exemple :

auto_calib: [6450, 6750]

Exemple :

auto_calib: [6450, 6750]

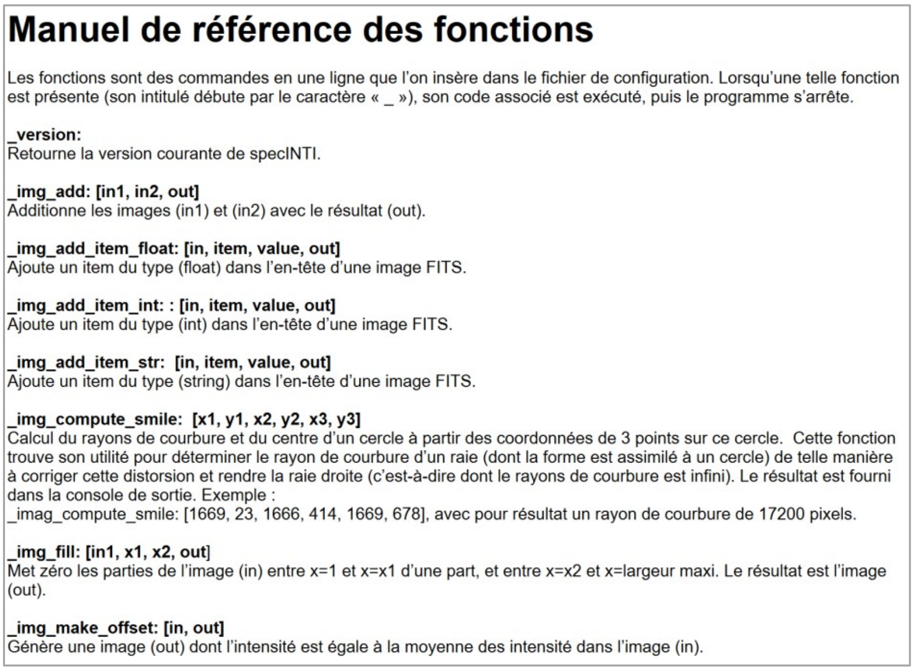
AUTO_CALIB_TH : *Paramètre optionnel.* Seuil de détection des raies d'étalonnage en ADU pour la fonction **auto_calib**. Les raies spectrales utilisées sont alors celles dont l'intensité au pic dépasse ce seuil. Normalement, il est inutile d'ajouter le paramètre **auto_calib_th**, (le seuil est dans ce cas calculé automatiquement par le logiciel), mais il peut dans quelques rares circonstances s'avérer utile de le définir manuellement.

BIN_FACTOR : *Paramètre optionnel.* Facteur de binning (agglomération) des points du spectre final. Par exemple, si la valeur de ce paramètre est 2, les points sont additionnées 2 par 2 (specINTI calcule une valeur moyenne). Le binning spectral permet d'accroitre le rapport signal sur bruit, lorsque celui-ci est bas dans le spectre initial, mais bien sur, le pouvoir de résolution diminue (dans une proportion déterminée par la valeur de l'échantillonnage relativement à la finesse spectrale — il n'y a pas nécessairement une relation directe entre le facteur de binning et la résolution spectrale au final).

Exemple :

bin_factor: 6

Functions manual - list of Specinti script functions



Manuel de référence des fonctions

Les fonctions sont des commandes en une ligne que l'on insère dans le fichier de configuration. Lorsqu'une telle fonction est présente (son intitulé débute par le caractère « _ »), son code associé est exécuté, puis le programme s'arrête.

_version:
Retourne la version courante de specINTI.

_img_add: [in1, in2, out]
Additionne les images (in1) et (in2) avec le résultat (out).

_img_add_item_float: [in, item, value, out]
Ajoute un item du type (float) dans l'en-tête d'une image FITS.

_img_add_item_int: : [in, item, value, out]
Ajoute un item du type (int) dans l'en-tête d'une image FITS.

_img_add_item_str: [in, item, value, out]
Ajoute un item du type (string) dans l'en-tête d'une image FITS.

_img_compute_smile: [x1, y1, x2, y2, x3, y3]
Calcul du rayons de courbure et du centre d'un cercle à partir des coordonnées de 3 points sur ce cercle. Cette fonction trouve son utilité pour déterminer le rayon de courbure d'un raie (dont la forme est assimilé à un cercle) de telle manière à corriger cette distorsion et rendre la raie droite (c'est-à-dire dont le rayons de courbure est infini). Le résultat est fourni dans la console de sortie. Exemple :
_imag_compute_smile: [1669, 23, 1666, 414, 1669, 678], avec pour résultat un rayon de courbure de 17200 pixels.

_img_fill: [in1, x1, x2, out]
Met zéro les parties de l'image (in) entre x=1 et x=x1 d'une part, et entre x=x2 et x=largeur maxi. Le résultat est l'image (out).

_img_make_offset: [in, out]
Génère une image (out) dont l'intensité est égale à la moyenne des intensité dans l'image (in).

Atlas - lamp spectra, sky background, solar spectrum

Atlas de raies dans les sources spectrales

Ce document regroupe un ensemble de spectres de sources spectrales, à consulter lorsque vous désirez trouver la longueur d'onde d'une raie particulière à partir d'une des lampes d'étalonnage ou dans un spectre naturel (le spectre solaire par exemple).

Ci-après, spectre de lampes à décharges, par l'auteur :

http://www.astrosurf.com/buil/specinti/Atlas_Spectral_Lamps.pdf

Specinti checklist

Aide-mémoire
specINTI / specINTI Editor V2

Projet Sol'Ex/Star'Ex : http://www.astrosurf.com/solex

Christian Buil, Valérie Desnoux, octobre 2024

1. Objet

Ce document présente **specINTI** et **specINTI Editor** (version V2 et ultérieures). Il ne s'agit pas d'un manuel complet d'usage, mais plutôt d'un aide-mémoire des fonctions principales dans des situations courantes, couvrant les modes de traitement en haute et basse résolution spectrale, ainsi qu'une section dédiée aux spectres d'objets étendus (tels que les nébuleuses). Référez-vous à ce document en cas de doute sur le déroulement des opérations.

Pour commencer, rappelons que **specINTI** est le moteur de calcul principal pour le traitement des spectres, tandis que **specINTI Editor** est une interface graphique qui interagit avec specINTI en fournissant deux fichiers essentiels :

- Un **fichier de configuration**, définissant les paramètres de traitement des spectres ;
- Un **fichier d'observation**, contenant les données spectrales à analyser.

Ces deux fichiers peuvent être édités directement dans specINTI Editor, qui intègre plusieurs outils pour simplifier ce travail, mais aussi pour visualiser le résultat des traitements et la qualité.

Vous pouvez télécharger l'ensemble specINTI/specINTI Editor via ce lien :
http://valerie.desnoux.free.fr/inti/specinti_editor.zip

2. Le traitement de spectres à haute résolution

MacOs execution

To execute an unsigned program on MacOs, place the file

in a directory of your choice.

Before zipping, display a Mac terminal console and enter the command: sudo xattr -cr /pathtofile/specinti_mac.zip

Replace /pathtofile/ with the path to your zip file

If your file is already unzipped, enter the directory path

As sudo is a supervisor command, the terminal asks for a password

Enter your Mac account password and press Enter. When you enter the password, nothing happens on the screen. If the result is correct, the terminal displays no error message.

You can then unzip your file or access the directory directly. The first time you launch the terminal, it may take a long time to load, approaching two minutes. Please be patient... this will not be the case for subsequent launches.