NIRPS babysitter manual

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May 11, 2026

Version 1.31

Introduction

The document is meant as a guide for 'NIRPS babysitters' (but may be useful for others as well).

We rely on 'babysitters' to make sure the incoming data for NIRPS is 'good' before we run the APERO reduction for a night.

As a bonus our checks for reduction also act as a 'backup' for monitoring what should be happening at the telescope and/or by others who receive automated emails (hopefully).

This work is incredibly important to allow us to reduce data in such a way that it can be used, in good faith, by NIRPS scientists (such as yourself).

Also if you see anything wrong or missing please leave a comment or ask us to update it, this document should never be 'complete' and any improvements benefit everyone.

Thank you for taking the time to do this.

Please know you are not alone . Please get in touch with us or previous babysitters to ask for help and anything you are uncertain with.

Contents

1 Important Information

1.1 Useful links

1. Online version of this document
2. PDF version of this document
3. APERO UdeM Wiki
4. Raw data + red checks google sheet
5. Known errors
6. User reported errors
7. NIRPS babysitter allocation + what to do
8. Complete babysitter task form
9. NIRPS babysitter meeting notes
10. APERO object google sheet (read only)
11. APERO reject google sheet (read only)
12. NIRPS instrument events
13. NIRPS targets list
14. NIRPS header key definition
15. Geneva sharepoint

1.2 Step by step guide - flow diagram

Link to a larger (pdf) version show in figure 1.

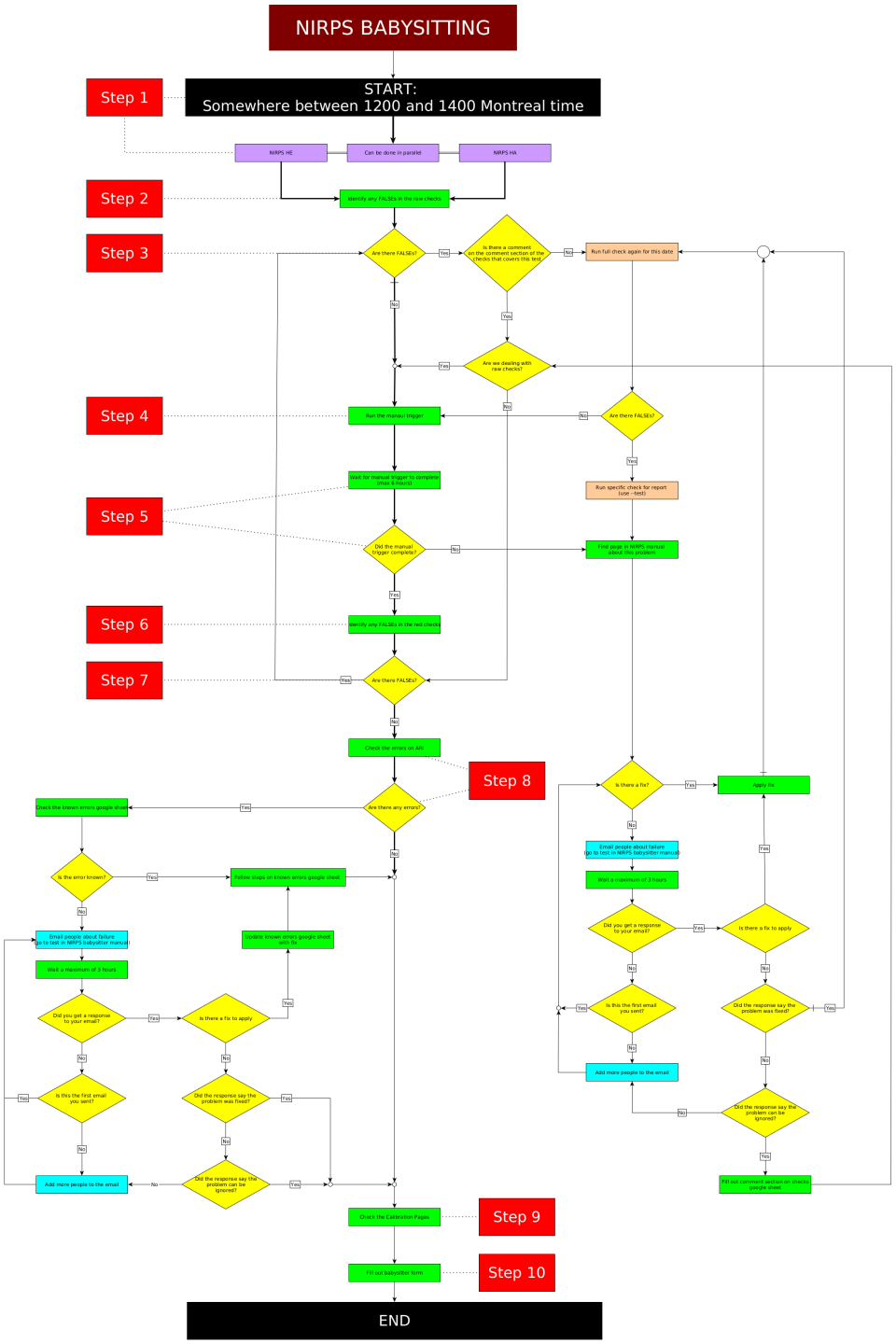

Figure 1: The step-by-step NIRPS Babysitter flow diagram

1.3 Step by step guide - In writing

Step 1/10

Every weekday (on Mondays you'll have to check the previous Saturday and Sunday).

Start somewhere between 1200 and 1400 Montreal time, you need to do this twice once for NIRPS-HE (online) and one for NIRPS-HA (online), these can be done in parallel so you don't need to wait for one to be completed to do the other, in many cases the errors will be linked to both.

Step 2/10

Open the Raw data + red checks google sheet

Identify any FALSEs in the raw checks that do not have comments.

Step 3/10

If there are FALSEs run the full check again, if there are still FALSEs run the check for a specific check (i.e. use –test).

If an error has been found, check the raw checks section of this manual for a fix or who to contact, fix the problem or email these people. Wait a maximum of 3 hours for a reply and email them again and/or add more people to the email until someone replies. Once you have a response, fix the problem, or if you are told the problem was fixed or can be ignored move to the next step. Make sure to fill out comment section on the check google sheet for any ignored problems (or while waiting for a reply).

Step 4/10

If there are no FALSEs in the raw check that do not have comments you can run the manual trigger.

Step 5/10

Wait for the manual trigger to complete (max 6 hours) if it did not complete find the people in this document to contact.

Step 6/10

Identify any FALSEs in the red checks that do not have comments.

Step 7/10

If there are FALSEs run the full check again, if there are still FALSEs run the check for a specific check (i.e. use –test).

If an error has been found, check the reduced checks section of this manual for a fix or who to contact, fix the problem or email these people. Wait a maximum of 3 hours for a reply and email them again and/or add more people to the email until someone replies. Once you have a response, fix the problem, or if you are told the problem was fixed or can be ignored move to the next step.

Step 8/10

Once this is done check the errors on ARI, if there are errors on ARI follow the steps in this section.

Step 9/10

Check the Calibration page on ARI. Look for any inconsistencies between the latest points and the previous trends. Note the yellow plots are for the lifetime of the instrument, the blue plots are the most recent points.

- NIRPS HE Calibration page
- NIRPS HA Calibration page

Step 10/10

Finally, fill in the babysitter form.

1.4 At the end of your week

At the end of your week, you are required to do a few final things:

1. Report on your week
2. Inform the next babysitter
3. Fill out an estimate for the number of hours (on this page) - a minimum of 2 hours should be added.

Reporting on your week

You should create a summary of your week for the babysitting meeting (and if possible attend that weeks meeting to report on your week.

This can be done in one of two places:

- In the NIRPS Montreal Data Team meeting notes (preferred)
- In the `#nirps_squad` slack channel

This can be as simple as the comments you entered in the babysitter form (All entries can be found here).

The next babysitter

You are responsible for letting the next babysitter know:

- that they are responsible for babysitting this week
- that your week is complete
- if there are any ongoing problems

The next babysitter can be found here.

You can use the following text to copy-and-paste to the next babysitter

```
Just a note you are responsible for the NIRPS checks this week:

- Instructions (latex):
https://www.overleaf.com/9565552353bsgzsfzbvpcw#252fab

- Instructions (pdf):
http://206.12.93.77/ari/data/docs/nirps_babysitting/NIRPS_babysitters.pdf
```

1.5 What days am I responsible for?

You are responsible for Monday - through to the following Sunday. As reduced checks and reductions are done for 'yesterday' this means you are responsible for reduced checks and reductions Sunday through to the following Saturday.

Note that we do not expect you to work on weekends, but you can choose to do the Saturday and Sunday steps on a weekend or on the following Monday.

Please make sure you inform the next babysitter that they should not do anything until you have finished your week. Obviously you can also choose to do the weekend steps on the weekend if you prefer.

e.g. Assuming Monday is the 2nd of the Month

- raw checks for Monday 2nd (checked on Monday 2nd), Tuesday 3rd, ..., Sunday 8th (checked at latest on Monday 9th)
- reduced checks and running the manual trigger for Sunday 1st, ..., Saturday 7th (run at latest on Monday 9th)

1.6 Need help? Ask!

If in doubt ask!

Who to go to for help:

1. The contact names for a specific check
2. The previous babysitters (or any in the last few weeks)
3. The core people (listed in the table below)
4. The nirps_squad slack channel

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Frederique Baron	frederique.baron@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Charles Cadieux	charles.cadieux.1@umontreal.ca
Thomas Vandal	thomas.vandal@umontreal.ca
UdeM NIRPS mailing list	nirps_mtl@listes.umontreal.ca

Note about emailing people

It is your responsibility to make sure people are replying to you. It is important you find someone to reply to you, please do not wait more than 12 hours for a reply.

In some cases you should see a '★' by the name, this indicates the most likely person you need a reply from (for example it may be hard to get a reply during a weekend or holiday period).

If no one answers please email more people (e.g. the core people above).

Note about reporting problems

If you report a problem and share the output of your terminal or the content of a file, please copy/paste the text do not send a screenshot .

This helps us a lot with debugging!

2 Raw data checks

2.1 Overview

Link to raw checks:

- RAW-NIRPS-HE
- RAW-NIRPS-HA

Check every day (around 14:00 Montreal time)

If a column title is in yellow do not check today (check yesterday)

Check for any columns with a FALSE.

If there is no test for today and yesterday, please run the raw checks again.

If something is FALSE, please run the raw checks again.

Any FALSES that someone has told you to ignore should be commented here:

- Comments-NIRPS-HE
- Comments-NIRPS-HA

Please note that checks have dependencies. Do not following instructions for a test if a tests dependencies have failed. The checks should display that a dependency has failed and will not work out if this test has failed until all dependencies have passed.

2.2 Current tests

These tests are described in detail in the following sections:

- BLANK: Always True if night has been run
- CRIT: Critical checks done at time of download.
- SYSTEM: Checks that the system is functioning properly.
- HAS_OBSDIR: Check that an observation directory has files
- CALIB_TEST: Checks a list of calibrations is present
- COB_TEST: Check if all calibration OB NAMES are present
- ENG_TEST: Check consistency of headers for engineering data
- CALIB_QUAL: Some basic quality checks for calibration files
- ASTROM_TEST: Check whether a science object is in the astrometric database
- CRIT_SCI: Critical science checks done at time of download.
- NO_SCI: Check that we have science data for this night
- SCI_QUAL: Some basic quality checks for science files.

2.3 RAW CHECK: BLANK

Overview

This test is there to show that the raw check ran at least once. Even if every other column is FALSE if the check was run for this date it should be True.

Requirements

None.

What to do

If FALSE there is a problem.

Please contact the following immediately:

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

2.4 RAW CHECK: CRIT

Overview

This test looks at the critical tests performed by the NIRPS download script. Currently, the NIRPS download critical tests perform the following tests:

- Are there any files on disk?
- Are there files missing from the archive? (May update later)

Requirements

- `BLANK = True`

What to do

This test will be FALSE until we have some data for today.

Please check the section on when to expect files to decide whether you should wait or contact someone. Note in good operations you should not have to wait more than 12 hours so if you are checking for 'yesterday' you shouldn't wait any longer.

If you have waited long enough please check on the ESO archives to see if there are data for today.

To see what data are on disk, use `ls /nirps_raw/nirps/raw-data/nirps_h*/<YYYY-MM-DD>/*.fits` (replace `<YYYY-MM-DD>` with the night you want to check). Do see what objects have been observed use `dfits /nirps_raw/nirps/raw-data/nirps_h*/2025-09-06/*.fits | fitsort OBJECT`.

If there is data for today (not including SUN data) then we have a problem.

Please contact the following immediately:

Contact name	Email
Thomas Vandal ★	thomas.vandal@umontreal.ca
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

If there is no data on the ESO archive follow the steps for no data in section 2.6.

2.5 RAW CHECK: SYSTEM

Overview

This test checks whether certain system features are working.

Current sub-tests are:

1. Test that the email server is working
2. Test that the disk usage on `/cosmos99` is less than 90%

Requirements

- `BLANK = True`

What to do

If FALSE please re-run the check with `--test=SYSTEM`.

If still FALSE please email the following people immediately with the log from the check.

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Thomas Vandal	thomas.vandal@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

2.6 RAW CHECK: HAS_OBSDIR

Overview

This test checks for an observation night directory to exist in the raw directory

- For NIRPS-HE: `/nirps_raw/nirps/raw-data/nirps_he`
- For NIRPS-HA: `/nirps_raw/nirps/raw-data/nirps_ha`

Requirements

- `BLANK = True`
- `CRIT = True`

What to do

If FALSE please re-run the check with `--test=HAS_OBSDIR`.

If still FALSE then the directory for that day/night has not been created on our machine.

Please check here for when you should expect files on our machines.

Then you need to check the ESO archives for data.

If there is no data on the ESO archive

This means that either:

- No data was taken
- No data was transferred from La Silla to the ESO Archive

If there is no data on the ESO archive either no data was taken or no data was transferred from La Silla to the ESO archive.

Check the observation log if there is a good reason for no data you can report this FALSE and ignore it – you can always email Lison Malo, Neil Cook, Frederique Baron and Etienne Artigau to ask if the reason is good enough to ignore there being no data.

If you are ignoring the data please update the comments section on the APERO checks google sheet.

If there was no good reason please contact the following people stating there was no data on the ESO archive.

Contact name	Email
ccauthorESO CL Service Desk1	cl-servicedesk@eso.org
The current observer	Click here
3.6m Telescope	3P6@eso.org
La Silla Day and Night Staff	ls-dnos@eso.org
Gaspare Lo Curto	glocurto@eso.org
Neil Cook	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Frederique Baron	frederique.baron@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Xavier Dumusque	xavier.dumusque@unige.ch

Note that even if confirmed that there is expected to be no data please still run the manual trigger. In the APERO processing step you will be prompted to continue you can say "No" (this will just skip the processing step) but all the other manual trigger steps should still run.

If there is data on the ESO archive

This means that we have a problem downloading the data from the ESO archive.

Please contact the following people stating that there was no data on our machines but was data on the ESO archive.

Contact name	Email
Thomas Vandal ★	thomas.vandal@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Neil Cook	neil.cook@umontreal.ca

After waiting for one of these people to reply (or resending the email if no one replies) please wait until there is data on our machine. This may be after your time has babysitter is over but you are still responsible for these nights (though in some cases we will run a batch of nights at once).

Please make sure you let the `#nirps_squad` channel know there is no data, and if there is still no data by the time it is the next babysitters turn, let them know that they should not run the manual trigger until you have run your dates. They may or may not be able to check the raw checks in the meantime (depending on whether new data is available).

2.7 RAW CHECK: CALIB_TEST

Overview

This test checks for at least one of each calibration file (based on the HIERARCH ESO DPR TYPE key) It will be FALSE if any of the following is missing:

- DARK
- FLAT,DARK,LAMP
- FLAT,LAMP,DARK
- WAVE,FP,FP
- WAVE,UN1,FP
- WAVE,FP,UN1,
- WAVE,UN1,UN1

Requirements

- `BLANK = True`
- `CRIT = True`
- `HAS_OBSDIR = True`

What to do

If FALSE please re-run the check with `--test=CALIB_TEST`.

If HAS_OBSDIR is FALSE please deal with this first and only continue with this section if HAS_OBSDIR is TRUE.

Next you need to check whether the missing calibrations are on the ESO archive.

You will have to check the files found in the ESO archive compared to the data on our machines (in the observation directory that was flagged as FALSE).

Step 1/3

ssh into nirps-client

Step 2/3

Change to the raw directory:

- NIRPS-HE: `bsdir/nirps_raw/nirps/raw-data/nirps_he/o`
- NIRPS-HA: `bsdir/nirps_raw/nirps/raw-data/nirps_ha/o`

Step 3/3

Check against the files on the ESO archives. Note that you'll have to confirm which files are HE and which are HA on the archive as they are not separated.

Note that ticking the "CALIB" box on the ESO archive will only show you calibrations.

Please check here for when the calibrations should have been taken and on our machines.

If there is missing data on the ESO archives with a good reason

This means that either:

- The calibration(s) were not taken
- The calibration were not transferred from La Silla to the ESO Archive

Check the observation log if there is a good reason for calibrations not to be taken.

If there is missing data on the ESO Archive with a good reason

We may need to reject other calibrations before running the manual trigger.

Please contact the following people, stating which calibrations are missing and you need someone to decide if other calibrations need to be rejected. Please also be specific about which calibrations are missing (the error message should say) if all calibrations are missing please mention that the Daily full calibration set usually taken at 12 UT (including darks) are missing (if this is the case).

Contact name	Email
The current observer ★	Click here
La Silla Day and Night Staff	ls-dnos@eso.org
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Neil Cook	neil.cook@umontreal.ca
Frederique Baron	frederique.baron@umontreal.ca
Gaspare Lo Curto	glocurto@eso.org

If there is missing data on the ESO archives with no good reason

If there was no good reason please contact the following people stating there was no data on the ESO archive.

Contact name	Email
The current observer ★	Click here
3.6m Telescope	3P6@eso.org
La Silla Day and Night Staff	ls-dnos@eso.org
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Neil Cook	neil.cook@umontreal.ca
Gaspare Lo Curto	glocurto@eso.org
Xavier Dumusque	xavier.dumusque@unige.ch

Please then wait for a response, re-send the email if you get no response, and act accordingly if there if no data for a good reason.

If there is data on the ESO archive but not on our disks

This means that we have a problem downloading the data from the ESO archive.

Please contact the following people with the report from the raw check stating there was no data on the ESO archive.

Contact name	Email
Thomas Vandal ★	thomas.vandal@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Neil Cook	neil.cook@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

After waiting for one of these people to reply (or re-sending the email if no one replies) please wait until there is data on our machine. This may be after your time has babysitter is over but you are still responsible for these nights (though in some cases we will run a batch of nights at once).

Please make sure you let the `#nirps_squad` channel know there is no data, and if there is still no data by the time it is the next babysitters turn, let them know that they should not run the manual trigger until you have run your dates. They may or may not be able to check the raw checks in the meantime (depending on whether new data is available).

2.8 RAW CHECK: COB_TEST

Overview

This test checks whether calibrations exist for both the full daily calibration set and the shorter afternoon calibration set. It uses the `HIERARACH ESO OBS NAME` to check for at least one entry of:

- Daily-Calibrations-Full-Set
- Daily-Calibrations-Full-Set
- For Modified Julien dates after 59895
- Afternoon-Calibrations
- For Modified Julien dates after 60096

Note this is called 'OB Name' on the ESO archive.

Requirements

- `BLANK = True`
- `CRIT = True`
- `HAS_OBSDIR = True`

What to do

If FALSE please re-run the check with `--test=COB_TEST`.

If the HAS_OBSDIR or CALIB_TEST is FALSE please deal with these first. Only continue with this section if HAS_OBSDIR and CALIB_TEST are TRUE.

If the test if still FALSE it may mean the afternoon calibrations have not been taken yet.

Please check here for when the afternoon calibrations should have been taken and on our machines.

If calibrations are abnormally late

If you have waited 12 hours then please check whether the missing calibrations are on the ESO archive.

The rest of the steps are the same as the CALIB_TEST section.

But make sure when emailing people you point out that you are missing all calibrations from the 'Daily-Calibrations-Full-Set' observation block or the 'Afternoon-Calibrations' observation block. If the 'Daily-Calibrations-Full-Set' of calibrations are missing also mention that this calibation set should have been taking at 12:00UT and includes darks. The 'Afternoon-Calibrations' does not include darks, flats etc

and only includes FPs and UN1 sequences therefore confusion can arise from just saying 'calibrations' are missing - be specific!

To see the 'OB Name' column on the archive you have to tick the OB Name box in this section (See figure 2.

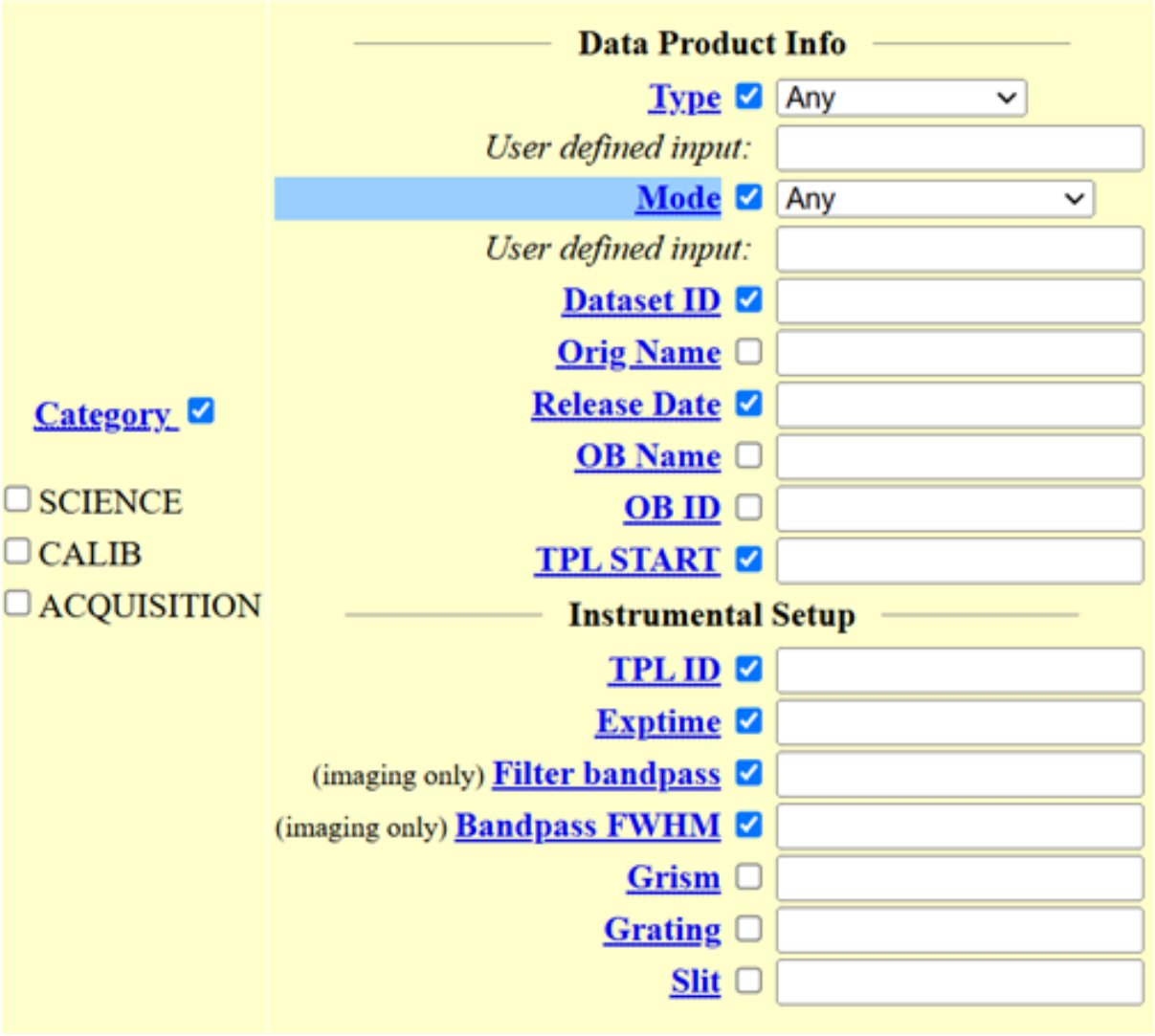

Figure 2: ESO Data Product Info box.

2.9 RAW CHECK: ENG_TEST

Overview

The engineering test tests the raw calibration files against a suite of sub-tests designed to see if the instrument is behaving as expected.

Requirements

- `BLANK = TRUE`
- `CRIT = True`
- `HAS_OBSDIR = TRUE`
- `CALIB_TEST = TRUE`

What to do

If FALSE please re-run the check with `--test=ENG_TEST`.

If HAS_OBSDIR is FALSE or CALIB_TEST is FALSE please deal with these first and only continue with this section if HAS_OBSDIR is TRUE and TEST is True.

Please refer to the following sub-section and fix the problems/email the required people as stated.

Current sub-tests are:

1. test_enclosure_temperature
2. test_enclosure_temperature_setpoint
3. test_vacuum_gauge1
4. test_isolation_valve
5. test_cryo1_stat
6. test_cryo2_stat
7. test_turbo_pump_status
8. test_warning_cryo1
9. test_warning_cryo2
10. test_fp_temperature
11. test_fp_temperature_ext
12. test_fp_temperature_setpoint

13. test_encloser_heater_power
14. ScramblingStatus
15. StretcherStatus
16. BackEnd_DeviceError

Please make sure to include the failures that are printed out.

Please copy and paste the text and do not use a screenshot .

Contact information

A list of all emails for the below sub-sections is here (please do not use all of them unless no one replies and choose the emails for each sub-test.

Contact name	Email
Lison Malo	lison.malo@umontreal.ca
Gaspare Lo Curto	glocurto@eso.org
Neil Cook	neil.cook@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Frederique Baron	frederique.baron@umontreal.ca
Philippe Vallee	philippe.vallee@umontreal.ca
La Silla Day and Night Staff	ls-dnos@eso.org
NIRPS Support	nirps_support@listes.umontreal.ca

ENG TEST: test_enclosure_temperature

Variables:

```
EncloserTemperature = "HIERARCH ESO INS TEMP185 VAL"
EncloserTemperatureSetpoint = "HIERARCH ESO INS TEMP187 VAL"
RMS = np.nanstd(EncloserTemperature - EncloserTemperatureSetpoint)
```

Tests:

```
RMS < 0.1
```

Actions:

```
Email: Gaspare Lo Curto*, Lison Malo, Neil Cook, Etienne Artigau
```

ENG TEST: test_enclosure_temperature_setpoint

Variables:

```
EncloserTemperature = "HIERARCH ESO INS TEMP185 VAL"
EncloserTemperatureSetpoint = "HIERARCH ESO INS TEMP187 VAL"
MEAN_DIFF = np.nanmean(EncloserTemperature - EncloserTemperatureSetpoint)
```

Tests:

```
ABS(MEAN_DIFF) < 0.1
```

Actions:

```
Email: Gaspare Lo curto*, Lison Malo, Neil Cook, Etienne Artigau
```

ENG TEST: test_vacuum_gauge1

Variables:

```
VacuumGauge1 = "HIERARCH ESO INS PRES104 VAL"
MAX = np.nanmax(VacuumGauge1)
```

Tests:

```
MAX < 1.0e-4
```

Actions:

```
Email: Etienne Artigau*, Lison Malo, Neil Cook
```

ENG TEST: test_isolation_valve

Variables:

```
IsolationValve = HIERARCH ESO INS SENS100 STAT
```

Tests:

```
IsolationValve = 0
```

Actions:

```
Email: Etienne Artigau*, Lison Malo, Neil Cook
```

ENG TEST: test_cryo1_stat

Variables:

```
Cryo1Status = "HIERARCH ESO INS SENS126"
```

Tests:

```
Cryo1Status = 0
```

Actions:

```
Do nothing if there are less than 3 instances of this error.

Email:  Lison Malo* ,Gaspare Lo curto, Philippe Vallee,
        Neil Cook, Etienne Artigau
```

ENG TEST: test_cryo2_stat

Variables:

```
Cryo2Status = "HIERARCH ESO INS SENS127"
```

Tests:

```
Cryo2Status = 0
```

Actions:

```
Do nothing if there are less than 3 instances of this error.

Email:  Lison Malo* ,Gaspare Lo curto, Philippe Vallee,
        Neil Cook, Etienne Artigau
```

ENG TEST: test_turbo_pump_status

Variables:

```
TurboPumpStatus = "HIERARCH ESO INS SENS102 STAT"
TSUM = np.sum(TurboPumpStatus)
TMEAN = np.mean(TurboPumpStatus)
TPER = TMEAN * 100.0
```

Tests:

```
TurboPumpStatus = 0
```

Actions:

```
Email: Lison Malo*, Neil Cook, Etienne Artigau
```

ENG TEST: test_warning_cryo1

Variables:

```
WarningCryo1 = "HIERARCH ESO INS SENS144 STAT"
SUM = sum(WarningCryo1)
```

Tests:

```
WarningCryo1 = 0
```

Actions:

```
Email:  Lison Malo*, Philippe Vallee, Neil Cook, Etienne Artigau
```

ENG TEST: test_warning_cryo2

Variables:

```
WarningCryo2 = "HIERARCH ESO INS SENS146 STAT"
SUM = sum(WarningCryo2)
```

Tests:

```
WarningCryo2 = 0
```

Actions:

```
Email:  Lison Malo*, Philippe Vallee, Neil Cook, Etienne Artigau
```

ENG TEST: test_fp_temperature

Variables:

```
FPtemperature_interior = "HIERARCH ESO INS TEMP14 VAL"
RMS = std(FPtemperature_interior)
```

Tests:

```
RMS < 1.0e-2
```

Actions:

```
Email:  Lison Malo*, Philippe Vallee, Neil Cook, Etienne Artigau
```

ENG TEST: test_fp_temperature_ext

Variables:

```
FPtemperature_exterior = "HIERARCH ESO INS TEMP13 VAL"
NANMIN = np.nanmin(FPtemperature_exterior)
NANMAX = np.nanmin(FPtemperature_exterior)
```

Tests:

```
NANMIN > 23.496
NANMAX < 24.504
```

Actions:

```
Email: Lison Malo*, Lison Malo, Neil Cook, Etienne Artigau
```

ENG TEST: test_fp_temperature_setpoint

Variables:

```
FPtemperature_interior = "HIERARCH ESO INS TEMP14 VAL"
FPtemperature_setpoint = "HIERARCH ESO INS TEMP188 VAL"
RMS = std(FPtemperature_interior - FPtemperature_setpoint)
```

Tests:

```
RMS < 0.005
```

Actions:

```
Email: Etienne Artigau*, Lison Malo, Neil Cook
```

ENG TEST: test_encloser_heater_power

Variables:

```
EncloserHeaterPower = "HIERARCH ESO INS SENS121 VAL"
MAX = np.nanmax(EncloserHeaterPower)
```

Tests:

```
MAX < 98.0
```

Actions:

```
Email: Gaspare Lo Curto*, Lison Malo, Neil Cook, Etienne Artigau
```

ENG TEST: ScramblingStatus

Variables:

```
ScramblingStatus = "HIERARCH ESO INS2 AOS SCRAMB ST"
```

Tests:

```
ScramblingStatus = True
```

Actions:

```
Email: Lison Malo*, Gaspare Lo curto, Neil Cook, Etienne Artigau
```

ENG TEST: StretcherStatus

Variables:

```
StretcherStatus = "HIERARCH ESO INS OPTI10 STAT"
```

Tests:

```
StretcherStatus = ON
```

Actions:

```
Email: Lison Malo*, Gaspare Lo curto, Neil Cook, Etienne Artigau
```

ENG TEST: BackEnd_DeviceError

Variables:

```
BackEndDeviceError = "HIERARCH ESO INS SENS129 STAT"
```

Tests:

```
BackEndDeviceError != NOK
```

Actions:

```
Email: Lison Malo*, La Silla Day and Night Staff,
       NIRPS Support, Etienne Artigau, Neil Cook
```

2.10 RAW CHECK: CALIB_QUAL

Overview

Checks the quality of raw calibration files. The following metrics are used:

- Minimum 99th percentile
- Maximum 99th percentile
- The max fraction of saturated pixels

For the following HIERARCH ESO DPR TYPE files:

- FLAT:
  - FLAT,LAMP,DARK
  - FLAT,DARK,LAMP
  - FLAT,LAMP,DARK
  - ORDERDEF,DARK,LAMP
  - ORDERDEF,LAMP,DARK
- FP:
  - WAVE,FP,FP
  - WAVE,UN1,UN1
  - WAVE,FP,UN1
  - WAVE,UN1,FP
  - CONTAM,DARK,FP
- TELLURIC:
  - TELLURIC,SKY

Requirements

- `BLANK = True`
- `CRIT = True`
- `HAS_OBSDIR = True`
- `CALIB_TEST = True`

What to do

If FALSE please re-run the check with `--test=CALIB_QUAL`.

If HAS_OBSDIR is FALSE or CALIB_TEST is FALSE please deal with these first and only continue with this section if HAS_OBSDIR is TRUE and CALIB_TEST is True.

If still FALSE after re-running the checks please contact the following people with the report from the raw check.

Contact name	Email
Etienne Artigau	etienne.artigau@umontreal.ca
1 Neil Cook	neil.cook@umontreal.ca
Charles Cadieux	charles.cadieux.1@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
NIRPS Support	nirps_support@listes.umontreal.ca

2.11 RAW CHECK: ASTROM_TEST

Overview

This test checks that all science file object names are in the astrometric database. This test, regardless of the observation directory, works on all files. Therefore if one science file is missing from the astrometric database all tests will be FALSE until this is fixed.

Requirements

- `BLANK = True`
- `CRIT = True`
- `HAS_OBSDIR = True`

What to do

If FALSE please re-run the check with `--test=ASTROM_TEST`.

If still FALSE you'll get a list of objects to add to the astrometric database (see figure 3.

```
Some objects must be added to astrometric database (via apero_astrometrics) or added to the reject list.

        1       TELLURIC,SKY                    (APERO: HR9098) LAST[60.A-9109(A), UNKNOWN, 2024-02-01]
        2       Night sky-sky HE                (APERO: NIGHT_SKYMSKY_HE)       LAST[60.A-9109(A), UNKNOWN, 2023-10-25]
        3       LP885-35                        (APERO: LP885M35)       LAST[112.25NZ.001, UNKNOWN, 2023-12-30]
        4       SKY-SKY                         (APERO: SKYMSKY)        LAST[112.25P3.001, UNKNOWN, 2023-11-03]
        5       Tau3Eridani                     (APERO: TAU3ERIDANI)    LAST[112.25P3.001, UNKNOWN, 2024-01-12]
        6       Night sky-sky - HE              (APERO: NIGHT_SKYMSKY_M_HE)     LAST[60.A-9109(A), UNKNOWN, 2023-01-23]
        7       GJ328                           (APERO: GJ328)  LAST[112.25NZ.001, UNKNOWN, 2024-01-30]
        8       SKY_SKY_04_10                   (APERO: SKY_SKY_04_10)  LAST[112.25P3.001, UNKNOWN, 2023-10-04]
```

Figure 3: The log message displayed when the astrometric test is FALSE.

You must then decide whether these objects should be:

1. Added to the astrometric database (for real astrophysical objects not in the solar system)
2. Added to the astrometric database as a Solar system objects
3. Added to the rejection database (for anything else)

These three options are described in the next sub-sections.

Adding an object to the astrometric database

Follow the steps here.

Once you have added the object please email the following people for reference. Please state that no reply is required.

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

Solar system objects

Currently these need to be added manually to the astrometric database. Please find one of the raw observations and get the object name of the object from the header checking the following keys:

- OBJECT
- HIERARCH ESO TARG NAME

Please then email the following people, stating that you need a solar system object adding to the astrometric database and giving the object name/names from the header.

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

Adding an object to the reject list

Follow the steps here.

Once you have rejected the object please email the following people for reference. Please state that no reply is required.

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

What if I've already run the manual trigger?

In this case it is safest to remove all entries from apero before re-running the trigger (but after adding the object to the astrometric catalogue or the reject list).

To remove an object follow the steps here.

2.12 RAW CHECK: CRIT_SCI

Overview

This test looks at the critical tests performed by the NIRPS download script specifically related to the science data. Currently, the NIRPS download critical tests perform the following tests:

- Did we receive an observing log on the APERO gmail? (logs are only generated for GTO data).
- Is any data from the observing logs missing on the ESO archive?

If you choose to override this test in most cases you will need to override `NO_SCI` as well.

Requirements

- `BLANK = True`
- `CRIT = True`
- `HAS_OBSDIR = True`

What to do

If FALSE please re-run the check with `--test=CRIT_SCI`. If still FALSE, this should tell you that 'Check logs failed - Check for files from the observing logs missing on the archive'.

This either means that:

1. we did not receive a log
2. there is data from the logs missing on the archive.

Most of the time it is option 1 (we did not receive a log). To confirm this, use `ls /nirps_raw/nirps/lasilla-night-logs/ -l`

If we did not receive a log

Check the observation log to see if any data was taken. If no GTO science observations were taken, it is expected that we did not receive the log. You can also double check that there is no science data on the ESO archive.

Note that the logs are only generated for GTO data , so this test will be FALSE if there was no science data. Make sure you look at the special access ESO archive. Also make sure you turn on the PI CoI tick box in the pink box. For GTO data this list should be something similar to the following: `BOUCHY, DOYON, MIGNON, MALO, ALLART, ARTIGAU...`.

You can also check the how to find science data section. If there was science data, please reach out (see below).

If you need to see what data are on disk, use `ls /nirps_raw/nirps/raw-data/nirps_h*/<YYYY-MM-DD>/*.fits` (replace `<YYYY-MM-DD>` with the night you want to check). Do see what objects have been observed use `dfits /nirps_raw/nirps/raw-data/nirps_h*/2025-09-06/*.fits | fitsort OBJECT`.

If we received a log and the archive is missing data from the log

This should never happen. It means that some data was taken at the telescope but never made it to the archive and we should understand why. Please contact us (see below).

If there is a good reason for no log

Run the apero check override code with `--test=CRIT_SCI`.

If there is no good reason for no logs, or missing files on the archive

If as far as you can tell there should be a log and there is none, or if some data is missing from the archive, please check the ESO archive to see what data is available.

You can filter to only show 'SCIENCE' data using the category 'SCIENCE' in the yellow section (see figure 2).

Please contact the following people stating that we did not receive a log from the telescope, or that there is data from the logs missing on the archive.

Contact name	Email
Thomas Vandal ★	thomas.vandal@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Neil Cook	neil.cook@umontreal.ca
The current observer ★	Click here
3.6m Telescope	3P6@eso.org
La Silla Day and Night Staff	ls-dnos@eso.org
Neil Cook	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Lucile Mignon	lucile.mignon@univ-grenoble-alpes.fr
Romain Allart	romain.allart@umontreal.ca

2.13 RAW CHECK: NO_SCI

Overview

Check whether there are any science observations for a night.

In most cases this test will need overriding if you did an override for `CRIT_SCI`.

For the following HIERARCH ESO DPR TYPE files:

- SCIENCE:
  - OBJECT,SKY
  - OBJECT,FP

Requirements

- `BLANK = True`
- `CRIT = True`
- `HAS_OBSDIR = True`
- `CRIT_SCI = True`
- Check yesterday's data not today's

What to do

If FALSE please re-run the check with `--test=NO_SCI`.

IF still FALSE please check the how to find science data section.

If there is a good reason for no science data

Run the apero check override code with `--test=NO_SCI`.

If there is no good reason for no science data

If as far as you can tell there should be science data please check the ESO archive to see if data is available.

You can filter to only show 'SCIENCE' data using the category 'SCIENCE' in the yellow section (see figure 2).

If there is science data on the ESO archive

Please contact the following people stating that there was no data on our machines but was data on the ESO archive.

Contact name	Email
Thomas Vandal ★	thomas.vandal@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Neil Cook	neil.cook@umontreal.ca

If there is no science data on the ESO archive

Please contact the following people asking whether science data was observed for the observation night:

Contact name	Email
The current observer ★	Click here
3.6m Telescope	3P6@eso.org
La Silla Day and Night Staff	ls-dnos@eso.org
Neil Cook	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Frederique Baron	frederique.baron@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Lucile Mignon	lucile.mignon@univ-grenoble-alpes.fr
Romain Allart	romain.allart@umontreal.ca

2.14 RAW CHECK: SCI_QUAL

Overview

Checks the quality of raw science files. The following metrics are used:

- Minimum 99th percentile
- Maximum 99th percentile
- The max fraction of saturated pixels

For the following HIERARCH ESO DPR TYPE files:

- SCIENCE:
  - OBJECT,SKY
  - OBJECT,FP

Requirements

- `BLANK = True`
- `CRIT = True`
- `HAS_OBSDIR = True`
- `CRIT_SCI = True`
- `NO_SCI = True`
- Check yesterday's data not today's

What to do

If FALSE please re-run the check with `--test=SCI_QUAL`.

If HAS_OBSDIR is FALSE or NO_SCI is FALSE please deal with these first and only continue with this section if HAS_OBSDIR is TRUE and NO_SCI is True.

Note science files will appear after a night has been completed. The way the observation directories are set up means you have to wait until the next calendar day to do this test.

If still FALSE after re-running the checks please contact the following people with the report from the raw check.

Contact name	Email
Etienne Artigau ★	etienne.artigau@umontreal.ca
Neil Cook	neil.cook@umontreal.ca
Charles Cadieux	charles.cadieux.1@umontreal.ca
Lison Malo	lison.malo@umontreal.ca

3 Reduced data checks

3.1 Overview

Link to reduced checks:

- test
- RED-ONLINE-NIRPS-HE
- RED-ONLINE-NIRPS-HA

Check everyday (for the previous day) after running the manual trigger.

Do not check todays values (or run the manual trigger for today)

Check for any columns with a FALSE.

If there is not test for today and yesterday, please run the red checks again.

If something is FALSE, please run the reduced checks again.

Any FALSES that someone has told you to ignore should be commented here:

- Comments-NIRPS-HE
- Comments-NIRPS-HA

If you enter the wrong night you cannot undo this yourself, please see this section on how to undo this.

3.2 Current tests

These tests are described in detail in the following sections:

- BLANK: Always True if night has been run
- HAS_OBSDIR: Check that manual trigger symlinked observation directories
- APERO_CALIB: Check that symlinked directories have all required calibrations for APERO
- MANUAL_START: Check that the manual trigger was started for this observation directory
- MANUAL_END: Check that the manual trigger got to the end
- APERO_START: Check that APERO+LBL processing (inside manual trigger) was started
- APERO_END: Check that APERO+LBL processing(inside manual trigger) ended
- ARI_START: Check that LBL (inside manual trigger) was started
- ARI_END: Check that LBL (inside manual trigger) ended
- PIXEL_SHIFTS: Check for pixel shifts in pp files
- EXCESS_MODAL: Check excess modal noise
- LOW_SNR: Check for low SNR
- PREV_REDUC: Check whether the last 7 days has any raw data that has not been reduced

3.3 RED CHECK: BLANK

Overview

This test is there to show that the reduced check ran at least once. Even if every other column is FALSE if the check was run for this date it should be True.

Requirements

None.

What to do

If FALSE there is a problem.

Please contact the following immediately:

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

3.4 RED CHECK: HAS_OBSDIR

Overview

This test will be FALSE if there is no observation directory in the apero profile's raw data (i.e. the symlinks have not been created).

This test will be FALSE until the manual trigger has been run.

Requirements

- `BLANK = True`
- (All raw checks have passed) or (Failures verified as ignorable and are documented)
- Manual trigger has been run

What to do

Please verify that you are not checking today's value. This test should only be tested for yesterday (or earlier) observation dates.

If FALSE please re-run the check with `--test=HAS_OBSDIR`.

If still FALSE please try re-running the manual trigger with `--only_links=True` to make sure we have files sym-linked correctly (followed by re-running the checks).

If still FALSE and all requirements above are satisfied, please contact the following people stating that you have re-run the manual trigger with the `--only_links` argument and the HAS_OBSDIR is still failing.

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

3.5 RED CHECK: APERO_CALIB

Overview

This runs the calibration check from apero_precheck.

It essentially checks for the correct number of calibration files (as defined inside APERO).

Requirements

- `BLANK = True`
- `HAS_OBSDIR = True`
- (All raw checks have passed) or (Failures verified as ignorable and are documented)
- Manual trigger has been run

What to do

Please verify that you are not checking today's value. This test should only be tested for yesterday (or earlier) observation dates.

If FALSE please re-run the check with `--test=APERO_CALIB`.

If you rejected (or someone else) rejected all calibrations for this night then this test is expected to be FALSE - please add a comment on the checks page saying which calibrations were rejected (you can just say 'all calibrations were rejected' if this was the case and mention that this was the reason `APERO_CALIB` failed.

If still FALSE please try re-running the manual trigger with `--only_links=True` to make sure we have files sym-linked correctly (followed by re-running the checks).

Please then go to the ESO archive and produce a full list of calibrations for this observation directory.

If still FALSE and all requirements above are satisfied, please contact the following people stating that you have re-run the manual trigger with the `--only_links` argument and the APERO_CALIB is still failing.

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

3.6 RED CHECK: MANUAL_START

Overview

This flags whether the manual trigger has been started at least once for this observation date.

Requirements

- `BLANK = True`
- `HAS_OBSDIR = True`
- (All raw checks have passed) or (Failures verified as ignorable and are documented)
- Manual trigger has been run

What to do

If FALSE please re-run the check with `--test=MANUAL_START`.

Please try re-running the manual trigger and look for errors in the code running.

If still FALSE and all requirements above are satisfied, please contact the following people stating that you have re-run the manual trigger and the MANUAL_START reduced check is still failing.

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

3.7 RED CHECK: MANUAL_END

Overview

If FALSE this normally means the manual trigger crashed before finishing completely.

Requirements

- `BLANK = True`
- `HAS_OBSDIR = True`
- `MANUAL_START = True`
- (All raw checks have passed) or (Failures verified as ignorable and are documented)
- Manual trigger has been run

What to do

If FALSE please re-run the check with `--test=MANUAL_END`.

Please try re-running the manual trigger and look for errors in the code running.

If still FALSE and all requirements above are satisfied, please contact the following people stating that you have re-run the manual trigger and the MANUAL_END reduced check is still failing.

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

3.8 RED CHECK: APERO_START

Overview

If FALSE this normally means the manual trigger has crashed before apero processing could start.

Requirements

- `BLANK = True`
- `HAS_OBSDIR = True`
- `MANUAL_START = True`
- (All raw checks have passed) or (Failures verified as ignorable and are documented)
- Manual trigger has been run

What to do

If FALSE please re-run the check with `--test=APERO_START`.

If still FALSE please try re-running the manual trigger with `--only_apero_process=True` and look for errors in running code.

Please then email the following people with the copy and paste of what happened in the manual trigger:

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

3.9 RED CHECK: APERO_END

Overview

If FALSE normally means the manual trigger has crashed before apero processing finished.

Requirements

- `BLANK = True`
- `HAS_OBSDIR = True`
- `MANUAL_START = True`
- `APERO_START = True`
- (All raw checks have passed) or (Failures verified as ignorable and are documented)
- Manual trigger has been run

What to do

If FALSE please re-run the check with `--test=APERO_END`.

If still FALSE please try re-running the manual trigger with `--only_apero_process=True` and look for errors in running code.

Please then locate the log file for `apero_processing.py` and email the following people with a copy of the log (and/or the location of the log file on disk):

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

3.10 RED CHECK: ARI_START

Overview

If FALSE this normally means the manual trigger has crashed before ARI was started.

Requirements

- `BLANK = True`
- `HAS_OBSDIR = True`
- `MANUAL_START = True`
- (All raw checks have passed) or (Failures verified as ignorable and are documented)
- Manual trigger has been run

What to do

If FALSE please re-run the check with `--test=ARI_START`.

If still FALSE please try re-running the manual trigger with `--only_ari=True` and look for errors in running code.

Please then email the following people with the copy and paste of what happened in the manual trigger:

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

3.11 RED CHECK: ARI_END

Overview

If FALSE this normally means the manual trigger has crashed before ARI finished.

Requirements

- `BLANK = True`
- `HAS_OBSDIR = True`
- `MANUAL_START = True`
- `ARI_START = True`
- (All raw checks have passed) or (Failures verified as ignorable and are documented)
- Manual trigger has been run

What to do

If FALSE please re-run the check with `--test=ARI_END`.

If still FALSE please try re-running the manual trigger with `--only_ari=True` and look for errors in running code.

Please then locate the log file for `apero_ri.py` and email the following people with a copy of the log (and/or the location of the log file on disk):

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

3.12 RED CHECK: PIXEL_SHIFTS

Overview

Checks for pixel shifts in the preprocessed files.

Specifically checks 'DETOFFDX' and 'DETOFFDY' header keys to look for any non-zero values

Requirements

- `BLANK = True`
- `HAS_OBSDIR = True`
- `MANUAL_START = True`
- `APERO_START = True`
- `APERO_END = True`
- (All raw checks have passed) or (Failures verified as ignorable and are documented)
- Manual trigger has been run

What to do

If FALSE please re-run the check with `--test=PIXEL_SHIFTS`.

If still FALSE please email:

Contact name	Email
Etienne Artigau ★	etienne.artigau@umontreal.ca
Neil Cook	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca

3.13 RED CHECK: EXCESS_MODAL

Overview

Test for excess modal noise in telluric stars. It checks for tcorr files of vetted telluric stars and computes the rms of the pixel to pixel vs the rms with a stride a 20 pixels on a sample order in H band. The pixel to pixel rms should be smaller than the rms with a stride of 20 pixels. The pixel-to-pixel samples photon noise while the other one samples the modal noise. The test is passed if the pixel-to-pixel rms is smaller than the modal noise rms by a known threshold.

Requirements

- `BLANK = True`
- `HAS_OBSDIR = True`
- `MANUAL_START = True`
- `APERO_START = True`
- `APERO_END = True`
- (All raw checks have passed) or (Failures verified as ignorable and are documented)
- Manual trigger has been run
- Hot star observations (should be True always if no hot stars were observed this night)

What to do

If FALSE please re-run the check with `--test=EXCESS_MODAL`.

If still FALSE please email:

Contact name	Email
Etienne Artigau ★	etienne.artigau@umontreal.ca
Neil Cook	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca

3.14 RED CHECK: LOW_SNR

Overview

This test checks whether any science files have `SNR < 10` in extracted order 15 and 60.

Requirements

- `BLANK = True`
- `HAS_OBSDIR = True`
- `MANUAL_START = True`
- `APERO_START = True`
- `APERO_END = True`
- (All raw checks have passed) or (Failures verified as ignorable and are documented)
- Manual trigger has been run

What to do

If FALSE please re-run the check with `--test=LOW_SNR`.

If still FALSE you should check ARI for previous observations of this object.

First check the APERO object flags spreadsheet. If the object is in this list with the `CHECK=LOW_SNR` then you can override the value with the APERO check override code with `--test=LOW_SNR`.

This object is always below or around an SNR of 10

If the previous observations are always below or around 10, you should bring this up at the next meeting but override the value with the APERO check override code with `--test=LOW_SNR`. Please state that you are overriding as the object (state the object name) is usually around this SNR. If deemed okay remember to add this to the APERO object flags spreadsheet after the meeting.

If the weather was terrible or another issue was mentioned in the log that could explain the low SNR (this should be reported in the log here) you should bring this up at the next meeting but override the value with the APERO check override code with `--test=LOW_SNR`. Please state that you are overriding as the object (state the object name) due to bad weather conditions (or the other reason for the low SNR). Please then reject this file so it is not used in future reductions.

If the previous observations are usually way above 10 and the weather wasn't terrible you should report this to the following people, stating that the SNR was flagged as being well below average (give the object name and the SNR usually found and the SNR for this observation):

Contact name	Email
The current observer ★	Click here
3.6m Telescope	3P6@eso.org
La Silla Day and Night Staff	ls-dnos@eso.org
Neil Cook	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Frederique Baron	frederique.baron@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Lucile Mignon	lucile.mignon@univ-grenoble-alpes.fr
Romain Allart	romain.allart@umontreal.ca

Please then reject this file so it is not used in future reductions.

3.15 RED CHECK: PREV_REDUC

Overview

This test checks whether there are any raw files without any reduced products.

Specifically, every raw file must have a 'pp file' for the previous 7 days.

Every day after this failure (for up to 7 days) will fail until this is fixed.

Requirements

- `BLANK = True`
- `HAS_OBSDIR = True`
- `MANUAL_START = True`
- `APERO_START = True`
- `APERO_END = True`
- (All raw checks have passed) or (Failures verified as ignorable and are documented)
- Manual trigger has been run

What to do

If FALSE please re-run the check with `--test=PREV_REDUC`.

If still FALSE you should get a list of files that are missing.

Please try re-running the manual trigger on this specific observation directory (seen in the file path).

If still False after re-running the manual trigger please check the DPR TYPE of the files that are missing.

This can be done by running the following command:

Bash

```
dfits {filename} | fitsort dpr.type
```

Also please locate the log file for the preprocessing of this file (`apero_preprocess` – this is most likely where the error came from.

In rare cases the log will not exist, but in most cases it should!

Hint for locating the correct preprocesing log file

You need to first find the APERO group directory inside the `msg/processing/` directory (this will most likely be the most recent APERO group) you can then change into the observation directory, then there may be a log of logs so using a grep works well to locate the log file:

Bash

```
grep -n {file identifier} *preprocess*
```

Where `file identifier` is the `NIRPS-YYYY-MM-DDThh_mm_ss_sss` part of the filename (without `_pp... .fits`)

After re-running the manual trigger, running the dfits command and finding the preprocessing log file for this file/ these files. Please email the list of files (and the log from the reduced check) to the following people:

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Lison Malo	lison.malo@umontreal.ca

4 Manual trigger

4.1 Overview

The manual trigger does the following:

1. Runs raw and reduced checks before and after most stages of the manual trigger
2. Creates symlinks from the raw download directory to the apero profile raw directory (depending on the yaml file used)
   - For NIRPS-HE (online):
     - From `/nirps_raw/nirps/raw-data/nirps_he/`
     - To `/cosmos99/nirps/apero-data/nirps_he_online/raw/`
   - For NIRPS-HA (online):
     - From `/nirps_raw/nirps/raw-data/nirps_ha/`
     - To `/cosmos99/nirps/apero-data/nirps_ha_online/raw/`
   - For NIRPS-HE (offline):
     - From `/nirps_raw/nirps/raw-data/nirps_he/`
     - To `/cosmos99/nirps/apero-data/nirps_he_offline/raw/`
   - For NIRPS-HA (offline):
     - From `/nirps_raw/nirps/raw-data/nirps_ha/`
     - To `/cosmos99/nirps/apero-data/nirps_ha_offline/raw/`
3. Runs `apero_processing.py` (with either the `online_run.ini` or `offline_run.ini` depending on the yaml file used).
4. Creates or updates an 'objects' directory with sym-links to each astrophysical object (using `apero_get.py`)
5. Runs the apero reduction interface (ARI) - using `apero_ri.py`

Note you can stop a manual trigger and 'undo' most of its actions. Please see this section.

To run the manual trigger you use the following commands.

Step 1/6

Log in to the UdeM machine.

Step 2/6

Log into the correct screen (or create one)

You can check this by using the command: `screen -list`.

And look for the appropriately named screen (normally something like `nirps_he_online`)

If the screen is attached please contact:

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Lison Malo	lison.malo@umontreal.ca

Step 3/6

Activate the conda environment (if not already activated, if an APERO profile is activated make sure you check it is the correct one!)

Step 4/6

Change to the manual trigger directory by typing this command:

Bash

```
manual_trigger
```

Step 5/6

Run the manual trigger script:

Bash

```
manual_trigger.py {yaml_file} --obsdir={OBSDIR}
```

Where `yaml_file` depends on what you are reducing (normally an online profile, see section 4.2). For offline profiles in section 4.3.

Where `OBSDIR` is the `YYYY-MM-DD` you wish to run, note it can be a comma-separated list, if left out it will run for all nights, if mistyped it will try to run for this night and you'll have to contact us to sort it out!

Note unlike the raw and reduced checks you cannot use `--yesterday` and `--today` (though maybe we will add this in the future if people prefer this option).

Note in normal operations you should be running for yesterday. Never reduce data for today without permission - observations come in at the end of the night - so observations for 'today' are only normally available on disk 'tomorrow'.

Step 6/6

Last step is to detach the screen.

Please also remember to check back regularly as something may have gone wrong. After the manual trigger is completed, you can re-check the reduced checks, then check the apero errors, then fill out the daily form.

Optional arguments

You can also add other arguments which may be required for how you want to use the manual trigger.

Only run one step

You can only run one step by setting one of the following arguments to True (please don't set multiple)

- To only create the symlinks add the argument: `--only_links=True`
- To only run apero processing add the argument: `--only_apero_process=True`
- To only create or update the "objects" directory add the argument: `--only_aperoget=True`
- To only run ARI add the argument: `--only_ari=True`

Note you cannot turn off the checks that happen inside the manual trigger.

Run a subset of the steps

You can also run any combination of these with the following (setting them to True and False as needed):

- `--links=True` or `--links=False`
- `--apero_process=True` or `--apero_process=False`
- `--get=True` or `--get=False`
- `--ari=True` or `--ari=False`

Note the `--only` commands basically set all other ones of these to False (please do not use both `--only` and the command above together – choose one or the other!)

Run in test mode

When the manual trigger crashes (or you wish to see what would happen with the arguments you have given) you can run in test mode first.

This is done by adding the following to the arguments: `--test=True`

Run with a different run file

As mentioned above, by default the manual trigger uses the run file defined in the yaml file given as an argument (linked to an APERO profile, e.g., NIRPS-HE online).

Sometimes you will need to use another run file (see this section).

For the manual trigger this can be done by using the argument: `UN FILE--run=R`

4.2 Online reductions

The online reductions are the main reduction you will run. They are (in general) run on a nightly bases by the babysitters after all raw checks are either TRUE or dealt with (i.e. someone has said you can ignore any FALSEs and those FALSEs have been commented).

- For NIRPS-HE:
  - The apero profile to use is `nirps_he_online`
  - The manual trigger yaml file is `nirps_he_online_udem.yaml`
  - The raw checks page is RAW-NIRPS-HE
  - The reduced checks page is RED-ONLINE-NIRPS-HE
  - The check comments page is Comments-NIRPS-HE
- For NIRPS-HA:
  - The apero profile to use is `nirps_ha_online`
  - The manual trigger yaml file is `nirps_ha_online_udem.yaml`
  - The raw checks page is RAW-NIRPS-HA
  - The reduced checks page is RED-ONLINE-NIRPS-HA
  - The check comments page is Comments-NIRPS-HA

Normally you will be running for yesterday remember to add the argument: `--obsdir=YYYY-MM-DD`

Where `YYYY-MM-DD` is yesterday (i.e. `2024-12-25`)

Note if for some reason a night was missed (e.g. you were waiting for a problem to be fixed) you can run multiple nights at once: `--obsdir=2024-12-25,2025-12-26`

4.3 Offline reductions

The offline reduction has a similar process to the online but with a few more important steps.

Do not run the offline reductions without being asked to by one of the following people:

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Lison Malo	lison.malo@umontreal.ca

Note that you will be asked to reset all data. Please make sure you are in the correct profile – everything is deleted after this point!

To run the offline reduction first follow steps 1-6 here. We start from step 8 below to emphasize that you must do these 6 steps first.

When the manual trigger has been completed (note this could be 3-4 weeks) then you need to do the following:

Step 7/10

Run the 'catch up' yaml file in the manual trigger

e.g. for NIRPS-HA (once inside the manual trigger directory)

Bash

```
python manual_trigger.py nirps_ha_offline_udem_catchup.yaml --since={date}
```

Where `date` should be ∼2 days before you ran the original offline reduction (to make sure we have reduced all files with a sensible overlap).

This will run the manual trigger for all days since the reduction was running – depending how long the offline reduction was running this may take a few days.

Step 8/10

Once the catch-up is done please re-fill out the the babysitter form.

Step 9/10

Verify with the NIRPS Montreal team that the data is good (usually this will be done across several group meetings).

Step 10/10

Warn everyone that NIRPS-HE online or NIRPS-HA online data is about to be erased (maybe give people a day to copy any data they require immediately).

It is important to let the current NIRPS online babysitter know that they should not reduced any observations for this APERO profile until this step is complete.

Then and only then run the offline to online script.

Warning this will delete all online data for the matching APERO profile – and if it goes wrong may lead to having to reset everything and start again leading to no data for 3-4 weeks – so be careful!

Once this is completed please let everyone know that they can use the NIRPS online data and let the current babysitter know that they will need to run the online APERO profile for this for all dates since the catch-up script was run (so possibly a few days). This can be checked by looking at the reduced data directories:

- For NIRPS-HE online: `/cosmos99/nirps/apero-data/nirps_he_online/red/`
- For NIRPS-HA online: `/cosmos99/nirps/apero-data/nirps_ha_online/red/`

Missing directories need to be run by the online babysitter.

4.4 How to undo a manual trigger run

Sometimes we run the wrong night or just need to stop the manual trigger.

A simple `Ctrl+C` isn't usually enough to stop everything the manual trigger wants to do, however you have to be careful doing multiple `Ctrl+C` as you could corrupt a database.

To be safe do a `Ctrl+C` once and wait to see what message comes up.

If you get a message as follows:

```
18:06:49.342-!!|LOCSCI[00029]| SIGINT or CTRL-C detected. Exiting
```

Please do not press Ctrl+C again. And wait for the next line to say something similar to the following:

```
18:06:49.450-@!|LOCSCI[00029]| W[40-003-00005]: Recipe {recipe name} has NOT been successf
18:06:49.450-@!|LOCSCI[00029]|   (59.214 seconds)
```

The manual trigger will then go to the next task which you may `Ctrl+C` again, follow the same procedure of waiting if a similar line to above is shown, otherwise continue with more `Ctrl+C` one at a time .

Eventually, you'll be out of the running codes and will have cancelled the manual trigger successfully.

Unfortunately there is a little cleaning up to do after this:

1. Use apero remove on the night you cancelled (unless you don't think you should remove all data from the night run - i.e. running a custom run)
2. Remove the entries from the manual trigger log
3. Re-run the reduced checks again for this night

Removing the entries from the manual trigger log

Locate the manual trigger log file

Open it in `nano` (or similar text editor of your choice). Find the lines that correspond to your night (they should be at the bottom of the file). Remove these lines, e.g. for 2024-03-10, NIRPS-HA was run incorrectly, so the following lines need to be removed.

```
2025-03-10T17:33:55.446, nirps ha online, MANUAL_START, 2025-03-09, "None"
2025-03-10T17:34:53.459, nirps ha online, APERO_START, 2025-03-09, "None"
2025-03-10T18:14:52.506, nirps ha online, APERO_END, 2025-03-09, "None"
2025-03-10T18:21:27.136, nirps ha online, ARI_START, 2025-03-09, "None"
2025-03-10T18:28:29.498, nirps ha online, ARI_END, 2025-03-09, "None"
2025-03-10T18:28:45.990, nirps ha online, MANUAL_END, 2025-03-09, "None"
```

After this please make sure you re-run the checks for this night (to update the google sheet).

Adding a non-real or future night

It is possible to add a non-real night (i.e. '2025-01') or a night in the future (i.e. '2095-01-01') these should be removed from two places - however you will not be able to do this.

Please contact the following people with the following instruction on how to correct this.

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Lison Malo	lison.malo@umontreal.ca

Instructions:

1. Login to the apero-drs gmail account and remove the offending rows
2. Go to the apero-checks directory (just type 'apero_check') and find the 'local' directory
3. Remove all backup databases where you removed a row
4. Re-run the offending checks (with '–yesterday') to re-create the backup files

Note that this can fail if another apero_check is already running - what will happen is that you'll remove a row and it will come back - so you may have to re-follow these steps again. Once the backup database has been remove this should not be a problem (however you must have removed the row in the google sheet as well).

4.5 Who to contact for help with the manual trigger

First, if you have a problem with the manual trigger, please check the troubleshooting section.

If your problem is not described there, please email:

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Lison Malo	lison.malo@umontreal.ca

4.6 Offline to Online script

This script currently needs rewriting.

Please contact the following people to know you have reached this step:

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Lison Malo	lison.malo@umontreal.ca

5 How to

5.1 How to log into a UdeM Machine

First you need to log on to venus.astro.umontreal with your personal account.

For example:

Bash

```
ssh -XY -oport=5822 cook@venus.astro.umontreal
```

Then login to the “nirp-client” account (please ask for password) on rail.

Bash

```
ssh nirps-client@rali
```

Note please do not use the rali.astro.umontreal.ca machine for non-babysitter activities .

5.2 How to activate the environment

Currently we are using APERO version 7 so we activate this conda environment as follows:

Bash

```
conda deactivate
conda deactivate
conda deactivate
conda activate apero-env-07
```

This loads all python modules required to run various apero and apero affiliated recipes.

Note you need to deactivate as many times as required until there is no longer the word (base) in the command prompt (or until you see no * next to any profile when using 'conda env list'.

How to check your conda environment

You can check you conda environment by using the command:

Bash

```
conda env list
```

There will be an asterisk () by the conda environment you are currently in.

Note that you may already be in the correct environment

If you use `conda env list` and see you are already in 'apero-env-07' you don't need to deactivate and re-activate as said above (unless you want to be extra safe).

5.3 How to load an apero profile

Introduction

An ‘apero profile’ is a specific setup for a specific instrument, mode and reduction.

Note there is no way to ‘deactivate’ an apero profile – you just load a new one over an old one.

Step 1/3

Log on to the correct machine.

Step 2/3

Activate the conda environment.

Step 3/3

Load the correct APERO profile

The following is for NIRPS-HE (online):

Bash

```
nirps_he_online
```

And the following for NIRPS-HA (offline):

Bash

```
nirps_ha_online
```

If done correctly, you should see something similar to the following:

Figure 4: APERO validation - this appears when you correctly activate an apero profile

How to check you are in the correct apero profile

You'll know if you are in a current apero profile in two ways:

- The command prompt should start with something like `nirps_he_online` in yellow followed by the date and then user@machine and then your current path.

  Bash

  ```
  nirps_he_online Fri Jan 31 10:24:16 /your/path/here
  ```

- You can check the `DRS_UCONFIG` environmental variable. This is done by typing the command: `echo $DRS_UCONFIG$`

  And you should see the path linking to the APERO you want e.g. for NIRPS-HE online the path should be `/cosmos99/nirps/apero-settings/nirps_he_online`

There is no way to deactivate another APERO profile so you just activate a new one on top of an old one.

5.4 How to re-run an apero check

Step 1/4

Log on to the correct machine.

Step 2/4

Activate the conda environment.

Step 3/4

Type the following in the command line to change to the correct directory

Bash

```
apero_checks
```

Step 4/4

You need to decide:

- Whether you want to Run a 'raw check' or a 'reduced check'
- Which yaml you want to check (linked to a specific apero profile)
- Which observation date you want to check
- What kind of test you want to run

Which check?

If you are looking at the 'raw checks' (e.g. RAW-NIRPS-HE or RAW-NIRPS-HA) then the code you need to run is `apero_raw_check.py`.

Bash

```
apero_raw_check.py {yaml name} {obs dir} {test}
```

If you are looking at the 'reduced checks' (e.g. RED-ONLINE-NIRPS-HE or RED-ONLINE-NIRPS-HA) then the code you need to run is `apero_red_check.py`.

Bash

```
apero_red_check.py {yaml name} {obs dir} {test}
```

Which YAML name

The yaml files are in the directory you changed to with the `apero_checks` command.

Currently, they are:

- `nirps_he_online_udem`
- `nirps_he_offline_udem`
- `nirps_ha_online_udem`
- `nirps_ha_offline_udem`

In the commands below we refer to this as 'yaml name':

Bash

```
apero_raw_check.py {yaml name}
```

Which observation date(s)

You can choose from:

- any observation night in format `YYYY-MM-DD` or observation nights (as a comma-separated list)

  Bash

  ```
  apero_raw_check.py {yaml name} --obsdir=YYYY-MM-DD
  apero_raw_check.py {yaml name} --obsdir=YYYY-MM-DD,YYYY-MM-DD
  ```

- today

Bash

```
apero_raw_check.py {yaml name} --today
```

- yesterday

Bash

```
apero_raw_check.py {yaml name} --yesterday
```

You can also leave out this argument to run all nights (though this will take a long time, so think carefully about what kind of test you want to run.

What kind of test you want to run

You have a choice:

1. re-run all tests for the observation date (in this case no `test` argument is required):

Bash

```
apero_raw_check.py {yaml name} --obsdir={obs dir}
apero_red_check.py {yaml name} --obsdir={obs dir}
```

2. re-run a specific test or set of tests for the observation

Bash

```
apero_raw_check.py {yaml name} --obsdir={obs dir} --testfilter={TEST1},{TEST2}
apero_red_check.py {yaml name} --obsdir={obs dir} --testfilter={TEST1},{TEST2}
```

3. run in test mode to display a report of a specific test failure

Bash

```
apero_raw_check.py {yaml name} --obsdir={obs dir} --test={TEST1}
apero_red_check.py {yaml name} --obsdir={obs dir} --test={TEST1}
```

Where `TEST1, TEST2, ..., TESTN` are the raw or reduced test column names.

5.5 How to override a check

For some checks we require you to override a FALSE value with a TRUE value manually. This is normally when a FALSE has been triggered correctly but the reason for the FALSE is okay.

This can only be done on certain raw checks:

- CRIT_SCI
- NO_SCI

and certain red checks:

- HAS_OBSDIR (Though please do not use this without verifying with Neil first).
- LOW_SNR

To override a FALSE first run steps 1 to 3 of re-running a check

Then run the following command:

Bash

```
python apero_check_override.py {yaml name} --test={TEST NAME} --obsdir=XXXX
```

Where 'XXXX' is the observation directory for the override required and `TEST NAME` is the test you wish to override.

Make sure to add your name and a good reason why there were no observations (i.e. don't just write things like "no data" please try to explain why there was no data.

You may need to re-run the apero checks for this night again if it doesn't update from FALSE to TRUE.

5.6 How do I know which data are which?

Unless you are Etienne, most of us can't identify a calibration from science data without a lot of hard work looking at images along (and this isn't practical when wanting to know this about many files).

The headers of fits files are your friend and reading fits file headers is a must.

You can of course open up files in python but it is must faster (and convienient) to do so from the command line.

Opening a fits header from the command line

We use two commands which are installed on the servers `dfits` and `fitsort`, we don't use them separately but together to give us a table like result.

Bash

```
dfits {filename} | fitsort {header_key_1} {header_key_2}
```

Where `filename` can have unix wildcards such as `*`, `?`, `[]` etc, and `header_key_1` and `header_key_2` are a list of header keys separated by whitespace (you can use as many as you need, though for readability avoid too many).

An example is the following on NIRPS HE data:

Bash

```
cd /nirps_raw/nirps/raw-data/nirps_he/
dfits 2025-10-1[0-9]/*.fits | fitsort OBJECT dpr.type
```

This will display all fits files from 2025-10-10 to 2025-10-19 and give the header keys OBJECT and dpr.type (see section 5.6.3). The `[]` gives all permutations between 0 and 9, the `*` gets everything with this prefix (followed by .fits).

Opening a fits header in python

Bash

```bash
# import astropy
from astropy.io import fits
# read the header
hdr = fits.getheader(filename)
# access a header key
print(hdr['OBJECT'])
```

Useful header keys

There are some extremely useful header keys in the raw and reduced data.

Header key	what files	Data Type	Comment
OBJECT	raw+reduced	STRING	Observation type (from telescope)
obs.targ.name	raw+reduced	STRING	Observation Block target name (usually what was set by scheduler/observer)
dpr.type	raw+reduced	STRING	The ESO data type (see below)
DPRTYPE	reduced [APERO]	STRING	The APERO data type
dpr.catg	raw+reduced	STRING	The ESO data catagory

Note that more information on data types can be found here, how we define the APERO DPRTYPE based on the ESO keywords.

- NIRPS HE
- NIRPS HA

Note that:

- a calibration is one that has a DARK, LED, LAMP, FP, UN1, UN2, in the science fiber (we can never have science in the reference fiber).
- a telluric or hot star is a bright, fast rotating, hot star (spectral type A or F) which we use for telluric correction these are denoted by `TELLURIC,SKY` in multiple header keys (including `dpr.type` and `OBJECT`)
- a science observation will be either `OBJECT,SKY` or `OBJECT,FP` in `dpr.type`

5.7 How to find and read a log file

Log files are an important way (the only way sometimes) to diagnose a problem.

They come in different flavours depending on what has been run.

We document the following below:

- apero recipes
- apero check scripts
- manual trigger

APERO recipes

This includes:

- `apero_processing.py`
  - all apero recipes run inside `apero_processing.py`
- apero tools:
  - `apero_ri.py` [ARI]
  - `apero_reject.py`
  - `apero_remove.py`
  - `apero_get.py`

Note that the manual trigger runs `apero_processing`, `apero_ri`, `apero_get`

The place to look for these log messages is here:

- NIRPS-HE (online): `/cosmos99/nirps/apero-data/nirps_he_online/msg`
- NIRPS-HA (online): `/cosmos99/nirps/apero-data/nirps_ha_online/msg`

Logging style

All APERO logs are separated into 3 bits:

- Splash: the "start of the apero recipe" – contains inputs etc
  - Starting with `NIRPS_HE @PID-XXXXXXXXXXXX`
  - Stating the version, git branch, config and run arguments used
- What was run in the recipe
- A statement saying the recipe finished successfully or did not (had a caught error). Start with:
  - `I[40-003-00001]: Recipe recipe_name has been successfully completed`
  - `W[40-003-00005]: Recipe recipe_name has NOT been successfully completed`

If you do not see one of these lines at the end the APERO recipe crashed unexpectedly and needs reporting!

apero processing logs

`apero_processing` logs will be stored in the sub-directory `/tool/other` there will be one per run (or per manual trigger run).

Note that the 'what was run in the recipe section' can be separated into three important bits:

- Verification and skipping – contains what was planned to be run
- What was run (the run string for each command that was run)
- What finished + errors for individual recipes

Also note that the name of the log has a long PID code which is used as the APERO group for recipes run inside `apero_processing`.

APERO recipe run inside apero processing

These are stored in the `/processing/{APERO_GROUP}/{obsdir}` directory.

Where APERO_GROUP comes from the `apero_processing` run (see above section) followed by `_group`

There will be one log for each recipe run.

Note that any recipes that don't have a group wont go into `YYYY-MM-DD` but an 'other' directory e.g. for template creation or any LBL step.

Note there is also a 'sub-recipe' directory in the log directory – this is for recipes run inside other recipes and works similarly with the group being the parent recipe pid followed by `_group`

Hint for locating the correct recipe log

You need to first find the APERO group directory inside the `msg/processing/` directory (this will most likely be the most recent APERO group) you can then change into the observation directory, then there may be a log of logs so using a grep works well to locate the log file:

Bash

```
grep -n {file identifier} *recipe*
```

Where `ile identifier` is the `NIRPS-YYYY-MM-DDThh_mm_ss_sss` part of the filename (without `_pp... .fits`).

After re-running the manual trigger, running the dfits command and finding the recipe log file for this file/ these files. Please email the list of files (and the log from the reduced check) to the following people:

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Lison Malo	lison.malo@umontreal.ca

APERO recipes that are run on their own

These will be in a `/recipes/ sub-directory` (or `/sub-recipes/` sub-directory) and are in the same format as those run inside `apero_processing`.

APERO tools

These include:

- `apero_ri.py` [ARI]
- `apero_reject.py`
- `apero_remove.py`
- `apero_get.py`

They can be found in either the `nolog-tool/other` or `tool/other` sub-directory.

APERO checks

The APERO checks dump all log messages into: `HOMEDIR/apero_check.log` this file can be long if it has not been cleaned out properly, so we advise using a command like:

Bash

```
1 tail -n 200 HOMEDIR/apero_check.log
```

Where the '-n' is the number of lines at the end of the file to look at.

The log format is as follows:

- A splash
  - starting with 'APERO Raw data checks'
  - which has the version and date last updated
- A part showing what was run
- A line saying 'Code finished successfully'

Manual trigger

The manual trigger log file is a lot more basic than the others. It stores one log per yaml file.

They are stored in `HOMEDIR/.apero/manual_trigger/` and the name of the file is the yaml file name with the `.yaml` replaced with `.log`.

These logs are a big csv file with no header.

The format of each file is as follows:

```
YYYY-MM-DD hh:mm:ss.sss, {apero profile}, {step}, {obsdir}, {comment}
```

where:

apero_profile

The apero profile that was used (e.g. `nirps ha online`)

step

One of the steps that was run in the manual trigger, and is only added once that step is complete. Possible steps are as follows:

- MANUAL_START
- MANUAL_END
- APERO_START
- APERO_END
- ARI_START
- ARI_END

Please refer to the reduced checks section for details on these.

obsdir

is a `|` separated list of observation nights that were asked for in the call to manual trigger

comment

Is a possible comment (but most the time is 'None')

5.8 How to find the observer, observation log, and schedule

Open the link to the correct semester.

- Scheduling tab
- Find the row with the date of observations
- Last columns have observer contact information

Semester name	Start	End	Link
P111	April 2023	Sept 2023	Here
P112	Oct 2023	March 2024	Here
P113	April 2024	Sept 2024	Here
P114	Oct 2024	March 2025	Here
P115	April 2025	Sept 2025	Here
P116	Oct 2025	April 2026	Here
P117	May 2026	April 2027	Here
P118			
P119			
P120			

Note all semesters will be available on the Geneva share point `Documents>Science Team>Observations>Time Share`.
Look for the `PXXX-TimeShare.url`

5.9 How to find information on a observation

The NIRPS observation schedules are given in the following table, you can check here which work packages targets belonged to, various astrophysical parameters and other requested observation conditions.

Semester name	Start	End	Link
P111	April 2023	Sept 2023	Here
P112	Oct 2023	March 2024	Here
P113	April 2024	Sept 2024	Here
P114	Oct 2024	March 2025	Here
P115	April 2025	Sept 2025	Here
P116	Oct 2025	March 2026	Here
P117			
P118			

Note all semesters will be available on the Geneva share point `Documents>Science Team>Observations>Time Share`. Look for the `PXXX-Instructions.url`

5.10 How to check for data on the ESO Archives

There are various times when you may need to look on the ESO archives for data, mostly when we don't seem to have data on our machines.

The following steps show you how to check for data on the archives:

Step 1/3

Go to here. The page should look like figure 5 (or for GTO data go to the special access archive - note that you will need to create and log in to an ESO account. For the GTO observations you should use the `NIRPSteam` account).

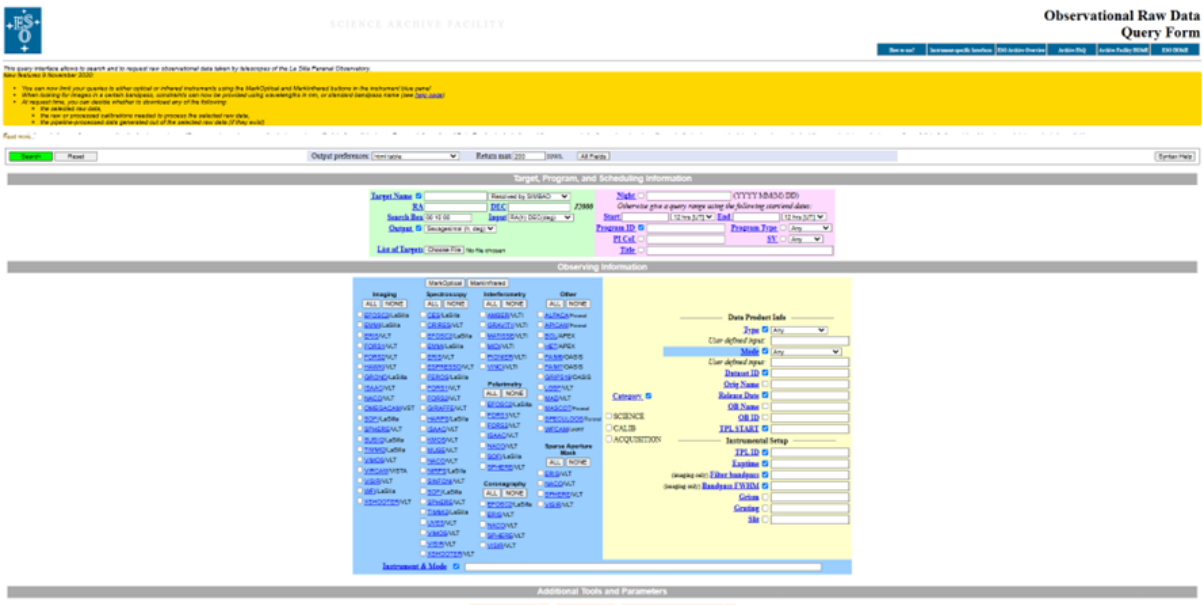

Figure 5: The ESO archive page

Step 2/3

Enter the night (or Start and End nights) in the box in figure 6.

If you want to filter out sun observations, add "not SUN" under "Target Name" and change the drop-down to "OBJECT - FITS keyword".

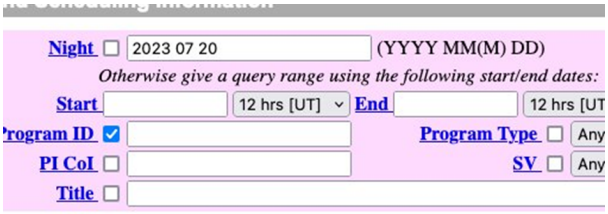

Figure 6: ESO Archive night(s) information

Step 3/3

Check the NIRPS/LaSilla box as in Figure 7

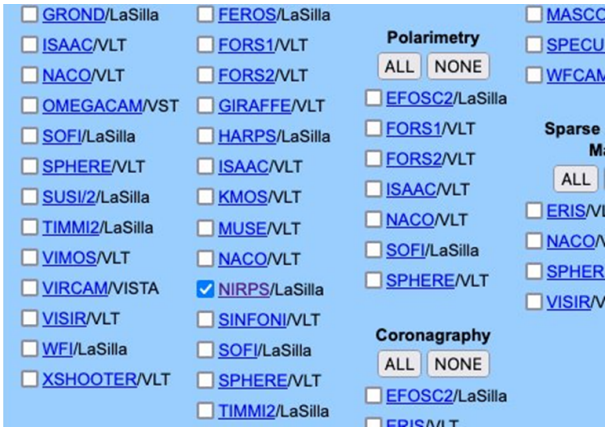

Figure 7: ESO Archive instrument selection

Then click the green "search" button to show all observations for your criteria.

Notes on the ESO archive

Note 1

It may also be useful for some checks to set the OB Name and the Category (i.e. to SCIENCE or CALIB) in the box shown in figure 8.

Note 2

If you are searching for something specific by default it returns 200 rows. You can increase the number of rows in this box as in figure 9.

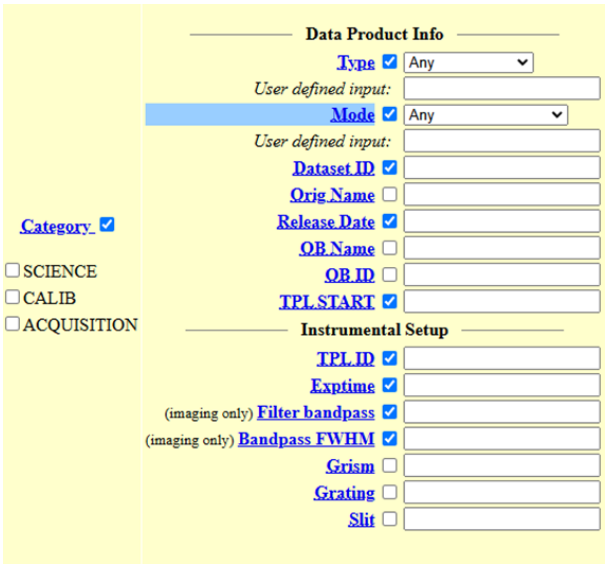

Figure 8: ESO Archive data product selection

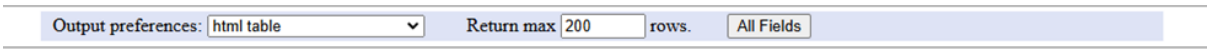

Figure 9: ESO archive number of rows

5.11 How to figure out when observations should happen

For good operations observations should happen at particular times:

What	UTC	Chile summer UTC-4	Chile winter UTC-3	MTL summer UTC-4	MTL winter MTL-5
HELIOS observations	9:00-12:00	5:00–8:00	6:00-9:00	5:00-8:00	4:00-7:00
Daily-Calibrations Full-Set [start]	12:00	8:00	9:00	8:00	7:00
Daily-Calibrations Full-Set [end]	14:00	10:00	11:00	10:00	9:00
Daily-Calibrations Full-Set [in MTL]	16:00	12:00	13:00	12:00	11:00
HELIOS observations	14:00-19:00	10:00-15:00	11:00-16:00	10:00-15:00	9:00-14:00
Afternoon-Calibrations [start]	20:00-21:00	16:00-17:00	17:00-18:00	16:00-17:00	15:00-16:00
Afternoon-Calibrations [end]	21:00-22:00	17:00-18:00	18:00-19:00	17:00-18:00	16:00-17:00
Afternoon-Calibrations [in MTL]	22:00-23:00	18:00-19:00	19:00-20:00	18:00-19:00	17:00-18:00
Telluric stars	21:00-22:00	17:00-18:00	18:00-19:00	17:00-18:00	16:00-17:00
Night time observations	22:00-9:00★	18:00-5:00★	19:00-6:00★	18:00-5:00★	17:00-4:00★

Where ★ means next day in the daily cycle

5.12 How to report a FALSE on the check spreadsheet

If and only if you were asked to ignore a check should you fill out the comments section on the APERO NIRPS UdeM checks google sheet.

Please make sure there is one entry per observation night – do not stack multiple even if everything else is the same.

You do not need multiple entries per observation night (even if more than one thing is still FALSE)

Location of comment pages

- Comments-NIRPS-HE
- Comments-NIRPS-HA

Comment page columns

obsdir

The observation directory that has the FALSE (please make sure there is one entry per observation directory).

date

The date you filled out this comment.

Name

First and last name of the person filling this out.

Comments

A good comment on what is FALSE for that night.

This should include:

- The test(s) that failed.
- Who said you could ignore this test/these tests?
- Any other relevant information.

Please don't just write vague statements like 'telescope was broken' or 'got a weird message.'

5.13 How to use a screen on the UdeM machines

The screen command is a useful way of running a script in the background (so that when you log out or close your ssh session it continues running).

This means that you can go back to it later.

It also means that the previous babysitter may have a screen that you can use.

It also means that someone else might be using a specific screen when you try to connect to it (i.e. it is "attached")

If the screen is attached please contact:

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Lison Malo	lison.malo@umontreal.ca

Screen that are usually on rali

Screen that are usually on `rali.astro.umontreal.ca` are:

- `nirps_he_online` - this is the online reduction screen for NIRPS-HE.
- `nirps_ha_online` - this is the online reduction screen for NIRPS-HA.
- `nirps_he_offline` - this is the offline reduction screen for NIRPS-HE.
- `nirps_ha_offline` - this is the offline reduction screen for NIRPS-HA.

These screens can be used to avoid having to load the conda environment and apero profiles over and over again, but be warned you should check that the conda environment and check that the apero profile is correct.

Useful screen commands

Here are some useful screen commands/keyboard control shortcuts:

List the available screens

Bash

```
screen -list
```

Join the screen

Bash

```
screen -r {screen name}
```

Make a new screen

Bash

```
screen -R {screen name}
```

Leave a screen (but do not terminate it)

Bash

```
Ctrl+A+D
```

Leave a screen and terminate it

Bash

```
Ctrl+D
```

Scroll up (but not infinitely)

Bash

```
Ctrl+A+Esc
```

Attach to an already attached screen

Bash

```
screen -x {screen_name}
```

When using the `-x` option please do not type commands while someone else is connected but it is a good way to screen what's happening without detaching someone else's screen.

5.14 How to re-run apero with a custom run file

Introduction

Sometimes, things go wrong in the manual trigger and you need to re-run specific steps of the reduction or all steps for specific objects.

One example where this is required is if an object fell through the cracks of the 'ASTROM_TEST' and it wasn't checked (or the files didn't exist on disk at the time the reduction was run).

This will usually be done by forcing `apero_processing` to use a different run file as an argument.

This can be done one of two ways:

- directly with `apero_processing`
- using the `manual_trigger`

The advantages of using the `manual_trigger` are that object sym-links are updated and ARI is also run after `apero_processing` making sure everything is up-to-date.

However you may want to run `apero_processing` in test mode first to check any changes you made to a run file worked as expected.

Modifying a run file

Run files are stored in the APERO profile data directory:

- For NIRPS-HE online, this is located at: `/cosmos99/nirps/apero-data/nirps_he_online/run/`
- For NIRPS-HA online, this is located at: `/cosmos99/nirps/apero-data/nirps_ha_online/run/`

There are different types of run files depending on the task.

Please do not edit default run files themselves—always create new ones with a sensible name (e.g., including your name and the date).

Default run files are:

- `complete_run.ini` – Used to run all recipes
- `ref_calib_run.ini` – Used to run the reference night calibrations
- `calib_run.ini` – Used to run nightly calibration recipes
- `science_run.ini` – Used to run nightly science observation recipes
- `lbl_run.ini` – Used to run the LBL recipes
- `other_run.ini` – Used for engineering/diagnostic work
- `online_run.ini` – Used by the `manual_trigger` for online runs
- `offline_run.ini` – Used by the `manual_trigger` for offline runs

Each run file uses one or multiple "APERO sequences" to run different recipes in a reduction:

- `pp_seq`, `pp_seq_opt`
- `full_seq`, `limited_seq`
- `ref_seq`, `calib_seq`, `tellu_seq`
- `science_seq`
- `quick_seq`, `eng_seq`, `lbl_seq`

Documentation on these can be found here:

- NIRPS-HE sequences
- NIRPS-HA sequences

These allow us to use certain recipes which can be turned on and off with the `HORTNAME_RUN_S` ter in the run files (where `HORTNAMESHORTNAME` ame of a recipe). See the recipe definitions here:

- NIRPS-HE recipes
- NIRPS-HA recipes

For most babysitting purposes, the `science_run.ini` file can be copied and modified. This is useful when needing to re-process one or more science observations for a night (or completely).

Key parameters in the run files

All parameters can be found here, but a few are important for babysitters:

RUN_OBS_DIR

Whether to limit processing to a single observation directory.

INCLUDE_OBS_DIRS

Whether to limit processing to a set of observation directories.

CORES

The number of cores to use (should never be more than 20 in total for APERO on one machine). You should consider whether other `manual_trigger` processes (e.g., NIRPS-HE and NIRPS-HA) are already running.

TEST_RUN

Set this to `True` to test your run file without running any recipes—recommended to verify everything works before running the wrong thing!

UPDATE_OBJ_DATABASE

Required if a manual change to the astrometric database has been made.

RUN_XXX

These should be `True` for the steps you want to run.

SKIP_XXX

These should be `False` for the steps you want to override.

SCIENCE_TARGETS

This specifies which targets APERO should reduce. Use the name from the astrometric database.

Using apero processing

Either use these four steps or the manual trigger steps in the next session. Do not use both!

The full documentation for `apero_processing` can be found here.

This assumes you have already modified a run file.

Step 1/4

Activate the apero profile you want to reduce from

Step 2/4

Run the following command (to test your run file):

Bash

```
apero_processing.py {run file} --test=True
```

Step 3/4

Run the following command (to run the reduction):

Bash

```
apero_processing.py {run file}
```

Step 4/4

Re-run the manual trigger for updating the ‘objects‘ directory and ARI:

Bash

```
manual_trigger
python manual_trigger.py {yaml file} --links=False --apero_process=False --get=True --ari=
```

You will want to use the `--obsdir` argument if running for a specific set of days (or the `--since` argument if running for a large set of days since a certain date).

Using the manual trigger directly

We highly recommend running `apero_processing` steps 1 and 2 before running this (to test your run file)

Step 1/2

Activate the apero profile you want to reduce from

Step 2/2

Re-run the manual trigger for updating the "objects" directory and ARI:

Bash

```
manual_trigger
python manual_trigger.py {yaml file} --run={run_file}
```

5.15 How to run APERO astrometrics

Adding an object

You can add an object to the astrometric database as follows:

Step 1/2

Activate the apero profile

Step 2/2

Run apero astrometrics:

Bash

```
apero_astrometrics.py {objname}
```

Where `objname` is any alias of the object you wish to add (or a comma-separated list of objects)

Then follow the options on the screen and answer all the questions.

Please think about aliases of the object

It is important to think about all possible names (aliases for each object) people can name the same object many things and we want all possible names to be caught by APERO and merged into the same object.

APERO does some cleaning of objects to allow them to be proper filenames:

- White spaces will be replaced with "_" (underscore).
- All punctuation except "-" and "+" will be replaced with "_" (underscore).
- "-" will be replaced with "M" and "+" will be replaced with "P".
- All characters will be converted to uppercase.

For example, the following transformations occur:

- `TRAPPIST 1` → `TRAPPIST_1`
- `TRAPPIST1` → `TRAPPIST1`
- `TRAPPIST-1` → `TRAPPISTM1`
- `Trappist1` → `TRAPPIST1`

Thus, at least the first three variations should be included in the aliases.

Solar system objects and objects without proper motion

APERO astrometrics required a match to a proper motion catalog.

Solar system objects and objects without proper motion might not get resolved with APERO astrometrics.

Please contact the following people stating that you need an object manually added to the astrometric database.

Please also remind those people that they will have to update the local astrometric databases themselves (or you could run `apero_astrometrics` to do it).

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Lison Malo	lison.malo@umontreal.ca

What if apero astrometrics can not find my target?

Sometimes APERO astrometrics can not find your object name. This can happen, especially for newer TOI objects. APERO astrometric first scans for the name in SIMBAD, then checks several proper motion catalogues for a match to the ID.

Therefore if APERO astrometrics can't find your object, first see if you can find another name for the object that works in SIMBAD (these include many aliases including in many cases Gaia IDs) and worst case choose an ID that will be found in one of the proper motion catalogues below (hint the Gaia ID is always a safe bet):

- Gaia DR3
- Gaia EDR3
- Gaia DR2
- Gaia DR1
- UCAC4
- HIP

You can also look at the following for information on the targets:

- For TESS candidates: https://exofop.ipac.caltech.edu/tess/
- For exoplanet hosts: https://exoplanetarchive.ipac.caltech.edu/

Please make sure you add all variants of the original name and the name in the header to the alias list, otherwise your target will not be found by APERO and linked to this other name.

What if I don't have a Teff

A Teff is optional for most of APERO but mandatory for LBL, therefore you will get an error in LBL if an object has no Teff in the astrometrics database.

If your object is resolved in SIMBAD, the astrometrics code will provide a list of $\texttt{T}_{\texttt{eff}}$ values (from SIMBAD). However, some objects may not resolve in SIMBAD (especially TOI objects), or even if they do, they may not have a $\texttt{T}_{\texttt{eff}}$ value.

The best places to look are as follows:

- For TESS candidates: https://exofop.ipac.caltech.edu/tess/
- For exoplanet hosts: https://exoplanetarchive.ipac.caltech.edu/

If you still can't find an entry, you can always use an estimate from the spectral type of the object.

One such site that provides this conversion is: provides this conversion is here.

In the source, include a note like: '$\texttt{T}_{\texttt{eff}}$ estimated from Spectral type'.

Note keep the source column short it must be able to fit in ∼60 characters.

What if I can't find my object anywhere?

There are some cases where the name given to a target is not helpful at all in knowing what the object is (i.e. you have tried apero astrometrics and simbad cannot resolve the object). apero astrometrics has another option

Bash

```
apero_astrometrics.py Unknown --fileoption={ABSOLUTE PATH}
```

This should look up the file, find the RA and Dec and then give you a list of the 10 brightest objects within an arc-minute. This can be used to select the target (which is probably the brightest one in this list) however please be sure this is actually the correct object by continuing and looking carefully at the retrieved SIMBAD information.

- Step 1/4: Find the file you need the observation directory (if you are running from a check the check should give you the last night this object was found).
- Step 2/4: then you can go to:
  - NIRPS HE: `/cosmos99/nirps/apero-data/nirps_he_online/raw`
  - NIRPS HA: `/cosmos99/nirps/apero-data/nirps_ha_online/raw`

  and open the observation directory you file is in.
- Step 3/4: Run the following command to find your filename

  Bash

  ```
  dfits * | fitsort OBJECT obs.targ.name
  ```

  This will give you several names for each file in that directory.
- Step 4/4: Run apero astrometrics with the `--fileoption` argument being the full path to the file (e.g. `/cosmos99/nirps/apero-data/nirps_he_online/raw/2025-11-01/NIRPS_2025-11-02T00_27_21_546.fits`)

5.16 How to run APERO reject

Introduction

At some points, we need to reject an object (from the astrometric database), a file or set of files (from being reduced). For this, we use `apero_reject.py`.

Below are three ways to use `apero_reject.py`:

- Rejecting an astrophysical object
- Rejecting a specific file or set of files
- Rejecting a whole observation night

Rejecting a non-astrophysical object

Step 1/2

Activate the apero profile

Step 2/2

Run apero reject:

Bash

```
apero_reject.py --objname={objname}
```

where `objname` is any alias of the object you wish to add (or a comma-separated list of objects)

Only reject objects that are truly non-astrophysical.

You'll be asked some questions:

- Where to reject from [PP, TEL, RV] (to which in most cases you should say yes)
- To give a comment (Please make sure the comment is descriptive)

You can skip these questions by adding an argument:

`--autofill="1,1,1,my comment"`

Again, make sure the 'my comment' is descriptive.

Rejecting a specific file or set of files

You can reject a specific file or set of files using the "identifier" argument:

Step 1/2

Activate the apero profile

Step 2/2

Run apero reject:

Bash

```
apero_reject.py --identifier=file1,file2,file3
```

Where file1, file2, file3 are filenames

You'll be asked some questions:

- To give any aliases for a target
- To give a comment (Please make sure the comment is descriptive)

You can skip these questions by adding an argument:

`--autofill="alias1|alias2|alias3,my comment"`

Again, make sure the 'my comment' is descriptive.

Filenames for reject script

- Please do not include the path
- Please only include the raw file name (i.e. the characters before the `_pp` suffix in any reduced files)
- Please use the APERO filename not the ESO filename i.e. the file format should be:
  - `NIRPS_YYYY-mm-ddTHH_MM_SS_sss`

Rejecting a whole observation

Sometimes you'll have to reject a whole night as the telescope or instrument means all data is unusable. You must have all data on disk, so make sure all data is downloaded - otherwise you may only reject some data.

Step 1/2

Activate the apero profile

Step 2/2

Run apero reject:

Bash

```
apero_reject.py --obsdir=NIGHT1
```

Note this overrides the use of `--identifier`.

You'll be asked some questions:

- Where to reject from [PP, TEL, RV] (to which in most cases you should say yes)
- To give a comment (Please make sure the comment is descriptive)

You can skip these questions by adding an argument:

`--autofill="1,1,1,my comment"`

Again, make sure the 'my comment' is descriptive.

APERO reject can't find the raw directory

You cannot reject data on a night where the raw sym-links have not been created.

If this is the case you need to run the manual trigger (See this section) as you normally would do but add the argument `--only_links=True`

This will generate the links and then allow you to run `apero_reject` without problem (assuming the data is actually on our disks in the first place).

You can check for raw data in the following directories:

- NIRPS-HE: `/nirps_raw/nirps/raw-data/nirps_he`
- NIRPS-HA: `/nirps_raw/nirps/raw-data/nirps_ha`

Note that the symbolic links should be created in the following directories:

- NIRPS-HE: `/cosmos99/nirps/apero-data/nirps_he_online/raw`
- NIRPS-HA: `/cosmos99/nirps/apero-data/nirps_ha_online/raw`

Also note that the directories should be symbolic links, not the files themselves.

5.17 How to run APERO remove

Some times the manual trigger is run and there is a problem that is not known about.

For example, a binary was aliased to the same name in the astrometric database.

In this case (or other cases) we need to remove all traces of data from the disk/databases of APERO, and then (normally) re-reduced the data. To do this we use `apero_remove.py` .

Step 1/2

Activate the apero profile

Step 2/2

Run apero remove:

Bash

```
apero_remove.py {args}
```

Please note that this is permanent we cannot undo this, all files you ask to be removed will be removed, please test before running properly (using –test=True)

Note that we never remove raw data - so we can always reprocess.

In some cases (i.e. for astrometric database corrections) you will need to remove entries from the raw database (with the `--rawdb` argument)

APERO remove arguments

Below we list some useful arguments

obsdir

Delete all instances of a certain observation directory from disk and databases.

blocks

Delete all instances of a block from disk and database (multiple blocks should be separated by a comma). The blocks are as follows:

- `tmp` (preprocessed files)
- `red` (reduced files after preprocessing, not including post-processed files or LBL)
- `out` (post-processed files)
- `calib` (reduced calibrations that passed all QC)
- `tellu` (reduced telluric hot stars and science files that passed all QC)

file_prefix

Delete all instances of a certain file prefix from disk and databases.

file_suffix

Delete all instances of a certain file suffix from disk and databases.

objnames

Delete all instances of a certain object name (`DRSOBJN`) from disk and databases.

test

Whether to run in test mode (recommended first time).

rawdb

Whether to remove raw database entries.

5.18 How to add a new reduction product to the objects directory

The `objects` directory is a directory of symbolic links sorted by target.

For the online reductions, these are located here:

- NIRPS-HE: `/cosmos99/nirps/apero-data/nirps_he_online/objects`
- NIRPS-HA: `/cosmos99/nirps/apero-data/nirps_ha_online/objects`

Currently, we do not copy every product here. If you decide that a product that is not included is worth having for everyone, you can add the product using the following steps:

1. Go to the `manual_trigger` directory (on `nirps_he` / `nirps_ha`) - usually, you just type `manual_trigger`.
2. Open the `nirps_he` and `nirps_ha` YAML files.
3. Find the section: `get: science out types:`
4. Add the required new product (a list of products can be found here, use the "name" column):
   - NIRPS-HE reduced products
   - NIRPS-HE post-processing products
   - NIRPS-HA reduced products
   - NIRPS-HA post-processing products
5. Run `manual_trigger` with the argument `--only_aperoget` and no `obsdir`.

This should update all objects (to be consistent, we should do this for both `nirps-he` and `nirps-ha`) and keep the offline and online YAML files the same. (Hence, in step 2, both YAML files should be opened.)

5.19 How to find whether there should be science data

With NIRPS we have two modes (HE and HA) often only HE is used so there may genuinely be no data for HA (or in some cases for HE, if only HA was used). It is ambiguous whether we have no data due to technical issues or because there was genuinely no data taken.

Note science files will appear after a night has been completed. The way the observation directories are set up means you have to wait until the next calendar day to do this test.

Even if science data is taken we may not have access to it, therefore you need to find out if there should have been data we should have access to.

Please check whether we expect data on our disks based on the time it is now.

Next check the observation log to see if there was a good reason for no science files.

If not mentioned in the observation log follow the 'special archive' steps in section 5.10. Please note if you are specifically looking to see whether there is no HA data or no HE data (as the other does have data) you must click the tick for 'Orig Name' column in the 'Data Product Info' (yellow) section before searching - this will give you the original file name which does start with either 'NIRPS_HE' or 'NIRPS_HA'. Please also note that by default results are trucated to 200 rows so you may need to increase the 'Return max' rows value to a higher number (before searching).

If there are no 'NIRPS_HA' data here but we have 'NIRPS_HE' data then you can safely assume that no 'NIRPS_HA' data was observed (and vice-versa).

If there are no data for either 'NIRPS_HA' or 'NIRPS_HE' or there are data for both you need to go to and set:

- filter by Instrument to 'NIRPS'
- filter by Telescope to '3P6'
- set a loose schedule time interval (a few days before to a few days after the night you are investigating)

This will give you the program ids which you can match to the 'Instructions' page of the observation log (Section 5.8). Note you should only assume we have access to NIRPS GTO programs - PI 'BOUCHY').

Good reasons for no science data include:

- No GTO data for that night
- Bad weather
- Technical problems
- HARPS only run

You will have to look in the "Obs time" sheet and look for the date of observations row and the columns marked GTO-WP3, GTO-WP1, GTO-WP2, GTO-OS2

If any of these have non-zero values science data should have been taken, it may be the observer hasn't filled out the time, so also check the comment for that night for information on whether science was observed.

6 APERO errors

6.1 Overview

After the manual trigger has run you must check on any errors encountered by APERO.

The dates given are the date the manual trigger was run NOT the observation directory or night.

The following sections list where to find the errors for all profiles (NIRPS HE/HA and online/offline) but the two most important sections are:

- NIRPS HE errors found on ARI
- NIRPS HA errors found on ARI

6.2 Known Errors

There is a list of known errors here

If an error is known it will have an action for you to do (report, check, ignore)

If an error is not known please add it and report it to the following people:

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Lison Malo	lison.malo@umontreal.ca

6.3 Common LBL Error

There is a common LBL Error when running in online mode.

If you get an LBL error please first check the object name in ARI and look at the BERV coverage plot. If there are only a few valid telluric points and/or the BERV coverage is low less than $\sim 10\ km\ s^{-1}$ there may be no template, which in turn means LBL will give an error at all steps, the error in the recipe table should read something similar to:

```
Template_s1dv_{OBJNAME}_sc1d_v_file_A.fits cannot be found
```

where OBJNAME is the ARI name for this object.

If this is the case you can report this when filling out the the babysitter form. But no other action is necessary.

6.4 NIRPS-HE online errors

Online errors can be found here (you must log on to ARI to see this page)

From this page, navigate to the recipe table and check `num_fail`

Click the link for a given day and filter failures with `ended = False`

In general ignore any errors with CRUNFILE not equal to `online_run`

Check for actions

Check for actions here

If any error is "None" you can look up the log file (displayed in the `LOGFILE` column).

6.5 NIRPS-HA online errors

Online errors can be found here (you must log on to ARI to see this page)

From this page, navigate to the recipe table and check `num_fail`

Click the link for a given day and filter failures with `ended = False`

In general ignore any errors with CRUNFILE not equal to `online_run`

Check for actions

Check for actions here

If any error is "None" you can look up the log file (displayed in the `LOGFILE` column).

7 Nightly debugging

7.1 Overview

A night-by-night list of targets can be found on the ARI apero profile page, under the "observation table" link in figure 10

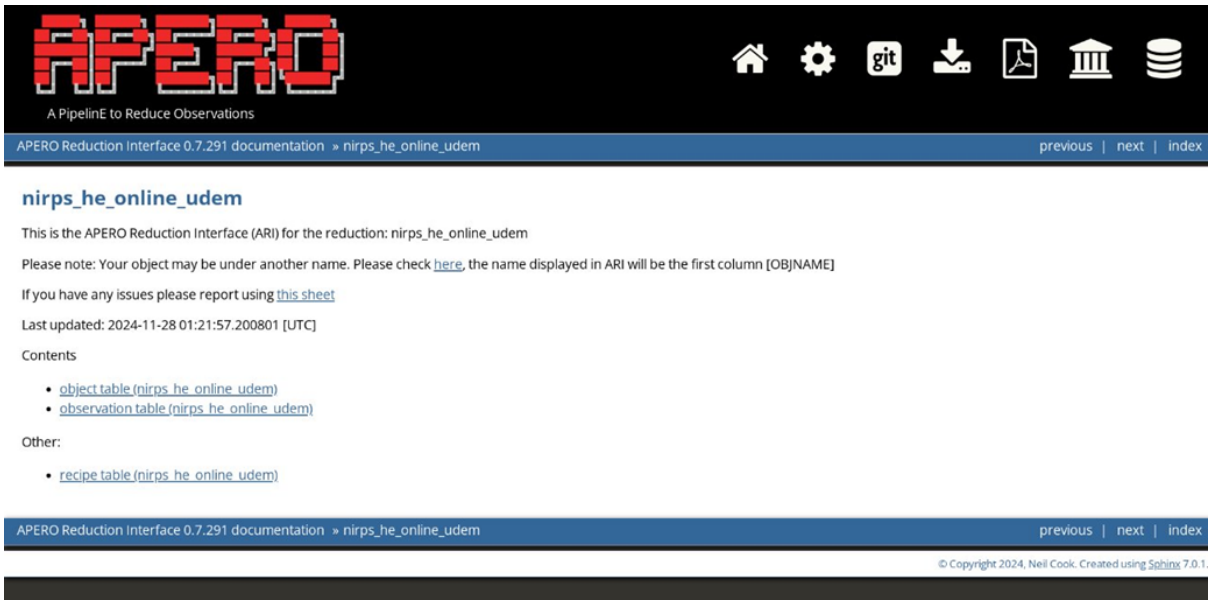

Figure 10: An example ARI profile page

This gives a table of all observations sorted by observation night directory:

If there are observations for this night you must check all objects for that given night (briefly).

To aid this there are links to the Target, Spectrum, LBL, CCF, Timeseries and Debug sections.

Please familiarize yourself with the graphs in each section (Target, Spectrum, LBL, CCF) and what they should look like.

Please report anything that looks weird to the following people:

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Frederique Baron	frederique.baron@umontreal.ca
Thomas Vandal	thomas.vandal@umontreal.ca
Charles Cadieux	charles.cadieux.1@umontreal.ca
UdeM NIRPS mailing list	nirps_mtl@listes.umontreal.ca

Night	Object name	Number of ext	Number of tcorr	TARGET	SPECTRUM	LBL	CCF	TIMESERIES	DEBUG
2024-11-26	GJ3307	2	2	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-26	YZ CMI	3	3	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-26	TOI210	2	2	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-26	GJ3090	2	2	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-26	GL229	3	3	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-26	HR9098	3	3	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-26	TIC427346731	1	1	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-26	TOIM4508	2	2	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-26	GL299	1	1	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-26	GL166C	2	2	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-26	LP 938M71	1	1	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-26	G 99M49	3	3	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-26	L230M188	1	1	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-26	TZ ARI	2	2	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-26	LP 783M2	1	1	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-25	YZ CMI	3	3	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-25	TOI1078	2	2	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-25	HR3131	3	3	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]
2024-11-25	GL299	1	1	[TARGET]	[SPECTRUM]	[LBL]	[CCF]	[TIMESERIES]	[DEBUG]

Figure 11: ARI Observation table

7.2 ARI: Target section

No graphs in this section, however it is worth looking at the OBJECT name(s) in headers for any weird names that you think shouldn't be there (compared to the actual name of the target and the aliases provided)

7.3 ARI: Spectrum section

There are graphs of the extracted SNR (as measured in APERO extract recipe), and BERV coverage plot and an example of the extracted and telluric corrected spectrum (with zoom-ins on three regions) see figure 12.

Just check that the SNR hasn't dropped horribly, and that the telluric correction looks okay.

You can also take a look at the number of files passing and failing QC (either in the BERV coverage plot - second panel or from the Spectrum information table)

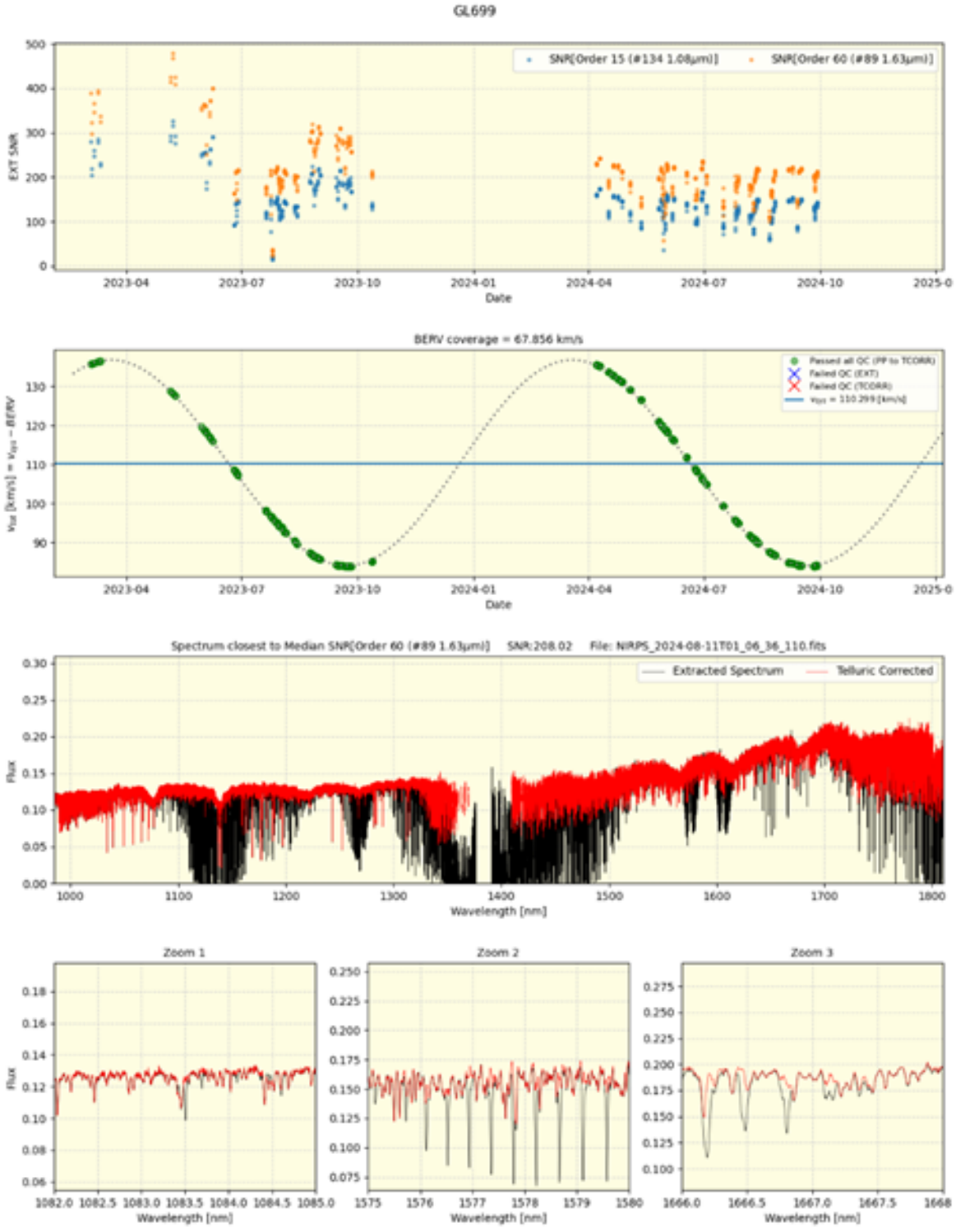

Figure 12: Example of the plots in the ARI spectrum section

7.4 ARI: LBL section

There are graphs of the LBL velocity, the SNR (again) and the RV in the blue vs red - see figure 13.

For the LBL velocity if there are many possibly bad points (or many red arrows) report it.

Note that there are various combinations of object and 'friend' template so you may have several sets of graphs to look at (they are named `{OBJECT_NAME}_{TEMPLATE_NAME}`)

In the bottom panel just make sure that roughly that the blue and red points are centered around the black points and look equally distributed on either side (blue points are normally more uncertain than the red points).

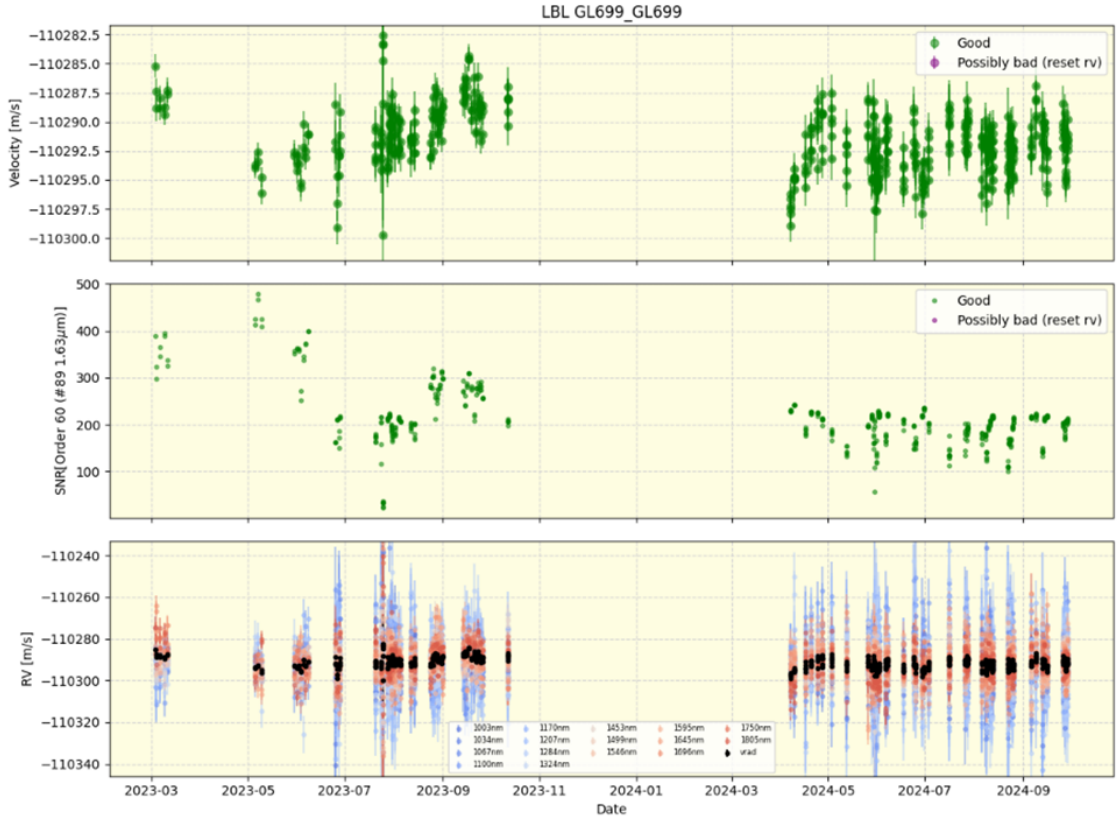

Figure 13: Example of the plots in the ARI LBL section

7.5 ARI: CCF section

There are graphs for the velocity, the mean CCF, mean residuals and the residuals to the median. See figure 14.

For the velocity graph (similar to LBL)y look out for lots of red outlier arrows.

The mean CCF should look like a Gaussian curve with a continuum and a negative peak.

The residual may have some wiggles to it but should general be small (compared to the scale of the peak in the CCF above).

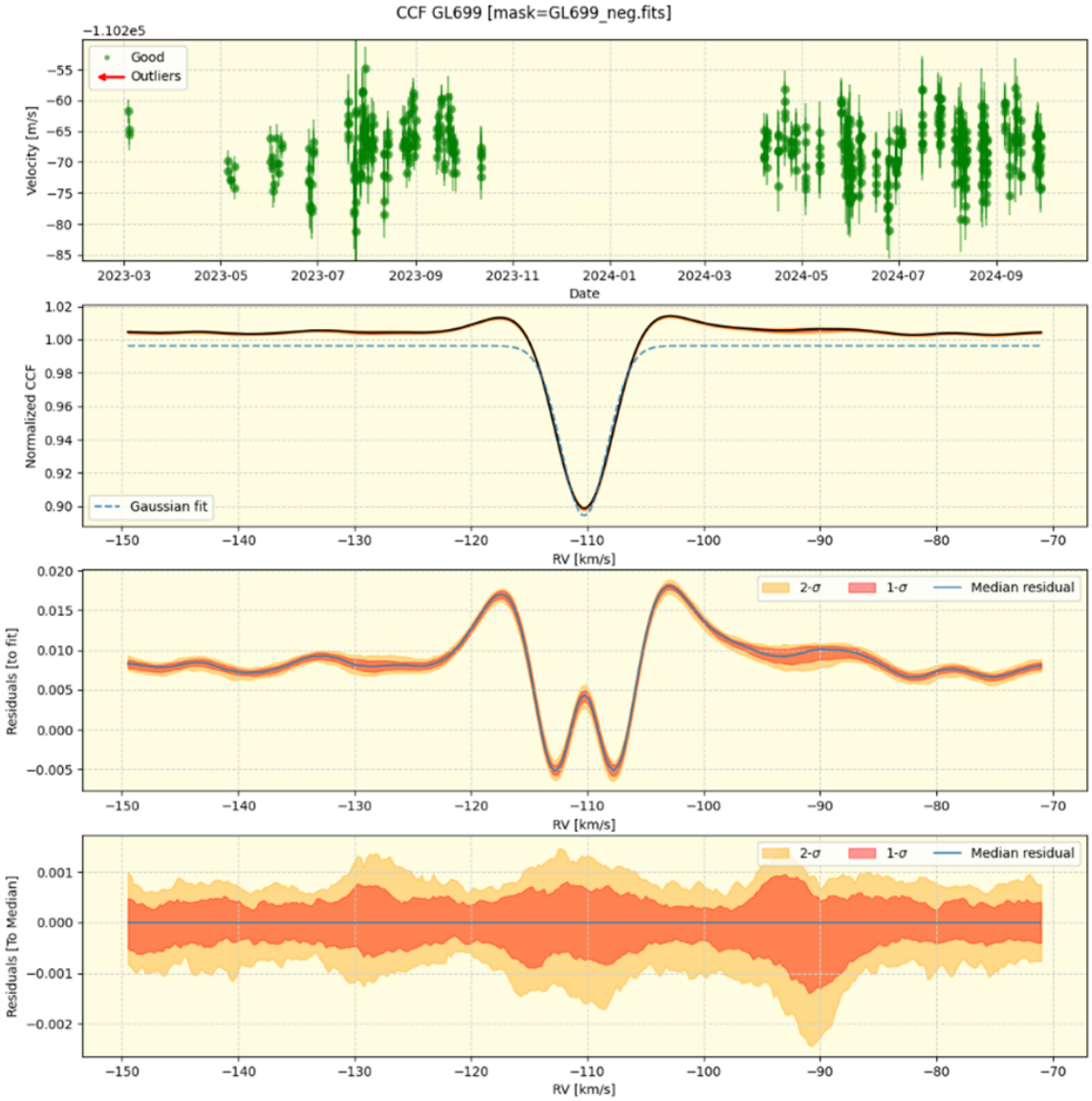

Figure 14: Example of the plots in the ARI CCF section

7.6 ARI: Time-series section

This is a table of observed points.

You can roughly make sure the newest points (which should be the ones you reduced most recently) have similar values to other observations (though note that things such as weather and changes in observation plan can affect this – though ask if you are unsure!)

7.7 ARI: Debug section

This section has a lot of graphs that it might be worth familiarizing yourself with. We try to show good examples below.

Telluric map plot

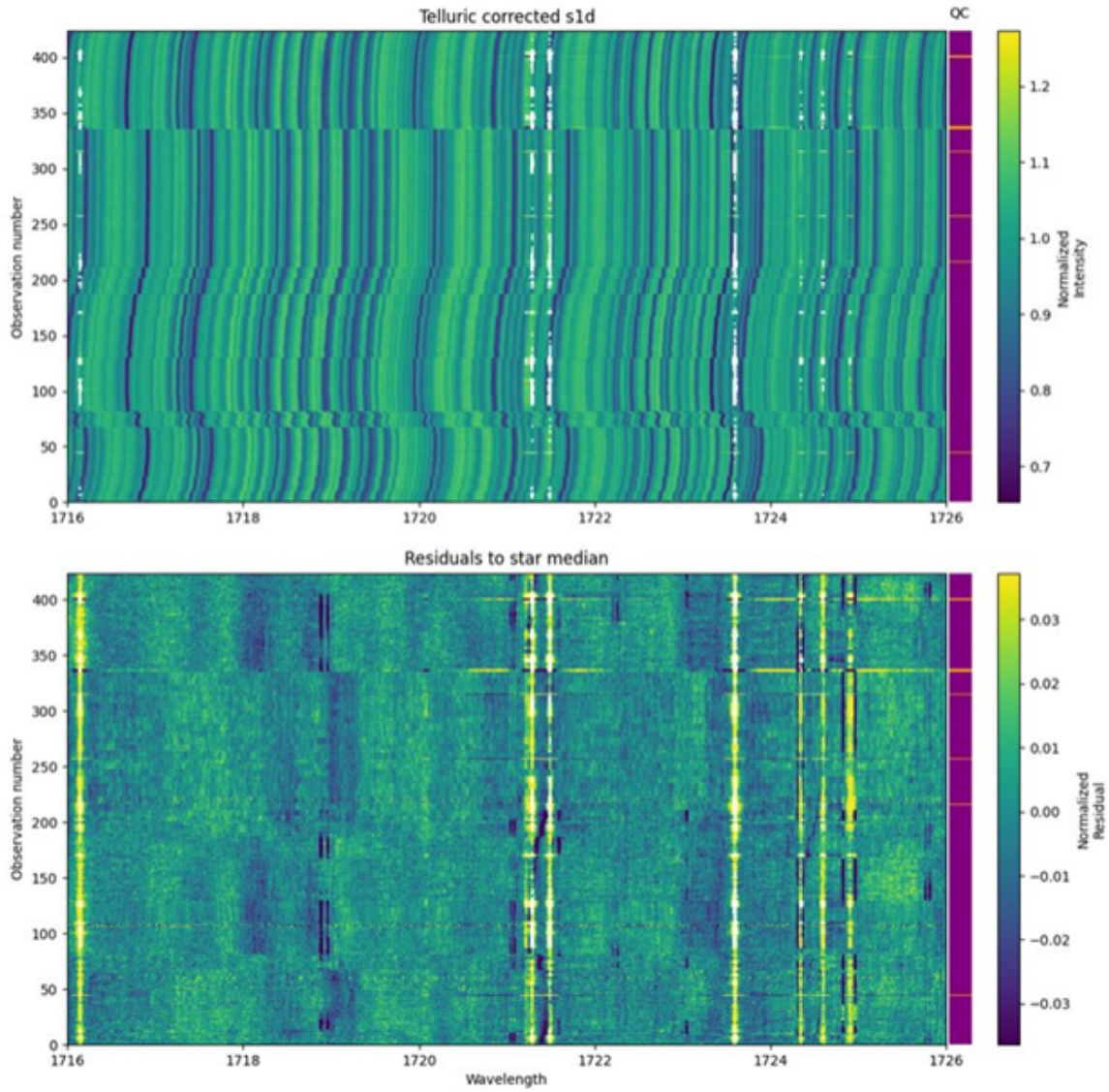

Figure 15: Example of the ARI Debug telluric map plot

In general, the bottom plot shouldn't have large values and in an ideal case should just be noise. See

figure 15.

Vertical lines are what we want to remove - but currently we still have some in there.

Note that the QC bar (purple and orange) shows which observations were rejected – so you can ignore horizontal rows with an orange flag.

Some observations are just very log SNR – these will appear as noisier horizontal rows – you could look at the SNR in the other graphs but mostly these can be ignored.

Shape quality control plot

These show how the detector moved (dx and dy being horizontal and vertical shifts) and A,B,C,D being an affine transformation matrix describing rotation, sheer etc. See figure 16.

These should all be clustered around zero (A and D have been normalized around 0 their true value is close to 1), but most importantly these should be consistent across time.

We do have jumps in the detector but if you see a large jump in the most recent observations you can report it.

WFPDRIFT and wave cavity plots

These show how the FP has changed over time. They should all be following the same overall trend. See figure 17.

We do have jumps in the detector but if you see a large jump in the most recent observations you can report it.

Saturation and Effective readout noise plots

Figure 18 show some metrics we are measuring when extracting a spectrum.

They should all be following the same overall trend. However maximum saturation levels can vary with observing conditions but very large values could indicate something very wrong with the observation.

We do have jumps in the detector but if you see a large jump in the most recent observations you can report it.

APERO Processing Debug Plot

The top panel of figure 19 shows the version of the DRS used - it should not be different in most cases. Please report if it has changed.

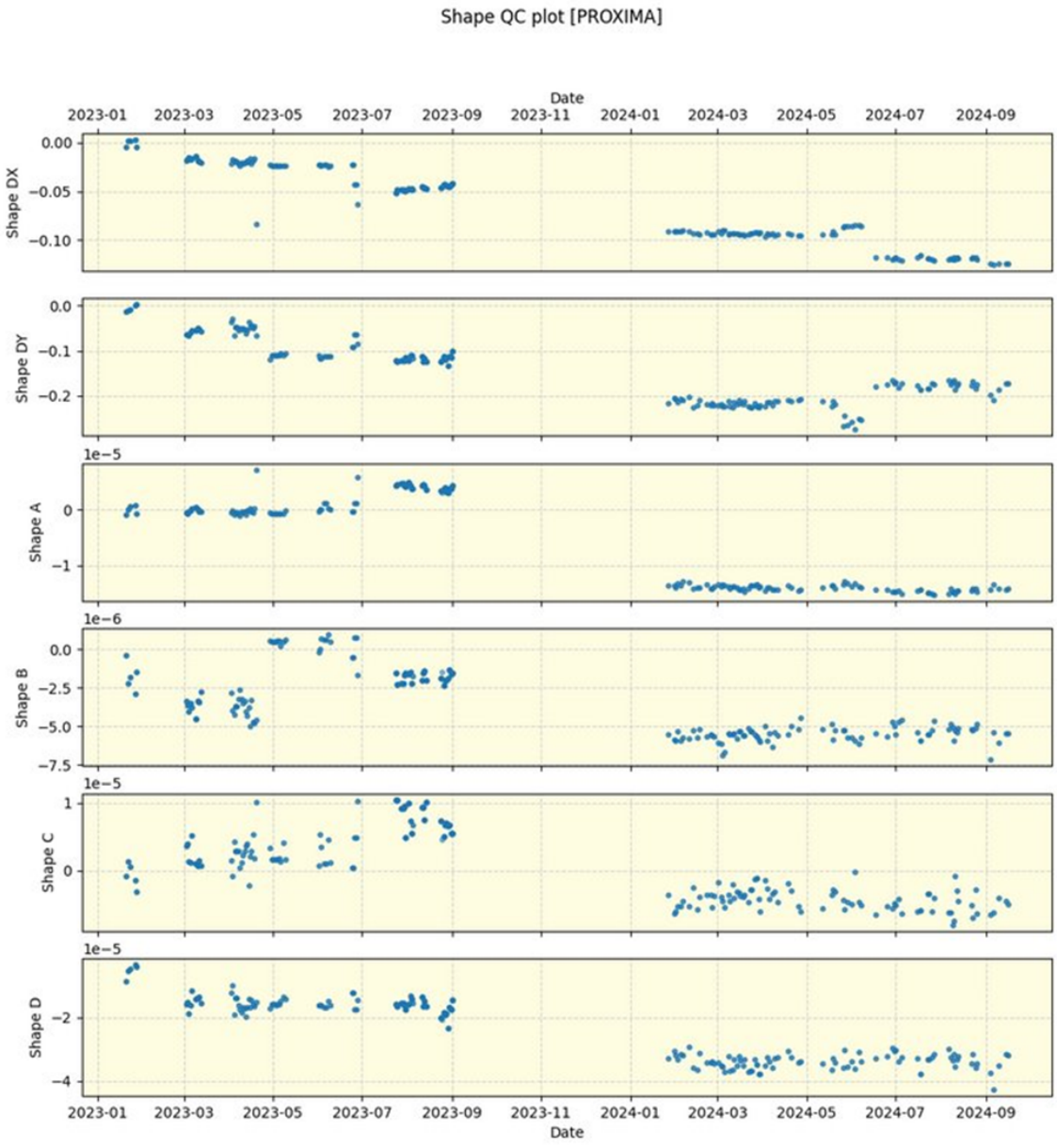

Figure 16: Example of the ARI Debug shape quality plot

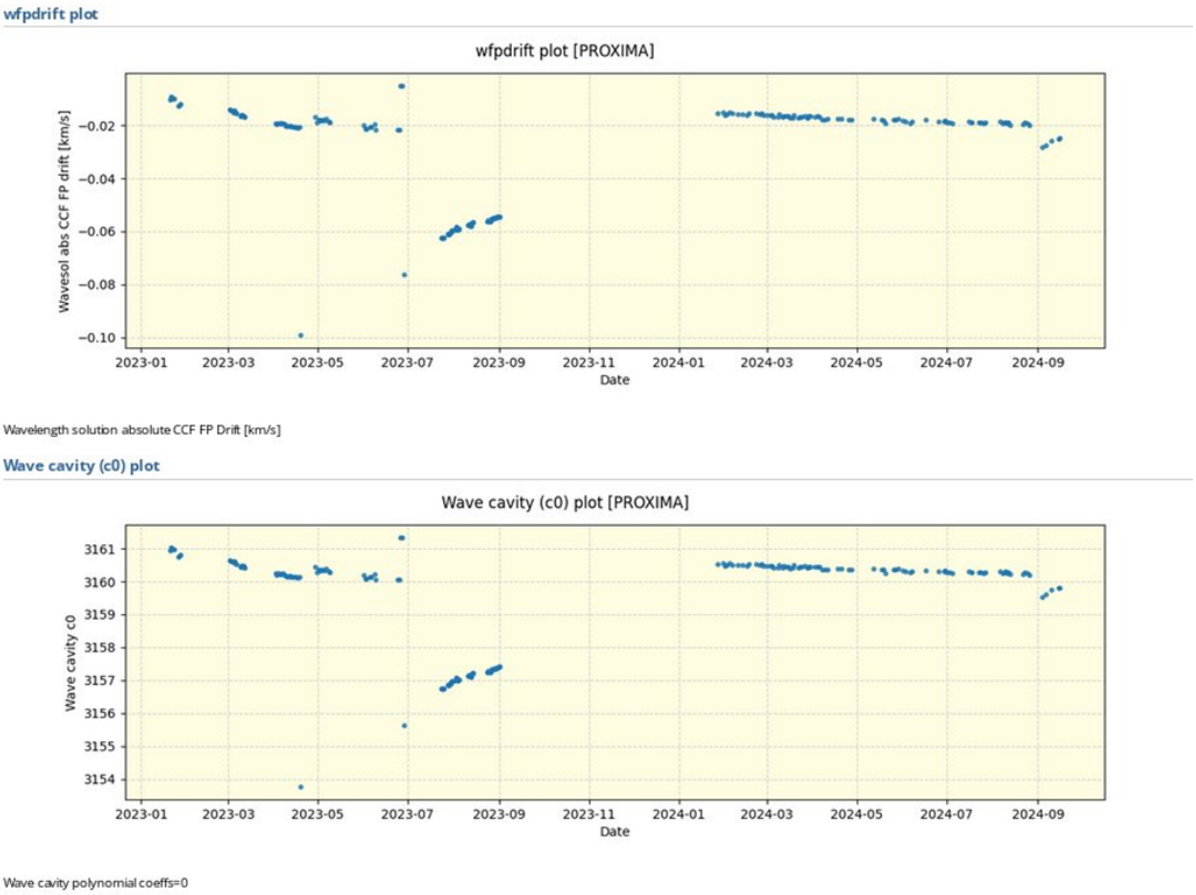

Figure 17: Example of the ARI Debug wave drift plots

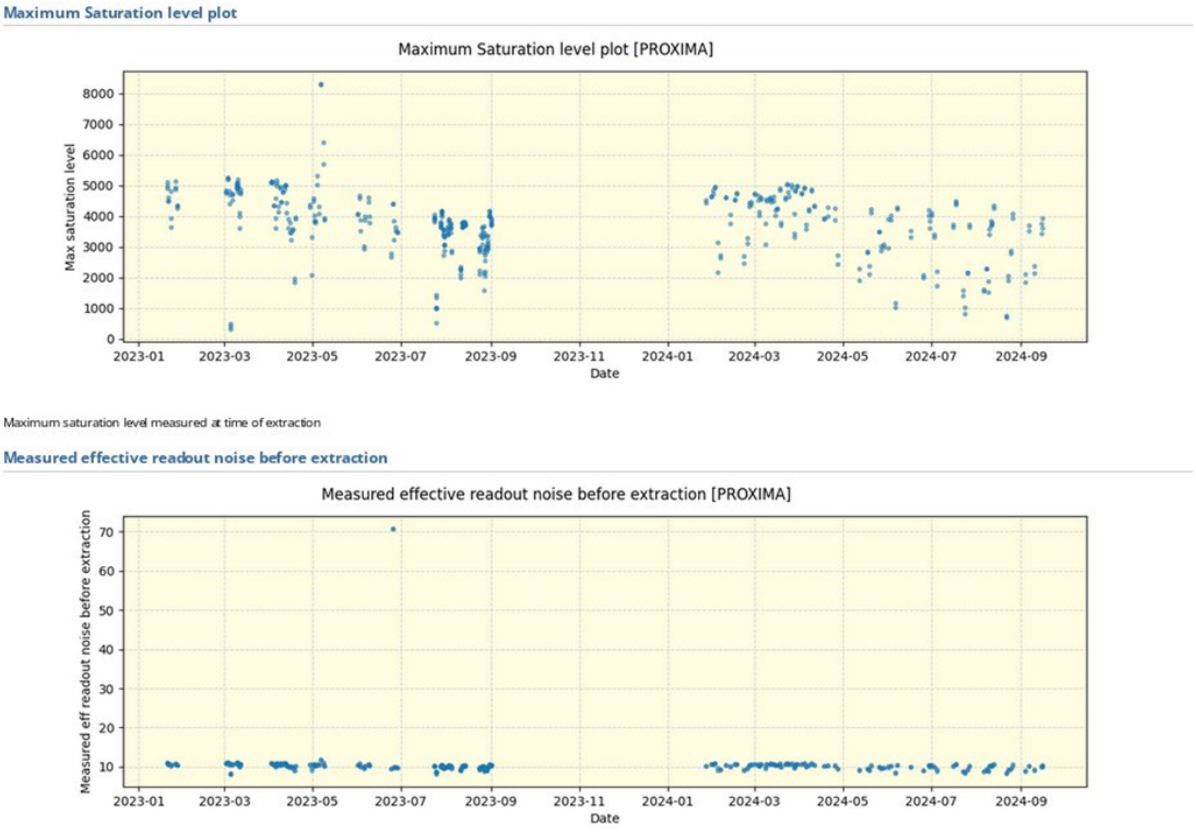

Figure 18: Example of the ARI Debug saturation and effective readout noise plots

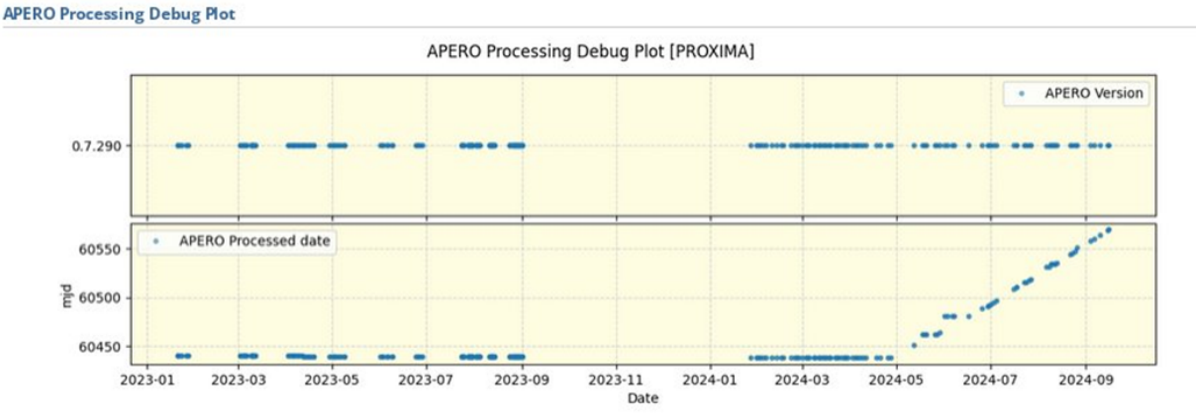

Figure 19: Example of the APERO Debug processing plot

The bottom panel shows when the data was processed. This should be a flat line (for data originating from offline reductions) followed by a one-to-one slope with date (i.e. data has been reduced day by day after the last offline reduction) if this is not the case please report it (note you'll also see when multiple day were reduced at the same time by horizonal lines – this is not a problem but long stretches may need to be reported.

APERO calibration times plot

This checks the calibration file's observed time against the observation time of the science target.

Calibrations checked are as follows:

- Dark (reference)
- Bad pixel file
- Order profile
- Localization
- Local shape file
- Shape X file (reference)
- Shape Y file (reference)
- Flat file
- Blaze file
- Wave file
- Wave solution

Reference objects may diverge, while all other calibrations should be within approximately one day, unless the calibrations were bad or not taken.

A report should be generated for cases exceeding two days, unless there are comments about the calibration tests failing for multiple days and the babysitter was explicitly asked to ignore those failures.

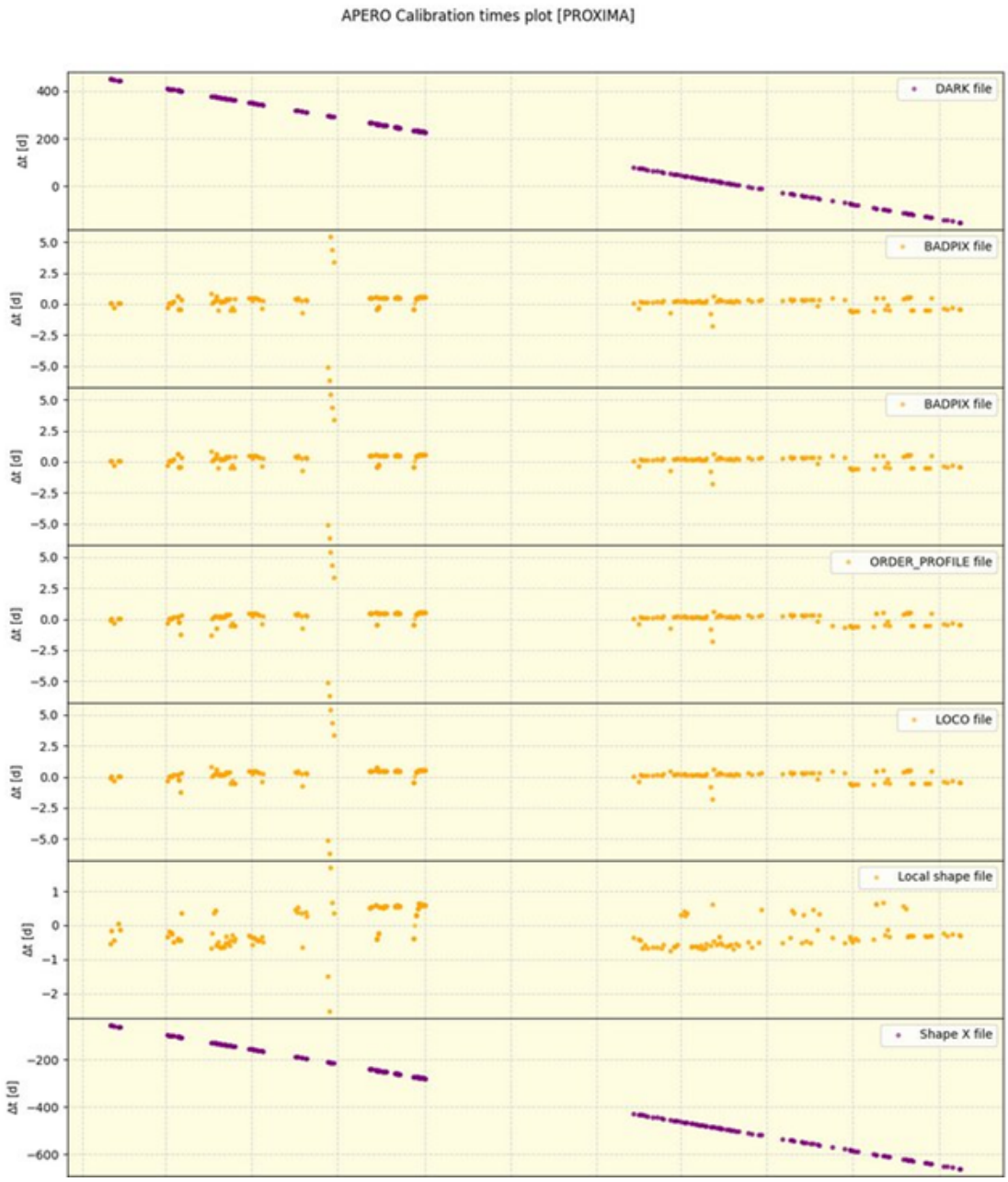

Figure 20: Example of the APERO Debug calibration time plots

8 Troubleshooting

8.1 Overview

If you cannot find a problem elsewhere, check here before reporting it.

Currently, these problems are as follows:

- APERO processing pauses with no files after whitelisting.
- ARI crashes inside `manual_trigger`.
- APERO Checks Google Sheet has no/few entries.
- `manual_trigger` is locked.

8.2 APERO processing pauses with no files after whitelisting

You may get the following message: W[10-503-00007]: No files after whitelisting. Skipping

If for some reason you expected no files for this night please type "N"

If you expected files re-run the raw checks and then either report no files or try running the manual trigger again

If you get this message again and expect files please report it to the core team:

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca
Frederique Baron	frederique.baron@umontreal.ca
Thomas Vandal	thomas.vandal@umontreal.ca
Charles Cadieux	charles.cadieux.1@umontreal.ca

Note typing 'Y' or 'N' will lead to a red error that will be reported in the checks. So recall that you will get that extra error in the error check table.

8.3 ARI crashes inside manual trigger

Sometimes, ARI will crash in manual trigger, mostly when ARI is running in more than one place at once.

This can be fixed by:

- Waiting for other ARI instances to finish.
- Running the manual trigger with an added argument.

Running the manual trigger with added argument: `--only_ari=True`

8.4 APERO checks Google sheet has no or few entries

Sometimes APERO checks will get confused and delete old entries

This is normally when multiple APERO checks ran at the same time

If this happens contact:

Contact name	Email
Neil Cook ★	neil.cook@umontreal.ca
Lison Malo	lison.malo@umontreal.ca
Etienne Artigau	etienne.artigau@umontreal.ca

8.5 Manual trigger is locked

We have a lock on uploading to the `apero_checks`

You may get the following error:

```
Lock file timeout. Please remove: {lock file} manually
```

If this happens wait for any other processes to finish (or kill them) and then remove the file above and re-run all codes that were running.

The lock file is located in the `apero_check` directory:

`/cosmos99/nirps/git-bin/apero-utils/nirps/apero_check/lock.lock`