

# APERO Documentation



Version 0.6.018

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It is the official pipeline for:

- [SPIROU](#) (SPectropolarimeter InfraROUge) on the Canada-France-Hawaii Telescope [CFHT](#).
- NIRPS (Currently under construction)

# Chapter 1

## General User documentation

This section provides a general guide to using APERO.

### 1.1 Installation

#### 1.1.1 Prerequisites

APERO is tested with [python 3](#)

The following python modules are required:

```
astropy
matplotlib
numpy
scipy
```

The following python modules are recommended:

```
astroquery
barycorrpy
bottleneck
ipdb
numba
pandas
PIL
tqdm
```

See :ref: *here* <*python\_install*> for guide to installing python and modules with the recommended setup.

#### 1.1.2 Download from GitHub

##### 1.1.2.1 Clone

Clone from [github](#):

```
> git clone https://github.com/njcuk9999/apero-drs
```

This may take some time (in future most of the data required will be a separate download), and we still have many (now redundant) files from the spirou\_py3 repository.

### 1.1.2.2 Choose branch

Change to the *aper0-drs* directory

Choose which branch:

- **master version** This is the version currently recommended for all general use. It may not contain the most up-to-date features until long term support and stability can be verified.

Change to this branch with:

```
> git checkout master
> git pull origin master
```

- **developer version** Note the developer version should have been tested and semi-stable but not ready for full sets of processing and definitely not for release for non-developers or for data put on archives. Some changes may not be in this version that are in the working version.

Change to this branch with:

```
> git checkout developer
> git pull origin developer
```

- **working version** Note the working version will be the most up-to-date version but has not been tested for stability - use at own risk.

Change to this branch with:

```
> git checkout working
> git pull origin working
```

## 1.1.3 Setup

### 1.1.3.1 Run the installation script

Change to the *aper0-drs* directory

Run the installation script:

```
python setup/install.py
```

### 1.1.3.2 Step-by-step guide

Follow the step-by-step guide:

- A: User configuration path  
This is the path where your configuration will be saved. If it doesn't exist you will be prompted to create it. (This will be referred to as *DRS\_UCONFIG* from now on (default is */home/user/aper0/*)
- B: Instrument settings  
Install *INSTRUMENT*. If yes it will install the instrument if not then it will not install the instrument. Currently only SPIRou is supported
- C: Set up paths  
The first question will ask whether to set up paths individually. If */Y/es* it will allow you to set each path separately (i.e. for raw, tmp, reduced, calibDB etc). If */N/o* you will just set one path and all folders (raw, tmp, reduced, calibDB etc)) will be created under this directory.
- D: Setting the directory/directories  
Will prompt you to enter the directory path/paths (will ask you for each if you answered that paths be set up individually in step C above.
- E: Clean install  
If you type *[Y]es* you will be prompted (later) to reset the directories this means any previous data in these directories will be removed. Note you can always say later to individual cases.

**Warning:** Resetting a directory will remove all files/sub-directories from within these folders

---

**Note:** A to E will repeat for all installable instruments (To step up just one use the *-instrument* argument)

---

### 1.1.3.3 Additional options

One will be prompted to give installation paths to various optional tools (currently *ds9* and *pdflatex* note the user will not be prompted if these were automatically found using the *where* command)

### 1.1.4 Updating from github

1. Choose a branch (as in *Choose branch*)
2. Update the branch (pull from github):

```
> git pull origin {branch}
```

3. Update using the installation script:

```
> python setup/install.py --update
```

This will use all current settings and update the

## 1.2 Using APERO with SPIRou

This section describes the process to use APERO.

## 1.3 Known Issues

Currently known issues and problems with APERO. Last updated: 2020-01-07 (NJC).

### 1.3.1 Recipes

- CCF still showing problems with noise - problem with wavelength solution?
- No exposure meter recipe (TODO)
- no uncertainties propagated in recipes

### 1.3.2 External

- barycorrpy requires astropy 2.0.16 and 3.2.3 to run (IERS table mirror links in older versions out of date - server offline)

## 1.4 TODO

This is the currently list of items that need to still be completed. Last updated: 2020-01-07 (NJC).

### 1.4.1 In progress

- finish *obj\_spec\_spirou* and *obj\_pol\_spirou* [Do not use them now]
- output files like CFHT (e.fits, p.fits, v.fits etc)
- go through all summary plots and decide which plots, write figure captions, improve plots, write quality control description, decide which header keys to print
- display func for all functions
- add doc strings to all functions, descriptions to all constants, review all constant min/max/dtypes
- add more debug printouts
- deal with all python warnings
- write documentation

### 1.4.2 As soon as possible

- add *plot==3* (all debug plots shown) and *plot==4* (all debug plots saved) modes
- move *object\_query\_list.fits* to *calibDB*
- write paper
- setup instrument tool
- add exposure meter recipes (*cal\_exposuremeter\_spirou.py*)
- Windows compatibility
- output in form required for CFHT/CADC (discussion required)
- co-production of e2ds and e2dsff
- uncertainty propagation
- proper SNR calculation
- add *cal\_drift* recipe?
- NIRPS integration
- uncertainty propagation
- data separate download from DRS
- add EA mask generation from templates
- add EA template matching

## 1.5 General Tools

---

For instrument specific guide see:

- [\*SPIROU\*](#)



## Chapter 2

# SPIRou documentation

### 2.1 Using APERO with SPIRou

This section describes the process to use APERO.

### 2.2 SPIRou Recipes

This section describes are all the SPIROU recipes to use with APERO.

### 2.3 SPIRou Tools

These are all useful tools to use with APERO.

## Chapter 3

# Developer how to guide

Below is a guide for those developing APERO for the current set of instruments and for future instruments.

### 3.1 Adding a new constant

### 3.2 Adding a new keyword

### 3.3 Adding a new recipe

### 3.4 Adding a new filetype

### 3.5 Adding a new plot

# Chapter 4

## Other

- [genindex](#)
- [modindex](#)
- [search](#)

### 4.1 Recommended python installation

If you already use anaconda/conda skip to step 3

1. Download anaconda, i.e. in bash and wget (or go to the *anaconda website* [<https://www.anaconda.com/distribution/#download-section>](https://www.anaconda.com/distribution/#download-section))  
``bash wget https://repo.anaconda.com/archive/Anaconda3-2019.10-Linux-x86_64.sh ``
2. Install anaconda, i.e. with bash  
``bash bash Anaconda3-2019.10-Linux-x86_64.sh ``
3. **Add conda-forge to list of anaconda repositories:** ``bash conda config --add channels conda-forge conda config --set channel_priority strict ``
4. **Create a new conda environment** ``bash conda create -n aperienv --clone base ``
5. Activate conda environment (you will have to do this each time to use aperi) so putting it in the generated setup script (for convinence) or in `~/.bashrc` `~/.tcshrc` to always use, is recommended. i. e. to activate in bash: ``bash conda activate aperienv ``
6. **Install python packages not in anaconda:** ``conda install astroquery conda install numba conda install yagmail ``

### 4.2 Constants

#### DRS\_UCONFIG

- The directory containing the users configurations files
- default is `/home/user/aperio/`

#### INSTRUMENT

- This is the instrument used at a specific telescope. Some settings are instrument specific.
- Currently supported instruments are:: SPIROU

### 4.3 Glossary

#### ds9

- An astronomical imaging and data visualization application
- see [ds9.si.edu](https://ds9.si.edu)

#### pdflatex

- The pdf latex compiler
- see [www.latex-project.org](http://www.latex-project.org)

## 4.4 Changelog

### 4.4.1 0.6.018 (2020-01-10)

- *Recipes.spirou.obj\_mk\_template\_spirou.py* - add logging for when file is skipped (and qc passes) [Neil Cook]
- *Recipe.dev.apero\_changelog.py* and *module.documentation.drs\_changelog.py* - need to format changelog so it works as .rst file (for documentation) [Neil Cook]
- Update documentation. [Neil Cook]
- *Tools.module.documentation.drs\_documentation.py* - make sure we copy the contents of output folder not the folder itself. [Neil Cook]
- *Tools.recipes.dev.apero\_documentation.py* - add update option to making documentation (for updating doc website) [Neil Cook]
- *Tools.module.testing.drs\_log\_stats.py* - make sure path is in nights list + sort by htime. [Neil Cook]
- *Tools.resources.setup.apero.bash.setup\** - correct typo – missing speech mark. [Neil Cook]
- *Science.calib.wave.py* - seperate master and old wave writing functions + add in night qc and write functions. [Neil Cook]
- *Cal\_wave\_night\_spirou.py* - add in ccf computation. [Neil Cook]
- *Cal\_wave\_master\_spirou.py* - change writing functions to master functions (to separate from *cal\_wave* – old) - master now writes to key WAVEM. [Neil Cook]
- Update the *master\_\*\_SPIROU.txt* files - default master files now *WAVEM\_D\_{fiber}* [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - need a set of files for master (can remove non-master if we go with master/night recipes) [Neil Cook]
- *Core.instruments.spirou.file\_definitions.py* - need a set of files for master (can remove non-master if we go with master/night recipes) [Neil Cook]
- *Core.instruments.spirou.default\_keywords.py* - group all wave header keys. [Neil Cook]
- *Core.core.drs\_startup.py* - add argument ‘required’ to *get\_file\_definition* to allow not finding a key and return None if this is the case. [Neil Cook]
- *Core.core.drs\_log.py* - add pipes to the end of each qc to ease splitting in log analysis. [Neil Cook]
- Update language database. [Neil Cook]
- *Science.calib.wave.py* - move logs to language database. [Neil Cook]
- *Setup.install.py* - remove blank spaces. [Neil Cook]
- Update date/version/changelog/documentation. [Neil Cook]

### 4.4.2 0.6.017 (2020-01-08)

- *Setup.install.py* - add dev section to modules (sphinx, ipdb, git-changelog) [Neil Cook]
- *Core.instruments.default.recipe\_definitions.py* - change dtype to ‘bool’ [Neil Cook]
- *Tools.recipe.general.apero\_log\_stats.py* - allow saving of all the log files to one file. [Neil Cook]
- *Tools.module.testing.drs\_log\_stats.py* - update recipe print outs. [Neil Cook]
- *Tools.module.testing.drs\_log\_stats.py* - correct error/warn sample. [Neil Cook]
- *Tools.module.testing.drs\_log\_stats.py* - correct typo. [Neil Cook]
- *Tools.module.testing.drs\_log\_stats.py* - keep all error/warning messages and use error/warn samples to keep just one for each code. [Neil Cook]
- Update language database. [Neil Cook]
- *Tools.module.testing.drs\_log\_stats.py* - add separations between warnings/errors. [Neil Cook]
- *Tools.module.testing.drs\_log\_stats.py* - add print out of unique errors/warnings. [Neil Cook]
- *Tools.module.testing.drs\_log\_stats.py* - change eval -> int. [Neil Cook]
- *Drs\_startup.py* log file should use group (only used to save where log files are correctly) [Neil Cook]
- *Tools.module.testing.drs\_log\_stats.py* - try to locate log file if not found immediately. [Neil Cook]
- *Tools.module.testing.drs\_log\_stats.py* - add check if log file exists. [Neil Cook]
- *Plotting.core.py* - try fix to plt.show, plt.close. [Neil Cook]
- *Core.constants.constant\_functions.py* - add parent/author to set method. [Neil Cook]

- Correct README.md. [Neil Cook]
- *Sciece.calib.wave.py* - correct typo *IC\_LITTROW* -> *WAVE\_LITTROW*, move wave night params to config. [Neil Cook]
- Constants - start adding parents to keywords and add *wave\_night* constants. [Neil Cook]
- *Tools.module.testing.drs\_log\_stats.py* - change where we get the log fits file from. [Neil Cook]
- *Data/spirou/reset/runs/batch\_run.ini* - correct batch run as example of EA *mini\_data*. [Neil Cook]
- *Tools/resource/setup/\** - update all environmental variables. [Neil Cook]
- *Misc.tools.ccf\_plot.py* - basic plot to plot all ccfs for a given object (minus the mean) [Neil Cook]
- *Setup.install.py* - astropy must be v3.2 or greater. [Neil Cook]
- *Tools.recipes.dev.apero\_changelog.py* - update locations of docs. [Neil Cook]
- *Tools.recipes.dev.apero\_documentation* - add codes to build documentation [unfinished] [Neil Cook]
- Re-build documentation. [Neil Cook]
- Update documentation (add fontawesome icons) [Neil Cook]
- *Core.instruments.default.recipe\_definitions.py* - add *remake\_doc* (*apero\_documentation*) to recipe definitions. [Neil Cook]
- Reorganise documentation - move build into working dir and have an output dir. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.3 0.6.016 (2020-01-07)

- Update docs - *known\_issues* and *todo*. [Neil Cook]
- *Tools.module.documentation.drs\_changelog.py* - add function to update a file based on a prefix and add in a suffix. [Neil Cook]
- *Tools.recipes.dev.apero\_changelog.py* - add doc changes to changelog (including copying changelog) [Neil Cook]
- *Misc.updates\_to\_drs.mk\_night\_wave.py* - question for EA. [Neil Cook]
- *Science.calib.wave.py* - continue work adding wave night functions. [Neil Cook]
- *Recipe.spirou.cal\_wave\_night\_spirou.py* - continue work on EA code. [Neil Cook]
- *Plotting.plot\_functions.py* - add wave night plots. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add debug plots to wave night recipe def. [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add wave night plots to constants. [Neil Cook]
- *Science.velocity.general.py* - add ccf per order normalisation to table 2 of ccf output. [Neil Cook]
- Continue work adding *cal\_wave\_night* functionality. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add *cal\_wave\_night* recipe. [Neil Cook]
- *Core.instruments.spirou.file\_definitions.py* - correct typo in raw file definition. [Neil Cook]
- *Io.drs\_lock.py* - mkdir can be accessed by two parallel processes at the same time - try 10 times with a sleep timer to allow one to complete and other to pass on before raising an error (due to e.g. bad file path) [Neil Cook]
- *Tools.module.setup.drs\_processingl.py* - if we have a master item do not skip if file is missing (cause error) [Neil Cook]
- *Tools.resources.setup.\** - add alias to installation dir. [Neil Cook]
- *Setup/inall.py* - add *-name* to *install.py* to allow different profiles to be set up on the same system. [Neil Cook]
- Update changelog/version/date. [Neil Cook]

#### 4.4.4 0.6.015 (2020-01-04)

- Add *apero-data* and *gitignore* contents. [Neil Cook]
- *Core.instruments.default.default\_config.py* - change default locations to a relative location. [Neil Cook]
- *Core.core.drs\_startup.py* - do not index if there are no outputs (including lock) [Neil Cook]
- *Tools.recipe.general.apero\_validate.py* - remove recipe log from non- instrument recipe. [Neil Cook]
- *Io.drs\_lock.py* - remove unused imports. [Neil Cook]
- *Io.drs\_fits.py* - all writing to file must be locked (for parellisation) based on filename. [Neil Cook]
- *Science.telluric.general.py* - change write -> *write\_file*. [Neil Cook]
- *Science.polar.general.py* - change write -> *write\_file*. [Neil Cook]
- *Science.extract.general.py* - change write -> *write\_file*. [Neil Cook]

- *Science.calib.wave.py* - change write -> *write\_file*. [Neil Cook]
- *Science.calib.shape.py* - change write -> *write\_file*. [Neil Cook]
- *Science.calib.localisation.py* - change write -> *write\_file*. [Neil Cook]
- *Science.calib.flat\_blaze.py* - change write -> *write\_file*. [Neil Cook]
- *Science.calib.dark.py* - change write -> *write\_file*. [Neil Cook]
- *Science.calib.badpix.py* - change write -> *write\_file*. [Neil Cook]
- *Recipe.spirou.cal\_wave\_spirou.py* - change write -> *write\_file*. [Neil Cook]
- *Recipe.spirou.cal\_Wave\_master\_spirou.py* - change write -> *write\_file*. [Neil Cook]
- *Recipe.spirou.cal\_thermal\_spirou.py* - change write -> *write\_file*. [Neil Cook]
- *Recipes.spirou.cal\_preprocess\_spirou.py* - change write -> *write\_file*. [Neil Cook]
- *Recipes.spirou.cal\_extract\_spirou.py* - change write -> *writelog*. [Neil Cook]
- *Core.core.drs\_file.py* - change write -> *write\_file* (more unique) [Neil Cook]

#### 4.4.5 0.6.014 (2020-01-03)

- *Io.drs\_lock.py* - make all lock files under the *DRS\_DATA\_MSG* path (not the group modified path) [Neil Cook]
- *Io.drs\_lock.py* - add absolute path to the files. [Neil Cook]
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- *Core.core.drs\_log.py* - if *use\_group=False* need to reset *drs\_data\_msg* (otherwise it will already have group name in even if group=None) [Neil Cook]
- *Tools.module.setup.drs\_reset.py* - remove breakpoint. [Neil Cook]

#### 4.4.6 0.6.013 (2020-01-02)

- Continue work on sphinx documentation (html and linux) [njcuk9999]
- *Recipes.spirou.cal\_extract\_spirou.py* - remove breakpoint. [Neil Cook]
- *Core.core.drs\_startup.py* - make sure log file does not use group (different groups may need to lock same file) [Neil Cook]
- *Core.core.drs\_log.py* - give an option to turn off using group. [Neil Cook]
- *Recipes.spirou.cal\_extract\_spirou.py* - force breakpoint. [Neil Cook]
- *Recipes.spirou.cal\_extract\_spirou.py* - add breakpoint to help find problem. [Neil Cook]
- *Core.core.drs\_log.py* - pep8 correction. [Neil Cook]

#### 4.4.7 0.6.012 (2019-12-31)

- Start of documentation with Sphinx. [njcuk9999]

#### 4.4.8 0.6.011 (2019-12-23)

- *Core.core.drs\_log.py* - try to catch log problems. [Neil Cook]
- Update date/version/changelog/readme. [Neil Cook]

#### 4.4.9 0.6.010 (2019-12-19)

- *Science.calib.wave.py* + *recipes.spirou.cal\_wave\_master\_spirou.py* - add hc/fp line creation from EA. [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add *PLOT\_WAVEREF\_EXPECTED*. [Neil Cook]
- *Plotting.plot\_functions.py* - add *plot\_waveref\_expected*. [Neil Cook]
- *Io.drs\_data.py* - add a raw mode for getting the cavity file. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments.spirou.py* - add plot *WAVEREF\_EXPECTED* for hc/fp lines. [Neil Cook]
- *Core.instrumnets.\*.pseudo\_const.py* - add *FIBER\_DPR\_POS* (correct dpr type for fiber) [Neil Cook]

- *Core.instruments.spirou.file\_definitions.py* - add dbname,key and datatype for hc and fp master line files. [Neil Cook]
- Re-make directories (if they don't exist) [Neil Cook]
- *Io.drs\_lock.py* - replace `__remove__empty__` function. [Neil Cook]
- *Core.core.drs\_log.py* - only continue with *DRS\_DATA\_MSG\_FULL* if it exists. [Neil Cook]
- *Core.core.drs\_startup.py* - fix location of where we define *drs\_data\_msg\_full* the first time. [Neil Cook]
- *Core.core.drs\_startup.py* - must pass group to log dir. [Neil Cook]
- *Tools.module.setup.drs\_processing.py* - deal with KeyboardInterrupt. [Neil Cook]
- *Drs\_log.py* - sort out log structure. [Neil Cook]
- *Drs\_reset.py* - should not remove read of path. [Neil Cook]
- Update the reset codes to reset log.fits files. [Neil Cook]
- *Core.core.drs\_startup.py* - only use recipe.log if *recipe\_kind* = 'recipe' [Neil Cook]
- *Core.core.drs\_log.py* - set logfitsfiles name from constants. [Neil Cook]
- *Core.instruments.default.default\_config.py* - add *DRS\_LOG\_FITS\_NAME*. [Neil Cook]
- Update language database. [Neil Cook]
- *Io.drs\_lock.py* - replace print statements for WLOG. [Neil Cook]
- Add reset options to run files. [Neil Cook]
- Remove recipe.log from non-recipe scripts (i.e. tools) [Neil Cook]
- *Core.core.drs\_startup.py* - address not initially having instrument for *DRS\_RECIPE\_KIND*. [Neil Cook]
- *Core.core.drs\_startup.py* - correctly manage KeyboardInterrupts. [Neil Cook]
- Correctly manage KeyboardInterrupts. [Neil Cook]
- *Core.core.drs\_log.py* - add way to add an error (if found at the right time) [Neil Cook]
- *Core.instruments.default.pseudo\_const.py* and *io.drs\_lock.py* - update *drs\_data\_msg* path (to full path) [Neil Cook]
- *Core.core.drs\_startup.py* - get recipe kind and add to params and figure out how to log to files only once we have correct information. [Neil Cook]
- *Core.core.drs\_log.py* - add *recipe\_kind* to *recipe\_log*. [Neil Cook]
- *Core.instruments.\*.recipe\_definitions.py* - add a kind to every recipes ("test","recipe","tool","processing") for logging. [Neil Cook]
- *Core.core.drs\_recipe.py* - add a recipe kind (for logging) [Neil Cook]
- *Core.core.drs\_log.py* - sort logs into night names and by *recipe\_kind*. [Neil Cook]
- *Core.core.drs\_log.py* - add group and runstring to recipe log fits file. [Neil Cook]
- Update date/version/changelog/readme. [Neil Cook]
- Update doc string. [Neil Cook]

#### 4.4.10 0.6.009 (2019-12-18)

- *Core.core.drs\_log.py* + *drs\_log\_stats.py* - add option to save time of file and then do log analysis on -since -before log files only. [Neil Cook]
- *Recipes/test/blank\_spirou.py* - blank recipe. [Neil Cook]
- Update doc strings for recipes. [Neil Cook]
- *Misc/updates\_to\_drs/mk\_night\_wave.py* - EA code to do nightly wavelength solution. [Neil Cook]
- *Plotting.plot\_functions.py* - log scale on some wave plots. [Neil Cook]
- *Science.calib.wave.py* - update wave triplet fit by EA. [Neil Cook]
- *Science.calib.wave.py* - add breakpoint to look at wave res map problem. [Neil Cook]
- *Science.calib.wave.py* - EA changes to triplets fit. [Neil Cook]
- *Recipe/spirou/cal\_wave\_spirou.py* - force initial wavelength solution as the master. [Neil Cook]
- *Core.instruments.spirou.default\_constants.py* - change the number of triplet iterations to 1. [Neil Cook]
- *Science.calib.wave.py* - EA modifications to triplet fitting. [Neil Cook]
- Update changelog.md to include *core.core.drs\_recipe* fixes. [Neil Cook]

#### 4.4.11 0.6.008 (2019-12-17)

- *Core.core.drs\_recipe.py* - add other list arguments - attempt to correct bug. [Neil Cook]
- *Core.core.drs\_recipe.py* - add other list arguments (i.e. -fpfiles=X Y Z) as separate elements of *str\_arg\_list*. [Neil Cook]

- *Core.core.drs\_recipe.py* - add other list arguments (i.e. `-fpfiles=X Y Z`) as separate elements of *str\_arg\_list*. [Neil Cook]
- Update date/version/changelog/readme. [Neil Cook]
- README.md - correct typo “processing” -> “*apero\_processing*” [Neil Cook]
- *Setup/install.py* - install.update does not require “args” as input. [Neil Cook]
- *Drs\_log\_stat* - reset the code to remove xytext change (doesn’t work currently) [Neil Cook]
- *Science.calib.wave.py* - add EA changes (no *linear\_minimisation* now use *wave\_lmfit*) [Neil Cook]
- Update language database. [Neil Cook]
- *Core.core.drs\_startup.py* - only start in quiet mod if `kwargs['quiet']` is True. [Neil Cook]
- *Core.core.drs\_recipe.py* - fix bug introduced by having `-arguments` only (need to append all list items to string for *self.str\_arg\_list*). [Neil Cook]
- *Core.instruments.spirou.default\_constants.py* - tweak hc tfit order fit continuum parameters (EA) [Neil Cook]
- *Core.instruments.spirou.default\_constants.py* - change hc tfit order fit continuum constants (EA) [Neil Cook]
- *Core.instruments.spirou.default\_constants.py* - lower the values of the wave hc tfit order fit continuum (EA) [Neil Cook]
- *Science.calib.wave.py* - add breakpoint to test problem. [Neil Cook]
- *Science.calib.wave.py* - attempt fix of wave solution triplets rms diverging. [Neil Cook]
- *Science.calib.wave.py* - add breakpoint. [Neil Cook]
- *Science.calib.flat\_blaze.py* - EA played with bounds. [Neil Cook]
- *Tools.recipes.general.apero\_log\_stats.py* - tweak plot. [Neil Cook]
- *Tools.recipes.general.apero\_log\_stats.py* - tweak plot. [Neil Cook]
- *Tools.recipes.general.apero\_log\_stats.py* - add recipe mode - correct bug. [Neil Cook]
- *Tools.recipes.general.apero\_log\_stats.py* - add recipe mode. [Neil Cook]
- *Plotting.plot\_functions.py* - correct pep8. [Neil Cook]
- *Science.calib.wave.py* - remove break points. [Neil Cook]
- *Science.calib.flat\_blaze.py* - add comments to EA new additions. [Neil Cook]
- *Science.calib.dark.py* - correct bug *dark\_time* must be an array. [Neil Cook]
- Changelog/readme/date/version. [Neil Cook]

#### 4.4.12 0.6.007 (2019-12-16)

- *Tools/bin/apero\_log\_stats.py* - start adding options for stats on specific recipes. [Neil Cook]
- *Science/extract/other.py* - add extra printout to show files were extracted and loaded from extraction (before silent in log) [Neil Cook]
- *Science/extract/extraction.py* - add extra arguments for *calculate\_blaze\_flat\_sinc*. [Neil Cook]
- *Science.calib.flat\_blaze.py* - fix issue with fitting blaze function (and given better error if *curve\_fit* fails) [Neil Cook]
- *Science.calib.dark.py* and *science.calib.shape.py* - make sure files for cubes are deep copied (try to prevent memory issues) [Neil Cook]
- *Cal\_wave\_spirou.py* - update convergence test on hc solution (EA bug fix) [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments.default\_recipe\_definitions.py* - add recipe argument to log stats. [Neil Cook]
- *Data.core.runs - limited\_run.ini* - update the default limited run. [Neil Cook]
- *Install.py / drs\_installation.py* - Allow user to define all userinputs from the command line (Issue #579) [Neil Cook]
- *Drs\_startup.py* - need to re-set the instrument when found in params. [Neil Cook]
- Update changelog/data/version/readme. [Neil Cook]

#### 4.4.13 0.6.006 (2019-12-13)

- Update non-instrument specified recipes (and make sure *apero\_processing* can be run correctly from main call. [Neil Cook]
- *Drs\_startup.py* - need to be careful when we don’t have an instrument set. [Neil Cook]
- *Setup.install.py* - correct help string. [Neil Cook]
- *Tools.module.testing.drs\_log\_stats.py + tools.recipes.general.py* - add log stat code to *apero\_log\_stats.py*. [Neil Cook]



- *Plotting.plot\_functions.py* - add *plot\_logstats\_bar* plot. [Neil Cook]
- *Core.instruments.default.recipe\_definitions.py* - add logstats recipe. [Neil Cook]
- Update language database and add recipe to *apero\_tools*. [Neil Cook]
- *Tools.module.documentation.drs\_changelog.py* - update VERSIONSTR/DATESTR with changes to const files. [Neil Cook]
- Update *default\_config/default\_constants* with groups and some descriptions. [Neil Cook]
- *Core.core.drs\_startup.py* - allow quiet to be passed from fwkargs. [Neil Cook]
- *Core.core.drs\_log.py* - move textwrap to constants. [Neil Cook]
- *Core.constants.param\_functions.py* - add “from\_file” and “cache” options to *load\_config* (for installation purposes) [Neil Cook]
- *Core.constants.constant\_functions.py* - move textwrapper here, add description to constants, add *write\_line* method for writing user configs + add ‘=’ to end of update string to make constants unique. [Neil Cook]
- *Setup.install.py* + *drs\_installation.py* - add an update mode to the *install.py* (and fix reset bug) [Neil Cook]

#### 4.4.14 0.6.005 (2019-12-12)

- Updates to installation script (UNFINISHED) [Neil Cook]
- *Io.drs\_lock.py* - change warning message (name.lock) [Neil Cook]
- *Cal\_preprocessing\_spirou.py* - typo fix qc inputs. [Neil Cook]
- *Core.core.drs\_recipe.py* - change “.” to “\_” [Neil Cook]
- Update tools with recipe log. [Neil Cook]
- *Science.telluric.genearl.py* - return *qc\_params* and passed in qc functions. [Neil Cook]
- *Core.core.drs\_log.py* - add *no\_qc* and RECIPE to log file and only write newlog on *add\_level*. [Neil Cook]
- *Cal\_thermal\_spirou.py* - add *no\_qc*. [Neil Cook]
- *Science.preprocessing.general.py* - add quality control to function. [Neil Cook]
- *Science.calib.badpix.py* - remove redundant code. [Neil Cook]
- Modify recipes and add recipe logging. [Neil Cook]

#### 4.4.15 0.6.004 (2019-12-12)

- *Recipe.spirou.\** - test locking [not working yet] [Neil Cook]
- *Io.drs\_lock.py* - provide function to lock function. [Neil Cook]
- *Core.ocre.drs\_startup.py* - setup the recipe log. [Neil Cook]
- *Core.core.drs\_recipe.py* - add a self.log to store to RecipeLog. [Neil Cook]
- *Core.core.drs\_log.py* - add RecipeLog. [Neil Cook]
- Make sure all arguments that are words start with – [Neil Cook]
- Update date/changelog/version. [Neil Cook]

#### 4.4.16 0.6.003 (2019-12-10)

- Update README.md. [Neil Cook]
- *Tools.module.listing.file\_explorer.py* - deal with no ds9 path set (Issue #576) [Neil Cook]
- Fix typos for *apero\_validate* and *apero\_reset* (Issue #577) [Neil Cook]
- *Core.instruments.default.pseudo\_const.py* - modify logfile to have .log and latex to replace .log (make unique) [Neil Cook]
- *Core.instruments.default.default\_config.py* - *DRS\_DS0\_PATH* and *DRS\_PDFLATEX\_PATH* should be str not ‘path’ (Issue #576) [Neil Cook]
- Localisation - remove breakpoints. [Neil Cook]
- Update readme (*cal\_preprocessing* → *cal\_preprocess*) [Neil Cook]
- *Localisation.py* - fix bug with loc order 0. [Neil Cook]
- *Science.calib.localisation.py* - move break point. [Neil Cook]
- *Science.calib.localisation.py* - changes to fix loc. [Neil Cook]
- *Cal\_loc\_spirou.py* - move break point. [Neil Cook]
- *Cal\_loc\_spirou.py* - add breakpoint to test qc failure. [Neil Cook]
- *Tools.module.setup.py* - *drs\_installation.py* - add to clean install message. [Neil Cook]
- README.md - update read me with extra comments. [Neil Cook]

- Prepare *cal\_wave\_master\_spirou.py*. [Neil Cook]
- *Tools.module.setup.drs\_installation.py* - update ‘apero-validate.py’ -> ‘*apero\_validate.py*’ [Neil Cook]
- *Recipes.spirou.cal\_wave\_spirou.py* - correct typo in comment. [Neil Cook]
- *Science.calib.wave.py* - add a TODO. [Neil Cook]
- *Tools.modules.setup.drs\_processing.py* - correct returns for *prerun\_test()* [Neil Cook]
- Change the *file\_explorer* name. [Neil Cook]
- *Core.core.drs\_recipe.py* - fix telluric test. [Neil Cook]
- Update config/changelog/readme/version. [Neil Cook]

#### 4.4.17 0.6.002 (2019-12-09)

- *Core.core.drs\_recipe.py* - change source of tellurics (shouldn’t be here) [Neil Cook]
- Get whitelist for tellurics in *drs\_processing.py*. [Neil Cook]
- *Tools.module.setup.drs\_processing.py* - add a pre-run test to test if files exist before running. [Neil Cook]
- *Tools.module.listing.file\_explorer.py* - update plotting function and check before loading ds9. [Neil Cook]
- *Science.velocity.general.py* - remove old function (*create\_drift\_file*) [Neil Cook]
- *Science.extract.crossmatch.py* - add simbad query (when we have no ra and dec and only have object name) [Neil Cook]
- *Science.calib.wave.py* - remove todo. [Neil Cook]
- *Science.calib.localisation.py* - add order to params (for plotting) [Neil Cook]
- *Science.calib.flat\_blaze.py* - make it clear *calculate\_blaze\_flat* should not be used. [Neil Cook]
- *Recipes.spirou.cal\_shape\_master\_spirou.py* - remove master cube npy debug. [Neil Cook]
- Plotting - add general use image/plot functions + add cursor + add main() and allow use without recipe defined + add new graph type “show” [Neil Cook]
- Update language database. [Neil Cook]
- *Io.drs\_table.py* - remove redundant lock checks (new system works better) [Neil Cook]
- *Io.drs\_lock.py* - push messages into language database. [Neil Cook]
- *Io.drs\_data.py* - remove todo. [Neil Cook]
- *Core.math.gauss.py* - remove todo here. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add plots that were missing. [Neil Cook]
- *Core.instruments.default.file\_definitions.py* - remove unused file objects. [Neil Cook]
- *Core.instruments.default.recipe\_definitions.py* - add Help strings. [Neil Cook]
- *Core.instruments.\*.default\_\*.py* - add config/constants/keyword args. [Neil Cook]
- *Core.core.drs\_recipe.py* - deal with *TELLURIC\_TARGETS* being set to None (get all) [Neil Cook]
- *Core.core.drs\_log.py* - remove old WLOG string warning. [Neil Cook]
- *Core.core.drs\_database.py* - set Database constants from constants files. [Neil Cook]
- *Core.core.drs\_argument.py* - add help string for *set\_quiet*. [Neil Cook]
- Convert readme.md to pdf. [Neil Cook]
- Add subsections to contents in README.md. [Neil Cook]
- Add descriptions for each recipe in the README.md. [Neil Cook]
- Correct typo in readme. [Neil Cook]
- Update changelog/version/date. [Neil Cook]
- Correct typos in *file\_definitions*. [Neil Cook]
- Update the read me with recipe + output descriptions. [Neil Cook]

#### 4.4.18 0.6.001 (2019-12-06)

- Remove old breakpoints. [Neil Cook]
- *Science.calib.wave.py* - add breakpoint for debugging. [Neil Cook]
- *Flat\_blaze.py* - fix bug with sinc fitting (bounds for quad and cube parameters to constraining) [Neil Cook]
- Add error dumps directory. [Neil Cook]
- *Io.drs\_lock.py* - make all lock files go to the log/lock dir and add a way to remove all empty ones of these (after processing is complete) using *drs\_lock.reset\_lock\_dir*. [Neil Cook]
- Update the Lock (not longer need lockdir -> will all go to log directory (under the a lock dir) [Neil Cook]
- Update README.md. [Neil Cook]
- Update README.md. [Neil Cook]

- *Io.drs\_lock.py* - remove the lock directory if directory is empty. [Neil Cook]
- *Science.calib.wave.py* - badvalues must be a string list. [Neil Cook]
- *Core.core.drs\_startup.py* - random seed needs to be set to randomise the cores. [Neil Cook]

#### 4.4.19 0.5.124 (2019-12-05)

- *Tools.module.setup.drs\_processing.py* - set *multi\_process* back to group by core (Process) [Neil Cook]
- *Tools.module.setup.drs\_processing.py* - correct typo *manger.event* -> *manger.Event*. [Neil Cook]
- Update language database. [Neil Cook]
- Parallel test2 - test out Pool (from @cusher) [Neil Cook]
- *Tools.modules.setup.drs\_processing.py* - test out Pool (from @cusher) [Neil Cook]
- Add second parallel check based on @cusher example. [Neil Cook]
- Update log and group names (slightly shorter - no host) [Neil Cook]
- Update *analyse\_logs.py*. [Neil Cook]
- *Core.core.drs\_startup.py* - add a random set of characters to the end of pid to make unique. [Neil Cook]
- Add contents to main README.md. [Neil Cook]
- Update default run scripts. [Neil Cook]
- *Tools.module.setup.drs\_reset.py* - change empty dir param (typo) [Neil Cook]
- Update paths given changes to tool name/location. [Neil Cook]
- Update paths given changes to tool name/location. [Neil Cook]
- Remove dashes from program names to allow importing. [Neil Cook]

#### 4.4.20 0.5.123 (2019-12-05)

- *Core.drs\_startup.py* - make sure pids are really unlikely to be the same (add random component) [Neil Cook]
- *Io.drs\_lock.py* - deal with folder/queue files disappear during lock process. [Neil Cook]
- *Misc/problems/\** - add copy to analyse log files for preprocessing + modify the parallel test. [Neil Cook]
- *Tools.module.setup.drs\_processing.py* - change grouping -> only number of cores files per group (instead of total/cores per group per recipe) [Neil Cook]
- *Recipe/spirou/cal\_preprocess\_spirou.py* - change error message. [Neil Cook]

#### 4.4.21 0.5.122 (2019-12-04)

- *Misc.problems.parellel\_test\_20191203.py* - minimum working version of parallisation problem. [Neil Cook]
- *Misc.problems.parellel\_test\_20191203.py* - minimum working version of parallisation problem. [Neil Cook]
- *Core.core.drs\_startup.py* - add SystemExit to the possible exceptions to catch. [Neil Cook]
- Add an export command to *file\_explorer*. [Neil Cook]
- *Tools.module.setup.drs\_installation.py* - make optional programs not create "None" path. [Neil Cook]
- *Tools.module.setup.drs\_installation.py* - fix typo. [Neil Cook]
- *Setup/install.py* - check for python 3. [Neil Cook]
- Add ds9/pdflatex to the codes. [Neil Cook]
- Add *DRS\_DS9\_PATH* and *DRS\_PDFLATEX\_PATH* to constants. [Neil Cook]
- *Tools.module.setup.drs\_installation.py* - macs still suck. [Neil Cook]
- *Tools.module.setup.drs\_installation.py* - macs suck. [Neil Cook]

#### 4.4.22 0.5.121 (2019-12-02)

- Add README.md to bin and dev tool folders. [Neil Cook]
- Change `__INSTRUMENT__ = None` to `__INSTRUMENT__ = 'None'` and move tools/bin and tools/dev to the new loc + add chmod + symlinks. [Neil Cook]
- - make *file\_explorer.py* work again. [Neil Cook]
- Add runs to default user config files. [Neil Cook]
- Add README.md to reset run files. [Neil Cook]
- *Tools.bin.reset.py* + *drs\_reset.py* - add run files to reset. [Neil Cook]
- *Core.instruments.\*.default\_config.py* - add *DRS\_RESET\_RUN\_PATH*. [Neil Cook]

- Add reset run files. [Neil Cook]
- *Science.preprocessing.identification.py* - fileset must be string to go into .join. [Neil Cook]
- *Core.instruments.spirou.file\_definitions.py* - add the *pp\_lfc\_lfc* to *pp\_file* set. [Neil Cook]
- *Science.calib.general.py* - catch warnings for unphysical pixel nan setting. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.23 0.5.120 (2019-11-29)

- Replace old locking mechanism with new one. [Neil Cook]
- *Science.calib.general.py* - fix upper and lower limit after conversion to electrons. [Neil Cook]
- *Science.extract.extraction.py* - change breakpoint location. [Neil Cook]
- Change breakpoint location. [Neil Cook]
- Update language database. [Neil Cook]
- *Science.calib.flat\_blaze.py* - add breakpoint. [Neil Cook]
- *Tools.module.setup.drs\_installation.py* - correct install messages. [Neil Cook]
- *Apero/tools/module/setup/drs\_installation.py* + *setup.install.py* - update the installation after Etienne's first attempt. [Neil Cook]
- Update README.md. [Neil Cook]
- Processing add to README.md. [Neil Cook]
- *Drs\_startup* + *drs\_lock* - continue to test the locking mechanism. [Neil Cook]
- *Drs\_startup* + *drs\_lock* - continue to test the locking mechanism. [Neil Cook]
- *Drs\_startup* + *drs\_lock* - continue to test the locking mechanism. [Neil Cook]
- *Drs\_startup* + *drs\_lock* - continue to test the locking mechanism. [Neil Cook]
- *Drs\_startup* + *drs\_lock* - continue to test the locking mechanism. [Neil Cook]
- *Drs\_startup* + *drs\_lock* - continue to test the locking mechanism. [Neil Cook]
- *Drs\_startup* + *drs\_lock* - continue to test the locking mechanism. [Neil Cook]
- *Drs\_startup* + *drs\_lock* - continue to test the locking mechanism. [Neil Cook]
- *Drs\_startup* + *drs\_lock* - continue to test the locking mechanism. [Neil Cook]
- *Core.core.drs\_database.py* - correct typo. [Neil Cook]

#### 4.4.24 0.5.119 (2019-11-29)

- *Io.drs\_lock.py* - change name of function in @sync call. [Neil Cook]
- *Drs\_startup* + *drs\_lock* - try to improve locking. [Neil Cook]
- *Core.core.drs\_startup.py* - correct name of function. [Neil Cook]
- *Io.drs\_table.py* - remove use of locking (for debug) [Neil Cook]
- *Io.drs\_lock.py* - add a randomisation to the wait time (so multiple hits don't start at the same time) [Neil Cook]
- Add to readme. [Neil Cook]
- Test out new lock. [Neil Cook]
- Add more readme.md. [Neil Cook]
- Merge remote-tracking branch 'origin/dev' into dev. [Neil Cook]
- Update README.md. [Neil Cook]
- Update readme.md. [Neil Cook]
- Update readme.md. [Neil Cook]
- *Io.drs\_lock.py* - add a printout when file unlocks (debug?) [Neil Cook]
- Update language database. [Neil Cook]
- Update the README.md with new installation instructions. [Neil Cook]
- *Tools.module.setup.drs\_installation.py* - add in skipping of reset if not *clean\_install* (and print that we are doing reset) [Neil Cook]
- Update *data\_example*. [Neil Cook]
- *Science.calib.general.py shape.py* - fix typo and remove breakpoint. [Neil Cook]
- *Science.calib.general.py* - remove unphysical pixel values (set to NaN) [Neil Cook]
- *Io.drs\_image.py* - fix for high bad pixels (clean with border) [Neil Cook]
- *Core.instruments.\*.default\_keywords.py* - add frmtime and saturate + add comments for input header keys. [Neil Cook]

- *Io.drs\_table.py* - change the locking order. [Neil Cook]
- *Science.calib.shape.py* - move breakpoint. [Neil Cook]
- Update debug table. [Neil Cook]
- *Science.calib.shape.py* - remove old breakpoint. [Neil Cook]
- Add breakpoints and saving of fpcube for debug. [Neil Cook]
- *Science.calib.background.py* - correct axis order in *sz\_small*. [Neil Cook]
- Add *dark\_fp\_sky* and *lfc\_lfc* file types. [Neil Cook]
- *Core.core.drs\_startup.py* - fix for quiet always being found (even when None) [Neil Cook]
- *Core.instruments.spirou.default\_config.py* - remove INTROOT references. [Neil Cook]
- *Io.drs\_table.py* - try to add more informative error in *write\_table* (index.fits is not saving every time in parallel) [Neil Cook]

#### 4.4.25 0.5.118 (2019-11-27)

- Etienne's speed up codes. [Neil Cook]
- *Tools.module.setup.drs\_reset.py* - update `__NAME__` [Neil Cook]
- *Tools.module.setup.drs\_installation.py* - add print headers, add validation command, add quiet mode to reset, add paths before executing os.system commands. [Neil Cook]
- *Tools.dev.requirement\_check.py* - add code (from SpirouDRS) to check requirements. [Neil Cook]
- *Tools.bin.validate.py* - add code to validate (for now just a splash screen) [Neil Cook]
- *Setup.install.py* - add validation check for required/recommended modules. [Neil Cook]
- Remove unused imports. [Neil Cook]
- *Misc.fast\_convolve\_correct\_local\_background.py* - etienne's correct to add (speed up) [Neil Cook]
- Remove unused imports. [Neil Cook]
- *Core.instruments.default.recipe\_definitions.py* - add *required\_check* program (in tools) [Neil Cook]
- Update permissions. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.core.\*.py* - add quiet option so setup info/splash is not displayed. [Neil Cook]
- *Core.constants.param\_functions.py* - add window size function. [Neil Cook]
- *Tools.resources.setup* - rename from terrapipe → apero. [Neil Cook]
- *Core.instruments.default.recipe\_definitions.py* - fix problem with listing.instrument name and add validate placeholder. [Neil Cook]
- Update .gitignore. [Neil Cook]
- Terrapipe → apero, move INTROOT2 to ..., move INTROOT to misc. [Neil Cook]
- Terrapipe → apero, move INTROOT2 to ..., move INTROOT to misc. [Neil Cook]
- Terrapipe → apero, move INTROOT2 to ..., move INTROOT to misc. [Neil Cook]
- *Core.instruments.spirou.file\_definitions.py* - correct *out\_dark\_master* (accept *dark\_dark\_tel* and *dark\_dark\_int*) [Neil Cook]
- *Setup.install.py* - add a todo (need to make sym links) [Neil Cook]
- *Tools.module.setup.drs\_reset.py* - add functionality to skip warning if folder is empty (there is no point warning if we have an empty folder) [Neil Cook]
- *Tools.module.setup.drs\_installation.py* - add functionality to install drs. [Neil Cook]
- *Setup/install.py* - fill out the installation code (formally in *drs\_installation.py*) [Neil Cook]
- *Tools.bin.reset.py* - add directory to *reset\_confirmation*. [Neil Cook]
- *Tools.bin.validate.py* - add placeholder (needs filling out) [Neil Cook]
- *Tools.resources.setup/\** - add env setup codes. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.26 0.5.117 (2019-11-26)

- *Recipes.spirou.obj\_fit\_tellu\_db\_spirou.py* + *obj\_mk\_tellu\_db\_spirou.py* + *obj\_spec\_spirou.py* - add global output list for displaying errors at the end. [Neil Cook]
- *Recipes.spirou.obj\_fit\_tellu\_db\_spirou.py* + *obj\_mk\_tellu\_db\_spirou.py* + *obj\_spec\_spirou.py* - add global output list for displaying errors at the end. [Neil Cook]
- *Tools.module.setup.drs\_processing.py* - *run\_process* and *combine\_outlist*. [Neil Cook]
- *Tools.module.setup.drs\_processing.py* - add *run\_process* function to run a recipe. [Neil Cook]

- *Science.extract.other.py* - remove breakpoint. [Neil Cook]
- *Recipes.spirou* - change *pol\_spirou* name + add place holders for *obj\_spec\_spirou* and *obj\_pol\_spirou*. [Neil Cook]
- *Recipes.spirou.obj\_fit\_tellu\_db\_spirou.py* *obj\_mk\_tellu\_db\_spirou.py* - add new functions to *run\_process*. [Neil Cook]
- *Recipes.spirou.obj\_fit\_tellu\_db\_spirou.py* *obj\_mk\_tellu\_db\_spirou.py* - add new functions to *run\_process*. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add *obj\_spec\_spirou* and *obj\_pol\_spirou*. [Neil Cook]
- *Core.instruments.default.recipe\_definitions.py* - add white/black list kwarg to processing. [Neil Cook]
- *Core.core.drs\_startup.py* - Add a group title to header (if in group) [Neil Cook]
- *Core.constants.param\_functions.py* - if we have a list then just return (*map\_listparameter* function) [Neil Cook]
- *Recipes.spirou.cal\_thermal\_spirou.py* - add log message for writing thermal files. [Neil Cook]
- *Core.instruments.spirou.default\_constants.py* - set *thermal\_always\_extract* to False. [Neil Cook]
- *Tools.module.setup.drs\_processing.py* - move *group\_name* to *drs\_startup*. [Neil Cook]
- *Tools.bin.processing.py* - update link to *group\_name* (now in *drs\_startup*) [Neil Cook]
- *Science.extract.other.py* - add breakpoint to test code. [Neil Cook]
- *Recipes.spirou.cal\_thermal\_spirou.py* - remove breakpoint. [Neil Cook]
- *Core.core.drs\_startup.py* - move *group\_name* construct from processing to *drs\_startup*. [Neil Cook]
- *Tools.module.setup.drs\_processing.py* - construct group name and pass it to recipe via *linear\_process*. [Neil Cook]
- *Tools.bin.processing.py* - generate group name. [Neil Cook]
- *Recipes.spirou.cal\_thermal\_spirou.py* - add breakpoint for debugging. [Neil Cook]
- *Core.instruments.spirou.default\_keywords.py* - change order to reflect current and wanted input header keys. [Neil Cook]
- *Core.core.drs\_log.py* - add group handling. [Neil Cook]
- *Core.core.drs\_startup.py* - add group handling. [Neil Cook]
- *Core.instruments.default.recipe\_definitions.py* - update the dtype setting for *-cores* in processing recipe. [Neil Cook]
- *Core.instruments.default.recipe\_definitions.py* - update the default setting for *-cores* in processing recipe. [Neil Cook]
- *Tools.module.setup.drs\_processing.py* - add blacklist, whitelist, cores and test run arguments from user input. [Neil Cook]
- *Tools.bins.processing.py* - update instrument name. [Neil Cook]
- *Core.instruments.default.recipe\_definitions.py* - add arguments to processing recipe. [Neil Cook]
- Update language database. [Neil Cook]
- *Science.calib.wave.py* - correct input to *get\_input\_files*. [Neil Cook]
- *Core.core.drs\_database.py* - add in debug function names to find problem. [Neil Cook]
- *Science.calib.dark.py* - add *dprtype* to *dprtypes* for dark master table. [Neil Cook]
- *Recipes.spirou.cal\_dark\_master\_spirou.py* - get allowed types as a list. [Neil Cook]
- *Core.instruments.spirou.default\_constants.py* - add *DARK\_DARK\_INT* to dark master allowed types. [Neil Cook]
- *Science.calib.dark.py* - add *dprtype* to dark table. [Neil Cook]
- *Recipes.spirou.cal\_dark\_master\_spirou.py* - allow dark master to use multiple *dark\_dark* types. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - allow *cal\_badpix* to use *dark\_dark\_tel* and *dark\_dark\_int*. [Neil Cook]
- *Io.drs\_fits.py* - improve id file error. [Neil Cook]
- Update language database. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.27 0.5.116 (2019-11-15)

- *Tools.module.setup.drs\_processing.py* - remove breakpoint. [Neil Cook]
- *Science.extract.general.py* - fix input to *get\_input\_files*. [Neil Cook]
- *Science.extract.berv.py* - remove breakpoint. [Neil Cook]
- *Science.calib.wave.py* - correct pep8. [Neil Cook]

- *Science.calib.general.py* - add darkfile, abdpxfile, backfile from kwargs. [Neil Cook]
- *Core.constants.param\_functions.py* - disable the Ctrl+C -> breakpoint functionality it doesn't work well. [Neil Cook]
- *Tools.module.setup.drs\_processing.py* - deal with optional file args being requested. [Neil Cook]
- *Tools.module.setup.drs\_processing.py* - add extra keys to default run keys. [Neil Cook]
- *Core.core.drs\_startup.py* - set the source when debug mode taken from arguments. [Neil Cook]
- *Core.constants.param\_functions.py* - add info and history functions to ParamDict and cache some settings for immediate use. [Neil Cook]
- *Science.preprocessing.identification.py* - fix return to *fix\_header* (for case where we have an input infile) [Neil Cook]
- *Tools.module.setup.drs\_processing.py* - add defaults after only if not found and warn user. [Neil Cook]
- Update language database. [Neil Cook]
- *Tools.module.setup.drs\_processing.py* - add default run keys (for when values are not in files) [Neil Cook]
- *Science.velocity.general.py* - add ccf mask to suffix of output file. [Neil Cook]
- *Science.velocity.general.py* - add ccf mask to suffix of output file. [Neil Cook]
- Add masks from Andres. [Neil Cook]
- *Science.prprocessing.identification.py* - *fix\_header*: fix return when no infile given. [Neil Cook]
- *Tools.module.setup.drs\_processing.py* - *fix\_header* make sure header comes in as keyword argument. [Neil Cook]
- *Science.preprocessing* - add recipe as arg in *fix\_header* (and push to *pseudo\_const.py*) [Neil Cook]
- Update date/version/changelog. [Neil Cook]
- *Science.velocity.general.py* - make sure users input of ccf step and width is good ( $ccfstep < ccfwidth / 10$ ) [Neil Cook]
- *Core.instruments.default.\*.default\_constants.py* - add *CCF\_MAX\_CCF\_WID\_STEP\_RATIO*. [Neil Cook]

#### 4.4.28 0.5.115 (2019-11-14)

- Update language database. [Neil Cook]
- *Science.velocity.general.py* - add break point to test crash. [Neil Cook]
- Update language database. [Neil Cook]
- *Io.drs\_lock.py* - add way to get out of lock loop (Ctrl + C) will now delete file - otherwise Ctrl + C goes to debugger (and then exits) [Neil Cook]
- *Core.core.drs\_database.py* - deal with not having a night name. [Neil Cook]
- *Core.core.drs\_database.py* - make sure all strings are stripped of whitespaces (before and after) [Neil Cook]
- Add new ccf mask. [Neil Cook]
- Rename *error.py* -> *language\_db.py*. [Neil Cook]
- *Tools.bin.remake\_db.py* -fix *db\_time*. [Neil Cook]
- *Tools.bin.remake\_db.py* - do not open all files at once (save to master one by one) [Neil Cook]
- *Tools.module.setup.drs\_reset.py* - split *reset\_dbdir* to allow accessing *copy\_default\_db*. [Neil Cook]
- *Tools.dev.error.py* - add a TODO here. [Neil Cook]
- *Tools.bin.remake\_db.py* - add code to remake databases. [Neil Cook]
- *Science.preprocessing.py* - replace *drs\_infile\_id* with call to *fits.drs\_fits*. [Neil Cook]
- *Science.extract.general.py* - add fiber. [Neil Cook]
- *Science.calib.flat\_blaze.py* + localisation + wave - add fiber to outputs. [Neil Cook]
- Update language database. [Neil Cook]
- *Io.drs\_fits.py* - add *id\_drs\_file* to identify any filename in a *drs\_file\_set* (and return its DrsInput-File/DrsFitsFile instance) [Neil Cook]
- *Core.instruments.default.recipe\_definitions.py* - add *remake\_db* (generalised *remake\_cdb*) [Neil Cook]
- *Core.instruments.default.default\_constants.py* - *remake\_database\_default*. [Neil Cook]
- *Core.instruments.spirou.pseudo\_const.py* - pep8 clean up. [Neil Cook]
- *Core.instruments.default.recipe\_definitions.py* - add *remake\_cdb* recipe definition. [Neil Cook]
- *Core.instruments.\*.file\_definitions.py* - add *calib\_file* set and clean up (pep8 wise) [Neil Cook]
- *Core.core.drs\_file.py* - check if drsfile has recipe (and if not set it to self.recipe) [Neil Cook]
- *Core.core.drs\_database.py* - make *\_get\_time* more specific to using header/hdict. [Neil Cook]
- *Core.instrument.spirou.default\_constants.py* - change to gl581. [Neil Cook]
- *Science.velocity.general.py* - correct plot keyword *found\_rv* -> *rv*. [Neil Cook]

#### 4.4.29 0.5.114 (2019-11-14)

- *Science.preprocessing.identification* - add the *fix\_headers* wrapper (passes it to instrument pseudo constants) + add a debug in id process to show which drs file we are currently looking at. [Neil Cook]
- *Tools.module.setup.drs\_processing* - add header keys via *fix\_header* (non-instrument specific) [Neil Cook]
- *Science.calib.dark.py* - make sure get dark is getting dark master only (dark master is *DARK\_DARK\_TEL* by default) [Neil Cook]
- *Cal\_thermal\_spirou.py* - deal with different types of darks (OBJ -> *dark\_tel*, HC,FP-> *dark\_int*) + add switch to turn off thermal correction. [Neil Cook]
- *Recipe.spirou.cal\_loc\_spirou.py* - add *center\_fits* to qc (diff of order cols must be positive) [Neil Cook]
- *Recipe.spirou.cal\_preprocessing.py* - add *fix\_header* to fix keys before *drs\_infile\_id*. [Neil Cook]
- *Io.drs\_fits.py* - change *get\_mid\_obs\_time* assuming it is now always present in header. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments.spirou.file\_definitions* + *recipe\_definitions* - split *dark\_dark* in to *dark\_dark\_int*, *dark\_dark\_tel*, *dark\_dark\_sky*. [Neil Cook]
- *Core.instruments.\*pseudo\_const.py* - add *HEADER\_FIXES* (to control instrument specific header fixes required) [Neil Cook]
- *Core.instruments.\*default\_keywords.py* - add *calibwh* and *target\_type* keywords. [Neil Cook]
- *Core.core.drs\_file.py* - fix how we check read before copying. [Neil Cook]
- *Core.instruments.\*default\_constants.py* - remove skydark references and update references to *DARK\_DARK* -> *DARK\_DARK\_INT*, *DARK\_DARK\_TEL*, *DARK\_DARK\_SKY*. [Neil Cook]

#### 4.4.30 0.5.113 (2019-11-12)

- *Core.instruments.spirou.recipe\_definitions.py* - add blaze file, flat file and thermal file arguments to required recipes. [Neil Cook]
- *Science.calib.flat\_blaze.py* - allow user to set flat and blaze file. [Neil Cook]
- *Calib.general.py* - allow user defined thermal file to come from calibDB. [Neil Cook]
- *Calib.general.py* - allow user defined file to come from calibDB. [Neil Cook]
- *Calib.wave.py* - allow user defined file to come from calibDB. [Neil Cook]
- *Calib.shape.py* - allow user defined file to come from calibDB. [Neil Cook]
- *Calib.localisation.py* - allow user defined file to come from calibDB. [Neil Cook]
- *Calib.dark.py* - allow user defined file to come from calibDB. [Neil Cook]
- *Calib.badpix.py* - allow user defined file to come from calibDB. [Neil Cook]
- *Calib.background.py* - allow user defined file to come from calibDB. [Neil Cook]

#### 4.4.31 0.5.112 (2019-11-12)

- *Recipes/spirou/obj\_pol\_spirou.py* and *science/polar/general.py* - add polar s1d (calculation, file writing and plotting) [Neil Cook]
- *Core.instruments.spirou.py* - add s1d plotting. [Neil Cook]
- *Plotting.plot\_functions.py* - allow s1d plot to not have fiber argument. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments.spirou.file\_definitions.py* *recipe\_definitions.py* - add polar s1d outputs. [Neil Cook]
- *Core.instruments.default.default\_config.py* - update author list. [Neil Cook]
- *Misc/dispatch\_object.py* - add argparse arguments. [Neil Cook]

#### 4.4.32 0.5.111 (2019-11-09)

- *Tools.module.setup.drs\_installation.py* - add *user\_interface*, *copy\_configs* and *update\_configs*. [njcuk9999]
- *Core.constants.constant\_functions.py* - add *get\_constants\_from\_file* and *update\_file* functions. [njcuk9999]
- *Core.instruments.default.pseudo\_const.py* - add print function to Color class (to print in colour) [njcuk9999]
- *Tools.module.setup.drs\_installation.py* - first commit of the installation script. [njcuk9999]



#### 4.4.33 0.5.110 (2019-11-09)

- *Obj\_pol\_spirou.py* - add generate stats + plotting + writing of files. [Neil Cook]
- *Science.calib.dark.py* - add text entry for error 40-011-00006. [Neil Cook]
- *Recipe.spirou.cal\_shape\_spirou.py* - add recipe to args + add new debug plot. [Neil Cook]
- *Plotting.plot\_functions.py* - add polar plots. [Neil Cook]
- Update language database. [Neil Cook]
- *Io.drs\_text.py* - add text entry for error 00-008-00020. [Neil Cook]
- *Io.drs\_fits.py* - add text entry for error 00-008-00019. [Neil Cook]
- *Io.drs\_data.py* - add text entry for error 09-021-00009. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* + *file\_definitions.py* - add plot and file definitions for polar + extra debug plot for *shape/shape\_master*. [Neil Cook]
- *Core.instruments.spirou.py* - add *file\_definitions* for polar outputs. [Neil Cook]
- *Core.core.drs\_startup.py* - remove input params from *plotter.close\_plots*. [Neil Cook]
- *Core.core.drs\_file.py* - make sure all filenames in *add\_hkey\_1d* and *2d* are basenames only. [Neil Cook]
- *Instruments.\*.default\_constants.py* and *default\_keywords.py* - add polar keywords/constants/plot constants. [Neil Cook]
- *Core.constants.param\_functions.py* - *ParamDict.copy* - add doc string (with return type) [Neil Cook]
- *Misc.dispatch\_object.py* - code to process tar of objects. [Neil Cook]
- *Misc.dispatch\_object.py* - code to process tar of objects. [Neil Cook]
- *Recipes/spirou/cal\_ccf\_spirou.py* - fix that we need to check whether *wprops['WFP\_DRIFT']* is None. [Neil Cook]
- *Science.velocity.general.py* - fix bug in plotting. [Neil Cook]
- *Recipes/spirou/cal\_ccf\_spirou.py* - fix bug with *compute\_ccf\_fp*. [Neil Cook]
- *Recipes/spirou/cal\_ccf\_spirou.py* - fix bug with *compute\_ccf\_fp*. [Neil Cook]
- *Science.polar.general.py* - update polar class. [Neil Cook]

#### 4.4.34 0.5.109 (2019-11-07)

- Update *construct\_filename* -> *construct\_path*. [Neil Cook]
- *Tools.module.setup.drs\_reset.py* - change call to *construct\_filename* -> *construct\_path*. [Neil Cook]
- *Science.polar.\** - add whole lsd module. [Neil Cook]
- *Recipes/spirou/obj\_pol\_spirou.py* - add call to lsd analysis wrapper. [Neil Cook]
- *Io.drs\_data.py* - add lsd mask getting. [Neil Cook]
- *Data/spirou/lsd/lsd\_order\_mask.dat* - add order wavelength file for lsd. [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add polar lsd constants. [Neil Cook]
- *Data/spirou/lsd* - add lsd masks and meta data. [Neil Cook]

#### 4.4.35 0.5.108 (2019-11-07)

- *Science.telluric.general.py* - curve fit forces floats - cast kp as bool after it was forced to floats. [Neil Cook]
- *Science.telluric.general.py* - add breakpoint to investigate bug. [Neil Cook]
- *Tools.dev.cal\_update\_berv.py* - re-fix erv measurement - group all files by odometer code. [Neil Cook]
- *Tools.dev.cal\_update\_berv.py* - need to group files to make this quicker + skip those that use barycorrpy already. [Neil Cook]

#### 4.4.36 0.5.107 (2019-11-06)

- *Recipe/spirou/obj\_pol\_spirou.py* - continue adding to polar recipe. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.maths.\*.py* - add continuum calculation function. [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add polar constants. [Neil Cook]

#### 4.4.37 0.5.106 (2019-11-05)

- *Berv.py* - set *leap\_update* to False, add file update to *cal\_update\_berv.py*. [njcuk9999]
- Update *object\_query\_list*. [njcuk9999]
- *Cal\_update\_berv.py* - print filename processing. [njcuk9999]
- *Science.extract.berv.py* - catch iers warning and display. [njcuk9999]
- *Science.extract.berv.py* - split exception in barycorrpy and iers. [njcuk9999]
- *Science.extract.berv.py* - add force=False (force recalculation of berv) [njcuk9999]
- *Science.extract.berv.py* - add warn=False (when True prints exception when barycorrpy fails) [njcuk9999]
- Merge remote-tracking branch 'origin/dev' into dev. [njcuk9999]  
*pirou\_py3* into dev  
# Please enter a commit message to explain why this merge is necessary, # especially if it merges an updated upstream into a topic branch. # # Lines starting with '#' will be ignored, and an empty message aborts # the commit.
- Add *cal\_update\_berv.py* - to update bervs. [njcuk9999]
- Add gui stuff. [njcuk9999]

#### 4.4.38 0.5.105 (2019-11-03)

- First commit of a gui module. [njcuk9999]
- Add trigger place-holders. [njcuk9999]
- Rename *drs\_reprocess* -> *drs\_processing*. [njcuk9999]
- Rename *drs\_reprocess* -> *drs\_processing*. [njcuk9999]
- *Plotting.core.py* - fix *\_\_NAME\_\_* [njcuk9999]
- *Core.instruments.default.recipe\_definitions.py* - rename reprocess.py to processing.py. [njcuk9999]

#### 4.4.39 0.5.104 (2019-11-01)

- *Science.calib.dark.py* - rearrange steps. [njcuk9999]
- *Science.calib.dark.py* - clean out data. [njcuk9999]
- *Science.calib.dark.py* - replace median with a smart median (smaller) [njcuk9999]

#### 4.4.40 0.5.103 (2019-11-01)

- *Io.drs\_table.py* - fix problem with hdu lists. [njcuk9999]
- *Tools.modules.setup.drs\_reprocess.py* - fix bug in keepmask for engineering files. [njcuk9999]
- *Drs\_reprocess.py* - fix error in remove engineering (fdata->ftable) [Neil Cook]
- Add option to listing code to regenerate rawindex.fits (for all raw files) [Neil Cook]
- Add *PI\_NAME* to raw columns in index files. [Neil Cook]

#### 4.4.41 0.5.102 (2019-10-30)

- Merge remote-tracking branch 'origin/dev' into dev. [njcuk9999]
- *Module.setup.drs\_reprocess.py* - add *\_remove\_engineering* option. [njcuk9999]
- *Core.core.drs\_recipe.py* - change break for continue if DrsRecipeException. [njcuk9999]

#### 4.4.42 0.5.101 (2019-10-29)

- *Science.calib.localisation.py* - remove break point. [Neil Cook]
- *Science.calib.localisation.py* - pep8 add second blank line. [Neil Cook]
- Test changes to localisation. [njcuk9999]
- Update date/version/changelog. [Neil Cook]

#### 4.4.43 0.5.100 (2019-10-28)

- *Science.telluric.general.py* - catch all `berv = nan` (not allowed) [Neil Cook]
- *Science.telluric.general.py* - should be using `USE_BERV` not `BERV`. [Neil Cook]
- Berv update - add in additional barycorrpy parameters. [Neil Cook]
- Update language database. [Neil Cook]
- *Science.telluric.general.py* - catch bad `berv` value. [Neil Cook]
- Update language database. [Neil Cook]
- *Science.extract.berv.py* - correct setting `use_berv` from estimate. [Neil Cook]
- *Science.telluric.general.py* - add break point to identify bug in `_wave_to_wave`. [Neil Cook]
- *Science.calib.wave.py* - hc only solution has no CCF  $\rightarrow$  set CCF used keys to None. [Neil Cook]
- *Science.calib.wave.py* - deal with header not having fiber kwarg (is a pp file header) [Neil Cook]
- *Science.calib.wave.py* - need to add more empty constants for hc only wave sol. [Neil Cook]
- *Obj\_pol\_spirou.py* - start filling out polarisation code (from SPIrou DRS) [Neil Cook]
- Update language database. [Neil Cook]
- *Science.calib.wave.py* - fix differing fiber values from header vs usefiber. [Neil Cook]
- *Plot\_functions.py* - only add suffix if kind is not None. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.44 0.5.099 (2019-10-25)

- *Science.polar.general.py* - add `PolarObj` class and `validate_polar_files` + `valid_polar_file` functions. [Neil Cook]
- *Recipes.spirou.obj\_pol\_spirou.py* - first commit - start filling out polar recipe. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add `obj_pol_spirou`. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add polar constants. [Neil Cook]
- Plotting - fix `loop_allowed` switch. [Neil Cook]
- *Plotting.\** - fix summary plots using `plotloop`. [Neil Cook]
- *Plotting.plot\_functions.py* - make sure all plots in loops update the filename. [Neil Cook]
- *Plotting.plot\_functions.py* - fix generators in `plot_shape_angle_offset`. [Neil Cook]
- *Flat\_blaze* - fix problem with `SHAPE_ANGLE_OFFSET_ALL` arguments. [Neil Cook]
- *Flat\_blaze* - make threshold for `scut = 0.1` + add a cubic term to sinc function + adjust the flat/blaze rms calculation. [Neil Cook]
- *Science.calib.shape.py* - try to fix bug with `corr_dx_from_fp`. [Neil Cook]
- *Science.calib.shape.py* - remove breakpoint for `lin_mini`. [Neil Cook]
- *Cal\_shape\_master\_spirou.py* - add in breakpoint to address bug. [Neil Cook]
- *Core.math.general.py* - fix `linear_minimization` (need to re-calculate shapes after masking) [Neil Cook]
- *Recipe.spirou.cal\_shape\_master\_spirou.py* + *science.calib.shape.py* - add breakpoint to identify crash. [Neil Cook]
- *Plotting.core.py* - do not clean html warning messages and add text in one paragraph. [Neil Cook]
- *Science.calib.wave.py* and *plotting.plot\_functions.py* - add fiber to `WAVE_FP_IPT_CWD_LLHC` and `SUM_WAVE_FP_IPT_CWID_LLHC` plots. [Neil Cook]
- *Science.calib.wave.py* and *plotting.plot\_functions.py* - add fiber to `WAVE_FP_IPT_CWD_LLHC` and `SUM_WAVE_FP_IPT_CWID_LLHC` plots. [Neil Cook]
- *Cal\_wave\_spirou.py* - fix `hcprops` not having `fpprops` values (for summary) + don't base summary plot on pass/fail just `fp_e2ds_file` being set. [Neil Cook]
- *Core.math.fast.py* - fix and catch `jit` (numba) [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.45 0.5.098 (2019-10-24)

- *Recipe.spirou.cal\_wave\_spirou.py* + *science.calib.wave.py* - add summary plot functionality. [Neil Cook]
- *Plotting.\** - add summary plots. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add wave solution summary plots. [Neil Cook]

- *Flat\_blaze.py* and *extraction.py* - add sloping sinc fit for blaze and move summary/qc to modules. [Neil Cook]
- *Obj\_fit\_tellu\_spirou*, *obj\_mk\_tellu\_spirou* and *obj\_mk\_template\_spirou* - add telluric plotting. [Neil Cook]
- Move summary + qc + writing to modules (not in main recipes) [Neil Cook]
- *Plotting.\** - add telluric plots. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.math.general.py* - add sloped sinc function. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add *fit\_tellu* plots and *mk\_template* plots. [Neil Cook]
- *Core.instruments.\*.default\_\*.py* - add blaze sinc constants + plotting constants for *fit\_tellu*. [Neil Cook]
- Misc - copy of Etienne's sinc function for blaze correction. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.46 0.5.097 (2019-10-23)

- *Science.velocity.general.py* - change arguments (*found\_rv* → *rv*) [Neil Cook]
- *Science.telluric.general.py* - add recipe to inputs (for plotting) [Neil Cook]
- *Science.calib.wave.py* - fix plots + force wave modes to ints (were strings) [Neil Cook]
- *Recipe.obj\_mk\_tellu\_spirou.py* - add debug and summary plots. [Neil Cook]
- *Recipe.spirou.cal\_loc\_spirou.py* - fix check coeffs (Etienne's fix) [Neil Cook]
- *Plotting.\*.py* - add mktellu plots, fix ioff in pdb, fix mask order in html, add warnings to summary document. [Neil Cook]
- *Plotting.\*.py* - add mktellu plots, fix ioff in pdb, fix mask order in html, add warnings to summary document. [Neil Cook]
- Update the language database. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add mktellu plot outputs. [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add wave and mktellu plot constants. [Neil Cook]
- *Drs\_log.py* - allow use of *output\_param\_dict* without updating parameter dictionary. [Neil Cook]

#### 4.4.47 0.5.096 (2019-10-17)

- Update language database. [Neil Cook]
- *Science.velocity.general.py* - add *rv\_fit* plot. [Neil Cook]
- *Science.calib.wave.py* - add plotting. [Neil Cook]
- *Plotting.plot\_functions.py* - add wave plotting functions. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add wave plots (and a ccf plot) [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add WAVE plot constants. [Neil Cook]
- *SpirouWAVE2.py* - remove todo statement. [Neil Cook]

#### 4.4.48 0.5.095 (2019-10-16)

- *Math.fast.py* - rearrange imports. [Neil Cook]
- *Recipes/spirou/cal\_loc\_spirou.py* - fix problems with clean loc coeffs. [Neil Cook]
- *Lin\_mini\_upgrade.py* - raw source code from Etienne. [Neil Cook]
- *Plotting.plot\_functions.py* - close plots if we have an open (before plot loop) + fix loc coeff plot. [Neil Cook]
- *Plotting.py* - add *self.plots\_active* (flag that is true when we have plots open in interactive mode) [Neil Cook]
- *Core.math.fast.py* + *general.py* - add linear minimisation speed up using numba (if present on system) [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add *master\_run*, *calib\_run* and *science\_run* (for trigger?) [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add loc plot/clean up coeff constants. [Neil Cook]
- *Core.core.drs\_recipe.py* - in *add\_extras* value can now be objects other than string → re-test instance. [Neil Cook]
- *Core.core.drs\_recipe.py* - fix how we identify special list keys (arguments that come from params but are lists) [Neil Cook]
- *Core.core.drs\_recipe.py* - fix *new\_runs* in *\_gen\_run*. [Neil Cook]

- *Core.core.drs\_recipe.py* + *tools.module.setup.drs\_reprocess.py* - deal with multiple extra arguments better (from sequences) [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - *obj\_mk\_template* need objname arguments. [Neil Cook]

#### 4.4.49 0.5.094 (2019-10-15)

- *Core.instruemnts.spirou.recipe\_definitions.py* - fix the full run and remove science run sequences. [Neil Cook]
- *Core.instruemnts.spirou.recipe\_definitions.py* - add back mk and fit tellu limited run individual commands (for object specific) [Neil Cook]
- *Science.calib.wave.py* - remove interactive plot sections and add *WAVE\_HC\_GUESS* plot. [Neil Cook]
- *Science.calib.shape.py* - deal with *norm\_fp* being zero (skip) [Neil Cook]
- *Science.calib.localisation.py* - add *check\_coeffs* function. [Neil Cook]
- *Recipe.spirou.cal\_loc\_spirou.py* - check coefficient and sigma clip / smooth them between orders. [Neil Cook]
- *Plotting.plot\_functions.py* - add *plot\_loc\_check\_coeffs* and *plot\_wave\_hc\_guess*. [Neil Cook]
- *Core.math.general.py* - add *robust\_polyfit*. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add loc and wave plots. [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add loc and wave plot constants. [Neil Cook]
- Plotting - make sure location is set in all recipes. [Neil Cook]

#### 4.4.50 0.5.093 (2019-10-14)

- *Core.instruments.spirou.recipe\_definitions.py* + *recipes.spirou.obj\_fit\_tellu\_spirou.py* - must add s1d plot args to *fit\_tellu*. [njcuk9999]

#### 4.4.51 0.5.092 (2019-10-13)

- *Plotting.core.py* + *latex.py* - update layout for stat + qc tables + try to latex floating orders. [Neil Cook]
- Update language database. [Neil Cook]
- *Science.extract.general.py* - add fiber to *e2ds\_to\_s1d* inputs (for plotting) [Neil Cook]
- *Plotting.\*.py* - continue work on plotting. [Neil Cook]
- *Core.instruments.spirou.default\_constants.py* - adjust extract s1d zoom parameters. [Neil Cook]
- *Recipe.spirou.\*.py* - add *recipe.plot.set\_location* (need iterator) [Neil Cook]
- *Plotting.plot\_functions.py* - remove full spectrum plot (too big) [Neil Cook]
- *Science.extract.general.py* - move qc and file writing to functions. [Neil Cook]
- *Cal\_extract\_spirou.py* - add plots + summary document. [Neil Cook]
- *Plotting.plot\_functions.py* - add extraction plots. [Neil Cook]
- *Plotter.core.py* - update test case. [Neil Cook]
- Update object query list file. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add plot definitions to recipe. [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add extract plot constants. [Neil Cook]
- *Core.core.drs\_recipe.py* - correct problem with recipes that have no file arguments (were just being skipped) [Neil Cook]
- *Core.core.drs\_file.py* - correct a problem with using fibers = [None] [Neil Cook]
- *Plotting.core.py* - fix the addition of fibers to *qc\_params* and stat table. [Neil Cook]

#### 4.4.52 0.5.091 (2019-10-11)

- Add a section to how to (to fill in later) [Neil Cook]
- *Science.calib.shape.py* - move qc and file writing to module + todo identified problem. [Neil Cook]
- *Science.calib.localisation.py* - move qc and file writing to module. [Neil Cook]
- *Science.calib.flat\_blaze.py* - move qc and file writing to module. [Neil Cook]
- *Recipe.spirou*. badpix, dark, flat, loc, shape, *shape\_master* - add plotting. [Neil Cook]
- *Plotting.\*.py* - continue adding plotting functionality. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add plots to shape and flat recipes. [Neil Cook]
- *Core.math.general.py* - fix sigfig (deal with zero and non-finites) [Neil Cook]

- *Core.instruments.\*.default\_constants.py* - add plotting constants. [Neil Cook]

#### 4.4.53 0.5.090 (2019-10-10)

- *Recipe.spirou.cal\_shape\_master\_spirou.py* + *science.calib.shape.py* - add plots. [Neil Cook]
- *Recipe.spirou.cal\_loc\_spirou.py* - fix typo in qc. [Neil Cook]
- *Plotting.\*.py* - continue work on plotting functionality. [Neil Cook]
- *Core.math.general.py* - add the sigfig function. [Neil Cook]
- Update the language database. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add some plots to *cal\_shape\_master*. [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add plot constants. [Neil Cook]

#### 4.4.54 0.5.089 (2019-10-10)

- Continue adding plotting. [Neil Cook]
- Update how to terrapipe guide. [Neil Cook]
- Update language database. [Neil Cook]
- *Data.core.pdbrc* - need to go up two levels (up via exception) [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add loc graphs. [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add plot constants. [Neil Cook]
- *Core.core.drs\_startup.py* - change plotter → plot, move end plotting to plotter. [Neil Cook]
- *Core.core.drs\_recipe.py* - change plotter → plot. [Neil Cook]
- *Core.constants.param\_functions.py* - fix ipdb exception on exit. [Neil Cook]

#### 4.4.55 0.5.088 (2019-10-08)

- *Tools.module.setup.drs\_reprocess.py* - add plot closing and fix bugs with *nightname/str\_arg\_list* and *self.recipe.args*. [Neil Cook]
- *Reprocess.py* + *telluric\_db* recipes - change how *process\_run\_list* works (now needs recipe) [Neil Cook]
- *Recipe.spirou.cal\_dark\_spirou.py* - add plots. [Neil Cook]
- *Recipe.spirou.cal\_badpix\_spirou.py* - add plots. [Neil Cook]
- *Plotting.\*.py* - add html, fix some latex issues and add dark/badpix plot definitions. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add debug/summary plot definitions to *cal\_dark* and *cal\_badpix*. [Neil Cook]
- *Core.instruments.default.pseudo\_const.py* - fix night name in *index\_lock\_filename* definition. [Neil Cook]
- *Core.instruments.output\_filenames.py* - fix nightname. [Neil Cook]
- *Core.instruments.\*.default\_\** - add plotting constants. [Neil Cook]
- *How\_to\_terrapipe.md* - add readme file on how to develop using terrapipe. [Neil Cook]
- *Core.core.drs\_recipe.py* add *set\_debug\_plots* and *set\_summary\_plots*. [Neil Cook]

#### 4.4.56 0.5.087 (2019-10-07)

- *Core.constants.param\_functions.py* - if breakpoints does not have params force *allow\_breakpoints*. [Neil Cook]

#### 4.4.57 0.5.086 (2019-10-06)

- *Tools.module.setup.drs\_reprocess.py* - deal with input nightname and filename. [njcuk9999]
- *Science.calib.wave.py* - change 'night\_name' to nightname. [njcuk9999]
- Update language database. [njcuk9999]
- *Core.core.drs\_recipe.py* - remove breakpoint. [njcuk9999]
- *Core.instruments.default.default\_config.py* - add *allow\_breakpoints* constant. [njcuk9999]
- *Core.core.drs\_recipe.py* + *drs\_startup.py* - add breakpoint special argument. [njcuk9999]

- *Core.core.drs\_argument.py* - add breakpoint special argument. [njcuk9999]
- *Core.constants.constant\_functions.py* - add break point to allow stopping at certain point in the code easily. [njcuk9999]
- *Core.constants.\_\_init\_\_.py* - add break point to aliases. [njcuk9999]

#### 4.4.58 0.5.085 (2019-10-05)

- *Tools.module.setup.drs\_reprocess.py* - add filename and nightname from inputs. [njcuk9999]
- Replace . imports with terrapipe imports. [njcuk9999]
- *Plotting.core.py* - replace . imports with terrapipe + store debug plots. [njcuk9999]
- *Locale.core.\*.py* - replace . imports with terrapipe imports. [njcuk9999]
- Update language database. [njcuk9999]
- *Io.\*.py* - replace . imports with terrapipe imports. [njcuk9999]
- *Core.\_\_init\_\_.py* - replace . imports with terrapipe imports. [njcuk9999]
- *Core.math.\** - replace . imports with terrapipe imports. [njcuk9999]
- *Core.instruments.default.file\_definitions.py* - remove call to *output\_filenames*. [njcuk9999]
- *Core.instruments.\*.recipe\_definitions.py* - remove *drs\_interactive* and add filename to reprocess definition. [njcuk9999]
- *Core.instruments.\*.default\_config* - remove *drs\_interactive* and add *drs\_plot\_ext* and *drs\_summary\_ext*. [njcuk9999]
- *Core.core.\** - remove . imports and add plotter to *drs\_startup*. [njcuk9999]
- *Core.core.\_\_init\_\_.py* - remove imports. [njcuk9999]
- *Core.constants* - move . imports to terrapipe imports. [njcuk9999]

#### 4.4.59 0.5.084 (2019-10-04)

- Update language database. [Neil Cook]
- *Core.core.drs\_recipe.py* - record sys.argv to *self.str\_arg\_list* if not from fkwargs. [Neil Cook]
- Plotting - add in latex functions and summary plot. [Neil Cook]

#### 4.4.60 0.5.083 (2019-10-03)

- *Tools.modules.setup.drs\_reprocess.py* - change closeall (now in plotter) [Neil Cook]
- Modify inputs to *core.post\_main* (tools) [Neil Cook]
- Modify inputs to *core.post\_main* (tools) [Neil Cook]
- Continue work on plotting functions. [Neil Cook]
- Update language database. [Neil Cook]
- *Io.drs\_path.py* - add makedirs function. [Neil Cook]
- *Core.core.drs\_startup.py* - remove call to plotter module (and get via recipe) [Neil Cook]
- Change inputs to *core.post\_main()* [Neil Cook]
- Start work on plotting. [Neil Cook]
- Update the language database. [Neil Cook]
- *Core.instruments.spirou.py* - only calculate ccf for science targets. [Neil Cook]
- *Core.core.drs\_file.py* - fix type keyword in *check\_table\_filename* should be “allowedfibers” not “fiber” [Neil Cook]
- *Core.instruments.spirou.default\_constants.py* - change default ccf width to 300 km/s. [Neil Cook]
- Update object list. [njcuk9999]
- *Core.instruments.spirou.recipe\_definitions.py* - add ccf to limited run. [Neil Cook]
- *Core.instruments.default.output\_filenames.py* - need to re-get suffix in fiber loop. [Neil Cook]
- *Core.core.drs\_file.py* - fix adding fiber to historic files. [Neil Cook]
- Update changelog/version/date. [Neil Cook]
- Update object list. [njcuk9999]

#### 4.4.61 0.5.082 (2019-10-02)

- *Tools.module.setup.drs\_reprocess.py* - deal with traceback as a list or string. [Neil Cook]
- *Science.telluric.general.py* - fix bug if we have template must divide image by it! [Neil Cook]
- *Science.calib.wave.py* - check for empty wfp variables and set to None. [Neil Cook]
- *Recipe.spirou.cal\_extract\_spirou.py* - correct typo in text entry. [Neil Cook]
- *Recipe.spirou.cal\_ccf\_spirou.py* - add saving of files (via *write\_ccf*) [Neil Cook]
- Update language database. [Neil Cook]
- Update object list. [Neil Cook]
- *Core.instruments.spirou.file\_definitions.py* + *recipe\_definitions.py* - add *out\_ccf\_fits*. [Neil Cook]
- *Core.instruments.\*.default\_keywords.py* - add CCF keywords. [Neil Cook]
- *Core.constants.param\_functions.py* - correct typo in merge function “source” -> “sources” [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.62 0.5.081 (2019-10-01)

- *Science.velocity.general.py* - add *locate\_reference\_file* function and work on calculating ccf (now combining with nanmean) [Neil Cook]
- *Science.telluric.general.py* - add *make\_1d\_template\_cube* and *mk\_1d\_template\_write* functions. [Neil Cook]
- *Science.extract.berv.py* - add option not to log obtaining berv (log=True/False) [Neil Cook]
- *Science.calib.wave.py* - get wave time in wprops. [Neil Cook]
- *Recipe.spirou.obj\_mk\_template\_spirou.py* - add s1d template code to *mk\_template*. [Neil Cook]
- *Recipe.spirou.cal\_ccf\_spirou.py* - start adding in ccf fp stuff. [Neil Cook]
- Update language database. [Neil Cook]
- *Io.drs\_fits.py* - correct typo “fornat” -> “format” [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add s1d files to set outputs. [Neil Cook]
- *Core.instruments.spirou.file\_definitions.py* - add the s1d template files + s1d lists for e2ds files. [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add new *mk\_template* constants. [Neil Cook]
- *Core.core.drs\_file.py* - add s1d property and fix shape for table. [Neil Cook]

#### 4.4.63 0.5.080 (2019-09-30)

- *Tools.module.setup.drs\_reprocess.py* - fix error in printing errors at end (and add these errors to the log properly) [Neil Cook]
- *Core.core.drs\_log.py* - add *wlog.logmessage* (to manually add a message to the log file) [Neil Cook]
- *Neil\_TODO.md* - update list. [Neil Cook]
- *Terrapipe.science.velocity.general.py* - add test plots while ccf is not working. [Neil Cook]
- *Terrapipe.recipes.spirou.py* - add *TEST\_RUN* to *obj\_fit\_tellu\_db\_spirou* and *obj\_mk\_tellu\_db\_spirou* and uncomment *mk\_obj\_template*. [Neil Cook]
- Update language database. [Neil Cook]
- *Terrapipe.io.drs\_fits.py* - make sure values are striped of whitespaces before comparison. [Neil Cook]
- *Core.core.recipe\_definition.py* - add *obj\_mk\_telludb* and *obj\_fit\_telludb* instead of *obj\_mk\_tellu/obj\_fit\_tellu* and *obj\_mk\_template*. [Neil Cook]
- *Tools.module.setup.drs\_reprocess.py* - deal with adding extra arguments to reprocessing recipes. [Neil Cook]
- *Science.calib.wave.py* - remove maxcpp references. [Neil Cook]
- *Core.core.drs\_recipe.py* - add extras to recipe (to overwrite arguments from reprocessing) [Neil Cook]
- *Core.core.drs\_log.py* - update debugging in print function mode. [Neil Cook]
- *Core.core.drs\_file.py* - do not continue if not valid. [Neil Cook]
- Update language database. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.64 0.5.079 (2019-09-26)

- *Tools.module.setup.drs\_reprocess.py* - take out pushing skip to recipes and add in pushing debug to recipes, rename DEBUG -> *TEST\_RUN* to do a test run. [Neil Cook]



- *Sciecne.velocity.general.py* - new ccf calculation functions + work on ccf for science/fp. [Neil Cook]
- *Science.preprocessing.detectory.py* - remove unused functions/imports. [Neil Cook]
- *Science.calib.wave.py* - clean up and move ccf stuff to velocity module. [Neil Cook]
- *Cal\_preprocess\_spirou.py* - pep8 empty line clean up. [Neil Cook]
- *Cal\_ccf\_spirou.py* - remove nan filling and copy image from infile when tellurics are not removed. [Neil Cook]
- Update language database. [Neil Cook]
- Add Etiennes ccf mask for G1699. [Neil Cook]
- Update run files. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add mask file definition and add path in `-mask` kwarg. [Neil Cook]
- *Core.instruments.\*pseudo\_const.py* - add *FIBER\_CCF* (defines what is a science fiber and what is a reference fiber for CCF calculation. [Neil Cook]
- *Core.instruments.\*default\_constants.py* + *default\_keywords.py* - fix/modify constants/keywords for wavecff/ccf. [Neil Cook]
- *Core.core.drs\_startup.py* - `_get_arg_strval`: deal with DrsInputFile as well as DrsFitsFile. [Neil Cook]
- *Core.core.drs\_recipe.py* - add `display_func` and deal with no `drs_files` added to files when `dtype=file/files`, add function `_check_arg_path`. [Neil Cook]
- *Core.core.drs\_log.py* - `find_param`: add required and default inputs (and allow them to return without error) [Neil Cook]
- *Core.core.drs\_file.py* - add methods `has_correct_extension`, `header_keys_exist`, `has_correct_header_keys`, `read`, `write` for DrsInputFile. [Neil Cook]
- *Core.core.drs\_argument.py* - need to deal with drsfiles being a single drsfile + add attribute "path" [Neil Cook]
- *Core.instruments.spirou.default\_constants.py* - do not force get the wave solution from the calibDB (use header) [Neil Cook]
- *Core.instruments.spirou.default\_constants.py* - default wave mode now C Lovis method. [Neil Cook]
- *Science.telluric.general.py* - for `drs_data.load_text_file` must define dtype. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.65 0.5.078 (2019-09-25)

- *Misc.mk\_template\_s1d.py* - etiennes code to be added to *mk\_template*. [Neil Cook]
- *Recipe\_definitions.py* - only process e2dsff files for *obj\_mk\_tellu* and *obj\_fit\_tellu*. [Neil Cook]
- *Core.drs\_file.py* - make sure tested keys have no white spaces at start/end and all are upper case (case insensitive) [Neil Cook]
- *Science.velocity.general.py* - coravelation - fix reporting of number of lines found. [Neil Cook]
- *Science.calib.wave.py* - change name of `fp_wavelength_sol_new` to `add_fpline_calc_cwid`, remove unused outputs of `assign_abs_fp_numbers`, make two method consistent with FP equation  $d = m * \lambda/2$ , fix `no_overlap_match_calc`, and try to fix NaNs in fp e2ds for ccf calculation. [Neil Cook]
- Add cavity length `ll` and `m` fit files to data. [Neil Cook]
- Update language database. [Neil Cook]
- *Recipes.spirou.cal\_wave\_spirou.py* - print that we are updating hc/fp files with new wave solution. [Neil Cook]
- *Io.drs\_data.py* - load text file needs to default to floats in an array. [Neil Cook]
- *Core.instruments.spirou.default\_keywords.py* - correct typos in keywords. [Neil Cook]
- *Core.instrument.\*default\_constants.py* - `cavity_length_m_fit.dat`. [Neil Cook]

#### 4.4.66 0.5.077 (2019-09-24)

- *Science.velocity.general.py* - add `compute_ccf_sciecne` and `fill_e2ds_nans` functions (continued work on `cal_ccf_spirou`) [Neil Cook]
- *Science.calib.wave.py* - add some extra wave keys (from ccf process) [Neil Cook]
- *Cal\_wave\_spirou.py* - add a TODO for *cal\_wave\_spirou*. [Neil Cook]
- *Recipe.spirou.cal\_ccf\_spirou.py* - continue to port code from SpirouDRS -> terrapipe. [Neil Cook]
- Update language database. [Neil Cook]

- *Core.instruments.spirou.recipe\_definitions.py* - correct typo in *cal\_wave* -fpmode definitions (found by @melissa-hobson) [Neil Cook]
- *Core.instruments.\*.default\_constants.py* + *default\_keywords.py* - add CCF/RV keys. [Neil Cook]
- *Core.core.drs\_file.py* - add option in *read\_header\_key\_1d\_list* to try to guess dim1 (if manually set to None) [Neil Cook]
- *Core.constants.param\_functions.py* - add merge function (to merge one param dict into another) [Neil Cook]
- *Tools.module.setup.drs\_reprocess.py* - fix how we set *infile.filetype* (look at *output.intype* and deal with None/list/str) [Neil Cook]

#### 4.4.67 0.5.076 (2019-09-23)

- *Science.telluric.general.py* - re calculate *tapas\_water* and *tapas\_other* after shift. [Neil Cook]
- *Science.extract.general.py* - fix s1d how we interpolate over NaN gaps. [Neil Cook]
- *Core.instruments.spirou.file\_definitions.py/recipe\_definitions.py* - fix intypes for file definitions and tellu *default\_refs*. [Neil Cook]
- Update object list. [Neil Cook]
- *Core.instruments.spirou.default\_keywords.py* - fix *KW\_MKTELL\_AIRMASS/WATER* values. [Neil Cook]
- *Core.instruments.\*.default\_constants* - change telluric filetype/dprtype/fiber type definitions. [Neil Cook]
- *Core.core.drs\_log.py* - always have log file (put it in home directory) [Neil Cook]
- Update changelog/date/version. [Neil Cook]

#### 4.4.68 0.5.075 (2019-09-20)

- *Tools.module.setup.drs\_reprocess.py* - set filemod and recipemod for srecipes that do not have them set. [Neil Cook]
- *Science.telluric.general.py* - guess the sed that goes in (not just ones) + sigma clip around *fit\_dd* + add a bad mask for sp2 (set to NaN) [Neil Cook]
- *Drs\_recipe.py* - for process adds method (in *DrsRunSequence*) add filemod and recipemod if recipe does not have them set. [Neil Cook]
- Update *object\_query\_list*. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.69 0.5.074 (2019-09-19)

- *Science.telluric.general.py* - add an upper and lower limit to keep for the pca fit. [Neil Cook]
- *Science.extract.general.py* - fix some minor bugs + pep8 correction. [Neil Cook]
- *Calib.wave.py*, velocity module - change module rv-> velocity, add *remove\_telluric\_domain* function. [Neil Cook]
- *Recipe.spirou.cal\_extract\_spirou.py* - add *KW\_EXT\_TYPE*. [Neil Cook]
- *Recipe.spirou.cal\_ccf\_spirou.py* - first commit + testing of inputs. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - change -add2calib to -database, add *cal\_ccf* definition. [Neil Cook]
- *Core.instruments.\*.default\_constants.py* + *default\_keywords.py* - add first CCF constants. [Neil Cook]
- *Core.core.drs\_startup* - change p to param. [Neil Cook]
- *Core.core.drs\_database.py* - add a check for params['INPUTS']['DATABASE'] to check whether we should save to database when *add\_file* is used. [Neil Cook]
- *Core.constants.param\_functions.py* - deal with copying ParamDict inside ParamDict. [Neil Cook]
- Update language database. [Neil Cook]
- *Io.drs\_lock.py* - add debug printout for locking. [Neil Cook]
- *Core.math.fast.py* - bn.nansum return bool arrays as bools we don't want this. [Neil Cook]
- *Core.core.drs\_log.py* - only turn off wrapping for debug wlog entries. [Neil Cook]
- *Core.core.drs\_database.py* - move locking/checking into copy db file function. [Neil Cook]
- Update changelog.md. [Neil Cook]

#### 4.4.70 0.5.073 (2019-09-18)

- *Tools.module.setup.drs\_reprocess.py* - add shortname to Run class, check that all recipes in run table are valid, print group name (recipe short name) on group print out. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.math.gauss.py* - mp references should be “fast” references within math module. [Neil Cook]
- *Core.instruments.spirou.py* - remove unused recipes + give names to wavehc and wavefp. [Neil Cook]
- *Core.core.drs\_recipe.py* - *process\_adds* should look for [‘files’, ‘file’] in arg dtype. [Neil Cook]
- *Core.core.drs\_log.py* - params may be None - deal with this. [Neil Cook]
- *Drs\_database.py* - lock the input and output files before copying to database. [Neil Cook]
- *Recipes.spirou.cal\_loc\_spirou.py* - need to import math as mp. [Neil Cook]
- Update date/version/changelog. [Neil Cook]
- *Core.math* - add a fast *medfilt\_1d* function. [Neil Cook]
- *Core.math.fast.py* - first commit numpy nan functions from bottleneck if available. [Neil Cook]
- Change nan numpy functions to mp.nan functions (use bottleneck if available for speed up) [Neil Cook]
- *Science.calib.shape.py* - test cube as array. [Neil Cook]
- *Science.calib.shape.py* - add length of cube for printout. [Neil Cook]
- *Science.calib.shape.py* - add printouts to check. [Neil Cook]
- *Science.calib.shape.py* - set transforms/xres/yres to zero. [Neil Cook]
- *Science.calib.shape.py* - test the fpmaster loop (without long parts) [Neil Cook]
- Update date/changelog/version. [Neil Cook]

#### 4.4.71 0.5.072 (2019-09-17)

- *Tools.bin.reset.py* - remove instrument re-definition (now done in core.setup) [Neil Cook]
- *Science.telluric.general.py* - change *KW\_DPRTYPES* → *KW\_DPRTYPE*. [Neil Cook]
- *Science.calib.shape.py* - add filename and basename (just for printing/logging) [Neil Cook]
- *Recipes.spirou.obj\_fit\_tellu\_db\_spirou.py* - fix inputs. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - fix kwargs -objname. [Neil Cook]
- *Core.core.drs\_argument.py* - checks for arg/kwarg/special arg on naming - kwarg and special should have ‘-’ positional should not. [Neil Cook]
- *Science.core.shape.py* - correct type *fpfile\_it.image* → *fpfile\_it.data*. [Neil Cook]
- Correct *vstack\_cols* (needs to handle single row as well as astropy table) [Neil Cook]
- *Science.telluric.general.py* - change function *get\_objects* to *get\_non\_tellu\_objs* and generalise. [Neil Cook]
- *Recipes.spirou.obj\_fit\_tellu\_db\_spirou.py* - get dprtypes and robjnames in main code. [Neil Cook]
- *Science.calib.shape.py* - calibrate after combining group of FPs. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - change default to None. [Neil Cook]
- *Science.telluric.general.py* - add function *get\_objects* to get non telluric objects. [Neil Cook]
- *Recipe.spirou.obj\_fit\_tellu\_db\_spirou.py* - first commit (mostly just copy of *obj\_mk\_tellu\_db\_spirou*) but does *fit\_tellu*, *mk\_template*, *fit\_tellu* on all objects except telluric stars) [Neil Cook]
- *Recipe.spirou.obj\_mk\_template\_spirou.py* - add ending script when files are skipped. [Neil Cook]
- *Recipes.spirou.obj\_mk\_tellu\_db\_spirou.py* - remove todo (dealt with internally) [Neil Cook]
- Update the language database. [Neil Cook]
- *Core.io.drs\_table.py* - lock the index file when reading (and don’t try to open when closing) [Neil Cook]
- *Io.drs\_fits.py* - update *find\_files* to allow returning of a astropy table for all files found (a stack of the valid entries in the index files) [Neil Cook]
- *Core.instruments.spirou.recipe\_deinfitions.py* - fix help files + add *obj\_fit\_tellu\_db* + add options to feiltypes and fiber arguments. [Neil Cook]
- *Cpre.instruments.default.pseudo\_const.py* - remove *EXT\_TYPE* (and add *DPRTYPE*) to list of indexing columns. [Neil Cook]
- *Core.instruments.\*.default\_\** - add telluric db keys. [Neil Cook]
- *Core.core.drs\_recipe.py* - make *vstack* a public function and change how coluns are added (via list comprehension) [Neil Cook]

#### 4.4.72 0.5.071 (2019-09-16)

- *Tools.module.setup.drs\_reprocess.py* - add *generate\_run\_table* to generate *run\_table* from a set of args/kwargs. [Neil Cook]
- *Tools.module.listing.general.py* - functions for listing.py. [Neil Cook]
- *Tools.bin.listing.py* - first commit - code to re-index directories. [Neil Cook]
- *Recipes.spirou.obj\_mk\_template\_spirou.py* - correct typo (get filetype and fiber from inputs) [Neil Cook]
- *Recipe.spirou.obj\_mk\_tellu\_db\_spirou.py* - first commit. [Neil Cook]
- *Io.drs\_fits.py* - correct typo and add required switch to *get\_index\_files*. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add *mk\_tellu\_db* and *obj\_fit\_tellu\_db*. [Neil Cook]
- *Core.instruments.default.recipe\_definitions.py* - add listing recipe. [Neil Cook]
- *Core.core.drs\_startup.py* - make indexing and *save\_index\_file* non private functions. [Neil Cook]
- *Core.core.drs\_recipe.py* - test log message in *group\_run\_files* + remove old olg test message. [Neil Cook]
- *Core.core.drs\_recipe.py* - change how we stack tablelist. [Neil Cook]
- *Core.core.drs\_recipe.py* - test wlog statements. [Neil Cook]
- *Core.core.drs\_recipe.py* - test wlog statements. [Neil Cook]
- *Core.core.drs\_recipe.py* - add print statements. [Neil Cook]
- *Tools.module.setup.drs\_reprocess.py* - add nickname for all (for when ftable is empty) [Neil Cook]
- *Tools.module.listing.file\_explorer.py* - change where params comes from. [Neil Cook]
- *Io.drs\_table.py* - try to fix index file error. [Neil Cook]
- *Core.core.drs\_startup.py* - remove unused import. [Neil Cook]
- *Core.core.drs\_recipe.py* - clear printer after printing filenames. [Neil Cook]
- *Science.preprocessing.identification.py* - need kind to be set (even if file not found) for error message. [Neil Cook]
- *Science.calib.shape.py* - need to only copy extract parameters for those that are not skipped. [Neil Cook]
- *Io.drs\_table.py* - remove table before writing it (to try to get rid of “file exists” error) [Neil Cook]
- Add “runs” folder to data. [Neil Cook]
- Update date/version/changelog. [Neil Cook]
- *Science.extract.berv.py* - fix bug that berv will be set to NaN if coming from header (need to check both key and output[0] for kwargs) [Neil Cook]
- *Core.instruments.default.pseudo\_const.py* - fix bug that p is locked (so set manually) [Neil Cook]
- *Drs\_changelog.py* - fix bug in updating version/date. [Neil Cook]

#### 4.4.73 0.5.070 (2019-09-13)

- *Tools.bin.reprocess.py* - change how master table is defined (keys ‘*KW\_MID\_OBS\_TIME*’ and ‘*KW\_DPRTYPE*’ need values creating as not in raw file headers), filters need to check for lists. [Neil Cook]
- *Science.telluric.general.py* - add some new logging. [Neil Cook]
- *Science.calib.dark.py* - add some new logging for dark master creation. [Neil Cook]
- *Recipes.spirou.obj\_fit\_tellu\_spirou.py* - change how image2 is normalised by blaze (not the same as *mk\_tellu*) [Neil Cook]
- Update language database. [Neil Cook]
- *Io.drs\_fits.py* - add *get\_dpctype*. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - move filemod to pseudo consts + add *KW\_DPRTYPE* to limited run for *fit\_tellu/mk\_tellu*. [Neil Cook]
- *Core.instruments.spirou.py* - add some new intypes. [Neil Cook]
- *Core.instruments.\*.pseudo\_const.py* - add FILEMOD and RECIPEMOD definitions. [Neil Cook]
- *Core.instruments.\*.default\** - add end of file and debug constants. [Neil Cook]
- *Core.core.drs\_startup.py* - get filemod and recipemod from pseudo constants (and re-get them if we change instrument) [Neil Cook]
- *Core.core.drs\_recipe.py* - add some *display\_func*, and debug logging + add params to *check\_table\_keys*. [Neil Cook]
- *Core.core.drs\_log.py* - add *display\_func* and put debug numbers into params (not hard coded) [Neil Cook]
- *Core.core.drs\_file.py* - add *generate\_reqfiles* (for checking infile name in *construct\_filename*) [Neil Cook]
- *Science.calib.dark.py* - add some extra print outs. [Neil Cook]

- *Core.instruments.spirou.file\_definitions.py* - fix bad shape intypes (some should be *hc1\_hc1* not *fp\_fp*) [Neil Cook]
- *Core.core.drs\_recipe.py* - when running a master recipe only do one run (multiple are not needed) [Neil Cook]
- *Tools.module.setup.drs\_reprocess.py* - add changes to *generate\_runs* and add allowed fibers getting. [Neil Cook]
- *Sciecne.telluric.general.py* - change message in recon sld writing. [Neil Cook]
- *Sciecne.extract.berv.py* - fix *berv* - properties weren't copying. [Neil Cook]
- *Sciecne.calib.background.py* - do not check file for debug (could be any input file and we don't care here) [Neil Cook]
- Update language database. [Neil Cook]
- *Io.drs\_fits.py* - add changes to *RAW\_OUTPUT\_KEYS/REDUC\_OUTPUT\_KEYS*. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - change sequences (must start with full preprocess - master dark + master shape wont work otherwise) [Neil Cook]
- *Core.instruments.spirou.file\_definitions.py* - add intypes to all out files (for file history lookup) [Neil Cook]
- *Core.instruments.spirou.default\_keywords.py* - *KW\_OBJNAME* from *OBJNAME* → *OBJECT*. [Neil Cook]
- *Core.instruments.default.pseudo\_const.py* - re-work output columns (now only *output\_keys*) [Neil Cook]
- *Core.instruments.default.py* - add additional features to general output file (infile suffix removal) [Neil Cook]
- *Core.core.drs\_startup.py* - change how we index using raw and reduc output columns → keys (allows more flexible changing of header keys without rewriting full index) [Neil Cook]
- *Core.core.drs\_recipe.py* - fix how we generate file names for runs (follow file history) [Neil Cook]
- *Core.core.drs\_file.py* - add remove insuffix, control better construct filename. [Neil Cook]
- *Recipes.spirou.cal\_extract\_spirou.py* + *cal\_flat\_spirou.py* - transform localisation coefficients to master grid. [Neil Cook]
- *Science.calib.shape.py* - add *ea\_transform\_coeff* function to transform per night localisation coefficients to master grid. [Neil Cook]
- *Science.extract.berv.py* - fix problem when we don't have BERV variables (set header keys to None) [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - update shortname of *fit\_tellu*. [Neil Cook]
- Update language database. [Neil Cook]
- *Tools.module.setup.drs\_reprocess.py* - deal with fact RunSequence recipes are lost after generation (run must take inrecipe when recipe is given) [Neil Cook]
- *Tools.module.setup.drs\_reprocess.py* - deal with fact RunSequence recipes are lost after generation (run must take inrecipe when recipe is given) [Neil Cook]
- *Tools.module.setup.drs\_reprocess.py* - take out stop just use *event.is\_set*. [Neil Cook]
- *Tools.module.setup.drs\_reprocess.py* - deal with recipe finishing (but not successfully) [Neil Cook]
- *Tools.module.setup.drs\_reprocess.py* - extra stopping criteria added. [Neil Cook]
- *Tools.module.setup.drs\_reprocess.py* - extra stopping criteria added. [Neil Cook]
- *Tools.module.setup.drs\_reprocess.py* - make master stop at exception always. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.74 0.5.069 (2019-09-11)

- *Science.extract.general.py* - fix loading of tapas (in thermal correction 1) [Neil Cook]
- *Science.extract.berv.py* - fix how *berv* is obtained from header. [Neil Cook]
- *Science.calib.wave.py* - add a way to get dimensions from header (NAXIS2 and NAXIS1) if image (via infile) is not defined. [Neil Cook]
- *Recipe.spirou.obj\_fit\_tellu\_spirou.py* + *obj\_mk\_tellu\_spirou.py* + *obj\_mk\_template\_spirou.py* - continue work on telluric functions (SpirouDRS → terrapipe) [Neil Cook]
- *Recipe.spirou.cal\_extract\_spirou.py* - add fiber key to header. [Neil Cook]
- *Locale.core.drs\_text.py* - add way to deal with TextEntry args being a int/float/bool (still not a list) → list. [Neil Cook]
- Update language database. [Neil Cook]
- *Io.drs\_fits.py* - fix *find\_files* (now deals with having a fiber filter as well) [Neil Cook]
- *Io.drs\_data.py* - return both table and outfilename in *load\_tapas* function. [Neil Cook]
- *Data.spirou.reset.telludb.master\_tellu\_SPIROU.txt* - add objname to default telluDB entries. [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add outputs to telluric recipes. [Neil Cook]

- *Core.instruments.spirou.pseudo\_const.py* - fix typo in bervmaxest key. [Neil Cook]
- *Core.instruments.spirou.file\_definitions.py* - make adjustments to telluric files. [Neil Cook]
- *Core.instruments.default.output\_filenames.py* - allow suffix to be added to *set\_file*. [Neil Cook]
- *Core.instruments.\*.default\_constants/default\_keywords* - add missing *make\_tellu*, *fit\_tellu* and *make\_template* constants/keywords. [Neil Cook]
- *Core.core.drs\_file.py* - by default overwrite data if already read in *DrsFitsFile.read()* [Neil Cook]
- *Core.core.drs\_database.py* - add objname to telludb column. [Neil Cook]
- *Tools.module.setup.drs\_reprocess.py* = add total time calculation. [Neil Cook]
- *Science.telluric.general.py* - add *make\_template\_cubes* placeholder. [Neil Cook]
- *Recipe.spirou.obj\_mk\_template\_spirou.py* - first commit - port from SpirouDRS. [Neil Cook]
- *Recipe.spirou.cal\_dark\_master/cal\_spirou\_master* - update call to *find\_files*. [Neil Cook]
- *Recipe.spirou* - add *KW\_OUTPUT* (needs to be added everywhere we *copy\_hdict* to separate different files) [Neil Cook]
- Update language database. [Neil Cook]
- *Io.drs\_fits.py* - remove *find\_filetypes* and add (more generic) *find\_files* function. [Neil Cook]
- *Core.instruments.spirou.py* - add in *obj\_mk\_template*. [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add in *mk\_template* constants. [Neil Cook]
- *Core.core.drs\_database.py* - add in default mode (*CALIB\_DB\_MATCH*) [Neil Cook]
- *Core.constants.constant\_functions.py* - for bool arguments make sure they are strings to do .lower and change second if to elif. [Neil Cook]
- *Core.core.drs\_file.py* - update pep8 remove redundant lines. [Neil Cook]
- Update version/date/changelog. [Neil Cook]

#### 4.4.75 0.5.068 (2019-09-10)

- *Tools.module.setup.drs\_reprocess.py* - load “adds” when checking sequences (taken out of recipe init) [Neil Cook]
- *Science.extract.berv.py* - do not report estimate used when we are meant to be return no berv. [Neil Cook]
- *Science.calib.general.py* + *science.telluric.general.py* - need to enumerate around entries. [Neil Cook]
- *Locale.core.drs\_text.py* - cache data - do not load a textdict again for an instrument (now cached) [Neil Cook]
- *Core.math.gauss.py* - import general (for fwhm) [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add *obj\_mk\_temp*. [Neil Cook]
- *Drs\_recipe.py* - remove second deep copy (now copied internally to constants.load) [Neil Cook]
- *Core.core.drs\_file.py* - replace *KW\_DRS\_QC* with *params['KW\_DRS\_QC']* [Neil Cook]
- *Core.core.drs\_argument.py* - move textdict loading to error handling (only needed here) [Neil Cook]
- *Core.constants.param\_functions.py* - add caches to speed up loading. [Neil Cook]
- Update language database. [Neil Cook]
- Rename *obj\_mk\_tellu* and *obj\_fit\_tellu* (add *\_spirou* suffix) [Neil Cook]
- Make recipes executable. [Neil Cook]
- Update language database. [Neil Cook]
- *Obj\_fit\_tellu.py* + *obj\_mk\_tellu.py* - keep porting telluric code from SpirouDRS. [Neil Cook]
- *Recipe.spirou* - pep8 changes. [Neil Cook]
- *Core.math.\_\_init\_\_.py* - add fwhm alias. [Neil Cook]
- *Core.instruments* - add telluric constants/keywords/definitions. [Neil Cook]

#### 4.4.76 0.5.067 (2019-09-06)

- *Science.extract.berv.py* - add additional flag for when estimate is used/not used. [njcuk9999]
- *Extract.berv.py* - add *USE\_BERV*, *USE\_BJD* and *USE\_BERV\_MAX* to berv props (these are the ones that should be used and will be either estimate or barycorrpy values. [njcuk9999]
- *Science.telluric.general.py* - add *gen\_abso\_pca\_calc*, *shift\_all\_to\_frame* and *calc\_recon\_and\_correct* functions. [njcuk9999]
- *Obj\_fit\_tellu.py* - continue porting content from SpirouDRS to terrapipe. [njcuk9999]
- Update language database. [njcuk9999]
- *Core.core.drs\_database.py* - add default parameters to *get\_db\_file*. [njcuk9999]

#### 4.4.77 0.5.066 (2019-09-05)

- *Obj\_fit\_tellu.py* - update how far we have got. [njcuk9999]
- Update language database. [njcuk9999]
- *Science.calib* and *science.extract* - fix calls to *load\_calib\_file*. [njcuk9999]
- *Obj\_fit\_tellu.py/obj\_mk\_tellu.py* - continue to port from SpirouDRS to terrapipe. [njcuk9999]
- *Core.io.drs\_path.py* - add *'get\_most\_recent'* function. [njcuk9999]
- *Core.instruments* - add *mk\_tellu* constants/keywords. [njcuk9999]
- *Core.core.drs\_database.py* - change how loading works (rearrange functionality) [njcuk9999]
- *Obj\_fit\_tellu.py* - start to copy over code from SpirouDRS to terrapipe. [njcuk9999]

#### 4.4.78 0.5.065 (2019-09-04)

- Update language database. [njcuk9999]
- *Core.core.drs\_file.py* - add overall pass/fail QC key. [njcuk9999]
- *Obj\_mk\_tellu.py* - continue work on adding SpirouDRS code to terrapipe. [njcuk9999]
- *Cal\_loc\_spirou.py* - remove blank space. [njcuk9999]
- *Core.instruments* - add *mk\_tellu* constants. [njcuk9999]
- Update language database. [njcuk9999]
- *Science.rv.general.py* - remove empty lines. [njcuk9999]
- *Recipe.spirou.obj\_mk\_tellu.py* - continue copying over SpirouDRS code (*obj\_mk\_tellu*) [njcuk9999]
- *Core.maths* - split out some functions into own scripts (separate from general.py) [njcuk9999]
- *Core.instruments.spirou.py* - add *obj\_mk\_tellu* and *obj\_fit\_tellu* as DrsRecipes. [njcuk9999]
- *Core.core.drs\_database.py* - add option to get header from database file. [njcuk9999]

#### 4.4.79 0.5.064 (2019-09-02)

- *Science.calib.wave.py* - add NBPIX to wprops. [njcuk9999]
- *Core.core.drs\_startup.py* - add success and passed to outdict. [njcuk9999]
- Fix *end\_main* calls. [njcuk9999]
- *Tools.module.setup* - fix some small bugs. [njcuk9999]
- *Obj\_mk\_tellu.py* - first commit and functions ported from SpirouDrs. [njcuk9999]
- *Science.extract* - add fiber key and fix orderp logging in npy read/write functions. [njcuk9999]
- *Science.calib.wave.py* - allow *get\_wavelength* solution to force to master. [njcuk9999]
- *Science.calib.general.py* - move *load\_calib\_file* to *drs\_database*. [njcuk9999]
- Update language database. [njcuk9999]
- *Data.core.pdbrc* - update pdb rc file (print out) [njcuk9999]
- *Core.core.recipe\_definitions.py* - add *reprocess=True* to *cal\_wave* + add wave to *limited\_run*. [njcuk9999]
- *Core.instruments.\*.default\_keywords* - add fiber and *KW\_MID\_OBS\_TIME*. [njcuk9999]
- *Core.core.drs\_startup.py* - fixes to indexing + pdb debug mode and exit functionality. [njcuk9999]
- *Core.core.drs\_recipe.py* - add *output\_file* method and remove params['OUTPUTS'] [njcuk9999]
- *Core.core.drs\_file.py* - add *get\_fiber* method. [njcuk9999]
- *Core.core.drs\_database.py* - *load\_db\_file* *load\_db\_file\_from\_filename* functions. [njcuk9999]
- *Core.core.drs\_argument.py* - add a *reprocess* key as well as *required* key. [njcuk9999]
- *Recipes.spirou.\** - add *output\_file* to allow indexing to work. [njcuk9999]

#### 4.4.80 0.5.063 (2019-08-31)

- *Data.core.pdbrc* - add pdb/ipdb script to run on execution (after copying to working directory) [njcuk9999]
- *Tools.module.error.find\_error.py* *tools.module.listing.file\_explorer.py* - change exit/cleanup function calls. [njcuk9999]
- *Tools.dev.changelog.py* - change exit/cleanup function calls. [njcuk9999]
- *Science.extract.other.py* - fix problem with thermal (was returning e2ds instance not thermal e2ds instance) [njcuk9999]
- Update the exit/clean up function calls in *main* and *\_\_main\_\_* functions. [njcuk9999]

- Update language database. [njcuk9999]
- Update object query list. [njcuk9999]
- *Core.\_\_init\_\_.py* - add aliases to new exit/cleanup functions. [njcuk9999]
- *Core.instruments.default.default\_config.py* - add idebug constants. [njcuk9999]
- *Core.core.drs\_startup.py* - change the way ending is cleared up (ipdb + ll redo + locals sorting) [njcuk9999]
- *Core.core.drs\_recipe.py* - add special *set\_ipython\_return* (for idebug mode) [njcuk9999]
- *Core.core.drs\_argument.py* - add *SetIpythonReturn* class (for idebug mode) [njcuk9999]
- *Core.constants.param\_functions.py* - add *get\_relative\_folder* and. [njcuk9999]
- *Tools.module.setup.drs\_reprocess.py* - change when to lock/unlock params + handle deep copying / deletion better. [njcuk9999]
- *Tools.dev.\** - change call to *core.end\_main*. [njcuk9999]
- *Tools.bin.\** - change call to *core.end\_main*. [njcuk9999]
- *Science.calib.localisation.py* - use fiber params to get some parameters. [njcuk9999]
- *Science.calib.dark.py* - change where filetype comes from (not params) [njcuk9999]
- *Recipes.spirou.\** - change call to *core.end\_main*. [njcuk9999]
- *Core.instruments.\*pseudo\_const.py* - fix writing to params (now *fiber\_params*) [njcuk9999]
- *Drs\_startup.py* - get params from *llmain*. [njcuk9999]
- *Param\_functions.py* - add a way to set while being locked (only for use when really know what you are doing) [njcuk9999]

#### 4.4.81 0.5.062 (2019-08-30)

- *Tools.module.setup.drs\_reprocess.py* - fix copying (deep copy) [njcuk9999]
- *Tools.dev.changelog.py* - fix *end\_main* and *get\_locals()* [njcuk9999]
- *Tools.bin.\** - fix main function (*end\_main* + *get\_locals*) [njcuk9999]
- *Science.extract.other.py* - remove params['QC'] -> passed. [njcuk9999]
- *Science.extract.general.py* - fix *order\_profiles* (must be *DrsNpyFile*) [njcuk9999]
- *Science.calib.wave.py* - continue work to get *cal\_wave\_spirou.py* to work. [njcuk9999]
- *Science.calib.shape.py* - fix spelling in comment. [njcuk9999]
- *Recipe.spirou.\** - remove params['QC'] -> passed, fix *core.end\_main* params call. [njcuk9999]
- Update the language database. [njcuk9999]
- *Core.instruments.spirou.recipe\_definitions.py* - add a *hcmode* and *fpmode* (for changing the *WAVE\_MODE\_HC* and *WAVE\_MODE\_FP*) [njcuk9999]
- *Output\_filenames.py* - add output function to *func\_name* (for error printing - need to locate the problem better) [njcuk9999]
- *Core.core.instruments* - deal with copying better (deep copies) + check used/unused keys. [njcuk9999]
- *Core.core.drs\_startup.py* - deal with copying params better + lock after copies. [njcuk9999]
- *Core.core.\** - deal with deep copying better. [njcuk9999]
- *Core.constants.param\_functions.py* - add locking/unlocking function - stop setting keys to params. [njcuk9999]

#### 4.4.82 0.5.061 (2019-08-29)

- *Science.rv.general.py* - fix tabbing typo + other fixes (found after first run) [njcuk9999]
- *Science.calib.shape.py* - fix error in log args (C pos 3 -> 4) [njcuk9999]
- *Cal\_wave\_spirou.py* + *science.calib.wave.py* - continue work on converting *spiroudrs* to *terrapipe*. [njcuk9999]
- *Recipes.spirou.cal\_shape\_spirou.py* - add shape keywords. [njcuk9999]
- *Recipes.spirou.cal\_extract\_spirou.py* - add shape keywords. [njcuk9999]
- Update language database. [njcuk9999]
- *Io.drs\_data.py* - add colnames to *ccf\_mask\_data* function. [njcuk9999]
- *Core.\_\_init\_\_.py* - add *fiber\_processing\_update*. [njcuk9999]
- *Core.math.general.py* - fix *nanpolyfit* (if *kwargs['w']* is *None* it breaks) [njcuk9999]
- *Core.instruments.spirou.recipe\_definitions.py* - add new wave fp outputs. [njcuk9999]
- *Core.instruments.spirou.file\_definitions.py* - add wave definitions and make sure name == *KW\_OUTPUT*. [njcuk9999]



- *Data.spirou.ccf* - add CCF masks. [njcuk9999]
- *Core.instruments.\*.output\_filenames.py* - add *set\_file* function. [njcuk9999]
- *Core.instruments.\** - add wave constants/keyword args. [njcuk9999]
- *Core.core.drs\_startup.py* - *get\_file\_definition* needs to remove fiber if present + add function 'fiber\_processing\_update' [njcuk9999]
- *Core.core.drs\_file.py* - add group option to *copy\_original\_keys* (including checking *\_check\_keyworddict*) [njcuk9999]
- *Core.constants.param\_functions.py* - add *get\_keyword\_instances* (for obtaining dictionary of header keys linked to params + their instances) [njcuk9999]
- *Core.constants.constant\_functions.py* - add group. [njcuk9999]
- *Cal\_wave\_spirou.py* - corrections from Melissa commit + *nanpolyfit* change. [njcuk9999]

#### 4.4.83 0.5.060 (2019-08-28)

- *Tools.module.setup.drs\_reprocess.py* - fix updating keys in Run (runstring/args/kwargs), deal with wrong nightname. [njcuk9999]
- Update language database. [njcuk9999]
- *Io.drs\_fits.py* - correct formatting of Time (need to use dtype) [njcuk9999]
- *Core.instruments.spirou.default\_keywords.py* - correct typo in constants. [njcuk9999]

#### 4.4.84 0.5.059 (2019-08-27)

- *Science.rv.general* - add *get\_ccf\_mask*, *coravelation*, *delta\_v\_rms\_2d* *calculate\_ccf* *correlbin* and *fit\_ccf* functions. [njcuk9999]
- *Cal\_wave\_spirou.py* - continue updating from SpirouDRS -> terrapipe. [njcuk9999]
- Update language database. [njcuk9999]
- Update language database. [njcuk9999]
- *Drs\_data.py* - add *load\_ccf\_mask* function. [njcuk9999]
- *Core.math.\** - add *fitgauss*, *get\_dll* and *get\_ll* functions. [njcuk9999]
- *Core.instruments.\*.py* - continue adding wave constants/keywords. [njcuk9999]
- *Drs\_reprocess.py* - fix the return to *self.find\_recipe*. [njcuk9999]
- *Drs\_reprocess.py* - fix the return to *self.find\_recipe*. [njcuk9999]

#### 4.4.85 0.5.058 (2019-08-22)

- *Neil\_TODO.md* - currently needed before release of terrapipe. [Neil Cook]
- *Tools.module.setup.drs\_reprocess.py* - change *SystemExit* to *LogExit*. [Neil Cook]
- *Science.calib.wave.py* - continue convert spiroudrs wave fp solution to terrapipe. [Neil Cook]
- Update test files with new *\_\_main\_\_* and exception handling (from default and spirou) [Neil Cook]
- Update language database. [Neil Cook]
- *Drs\_exceptions.py* - add *LogExit* and *Exit* classes. [Neil Cook]
- *Io.drs\_text.py* - add save text file. [Neil Cook]
- *Terrapipe.io.drs\_data.py* - add load + save cavity files. [Neil Cook]
- *Core.instruments.\** - add *WAVE\_FP* constants. [Neil Cook]
- *Core.core.drs\_startup.py* - change *SystemExit* catch to *LogExit* catch. [Neil Cook]
- *Core.core.drs\_log.py* - change exit system (now via *LogExit*) [Neil Cook]
- *SpirouWAVE2.py* - another question for Melissa. [Neil Cook]

#### 4.4.86 0.5.057 (2019-08-21)

- *Science.calib.wave.py* - continue to add wave fp code. [Neil Cook]
- Update language database. [Neil Cook]
- *SpirouWAVE2.py* - add a todo on progress of terrapipe adding. [Neil Cook]
- *Cal\_wave\_spirou.py* - continue adapting SpirouDRS wave codes to terrapipe. [Neil Cook]
- *Science.rv.general.py* - add *measure\_fp\_peaks* (*create\_drift\_file*) and *remove\_wide\_peaks*. [Neil Cook]

- *Core.math.general.py* - add *gauss\_function*. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments.\** - continue to add *wave\_fp* constants. [Neil Cook]

#### 4.4.87 0.5.056 (2019-08-21)

- *Constants\_SPIROU\_H4RG.py* - add comments for @melissa-hobson to try to explain. [Neil Cook]
- *Cal\_wave\_spirou.py* and *science.calib.wave.py* - continue work on converting from SpirouDRS. [Neil Cook]
- *Cal\_loc\_spirou.py* - fix comment indentation. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments.spirou.file\_definitions.py* - add *out\_wave\_hc*, *out\_wave\_fp*, *out\_wave\_hcline*, *out\_wave\_hcres* and update recipe definitions accordingly. [Neil Cook]
- *Core.instruments.\** - continue adding wave constants + keywords. [Neil Cook]
- *Core.core.drs\_file.py* - fix *add\_hkey\_1d* function (no longer using *kwstore* in same way) [Neil Cook]

#### 4.4.88 0.5.055 (2019-08-19)

- *Science.calib.wave.py* - continued integration of wave from SpirouDRS. [Neil Cook]
- *Cal\_wave\_spirou.py* - update call to *wave.hc\_wavesol*. [Neil Cook]
- *Core.math.general.py* - add *fit\_gauss\_with\_slope* function. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments* - add wave constants. [Neil Cook]
- *Core.constants.param\_functions.py* - *\_map\_listparameter* and *\_map\_dictparameter* - deal with value == '' [Neil Cook]
- *SpirouWAVE2.py* - clean up (for integration into terrapipe) [Neil Cook]

#### 4.4.89 0.5.054 (2019-08-16)

- *Tools.module.setup.drs\_reprocess.py* - change how *find\_recipe* works. [Neil Cook]
- *Science.extract.other.py* - add other extraction functions (specifically for extracting files in recipes) [Neil Cook]
- *Recipe.spirou.cal\_wave\_spirou.py* - start conversion of *cal\_wave* / *wave.py*. [Neil Cook]
- *Recipes.spirou.\*.py* - add *DATA\_DICT* and change average/sum to median for combining. [Neil Cook]
- Update language database. [Neil Cook]
- *Io.drs\_image.py* - only check fiber in *params['inputs']* if it is in *inputs*. [Neil Cook]
- *Core.instruments.recipe\_definitions.py* - add *cal\_wave*. [Neil Cook]
- *Core.instruments.file\_definitions.py* - add *out\_hcline*. [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add wave constants. [Neil Cook]
- *Core.core.drs\_startup.py* - add *DATA\_DICT* functionality + *recipemod* saving. [Neil Cook]
- *Core.core.drs\_recipe.py* - add unset *recipemod* to recipe class. [Neil Cook]
- *Core.core.drs\_file.py* - change combine to include median. [Neil Cook]
- Merge branch 'melissa' into dev. [Neil Cook]
- **Conflicts:** *INTROOT/config/constants\_SPIROU\_H4RG.py* *INTROOT/misc/cal\_HC\_E2DS\_spirou.py*
- *Cal\_wave\_spirou*: new QC: consecutive pixels along an order must have increasing wavelengths. [melissa-hobson]
- Merge remote-tracking branch 'origin/melissa' into melissa. [Melissa Hobson]
- **Conflicts:** *INTROOT/bin/cal\_CCF\_E2DS\_FP\_spirou.py* *INTROOT/misc/cal\_CCF\_wrap\_MH.py*
- *SpirouWAVE2* - bug fixes. [melissa-hobson]
- *SpirouWAVE2.py* - implementation of *fit\_1d\_solution* method for *wave\_new*. [melissa-hobson]
- *SpirouWAVE2.py* - move polynomial fitting to function. [melissa-hobson]
- *SpirouWAVE2* - corrections to saves for line list table. [melissa-hobson]
- *Cal\_wave\_spirou*, *spirouWAVE2.py* - fixed line list table for *wave\_new* method. [melissa-hobson]
- *Cal\_wave\_spirou*, *spirouWAVE2.py* - fixed results table for *wave\_new* method. [melissa-hobson]
- *SpirouPlot*, *spirouWAVE2* - plot fixes. [melissa-hobson]
- Merge branch 'melissa' of [https://github.com/njcuk9999/spirou\\_py3](https://github.com/njcuk9999/spirou_py3) into melissa. [melissa-hobson]

- *Constants\_SPIROU\_H4RG*: added wave constants *spirouPlot.py*: added plots for *cal\_wave\_new spirouWAVE2.py* - *cal\_wave\_new* adaptation - *update\_cavity* switch and proper paths, plots moved to *spirouPlot*, fitting cleaned up. [melissa-hobson]
- *Cal\_wave\_new\_final* save. [melissa-hobson]
- *Cal\_HC\_E2DS\_EA* - corrected QC mistake. [melissa-hobson]
- *Constants\_SPIROU\_H4RG*: added wave constants *spirouPlot.py*: added plots for *cal\_wave\_new spirouWAVE2.py* - *cal\_wave\_new* adaptation - *update\_cavity* switch and proper paths, plots moved to *spirouPlot*. [melissa-hobson]
- *Constants\_SPIROU\_H4RG*: added wave constants for FP peak ID *spirouWAVE2.py* - *cal\_wave\_new* adaptation - FP peak ID. [melissa-hobson]
- *Constants\_SPIROU\_H4RG*: added wave constants *spirouWAVE2.py* - *cal\_wave\_new* adaptation. [melissa-hobson]
- *SpirouWAVE2.py* - clarification of *all\_lines* creation; fix of start and end orders for FP method 0; common parts of FP solution (Littrow, CCF) moved outside if loop. [melissa-hobson]
- *Cal\_wave\_spirou.py*, *spirouWAVE2* - cleanup. [melissa-hobson]
- *Cal\_wave\_spirou.py* - bug fixes. [melissa-hobson]
- *Cal\_wave\_spirou.py*, *spirouWAVE2.py* - C Lovis method incorporation. [melissa-hobson]
- *Cal\_wave\_spirou.py*, *spirouWAVE2.py* - creation of single unified wavelength solution codes. [melissa-hobson]
- *Cal\_WAVE\_NEW\_E2DS\_spirou\_2.py* - fixes to correctly handle NaNs. [melissa-hobson]
- *Cal\_HC\_E2DS\_EA*, *cal\_WAVE\_E2DS\_EA*: New QC that verifies that the difference in wavelength fits between consecutive orders is positive. [melissa-hobson]
- *SpirouWAVE.py*, *spirouRV.py* - fixes to correctly deal with NaN warnings. [melissa-hobson]
- *SpirouWAVE.py* - in *find\_hc\_gauss\_peaks*, segments with fewer not-nan values than gaussian parameters + 1 are ignored. [melissa-hobson]
- Merge branch 'master' into melissa. [melissa-hobson]  
 # Conflicts: # INTROOT/bin/cal\_CCF\_E2DS\_FP\_MH\_spirou.py # INT-  
 ROOT/bin/cal\_CCF\_E2DS\_FP\_spirou.py # INTROOT/misc/cal\_CCF\_wrap\_MH.py # INT-  
 ROOT/misc/cal\_WAVE\_NEW\_E2DS\_spirou\_2.py
- Merge remote-tracking branch 'origin/melissa' into melissa. [melissa-hobson]  
 # Conflicts: # INTROOT/bin/cal\_CCF\_E2DS\_FP\_spirou.py # INT-  
 ROOT/misc/cal\_CCF\_wrap\_MH.py
- Cal CCF bla. [melissa-hobson]
- Merge branch 'master' into melissa. [Melissa Hobson]  
**Conflicts:** INTROOT/bin/cal\_CCF\_E2DS\_FP\_MH\_spirou.py INTROOT/bin/cal\_CCF\_E2DS\_FP\_spirou.py  
 INTROOT/misc/cal\_CCF\_wrap\_MH.py INTROOT/misc/cal\_WAVE\_NEW\_E2DS\_spirou\_2.py
- *Cal\_HC* function updates *cal\_WAVE\_NEW* save all input files. [melissa-hobson]
- *Cal\_CCF\_MH*: allows wavesols as arguments *cal\_CCF\_wrap*: calls all CCFs. [melissa-hobson]
- *Cal\_WAVE\_E2DS\_EA*: fix wave file reading. [melissa-hobson]
- *Recipes.spirou.cal\_wave\_spirou.py* - first commit. [Neil Cook]

#### 4.4.90 0.5.053 (2019-08-15)

- *Tools.module.setup.drs\_reprocess.py* - correct how we determine whether we have errors in odict. [Neil Cook]
- *Core.instruments.spirou.py* - add *hc\_run*. [Neil Cook]
- Update object list. [Neil Cook]
- *Tools.module.setup.drs\_reprocess.py* - add shortname to processing list and skip RUN=False before generation (speed up) [Neil Cook]
- *Science.extract.berv.py* - make columns lower case (to fix table) [Neil Cook]
- *Core.core.drs\_startup.py* - lock before making directories (for parallisation) [Neil Cook]
- Update language database. [Neil Cook]
- *Science.preprocessing.identification.py* - fix problem shallow copying fileset instance (use completecopy) [Neil Cook]
- *Science.preprocessing.detector.py* - add dx/dy and suppress warnings for nan problems in pp functions. [Neil Cook]
- *Science.calib.\** - change times to *mid\_obs\_time* + change *debug\_back* to recipe.outputs definition. [Neil Cook]

- Berv - shift around berv code + make time used come from *mid\_obs\_time*. [Neil Cook]
- *Cal\_preprocess\_spirou.py* - add in fix for 1 pixel shift + add in calculation of mid observation time. [Neil Cook]
- Update language database. [Neil Cook]
- *Drs\_fits.py* - add *header\_end\_time* and *get\_mid\_obs\_time* functions. [Neil Cook]
- *Core.instrument.spirou.recipe\_definitions.py* - add *debug\_back* to outputs. [Neil Cook]
- *Core.instruments.\*.file\_defintions.py* - move *debug\_back* to instrument setup. [Neil Cook]
- *Drs\_database.py* - correct typo need to return t for *get\_mid\_obs\_time* call. [Neil Cook]
- *Core.instruments.\*.py* - add new time constants. [Neil Cook]
- *Drs\_database.py* - go from *start\_time* -> *mid\_obs\_time*. [Neil Cook]

#### 4.4.91 0.5.052 (2019-08-14)

- Update object query list. [Neil Cook]
- Update language database. [Neil Cook]
- Reprocessing fix - continue work. [Neil Cook]

#### 4.4.92 0.5.051 (2019-08-13)

- Reprocessing - continue work on reprocessing. [Neil Cook]
- Reprocessing - continue work on reprocessing. [Neil Cook]
- *Recipe.spirou.cal\_thermal\_spirou.py* - fix bug with *THERMAL\_E2DS\_FILE* -> *recipe.outputs['THERMAL\_E2DS\_FILE']* [Neil Cook]
- *Data.core.object\_query\_list.fits* - update query list. [Neil Cook]
- *Core.instruemnts.spirou.recipe\_definitions.py* - update shortnames + add science run. [Neil Cook]
- *Core.core.drs\_recipe.py* - copy arguments/files properly (avoid shallow copying) [Neil Cook]
- *Core.core.drs\_log.py* - add printmessage to WLOG. [Neil Cook]
- *Core.core.drs\_file.py* - allow copying of drsfiles (required to allow recipe copying) [Neil Cook]
- *Core.core.drs\_argument.py* - add changes to allow copying of arguments (needed for new recipe copies) [Neil Cook]
- *Drs\_reprocess.py* - fix problems with modulemain. [Neil Cook]
- *Recipes.spirou.cal\_extract\_spirou* - remove unused imports. [Neil Cook]
- *Core.instrument.\** - add reprocessing constants. [Neil Cook]
- *Drs\_startup.py* - every call to *import\_module* should call *func\_name* (so we know where they come from) [Neil Cook]
- *Drs\_recipe.py* - remove *\_import\_module* without path. [Neil Cook]
- *Core.constants.param\_functions.py* - every call to *import\_module* should have *func\_name* as argument (so we know where it came from) [Neil Cook]
- *Core.constants.constant\_functions.py* - every use of *import\_module* should have '*func\_name*' as argument (so we know where it came from) [Neil Cook]
- *Recipes.spirou.cal\_badpix\_spirou.py* - fix bug BACKMAP -> *recipe.outputs['BACKMAP']* [Neil Cook]
- Update old version file. [Neil Cook]
- Update changelog/version/date. [Neil Cook]

#### 4.4.93 0.5.050 (2019-08-12)

- Tools.reprocess - add processing (linear/parallel) functionality. [Neil Cook]
- *Science.telluric.general.py* - first commit - add *get\_whitelist* and *get\_blacklist* functions. [Neil Cook]
- Update language database. [Neil Cook]
- *Drs\_text.py* - first commit - add text reading functionality. [Neil Cook]
- *Io.drs\_data.py* - add *load\_text\_file* functionality. [Neil Cook]
- *Data.spirou.telhu\_\*list.txt* - add telluric black/white list. [Neil Cook]
- Core.instruments - add white/black list for tellurics (needed for reprocessing) [Neil Cook]
- *Core.core.drs\_startup.py* - get recipe definitions module from call. [Neil Cook]
- *Drs\_recipe.py* - changes to *generate\_runs*. [Neil Cook]
- *Core.core.drs\_file.py* - outfile should just be the basename. [Neil Cook]

#### 4.4.94 0.5.049 (2019-08-10)

- *Drs\_reprocess.py* - address new bugs. [Neil Cook]
- *Drs\_reprocess.py* - address new bugs. [Neil Cook]
- *Core.instruments* - add outfunc=out.blank (and blank description) [Neil Cook]
- *Drs\_recipe.py* - add return of runs. [Neil Cook]
- *Drs\_reprocessing.py* - update for continued work on reprocessing. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments* - add reprocessing constants. [Neil Cook]
- *Drs\_file.py* - add functionality for reprocessing. [Neil Cook]

#### 4.4.95 0.5.048 (2019-08-08)

- *Tools.reset.py* - remove *update\_params* and set *\_\_INSTRUMENT\_\_* from recipe update. [Neil Cook]
- *Reprocess.py/drs\_reprocess.py* - continue work on reprocessing (unfinished) [Neil Cook]
- *Cal\_preprocess\_spirou.py* - allow skipping of files if done and *-skip=True*. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.\_\_init\_\_.py* - remove *update\_params* (now done in setup) [Neil Cook]
- *Core.instruments.spirou.recipe\_definitions.py* - add file module to DrsRecipe calls, add shortname and master to master recipes, add section defining run sequences (run order + filters) [Neil Cook]
- *Core.instruments.spirou.py* - add outfunc for *pp\_file*. [Neil Cook]
- *Core.instruments.\*.output\_filenames.py* - fix how *\_calibration\_prefix* works and add an error if “outpath” is None. [Neil Cook]
- *Core.instruments.\*.default\_constants.py* - add and update constants. [Neil Cook]
- *Drs\_startup.py* - update parameters if instrument is in inputs (go from no instrument to using an instrument) [Neil Cook]
- *Drs\_recipe.py* - add copy function to DrsRecipe add DrsRunSequence class. [Neil Cook]
- *Drs\_argument.py* - remove debug print statement. [Neil Cook]

#### 4.4.96 0.5.047 (2019-08-07)

- *Drs\_reprocess.py* - add RUN and SKIP names (unfinished) [Neil Cook]
- Add outfiles from recipe.outputs. [Neil Cook]
- *Recipe\_definitions.py* - add *set\_outputs* and outputs to all recipes. [Neil Cook]
- *Drs\_recipe.py* - add *set\_outputs* method and outputs attribute (for adding output file definitions to files) [Neil Cook]

#### 4.4.97 0.5.046 (2019-08-06)

- *Tools.bin* - first commit of reprocessing (not finished) [Neil Cook]
- Update language database. [Neil Cook]
- *Io.drs\_table.py* - fix problem with no *data\_start* keyword in *fnt='fits'* [Neil Cook]
- *Core.instruments* - add in reprocessing constants. [Neil Cook]
- *Core.core.drs\_startup.py* - allow *find\_recipe* not be non-private. [Neil Cook]
- *Core.core.drs\_recipe.py* - add a way to skip checks (for getting arg list from runlist) [Neil Cook]
- *Core.core.drs\_argument.py* - add a way to skip checks (for getting arg list from runlist) [Neil Cook]
- *Core.constants.constant\_functions.py* - modify *import\_module* to have quiet mode. [Neil Cook]
- Update todo statements (more specific) [Neil Cook]

#### 4.4.98 0.5.045 (2019-07-27)

- *Sciecn.e.extract.extraction.py* - remove use of *params['FIBER']* [Neil Cook]
- *Sciecn.e.extract.berv.py* - fix *assign\_properties*. [Neil Cook]
- *Science.calib.\** - add in the option to get filename from call and from *params['INPUTS']* [Neil Cook]
- *Cal\_thermal\_spirou.py* - check if *cal\_extract* (for the *DARK\_DARK*) failed before continuing. [Neil Cook]

- *Cal\_shape\_master\_spirou.py* - remove use of params['FIBER'] [Neil Cook]
- *Cal\_loc\_spirou.py* - remove use of params['FIBER'] [Neil Cook]
- *Cal\_flat\_spirou.py* - remove use of params['FIBER'] [Neil Cook]
- *Cal\_extract\_spirou.py* - add options to skip on DPRTYPE and OBJNAME. [Neil Cook]
- Update language database. [Neil Cook]
- *Io.drs\_image.py* - remove use of params['FIBER'] [Neil Cook]
- *Recipe\_definitions.py* - add more options (calibration files) [Neil Cook]
- *Pseudo\_const.py* - remove use of params['FIBER'] [Neil Cook]
- *File\_definitions.py* - add KW\_OBSTYPE to raw files. [Neil Cook]
- *Pseudo\_const.py* - remove use of params['FIBER'] [Neil Cook]
- *Recipe\_definition* - replace kwarg -> *set\_kwarg* and arg -> *set\_arg*. [Neil Cook]
- Update language database. [Neil Cook]
- *Berv.py* - add things left to do. [Neil Cook]
- Update *example\_run\_list.txt*. [Neil Cook]
- Update *example\_run\_list.txt*. [Neil Cook]
- *Core.instruments.spirou.file\_defintions.py* - correct suffix for *out\_shape\_debug\_ihc*. [Neil Cook]
- *Cal\_flat\_spirou.py* - correct order call. [Neil Cook]
- *Misc.update\_wave\_header.py* - script to update *master\_wave* header with new keys. [Neil Cook]
- *Misc.example\_run\_list.txt* - list of test codes to run (while reprocessing script is being built) [Neil Cook]
- Tools.bin - add reset code (formally *cal\_reset.py*) [Neil Cook]
- *Identification.py* - fix *drs\_outfile\_id* to find files with a different prefix. [Neil Cook]
- Science.calib - *get\_file\_definition* must specify kind (raw/tmp/red) [Neil Cook]
- *Cal\_preprocess\_spirou.py* - correct problems with *drs\_outfile\_id*. [Neil Cook]
- *Cal\_dark\_master\_spirou.py* - deal with no dark files being found. [Neil Cook]
- *Drs\_data.py* - *construct\_filename* function all filename/directory name to be unset. [Neil Cook]
- Data.spirou.reset - update *MASTER\_WAVE.fits* (new header keys) [Neil Cook]
- *Core.\_\_init\_\_.py* - add some new aliases and rearrange order. [Neil Cook]
- Update language database. [Neil Cook]
- Core.instruments - add reset functionality + small fixes to run codes. [Neil Cook]
- *Core.core.drs\_startup.py* - pipe errors in main end script to WLOG (were just raising) + add function *update\_params* (to update param with instrument params) [Neil Cook]
- *Core.core.drs\_recipe.py* - add exceptions for bad sys.argv and misbehaving parsing to argparse. [Neil Cook]
- *Core.core.drs\_file.py* - fix error message (should be the drs file not just the name) [Neil Cook]
- Data.spirou.reset - add reset files for calibdb and telludb. [Neil Cook]
- Reorganisation of the tools folder. [Neil Cook]
- Tools - update tools now have bin folder and dev folder (rest are modules) [Neil Cook]
- *Science.calib.shape.py* - add log for *ea\_transform*. [Neil Cook]
- Update language database. [Neil Cook]
- *Object\_query\_list.fits* - first commit - the gaia query database (so we don't have to query online every time) [Neil Cook]
- *Science.extract.general.py* - fix problems with thermal. [Neil Cook]
- *Science.extract.crossmatch.py* - correction to new berv functionality including plx limit and mag limit. [Neil Cook]
- *Science.extract.berv.py* - correction to new berv functionality (including dberv and rv when present) [Neil Cook]
- *Cal\_loc\_spirou.py* - add calibs to header. [Neil Cook]
- *Cal\_extract\_spirou.py* - add rest of the cdb keywords. [Neil Cook]
- *Drs\_data.py* - correct problems with *construct\_filename* and add unique error message for *obj\_list* function. [Neil Cook]
- *Core.math.general.py* - apply fix #567 by @melissa-hobson. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments.\** - added calibration and extraction (berv) keyword defintions. [Neil Cook]
- *SpirouMath.py* - correct issue #567 (fix by @melissa-hobson) [Neil Cook]

#### 4.4.99 0.5.043 (2019-07-25)

- *Science.extract.berv.py* - add features to query gaia / lookup table. [Neil Cook]

- `.gitignore` - add `.lock` to ignore list. [Neil Cook]
- `Science.extract.crossmatch.py` - first commit – adding to query gaia/lookup table. [Neil Cook]
- `Science.extract.extraction.py` - change warning keys 0016 -> 016. [Neil Cook]
- `Cal_extract_spirou.py` - fix typo `add_berv_keys` requires params. [Neil Cook]
- `Drs_data.py` - add return file option to data functions. [Neil Cook]
- Update language database. [Neil Cook]
- `Core.instruments` - add `obj_list` constants (for gaia crossmatch) [Neil Cook]
- `Param_functions.py` - add `set_instance` and `set_instances`. [Neil Cook]

#### 4.4.100 0.5.042 (2019-07-23)

- `Science.extract.berv.py` - continue work on adding berv calculation. [Neil Cook]
- `Cal_extract_spirou.py` - add header to `get_berv`. [Neil Cook]
- `Dsr_fits.py` - use `param.instances` to get `fnt` and `dtype` for `KW_ACQTIME`. [Neil Cook]
- `Core.constants` - add instance dictionary (like source dictionary) for `ParamDict`. [Neil Cook]
- Update language database. [Neil Cook]
- `Core.instruments.*` - add constants for berv. [Neil Cook]
- `Changelog.md`: refactor `header_time` -> `header_start_time`. [Neil Cook]
- `Science.extract` - add berv functionality. [Neil Cook]
- `Science.extract.wave.py` - add function `add_wave_keys`. [Neil Cook]
- `Science.calib.dark/shape` - refactor `header_time`->`header_start_time`. [Neil Cook]
- `Cal_extract_spirou.py` - add berv stuff. [Neil Cook]
- Update language database. [Neil Cook]
- `Io.drs_fits.py` - rename `header_time` -> `header_start_time`. [Neil Cook]
- `Drs_database.py` - rename `header_time` -> `header_start_time`. [Neil Cook]

#### 4.4.101 0.5.041 (2019-07-19)

- `Science.extract.general.py` - correct typo: `red_limt` -> `red_limit`. [Neil Cook]
- `Science.extract.general.py` - correct `corrtype2` type: `THERMAL_CORRETION_TYPE1` -> `THERMAL_CORRETION_TYPE2`. [Neil Cook]
- `Cal_extract_spirou.py` - print process of extraction fiber {0} of [{0} {1} {2}] [Neil Cook]
- Update language database. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.102 0.5.040 (2019-07-19)

- `Science.extract.general.py` - add `s1d` functionality and add log message to thermal correction. [Neil Cook]
- `Science.calib.wave.py` - get the `wfp` keys and store in `wprops`. [Neil Cook]
- `Science.calib.localisation.py` - return `locofile` instance with localisation properties. [Neil Cook]
- `Science.calib.flat_blaze.py` - correct `blaze` getting function (was set to get flat) [Neil Cook]
- `Cal_extract_spirou.py` - add `s1d` functionality. [Neil Cook]
- Update language database. [Neil Cook]
- `Drs_fits.py` - fix problem that table cannot be primary hdu (start from `ext=1` in these cases) [Neil Cook]
- `Core.instruments` - add `s1d` constants. [Neil Cook]
- `Drs_file.py` - fix `hdict` copying header cards, make sure header keys only copy `basename` for paths, add key formatting for 1d and 2d keys. [Neil Cook]

#### 4.4.103 0.5.039 (2019-07-18)

- `Science.extract.general.py` - fix typo “`red_limt`” -> “`red_limit`” [Neil Cook]
- `Wave.py` - make wave master use specific fibers and search for file definition. [Neil Cook]
- `Shape.py` - correct program with shape finding (`dymap y0[:, ix]` -> `y0[:, dim2//2]`) [Neil Cook]
- `Cal_thermal_spirou.py` - add program name for when `cal_thermal` uses `cal_extract` (`thermal_extract`), make sure header is added to outfile before adding to `calibDB`. [Neil Cook]

- *Cal\_flat\_spirou.py* - add textentry for qc fail message (missed before) [Neil Cook]
- *Cal\_extract\_spirou.py* - update QC should just check for NaN image. [Neil Cook]
- *Drs\_table.py* - remove “data\_start” for fits files (in *read\_table*) [Neil Cook]
- *File\_definitions.py* - add wavem file and correct thermal file (should be a *general\_file* not a *calib\_file*) [Neil Cook]
- *Drs\_startup.py* - always plot the header line before file processing message. [Neil Cook]
- *Drs\_database.py* - update the error when there is not hdct or header present (must be one or the other) [Neil Cook]
- *Drs\_argument.py* - make debug message a text entry. [Neil Cook]
- Update language database. [Neil Cook]
- *SpirouImage.py* - fix the shape problem with dymap bending (fit y0 for center pixel not ix'th pixel) [Neil Cook]
- Data.core - add *tapas\_all\_sp.fits*. [Neil Cook]
- *Extract.general.py* - continue to port thermal correction code. [Neil Cook]
- *Shape.py* - remove test cases for dymap generation (still unfixed/unworking) [Neil Cook]
- *General.py* - reorganise *load\_calib\_file* (no *load\_calib\_table*) [Neil Cook]
- *Drs\_image.py* - allow fiber type “ALL” [Neil Cook]
- *Drs\_data.py* - add *load\_tapas*. [Neil Cook]
- *Core.\_\_init\_\_.py* - *copy\_kwargs* alias. [Neil Cook]
- *Cal\_extract/cal\_thermal* - continue work on porting from spirou drs. [Neil Cook]
- Update language database. [Neil Cook]
- Core.instruments - add constanst for extraction (thermal mostly) [Neil Cook]
- *Drs\_startup.py* - add *copy\_kwargs* function. [Neil Cook]
- *Drs\_recipe.py* - add *set\_program* special argument. [Neil Cook]
- *Drs\_log.py* - set default values for params. [Neil Cook]
- *Drs\_argument.py* - correct how to handle string instead of list for files. [Neil Cook]
- *SpirouImage.py* - remove test cases. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - correct comment. [Neil Cook]

#### 4.4.104 0.5.037 (2019-07-10)

- Extraction/flat/blaze - continue work to port changes from spiroudrs. [Neil Cook]
- Extraction/flat/blaze - continue work to port changes from spiroudrs. [Neil Cook]
- Update language database. [Neil Cook]
- *Recipe\_definitions.py* - change -extfiber to -fiber. [Neil Cook]
- *Pseudo\_const.py* - update constants (add *FIBER\_DATA\_TYPE*) [Neil Cook]
- *SpirouMath.py* - pep8 change. [Neil Cook]
- *Cal\_shape\_master\_spirou.py* - fix problem FP file should be FPfiles. [Neil Cook]
- *Science.extract.py* - work on completing the extraction functions (for *cal\_flat*) [Neil Cook]
- *Science.calib.shape.py* - fix getting the calibration files (don't want to use *file\_definitions* for specific instrument) [Neil Cook]
- *Science.calib.localisation.py* - fix *load\_orderp*. [Neil Cook]
- *Science.calib.general.py* - check dtype in *add\_calibs\_to\_header*. [Neil Cook]
- *Cal\_flat\_spirou.py* - continue porting over code from spiroudrs. [Neil Cook]
- *Recipes.spirou.py* - add missing keywords to header. [Neil Cook]
- Update language database. [Neil Cook]
- *Drs\_image.py* - fix *get\_fiber\_types*. [Neil Cook]
- *Drs\_fits.py* - add *check\_dtype\_for\_header* function. [Neil Cook]
- *Recipe\_definitions.py* - remove extract method. [Neil Cook]
- *Pseudo\_const.py* - add *FIBER\_WAVE\_TYPES*. [Neil Cook]
- *Core.instruments.spirou.file\_definitions.py* - fix types in calls. [Neil Cook]
- *Core.instruments..output\_filenames.py* - tweak *numpy\_file*. [Neil Cook]
- *Core.instruments.py* - add *cal\_flat* constants/keywords. [Neil Cook]
- *Drs\_startup.py* - make sure name == file.name if we aren't returning all files. [Neil Cook]
- *Drs\_log.py* - add dtype to allow listp/dictp to test/convert elements before returning. [Neil Cook]
- *Drs\_file.py* - fix NpyFile to overwrite needed functions of InputFile. [Neil Cook]
- *Core.constants.param\_function.py* - modify params.listp and params.dictp to add a dtype for list/dict ele-



ments. [Neil Cook]

#### 4.4.105 0.5.035 (2019-07-08)

- Update language database. [Neil Cook]
- *Science.extraction.py* - first commit (port from spiroudrs) [Neil Cook]
- *Science.calib.shape.py* - change shape files to load from *general.load\_calib\_file*. [Neil Cook]
- *Science.calib.localisation.py* - add *load\_orderp*. [Neil Cook]
- *Science.calib.general.py* - add *load\_calib\_file* and *load\_calib\_table*. [Neil Cook]
- *Cal\_extract\_spirou.py/cal\_flat\_spirou.py* - start porting code. [Neil Cook]
- *Drs\_image.py* - add function *get\_fiber\_types*. [Neil Cook]
- *Drs\_data.py* - change error code. [Neil Cook]
- *File\_definitions.py* - add *drs\_ninput* and *out\_orderp\_straight*. [Neil Cook]
- *Output\_filenames.py* - add *numpy\_file*. [Neil Cook]
- *Drs\_log.py* - allow *find\_param* (pcheck) to get listp or dictp as well as constant. [Neil Cook]
- *Drs\_file.py* - add *DrsNpyFile* and move some functionality to *DrsInputFit*. [Neil Cook]
- *Param\_functions.py* - add *\_map\_dictparameter* and redefine *\_map\_listparameter*. [Neil Cook]
- *Science.calib.shape.py* - update how shape files are obtained from calibDB (including new function *get\_shapelocal*) [Neil Cook]
- *Science.calib.localisation.py* - update how we get loco files from calibDB. [Neil Cook]
- *Recipes.spirou.cal\_loc\_spirou.py* - change outfile definiton (and how we identify which fiber file is for) [Neil Cook]
- *Cal\_extract/cal\_flat* - continue porting functionality from spiroudrs. [Neil Cook]
- Update language database. [Neil Cook]
- *Drs\_path.py* - correct *\_\_NAME\_\_* [Neil Cook]
- *Drs\_fits.py* - allow read function to take function name as argument + correct pep8. [Neil Cook]
- *Drs\_data.py* - correct typoe in relfolder and filename for *load\_full\_flat\_pp()* [Neil Cook]
- *Recipe\_defintions.py* - update filetypes (no need to distiguish fiber files) [Neil Cook]
- *File\_defintions.py* - update all filedefinitions with prefix, suffix, filetype where needed. [Neil Cook]
- *Output\_filenames.py* - change how getting filenames work (now uses prefix/suffix/filetype and deal with having a fiber defined) [Neil Cook]
- *Drs\_startup.py* - allow *get\_file\_definition* to return all files found (and name to be a string within drs file instance name) [Neil Cook]
- *Drs\_recipe.py* - change variable index -> indextable. [Neil Cook]
- *Drs\_file.py* - add suffix, prefix, fiber, fibers and rename ext -> filetype, index -> indextable, add method *get\_dbkey* (adding use for fibers) [Neil Cook]
- *Drs\_database.py* - change how dbkey is obtained. [Neil Cook]

#### 4.4.106 0.5.034 (2019-07-05)

- README.md - move from recipes to terrapipe.recipes. [Neil Cook]
- README.md - move from recipes to terrapipe.recipes. [Neil Cook]
- *File\_definitions.py* - remove *slit\_shape*. [Neil Cook]
- Constants - add *FIBER\_TYPES*. [Neil Cook]
- *Param\_functions.py* - add listp method (to turn a string list into a list) [Neil Cook]
- *Cal\_thermal\_spirou.py* - get the nightname from parameter dict. [Neil Cook]
- *Science.calib.shape.py* - test how to deal with out of bounds coefficients in dymap [UNFINISHED + NOT WORKING] [Neil Cook]
- *Science.calib.general.py* - get number of files (from *DrsFitsFile* instance) and push this into dark correction (for average) [Neil Cook]
- *Science.calib.dark.py* - DARK key should be DARKM. [Neil Cook]
- *Core.instruments.spirou.pseduo\_const.py* = flip A and B coefficients to match spiroudrs. [Neil Cook]
- Update language database. [Neil Cook]
- *Drs\_file.py* - add and set numfiles constant (for use when combining files to know how many files were combined) [Neil Cook]

- *Cal\_shape\_master\_spirou.py* [terrapipe] - sum files don't average them, do not correct background (to make similar to spiroudrs code) and fix typo for dxmap0. [Neil Cook]
- *SpirouStartup.py* - only return unique files when returning multiple files. [Neil Cook]
- *SpirouImage.py* - fpdata1 -> masterfp, test how to deal with bounds in dymap. [Neil Cook]
- *Cal\_shape\_master\_spirou.py* - change fpfile to fpfiles, set frames to use all fp files, make fpdata1 not masterfp. [Neil Cook]
- *Science.calib.shape.py* - add *shape\_local* functions. [Neil Cook]
- *Science.calib.localisation.py* - change where we add one to the coefficient numbers. [Neil Cook]
- *Science.calib.general.py* - add calibration log message. [Neil Cook]
- Update language database. [Neil Cook]
- *Core.instruments.spirou.file\_definitions.py/rcipe\_defintions* - add *shape\_outputs/shape\_local* recipe definition. [Neil Cook]
- *Cal\_shape\_spirou.py* - first commit - push over code from spiroudrs. [Neil Cook]
- *Cal\_shape\_master\_spirou.py* - fix bugs with saving. [Neil Cook]
- *Cal\_loc\_spirou.py* - change math from average to sum. [Neil Cook]

#### 4.4.107 0.5.032 (2019-07-03)

- *Science.calib.wave.py* - correct bug in loading keys from wave header. [Neil Cook]
- *Science.calib.shape.py* - add dymap functionality + correct some dxmap bugs. [Neil Cook]
- *Science.calib.localisation.py* - correct *get\_coefficients* function. [Neil Cook]
- *Science.calib.general.py* - add *add\_calibs\_to\_header* function. [Neil Cook]
- Update language database. [Neil Cook]
- Constants - continue adding shape constants + add pseudo constant functions. [Neil Cook]
- *Drs\_log.py* - *find\_param* function: function call takes precedence over params[key] [Neil Cook]
- *Cal\_shape\_master\_spirou.py* - continue work on adding spiroudrs code (file saving) [Neil Cook]
- *Cal\_loc\_spirou.py* - change the way calibration files are added to header. [Neil Cook]
- *Cal\_dark\_master\_spirou.py* - fix comment. [Neil Cook]
- *SpirouBERV.py* - replace "t" with "jdutc" so all bjds returned. [Neil Cook]
- *Calib.science.preprocessing.detector.py* - move loading of full flat to *drs\_data.py*. [Neil Cook]
- *Calib.science.shape.py* - continue to add functionality from SpirouDRS. [Neil Cook]
- *Calib.science.localisation.py* - fix getting localisation coefficients. [Neil Cook]
- *Calib.science.badpix.py* - move loading of full flat to *drs\_data.py*. [Neil Cook]
- *Core.math.general.py* - fix when there are no NaNs (don't interpolate linearly) [Neil Cook]
- *Drs\_data.py* - first commit: module to control loading of internal drs data. [Neil Cook]
- Update language database. [Neil Cook]
- Add line lists and cavity length file. [Neil Cook]
- Add to config parameters. [Neil Cook]
- *Cal\_shape\_master\_spirou.py* - add dxmap and start dymap conversion. [Neil Cook]
- *Calib.science.shape.py* - continue to add functionality from SpirouDRS. [Neil Cook]
- *Localisation.py/wave.py* - change output return (props only) [Neil Cook]
- *Core.math.py* - add *fwfm*, *iuw\_spline*, *median\_filter\_ea*, *gaussian\_function\_nn*, *gauss\_fit\_nn*, *gauss\_fit\_s*. [Neil Cook]
- *Default\_constants.py* - add shape constants. [Neil Cook]
- *Cal\_shape\_master\_spirou.py* - change the *get\_coefficients*, *get\_wavesolution*. [Neil Cook]
- *Science.calib.shape.py* - start adding constants for shape master dxmap. [Neil Cook]
- *Default\_constants.py* - start adding constants for shape master dxmap. [Neil Cook]
- *Cal\_shape\_master\_spirou.py* - placeholder for *calculate\_dxmap*. [Neil Cook]
- *Reprocess.py* - do not scan tmp and reduced files. [Neil Cook]
- *Reprocess.py* - pep8 - remove extra blank space. [Neil Cook]
- *SpirouBACK.py* - correct typo *th\_blue\_limit = p['THERMAL\_RED\_LIMIT']* -> *th\_blue\_limit = p['THERMAL\_BLUE\_LIMIT']* [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - correct typo *THERMAL\_BLUE\_LIMIT = 24580* -> *THERMAL\_BLUE\_LIMIT = 2450* and add *ALLOWED\_TELLURIC\_DPRTYPES*. [Neil Cook]
- *Obj\_fit\_tellu.py* *obj\_mk\_tellu.py* - should only process files if DPRTYPE is correct, QC should fail if transmission map is all NaNs. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - QC should fail if file is all NaNs. [Neil Cook]

## 4.4.108 0.5.029 (2019-06-27)

- Update date/version/changelog. [Neil Cook]
- *Science.calib.shape.py* - fix rows missing from *fp\_table*. [Neil Cook]

## 4.4.109 0.5.028 (2019-06-27)

- *Science.calib.shape.py* - fix *construct\_master\_fp* (add *fp\_table* results) + place holder for *calculate\_dxmap*. [Neil Cook]
- *Science.calib.localisation.py* - add *get\_coefficients* function. [Neil Cook]
- *Science.calib.general.py* - add logging to various steps of *calibrate\_ppfile*. [Neil Cook]
- *Science.calib.badpix.py* - fix a comment. [Neil Cook]
- *Science.calib.wave.py* - first commit add *get\_masterwave\_filename* and *get\_wavesolution* functions. [Neil Cook]
- Update language database. [Neil Cook]
- *File\_definitions.py* - add more files to *out\_file* file set. [Neil Cook]
- *Recipe\_definitions.py* - remove instances of tilt file. [Neil Cook]
- Add default constants/keywords for *shape\_master*. [Neil Cook]
- *Drs\_startup.py* - fix error reporting in *get\_file\_definition* and fix *found\_file* when file not found. [Neil Cook]
- *Drs\_file.py* - fix the way keys are read in read/read1d and read2d keys. [Neil Cook]
- *Cal\_shape\_master\_spirou.py* - add plan for rest of code add localisation and wave files. [Neil Cook]
- *Science.calib.shape.py* - first commit add *fp\_master* functions - *construct\_fp\_table*, *construct\_master\_fp*, *get\_linear\_transform\_params*, *ea\_transform*, *\_max\_neighbour\_mask* and *\_xy\_acc\_peak*. [Neil Cook]
- *Science.calib.general.py* - first commit add *calibrate\_ppfile* function. [Neil Cook]
- *Science.calib.background/badpix/dark* - change the return of calib correction functions - now returns fileused + corrected image. [Neil Cook]
- Update language database. [Neil Cook]
- *Drs\_image.py* - add *clean\_hotpix* function. [Neil Cook]
- *Core.math.py* - add *fit2dpoly*, *linear\_minimization* functions. [Neil Cook]
- *Recipe\_definitions.py* - add *cal\_shape\_master* and remove *cal\_slit*. [Neil Cook]
- *Default\_constants.py* - add shape master (*fp\_master*) constant definitions. [Neil Cook]
- *Cal\_shape\_master\_spirou.py* - add master fp generation (untested) [Neil Cook]
- *Cal\_loc\_spirou.py* - update *cal\_loc* with changes to how we calibrate ppfiles. [Neil Cook]
- *Cal\_shape\_master\_spirou.py* - first commit (placeholder that needs filling) [Neil Cook]
- Update date/version/changelog. [Neil Cook]

## 4.4.110 0.5.027 (2019-06-26)

- *Drs\_path.py* - make sure *night\_name* does not start with a separator in “*get\_nightname*” function. [Neil Cook]
- *Drs\_database.py* - allow the addition of the night name to “*add\_file*” function. [Neil Cook]
- *Cal\_dark\_master\_spirou.py* - add nightname from reference file. [Neil Cook]
- *SpirouStartup.py* - remove unused import. [Neil Cook]
- Update language database. [Neil Cook]
- *Drs\_fits.py* - integrate *\_get\_time* functionality into *header\_time*. [Neil Cook]
- *Pseudo\_const.py* - add back nirps logo. [Neil Cook]
- *Drs\_database.py* - update *\_get\_time* to use *drs\_fits.header\_time*. [Neil Cook]
- Reorganize config and constants (now all in core sub-module) - update module order. [Neil Cook]
- Reorganize config and constants (now all in core sub-module) [Neil Cook]
- Reorganize where default settings are kept (now in config.instruments.default) – modifications to fix bugs. [Neil Cook]
- Reorganize where default settings are kept (now in config.instruments.default) – modifications to fix bugs. [Neil Cook]
- Reorganize where default settings are kept (now in config.instruments.default) [Neil Cook]
- *Science.calib.dark.py* - correct *dark\_master* functionality including setup to infile. [Neil Cook]
- *Background.py* - update how debug file is made (with updates to *write\_multi*) [Neil Cook]

- Update language database. [Neil Cook]
- *Drs\_path.py* - change conditions on finding *time\_unit* to be astropy unit/quantity. [Neil Cook]
- *Drs\_fits.py* - update Header class (from @cusher work) [Neil Cook]
- Constants/keywords - add/update values for *dark\_master*. [Neil Cook]
- *Drs\_startup.py* - fix *get\_drs\_params* inputs and make warning that code did not complete successfully red. [Neil Cook]
- *Drs\_file.py* - make corrections to *write\_multi* (including new *update\_header\_with\_hdict* function) [Neil Cook]
- *Cal\_dark\_master\_spirou.py* - finish converting *dark\_master* to terrapipe. [Neil Cook]

#### 4.4.111 0.5.026 (2019-06-25)

- *Science.calib.dark.py* - add dark master functionality. [Neil Cook]
- Update language database. [Neil Cook]
- Terrapio.io - add *find\_filetypes*, *get\_index\_files* and *header\_time* functions. [Neil Cook]
- Constants - add dark master constant definitions. [Neil Cook]
- *Drs\_startup.py* - add function *get\_file\_definition* and update pid getting (to add htime) [Neil Cook]
- *File\_definitions* - add *dark\_master* file definition. [Neil Cook]
- *Cal\_dark\_master\_spirou.py* - first commit and transfer from SpirouDRS. [Neil Cook]
- Remove old drsmodule files. [Neil Cook]
- Update version/changelog and date. [Neil Cook]

#### 4.4.112 0.5.025 (2019-06-24)

- *Obj\_mk\_obj\_template.py* + spirouTelluric - move location of GetBERV. [njcuk9999]
- *SpirouTable.py* - change order of backup operations (always close lock file last) [njcuk9999]
- *SpirouTable.py* - fix problem with closing/replacing index.fits. [njcuk9999]

#### 4.4.113 0.5.024 (2019-06-24)

- *SpirouTable.py* - remove the index file before writing it. [Neil Cook]
- *SpirouRfiles.py* - if reset is true make user confirm it. [Neil Cook]
- *SpirouRfiles.py* - add a raw index file that should save time opening already read headers. [Neil Cook]

#### 4.4.114 0.5.023 (2019-06-23)

- *SpirouRgen.py* - fix problem when two independent file types defined (i.e. *DARK\_FLAT* and *FLAT\_DARK*) [Neil Cook]
- *SpirouRgen.py* - check that master night name exists (raise error if it doesn't) [Neil Cook]

#### 4.4.115 0.5.022 (2019-06-21)

- *SpirouRgen.py* - rename *obj\_mk\_tellu\_new* -> *obj\_mk\_tellu*. [Neil Cook]
- *SpirouFITS.py* - try to create lock directory. [Neil Cook]
- *SpirouBERV.py* - add keys for processing. [Neil Cook]
- *SpirouDB.py* - try to create lock folder if needed. [Neil Cook]
- *SpirouMath.py* - linear bad pix must have at least two non-NaN pixels. [Neil Cook]
- *SpirouBACK.py* - deal with thermal being empty or NaN filled entirely. [Neil Cook]
- *Obj\_mk\_tellu\_db.py* - renamed *obj\_mk\_tellu\_new* to *obj\_mk\_tellu*. [Neil Cook]
- *Obj\_mk\_tellu.py* - renamed from *obj\_mk\_tellu\_new.py*. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add berv dtypes. [Neil Cook]
- *Cal\_dark\_master\_spirou.py* - fix type *dark\_cube* -> *dark\_cube1*. [Neil Cook]

#### 4.4.116 0.5.021 (2019-06-20)

- *SpirouBERV.py* - update comments to be more specific about inputs. [njcuk9999]
- *SpirouBERV.py* - update berv codes to be more specific about units etc. [njcuk9999]
- Update berv tests. [njcuk9999]
- *Constants\_SPIROU\_H4RG.py* - update observatory location. [njcuk9999]

#### 4.4.117 0.5.020 (2019-06-19)

- *SpirouKeywords.py* - add keywords to list. [njcuk9999]
- *Berv\_error\_test.py* - continue testing of berv. [njcuk9999]
- *Reprocess.py* - add back main function. [njcuk9999]
- *SpirouBERVest.py* - degtorad  $\rightarrow$  deg2rad. [njcuk9999]
- *SpirouBERV* - testing berv calculation. [njcuk9999]
- *SpirouImage/spirouStartup* - make sure files is a list (if string make a list) [njcuk9999]
- *SpirouLog.py* - add colour option in wlog.printmessage. [njcuk9999]

#### 4.4.118 0.5.019 (2019-06-18)

- *SpirouImage.py* - add warning capture for oweight (divide by NaNs okay) [njcuk9999]
- *SpirouRfiles.py* - add run directory from param dict. [njcuk9999]
- *Config.py* - add run directory. [njcuk9999]

#### 4.4.119 0.5.018 (2019-06-17)

- *SpirouTelluric.py* - add *tau\_h20* and *tau\_rest* to code. [Neil Cook]
- *SpirouReprocess.py* - add skipping into code. [Neil Cook]
- *SpirouLog.py* - add method: "print message" [Neil Cook]
- *SpirouKeywords.py* - add *tau\_h20* and *tau\_rest* header keys. [Neil Cook]
- *SpirouConst.py* - update file name function definitions. [Neil Cook]
- *SpirouBACK.py* - correct typo dim2  $\rightarrow$  dim1. [Neil Cook]
- *Obj\_fit\_tellu.py* - add *tau\_h20* and *tau\_rest* to header. [Neil Cook]
- *Cal\_shape\_spirou.py* - change debug file definitions (need filename defined) [Neil Cook]
- *Cal\_preprocess\_spirou.py* - make file name come from definition. [Neil Cook]

#### 4.4.120 0.5.017 (2019-06-14)

- *SpirouReprocess* - update the reprocessing codes. [Neil Cook]
- *Recipe\_definitions.py* - fix some recipe definitions. [Neil Cook]
- *File\_definitions.py* - update file definitions. [Neil Cook]

#### 4.4.121 0.5.016 (2019-06-13)

- *SpirouReprocessing* - continue work. [Neil Cook]
- Correct recipe and file definitions for non-input-redo. [Neil Cook]
- *Obj\_fit\_tellu\_db.py* - correct number of required arguments. [Neil Cook]

#### 4.4.122 0.5.015 (2019-06-12)

- *SpirouReprocess.py* - continue writing code. [Neil Cook]
- *SpirouBACK.py* - fix a problem with one of the returns in *correction\_thermal*. [Neil Cook]
- *Multiprocess\_test.py* - add an event (to terminate all current and future jobs on crash) [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - update a comment. [Neil Cook]

- Merge branch 'input\_redo' into dev. [Neil Cook]
- Merge branch 'dev' into *input\_redo*. [njcuk9999]
- Merge branch 'dev' into *input\_redo*. [njcuk9999]
- Merge branch 'dev' into *input\_redo*. [njcuk9999]
- # Conflicts: # *INTROOT2/drsmodule/io/drs\_lock.py*
- *Drs\_lock.py* - Merged 10b82f1 from @cusher into *input\_redo*. [njcuk9999]
- Localisation - update parameters for @melissa-hobson. [njcuk9999]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- *Localisation.py* - continue work for *cal\_loc*. [Neil Cook]
- *Background.py* - fix backfile. [Neil Cook]
- Update language database. [Neil Cook]
- *Drs\_fits.py* - fix write function having no dtype. [Neil Cook]
- *Constants.default.default\_constants.py* - add *fiber\_set\_num* key. [Neil Cook]
- *Config.instruments.spirou.\*.py* - add/correct loc keys. [Neil Cook]
- *Drs\_file.py* - correct problems with *add\_hkeys\_2d*. [Neil Cook]
- *Cal\_loc\_spirou.py* - continue work on input redo *cal\_loc*. [Neil Cook]
- *Background.py* - change key for *add\_hkey*. [Neil Cook]
- Update language database. [Neil Cook]
- *Drs\_fits.py* - fix import of *drs\_log*. [Neil Cook]
- *General.py* - fix imports. [Neil Cook]
- *Config.instruments.spirou.\*.py* - correct keys and constants. [Neil Cook]
- *Drs\_log.py* - correct the *find\_param* function. [Neil Cook]
- *Drs\_file.py* - fix when key = keywordstore. [Neil Cook]
- *Drs\_database.py* - correct call to *find\_param*. [Neil Cook]
- *File\_definitions.py* - correct bad extension. [Neil Cook]
- *Cal\_loc\_spirou.py* - continue fixes to *input\_redo* changes. [Neil Cook]
- Update language database. [Neil Cook]
- *Localisation.py* - add *image\_superimp* function. [Neil Cook]
- *Drs\_fits.py* - move the resize/flip images add convert functions. [Neil Cook]
- *Constants.defaults.\*.py* - add constants/headers from localisation. [Neil Cook]
- *Config.math* - add *calculate\_polyvals* function. [Neil Cook]
- *Instruments.spirou.\*.py* - add constants/keywords for localisation. [Neil Cook]
- *Drs\_file.py* - add method 'copy\_hdict' [Neil Cook]
- *Cal\_loc\_spirou.py* - continue work on adapting recipe for terrapipe. [Neil Cook]
- *Cal\_loc\_spirou.py* - continue work on adapting recipe for terrapipe. [Neil Cook]
- *Recipes.spirou* - move flip/resize functions. [Neil Cook]
- Update language database. [Neil Cook]
- *Science.calib.localisation.py* - continue work on localisation functions. [Neil Cook]
- *Constants.default.\*.py* - add localisation constant defintions. [Neil Cook]
- *Config.math.general.py* - add *measure\_box\_min\_max*, *nanpolyfit*. [Neil Cook]
- *Config.instruments.spirou.\*.py* - add localisation constants. [Neil Cook]
- *Output\_filenames.py* - make output file function generic. [Neil Cook]
- *File\_definitions.py* - make *debug\_back* output generic to debug outputs. [Neil Cook]
- *Cal\_loc\_spirou.py* - continue work on porting over *cal\_loc*. [Neil Cook]
- *Cal\_dark\_spirou.py* - modify how combine works for header input files. [Neil Cook]
- *Cal\_badpix\_spirou.py* - modify how combine works for header input files. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- *Localisation.py* - continue development from *cal\_loc*. [Neil Cook]
- *Dark.py* - continue development from *cal\_loc*. [Neil Cook]
- *Badpix.py* - continue development from *cal\_loc*. [Neil Cook]
- *Background.py* - continue development from *cal\_loc*. [Neil Cook]
- Update the language database. [Neil Cook]
- *Drs\_fits.py* - work on read/write single and multi functions (should be universal) + use @cusher Header class. [njcuk9999]
- *Constants.defaults.\*.py* - add *cal\_loc* constants. [Neil Cook]
- *Config.\_\_init\_\_.py* - add *find\_param* (aliased to *pcheck*) to *\_\_init\_\_* [Neil Cook]
- *Config.math* - add a general math functions module (and *nanpad/killnan* functions) [Neil Cook]
- *Config.instruments.spirou.\*.py* - add *cal\_loc* constants and definitions. [Neil Cook]

- *Drs\_log.py* - upgrade the *find\_param* function to look in kwargs if defined. [Neil Cook]
- *Drs\_file.py* - move read and write to io module. [Neil Cook]
- *Config.core.default.\*.py* - add loc constants and definitions. [Neil Cook]
- *Cal\_loc\_spirou.py* - continuing copying over and converting code. [Neil Cook]
- *Cal\_badpix\_spirou.py* - make sure images are np.array copies. [Neil Cook]
- *Science/calib/dark.py* - add dark correction function. [Neil Cook]
- *Drs\_table.py* - generalise lock functions. [Neil Cook]
- *Drs\_path.py* - pep8 corrections. [Neil Cook]
- *Drs\_lock.py* - generalise lock functions. [Neil Cook]
- *Constants/default* - add initial *cal\_loc* constants. [Neil Cook]
- *Config/instruments/spirou* - add initial *cal\_loc* constants. [Neil Cook]
- *Drs\_startup.py* - make lock functions more general and only index if recipe was successful. [Neil Cook]
- *Drs\_database.py* - add first methods for new Database class. [Neil Cook]
- Update language database. [Neil Cook]
- *Cal\_loc\_spirou.py* - first commit [unfinished] [Neil Cook]
- *Badpix.py* - fix bugs with conversion. [Neil Cook]
- Update language database. [Neil Cook]
- *Default\_keywords* - add default badpix keyword definitions. [Neil Cook]
- *Default\_constant.py* - add input kwargs. [Neil Cook]
- *Recipe\_definitions.py* - finalise *cal\_badpix* definition. [Neil Cook]
- *Output\_filenames.py* - add *badpix\_file* and *backmap\_file*. [Neil Cook]
- *File\_definitions.py* - add *out\_badpix* and *out\_backmap* output files. [Neil Cook]
- *Default\_keywords.py* - add badpix header keywords. [Neil Cook]
- *Default\_constants.py* - add input kwargs. [Neil Cook]
- *Cal\_preprocess\_spirou.py* - add dimanme for header of *KW\_INFILE1*. [Neil Cook]
- *Cal\_dark\_spirou.py* - change *\_\_NAME\_\_* to all lower case. [Neil Cook]
- *Cal\_badpix\_spirou.py* - update and finish first test. [Neil Cook]
- *Badpix.py* - first commit - space for bad pixel map functions. [Neil Cook]
- *Background.py* - first commit space for background functions. [Neil Cook]
- Update language database. [Neil Cook]
- *Drs\_fits.py* - add *flip\_image* function. [Neil Cook]
- *Default\_config.py* - add badpix values. [Neil Cook]
- *Default\_config.py* - add badpix values. [Neil Cook]
- *Cal\_dark\_spirou.py* - change name of parameter for combining files on input. [Neil Cook]
- *Cal\_badpix\_spirou.py* - first commit [UNFINISHED] [Neil Cook]
- *Default\_config.py* - update version. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- *Drs\_reset.py* - first commit of reset code. [Neil Cook]
- *Drs\_changelog.py* - add comments and move text to language database. [Neil Cook]
- Update language database. [Neil Cook]
- Update language database. [Neil Cook]
- *Default\_config.py* - update version and date. [Neil Cook]
- *Drs\_changelog.py* - make sure we define outputs=None for recipe without outputs. [Neil Cook]
- *Psuedo\_const.py* - deal with *DRS\_DATA\_MSG* being None. [Neil Cook]
- *Drs\_changelog.py* - preview is in params['INPUT'] [Neil Cook]
- *Recipe\_definitions.py* - add definition for *drs\_changelog*. [Neil Cook]
- *Drs\_startup.py* - allow no instrument to search for recipe name. [Neil Cook]
- Update language database. [Neil Cook]
- *Param\_functions.py* - force printing to string. [Neil Cook]
- *Drs\_changelog.py* - update with new locations. [Neil Cook]
- *Default\_config.py* - give more space for version. [Neil Cook]
- *Drs\_changelog.py* - correct number of arguments for *get\_relative\_folder*. [Neil Cook]
- *Recipe\_definitions.py* - add change log definition. [Neil Cook]
- Update database. [Neil Cook]
- *Drs\_changelog.py* - first commit of drs changelog for input redo. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- *Drs\_startup.py* - end with header. [Neil Cook]
- *Drs\_log.py* - tidy up logging messages. [Neil Cook]

- *Drs\_log.py* - tidy up logging messages. [Neil Cook]
- *Drs\_file.py* - remove references to hdict comments (now in fits.Header) [Neil Cook]
- *Drs\_argument.py* - do not print info. [Neil Cook]
- Change text message. [Neil Cook]
- Change text message. [Neil Cook]
- *Drs\_startup.py* - edit title. [Neil Cook]
- *Dark.py* - remove warning about NaNs. [Neil Cook]
- *Drs\_database.py* - change how we access hdict. [Neil Cook]
- *Drs\_file.py* - deal with how to access hdict. [Neil Cook]
- *Drs\_startup.py* - edit logo. [Neil Cook]
- *Drs\_startup.py* - edit logo. [Neil Cook]
- *Drs\_startup.py* - edit logo. [Neil Cook]
- *Drs\_startup.py* - edit logo. [Neil Cook]
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- *Drs\_startup.py* - edit logo. [Neil Cook]
- *Drs\_startup.py* - edit logo. [Neil Cook]
- *Drs\_file.py* - header is now fits.Header not OrderedDict. [Neil Cook]
- Rename drs to terrapipe. [Neil Cook]
- Rename drs to terrapipe. [Neil Cook]
- Merge branch 'dev2' into *input\_redo*. [Neil Cook]
- Merge branch 'dev2' into *input\_redo*. [Neil Cook]
- *Recipes.spirou.cal\_preprocess\_spirou.py* - chmod +x. [njcuk9999]
- *Recipes.spirou.cal\_dark\_spirou.py* - chmod +x. [njcuk9999]
- *Config.instruments.spirou.default\_keywords.py* - correct *KW\_EXT\_TYPE* value (was a typo) [njcuk9999]
- *Drs\_startup.py* - don't try to create folders when we don't have nightname. [njcuk9999]
- *File\_explorer.py* - define a path for ds9 (will need moving to some installation specific place) and better deal with index col differences in error report. [njcuk9999]
- *Constants.default.pseudo\_const.py* - add changes from old code (version and pversion in index.fits) [njcuk9999]
- *Config.core.drs\_file.py* - fix bug "copy" -> "copyother" [njcuk9999]
- Refactor new -> newcopy and copy -> copyother. [Neil Cook]
- Update datacutmask. [Neil Cook]
- Update language database. [Neil Cook]
- Update constants/config/keywords. [Neil Cook]
- *Drs\_recipe.py* - update functions after run through. [Neil Cook]
- *Drs\_file.py* - update functions after run through. [Neil Cook]
- *Drs\_database.py* - update functions after run through. [Neil Cook]
- Change ErrorEntry and ErrorText to TextEntry and TextDict. [Neil Cook]
- *Drs\_fits.py* - deal with zero and one infiles separately. [Neil Cook]
- Update language database. [Neil Cook]
- Update constants files. [Neil Cook]
- Delete drsmodule.config.database (moved to core in single .py file) [Neil Cook]
- *Drs\_startup.py* - add run function (to keep recipes clean) [Neil Cook]
- *Drs\_database.py* - update database setting (combine calib and telluric) [Neil Cook]
- *Cal\_preprocess\_spirou.py* - update qc to match *cal\_dark*. [Neil Cook]
- *Cal\_dark\_spirou.py* - flesh out functionality. [Neil Cook]
- *Drsmodule.science.calib.dark.py* - add *measure\_dark\_badpix* function. [Neil Cook]
- Update language database. [Neil Cook]
- *Drsmodule.constants.default* - add dark keys. [Neil Cook]
- *Drsmodule.config.instrument.spirou* - add dark keys. [Neil Cook]
- *Drsmodule.config.database* - first commit of database.py, calibdb.py, tellurdb.py. [Neil Cook]
- *Cal\_dark\_spirou.py* - fill out more of the sections. [Neil Cook]
- *Dark.py* - first commit add *measure\_dark* function. [Neil Cook]
- *Drs\_fits.py* - add combine and resize functions. [Neil Cook]



- Update language database. [Neil Cook]
- Add new constants to constants/keyword files. [Neil Cook]
- *Drs\_log.py* - add *find\_param* logger function. [Neil Cook]
- *Drs\_file.py* - add combine and *get\_key* functions. [Neil Cook]
- *Blank\_spirou.py* - update the blank example script. [Neil Cook]
- *Cal\_preprocess\_spirou.py* - move file processing to *config.file\_processing\_update*. [Neil Cook]
- *Cal\_dark\_spirou.py* - start filling out code. [Neil Cook]
- Update language database. [Neil Cook]
- *Drs\_fits.py* - add skeleton for combine function. [Neil Cook]
- *Drsmodule.constants.default.default\_constants.py* - add *COMBINE\_IMAGES* constant. [Neil Cook]
- *Drsmodule.config.\_\_init\_\_.py* - link to *file\_processing\_update*. [Neil Cook]
- *Instruments.spirou.recipe\_definitions.py* - add default value for combine option. [Neil Cook]
- *Instruments.spirou.default\_constants.py* - add *combine\_images* constant. [Neil Cook]
- *Drs\_startup.py* - add general file processing logger. [Neil Cook]
- *Recipes.spirou.cal\_preprocessing\_spirou* - continue *input\_redo*. [Neil Cook]
- *Drsmodule.science.preprocessing* - continue *input\_redo*. [Neil Cook]
- *Drsmodule.locale* - continue *input\_redo*. [Neil Cook]
- *Drsmodule.io* - continue *input\_redo*. [Neil Cook]
- *Drsmodule.constants.default* - continue *input\_redo*. [Neil Cook]
- *Drsmodule.config.instruments* - continue *input\_redo*. [Neil Cook]
- *Drsmodule.config.core* - continue *input\_redo*. [Neil Cook]
- *Drsmodule.science.preprocessing* - continue *input\_redo*. [Neil Cook]
- *Drsmodule.locale* - continue *input\_redo*. [Neil Cook]
- *Drsmodule.io* - continue *input\_redo*. [Neil Cook]
- *Drsmodule.data* - continue *input\_redo*. [Neil Cook]
- *Drsmodule.constants.default* - continue *input\_redo*. [Neil Cook]
- *Drsmodule.constants.core* - continue *input\_redo*. [Neil Cook]
- *Drsmodule.config.instruments.spirou* - continue *input\_redo*. [Neil Cook]
- *Drsmodule.config.core* - continue *input\_redo*. [Neil Cook]
- *SpirouRecipe.py* - continue *input\_redo*. [Neil Cook]
- *Test\_spirou.py* - remove bad code (test to crash) [Neil Cook]
- *Identification.py* - check file by copying *drs\_file* over *given\_drs\_file* and then use *self.check\_file()* [Neil Cook]
- *Drs\_recipe.py* - move checking functionality to *drs\_file*. [Neil Cook]
- *Dsr\_file.py* - add copy function to *drs\_file*. [Neil Cook]
- Update language file. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- *Identification.py* - start writing code to identify drs file. [Neil Cook]
- *File\_definitions* - change append to addset. [Neil Cook]
- *Drs\_file.py* - addset functions and plan new checking functions. [Neil Cook]
- Update input redo - work on *cal\_preprocess*. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- Continue working on upgrade. [Neil Cook]
- Continue working on upgrade. [Neil Cook]
- Update language database. [njcuk9999]
- Add placeholders for preprocessing functions. [njcuk9999]
- Add spirou preprocessing recipe. [njcuk9999]
- Update test recipes. [njcuk9999]
- Fix module pathing system. [njcuk9999]
- *Config.\_\_init\_\_.py* - add alias to *get\_locals*. [njcuk9999]
- *Recipe\_definitions* - update preprocessing definition. [njcuk9999]
- *Default\_config.py* - make plot variables an int. [njcuk9999]
- *Drs\_startup.py* - add temp messgae for loading arguments + add a code unsuccessful message. [njcuk9999]
- *Drs\_recipe.py* - change INPUT -> INPUTS + make param dict. [njcuk9999]
- *Drs\_log.py* - sort out *LOGGER\_ERROR* etc (now stored per PID + add Printer class (TLOG) to print temporary messages which disappear if no other text inbetween. [njcuk9999]
- *Drs\_argument.py* - add a new line in the debug messages (for Printer to be on new line) [njcuk9999]
- Add *\_\_init\_\_.py* files to new folders. [njcuk9999]

- *Port\_database.py* - output more log messages. [njcuk9999]
- *Test\_spirou.py* - fix function call. [njcuk9999]
- Update language database. [njcuk9999]
- *Constants\_functions.py* - fix problem with relative imports. [njcuk9999]
- *Recipe\_definitions.py* - make plot and integer and only allow values 0, 1, 2. [njcuk9999]
- *Drs\_startup.py* - fix the printing of arg log strings (arguments used) [njcuk9999]
- *Drs\_recipe.py* - fix missed error (should be from database) [njcuk9999]
- *Drs\_arguemnt.py* - allow arguments to specify a min and max value (and check for it) [njcuk9999]
- Attempt to remove relative imports. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- *File\_explorer.py* - move data loading / mask applying to different threads. [Neil Cook]
- *\*.\_\_init\_\_.py* - fix imports (should be empty) [Neil Cook]
- *Locale.core.\_\_init\_\_.py* - fix imports (should be empty) [Neil Cook]
- *File\_explorer.py* - update length and add new instrument box. [Neil Cook]
- *File\_explorer.py* - update about statement. [Neil Cook]
- *File\_explorer.py* - continue upgrade. [Neil Cook]
- *File\_explorer.py* - continue upgrade. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- *File\_explorer.py* - continue to write code. [Neil Cook]
- *File\_explorer.py* - add table. [Neil Cook]
- *Config.\_\_init\_\_.py*: add aliases to *\_\_all\_\_* [Neil Cook]
- *Drsmodule.io* - need to import *drs\_log* separately (*drs\_startup* uses *drs\_table*) [Neil Cook]
- *Find\_error* - change comment to better represent section. [Neil Cook]
- *Combine\_index\_files.py* - pep8 changes. [Neil Cook]
- *File\_explorer.py* - app to find drs files. [Neil Cook]
- *Drs\_table.py* - update doc strings. [Neil Cook]
- *Drs\_table.py* - update doc strings. [Neil Cook]
- *Drs\_lock.py* - update doc strings. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- Added a misc folder and a first misc script. [Neil Cook]
- *Recipes/test/\** - update paths to *drs\_setup* (via config) [Neil Cook]
- *\_\_init\_\_.py* - add a functions section (currently blank) [Neil Cook]
- *Tools.\** - update paths to *drs\_setup* (via config) [Neil Cook]
- *Plotting.\** - update paths to *drs\_setup* (via config) [Neil Cook]
- *Io.\** - update paths to *drs\_setup* (via config) [Neil Cook]
- *Config.\_\_init\_\_.py* - add aliases to functions that will be used lots. [Neil Cook]
- *Drs\_startup.py* - continue improvements to documentation. [Neil Cook]
- *User\_config.ini[NIRPS]* - update *DRS\_PLOT* value and comment (now an int [0, 1, 2]) [Neil Cook]
- *Drs\_text.py* - make *get\_relative\_folder* a public function. [Neil Cook]
- *Find\_error.py* - update doc strings to pep8 standards. [Neil Cook]
- *Find\_error.py* - update comments. [Neil Cook]
- *Find\_error.py* - add drop down instrument box. [Neil Cook]
- *Find\_error.py* - improve gui. [Neil Cook]
- *Drs\_setup* - add better doc strings. [Neil Cook]
- *Find\_error.py* - continued to work on application. [njcuk9999]
- *Drs\_text.py* - got args for language database reads. [njcuk9999]
- *Constant\_functions.py* - added the source to dtype errors in config files. [njcuk9999]
- *Drs\_startup.py* - allowed instrument to be None. [njcuk9999]
- Tool to find error codes in database/code. [njcuk9999]
- Drs general - initialise new sub package folders. [Neil Cook]
- Drs general - initialise new sub package folders. [Neil Cook]
- Merge remote-tracking branch 'origin/input\_redo' into *input\_redo*. [Neil Cook]
- **Conflicts:** *INTROOT2/drsmodule/config/core/drs\_startup.py*
- *Default\_config.py* - add *DRS\_DATA\_PLOT*. [Neil Cook]
- Add *drs\_data\_plot* to start up parameters. [Neil Cook]
- *Drs\_recipe.py* - change plotting mode - only if *drs\_plot* is 1 (to screen) [Neil Cook]
- *User\_config.ini* - add plot modes (instead of bool) [Neil Cook]

**4.4.123 0.5.014 (2019-06-11)**

- *SpirouReprocess.py* - add processing (parallalised) to reprocess. [Neil Cook]
- *SpirouImage.py* - fix small bug with position of log message. [Neil Cook]
- *Multiprocess\_test.py* - test of multiple. [Neil Cook]

**4.4.124 0.5.013 (2019-06-10)**

- *SpirouReprocess.py* - first commit reworking of reprocessing script and run files (works for unit test and any/all reprocessing) [Neil Cook]
- Correct names. [Neil Cook]
- Bin folder - add `__args__` and `__required__` [Neil Cook]
- *SpirouImage.py* - add in shape qc. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add in shape qc. [Neil Cook]
- *Cal\_shape\_master\_spirou.py* - add in QC (std of shape map) [Neil Cook]
- *SpirouConst.py* - remove overlap file and add *SLIT\_SHAPE\_BDXMAP\_FILE* debug file. [Neil Cook]
- *Cal\_shape\_spirou.py* - produce debug plots to check transform for the input fp file + save master shape (x/y) files to header. [Neil Cook]
- *Cal\_shape\_master\_spirou.py* - straighten the dxmap (using dymap) and save the bent dxmap as debug product. [Neil Cook]
- *SpirouBACK.py* - add *correction\_thermal2* functionality. [Neil Cook]
- *Recipe\_control.txt* - add new name for *cal\_shape\_master* (*cal\_shape\_master\_spirou*) [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add more thermal constants and correct thermal correction types to single fiber values. [Neil Cook]
- *Cal\_shape\_master\_spirou.py* - correct both dx and dy maps. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - thermal correction must be based on individual fiber type not DPRTYPE. [Neil Cook]

**4.4.125 0.5.012 (2019-06-08)**

- *SpirouUnitRecipes.py* - remove *cal\_SHAPE\_spirou* and add *cal\_shape\_spirou*. [Neil Cook]
- *SpirouImage.py* - add new loading functions (for new calibDB files) [Neil Cook]
- *SpirouPlot.py* - add new *thermal\_background\_debug\_plot* function. [Neil Cook]
- *SpirouKeywords.py* - add shape and new cdb keys. [Neil Cook]
- *SpirouConst.py* - add *SLIT\_SHAPE\_LOCAL\_FILE* + fix *slit\_SHAPE* functions. [Neil Cook]
- *SpirouBACK.py* - add *correction\_thermal*, *correction\_thermal1* and *correction\_thermal2*. [Neil Cook]
- *Reset\_calibDB* - add *tapas\_all\_sp.fits.gz* to calibDB. [Neil Cook]
- *Recipe\_control.txt* - add *cal\_shape\_spirou.py*. [Neil Cook]
- *Output\_keys.py* - add local shape to tags. [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - moved from bin folder (now old code) [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add thermal constants. [Neil Cook]
- *Cal\_shape\_spirou.py* - first commit new local shape recipe. [Neil Cook]
- *Cal\_shape\_master\_spirou.py* - put FPMaster in calibDB. [Neil Cook]
- *Cal\_FF\_RAW\_spirou.py* - add FP master file getting. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - add thermal correction (untested) [Neil Cook]

**4.4.126 0.5.011 (2019-06-07)**

- *Cal\_shape\_master.py* - apply dxmap and dymap + remove reference to FPFILLES (-> FPDFILE) [Neil Cook]
- *SpirouLOCOR.py* - add modifications for new shape parameters. [Neil Cook]
- *SpirouImage.py* - continue working on new shape functionality. [Neil Cook]
- *SpirouEXTOR.\_\_init\_\_.py* - add alias to CleanHotpix. [Neil Cook]
- *SpirouMath.py* - change how IUVSpline deals with NaNs (full set of NaNs and group of Nans -> fill with linear interp) [Neil Cook]
- *SpirouKeywords.py* - add backgroun key and new shape header keys. [Neil Cook]

- *SpirouBACK.py* - return background filename for adding to header. [Neil Cook]
- *Cal\_shape\_master.py* - correct change to table (needed extra term) [Neil Cook]
- *Cal\_SHAPE\_spirou\_old.py* - add changes for background file loading. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add shape master/local qc parameters. [Neil Cook]
- *Cal\_SLIT\_spirou.py* - add changes for background file loading. [Neil Cook]
- *Cal\_shape\_master.py* - add changes from Etiennes redo. [Neil Cook]
- *Cal\_loc\_RAW\_spirou.py* - add changes for background file getting. [Neil Cook]
- *Cal\_ff\_raw\_spirou.py* - add changes for new shape files. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - add changes for new shape files. [Neil Cook]

#### 4.4.127 0.5.010 (2019-06-06)

- *SpirouImage.py* - add *get\_x\_shape\_map* and *get\_y\_shape\_map* functions and aliases. [Neil Cook]
- *SpirouPlot.py* - add *shape\_linear\_trans\_param\_plot* debug plot. [Neil Cook]
- *SpirouConst.py* - add dxmap, dymap and fpmaster file definitions. [Neil Cook]
- *Output\_keys.py* - add dxmap, dymap and fpmaster file tags. [Neil Cook]
- *Register\_fp\_2.py* - add etiennes additional changes. [Neil Cook]
- *Cal\_SHAPE\_spirou\_old.py* - refractor file name. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add new *shape\_master* constants. [Neil Cook]
- *Cal\_shape\_master.py* - continue adapting *cal\_shape\_master* to handle dxmap and dymap. [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - refractor filename (now need sape x and shape y) [Neil Cook]
- *Cal\_shape\_master.py* - continue adding etiennes changes. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - write todos. [Neil Cook]

#### 4.4.128 0.5.009 (2019-06-05)

- *SpirouImage.py* - start adding etiennes new adaptations to *register\_fp\_2*. [Neil Cook]
- *Register\_fp\_2.py* - add etiennes new register fp code. [Neil Cook]
- *Calc\_berv.py* - add berv source / berv est. [Neil Cook]
- *SpirouTelluric.py* - move *get\_berv\_value* to *spirouImage(spirouBERV)* [Neil Cook]
- *SpirouBERV.py* - add *get\_berv\_value* and modify current functions to add berv estimate + lock berv while calculating barycorrpy. [Neil Cook]
- *SpirouTDB.py* - correct pep8. [Neil Cook]
- *SpirouKeywords.py* - add berv est and berv source. [Neil Cook]
- *Test\_bigcube\_berv.py* - add *berv/berv\_est* test. [Neil Cook]
- *Obj\_mk\_tellu\_new.py* - change how berv is obtained. [Neil Cook]
- *Obj\_fit\_tellu.py* - change how berv is obtained. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - add berv estimate and berv source. [Neil Cook]
- *Cal\_CCF\_E2DS\_spirou.py* - add berv estimate and berv source. [Neil Cook]
- *Berv\_estimate\_comparison.py* - test and compare berv estimate to barycorrpy. [Neil Cook]

#### 4.4.129 0.5.008 (2019-06-04)

- *SpirouImage.py* - correction to *register\_fp*. [Neil Cook]
- *SpirouKeywords.py* - estimated BERV keys added. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - estimated BERV keys added to hdct. [Neil Cook]
- *SpirouBERV.py* - add implementation of *BERV\_EST* and use lock file to only open one BERV instance. [Neil Cook]
- *SpirouEXTOR.py* - add quick mode for *clean\_hotpix*. [Neil Cook]
- *Merge\_fp\_fp.py* - correct typo for print statement. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add a way to turn off certain features that slow down the code (not to be used for science data) [Neil Cook]
- *SpirouImage.py* - correct *construct\_master\_fp*. [njcuk9999]

#### 4.4.130 0.5.007 (2019-06-03)

- *Cal\_shape\_master.py* - continued work integrating fp master function. [njcuk9999]
- *SpirouImage.py* - continued work on FP master functions. [njcuk9999]
- *Cal\_shape\_master.py* - change input to 1 hchc and 1 ffp. [njcuk9999]
- *SpirouImage.py* - add *construct\_master\_fp*, *group\_files\_by\_time* and *register\_fp* functions (for *cal\_shape\_master* and *cal\_dark\_master*) [njcuk9999]
- *Recipe\_control.txt* - add *cal\_shape\_master.py* to recipe control. [njcuk9999]
- *Merge\_fp\_fp.py* - etiennes merge fp code. [njcuk9999]
- *Constants\_SPIROU\_H4RG.py* - add the *cal\_shape\_master* constants. [njcuk9999]
- *Cal\_shape\_master.py* - first commit - copy of *cal\_SHAPE\_spirou.py* - with additions from Etienne for making the fp master file. [njcuk9999]
- *Cal\_dark\_master\_spirou.py* - remove code in common with shape master into function. [njcuk9999]
- Merge branch 'neil' into dev. [njcuk9999]
- Merge pull request #566 from njcuk9999/header-copy-exact. [Neil Cook]  
Header Copy Exact – also implemented into INTROOT2 in *input\_redo* branch
- Merge pull request #565 from njcuk9999/db-lock-fix. [Neil Cook]  
DB lock check retry bug - Okay this one I can merge with both INTROOT and INTROOT2!
- Fixed a bug with db locking check. [Chris Usher]

#### 4.4.131 0.5.006 (2019-06-01)

- Updated to match changes on dev. [Chris Usher]
- Reworked how fits headers are used. [Chris Usher]
- Update test.run. [Neil Cook]
- *SpirouImage.py* - change dark calibration to *dark\_master* calibration, make sure *read\_raw\_data* loading primary data array. [Neil Cook]
- *SpirouFITS.py* - adjust *read\_raw\_data* to add an imageext (otherwise defaults 0) [Neil Cook]
- *Recipe\_control.txt* - add *cal\_dark\_master* and *cal\_thermal\_spirou*. [Neil Cook]
- *Cal\_thermal\_spirou.py* - renamed from *cal\_thermal2\_spirou.py*. [Neil Cook]

#### 4.4.132 0.5.005 (2019-05-30)

- *SpirouBERVest.py* - first commit (test of berv estimate) [Neil Cook]
- *SpirouConst.py* - add filename to *EXTRACT\_E2DS\_FILE*. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add *always\_extract*. [Neil Cook]
- *Cal\_thermal\_spirou.py* - continue work. [Neil Cook]
- *Cal\_thermal2\_spirou.py* - extraction of darks (using *cal\_extract*) [Neil Cook]
- Merge branch 'thermal' into dev. [Neil Cook]
- Merge branch 'master' into thermal. [njcuk9999]
- First commit of thermal recipe for Low pass dark/thermal calibration. [njcuk9999]
- Add fiber to header. [Neil Cook]
- Add “*DRS\_DATE*” and “*DATE\_NOW*” to all recipes. [Neil Cook]
- *Cal\_dark\_master\_spirou.py* - fix bugs in while loop. [Neil Cook]

#### 4.4.133 0.5.004 (2019-05-29)

- *SpirouImage.py* - correct *get\_files* function. [Neil Cook]
- *SpirouEXTOR.py* - fix comment typos. [Neil Cook]
- *SpirouKeywords.py* - add dark master keys. [Neil Cook]
- *SpirouConst.py* - add *DARK\_FILE\_MASTER* function. [Neil Cook]
- *Output\_keys.py* - add *dark\_master\_file* tag. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add *cal\_dark\_master* constants. [Neil Cook]
- *Cal\_DARK\_spirou.py* - correct typo. [Neil Cook]
- *Cal\_dark\_master\_spirou.py* - continue adapting new recipe. [Neil Cook]

#### 4.4.134 0.5.003 (2019-05-28)

- *SpirouImage.py* - add *get\_files* function. [njcuk9999]
- *SpirouImage.py* - add *get\_files* function. [njcuk9999]
- *Hp\_dark.py* - store EA *cal\_dark\_master* code (raw) [njcuk9999]
- *Constants\_SPIROU\_H4RG.py* - add *dark\_master* constant to constants. [njcuk9999]
- *Cal\_dark\_master\_spirou.py* - first commit - first integration of EA code. [njcuk9999]
- *SpirouKeywords.py* - INFILE should be INF1, INF2, INF3. [njcuk9999]
- Update date/version/changelog. [njcuk9999]
- *Cal\_HC\_E2DS\_EA\_spirou.py* - CDBBAD -> CDBLAZE. [njcuk9999]

#### 4.4.135 0.5.002 (2019-05-27)

- *SpirouPlot.py* - add *output\_rv* to *ccf\_rv\_ccf\_plot*. [njcuk9999]
- *SpirouKeywords.py* - add new CCF keyword definitions. [njcuk9999]
- *Cal\_CCF\_E2DS\_spirou.py* - renamed from *cal\_CCF\_E2DS\_FP\_spirou.py*. [njcuk9999]
- Deal with move of *cal\_CCF\_E2DS\_FP\_spirou.py*. [njcuk9999]
- Move older CCF recipes to misc folder. [njcuk9999]
- Removed old *cal\_CCF\_E2DS\_spirou.py*. [njcuk9999]
- *Cal\_CCF\_E2DS\_spirou.py* - from *cal\_CCF\_E2DS\_FP.py* + cosmetic changes. [njcuk9999]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - add changes to allow science without FP. [njcuk9999]
- *Cal\_FF\_RAW\_spirou.py* - *IC\_EXTRACT\_TYPE* -> *IC\_FF\_EXTRACT\_TYPE* (always for *cal\_FF*) [njcuk9999]
- *SpirouTelluric.py* - change parameter name *MKTELLU\_MED\_SAMPLING* -> *IMAGE\_PIXEL\_SIZE*. [njcuk9999]
- *SpirouLOCOR.py* - add curve drop parameter. [njcuk9999]
- *Constants\_SPIROU\_H4RG.py* - change loc threshold. [njcuk9999]
- *SpirouKeyword.py* - Add key word for CCF (telluric cut) [njcuk9999]
- *Constants\_SPIROU\_H4RG.py* - add new constants for CCF. [njcuk9999]
- *Cal\_loc\_RAW\_spirou.py* - correct a bug in DEBUG (should be > 0) [njcuk9999]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - add changes from @Francois for CCF masked by tellurics. [njcuk9999]
- *Cal\_CCF\_E2DS\_FP\_spirou\_new.py* - modify line endings. [njcuk9999]
- *Cal\_CCF\_E2DS\_FP\_spirou\_new.py* - francois changes to cal ccf (to be integrated into *cal\_CCF* actual) [njcuk9999]

#### 4.4.136 0.5.001 (2019-05-27)

- Merge branch 'master' into neil. [Neil Cook]
- *SpirouConst.py* - fix sld names. [Neil Cook]
- *SpirouStartup.py* - fix the windows/unix *night\_name* bug. [Neil Cook]
- *SpirouFITS.py*, *spirouDB.py* - reset. [Neil Cook]
- *SpirouFITS.py*, *spirouDB.py* - fix problem with windows and lock file including paths that do not exist (i.e. when using night names with sub-directories) [Neil Cook]
- *SpirouFITS.py*, *spirouDB.py* - fix problem with windows and lock file including paths that do not exist (i.e. when using night names with sub-directories) [Neil Cook]
- *SpirouFITS.py*, *spirouDB.py* - fix problem with windows and lock file including paths that do not exist (i.e. when using night names with sub-directories) [Neil Cook]
- *Extract\_trigger.py* - update run. [Neil Cook]
- *SpirouConst.py* - *\_w\_* -> *\_v\_* [Neil Cook]
- Update settings for reprocess extract tellu/obj run for May pernight/perrun runs. [Neil Cook]
- Move unused test modules to misc. [Neil Cook]
- *Drs\_dependencies.py* - add a debug mode. [Neil Cook]
- *Select\_per\_tc\_per\_night\_calibs.py* - add Feb and April runs to the per run selection. [Neil Cook]
- Update date/version/update notes/changelog. [Neil Cook]

## 4.4.137 0.5.000 (2019-05-10)

- *SpirouDB.py* - add lock file in waiting printout. [Neil Cook]
- *SpirouPlot.py* - attempt to *setup\_figure* a second time before crashing. [Neil Cook]
- *SpirouPlot.py* - attempt to *setup\_figure* a second time before crashing. [Neil Cook]
- Update test.run. [Neil Cook]
- *SpirouPlot.py* - fix to plot crash. [Neil Cook]
- Update changelog.md. [Neil Cook]
- *Extract\_trigger.py* - modify extract trigger. [Neil Cook]
- *SpirouTDB.py* - add locking of file in *put\_file*. [Neil Cook]
- *SpirouCDB.py* - add locking of file in *put\_file*. [Neil Cook]
- Update date and changelog. [Neil Cook]
- *SpirouCDB.py* - fix calibDB file copy in parallisation. [Neil Cook]
- *Extract\_trigger.py* - note problem with parallisation. [Neil Cook]
- Update changelog.md. [Neil Cook]
- *Extract\_trigger.py* - update comments. [Neil Cook]
- Changelog.md - update the change log with new commits. [Neil Cook]
- Update test.run. [Neil Cook]
- *Extract\_trigger.py* - add email option (start + end) [Neil Cook]
- *SpirouPlot.py* - add fix for large files saved to disk (should be temporary fix) [Neil Cook]
- *SpirouLOG.py* - clear out logs after run. [Neil Cook]
- *SpirouImage.py* - replace *IC\_S1D\_BLAZE\_MIN* with *TELLU\_CUT\_BLAZE\_NORM*. [Neil Cook]
- *SpirouConst.py* - update version/changelog/constants file. [Neil Cook]
- *Comp\_s1d\_to\_s2d.py* - add a normalised blaze cut. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - change the blaze min value. [Neil Cook]
- *Comp\_s1d\_to\_s2d.py* - compare the output of s1d to s2d. [Neil Cook]
- Test.run - update text.run. [Neil Cook]
- *Time\_log\_file.py* - code to measure timing of log printouts. [Neil Cook]
- *Constnats\_SPIROU\_H4RG.py* - update s1d starting wavelength from 980 to 965. [Neil Cook]
- Changed permissions on new tools in spirouTools. [Neil Cook]
- *SpirouMath.py* - add nanpad and killnan functions. [Neil Cook]
- *SpirouBACK.py* - re-add warning around backmask condition. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - chagne *IC\_BKGR\_BOXSIZE* from 64 to 128. [Neil Cook]
- *Drs\_local\_background.py* - first commit - code to find amplitude scale for local background (using *DARK\_FLAT*) [Neil Cook]
- *SpirouPlot.py* - add *local\_scattered\_light\_plot*. [Neil Cook]
- *SpirouBACK.py* - add function *make\_local\_background\_map* and *measure\_local\_background*. [Neil Cook]
- *Recipe\_control.txt* - add *drs\_local\_background* to valid receipes. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add constants for *drs\_local\_background.py*. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - update *ic\_bkgr\_percent* value. [Neil Cook]
- *SpirouBACK.py* - add adjustments to background correction. [Neil Cook]
- *SpirouBACK.py* - fix some bugs with measure background from map function. [Neil Cook]
- Update test.run. [Neil Cook]
- *Cal\_BADPIX\_spirou.py* - background addition - fix typo in new file upload to calibDB. [Neil Cook]
- *SpirouBACK.py* - return background image only. [Neil Cook]
- *Cal\_extract,FF,loc,SHAPE,slit* - replace old background measurement with new one. [Neil Cook]
- *SpirouBACK.py* - correct bug in new function. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - change background from 5 to 10. [Neil Cook]
- *Cal\_BADPIX\_spirou.py* - resize flat as well as bad pixel. [Neil Cook]
- *SpirouImage.py* - add function *get\_background\_map*. [Neil Cook]
- *SpirouConst.py* - add function *BKGD\_MAP\_FILE*. [Neil Cook]
- *SpirouBACK.py* - add functions: *make\_background\_map* and *measure\_background\_from\_map*. [Neil Cook]
- *Output\_keys.py* - add background map tag. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add new background map constants. [Neil Cook]
- *Cal\_BADPIX\_spirou.py* - add the background map making and save to calibDB. [Neil Cook]
- Merge branch 'dev2' [Neil Cook]
- **Conflicts:** INTROOT/SpirouDRS/spirouUnitTests/Runs/test.run
- Remove CHANGELOG.md. [Neil Cook]

- Update changelog. [Neil Cook]
- Test.run. [Neil Cook]

#### 4.4.138 0.4.123 (2019-05-03)

- *Drs\_changelog\_2.py* - update comments for new changelogger. [Neil Cook]
- *Extract\_trigger.py* - update bugs. [Neil Cook]
- *SpirouUnitRecipes.py* - update for *fit\_tellu\_db*. [Neil Cook]
- *Extract\_trigger.py* - update for *fit\_tellu\_db*. [Neil Cook]
- *SpirouTelluric.py* - remove the print statement. [Neil Cook]
- *Obj\_fit\_tellu\_db.py* - add in second making of the target template. [Neil Cook]
- Update date/version/changelog. [Neil Cook]
- *Drs\_changelog\_2.py* - add changes to allow preview mode. [Neil Cook]
- *Obj\_fit\_tellu\_db.py* - correct type in wlog message. [Neil Cook]
- *SpirouTelluric.py* - p['OBJECTS'] when None will be a string. [Neil Cook]
- *Obj\_fit\_tellu\_db.py* - add full run through 1. *fit\_tellu* 2. *mk\_template* 3. *fit\_tellu*. [Neil Cook]
- *SpirouTelluric.py* - need to clean out sys.argv before running codes. [Neil Cook]
- *SpirouDB.py* - need to make sure folder exists otherwise lock will persist. [Neil Cook]
- *Obj\_fit\_tellu\_db.py* - correct bug in writing code. [Neil Cook]
- *SpirouTelluric.py* - add *find\_objects* function and alias. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - correction to comments. [Neil Cook]
- *Obj\_fit\_tellu\_db.py* - first commit of fit tellu db redo. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.139 0.4.122 (2019-05-02)

- *Drs\_changelog\_2.py* - add updating of drs files. [Neil Cook]
- *Drs\_changelog\_2.py* - add updating of drs files. [Neil Cook]
- *Update\_fileversion.py* - add extra code to fix the fix. [Neil Cook]
- *Drs\_changelog\_2.py* - update new change log code. [Neil Cook]
- Add git tools to replace *drs\_changelog*. [Neil Cook]
- Add git tools to replace *drs\_changelog*. [Neil Cook]
- *Update\_fileversion.py* - remove skip file check. [Neil Cook]
- *SpirouConst.py* - add new filenames. [Neil Cook]
- *Output\_keys.py* - add tellu s1d keys. [Neil Cook]
- *Update\_fileversion.py* - first commit fix code for bad header keys. [Neil Cook]
- *Obj\_fit\_tellu.py* - remove old header keys. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - remove old header keys. [Neil Cook]
- Update version. [Neil Cook]

#### 4.4.140 0.4.121 (2019-04-30)

- Update trigger. [Neil Cook]
- *Obj\_fit\_tellu.py* - fix NBLAZE to BLAZE in uniform velocity s1d. [Neil Cook]

#### 4.4.141 0.4.120 (2019-04-29)

- *Compare\_outputs.py* - change paths. [Neil Cook]

#### 4.4.142 0.4.119 (2019-04-26)

- *Extract\_trigger.py* - correct mistake with extraction trigger. [Neil Cook]
- Update test.run. [Neil Cook]
- *SpirouTable.py* - fix problem with NaNs in header (make string) [Neil Cook]



- *SpirouTable.py* - fix problem with NaNs in header (make string) [Neil Cook]
- *Extract\_trigger.py* - should use *DRS\_DATA\_RAW* in preprocessing. [Neil Cook]
- *Obj\_fit\_tellu.py* - add s1d telluric corrected files. [Neil Cook]
- *SpirouImage.py* - correct s1d ith telluric NaNs. [Neil Cook]
- *Obj\_fit\_tellu.py* - change to NBLAZE. [Neil Cook]
- *SpirouImage.py* - new s1d - deal with full order being NaNs (for telluric) [Neil Cook]
- *Obj\_fit\_tellu.py* - save s1d for corrected spectrum. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - increase edge smoothing size. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - increase edge smoothing size. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - increase edge smoothing size. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - s1d fix problems with adding new s1d code. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - s1d fix problems with adding new s1d code. [Neil Cook]
- *SpirouImage.py* - new s1d - iuv spline wrong. [Neil Cook]
- *SpirouImage.py* - edges was wrong. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - correct s1d (now s1dw and s1dv) [Neil Cook]

#### 4.4.143 0.4.118 (2019-04-25)

- *SpirouImage.py* - write new s1d function. [Neil Cook]
- *SpirouPlot.py* - add *ext\_1d\_spectrum\_debug\_plot* plot for debugging s1d plot. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add new s1d constants. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - added new s1d code (not finished) [Neil Cook]
- *SpirouRV.py* - update pearson r test for NaNs. [Neil Cook]
- Update test.run. [Neil Cook]
- *SpirouRV.py* - catch NaN warnings that are valid. [Neil Cook]
- *SpirouRV.py* - catch NaN warnings that are valid. [Neil Cook]
- *SpirouRV.py* - catch NaN warnings that are valid. [Neil Cook]
- *SpirouRV.py* - catch NaN warnings that are valid. [Neil Cook]
- *SpirouRV.py* - looking for NaN warnings. [Neil Cook]
- *SpirouRV.py* - looking for NaN warnings. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - looking for NaN warnings. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - looking for NaN warnings. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - looking for NaN warnings. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - looking for NaN warnings. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - looking for NaN warnings. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - looking for NaN warnings. [Neil Cook]
- *SpirouTelluric.py* - catch warnings from less than for NaNs. [Neil Cook]
- *Compare\_outputs.py* - script to difference all outputs in two folders with files of the same name (output difference) [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - turn off plotting all *fit\_tellu* orders. [Neil Cook]
- *Obj\_mk\_tellu\_new.py* - add warning around less than (for NaNs) [Neil Cook]
- *Obj\_fit\_tellu.py* - remove a NaN sum. [Neil Cook]
- Test.run - update just *mk\_tellu/fit\_tellu* to test. [Neil Cook]
- Test.run - update just *fit\_tellu* to test. [Neil Cook]
- Change np.sum -> np.nansum, np.mean -> np.nanmean, np.median -> np.nanmedian etc. [Neil Cook]

#### 4.4.144 0.4.117 (2019-04-24)

- Change all np.polyfit to SpirouDRS.spirouCore.spirouMath.nanpolyfit. [Neil Cook]
- Change all np.polyfit to SpirouDRS.spirouCore.spirouMath.nanpolyfit. [Neil Cook]
- Change all np.polyfit to SpirouDRS.spirouCore.spirouMath.nanpolyfit. [Neil Cook]
- Change all np.polyfit to SpirouDRS.spirouCore.spirouMath.nanpolyfit. [Neil Cook]
- Change all np.polyfit to SpirouDRS.spirouCore.spirouMath.nanpolyfit. [Neil Cook]
- Change all np.polyfit to SpirouDRS.spirouCore.spirouMath.nanpolyfit. [Neil Cook]
- Change all np.polyfit to SpirouDRS.spirouCore.spirouMath.nanpolyfit. [Neil Cook]
- Change the way InterpolatedUnivariateSpline works. [Neil Cook]

- Update test.run. [Neil Cook]
- Update test.run. [Neil Cook]

#### 4.4.145 0.4.116 (2019-04-10)

- Update test.run. [njcuk9999]
- *SpirouRV.py* - deal with NaNs. [njcuk9999]
- *SpirouLOCOR.py* - deal with NaNs. [njcuk9999]
- *SpirouImage.py* - deal with NaNs. [njcuk9999]
- *SpirouPlot.py* - convert zeros to NaNs. [njcuk9999]
- *See\_shift.py* - test for pixel shifting by different amounts. [njcuk9999]
- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - convert zeros to NaNs. [njcuk9999]
- *Cal\_SLIT\_spirou.py* - change zeros to NaNs. [njcuk9999]
- *Cal\_loc\_RAW\_spirou.py* - change zeros to NaNs. [njcuk9999]
- *Cal\_extract\_RAW\_spirou.py* - change zeros to NaN. [njcuk9999]

#### 4.4.146 0.4.115 (2019-04-08)

- *SpirouEXTOR.py* - add options in extraction method to test different weighting systems. [njcuk9999]
- *SpirouImage.py* - replace zeros with NaNs. [njcuk9999]
- *SpirouFLAT.py* - replace zero's with NaNs. [njcuk9999]
- *SpirouEXTOR.py* - replace zeros with NaNs. [njcuk9999]
- *SpirouPlot.py* - replace zeros with NaNs. [njcuk9999]
- *SpirouBACK.py* - replace zeros with NaNs. [njcuk9999]
- *Cal\_FF\_RAW\_spirou.py* - replace zeros with nans. [njcuk9999]
- *SpirouEXTOR.py* - readd *raw\_weights*. [njcuk9999]

#### 4.4.147 0.4.114 (2019-04-07)

- *Cal\_FF\_RAW\_spirou.py* - re-add in new background subtraction. [Neil Cook]
- *SpirouEXTOR.py* - reset *raw\_weights*. [Neil Cook]
- *SpirouEXTOR.py* - reset *raw\_weights*. [Neil Cook]
- *Cal\_FF\_RAW\_spirou.py* - try to match neil branch. [Neil Cook]
- *Cal\_FF\_RAW\_spirou.py* - try to match master. [Neil Cook]
- *Cal\_FF\_RAW\_spirou.py* - test force extractff type to 3c. [Neil Cook]
- *SpirouBACK.py* - add in old measure background function (as test) [Neil Cook]
- *Cal\_FF\_RAW\_spirou.py* - redo debananafication. [Neil Cook]
- *Cal\_FF\_RAW\_spirou.py* - undo debananafication. [Neil Cook]
- Reset *cal\_loc* (no background) for test. [Neil Cook]
- Reset *cal\_loc* (no background) for test. [Neil Cook]
- *Cal\_FF\_RAW\_spirou.py* - remove background subtraction (for test) [Neil Cook]

#### 4.4.148 0.4.113 (2019-04-06)

- *Cal\_FF\_RAW\_spirou.py* - remove background subtraction (for test) [Neil Cook]
- Test.run - update test.run. [Neil Cook]
- *Cal\_FF\_RAW\_spirou.py* - unfix negative values set to zero. [Neil Cook]

#### 4.4.149 0.4.112 (2019-04-05)

- *SpirouEXTOR.py* - remove weighting of raw pixels less than zero to very low value. [njcuk9999]
- *SpirouConst.py* - update date and version. [njcuk9999]
- *Cal\_SHAPE\_spirou\_old.py* - edit background correction. [njcuk9999]
- *Cal\_SLIT\_spirou.py* - do not mask out the zeros. [njcuk9999]

- *Cal\_loc\_RAW\_spirou.py* - do not mask out the zeros. [njcuk9999]
- *Cal\_FF\_RAW\_spirou.py* - do not mask out the zeros. [njcuk9999]
- *Cal\_extract\_RAW\_spirou.py* - do not mask out the zeros. [njcuk9999]
- Merge branch 'neil' into dev. [njcuk9999]
- *SpirouBACK.py* - add background debug plot to background finding function. [njcuk9999]
- *Cal\_SLIT\_spirou.py* - add hdr and cdr to background correction (to save debug file) [njcuk9999]
- *Cal\_loc\_RAW\_spirou.py* - add hdr and cdr to background correction (to save debug file) [njcuk9999]
- *Cal\_extract\_RAW\_spirou.py* - add hdr and cdr to background correction (to save debug file) [njcuk9999]
- *Cal\_FF\_RAW\_spirou.py* - add hdr and cdr to background correction (to save debug file) [njcuk9999]
- *Misc/cal\_SHAPE\_spirou\_old.py* - add changes to background subtraction. [njcuk9999]
- *Cal\_low\_RAW\_spirou.py* - add changes to background subtraction. [njcuk9999]
- *Cal\_FF\_RAW\_spirou.py* - add changes to background subtraction. [njcuk9999]
- *SpirouWAVE.py* - add initial keep parameter for line width. [njcuk9999]
- *SpirouBACK.py* - add Etienne's changes into *measure\_background\_flatfield*. [njcuk9999]
- *Cal\_WAVE\_NEW\_E2DS\_spirou\_2.py* - add fix for updating the HC/Fp header for wave solution. [njcuk9999]
- *Constants\_SPIROU\_H4RG.py* - change background correction constants. [njcuk9999]
- *Cal\_extract\_RAW\_spirou.py* - change background correction to Etienne's new method! [njcuk9999]

#### 4.4.150 0.4.111 (2019-04-04)

- *Cal\_SHAPE\_spirou.py* - fix typo in output filenames (only affected debug outputs) [njcuk9999]
- *Cal\_CCF\_wrap\_MH.py* - fix typo in return table values 'cloc' -> 'loc' [njcuk9999]
- *Cal\_CCF\_wrap\_MH.py* - call from command line was missing. [njcuk9999]
- *Cal\_CCF\_wrapper* changes for Melissa (temporary addition of *cal\_CCF\_E2DS\_FP\_MH\_spirou.py*) [njcuk9999]

#### 4.4.151 0.4.108 (2019-04-03)

- *SpirouPlot.py* - allow all orders to be plot in tellu plot. [Neil Cook]

#### 4.4.152 0.4.109 (2019-04-03)

- Update test.run. [njcuk9999]
- *SpirouWAVE.py* - comment out non-used line. [njcuk9999]
- *SpirouDrs.data* - undo changes from Melissa Branch. [njcuk9999]
- *Config.py* - undo changes from Melissa Branch. [njcuk9999]
- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - undo changes from Melissa branch. [njcuk9999]
- *Cal\_extract\_RAW\_spirou.py* - add WFP keys to cal extract and deal with not having values. [njcuk9999]
- Merge branch 'neil' into dev. [njcuk9999]
- *SpirouEXTOR.py* - fix normalisation of spelong (E2DSLL) [njcuk9999]
- *Cal\_extract\_RAW\_spirou.py* - add WFP keys to cal extract. [njcuk9999]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - replace manual call to filename. [njcuk9999]

#### 4.4.153 0.4.110 (2019-04-03)

- *Cal\_WAVE\_NEW*: fixes to m(x) residuals plot. [melissa-hobson]
- *Cal\_CCF\_E2DS\_FP*: keeps base name only for WFP file. [melissa-hobson]
- *Cal\_WAVE\_E2DS\_EA*: save wave FP CCF keys. [melissa-hobson]
- *Cal\_WAVE\_NEW*: save wave FP CCF target RV and width. [melissa-hobson]
- *Cal\_CCF\_E2DS\_FP*: writes WFP keys to CCF headers properly. [melissa-hobson]
- *Cal\_CCF\_E2DS\_FP*: read correct keyword for drift. [melissa-hobson]
- *Cal\_CCF\_E2DS\_FP*: reads correct keyword for wave sol drift, writes WFP keys to CCF headers spirouKeywords: added unique WFP file source keyword. [melissa-hobson]
- *SpirouKeywords*: add wave FP CCF keys to list. [melissa-hobson]

#### 4.4.154 0.4.107 (2019-04-02)

- *Cal\_WAVE\_NEW*: modified FP CCF keywords *spirouKeywords*: added unique WFP keywords for wave FP CCF keys. [melissa-hobson]
- Merge branch ‘melissa’ of [https://github.com/njcuk9999/spirou\\_py3](https://github.com/njcuk9999/spirou_py3) into melissa. [melissa-hobson]
- Merge branch ‘master’ into melissa. [Melissa Hobson]
- **Conflicts:** *INTROOT/SpirouDRS/spirouTHORCA/spirouWAVE.py* *INTROOT/bin/cal\_WAVE\_E2DS\_EA\_spirou.py* *INTROOT/misc/cal\_HC\_E2DS\_spirou.py* *INTROOT/misc/wave\_comp\_night.py*
- Merge branch ‘melissa’ of [https://github.com/njcuk9999/spirou\\_py3](https://github.com/njcuk9999/spirou_py3) into melissa. [melissa-hobson]
- Config save. [melissa-hobson]

#### 4.4.155 0.4.106 (2019-03-29)

- Github backup before merging with master. [melissa-hobson]
- *Cal\_WAVE\_NEW* improved cross-order matching. [melissa-hobson]

#### 4.4.156 0.4.104 (2019-03-28)

- Fix bug in extraction modes for *cal\_exposure\_meter* and *cal\_wave\_mapper*. [Neil Cook]
- *Cal\_FF\_RAW\_spirou.py* - missed the debananafication. [Neil Cook]
- *Cal\_extract/cal\_ff* - fix mode *extract\_shape/ll*. [Neil Cook]
- *Cal\_extract/cal\_FF* - fix mode selection. [Neil Cook]
- *SpirouImage.py* - DeBananafication needs ParamDict in function call. [Neil Cook]
- *Make\_1ds\_etienne\_new.py* - new s1d code to integrate into the drs. [Neil Cook]
- *SpirouImage.py* - fix for use of DeBananafication since change to function (for *cal\_SHAPE* here) [Neil Cook]
- Update *date/version/changelog/update\_notes*. [Neil Cook]

#### 4.4.157 0.4.102 (2019-03-28)

- *Cal\_extract\_RAW\_spirou.py* - turn off *ic\_extract* debug. [Neil Cook]
- Merge branch ‘*extract\_issue555*’ into neil. [Neil Cook]
- *SpirouEXTOR.py* - do not round in *dy* statement. [Neil Cook]

#### 4.4.158 0.4.105 (2019-03-28)

- *Cal\_HC\_E2DS\_EA*: log statistics *cal\_WAVE\_NEW*: improved cross-order FP peak matching, store *m(x)* fits, remove modulo-1-pixel line center errors. [melissa-hobson]

#### 4.4.159 0.4.101 (2019-03-25)

- *SpirouPlot.py* - add the debanana plot in. [Neil Cook]
- *Misc/new\_plot\_test.py* - test of plotting fixes. [Neil Cook]
- *Qc\_examples.py* - add code to document qc parameters for each output in reduced. [Neil Cook]

#### 4.4.160 0.4.100 (2019-03-22)

- *SpirouLOCOR.py* - add *get\_fiber\_data* function and *get\_straightened\_orderprofile* function. [Neil Cook]
- *SpirouEXTOR.py* - fix bug in modes which don’t use *pos\_a*. [Neil Cook]
- *SpirouImage* (*spirouFile/spirouFITS/spirouImage*) - add changes for new extraction mode. [Neil Cook]
- *SpirouEXTOR.py* - add etienne’s changes to debananafication. [Neil Cook]
- *SpirouPlot.py* - add *ext\_debanana\_plot* to show straightened image. [Neil Cook]
- *SpirouConfig.py* - fix ParamDict copy function. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - change mode to ‘5b’ and ‘5a’ [Neil Cook]

- *Cal\_extract\_RAW\_spirou.py* - add changes to all modes ‘5a’ and ‘5b’ to work. [Neil Cook]
- Merge branch ‘master’ into *extract\_issue555*. [Neil Cook]
- *Extract\_test\_5a\_5b.py* - want a and b and c separately. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - fix bug in width getting. [Neil Cook]
- *SpirouLOCOR.py* - add function required to get AB + C fiber coefficients when needed. [Neil Cook]
- *SpirouEXTOR.py* - add changes required for extract mode 5a/5b. [Neil Cook]
- Test of extract mode 5a/5b. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - add code required for mode 5a/5b. [Neil Cook]

#### 4.4.161 0.4.099 (2019-03-20)

- *Tellu\_file\_number\_test.py* - distinguish between *TELL\_OBJ* and *TELL\_MAP* in counting from telluDB. [Neil Cook]
- Merge pull request #557 from njcuk9999/neil. [Neil Cook]  
Neil → Master. Confirmed successful unit tests.

#### 4.4.162 0.4.098 (2019-03-19)

- *Cal\_extract\_RAW\_spirou.py* - fix problem with width getting for fiber A. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.163 0.4.097 (2019-03-19)

- *SpirouKeywords.py* - remove the “1” suffix (no longer needed) [Neil Cook]
- *SpirouEXTOR.py* - set up two new extract functions to test adding of fractional contributions of pixels. [Neil Cook]
- Update test.run. [Neil Cook]
- Update test.run. [Neil Cook]
- *SpirouFITS.py* - fix bug with index lock file (when path does not exist) [Neil Cook]
- *SpirouFITS.py* - add lock file descriptions for print message. [Neil Cook]
- *SpirouStartup.py* - allow *main\_end* script to be used not at the end. [Neil Cook]
- *SpirouFITS.py* - modify open/close lock file functions. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - reduced max db wait time to 10 minutes. [Neil Cook]
- *Cal\_preprocess\_spirou.py* - index files separately. [Neil Cook]
- Update *extract\_trigger* to be able to extract darks. [Neil Cook]
- Merge branch ‘sky\_dark\_fix’ into neil. [Neil Cook]
- **Conflicts:** INTROOT/SpirouDRS/spirouImage/spirouImage.py *UPDATE\_NOTES.txt*
- Update notes. [Neil Cook]
- *SpirouImage.py* - re-add skydark in. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add option to switch between SKYDARK only and “DARK or SKYDARK” (depending which is closest) [Neil Cook]
- *SpirouImage.py* - correct bug in sky dark. [Neil Cook]
- Update *extract\_trigger.py*. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.164 0.4.096 (2019-03-18)

- *Tellu\_file\_number\_test.py* - update the paths. [Neil Cook]
- *SpirouConst.py* - fix bug with *INDEX\_LOCK\_FILENAME* - must not use PID (must be unique to night name not individual process otherwise does not lock out other pids) [Neil Cook]
- Update *extract\_trigger.py*. [Neil Cook]
- *SpirouTelluric.py* - remove *extract\_file*. [Neil Cook]

**4.4.165 0.4.095 (2019-03-16)**

- *Obj\_mk\_obj\_template.py* - copy all cdb from other outputs. [Neil Cook]
- *SpirouFITS.py* - separate forbidden keys into absolutely don't copy and drs don't copy (that will be copied for updating current files) [Neil Cook]
- *SpirouFITS.py* - separate forbidden keys into absolutely don't copy and drs don't copy (that will be copied for updating current files) [Neil Cook]
- *SpirouFITS.py* - need to copy all keys when updating wave solutions. [Neil Cook]
- Fix the references to old values of *fp\_rv*. [Neil Cook]
- Update date/version/changelog. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - plot duplicate plot correctly. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - correct typo in WMREF. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - correct typo in WSOURCE (was WAVESOURCE) [Neil Cook]
- *SpirouConst.py* - correct typo. [Neil Cook]

**4.4.166 0.4.094 (2019-03-15)**

- *SpirouConst.py* - remove *DRS\_EOUT* from forbidden keys (it should follow extracted file) [Neil Cook]
- *Calc\_berv.py* - make sure CopyOriginalKeys comes first before other calls to hdct. [Neil Cook]
- *SpirouFITS.py* - change *QC\_HEADER\_KEYS* to *FORBIDDEN\_HEADER\_PREFIXES*. [Neil Cook]
- *SpirouKeywords.py* - change some keyword to make them unique (thus can remove them) [Neil Cook]
- *SpirouConst.py* - add more forbidden keys, change *qc\_keys* to any prefix that shouldn't be copied. [Neil Cook]
- *Obj\_fit\_tellu.py* - CopyOriginalKeys should be called before other hdct commands. [Neil Cook]
- Update unit test scripts. [Neil Cook]
- *SpirouRV.py* - fix problem with getting C file from header. [Neil Cook]
- *SpirouConst.py* - add *CCF\_FP\_TABLE1* and 2. [Neil Cook]
- *Recipe\_control.txt* - do not allow *OBJ\_DARK* files - only *OBJ\_FP*. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - add a C table as well as a fits table. [Neil Cook]
- *Extract\_trigger.py* - update settings. [Neil Cook]
- *SpirouKeywords.py* - remove unused keywords. [Neil Cook]
- *SpirouConst.py* - add AB and C files for *CCF\_FP*. [Neil Cook]
- *Tellu\_file\_number\_test.py* - change path (for new test) [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - separate AB and C files for output. [Neil Cook]
- *SpirouTelluric.py* - fix list of col names for bigcube (only one bad file now) [Neil Cook]
- *Extract\_trigger* - update trigger. [Neil Cook]
- *SpirouLOCOR.py* - fix localisation error - should be a median not an average (option was there but not used) [Neil Cook]
- *SpirouFITS.py* - remove a HUGE BUG - eval('2018-08-05') -> 2005 (as date is interpreted as a subtraction)!!!! [Neil Cook]
- *Tellu\_file\_number\_test.py* - add raw files and disk vs index.fits. [Neil Cook]
- *Log\_analyser.py* - code to look for errors in set of log files. [Neil Cook]
- *Cal\_DRIFT\_E2DS\_spirou.py* - fix typo in get wave sol return. [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - fix typo in cdbbad value name. [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - fix typo in cdbbad value name. [Neil Cook]

**4.4.167 0.4.093 (2019-03-14)**

- *Cal\_preprocess\_spirou.py* - fix filename (should only be filename not path) [Neil Cook]
- Update date/version/changelog/notes. [Neil Cook]

**4.4.168 0.4.092 (2019-03-14)**

- Make sure all input files are added to header in form: INF#### where the first digit shows the file-set and the other three the position i.e. for *recipe.py night\_name* file1 file2 file3 file4 where inputs expected are 1 flat and multiple darks header would add INF1001 INF2001 INF2002 INF2003. [Neil Cook]

- Add header keys for calibration files used to create outputs (CDBDARK, CDBWAVE) etc, also add a source for the wave solution (WAVELOC) [Neil Cook]
- *SpirouImage.py* - correct the rms percentile to allow more darks to pass the rms test. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.169 0.4.091 (2019-03-13)

- *Cal\_DARK\_spirou.py* and *spirouImage.py* - tweak changes to all SKYDARK files to be used. [Neil Cook]
- *Extract\_trigger.py* - readd the “skip” criteria. [Neil Cook]
- *Drs\_reset.py* - skip the log file for this instance of *drs\_reset* (otherwise can get stuck) [Neil Cook]
- *Drs\_reset.py* - fix removal of files when in dir (if still present) [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - correct bad qc parameters. [Neil Cook]
- *Obj\_mk\_tellu\_new.py* - fix typo in qc parameters. [Neil Cook]
- *Obj\_mk\_tellu\_new.py* - fix typo in qc parameters. [Neil Cook]
- *Drs\_reset.py* - fix typo in reset1. [Neil Cook]
- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - fix bug with new *qc\_pass* criteria. [Neil Cook]
- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - fix bug with new *qc\_pass* criteria. [Neil Cook]
- *Unit\_test.py* - update logging (log all) [Neil Cook]
- *SpirouFITS.py* - add function “*add\_qc\_keys*” to take the keys and push them into hdict correctly. [Neil Cook]
- *SpirouConst.py* - change PPVERSION to VERSION for reduced index.fits. [Neil Cook]
- Update QC parameters (to store in order) [Neil Cook]
- Update changelog. [Neil Cook]
- *Drs\_reset.py* - set DEBUG = False in reset, add the removal of all sub- directories in drs folders. [Neil Cook]
- *SpirouStartup.py* - fix bug that we only need lock file is outputs is not None. [Neil Cook]
- Update changelog. [Neil Cook]
- *SpirouConst.py* - add version to the index files. [Neil Cook]
- Update extraction trigger. [Neil Cook]

#### 4.4.170 0.4.090 (2019-03-12)

- Update extraction trigger. [Neil Cook]
- *SpirouPOLAR.py* - add *qc\_pass*. [Neil Cook]
- *SpirouFITS.py* - add a test for formatting defined in the keyword (for 1d and 2d lists only) [Neil Cook]
- *SpirouKeywords.py* - add *KW\_DRS\_QC\_PASS* + change position of number in QCV, QCN, QCL. [Neil Cook]
- *SpirouConst.py* - change the *qc\_keys* to look for. [Neil Cook]
- Add *qc\_pass* parameter (flag for each qc parameter) [Neil Cook]

#### 4.4.171 0.4.103 (2019-03-12)

- Updates to *cal\_WAVE\_NEW\_2*. [melissa-hobson]
- Updated to *cal\_HC*, *cal\_WAVE\_NEW*. [melissa-hobson]

#### 4.4.172 0.4.089 (2019-03-11)

- *Extract\_trigger.py* - update the settings ready for re-runs of extractions. [Neil Cook]
- *SpirouStartup.py* - fix where we lock the index file. [Neil Cook]
- *SpirouConst.py* - add an *INDEX\_LOCK\_FILENAME* to lock the indexing in parallel processes. [Neil Cook]
- *Tellu\_file\_number\_test.py* - code to test the number of telluric files at difference stages of the DRS. [Neil Cook]
- Merge pull request #553 from njcuk9999/dev. [Neil Cook]  
cfht/melissa\_fix->Dev->master. confirm until test completed
- Update date/version/changelog. [Neil Cook]

#### 4.4.173 0.4.088 (2019-03-09)

- *SpirouLSD.py* - fix str to float bug. [Neil Cook]
- *Test.run* - update. [Neil Cook]
- *SpirouPOLAR.py* - fix string - float bug. [Neil Cook]
- *SpirouTelluric.py* - fix berv from string. [Neil Cook]
- *SpirouRV* - must have finite BERV value – but should this be set to zero? [Neil Cook]
- *SpirouFITS.py* - undo hdr type fix. [Neil Cook]
- Update *test.run*. [Neil Cook]
- *SpirouBERV.py* - correct strings coming from header (BERV, BJD, *BERV\_MAX*) [Neil Cook]
- Update *test.run*. [Neil Cook]
- Update *test.run*. [Neil Cook]
- *SpirouLOCOR.py* - fix bug with strings not being ints. [Neil Cook]
- *SpirouFITS.py* - fix problem with changing output type (should not change) [Neil Cook]
- *Cal\_HC\_E2DS\_EA\_spirou.py* - fix typo in *updatewavesolution*. [Neil Cook]
- *SpirouWAVE.py* - fix typo in new masknaems *ordermask->omask*. [Neil Cook]
- *SpirouFITS.py* - fix values now as strings -> cast to ints/floats. [Neil Cook]
- Fix problem with *mjd* being a string. [Neil Cook]
- Fix problem with *mjd* being a string. [Neil Cook]
- *SpirouFITS.py* - allow NaNs into header by converting to string. [Neil Cook]
- *SpirouFITS.py* - allow NaNs into header by converting to string. [Neil Cook]
- *SpirouFITS.py* - allow NaNs into header by converting to string. [Neil Cook]
- *SpirouFITS.py* - allow NaNs into header by converting to string. [Neil Cook]
- *SpirouFITS.py* - allow NaNs into header by converting to string. [Neil Cook]
- *SpirouBERV.py* - fix bug when we don't need a BERV still need BERVHOUR in loc. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - fix typo BCHOURL -> BERVHOUR. [Neil Cook]
- *Cal\_loc\_RAW\_spirou.py* - fix mistake in assigned QCV value. [Neil Cook]
- *Cal\_loc\_RAW\_spirou.py* - fix mistake in assigned QCV value. [Neil Cook]

#### 4.4.174 0.4.087 (2019-03-08)

- Change *AddKey* -> *AddKey1DList* for QC names/values/logic. [Neil Cook]
- *Cal\_preprocess\_spirou.py* - correct qc missing from param dict. [Neil Cook]
- *SpirouKeywords.py* - fix missed comma in list. [Neil Cook]
- *SpirouBERV.py* - add BERVHOUR to loc (for saving to header) [Neil Cook]
- *SpirouBERV.py* - add BERVHOUR to loc (for saving to header) [Neil Cook]

#### 4.4.175 0.4.086 (2019-03-08)

- *SpirouBERV.py* - add BERVHOUR to loc (for saving to header) [Neil Cook]
- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - add some more TODO's for sections that need work. [Neil Cook]
- *Cal\_HC* - allow multiple files (need to update all files + add files to header) [Neil Cook]
- Add WMEANREF for AB and C to header. [Neil Cook]
- Add PID to output header files (so one can find the log file for each) [Neil Cook]
- Add Quality control header keys QC, QCV# (value), QCN# (name), QCL# (name) - and make sure these are not copied over from inputs + some pep8 fixes. [Neil Cook]
- *SpirouWAVE.py* - clean up the code (pep8) [Neil Cook]
- *SpirouFITS.py* - clean up the code (pep8) [Neil Cook]
- *SpirouBERV.py* - clean up the code (pep8) [Neil Cook]
- *SpirouPlot.py* - clean up the code (pep8) [Neil Cook]
- *SpirouConst.py* - clean up the code (pep8) [Neil Cook]
- *Cal\_WAVE\_NEW\_E2DS\_spirou.py* - clean up the code (pep8) [Neil Cook]
- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - clean up the code (pep8) [Neil Cook]
- Merge branch '*melissa\_fixes*' into dev. [Neil Cook]
- Merge pull request #551 from njcuk9999/cfht. [Neil Cook]  
Fixed lock timer bug and added barycorr retry.



#### 4.4.176 0.4.085 (2019-03-07)

- Fixed lock timer bug and added barycorr retry. [Chris Usher]

#### 4.4.177 0.4.084 (2019-03-05)

- Delete *wave\_comp\_night.py*. [melissa-hobson]
- Update *cal\_WAVE\_E2DS\_EA\_spirou.py*. [melissa-hobson]
- Merge pull request #547 from njcuk9999/melissa. [melissa-hobson]  
Melissa

#### 4.4.178 0.4.083 (2019-02-28)

- *SPlt.debug\_locplot\_finding\_orders* pauses correctly after each plot; plot limit modified to improve visualization. [melissa-hobson]
- *SpirouBACK.measure\_background\_and\_get\_central\_pixels*: removed duplicate call to *locplot\_y\_min\_y\_max*. [melissa-hobson]

#### 4.4.179 0.4.081 (2019-02-22)

- Littrow check plot: ylimits added based on QCs and results. [melissa-hobson]
- *Cal\_WAVE\_NEW* gets HC catalog lines correctly. [melissa-hobson]
- Merge pull request #542 from njcuk9999/master. [melissa-hobson]  
update
- Merge pull request #541 from njcuk9999/dev. [Neil Cook]  
Dev -> Master
- Update date/version/changelog. [Neil Cook]
- Correct error estimation for *cal\_WAVE\_NEW*. [melissa-hobson]
- Merge pull request #538 from njcuk9999/master. [melissa-hobson]  
update

#### 4.4.180 0.4.076 (2019-02-22)

- *SpirouLOCOR.py* - fix problem with *locplot\_im\_sat\_threshold* plot. [Neil Cook]

#### 4.4.181 0.4.082 (2019-02-22)

- *SpirouPlot.py* - fix problem with *locplot\_im\_sat\_threshold* plot. [Neil Cook]
- *Cal\_loc\_RAW\_spirou.py* - fix problem with *locplot\_im\_sat\_threshold* plot. [Neil Cook]
- Merge remote-tracking branch 'origin/dev' into dev. [Neil Cook]
- Merge pull request #537 from njcuk9999/neil. [Neil Cook]  
Neil
- Update date/version/changelog. [Neil Cook]

#### 4.4.182 0.4.075 (2019-02-21)

- *SpirouTelluric.py* - need to stop if not index files found. [Neil Cook]

#### 4.4.183 0.4.073 (2019-02-19)

- *Cal\_validate\_spirou.py* - fix bug it version checking (found by Melissa) [Neil Cook]
- Merge branch 'dev' into neil. [Neil Cook]
- *Cal\_validate\_spirou.py* - fix bug it version checking (found by Melissa) [Neil Cook]
- *SpirouWAVE.py* - add some more comments for resolution map. [Neil Cook]

#### 4.4.184 0.4.074 (2019-02-19)

- *SpirouTelluric.py* - remove hard coded number of orders. [njcuk9999]
- *Obj\_mk\_tellu\_new.py* - comment out unused lines. [njcuk9999]

#### 4.4.185 0.4.080 (2019-02-18)

- Testing linear minimization FP wave sol fitting. [melissa-hobson]
- Merge branch 'master' into melissa. [Melissa Hobson]
- Merge pull request #536 from njcuk9999/neil. [Neil Cook]  
Neil -> Master. Confirm full tests complete.
- Update *date/version/changelog/update\_notes*. [Neil Cook]
- Tests: -new version of Lovis method (fit  $n(x)$  for all lines, rather than linear interpolation) - wave sol comparison. [melissa-hobson]

#### 4.4.186 0.4.072 (2019-02-13)

- *Obj\_mk\_tellu\_db.py* - need to only print errors if we have errors. [Neil Cook]
- *Obj\_mk\_tellu\_db.py* - need to only print errors if we have errors. [Neil Cook]

#### 4.4.187 0.4.071 (2019-02-12)

- *Extract\_trigger.py* - make sure *obj\_fit\_tellu* errors are stored. [Neil Cook]
- *Obj\_mk\_tellu\_db.py* - keep track of errors and exceptions - only print at end. [Neil Cook]
- *Obj\_mk\_obj\_template.py* - fix bug when filtering by snr (all columns of fits table must be same length) [Neil Cook]
- *SpirouPlot.py* - fix bug with HC plot (from added save of plotting) [Neil Cook]
- *Cal\_preprocess\_spirou.py* - remove rms printout and add values to QC errors. [Neil Cook]
- *SpirouPlot.py* - deal with TclError (with new call for *setup\_figure*) [Neil Cook]
- *Cal\_loc\_RAW\_spirou.py* - add p to call to plotting function. [Neil Cook]
- *SpirouPlot.py* - modify figure setup to try to catch TclError's and deal with them. [Neil Cook]
- *Extract\_trigger.py* - modify printing to logfile (print input args) [Neil Cook]
- *Obj\_mk\_obj\_template.py* - change number of tell files to info. [Neil Cook]
- *Obj\_mk\_obj\_template.py* - fix typo in new snr constraint. [Neil Cook]
- *Obj\_mk\_obj\_template.py* - fix typo in new snr constraint. [Neil Cook]
- *Obj\_mk\_obj\_template.py* - fix typo in new snr constraint. [Neil Cook]
- *Obj\_mk\_obj\_template.py* - fix typo in new snr constraint. [Neil Cook]
- Update *date/version/changelog*. [Neil Cook]

#### 4.4.188 0.4.070 (2019-02-12)

- *SpirouFITS.py* - add *UpdateWaveSolution* (*update\_wave\_sol*) function to update correctly the HC and FP files. [Neil Cook]
- *Obj\_mk\_obj\_template.py* - add criteria to check median SNR and remove any below half the median SNR (in specific order) [Neil Cook]
- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - BUG FIX - hc and fp files have wrong headers when updating wave solution. [Neil Cook]

#### 4.4.189 0.4.069 (2019-02-11)

- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - Big Bug FIX ASAP. [Neil Cook]
- *SpirouPlot.py* - update *wave\_ea\_plot\_line\_profiles* fig size. [Neil Cook]
- *SpirouImage.py* - pep8 correction to corruption test. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add second criteria for corrupt files. [Neil Cook]
- *Cal\_preprocess\_spirou.py* - update corruption tests. [Neil Cook]
- *SpirouImage.py* - adjust rms values (scaled by percentile) [Neil Cook]
- *Cal\_preprocess\_spirou.py* - move qc cuts to main code (from function) [Neil Cook]
- *SpirouImage.py* - update corruption test. [Neil Cook]
- *SpirouPlot.py* - update some plot parameters. [Neil Cook]
- *SpirouPlot.py* - enforce a default fig size on all plots + only save in png and pdf. [Neil Cook]
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- **Conflicts:** INTROOT/SpirouDRS/spirouStartup/spirouStartup.py
- Merge remote-tracking branch 'origin/input\_redo' into neil. [Neil Cook]
- **Conflicts:** .gitignore
- DRS startup - need to make data/msg etc folders if they don't exist. [njcuk9999]

#### 4.4.190 0.4.068 (2019-02-10)

- *SpirouPlot.py* - make sure plots are unique. [njcuk9999]
- *Cal\_DRIFTPEAK\_E2DS\_spirou.py* - modifications to plotting changes. [njcuk9999]
- *Drs\_reset.py* - add option to reset plot folder. [njcuk9999]
- *SpirouStartup.py* - deal with getting / setting / displaying plot level. [njcuk9999]
- *SpirouPlot.py* - add all functionality to support plotting to file. [njcuk9999]
- *SpirouConst.py* - add plot extensions and plot figsize to constants (for saving plots to file) [njcuk9999]
- Spirou modules - make all plot calls compatible with saving to file. [njcuk9999]
- Misc - make all plot calls compatible with saving to file. [njcuk9999]
- *Config.py* - make *DRS\_PLOT* an int and change description of *DRS\_INTERACTIVE*. [njcuk9999]
- Bin folder - modify all calls to plot to allow saving to file (all calls require "p" as an argument) [njcuk9999]

#### 4.4.191 0.4.067 (2019-02-08)

- *Cal\_preprocess\_spirou.py* - print out the corruption check value. [Neil Cook]
- *Cal\_preprocess\_spirou.py* - print out the corruption check value. [Neil Cook]
- *Cal\_preprocess\_spirou.py* - better message for corrupt file. [Neil Cook]
- *Cal\_preprocess\_spirou.py* - better message for corrupt file. [Neil Cook]
- *SpirouImage.py* - catch warning "RuntimeWarning: All-NaN slice encountered r = func(a, *\*\*kwargs*)" [Neil Cook]
- *Cal\_preprocess\_spirou.py* - pep8 tidy up of QC. [Neil Cook]
- *SpirouImage.py* - add *get\_full\_flat*, *get\_hot\_pixels*, *test\_for\_corrupt\_files* functions (for checking corruption in preprocessing) [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add corrupt file constants. [Neil Cook]
- *Cal\_preprocess\_spirou.py* - add QC for corrupt files. [Neil Cook]
- *Extract\_trigger.py* - update conditions for *mk\_tellu* and *fit\_tellu*. [Neil Cook]
- *Extract\_trigger.py* - update conditions for *mk\_tellu* and *fit\_tellu*. [Neil Cook]
- *Obj\_mk\_obj\_template.py* - make sure BigCube table in both BigCube and BigCube0. [Neil Cook]
- *Obj\_mk\_obj\_template.py* - fit BADFILE -> BADPFILE keyword. [Neil Cook]
- *SpirouKeywords.py* - update *KW\_OBJECT* (was a typo) [Neil Cook]
- *Obj\_mk\_obj\_template.py* - add the data type to ReadParams (otherwise tries to make them floats) [Neil Cook]
- *SpirouImage.py* - deal with keylook up and report better error (via keylookup) [Neil Cook]
- *Obj\_mk\_obj\_template.py* - fix another typo since last update. [Neil Cook]
- *SpirouKeywords.py* - add keyword *KW\_OBJECT*. [Neil Cook]
- *Obj\_mk\_obj\_template.py* - fix type in previous changes. [Neil Cook]
- *Check\_for\_corrupt\_files.py* - add an extra fix from Etienne. [Neil Cook]

- *Obj\_mk\_tellu\_db.py* - fix typo in printout text. [Neil Cook]
- *Obj\_mk\_obj\_template.py* - correct mistake in calling ReadParams (from most recent edit) [Neil Cook]
- *SpirouTelluric.py* - add a function to construct the big cube table (added as a second import to BigCube) [Neil Cook]
- *SpirouFITS.py* - add a *write\_image\_table* function to write a image and a table to single fits file. [Neil Cook]
- *Check\_for\_corrupt\_files.py* - adjust with Etiennes changes. [Neil Cook]
- *Obj\_mk\_obj\_template.py* - add fits table to big table with rows of file parameters (used in the big cube) [Neil Cook]
- *Check\_for\_corrupt\_files.py* - fix bugs in the test. [Neil Cook]

#### 4.4.192 0.4.066 (2019-02-07)

- Update the leapseconds. [Neil Cook]
- *Check\_for\_corrupt\_files.py* - worker code to check corrupt files functionality (before implementing into preprocessing) [Neil Cook]
- Update to only do *mk\_tellu* and *fit\_tellu*. [Neil Cook]
- Add / get functions for recon file. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - qc snr for *mk\_tellu* and *fit\_tellu*. [Neil Cook]
- *Obj\_mk\_tellu\_\*.py* - distinguish between SNR cut in *fit\_tellu* and *mk\_tellu*. [Neil Cook]
- *Obj\_fit\_tellu.py* - add qc of SNR > 100 for order 33. [Neil Cook]
- *Check\_objname.py* - pep9 remove blank lines. [Neil Cook]
- *Check\_objname.py* - check objnames and dprtype for preprocessed files in a given directory. [Neil Cook]
- Update *extract\_trigger* settings. [Neil Cook]
- Update telluric white/black lists. [Neil Cook]
- *Extract\_trigger.py* - add a comment. [Neil Cook]
- *Check\_calibdb\_2.py* - check calibdb and sort and make “pernight” and “perte” calibdb entries. [Neil Cook]
- *SpirouTelluric.\_\_init\_\_.py* - Add aliases to blacklist and whitelist functions. [Neil Cook]
- *Extract\_trigger.py* - get whitelist from file. [Neil Cook]

#### 4.4.193 0.4.065 (2019-02-06)

- Add a note to locale README.md. [Neil Cook]
- Update language database. [Neil Cook]
- *Drs\_table.py* - remove text to language database. [Neil Cook]

#### 4.4.194 0.4.079 (2019-02-06)

- *Cal\_WAVE\_NEW* corrected Littrow extrapolation for reddest orders. [melissa-hobson]

#### 4.4.195 0.4.064 (2019-02-05)

- *Drs\_startup.py* - tweak display settings for interactive + debug mode in drs setup text. [Neil Cook]
- Update language database. [Neil Cook]
- *Drs\_text.py* - tweak short codes and how length works with Entry(None) [Neil Cook]
- *Drs\_exceptions.py* - tweak how exception work (and add string representation) [Neil Cook]
- Update language database. [Neil Cook]
- *Pseudo\_const.py* - do not automatically write debug message language codes (only when debug >= 100) [Neil Cook]
- *Drs\_startup.py* - continue editing how errors work. [Neil Cook]
- *Drs\_recipe.py* - continue update to errors. [Neil Cook]
- *Drs\_log.py* - do not use ‘p’ use params, update reporting (report all if debug >= 100) [Neil Cook]
- *Drs\_file.py* - add extra param (pep8) [Neil Cook]
- *Drs\_argument.py* - redo DrsArgument.exception and update *\_display\_info*. [Neil Cook]

- *Drs\_text.py* - expand functionality of Entry classes (`__add__`, `__radd__`, `__len__`, `__iter__`, `__next__`, `__eq__`, `__ne__`, `__contains__`) and how `.get()` works. [Neil Cook]
- *Drs\_exception.py* - add `ArgumentException/Error/Warning`. [Neil Cook]
- Update language database. [Neil Cook]
- *Param\_functions.py* - get `ArgumentError/Warning`. [Neil Cook]
- *Drs\_startup.py* - deal with changes to `ErrorEntry` (no “n” automatically added now) [Neil Cook]
- *Drs\_recipe.py* - move argument classes/functions to separate script + continue string moving to language database. [Neil Cook]
- *Drs\_loy.py* - add comment that some strings cannot be moved to language database. [Neil Cook]
- *Drs\_argument.py* - move argument classes/function to separate script. [Neil Cook]

#### 4.4.196 0.4.063 (2019-02-04)

- *Obj\_mk\_tellu\_db.py* - do not reset tellu db in code (do it manually before) [Neil Cook]
- Update *extract\_trigger.py* for *obj\_mk\_tellu\_db.py*. [Neil Cook]
- Merge branch ‘master’ into neil. [Neil Cook]
- Merge branch ‘master’ into neil. [Neil Cook]
- *Extract\_trigger.py* - add *obj\_mk\_tellu\_db* to triggered files. [Neil Cook]
- Unit test runs - add *obj\_mk\_tellu\_db* to runs. [Neil Cook]
- *SpirouTelluric.py* - fix bugs after moving functions here. [Neil Cook]
- Code to check the calibdb entries vs files. [Neil Cook]
- Add *obj\_mk\_tellu\_db* to list of available unit tests. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.197 0.4.078 (2019-02-04)

- *Cal\_WAVE\_NEW* update: no longer breaks if FP peak(s) next to reference line are missing. [melissa-hobson]

#### 4.4.198 0.4.062 (2019-02-03)

- *Port\_database.py* - just try to open csv files as they are done in the drs – hits problems here and not later. [njcuk9999]
- *Drs\_text.py* - edit the way csv databases are loaded (to avoid encoding errors) [njcuk9999]
- *Drs\_exceptions.py* - add `errorobj` as possible input to exceptions (and extract message/level accordingly) [njcuk9999]
- Update language database. [njcuk9999]
- *Drs\_recipe.py* - continue moving errors to database. [njcuk9999]
- *Drs\_log.py* - continue moving errors to database. [njcuk9999]
- *Drs\_file.py* - continue moving errors to database. [njcuk9999]

#### 4.4.199 0.4.061 (2019-02-01)

- Update language database. [Neil Cook]
- *Drs\_file.py* - continue taking out error messages. [Neil Cook]
- Merge branch ‘master’ into *input\_redo*. [Neil Cook]
- Add wiki plots. [Neil Cook]
- Merge branch ‘master’ into *input\_redo*. [Neil Cook]
- Update language databases. [Neil Cook]
- *Drs\_file.py* - continued error movement to database. [Neil Cook]

#### 4.4.200 0.4.077 (2019-02-01)

- *Cal\_WAVE\_NEW\_E2DS* attempt to fix issues with FP line adjacent to reference peak being missing. [melissa-hobson]
- Merge branch 'master' into melissa. [Melissa Hobson]
- Merge pull request #534 from njcuk9999/dev. [Neil Cook]  
Dev -> Master
- *SpirouWAVE.py* - fix a deprecated WLOG message (found by Melissa) [Neil Cook]
- *SpirouLog.py* - must catch WLOG error before trying to do anything with p. [Neil Cook]
- *Cal\_WAVE\_NEW\_E2DS*: added plot axis titles, littrow check and extrapolation, saving to files spirouConst: added functions for *cal\_WAVE\_NEW* spirouWAVE: corrected logging error. [melissa-hobson]
- Merge pull request #533 from njcuk9999/master. [melissa-hobson]  
update
- Merge pull request #531 from njcuk9999/master. [melissa-hobson]  
update melissa

#### 4.4.201 0.4.060 (2019-01-31)

- Update language databases. [Neil Cook]
- *Drs\_file.py* - continue to take out error messages. [Neil Cook]
- *Recipe\_definitions.py* - update location of locale module. [Neil Cook]

#### 4.4.202 0.4.021 (2019-01-30)

- *SpirouTelluric.py* - continue to write/upgrade new *mk\_tellu* functions and functions for *mk\_tellu\_db*. [Neil Cook]
- *SpirouPlot.py* - add new *mk\_tellu* plot. [Neil Cook]
- *SpirouConst.py* - add definition of whitelist file. [Neil Cook]
- *Tellu\_whitelist.txt* - add a white list of all possible telluric star names. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add constants from new recipes. [Neil Cook]
- *Obj\_mk\_tellu\_db.py* - move constants to constants files and functions to spirouTelluric. [Neil Cook]
- *Obj\_mk\_tellu\_new.py* - move constants to constants file. [Neil Cook]

#### 4.4.203 0.4.059 (2019-01-30)

- *Obj\_mk\_tellu\_new.py* - update code with Etienne's changes. [Neil Cook]
- *Obj\_mk\_tellu\_db.py* - new wrapper script for *mk\_tellu* + *fit\_tellu* on tellurics – creates the telluric database. [Neil Cook]

#### 4.4.204 0.4.020 (2019-01-29)

- Update .gitignore to ignore .npy files. [Neil Cook]
- *SpirouTelluric.py* - added aliases to two new *mk\_tellu* functions. [Neil Cook]
- *SpirouTelluric.\_\_init\_\_.py* - added aliases to two new *mk\_tellu* functions. [Neil Cook]
- *SpirouKeywords.py* - added two new keywords for new *mk\_tellu* recipe. [Neil Cook]
- *SpirouConfig.py* - update bug in ConfigError (forced list) [Neil Cook]
- *Combine\_tapas.py* - new *mk\_tellu* recipe (original code from E.A.) [Neil Cook]
- *Obj\_mk\_tellu\_new.py* - new *mk\_tellu* recipe. [Neil Cook]

#### 4.4.205 0.4.058 (2019-01-28)

- Upgrade of language database. [Neil Cook]
- *Drs\_lock.py* - continued upgrade of error entry. [Neil Cook]
- *Drs\_recipe.py* - continued upgrade of error entry. [Neil Cook]

- *Drs\_log.py* - continued upgrade of error entry. [Neil Cook]
- *Drs\_file.py* - continued upgrade of error entry. [Neil Cook]
- *Drs\_log.py* - fix bug in log and how exceptions are handled. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- Merge pull request #532 from njcuk9999/neil. [Neil Cook]  
Neil -> Master
- Update date/version/changelog. [Neil Cook]

#### 4.4.206 0.4.017 (2019-01-28)

- *SpirouLog.py* - fix a bug in logger (only a problem when log breaks) [Neil Cook]

#### 4.4.207 0.4.057 (2019-01-26)

- Modify test recipes with upgrades. [Neil Cook]
- *Drsmodule.plotting* - moved from *drsmodule.plot*. [Neil Cook]
- *Drsmodule.locale* - continue upgrade. [Neil Cook]
- *Drsmodule.constants.io* - continue upgrade. [Neil Cook]
- *Drsmodule.constants.default* - continue upgrade. [Neil Cook]
- *Drsmodule.constants.core* - continue upgrade. [Neil Cook]
- *Drsmodule.config.instruments* - continue upgrade. [Neil Cook]
- *Drsmodule.config.core* - continue upgrade. [Neil Cook]
- Update *DRS\_VERSION* / *DRS\_DATE* / *DRS\_RELEASE*. [Neil Cook]
- Update *user\_config.ini*. [Neil Cook]
- Update *user\_config.ini*. [Neil Cook]

#### 4.4.208 0.4.056 (2019-01-25)

- *Drs\_startup.py* - tweak the system information display section. [Neil Cook]
- *Drs\_log.py* - separate print and log (and use default language for log) [Neil Cook]
- Backup language database. [Neil Cook]
- *Drs\_text.py* - fill language database empty with 'N/A' [Neil Cook]
- Update language databases. [Neil Cook]

#### 4.4.209 0.4.055 (2019-01-24)

- Add READMEs to explain empty directories. [Neil Cook]
- Add instrument language packs and backup folder for language database. [Neil Cook]
- *Drsmodule.locale* - construct a readme. [Neil Cook]
- *Drsmodule.locale.\_\_init\_\_.py* - add *drs\_exceptions* to internal imported modules. [Neil Cook]
- *Drsmodule.locale.databases* - update language databases. [Neil Cook]
- *Drsmodule.locale.core* - move exceptions and make sure all are using basiclogger. [Neil Cook]
- *Drsmodule.constants* - update readme. [Neil Cook]
- *Constants.default* - make Const and Keywords have a source argument. [Neil Cook]
- *Constants.core* - change how exceptions work and where they are sourced from. [Neil Cook]
- *Config.instruments.spirou* - make copy have a source argument. [Neil Cook]
- *Config.instruments.nirps* - make copy have a source argument. [Neil Cook]
- *Drs\_setup.py* - change how the exceptions work and where they are sourced from + continue to replace hard-coded text to text from database. [Neil Cook]
- *Drs\_recipe.py* - carryon replacing text hard-coded to text in database. [Neil Cook]
- *Drs\_log.py* - change how the exceptions work and where they are sourced from. [Neil Cook]

**4.4.210 0.4.054 (2019-01-23)**

- Moved locale module to drsmodule root. [Neil Cook]
- Locale.databases - continued to add to databases. [Neil Cook]
- Locale.databases - continued to add to databases. [Neil Cook]
- .gitignore - added ignoring of .npy files and .~lock files. [Neil Cook]
- *Constants.default.pseudo\_const.py* - added *REPORT\_KEYS* method. [Neil Cook]
- *Constants.core.param\_functions.py* - started added language / basic log functionality. [Neil Cook]
- *Constants.core.constants\_functions.py* - added tracking of warnings (so they only print once) [Neil Cook]
- *Config.math.time.py* - added *get\_hhmmss\_now* function (for log) [Neil Cook]
- Removed locale folder from config folder to separate sub-module directory. [Neil Cook]
- *Instruments.spirou.recipe\_definitions.py* - language implementation. [Neil Cook]
- *Instruments.nirps.recipe\_definitions.py* - language implementation. [Neil Cook]
- *Instruments.nirps.pseudo\_const.py* - format change. [Neil Cook]
- *Drs\_startup.py* - language implementation. [Neil Cook]
- *Drs\_recipe.py* - language implementation. [Neil Cook]
- *Drs\_log.py* - language implementation. [Neil Cook]

**4.4.211 0.4.053 (2019-01-22)**

- Added error.csv and “language.xls” - use language.xls to edit strings for each language (given a specific key) [Neil Cook]
- *Default\_config.py* - updated options (now with ENG and FR allowed - ENG as default) [Neil Cook]
- Updated help.csv. [Neil Cook]
- Removed *recipe\_descriptions.py* from config.locale.core. [Neil Cook]
- *Drs\_text.py* - (formally text.py) - continued work on upgrade. [Neil Cook]
- *Recipe\_definitions.py* - use HelpText to define strings (language support) [Neil Cook]
- *Drs\_recipe.py* - *COLOURED\_LOG* -> *DRS\_COLOURED\_LOG*. [Neil Cook]
- *Drs\_log.py* - update WLOG to deal with ErrorEntry objects as WLOG messages. [Neil Cook]
- Use HelpText to define strings (language support) [Neil Cook]
- Update *user\_config.ini* file. [Neil Cook]
- Update *user\_config.ini* file. [Neil Cook]
- Add default help file. [Neil Cook]
- Change from ./configuration -> ./config. [Neil Cook]
- Change from ./configuration -> ./config. [Neil Cook]
- Added alias to new function “*get\_file\_names*” [Neil Cook]
- Adjusted path name ./configuration -> ./config. [Neil Cook]
- Started adding language support. [Neil Cook]
- Renamed drsmodule.configuration to drsmodule.config. [Neil Cook]

**4.4.212 0.4.052 (2019-01-21)**

- Add source config file to error messages. [Neil Cook]
- Fixed printing of config errors in constants file. [Neil Cook]
- Added a test recipe for spirou and nirps. [Neil Cook]
- Added lock and table to drsmodule.io package. [Neil Cook]
- Added “getmodnames” to *drsmodule.constants.\_\_init\_\_* file. [Neil Cook]
- Continued upgrade to drsmodule.constants.default. [Neil Cook]
- Continued upgrade to drsmodule.constants.core. [Neil Cook]
- Added *\_\_init\_\_* file to drsmodule.configuration. [Neil Cook]
- Continued upgrade to drsmodule.configuration.instruments.spirou. [Neil Cook]
- Added a drsmodule.configuration.core.default folder (for default file/recipe descriptions) [Neil Cook]
- Continued upgrade to drsmodule.configuration.core. [Neil Cook]
- Default file definitions and recipe definitions. [Neil Cook]
- Add test default config for NIRPS. [Neil Cook]
- Add test user config for NIRPS. [Neil Cook]



#### 4.4.213 0.4.051 (2019-01-19)

- Add minor changes to *drs\_recipe.py* and *drs\_startup.py*. [Neil Cook]
- Add a test recipe to *recipes.test*. [Neil Cook]
- Added a plot module. [Neil Cook]
- Continued upgrade of *constants.default* packages. [Neil Cook]
- Added locale package. [Neil Cook]
- Continued update of *instruments.spirou* definitions. [Neil Cook]
- Adding *drs\_recipe* + *drs\_file* to *configuration.core* modules. [Neil Cook]

#### 4.4.214 0.4.050 (2019-01-18)

- Move constants functions from package -> core (remove package module) [Neil Cook]
- Add init file for *drsmodule* (to be named something else eventually) [Neil Cook]
- Add *configuration.instruments.spirou* files. [Neil Cook]
- Remove the *core.general* package. [Neil Cook]
- Add init and *README.md* to constants module. [Neil Cook]
- Add a defaults folder (this has definitions of constants as well as default values) - sets up the classes for instruments to overwrite. [Neil Cook]
- Remove the *const* package (now “constants”) [Neil Cook]
- Add a time module to the *configurations.math* module. [Neil Cook]
- Add a init file to *configuration.instruments*. [Neil Cook]
- Add *spirou* config files to *configuration.instruments*. [Neil Cook]
- Add logging to *configuration.core*. [Neil Cook]
- Add default user config files (will be commented out in future) [Neil Cook]
- *SpirouRecipe.py* - add “instrument” to attributes of *spirouRecipe.py*. [Neil Cook]
- *Files\_spirou.py* - modify name and description docstring. [Neil Cook]
- *SpirouConst.py* - fix a bug in exit definition. [Neil Cook]

#### 4.4.215 0.4.049 (2019-01-17)

- Added additional file to *INTROOT 2* (remanage) [Neil Cook]
- *Test\_processing.py* - remove need for replacing ‘.py’ [Neil Cook]
- *Recipes\_spirou.py* - added instrument name (will be needed in the future) [Neil Cook]
- First draft of *INTROOT* remanage. [Neil Cook]
- Merge branch ‘master’ into *input\_redo*. [Neil Cook]
- Merge pull request #529 from njcuk9999/neil. [Neil Cook]  
Neil -> Master
- Update date/version/changelog. [Neil Cook]
- *Test\_processing.py* - modify code to return errors and timings (via *multiprocessing.Manager*) [Neil Cook]
- *SpirouRecipe.py* - modified the *generate\_runs\_from\_filelist* function to fix when there is no directory from pos args. [Neil Cook]
- *SpirouFile.py* - added *read\_header/read\_data* functions and optimized (with todo comment) the read function. [Neil Cook]
- *Wavecomp.py* - added some comments. [Neil Cook]

#### 4.4.216 0.4.048 (2019-01-16)

- *Test\_processing.py* - for now comment out main call (while testing) [Neil Cook]
- *SpirouRecipe.py* - reformat help printing, add required option to optional arguments (for when we do not have positional arguments) and rework the generation of runs from files (especially when we only have optional arguments) [Neil Cook]
- *Recipe\_spirou.py* - add required keyword (for testing) [Neil Cook]
- *Wavecomp.py* - code to compare wavelength solutions (misc) [Neil Cook]

#### 4.4.217 0.4.047 (2019-01-15)

- *Drs\_dependencies.py* - remove looking in the /misc/ folder for dependencies/code stats. [Neil Cook]
- *Test\_recipe.py* - test self. [Neil Cook]
- *Test\_processing.py* - upgrade to allow execution of recipes (in single and in parallel) [Neil Cook]
- *SpirouStartup2.py* - allow overwriting of *drs\_params* when they are obtained via kwargs (*get\_params*) [Neil Cook]
- *SpirouRecipe.py* - continued upgrade of *input\_redo*. [Neil Cook]
- *Recipe\_spirou.py* - continued upgrade of *input\_redo*. [Neil Cook]

#### 4.4.218 0.4.016 (2019-01-15)

- *SpirouLog.py* - fixed an error with logging (if p not set crashes because there was no *DRS\_DEBUG* key – fixed now) [Neil Cook]
- *SpirouRV.py* - fixed bug found with part of correlbin - only affects spectra which have peaks with start/end different by +2 (rare?) but for now using the old correlbin which works for these. [Neil Cook]

#### 4.4.219 0.4.046 (2019-01-11)

- *Recipe\_spirou.py* - change nomenclature require kwarg arguments have ‘-’ optional have ‘-’ [Neil Cook]
- *Test\_recipe.py* - change comment to make clearer. [Neil Cook]
- *SpirouStartup2.py* - remove ‘-’ in specials to allow them to work. [Neil Cook]
- *SpirouRecipe.py* - modify *\_parse\_args* to take into that we don’t want the ‘-’ [Neil Cook]
- *Recipes\_spirou.py* - testing file list as keyword arguments. [Neil Cook]
- *SpirouStartup2.py* - changed order of functions, modified display order, added functionality to deal with debug mode and other special keys. [Neil Cook]
- *SpirouRecipe.py* - continued upgrade (changes to parser handling of special arguments, check files + added debug as special argument) [Neil Cook]
- *SpirouFile.py* - small formatting changes in continued input redo. [Neil Cook]
- *Recipe\_spirou.py* - remove references to debug (now a special command added to all recipes) [Neil Cook]
- *Recipe\_descriptions.py* - remove unused help. [Neil Cook]
- *Files\_spirou.py* - modify names to better suit input redo. [Neil Cook]

#### 4.4.220 0.4.045 (2019-01-09)

- *Test\_recipe.py* - test on *cal\_HC\_E2DS\_spirou.py*. [Neil Cook]
- *SpirouStartup2.py* - modified which argument display on setup (now only those that were entered at run time) [Neil Cook]
- *SpirouRecipe.py* - redone error reporting on header check. [Neil Cook]
- *SpirouFile.py* - continued upgrade of input redo. [Neil Cook]
- *Recipes\_spirou.py* - added *cal\_hc* definition. [Neil Cook]
- *Recipe\_descriptions.py* - added *cal\_hc* text. [Neil Cook]
- *Files\_spirou.py* - updated names to better represent files (i.e. added fiber name) [Neil Cook]
- *SpirouRecipe.py* - make some methods/function private (protected) using the “\_” character as a prefix. [Neil Cook]
- *Recipe\_spirou.py* - add more argument definitions (blazefile/flatfile/wavefile), add *cal\_hc* test. [Neil Cook]
- *Recipe\_descriptions* - fix imports and define language in constants file. [Neil Cook]
- *SpirouConst.py* - add language constant (Not used yet) [Neil Cook]
- *SpirouStartup2.py* - modify *special\_keys\_present* function to look at altnames as well as names (i.e. *DrsArgument.names* instead of *DrsArgument.name*) [Neil Cook]
- *SpirouRecipe.py* - modify and add special actions (now: -help, -listing, -listall, -version, -info) [Neil Cook]
- *Recipe\_spirou.py* - convert remaining descriptions/help to *recipe\_descriptions* calls. [Neil Cook]
- *Recipe\_descriptions.py* - continue to fill out recipe descriptions/examples/help. [Neil Cook]

#### 4.4.221 0.4.044 (2019-01-08)

- *SpirouConst.py*, *spirouRecipe*, *spirouStartup2.py* - move around the header → into *spirouConst.py*. [Neil Cook]
- *SpirouStartup2.py* - add a check for special keys and do not display normal “splash” if found. [Neil Cook]
- *SpirouRecipe.py* - update listing, add version/ epilog and other small fixes to input redo. [Neil Cook]
- *Recipe\_spirou.py* - continued work on recipe definitions (including references to *recipe\_descriptions*) [Neil Cook]
- *Recipe\_descriptions.py* - storage for longer text (allowing possibility of language support later) [Neil Cook]
- *SpirouConst.py* - added constant to define the maximum display limit for files/directories (when showing an argument error) [Neil Cook]
- Merge branch ‘master’ into *input\_redo*. [Neil Cook]
- Merge pull request #528 from njcuk9999/neil. [Neil Cook]  
Neil → Master
- Merge remote-tracking branch ‘origin/neil’ into neil. [Neil Cook]
- Update the reset files for the calibDB and telluDB. [Neil Cook]
- Update date/version/changelog. [Neil Cook]
- Merge branch ‘master’ into *input\_redo*. [Neil Cook]
- **Conflicts:** INTROOT/SpirouDRS/spirouCore/spirouLog.py
- Merge pull request #527 from njcuk9999/neil. [Neil Cook]  
Neil → Master. Confirmed unit tests completed successfully.

#### 4.4.222 0.4.015 (2019-01-08)

- *SpirouPOLAR.py* - fix dependence on *KW\_ACQTIME\_KEY\_JUL* → *KW\_ACQTIME*. [Neil Cook]
- *SpirouCDB.py/spirouDB.py* - change all human times to be in format *YYYY-mm-dd\_HH:MM:SS.f* for consistency. [Neil Cook]
- Test.run - update test.run to finish testing (start before last failure) [Neil Cook]
- *SpirouDB.py* - fix database definitions in modified “*get\_database*” function. [Neil Cook]
- Updated version/date/changelog. [Neil Cook]
- Move old tests to *spirouUnitTests/old\_tests*. [Neil Cook]

#### 4.4.223 0.4.014 (2019-01-07)

- *SpirouDB.py* - changed from reading human date to reading julian date, changed to use *astropy.timea*. [Neil Cook]
- *SpirouCDB.py* - reformatted calibDB functions to use *spirouDB* wherever possible, changed from reading human date to reading julian date, changed to use *astropy.time*. [Neil Cook]
- *SpirouDB.\_\_init\_\_.py* - moved location of *get\_acqtime* (moved to *spirouDB*) [Neil Cook]
- *SpirouKeywords.py* - removed *KW\_ACQTIME\_KEY* and *KW\_ACQTIME\_KEY\_JUL* in place of *KW\_ACQTIME* (which is the modified julian date) - with supporting format in case of change (uses *astropy.time*) [Neil Cook]
- *SpirouConst.py* - removed the use of *ACQTIME\_KEY\_JUL* now uses *KW\_ACQTIME* (which is the modified julian date by definition) [Neil Cook]
- *Cal\_HC\_E2DS\_EA\_spirou.py* - changed acqtime to *ACQTIME* (for consistency) [Neil Cook]

#### 4.4.224 0.4.043 (2018-12-21)

- *Test\_processing.py* - continued work on *input\_redo*. [Neil Cook]
- *SpirouRecipe.py* - continued work on *input\_redo*. [Neil Cook]
- *Recipes\_spirou.py* - continued work on *input\_redo*. [Neil Cook]

#### 4.4.225 0.4.013 (2018-12-19)

- *SpirouLog.py* - fix for *printlogandcmd* now having argument “colour” [Neil Cook]

- *SpirouLog.py* - update of ipdb to allow magic commands. [Neil Cook]

#### 4.4.226 0.4.042 (2018-12-19)

- *SpirouRecipe.py* - continue input redo upgrade. [Neil Cook]
- *SpirouFile.py* - add some extra empty attributes to DrsInputFile and DrsFitsFile. [Neil Cook]
- *SpirouLog.py* - alias for embeded ipython (in ipdb type “ipython()”) [Neil Cook]
- *Recipes\_spirou.py* - update values during *input\_redo* upgrade. [Neil Cook]
- *Test\_processing.py* - script to test *input\_redo* with processing. [Neil Cook]

#### 4.4.227 0.4.041 (2018-12-18)

- *Test\_recipe.py* - continued update of input redo. [Neil Cook]
- *SpirouStartup2.py* - continued update of input redo. [Neil Cook]
- *SpirouStartup.py* - update from spirouStartup2.py. [Neil Cook]
- *SpirouRecipe.py* - continued update of input redo. [Neil Cook]
- *SpirouFile.py* - continued update of input redo. [Neil Cook]
- Merge branch ‘neil’ into *input\_redo*. [Neil Cook]

#### 4.4.228 0.4.012 (2018-12-18)

- *SpirouStartup.py* - update display. [Neil Cook]
- *SpirouConst.py* - update colours and themes and Color Class. [Neil Cook]
- *SpirouLog.py* - add debug and custom colour modes to log messages. [Neil Cook]
- *SpirouLog.py* - add debug and custom colour modes to log messages. [Neil Cook]
- *SpirouConst.py* - update log constants. [Neil Cook]
- *Obj\_mk\_obj\_template.py* - adjust log message to be more clear. [Neil Cook]
- Test codes for testing bug in BigCube/telluDB. [Neil Cook]
- *SpirouFile.sort\_by\_name* - return sort indices not array (so we can sort multiple arrays) [Neil Cook]
- *Obj\_mk\_obj\_template.py* - fix bug in sorting files (wrong OBJNAME for filename) [Neil Cook]

#### 4.4.229 0.4.040 (2018-12-17)

- *SpirouRecipe.py* - continued work on input redo. [Neil Cook]
  - *SpirouStartup2.py* - continued work on input redo. [Neil Cook]
  - *SpirouRecipe.py* - continued work on input redo. [Neil Cook]
  - *SpirouFile.py* - continued work on input redo. [Neil Cook]
  - *Test\_recipe.py* - continued update for *input\_redo*. [Neil Cook]
  - *SpirouRecipe.py* - continued update for *input\_redo*. [Neil Cook]
  - *SpirouFile.py* - continued update for *input\_redo*. [Neil Cook]
  - Merge branch ‘master’ into *input\_redo*. [Neil Cook]
- Conflicts:** *INTROOT/SpirouDRS/spirouUnitTests/extract\_trigger.py*

#### 4.4.230 0.4.011 (2018-12-17)

- *Obj\_mk\_obj\_template.py* - fix bug when forcing calibDB from wave solution (calibDB needs to be re-read each time) [Neil Cook]
- *Obj\_mk\_obj\_template.py* - fix bug when forcing calibDB from wave solution (calibDB needs to be re-read each time) [Neil Cook]
- *Obj\_mk\_obj\_template.py* - fix bug when forcing calibDB from wave solution (calibDB needs to be re-read each time) [Neil Cook]
- *SpirouLog.py* - update log to allow option to be added (by default uses “RECIPE” or “LOG\_OPT” or “”) [Neil Cook]

#### 4.4.231 0.4.010 (2018-12-16)

- *Wave\_sol\_to\_header.py* - code to update header of all e2ds/e2dsff (object and fpfps) in a *night\_name* or all files. [Neil Cook]
- Merge pull request #525 from njcuk9999/dev. [Neil Cook]  
Melissa -> Dev -> Master. Confirm tested.
- Update *date/version/changelog/update\_notes*. [Neil Cook]

#### 4.4.232 0.4.039 (2018-12-15)

- *SpirouFile.py* - continued work on input redo. [Neil Cook]
- *SpirouRecipe.py* - continued work on input redo. [Neil Cook]

#### 4.4.233 0.4.009 (2018-12-14)

- *Cal\_CCF\_E2DS\_FP\_spirou.py* - fix if *CCF\_RV2* not in whdr. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - fix if *CCF\_RV2* not in whdr. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - fix if *CCF\_RV2* not in whdr. [Neil Cook]
- Test.run - update for current testing. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - fix crash bug Exception -> SystemExit. [Neil Cook]
- Test.run - change for continued test. [Neil Cook]
- Test.run - change for continued test. [Neil Cook]
- *SpirouTHORCA.py* - fudge factor fix -> *n\_order\_init* = *p['IC\_LITTROW\_ORDER\_INIT\_{0}'].format(1)* [Neil Cook]
- *SpirouTHORCA.py* - test fix. [Neil Cook]
- *SpirouTHORCA.py* - fix for *n\_order\_init* (from *init* -> *init\_1/init\_2*) [Neil Cook]
- Update test.run - *cal\_test.run* (from *cal\_WAVE*) onwards. [Neil Cook]
- Merge branch 'melissa' into dev. [Neil Cook]
- *SpirouConst.py* - pep8 changes to *WAVE\_FILE\_EA\_2*. [Neil Cook]
- *Cal\_WAVE\_NEW\_E2DS\_spirou.py* - pep8 changes. [Neil Cook]
- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - few logic checks and pep8 changes. [Neil Cook]
- *Extract\_trigger.py* - update run time parameters. [Neil Cook]
- *Extract\_trigger.py* - fix incompatible version of *cal\_shape* in reprocessing code. [Neil Cook]

#### 4.4.234 0.4.038 (2018-12-14)

- *SpirouRecipe.py* and *spirouStartup2.py* - continued update to input redo. [Neil Cook]
- *Extract\_trigger.py* - fix incompatible version of *cal\_shape* in reprocessing code. [Neil Cook]

#### 4.4.235 0.4.037 (2018-12-13)

- *SpirouRecipe.py* - update to check code (put into DrsRecipe class as methods) [Neil Cook]
- *SpirouRecipe.py* - update to check code (put into DrsRecipe class as methods) [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]

#### 4.4.236 0.4.008 (2018-12-13)

- *Constants\_SPIROU\_H4RG*: new constants for start/end littrow orders. [melissa-hobson]
- *Cal\_WAVE\_E2DS\_EA*: littrow can now start and end at any order. Recalculation of littrow sigma handled for all cases. [melissa-hobson]
- *Extrapolate\_littrow\_sol*: correct initial littrow order. [melissa-hobson]
- *WAVE\_FILE\_EA\_2* function adds fp filename to wavefilename. [melissa-hobson]

- *Cal\_WAVE\_NEW* shifted plots. [melissa-hobson]
- Merge pull request #523 from njcuk9999/master. [melissa-hobson]  
update
- Merge pull request #522 from njcuk9999/dev. [Neil Cook]  
Francois -> Dev -> Master
- Update date/version/changelog. [Neil Cook]
- Update date/version/changelog. [Neil Cook]
- Merge pull request #521 from njcuk9999/francois. [melissa-hobson]  
Francois
- Merge branch 'master' into francois. [Neil Cook]
- Merge pull request #520 from njcuk9999/master. [melissa-hobson]  
Update melissa from master

#### 4.4.237 0.4.007 (2018-12-13)

- *Extract\_trigger.py* - changes to reprocessing code (correct order) [Neil Cook]
- Merge branch 'master' into dev. [Neil Cook]
- Merge pull request #519 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- Code to check the telluric corrections. [Neil Cook]

#### 4.4.238 0.4.006 (2018-12-12)

- Add .idea to .gitignore. [Neil Cook]
- Re-do requirements files. [njcuk9999]
- Merge branch 'francois' into dev. [Neil Cook]
- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - pep8 clean up of Francois branch. [Neil Cook]
- *Cal\_DRIFTPEAK\_E2DS\_spirou.py* - pep8 clean up of Francois branch. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - pep8 clean up of Francois branch. [Neil Cook]
- Format of flux ratio set to .3f. [FrancoisBouchy]
- Compute the absolute CCF drift of the FP and save it in the wavelength solution file as CCFRV2. [FrancoisBouchy]
- Absolute CCF drift of FP is read from the wavelength solution file. The relative CCF drift takes into account this Absolute drift. [FrancoisBouchy]
- Merge remote-tracking branch 'origin/master' [Neil Cook]
- Update README.md. [Neil Cook]  
Update with recent changes
- Update requirements (barycorrpy required) [Neil Cook]
- Add a minimum requirements and current requirements (as .txt files) [Neil Cook]
- Merge pull request #518 from njcuk9999/neil. [Neil Cook]  
Neil
- Update date/version/changelog/ update notes. [Neil Cook]

#### 4.4.239 0.4.005 (2018-12-11)

- *SpirouTable.py* - fix an error with missing end card. [Neil Cook]
- Update *extraction\_trigger.py* run time parameters. [Neil Cook]
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- *Cal\_validate\_spirou.py* - correct *cal\_validate* for new wlog. [Neil Cook]

#### 4.4.240 0.4.036 (2018-12-11)

- *Cal\_validate\_spirou.py* - correct *cal\_validate* for new wlog. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]

#### 4.4.241 0.4.004 (2018-12-10)

- *SpirouConst.py* - undo change to global file. [Neil Cook]
- *SpirouFITS.py* - fix for lock file on non-fits files. [Neil Cook]

#### 4.4.242 0.4.035 (2018-12-10)

- *SpirouStartup2.py* - upgrade WLOG (requires *drs\_params* to track pid) [Neil Cook]
- *SpirouRecipe.py* - upgrade WLOG (requires *drs\_params* to track pid) [Neil Cook]
- *SpirouFile.py* - upgrade WLOG function (requires *drs\_params* to track pid) [Neil Cook]
- *Recipes\_spirou.py* - fix pep8 in helpstr. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- Merge pull request #516 from *njcuk9999/dev\_shape\_redo*. [Neil Cook]  
Dev shape redo (confirmed testing on *cal\_test*, *tellu\_test* and *pol\_test*)
- Update date/version/changelog. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [njcuk9999]

#### 4.4.243 0.4.003 (2018-12-10)

- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - correct pep8 and add TODO's for problems. [Neil Cook]
- *Cal\_WAVE\_NEW\_E2DS\_spirou.py* - correct pep8 and WLOG changes. [Neil Cook]
- Merge branch 'dev' into *dev\_shape\_redo*. [Neil Cook]  
**Conflicts:** *INTROOT/misc/cal\_WAVE\_NEW\_E2DS\_spirou.py*
- Remove hard-coded initial wavelenth solution. [melissa-hobson]
- Merge pull request #515 from *njcuk9999/master*. [melissa-hobson]  
update melissa from master
- Add new CCF mask (*masque\_sept18.mas*) [njcuk9999]
- Improvements to *fp\_wavelength\_sol\_new* fp m value determination correction to fp line insertion into *all\_lines* assorted tests for fitting HC lines. [melissa-hobson]
- Littrow: get total orders from *echelle\_orders*, not *all\_lines*; save orders of min/max deviation. [melissa-hobson]
- *SpirouMath*: calculates wave coeff from chebyshev polynomials *spirouPlot*: correct wavelengths for fitted lines in *wave\_ea\_plot\_single\_order*. [melissa-hobson]
- *Cal\_WAVE\_NEW\_E2DS\_EA* update (calculates wave sol, does Littrow) [melissa-hobson]
- *Cal\_WAVE\_EA* order information on Littrow QC fail. [melissa-hobson]
- Update timings for V0.4.001. [Neil Cook]
- *SpirouRV.py* - change an info log message to general log message (too many for CCF) [Neil Cook]
- *SpirouLSD.py* - remove some of the info logs and make them general logs. [Neil Cook]
- *Pol\_spirou.py* - remove some of the info logs and make them general logs. [Neil Cook]
- Update date/version/changelog. [Neil Cook]

#### 4.4.244 0.4.001 (2018-12-08)

- *Unit\_Test* runs - update test for run. [Neil Cook]
- *Extract\_trigger.py* - update values for run time. [Neil Cook]
- *SpirouStartup.py* - define initial values for *log\_opt* and program in *Begin()* [Neil Cook]

#### 4.4.245 0.4.002 (2018-12-08)

- *Constants\_SPIROU\_H4RG.py* - add "*fitsopen\_max\_wait*" time. [Neil Cook]
- *Cal\_reset.py* - fix fake p (with real p) [Neil Cook]

#### 4.4.246 0.3.077 (2018-12-07)

- *SpirouTable.py* - add lock files around writing to fits file (avoids writing at the same time) [Neil Cook]
- *SpirouImage.\_\_init\_\_.py* - add links to check/close/open fits lock file. [Neil Cook]
- *SpirouFITS.py* - add fits file lock file (to avoid writing to same fits file at same time) [Neil Cook]
- *SpirouDB.py* - edit message and sleep time for waiting lock file. [Neil Cook]
- *Extract\_trigger* - update to allow skipping of *mk\_tellu* and *fit\_tellu* files. [Neil Cook]
- *Obj\_fit\_tellu.py* - fix problems with WLOG update. [Neil Cook]
- *SpirouStartup.py* - add telluDB info to the start up printout/log. [Neil Cook]

#### 4.4.247 0.3.076 (2018-12-05)

- SpirouDRS/spirouUnitTest folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- SpirouDRS/spirouUnitTest folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- SpirouDRS/spirouTools folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- SpirouDRS/spirouTHORCA folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- SpirouDRS/spirouTelluric folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- SpirouDRS/spirouStartup folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- SpirouDRS/spirouRV folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- SpirouDRS/spirouPOLAR folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- SpirouDRS/spirouLOCOR folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- SpirouDRS/spirouImage folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- SpirouDRS/spirouFLAT folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- SpirouDRS/spirouEXTOR folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- SpirouDRS/spirouDB folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- SpirouDRS/spirouCore folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- SpirouDRS/spirouConfig folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- SpirouDRS/spirouBACK folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- *Spirou\_drs/misc* folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- *Spirou\_drs/bin* folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- *Spirou\_drs/bin* folder - major redo of logging system (to allow passing of process-id) [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - remove the need to a TILT file is mode == '4a' or '4b' [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - remove the need to a TILT file is mode == '4a' or '4b' [Neil Cook]
- *SpirouConfigFile.py* - update comment to make it clear why two tests are needed. [Neil Cook]

#### 4.4.248 0.3.075 (2018-12-04)

- *SpirouImage.py* - adjust warning for getting *unix\_time* from string (where time is not valid) - warning or error? [Neil Cook]

#### 4.4.249 0.3.074 (2018-12-03)

- *SpirouConst.py* - modify colour for white screen people. [Neil Cook]
  - *SpirouKeywords.py* - update keys (must be shorter with addition of numbers) [Neil Cook]
  - *SpirouKeywords.py* - update keys (must be shorter) [Neil Cook]
  - *SpirouUnitRecipes.py* - remove *cal\_SHAPE\_spirou2*. [Neil Cook]
  - *Extract\_trigger.py* - update run arguments. [Neil Cook]
  - *Unit\_tests* - update test.run and *Pol\_Test.run*. [Neil Cook]
  - *SpirouStartup.py* - add functionality to assign process id (on begin) -> timestamp. [Neil Cook]
  - *SpirouTable.py* - update comment to give some idea of the IDL command to open table. [Neil Cook]
  - *SpirouLog.py* - start process of having individual logs for each instance. [Neil Cook]
  - Recipe control - adjust inputs to *cal\_SHAPE\_spirou*. [Neil Cook]
  - *Cal\_SHAPE\_spirou.py* - change name of *cal\_SHAPE\_spirou2.py* -> *cal\_SHAPE\_spirou.py*. [Neil Cook]
  - *SpirouLSD.py* - modify output of LSD table to be a FIT BINARY Table. [Neil Cook]
- Note to open fits tables in IDL see here:** [https://idlastro.gsfc.nasa.gov/ftp/pro/fits\\_table/aaareadme.txt](https://idlastro.gsfc.nasa.gov/ftp/pro/fits_table/aaareadme.txt)



**lookup:** *ftab\_print*, 'file.fits'

**read:** *tab* = readfits('file.fits', *hdr*, /EXTEN) *col1* = tbget(*hdr*, *tab*, 'COLUMN1')

- *Extract\_trigger.py* - update *extract\_trigger* run constants. [Neil Cook]
- *SpirouLSD.py* - change format of output to FITS table. [Neil Cook]
- *SpirouTable.py* - add option in *write\_table* to accept header (*hdict*) [Neil Cook]
- *SpirouUnitRecipes.py* - remove reference to *cal\_SHAPE\_spirou2.py*. [Neil Cook]
- *Extract\_trigger.py* - update run parameters (and slightly change order of constants) [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - change reference to *GetShapeMap2* -> *GetShapeMap*. [Neil Cook]
- *SpirouImage.py* - change *get\_shape\_map2* -> *get\_shape\_map* (change old *get\_shape\_map* -> *get\_shape\_map\_old*) [Neil Cook]
- *Recipe\_control.txt* - change *cal\_SHAPE\_spirou2* -> *cal\_SHAPE\_spirou* (remove old one) [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - renamed from *cal\_SHAPE\_spirou2.py* (old code moved to ./misc) [Neil Cook]

#### 4.4.250 0.3.073 (2018-11-30)

- Update test.run. [njcuk9999]

#### 4.4.251 0.3.072 (2018-11-28)

- Changes to parallelisation (test) [njcuk9999]
- *Extract\_trigger.py* - updates to extraction trigger. [njcuk9999]
- *Tellu\_whitelist.txt* - a white list of telluric stars. [njcuk9999]

#### 4.4.252 0.3.071 (2018-11-27)

- *Extract\_trigger.py* - correct problems with pre-processing automation. [njcuk9999]
- *Recipe\_control.txt* - add some more options for *POL\_STOKES\_I*. [njcuk9999]
- Merge pull request #514 from *njcuk9999/dev\_shape\_redo*. [Neil Cook]  
Dev shape redo - tested on *Cal\_test.run* and *Tellu\_Test.run*

#### 4.4.253 0.3.070 (2018-11-26)

- Update test.run. [njcuk9999]
- *Run\_off\_listing.py* - fix errors in code. [njcuk9999]
- Update date/version/changelog. [njcuk9999]

#### 4.4.254 0.3.069 (2018-11-26)

- *Run\_off\_listing.py* - correct to try/except in *run\_off\_listing.py*. [njcuk9999]
- *Extract\_trigger.py* - upgrades to extract trigger just do extractions. [njcuk9999]
- *Run\_off\_listing.py* - code to redo indexing. [njcuk9999]
- *SpirouStartup.py* - fix error with change to indexing (and old index files) [njcuk9999]
- *SpirouConst.py* - change *func\_name* for *REDUC\_OUTPUT\_COLUMNS*. [njcuk9999]

#### 4.4.255 0.3.068 (2018-11-24)

- Update extraction trigger. [njcuk9999]
- *SpirouConst.py* - add MJDATE to index.fit. [njcuk9999]
- Merge branch 'master' into *dev\_shape\_redo*. [njcuk9999]  
**Conflicts:** INTROOT/SpirouDRS/spirouImage/spirouBERV.py
- Update spirouBERV.py. [Neil Cook]  
Correct error with *spirouBerv.get\_earth\_velocity\_correction* - only calculate BERV for OBSTYPE = 'OBJECT' (an do not look for ra/dec etc in the headers - it wont be there for lab files)

- *Cal\_SHAPE\_spirou/spirou2* - correct mistakes found by unit test run. [njcuk9999]
- Update date/version/changelog. [njcuk9999]

#### 4.4.256 0.3.067 (2018-11-24)

- *Cal\_Test.run* - add *cal\_SHAPE\_spirou2* to *Cal\_Test.run*. [njcuk9999]
- Unit tests: add *cal\_SHAPE\_spirou2* to unit test definition. [njcuk9999]
- *SpirouImage.py* - update *get\_shape\_map2* and *get\_offset\_sp* in-line with Etienne's changes. [njcuk9999]
- *SpirouPlot.py* - update new shape plots in-line with Etienne's changes. [njcuk9999]
- *SpirouMath.py* - update "*gauss\_fit\_s*" (Etienne updated it) [njcuk9999]
- *SpirouKeywords.py* - add extra keys (for index.fits) and for wave-list in bigcubes. [njcuk9999]
- *SpirouConst.py* - update acquisition of filenames now we have "HCFILE" and "FPFILES" (not "HCFILES" and "FPFILE") [njcuk9999]
- *Constants\_SPIROU\_H4RG.py* - update constants inline with Etienne's changes. [njcuk9999]
- *Obj\_mk\_obj\_template.py* - list wave files in header (along with file name and berv) for big cube. [njcuk9999]
- *Cal\_SHAPE\_spirou2.py* - continued work on shape upgrade + now 1 hcfile and multiple fp files. [njcuk9999]

#### 4.4.257 0.3.066 (2018-11-23)

- *SpirouFits.py* - fix bug with hdict being empty (possible on some writes) [njcuk9999]

#### 4.4.258 0.3.065 (2018-11-22)

- *SpirouTable.py* - updated the error outputs to include filename. [njcuk9999]
- *SpirouImage.py* - continued to modify *get\_offset\_sp* and *get\_shape\_file2* (for new SHAPE code) [njcuk9999]
- *SpirouPlot.py* - adjusted *slit\_shape\_angle\_plot* and added *slit\_shape\_offset\_plot* (for new SHAPE recipe) [njcuk9999]
- *SpirouMath.py* - adjusted problem in *gauss\_fit\_s* file "correction = (x - np.mean(x)) \* slope" -> "correction = (x - x0) \* slope" [njcuk9999]
- Updated the *catalogue\_UNE.dat* file and added *cavity\_length.dat* file (for new SHAPE code) [njcuk9999]
- *Master\_tellu\_SPIROU.txt* - updated the master calibdb with the new *MASTER\_WAVE.fits*. [njcuk9999]
- *Master\_calib\_SPIROU.txt* - updated the master calibdb with the new *MASTER\_WAVE.fits*. [njcuk9999]
- *Recipe\_control.txt* - added *cal\_SHAPE\_spirou2* to the recipe control (with two arguments for *FP\_FP* and *HC\_HC* files - pp fits not e2ds!) [njcuk9999]
- *Constants\_SPIROU\_H4RG.py* - added new constants and modified constants changed by Etienne. [njcuk9999]
- *Cal\_SHAPE\_spirou2.py* - continued work on adapting Etienne's changes into *cal\_SHAPE*. [njcuk9999]

#### 4.4.259 0.3.064 (2018-11-21)

- Add copy of old xt code (to compare with new one for changes) [njcuk9999]
- Add function: *read\_cavity\_length*, *get\_shape\_map2*, *get\_offset\_sp* for new shape code. [njcuk9999]
- *SpirouConst.py* - add new file definitions. [njcuk9999]
- *Output\_keys.py* - add definitions for shape sanity check debug files. [njcuk9999]
- Notes on etienne's codes - no real changes just comments. [njcuk9999]
- *Constants\_SPIROU\_H4RG.py* - modify SHAPE constants to for new shape code. [njcuk9999]
- *Obj\_mk\_tellu.py* - fix copy of code - redundant. [njcuk9999]
- *Cal\_SHAPE\_spirou2.py* - modification of *cal\_SHAPE\_spirou.py* with changes to *cal\_shape* needed. [njcuk9999]
- *SpirouBERV.py* - fix bug in berv code - non-objects should not look for star parameters. [njcuk9999]
- Update version/dates/changelog.txt. [njcuk9999]

#### 4.4.260 0.3.063 (2018-11-20)

- Add test files to misc. [njcuk9999]
- Add Etiennes files in misc folder. [njcuk9999]
- Runs - update the unit tests. [njcuk9999]

#### 4.4.261 0.4.034 (2018-11-14)

- *Test\_recipe.py* - change permissions for file. [njcuk9999]

#### 4.4.262 0.3.062 (2018-11-14)

- *Fit\_triplets* sigma-clip change. [melissa-hobson]
- *Cal\_WAVE\_E2DS\_EA* - fix HC file being overwritten with FP data (fixes #513) [melissa-hobson]
- Merge pull request #512 from njcuk9999/master. [melissa-hobson]  
update Melissa
- Merge remote-tracking branch 'origin/melissa' into melissa. [Melissa Hobson]  
**Conflicts:** *INTROOT/bin/cal\_WAVE\_E2DS\_EA\_spirou.py*
- Merge pull request #509 from njcuk9999/master\_copy. [melissa-hobson]  
update melissa
- Merge branch 'melissa' into *master\_copy*. [melissa-hobson]
- Bug fix for *fit\_gaussian* triplet (fixes #507) [melissa-hobson]

#### 4.4.263 0.4.033 (2018-11-09)

- Continued work on input redo. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- Merge pull request #511 from njcuk9999/dev. [Neil Cook]  
Francois -> Dev, Neil-> Dev, Dev -> master

#### 4.4.264 0.3.060 (2018-11-08)

- *Cal\_WAVE\_EA* match to master. [melissa-hobson]

#### 4.4.265 0.3.061 (2018-11-08)

- Update date/version/changelog. [Neil Cook]

#### 4.4.266 0.3.056 (2018-11-08)

- *SpirouWAVE.py* - Melissa's fix for Issue #507 -> "<" needs to be "<=" [Neil Cook]
- Merge branch 'neil' into dev. [Neil Cook]
- Add hcone files for the *cal\_DRIFTCCF\_E2DS* recipe. [FrancoisBouchy]

#### 4.4.267 0.4.032 (2018-11-07)

- *SpirouFile.py* - continue to fill out drs file fits methods. [Neil Cook]

#### 4.4.268 0.3.055 (2018-11-07)

- New UrNe CCF mask based on lines used for the wavelength solution and to be used to compute DRIFT on hcone files. [FrancoisBouchy]

#### 4.4.269 0.4.031 (2018-11-06)

- *Test\_recipe.py* - tested *cal\_badpix\_spirou.py*. [Neil Cook]
- *SpirouStartup2.py* - continue work on inputs update. [Neil Cook]
- *SpirouRecipe.py* - continue work on inputs update. [Neil Cook]
- *SpirouFile.py* - allow filename to be set in construction (via kwargs) [Neil Cook]
- *Recipes\_spirou.py* - add and reformat options to set/take defaults. [Neil Cook]
- *SpirouConst.py* - add a variable that can globally update pp (for use when we don't have p) [Neil Cook]

#### 4.4.270 0.4.030 (2018-11-05)

- *Test\_recipe.py* - tested *cal\_FF\_RAW\_spirou.py* inputs. [Neil Cook]
- *SpirouStartup2.py* - modified code to line up with continued work on spirouRecipe. [Neil Cook]
- *SpirouRecipe.py* - continued to develop new recipe class. [Neil Cook]
- *SpirouFile.py* - filled out some attributes/methods. [Neil Cook]
- *Recipe\_spirou.py* - added more definitions and started to fill out drs recipes (badpix -> extract) [Neil Cook]
- *Files\_spirou.py* - updated call to spirouFile.DrsInput -> spirouFile.DrsInputFile. [Neil Cook]

#### 4.4.271 0.4.029 (2018-11-04)

- *SpirouRecipe.py* - move DrsInputs from here to spirouFile.py. [njcuk9999]
- *SpirouFile.py* - move DrsInputs from spirouRecipes to here. [njcuk9999]
- *Files\_spirou.py* - update links to DrsInput: spirouRecipe -> spirouFile. [njcuk9999]

#### 4.4.272 0.4.028 (2018-11-02)

- *SpirouRecipes.py* - add todo. [Neil Cook]
- *SpirouStartup2.py* - pushed renaming of recipes -> *recipes\_spirou* into code. [Neil Cook]
- *Recipes\_spirou.py* - renamed from recipes.py. [Neil Cook]
- *Files\_spirou.py* - renamed from spirouFiles.py. [Neil Cook]
- *SpirouRecipe.py* - add doc strings for new classes (DrsArgument/DrsRecipe/DrsInputFile/DrsFitsFile) [Neil Cook]
- *Test\_recipe.py* - update with new name for "ufiles"->"filelist" [Neil Cook]
- *SpirouStartup2.py* - continue work on input code - update with changes to spirouRecipe.py. [Neil Cook]
- *SpirouRecipe.py* - define how DrsArgument, DrsRecipe and DrsInput (+DrsFitsFile) interact - continued testing of input redo. [Neil Cook]
- *SpirouFiles.py* - define all raw/pp/out files as instances of DrsFitsFile. [Neil Cook]
- *Recipes.py* - continue to test new inputs with *test\_recipe* definition. [Neil Cook]

#### 4.4.273 0.3.059 (2018-11-01)

- Test of not using Littrow sols for *cal\_WAVE\_EA*. [melissa-hobson]

#### 4.4.274 0.4.027 (2018-11-01)

- *SpirouStartup2.py* - continue work on input code. [Neil Cook]
- *SpirouRecipe.py* - continue work on input code. [Neil Cook]
- *SpirouFiles.py* - define file types using new classes. [Neil Cook]

- *Recipe.py* - update recipe definitions based on changes. [Neil Cook]

#### 4.4.275 0.3.058 (2018-10-31)

- *Cal\_WAVE\_NEW* update. [melissa-hobson]

#### 4.4.276 0.4.026 (2018-10-31)

- *Recipe.py* - add new comment. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
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- Merge branch 'master' into *input\_redo*. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]

#### 4.4.277 0.3.054 (2018-10-30)

- *Test\_wavsol.py* - fixed bugs and added STD for H band. [Neil Cook]
- *Test\_wavsol.py* - added code to compare wave solutions from a calibDB (defined manually in the code) [Neil Cook]
- *HC\_Test.run* - added run 47 back in (had been missed) [Neil Cook]

#### 4.4.278 0.3.057 (2018-10-30)

- *Cal\_WAVE\_NEW* update. [melissa-hobson]
- Updates to C. Lovis method. [melissa-hobson]
- Merge pull request #500 from njcuk9999/master. [melissa-hobson]  
update melissa

#### 4.4.279 0.3.053 (2018-10-29)

- Add *hc\_test.run* back to unit tests. [Neil Cook]
- Merge pull request #501 from njcuk9999/neil. [Neil Cook]  
Neil → Master - confirm unit tests
- Update date/version/changelog. [Neil Cook]

#### 4.4.280 0.3.052 (2018-10-29)

- Pep8 clean up. [Neil Cook]

#### 4.4.281 0.3.051 (2018-10-26)

- Pep8 clean up. [Neil Cook]
- Update TODO's, remove old H3RG dependencies and clean up. [Neil Cook]
- Merge pull request #497 from njcuk9999/dev. [Neil Cook]  
Dev → Master (tested on *Cal\_Test.run*)
- Update date/version/changelog/update-notes. [Neil Cook]

## 4.4.282 0.3.050 (2018-10-26)

- *SpirouKeywords.py* - add separate set of header keys for the FP analysis. [Neil Cook]
- *SpirouConst.py* - add *CCF\_FP* versions so files are separate (for now) [Neil Cook]
- *Output\_keys.py* - add new keys for *CCF\_FP*. [Neil Cook]
- *SpirouConfig.py* - define a copy function for ParamDict - copy all keys into new ParamDict. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - separate and keep separate the FP analysis (cp and cloc) - including header keys. [Neil Cook]
- Merge pull request #495 from njcuk9999/dev. [Neil Cook]  
Neil -> Dev, Francois -> Dev, Dev -> Master. Confirm unit tested
- Update test files - mistake in run018b. [Neil Cook]
- *Gl699\_Aug05-A\_B.run* - unit test run for A and B files. [Neil Cook]
- Update date/version/update notes/changelog. [Neil Cook]

## 4.4.283 0.3.049 (2018-10-25)

- *Tellurics2.run* - add a second telluric run - to preprocess, extract and *mk\_tellu* missed tellurics. [Neil Cook]
- Update test - only 1 telluric test + move others to *old\_tests*. [Neil Cook]
- *SpirouTelluric.py* - template should be in MASTERWAVE frame not *WAVE\_IT* frame. [Neil Cook]
- *SpirouPlot.py* - modify *tellu\_fit\_debug\_shift\_plot* to only plot one order. [Neil Cook]
- *Recipe\_control.txt* - allow *cal\_CCF\_E2DS\_FP\_spirou* to use A, B files and *TELLU\_CORRECTED/POL* files. [Neil Cook]
- Update unit tests. [Neil Cook]
- *Obj\_fit\_tellu.py* - todo question about possibly broken plot. [Neil Cook]
- *SpirouFile.py* - better error message when wrong directory used for input files. [Neil Cook]
- New *unit\_test* runs for maestria with missed Gl699 targets. [Neil Cook]

## 4.4.284 0.3.048 (2018-10-24)

- *SpirouRV.py* - need to deal with the differing fibers (for now manually) [Neil Cook]
- *SpirouRV.py* - added function "*get\_foberc\_e2ds\_name*" to deal with the different file types expected -> need E2DS AB file for C fiber. [Neil Cook]
- *SpirouPOLAR.py* - adjusted calls to headers to not be hard coded (should have been called from p -> *spirouKeywords.py*) [Neil Cook]
- *SpirouKeywords.py* - add MJEND keyword (for *pol\_spirou.py*) - also changed naming to all upper case. [Neil Cook]
- *Obj\_mk\_tellu.py* - turn off debug plot. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - get correct filename for fiber C (E2DS file only) [Neil Cook]
- *Cal\_validate\_spirou.py* - add option to check (check=0 just prints paths) [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - correct imports and catch warnings (As with *cal\_CCF\_E2DS\_spirou*) [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - correct link to header key in p. [Neil Cook]
- *SpirouKeywords.py* - make tellu header keys shorter. [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - load file C not from a telluric corrected spectrum but from the E2DS itself (using header) [Neil Cook]
- *SpirouExposeMeter.py* - fix some pep8 issues. [Neil Cook]
- *SpirouKeywords.py* - add header key definitions for options input in tellu. [Neil Cook]
- *Obj\_fit\_tellu.py* - add extra header keys to know how many components were fit in PCA etc. [Neil Cook]
- *Cal\_CCF\_E2DS\_spirou.py* - fix some pep8 conversion. [Neil Cook]
- Merge branch 'neil' into dev. [Neil Cook]
- Update unit test runs. [Neil Cook]
- *SpirouUnitRecipes.py* - update input name for *cal\_exposure\_meter* and *cal\_wave\_mapper*. [Neil Cook]
- *Cal\_exposure\_meter.py* - correct input name: "reffile" -> "flatfile" [Neil Cook]
- *Cal\_CCF\_E2DS\_spirou.py* + *spirouRV.py* - catch warnings for NaNs in mean and divide. [Neil Cook]
- *SpirouUnitRecipes.py* - add *cal\_CCF\_E2DS\_FP\_spirou* to unit tests. [Neil Cook]
- Update date/version/update notes/changelog. [Neil Cook]

#### 4.4.285 0.3.047 (2018-10-23)

- *Cal\_Test.run* - add *cal\_wave\_mapper* to tested recipes. [Neil Cook]
- *SpirouExposureMeter.py* - use wave parameters instead of wave map + add normalisation option. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add constants for normalisation and *flat\_correction*. [Neil Cook]
- *Cal\_exposure\_meter.py* - try rescale for the flux (Issue #490) [Neil Cook]
- *Cal\_wave\_mapper.py* - divide through by flat field (on request) and attempt to rescale flux (Issue #490) [Neil Cook]
- *SpirouExposureMeter.py* - Issue #490 - add ability to not re-calculate order profile image (if already processed) + add shape as well as tilt (use shape if in calibDB) [Neil Cook]
- *SpirouKeywords.py* - add infilelist as keyword (For use for pushing input file list to header) [Neil Cook]
- *SpirouConst.py* - define a tmp file for the order profile map (Issue #490) [Neil Cook]
- *Cal\_wave\_mapper.py* - Issue #490 - add shape + fix badpixel function returns. [Neil Cook]
- *Cal\_exposure\_meter.py* - fix Issue #490 - use shape file + correct output of badpix mask. [Neil Cook]

#### 4.4.286 0.3.046 (2018-10-22)

- *Obj\_mk\_tellu.py* - make sure the NaNs do not propagate through to the convolution ( $\text{NaN} * 0.0 = \text{NaN} \rightarrow \text{need } 0.0$ ) [Neil Cook]
- *Obj\_mk\_tellu.py* - make sure the NaNs do not propagate through to the convolution ( $\text{NaN} * 0.0 = \text{NaN} \rightarrow \text{need } 0.0$ ) [Neil Cook]
- *Obj\_mk\_tellu.py* - catch warnings as sp now can have nans. [Neil Cook]
- *Obj\_mk\_obj\_template.py* - change median to nan median and catch warnings with nanmedian of empty stack (all nans) [Neil Cook]
- *Obj\_mk\_tellu.py* - catch warnings in dev (nans allowed) [Neil Cook]
- *SpirouTelluric.py* - kernal resize. [Neil Cook]
- *Obj\_mk\_tellu.py* - shift data to master before (to match tapas) - instead of shifting transmission after. [Neil Cook]

#### 4.4.287 0.3.045 (2018-10-22)

- Updated permissions on spirouUnitTest files (chmod +x) [Neil Cook]
- *Tellu\_Test.run* - added a test of *cal\_CCF\_E2DS\_FP\_spirou.py* (currently not working) [Neil Cook]
- *SpirouKeywords.py* - added *kw\_DRIFT\_RV* definition to keywords files (for use in *cal\_CCF\_E2DS\_FP\_spirou.py*) [Neil Cook]
- *Recipe\_control.txt* - added *cal\_CCF\_E2DS\_FP\_spirou* to *recipe\_control* - for fiber AB only (will only work with fiber AB) [Neil Cook]
- *Cal\_CCF\_E2DS\_FP\_spirou.py* - added changes to integrate into DRS. [Neil Cook]
- Merge branch 'francois' into dev. [Neil Cook]
- *Cal\_CCF\_E2DS* with simultaneous CCFDrift on FP fiber C. [FrancoisBouchy]
- Merge remote-tracking branch 'origin/francois' into francois. [FrancoisBouchy]
- New CCF mask for FP. [FrancoisBouchy]
- Merge pull request #491 from njcuk9999/neil. [Neil Cook]  
Melissa  $\rightarrow$  Neil  $\rightarrow$  Master (confirm unit tests)
- Update tests. [Neil Cook]
- Update date/version/changelog/update notes. [Neil Cook]

#### 4.4.288 0.3.043 (2018-10-19)

- *Unit\_test* runs - add maestria tests. [Neil Cook]
- Update *triggers/unit\_tests* to catch and handle errors better. [Neil Cook]
- Update *triggers/unit\_tests* to catch and handle errors better. [Neil Cook]
- Redo tests - comments where broken. [Neil Cook]
- *SpirouStartup.py* - remove print statement (was there to debug) [Neil Cook]

- *SpirouLog.py* - return useful message on sys.exit (after error log) [Neil Cook]
- *Error\_test.py* - test catching errors for *trigger/unit\_tests*. [Neil Cook]
- *SpirouWAVE.py* - make debug plot only show in debug mode (even with plotting on) [Neil Cook]
- Merge branch 'melissa' into neil. [Neil Cook]
- Merge branch 'master' into melissa. [Neil Cook]
- SpirouWAVE: plots will now appear in interactive mode only. [melissa- hobson]
- Merge pull request #487 from njcuk9999/master. [melissa-hobson]  
update melissa from master
- Update HC/WAVE test. [Neil Cook]
- *Unit\_test.py* - better catching/recording of errors (for batch run that doesn't crash out) [Neil Cook]
- Update HC/WAVE test. [Neil Cook]
- Update HC/WAVE test. [Neil Cook]
- Update HC/WAVE test. [Neil Cook]
- Update HC/WAVE test. [Neil Cook]
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- Merge pull request #489 from njcuk9999/dev. [Neil Cook]  
Francois -> Dev, Neil -> Dev, Dev -> Master
- Update date/version/changelog. [Neil Cook]
- Update date/version/changelog. [Neil Cook]
- *Cal\_DRIFTCCF\_E2DS\_spirou.py* - comment out saving of fits file - no loc['DRIFT'] defined. [Neil Cook]
- Update date/version/changelog. [Neil Cook]
- Merge branch 'neil' into dev. [Neil Cook]  
**Conflicts:** CHANGELOG.md INTROOT/SpirouDRS/spirouConfig/spirouConst.py VERSION.txt
- Fp.mas - added the fp mask to the *ccf\_masks* folder (for *cal\_driftccf*) [Neil Cook]
- Update HC/WAVE test. [Neil Cook]

#### 4.4.289 0.3.042 (2018-10-18)

- Update date/version/changelog. [Neil Cook]
- *Unit\_test.py* - fix comment. [Neil Cook]
- TelluricsAll.run - add a list of all tellurics for maestria. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add quality control parameters for *mk\_tellu* (RMS) [Neil Cook]
- *Obj\_mk\_tellu.py* - add an RMS cut to the QC parameters checked. [Neil Cook]
- *Obj\_mk\_obj\_template.py* - turn multi fits into fits cubes. [Neil Cook]
- *Unit\_test\_parallel.py* - test of multiprocessing on unit tests - DRS not stable to use this yet! [Neil Cook]
- *Extract\_trigger.py* - for now only do up to extraction of *HC\_HC* and *FP\_FP*. [Neil Cook]
- *Gl699\_small.run* - just extract and fit those across one glitch. [Neil Cook]
- *Cal\_HC/cal\_WAVE* only copy over original file parameters if QC passed. [Neil Cook]
- *SpirouFITS.py* - fix bug in *check\_wave\_sol\_consistency*. [Neil Cook]
- *Obj\_mk\_tellu.py* - add notes for new QC check (TODO's) [Neil Cook]
- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - remove print statement. [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - update permissions on *cal\_SHAPE*. [Neil Cook]
- Update run list (for maestria runs) [Neil Cook]
- *Extract\_trigger.py* - full calibration trigger test. [Neil Cook]
- *Extract\_trigger.py* - update imports. [Neil Cook]
- *Extract\_trigger.py* - use spirouUnitRecipes to run recipes. [Neil Cook]
- *Extract\_trigger.py* - print the error. [Neil Cook]
- *Extract\_trigger.py* - print output before running. [Neil Cook]
- *Extract\_trigger.py* - changes to test run printing. [Neil Cook]
- *Extract\_trigger.py* - fix for when there are no files found. [Neil Cook]
- *Extract\_trigger.py* - turn off test run. [Neil Cook]
- *Extract\_trigger.py* - add options to combine all files from a night and to limit the number of files used for a recipe. [Neil Cook]
- *Recipe\_control.txt* - do not support *FLAT\_DARK* and *DARK\_FLAT* in *cal\_FF*. [Neil Cook]



#### 4.4.290 0.3.040 (2018-10-17)

- *Extract\_trigger.py* - add filters to allow only certain files to be process based on DPRTYPE. [Neil Cook]
- *Clean\_calibDB* - custom script to remove all unwanted keys (set in the code) and remove files not in the calibDB and move all good files to new folder with a new master calibDB file. [Neil Cook]
- Reset the calibDB and telluDB with new MASTER wave solutions. [Neil Cook]
- *Extract\_trigger.py* - make test run - with printing/storing of commands only and add/modify printing/logging statements. [Neil Cook]
- *Extract\_trigger.py* - correct problem with preprocess trig. [Neil Cook]
- *Extract\_trigger* - fix bugs. [Neil Cook]
- *Extract\_trigger* - fix mistake. [Neil Cook]
- *Extract\_trigger* - correct mistake in ask function. [Neil Cook]
- *Extract\_trigger.py* - allow to skip pp and make function. [Neil Cook]
- *Extract\_trigger.py* - first working version. [Neil Cook]
- *SpirouStartup.py* - fix bug with inputs (numpy array not allowed) [Neil Cook]
- *Extract\_trigger.py* - start work on a simple calibration trigger (upto and including extraction) [Neil Cook]

#### 4.4.291 0.3.041 (2018-10-17)

- *SpirouStartup.py* - fixed problem when no column is present (set to None) [Neil Cook]
- *Extract\_trigger.py* - start of a trigger that goes from pp -> extraction (including all calibrations) - [NOT FINISHED] [Neil Cook]
- *SpirouConst.py* - add DPRTYPE to index file for raw outputs. [Neil Cook]
- *SpirouFITS.py* - added “*check\_wave\_sol\_consistency*” function to check and remap coefficients if incorrect from constants file (*IC\_LL\_DEGR\_FIT*) [Neil Cook]
- *Cal\_HC/ cal\_WAVE* - added check for consistent number of coefficients in wave solution - if wrong refitted onto new coefficients with correct number. [Neil Cook]
- *SpirouFile.py* - add function to sort by base name (*sort\_by\_name*) with alias SortByName. [Neil Cook]
- *Explore\_headers.py* - code to explore headers of all files in given dir string (with wild cards) [Neil Cook]
- *Obj\_mk\_obj\_stack.py* - for making stacks of images (Nobs x Nb\_xpix x Nbo) [Neil Cook]
- *SpirouKeywords.py* - add new header keys to list + define them as keywordstores. [Neil Cook]
- *Obj\_mk\_obj\_template.py* - sort template files by base file name. [Neil Cook]
- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - add some header keys to help identify the source of output. [Neil Cook]
- *Cal\_HC\_E2DS\_EA\_spirou.py* - add some more header keys to enable identifying source of output files. [Neil Cook]

#### 4.4.292 0.3.038 (2018-10-16)

- Update version/date/changelog/update notes. [Neil Cook]
- *Cal\_Test.run* - add *cal\_DRIFTCCF\_E2DS\_spirou* to tested codes. [Neil Cook]
- *SpirouUnitRecipes.py* - add *cal\_DRIFTCCF\_E2DS\_spirou* to unit recipe definitions. [Neil Cook]
- *SpirouKeywords.py* - add reference rv keyword and keywordstore definition. [Neil Cook]
- *SpirouConst.py* - fix tags in new DRIFTCCF file name definitions. [Neil Cook]
- *Recipe\_control.txt* - add *cal\_DRIFTCCF\_E2DS\_spirou* to the runnable codes - for FP only. [Neil Cook]
- *Output\_keys.py* - add *DRIFTCCF\_E2DS\_FITS\_FILE* to output keys. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add driftccf constants to constants file. [Neil Cook]
- *Cal\_DRIFTCCF\_E2DS\_spirou.py* - re-save driftfits to file. [Neil Cook]
- *Cal\_DRIFTCCF\_E2DS\_spirou.py* - pep8 changes + load constants from file + add flux ratio + save reference RV to header. [Neil Cook]
- Merge branch ‘francois’ into dev. [Neil Cook]
- Merge pull request #488 from njcuk9999/dev. [Neil Cook]
- *spirouEXTOR.py* - undo debananafication all zeros check - does not work
- *SpirouEXTOR.py* - undo debananafication all zeros check - does not work. [Neil Cook]

#### 4.4.293 0.3.039 (2018-10-16)

- New recipe to compute the drift of simultaneous FP on Fiber C with `fp.mas`. [FrancoisBouchy]

#### 4.4.294 0.3.044 (2018-10-16)

- New function `DRIFTCCF_E2DS_TBL_FILE` to save driftccf file `DRIFTCCF_E2DS_FITS_FILE` still to be adapted. [FrancoisBouchy]

#### 4.4.295 0.3.037 (2018-10-15)

- `SpirouKeywords.py` - add the two new header keys for bigcube list. [Neil Cook]
- `Obj_mk_obj_template.py` - add file names and bervs for input files to big cube header. [Neil Cook]
- `Update_note.txt` - update with telluric changes. [Neil Cook]
- `SpirouConst.py` - add prefix and change filename. [Neil Cook]
- `Obj_fit_tellu.py` - save and remove abso save files - massive speed up. [Neil Cook]
- `SpirouTelluric.py` - catch more NaN warnings from `order_tapas`. [Neil Cook]
- `SpirouFile.py` - add `get_most_recent` function to get most recent unix time of list of files. [Neil Cook]
- `SpirouConst.py` - add `TELLU_ABSO_SAVE` file (for saving loaded trans files) [Neil Cook]
- `Obj_fit_tellu.py` - store abso unless there are new `trans_files`. [Neil Cook]
- `SpirouTelluric.py` - swap sign on dv. [Neil Cook]
- `SpirouFITS.py` - fix for new output of `read_tilt_file`. [Neil Cook]
- `SpirouFITS.py` - add reading a key 1D list from header. [Neil Cook]
- `Constants_SPIROU_H4RG.py` - add constants for quality control in `obj_mk_tellu`. [Neil Cook]
- `Obj_mk_tellu.py` - quality control SNR in order `QC_TELLU_SNR_ORDER` greater than `QC_TELLU_SNR_MIN`. [Neil Cook]
- `Obj_mk_obj_tellu.py` - only use unique filenames for tellu files. [Neil Cook]
- `Obj_fit_tellu.py` - only use unique filenames from trans files. [Neil Cook]

#### 4.4.296 0.3.036 (2018-10-14)

- `SpirouEXTOR.py` - fix bug where whole order is zeros - will break spline. [Neil Cook]
- Merge pull request #486 from njcuk9999/dev. [Neil Cook]  
Melissa -> Dev -> Master (Confirm test on `Cal_Test.run`, `Tellu_Test.run`, `Tellu_Test2.run`, `Pol_Test.run`)
- Update changelog and test.run. [Neil Cook]
- `SpirouTelluric.py` - catch known warnings and disregard. [Neil Cook]
- Update notes and changelog. [Neil Cook]

#### 4.4.297 0.3.035 (2018-10-12)

- Update unit test runs. [Neil Cook]
- `SpirouTelluric.py` - modify `get_molecular_tell_lines` to use master wavelength solution, rename functions to better describe functionality, use relativistic dv correction function. [Neil Cook]
- `SpirouTDB.py` - rename functions to better describe functionality. [Neil Cook]
- `SpirouDB.__init__.py` - rename aliases to better describe functions. [Neil Cook]
- `SpirouPlot.py` - add `tellu_fit_debug_shift_plot` - Issue #478. [Neil Cook]
- `SpirouMath.py` - add `relativistic_waveshift` function. [Neil Cook]
- `Constants_SPIROU_H4RG.py` - turn off the fit derviative part for principle components - Issue #478. [Neil Cook]
- `Obj_mk_obj_template.py` - further fixes for wavelength shift addition - Issue #478. [Neil Cook]
- `Obj_fit_tellu.py` - further fixes for wavelength shift addition - Issue #478. [Neil Cook]
- `Obj_fit_tellu.py` - fix bugs in shifting wavelength (Issue #478) [Neil Cook]
- `Cal_extract/FF_RAW_spirou.py` - catch warnings from extraction process. [Neil Cook]
- `Cal_WAVE_E2DS_EA_spirou.py` - currently only supports one `FP_FP` and one `HC_HC` (due to file updating) - added check to error if more used. [Neil Cook]

- *Cal\_HC\_E2DS\_EA\_spirou.py* - currently only supports one *FP\_FP* and one *HC\_HC* (due to file updating) - added check to error if more used. [Neil Cook]
- *SpirouTelluric.py* - change bad mask from 0.999 to 0.5 to avoid NaN fringing - Issue #478. [Neil Cook]
- Update date/version/changelog/update notes. [Neil Cook]
- *SpirouWAVE.py* - small pep8 and visual changes / simplifications. [Neil Cook]
- *SpirouPlot.py* - bring new plot in-line with other plots + pep8 changes. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - small pep8 fixes to constants. [Neil Cook]
- Merge branch 'master' into melissa. [Melissa Hobson]
- Merge pull request #485 from njcuk9999/dev. [Neil Cook]  
Eder -> Dev -> Master
- Update *unit\_tests*. [Neil Cook]
- *Unit\_test.py* - make sure all plots are closed. [Neil Cook]
- *Cal\_WAVE\_EA*: moved plot of single HC order + fitted lines to *spirouPlot* constants: added *cal\_WAVE\_EA* constants *spirouWAVE*: improvements to FP line identification. [melissa-hobson]
- *SpirouPlot*: moved plot of single HC order + fitted lines here from *cal\_WAVE\_EA*. [melissa-hobson]
- Merge remote-tracking branch 'origin/melissa' into melissa. [Melissa Hobson]
- *Find\_hc\_gauss\_peaks*: added log message when found lines are read from table, reporting the table file. [melissa-hobson]

#### 4.4.298 0.3.034 (2018-10-11)

- *Unit\_test.py* - make sure all plots are closed. [Neil Cook]
- *SpirouEXTOR.\_\_init\_\_.py* - add alias for *compare\_extraction\_modes* (*CompareExtMethod*) - Issue #481. [Neil Cook]
- *SpirouEXTOR.py* - add *compare\_extraction\_mode* function to test difference between flat and e2ds extraction modes (#481) [Neil Cook]
- *Cal\_FF\_RAW\_spirou.py* - save extraction method to header (like *cal\_extract*) [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - get flat header, compare flat extraction to extraction type (Issue #481) [Neil Cook]
- *SpirouFITS.py* - return header for flat file so we can get extraction type for the flat (Issue #481) [Neil Cook]
- *Unit\_tests* - do not currently test *cal\_WAVE\_E2DS\_EA\_spirou.py* - comment out. [Neil Cook]
- Update date/version/changelog/update notes. [Neil Cook]
- *SpirouLSD.py* - add a few outstanding TODO comments and fix error print (filename may not be defined) [Neil Cook]
- *SpirouPOLAR.\_\_init\_\_.py* - chagen polarHeader -> PolarHeader (for convention) [Neil Cook]
- *Pol\_spirou.py* - Update to alias for convention polarHeader -> PolarHeader. [Neil Cook]
- Merge branch 'master' into eder. [Neil Cook]
- Merge pull request #484 from njcuk9999/neil. [Neil Cook]  
Neil -> Master (confirm test on *Cal\_Test.run*, *Tellu\_Test.run* and *Tellu\_Test2.run*)
- Update date/version/timings/changelog/update notes. [Neil Cook]
- Merge branch 'master' into eder. [Eder]
- Changed parameters for LSD analysis. [Eder]
- Implemented selection of CCFFILE in LSD analysis matching closest temperature to source observed. [Eder]
- Updated keywords BERV, BJD, and MJD of polar products by central values calculated in the module. Also updated keyword EXPTIME by the sum of all EXPTIME values from individual exposures. [Eder]
- Updated keywords BERV, BJD, and MJD of polar products by central values calculated in the module. Also updated keyword EXPTIME by the sum of all EXPTIME values from individual exposures. [Eder]
- Merge branch 'master' into eder. [Eder]
- Tuned parameters to improve LSD analysis and added new statistical quantities calculated from LSD analysis. [Eder]
- Added new keywords in polar products, mainly the BJD time calculated at center of observations. Also fixed small bugs. [Eder]
- Added new keywords in polar products, mainly the BJD time calculated at center of observations. Also fixed small bugs. [Eder]
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- small bugs. [Eder]
- Added new keywords in polar products, mainly the BJD time calculated at center of observations. Also fixed small bugs. [Eder]
- Merge branch 'master' into eder. [Eder]
- Merge branch 'master' into eder. [Eder]
- Resolved merging conflicts. [Eder]

#### 4.4.299 0.3.032 (2018-10-11)

- Unit\_tests* - update *tellu\_test2* and test. [Neil Cook]
- SpirouFITS.py* - fix output of wavelength solution - Issue #483. [Neil Cook]
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- Merge pull request #482 from njcuk9999/neil. [Neil Cook]
- Neil -> master - tested on *Cal\_Test.run*, *Tellu\_Test.run*, *Tellu\_Test2.run*
- SpirouConst.py* - after reading default config file must look for a user config file (parameters depend on it) [Neil Cook]
- SpirouConfigFile.py* - moved *get\_user\_config* to here (to allow accessing from *spirouConst.py*) [Neil Cook]
- SpirouConfig.py* - move *get\_user\_config* to *spirouConfigFile.py* - (needed to fix not obtaining constants from user config file) [Neil Cook]
- SpirouLog.py* - add a possibility to debug in ipython. [Neil Cook]
- SpirouFITS.py* - fix error - now if image is not defined tries to get dimensions from header before giving error - Issue #483. [Neil Cook]
- Update date/version/update notes and changelog. [Neil Cook]

#### 4.4.300 0.3.031 (2018-10-10)

- Tellu\_Test2.run* - add additional test to test different wavelength solutions in telluric recipes. [Neil Cook]
- SpirouUnitTests/Runs* - fix the units test with new recipes/names. [Neil Cook]
- SpirouUnitRecipes.py* - fix for the change of name of *obj\_mk\_tell\_template* -> *obj\_mk\_obj\_template*. [Neil Cook]
- SpirouWAVE.py* - Etienne's fix for *cal\_HC* stability in "fit\_gaussian\_triplets" [Neil Cook]
- SpirouFITS.py* - add a quiet mode (to not duplicate log) and fix bug in getting wavemap from header (from wave params) [Neil Cook]
- SpirouConst.py* - add filenames for *obj\_mk\_obj\_template*. [Neil Cook]
- Master\_calibDB\_SPIROU.txt* - no longer need AB wave solutions and shape - only AB and C needed / shape generated online. [Neil Cook]
- Output\_keys.py* - add *obj\_mk\_obj\_template* filenames to output keys + *recipe\_control*. [Neil Cook]
- Constnats\_SPIROU\_H4RG.py* - turn off force calibDB for wave solution + add HC parameters (Etienne's fix) [Neil Cook]
- Obj\_mk\_obj\_template* - renamed from *obj\_mk\_tell\_template.py* + fixed for wavelength grid shift - Issue #478. [Neil Cook]
- Obj\_mk\_tell\_template.py* - update with shifted wavelength grid - Issue #478. [Neil Cook]
- Cal\_HC\_E2DS\_EA\_spirou.py* - correct bug that wavelength solution parameters were not saved to header correctly. [Neil Cook]
- Recipe\_control.txt* - add *DARK\_FP* to drift and driftpeak allowed inputs - Issue #475. [Neil Cook]
- Constants\_SPIROU\_H4RG.py* - add *dark\_fp* to the drift peak allowed constants (to all in use for drift/driftpeak) - Issue #475. [Neil Cook]
- Recipe\_control.txt* - add *OBJ\_DARK* to allowed files used in *cal\_DARK\_spirou.py* (Issue #479) [Neil Cook]
- Cal\_DARK\_spirou.py* - all use of skydarks and push SKYDARK to calibDB if used (Issue #479) [Neil Cook]
- Constants\_SPIROU\_H4RG.py* - add key "use\_skydark\_correction" to allow SKYDARKs to be use (and take presence over DARK in calibDB) [Neil Cook]
- SpirouTelluric.py* - shift templates if they are not created at runtime from mastergrid to current wavelength grid - Issue #478. [Neil Cook]
- SpirouTelluric.py* - fix bug with *convolve\_files* (should not be re- copied into telluDB) [Neil Cook]
- SpirouImage.py* - allow SKYDARK to be used (if present in calibDB) if *USE\_SKYDARK\_CORRECTION* = True - Issue #479. [Neil Cook]

- *Obj\_mk\_tellu.py* - fix headers in saved file (now wavelength is shifted) - Issue #478. [Neil Cook]
- *Obj\_fit\_tellu.py* - fix bug with shifting PCA components (Issue #478) [Neil Cook]
- *Pol\_spirou.py* + all recipes use GetWaveSolution - force fiber A and B to use wave solution AB (Issue #480) [Neil Cook]
- All recipes using GetWaveSolution - force fiber A and B to use AB wave solution. [Neil Cook]

#### 4.4.301 0.3.030 (2018-10-09)

- *SpirouUnitRecipes.py* - remove the moved HC/WAVE recipes from import (no longer in bin folder) [Neil Cook]
- *SpirouTelluric* - add function wave2wave to shift an image from one wavelength grid to another (Issue #478) [Neil Cook]
- *SpirouFITS.py* - allow wave solution to be obtained quietly. [Neil Cook]
- *SpirouTDB* - add *get\_database\_master\_wave* to get the master wavelength grid from TelluDB (Issue #478) [Neil Cook]
- *Recipe\_control.txt* - Allow sky objects for *cal\_DARK\_spirou* (Issue #479) [Neil Cook]
- *Master\_tellu\_SPIROU.py* + file - modify master telluric database to have a *MASTER\_WAVE* key - containing the master wavelength grid [unfinished] - Issue #478. [Neil Cook]
- *Wave2wave.py* - backup of Etiennes function to shift images from one wavelength grid to another - Issue #478. [Neil Cook]
- HC/WAVE recipes - move all (older) recipes to misc folder - can still be used when in this directory - cannot currently be used with unit tests. [Neil Cook]
- *Obj\_mk\_tellu.py* - add code to shift transmission map [unfinished] - Issue #478. [Neil Cook]
- *Obj\_fit\_tellu.py* - add code to shift pca components and template components [unfinished] - Issue #478. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - fix bug with extraction method 4a and 4b - data2 shallow copied - shouldn't be! (Issue #477) [Neil Cook]
- Update date/version/changelog/update notes. [Neil Cook]

#### 4.4.302 0.4.025 (2018-10-06)

- *Input\_file.txt* - update list of inputs (Issue #475) [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]

#### 4.4.303 0.3.029 (2018-10-06)

- *Cal\_FF\_RAW\_spirou.py* - update extraction to deal with different outputs. [Neil Cook]
- *SpirouFile.py* - made sure pre-processing always adds DPRTYPE even if file not recognised (#Issue 475) [Neil Cook]
- *SpirouEXTOR.py* - for modes 3c, 3d, 4a, 4b add the e2dsl extraction type. [Neil Cook]
- *SpirouConst.py* - add file definition for e2dsl. [Neil Cook]
- *Recipe\_control.txt* - added and corrected *dark\_fp*, *dark\_flat* and *obj\_obj*. [Neil Cook]
- *Output\_keys.py* - added output type *extract\_e2dsl\_file*. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - added "un-sum" extraction output (E2DSL) to see what the extraction is doing. [Neil Cook]
- Merge pull request #476 from *njcuk9999/extract\_redo*. [Neil Cook]  
Extract redo -> Merge (*cal\_WAVE\_E2DS\_EA\_spirou* not working with new extraction)

#### 4.4.304 0.3.028 (2018-10-05)

- *Update\_note.txt* - update with note about setting extraction to 4b (default = 3d) [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - set *extraction\_type* back to 3d for now - until 4a/4b tested. [Neil Cook]
- Update - version/date/changelog/update notes. [Neil Cook]

## 4.4.305 0.3.027 (2018-10-05)

- Timings.txt - update timings with new runs. [Neil Cook]
- *Cal\_Test.run* - comment out *cal\_WAVE\_E2DS\_EA\_spirou* - not working with extraction 4b? [Neil Cook]
- *SpirouTHORCA.\_\_init\_\_.py* - add alias to *generate\_res\_files* (GenerateResFiles) [Neil Cook]
- *SpirouWAVE.py* - add *generate\_res\_files* functions to generate arrays/header dictionary in correct format for wave resolution line profile map file. [Neil Cook]
- *SpirouConst.py* - add *WAVE\_RES\_FILE\_EA* to file definitions. [Neil Cook]
- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - add saving of wavelength resolution line profiles to file. [Neil Cook]
- *Output\_keys.py* - added “WAVE\_RES” to output keys (for wave solution res map) [Neil Cook]
- *Cal\_HC\_E2DS\_EA\_spirou.py* - added saving of resolution map and line profiles to file. [Neil Cook]
- *SpirouUnitTest.py* - up date title of log timings. [Neil Cook]
- *Recipe\_control.txt* - hide *dark\_fp dark\_flat* for now (test later) [Neil Cook]
- *SpirouFITS.py* - allow fiber-forcing in getting wave solution (otherwise when calibDB is used, uses p[‘FIBER’]) [Neil Cook]
- *Off\_listing\_RAW\_spirou.py* - correct mistake with *off\_listing* (rawloc should be a list) [Neil Cook]
- *SpirouFITS.py* - make sure the source of the wavelength solution is reported (Issue #468) [Neil Cook]
- Update date/version/update notes and changelog. [Neil Cook]

## 4.4.306 0.3.026 (2018-10-05)

- *Cal\_Test.run* - add *cal\_SHAPE\_spirou.py* to unit test. [Neil Cook]
- *SpirouUnitsRecipes.py* - add *cal\_HC\_E2DS\_EA\_spirou*, *cal\_SHAPE\_spirou*, *cal\_WAVE\_E2DS\_EA\_spirou* to unit tests. [Neil Cook]
- *Recipe\_control.txt* - add *cal\_SHAPE\_spirou* (copy of *cal\_SLIT\_spirou*) [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - change *\_\_NAME\_\_* (after recipe control integration) [Neil Cook]
- *SpirouImage.py* - optimisation - moved a few things out of loop to speed up process. [Neil Cook]
- *SpirouPlot.py* - corrected type in constant name (*slit\_shape\_angle\_plot*) [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - move *cal\_SHAPE\_spirou.py* constants to constants file. [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - move constants to constants file. [Neil Cook]

## 4.4.307 0.3.025 (2018-10-04)

- *SpirouFITS.py* - get shape file from header. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - add shape file to header (if mode 4a/4b) [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - fix type - should be SHAPE file not TILT file. [Neil Cook]
- *SpirouImage.\_\_init\_\_.py* - add alias to *get\_shape\_map* (GetShapeMap) [Neil Cook]
- *SpirouImage.py* - move *get\_shape\_map* to *SpirouImage* functions (And add imports as required) [Neil Cook]
- *SpirouPlot.py* - add slit shape plot. [Neil Cook]
- *SpirouKeywords.py* - add *kw\_SHAPEFILE* to output keys. [Neil Cook]
- *SpirouConst.py* - add *SLIT\_SHAPE\_FILE* filename definition. [Neil Cook]
- *Output\_keys.py* - add *slit\_shape\_file* output key. [Neil Cook]
- *New\_bananarama.py* - fix to work with DRS. [Neil Cook]
- *Cal\_SLIT\_spirou.py* - replace old path function with new and correct small typo. [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - add plotting, filesaving, calibDB movement and move functions to *SpirouImage* (finally runs) [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - added plotting, file saving and adding to calibDB. [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - fix bugs that now produce identical results to *new\_bananarama* code. [Neil Cook]

## 4.4.308 0.3.024 (2018-10-03)

- *Cal\_SHAPE\_spirou.py* - fix typo *dx[iw] = coeffs[1]* -> *dx[iw] = gcoeffs[1]* [Neil Cook]
- *New\_bananarama.py* - added TODO questions for Etienne. [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - more changes to update with Etienne's *new\_bananarama* code. [Neil Cook]
- Merge branch ‘master’ into *extract\_redo*. [Neil Cook]

- *Cal\_Test.run* - must test HC/WAVE EA recipes - added to runs. [Neil Cook]
- *Cal\_HC\_E2DS\_EA\_spirou.py* - fix bug flatfile in header should be blaze file. [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - updated code [unfinished/not working] [Neil Cook]
- Copy of etiennes shap finding code. [Neil Cook]
- Merge branch 'master' into *extract\_redo*. [Neil Cook]
- **Conflicts:** .gitignore INTROOT/SpirouDRS/spirouImage/spirouFITS.py
- Merge pull request #473 from njcuk9999/neil. [Neil Cook]  
Neil -> Master
- Update timings and update notes. [Neil Cook]
- Test code for one target. [Neil Cook]
- Update version/date/changelog/update notes. [Neil Cook]
- Unit tests - remove some extractions (not needed for minimum test) [Neil Cook]
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- Unit tests - add full telluric test for TC3. [Neil Cook]
- *SpirouImage.py* - *WAVE\_FILE* is now *WAVEFILE*. [Neil Cook]
- *Dark\_test.py* - test of the values supplied in the dark header file (for specific files + *night\_name*) [Neil Cook]
- *Visu\_E2DS\_spirou.py* - readblaze file now need p returned. [Neil Cook]
- *Obj\_fit\_tellu.py* - re-add loc['WAVE'] (used for plotting) + loc['WAVE\_IT'] need filename returned. [Neil Cook]
- *Cal\_wave\_mapper.py* - remove flat file (not used or obtained) from header. [Neil Cook]
- *Cal\_exposure\_meter.py* - remove flatfile (not used or obtained) [Neil Cook]
- Update spirouImage.py. [Neil Cook]  
*spirouImage.py* - fix for bug in itable dtype being bytes not string (certain python installations only)
- Merge pull request #470 from njcuk9999/neil. [Neil Cook]  
Neil -> master
- *Cal\_SHAPE\_spirou.py* - working on integrating nuxtract from EA. [Neil Cook]
- Update gitignore to ignore misc folder. [Neil Cook]
- Sync file - not used. [Neil Cook]
- *Cal\_SHAPE\_spirou.py* - first commit [unfinished] [Neil Cook]
- *Reset\_calibDB* file - add shape map file (placeholder - will be generated in new *cal\_SLIT* code) [Neil Cook]
- .gitignore - remove unneeded ignore. [Neil Cook]
- *SpirouUnitRecipes.py* - remove references to *cal\_extract\_RAW\_spirouAB* and *C*. [Neil Cook]
- *SpirouFITS.py* - add *read\_shape\_file* function to get shape file from calibDB. [Neil Cook]
- *SpirouEXTOR.\_\_init\_\_.py* - add aliases and remove old commented aliases. [Neil Cook]
- *SpirouEXTOR.py* - modify extraction wrapper function to accept new arguments of shape extraction functions, fill out shape extraction functions and add "debananafication" function. [Neil Cook]
- *SpirouCDB.py* - fix typo in error message. [Neil Cook]
- *Master\_calib\_SPIROU.txt* - add SHAPE file for reset (until new *cal\_SLIT* code is running) [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - update normal method to 4b. [Neil Cook]
- *Cal\_extract\_RAW\_spirou*: add modifications required for extraction methods 4a and 4b. [Neil Cook]
- *Cal\_extract\_EA\_test*: update test for EA changes 2018-09-20. [Neil Cook]
- Misc - backup old files. [Neil Cook]
- *SpirouEXTOR.py* - add todo and comment to remind to move afterwards. [Neil Cook]
- *SpirouEXTOR.py* - add shape extract method to test methods. [Neil Cook]
- *Cal\_Extract\_EA\_test.py*: add test code to experiment with extraction methods. [Neil Cook]
- *Constants\_SPIROU\_H4RG*: add extra extraction types to allowed types. [Neil Cook]

#### 4.4.309 0.3.023 (2018-10-02)

- *Cal\_CCF\_E2DS\_spirou.py* - fix order out GetWaveSolution outputs (Issue #464) [Neil Cook]
- *Cal\_Test.run* - change over (*cal\_exposure\_meter* last) [Neil Cook]
- *SpirouTelluric.py* - modify functions to allow filename saved to p - for insertion into header at hdicet creation (Issue #471) [Neil Cook]
- *SpirouLOCOR.py* - modify functions to allow filename save to p - for insertion into header at hdicet creation (Issue #471) [Neil Cook]
- *SpirouImage.py* - modify functions to allow filename to be saved to p - to insert into header at hdicet creation (Issue #471) - fix bug with mask2 (in getting drift files function) [Neil Cook]

- *SpirouFITS.py* - mmodify read functions to save the filename to p - to inject into header at hdicet creation (Issue #471) [Neil Cook]
- *SpirouFLAT* - add filenames to headers (Issue #471) [Neil Cook]
- *SpirouKeywords.py* - add the keywords for each file (that will go in the header) - Issue #471. [Neil Cook]
- *Obj\_mk\_tellu.py* - add filenames to headers (Issue #471) [Neil Cook]
- *Obj\_mk\_tellu\_template.py* - add filenames to headers (Issue #471) [Neil Cook]
- *Obj\_fit\_tellu.py* - add filenames to headers (Issue #471) [Neil Cook]
- *Cal\_wavE\_mapper.py* - add filenames to headers (Issue #471) [Neil Cook]
- *Cal\_[WAVE\_E2DS]\_spirou.py* - add filenames to headers (Issue #471) [Neil Cook]
- *Cal\_SLIT\_spirou.py* - add filenames to headers (Issue #471) [Neil Cook]
- *Cal\_loc\_RAW\_spirou.py* - add filenames to headers (Issue #471) [Neil Cook]
- *Cal\_HC\_E2DS\_spirou.py* - add filenames to headers (Issue #471) [Neil Cook]
- *Cal\_HC\_E2DS\_EA\_spirou.py* - add filenames to headers (Issue #471) [Neil Cook]
- *Cal\_FF\_RAW\_spirou.py* - add filenames to headers (Issue #471) [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - add filenames to headers (Issue #471) [Neil Cook]
- *Cal\_exposure\_meter.py* - add filenames to headers (Issue #471) [Neil Cook]
- *Cal\_DRIFTPEAK\_E2DS\_spirou.py* - add filenames to headers (Issue #471) [Neil Cook]
- *Cal\_DRIFT\_E2D.py* - add filenames to headers (Issue #471) [Neil Cook]
- *Cal\_DARK\_spirou.py* - add filenames to headers (Issue #471) [Neil Cook]
- *Cal\_BADPIX\_spirou.py* - add filenames to headers (Issue #471) [Neil Cook]
- Update date/version/changelog. [Neil Cook]
- *SpirouWAVE* - replace *get\_e2ds\_ll* (Issue #468) [Neil Cook]
- *SpirouFITS.py* - allow header return. [Neil Cook]
- *SpirouPlot.py* - fix bug *plot\_style* cannot be None - now "" when empty. [Neil Cook]
- *Cal\_CCF\_E2DS\_spirou.py* - fix bug - swap wave and param. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - add header to wave solution returns. [Neil Cook]

#### 4.4.310 0.3.022 (2018-10-01)

- *SpirouTHORCA.\_\_init\_\_.py* - remove use of *GetE2DSll* - use *GetWaveSolution* (Issue #468) [Neil Cook]
- *SpirouTHORCA.py* - remove use of *GetE2DSll* - use *GetWaveSolution* (Issue #468) [Neil Cook]
- *Cal\_CCF\_E2DS\_spirou.py* - remove use of *GetE2DSll* - use *GetWaveSolution* (Issue #468) [Neil Cook]
- *SpirouTHORCA.py* - re-work the obtaining of wave solution (Issue #468) [Neil Cook]
- *SpirouFITS.py* - re work wave solution functions (Issue #468) [Neil Cook]
- *SpirouImage.\_\_init\_\_.py* - remove old wave sol functions (Issue #468) [Neil Cook]
- *Cal\_DRIFT\_RAW\_spirou.py* - work on wave solution functions (Issue #468) [Neil Cook]
- *Pol\_spirou.py* - work on wave solution functions (Issue #468) [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - work on wave solution functions (Issue #468) [Neil Cook]
- *Visu\_[ALL]\_spirou.py* - work on wave solution functions (Issue #468) [Neil Cook]
- *Obj\_[fit/mk]\_tellu.py* - work on wave solution functions (Issue #468) [Neil Cook]
- *Cal\_wave\_mapper.py* - work on wave solution functions (Issue #468) [Neil Cook]
- *Cal\_HC\_E2DS\_EA\_spirou.py* - work on wave solution functions (Issue #468) [Neil Cook]
- *Cal\_WAVE\_[ALL].py* - work on wave solution functions (Issue #468) [Neil Cook]
- *Cal\_exposure\_meter.py* - work on wave solution functions (Issue #468) [Neil Cook]
- *Cal\_DRIFTPEAK\_E2DS\_spirou.py* - work on wave solution functions (Issue #468) [Neil Cook]
- *Cal\_DRIFT\_E2DS\_spirou.py* - work on wave solution functions (Issue #468) [Neil Cook]
- *SpirouImage.py* - modify *get\_all\_similar\_files* to add check of fiber for *OBJ\_FP* *OBJ\_HCONE* etc (i.e. only allow on fiber C) and return filetype to show user which *DRS\_EXTOUT* were allowed (Issue #464) [Neil Cook]
- *SpirouImage.\_\_init\_\_.py* - update alias to better represent what we are doing *get\_all\_similar\_files* -> *GetSimilarDriftFiles*. [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add constant to check which fiber is being used (for *OBJ\_FP* and *OBJ\_HCONE* etc should only work on fiber C) - Issue #464. [Neil Cook]
- *Cal\_DRIFTPEAK\_E2DS\_spirou.py* - fix code to allow *FP\_FP* and *OBB\_FP* (and report back on allowed types) - Issue #464. [Neil Cook]
- *Cal\_DRIFT\_E2DS\_spirou.py* - fix code to allow *FP\_FP* and *OBB\_FP* (and report back on allowed types) - Issue #464. [Neil Cook]



- Teset.run - update tested files. [Neil Cook]
- Re-add misc folder to github sync. [Neil Cook]
- *SpirouImage.py* - change how *get\_all\_similar\_files* works (now look for *kw\_OUTPUT* based on “*DRIFT\_PEAK\_ALLOWED\_OUTPUT*” - Issue #464. [Neil Cook]
- *Constnats\_SPIROU\_H4RG.py* - Issue #464 - add definitions for which outputs are allowed for “fp” and “hc” [Neil Cook]
- Add misc backup files. [Neil Cook]
- Removed problematic *fitgaus.py* from fortran (conflicts with *fitgaus.f*) and removed *fitgaus.f* from *spirouTHORCA*. [Neil Cook]
- *SpirouImage.py* - Issue #464 - *get\_all\_similar\_files* - modify to run indexing if no *index.fits* exists. [Neil Cook]
- *Off\_listing\_REDUC\_spirou.py* - Issue #464 - allow *off\_listing* to run in quiet mode. [Neil Cook]

#### 4.4.311 0.3.021 (2018-09-26)

- *SpirouWAVE.py* - adapt to allow force creating of linelist. [Neil Cook]
- *SpirouPlot.py* - adapt to be able to use different style. [Neil Cook]
- *SpirouConst.py* - add plot style (for alternate plotting) [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - add control to force linelist re- computation. [Neil Cook]

#### 4.4.312 0.3.020 (2018-09-25)

- *SpirouPlot.py* - pass font changes for all graphs (via *matplotlib.rc*) [Neil Cook]
- *SpirouConst* - add descriptions for plot font functions. [Neil Cook]
- *SpirouConst.py* - add plot pseudo constants (to enable changing plot fontsize easily - for all plots) [Neil Cook]
- *Cal\_CCF\_E2DS\_spirou.py* - add inputs for *ccf\_rv\_ccf\_plot* (modified inputs for plot title) [Neil Cook]
- Merge pull request #466 from njcuk9999/neil. [Neil Cook]  
fix typo in last commit
- Merge pull request #465 from njcuk9999/neil. [Neil Cook]  
Neil -> Master (Fixes for issue #464)

#### 4.4.313 0.3.019 (2018-09-24)

- *Cal\_DRIFTPEAK\_E2DS\_spirou.py* - fix typo bug with *drift\_peak\_allowed\_types*. [Neil Cook]
- *Recipe\_control.txt* - add *HCTWO\_HCTWO* and *OBJ\_FP* to *cal\_DRIFT* and *cal\_DRIFTPEAK* recipes - Issue #464. [Neil Cook]
- *Constnats\_SPIROU\_H4RG.py* - added new constant to control with files (with header key *KW\_EXT\_TYPE*) are associated with fp and hc (for setting other constants) - Issue #464. [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py* - note from Etienne to Francois re: negative fluxes to zero after background correction. [Neil Cook]
- *Cal\_DRIFTPEAK\_E2DS\_spirou.py* - modified the lamp parameter to get from constants (for easier addition of different types) - Issue #464. [Neil Cook]
- Merge pull request #463 from njcuk9999/dev. [Neil Cook]  
Dev

#### 4.4.314 0.3.018 (2018-09-21)

- Update timings. [Neil Cook]
- Update date/version/changelog/timings. [Neil Cook]

#### 4.4.315 0.3.017 (2018-09-21)

- *SpirouTHORCA.py* - fix code to not have min/max of *HC/FP\_N\_ORD* START/FINAL for cal WAVE/cal HC. [Neil Cook]

- *Cal\_WAVE\_E2DS\_spirou.py* - fix code to not have min/max of *HC/FP\_N\_ORD* START/FINAL for cal WAVE. [Neil Cook]
- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - fix code to not have min/max of *HC/FP\_N\_ORD* START/FINAL for cal WAVE. [Neil Cook]
- *Cal\_HC\_E2DS\_spirou.py* - fix code to not have min/max of *HC/FP\_N\_ORD* START/FINAL for cal HC. [Neil Cook]

#### 4.4.316 0.3.016 (2018-09-21)

- Remove user specific ignore (should not be needed) [Neil Cook]
- Update .gitignore to ignore misc folder. [Neil Cook]
- *SpirouWAVE.py* - Merge changes from Dev into Melissa. [Neil Cook]
- *SpirouTHORCA.py* - Merge changes from Dev into Melissa. [Neil Cook]
- *SpirouRV.py* - Merge changes from Dev into Melissa. [Neil Cook]
- *SpirouPlot.py* - Merge changes from Dev into Melissa (Issue #460) [Neil Cook]
- *Constants\_SPIROU\_H4RG.py* - Merge changes from Dev into Melissa. [Neil Cook]
- *Cal\_WAVE\_E2DS\_EA\_spirou.py* - Merge changes from Melissa. [Neil Cook]
- *Cal\_CCF\_E2DS\_spirou.py* - full header added to “*CCF\_FITS\_FILE*” [Neil Cook]
- Merge pull request #459 from njcuk9999/dev. [Neil Cook]  
Dev -> master
- Update version/changelog/date/update notes. [Neil Cook]

#### 4.4.317 0.3.015 (2018-09-19)

- *Unit\_tests*: fix bug in run names. [Neil Cook]

#### 4.4.318 0.3.012 (2018-09-19)

- *Unit\_tests*: add *cal\_CCF* test to *Tellu\_Test.run*. [Neil Cook]
- *Unit\_tests*: update unit test with new hc files (from 2018-08-05) [Neil Cook]
- *Recipe\_control.txt* - remove duplicate line in *cal\_CCF* definition. [Neil Cook]
- *Cal\_CCF\_E2DS\_spirou.py* - update comments and remove extra spaces. [Neil Cook]
- Merge remote-tracking branch ‘origin/francois’ into francois. [FrancoisBouchy]
- Update date/version/changelog. [Neil Cook]

#### 4.4.319 0.3.013 (2018-09-19)

- New CCF mask provided by Xavier on 2018 Sept 19. [FrancoisBouchy]
- Add *E2DS\_FF* for *cal\_CCF\_E2DS* recipe. [FrancoisBouchy]
- Adaptation for telluric corrected spectra. [FrancoisBouchy]

#### 4.4.320 0.3.011 (2018-09-19)

- *Recipe\_control.txt* - add e2dsff files to *cal\_drift* codes and *cal\_ccf*. [Neil Cook]
- *Cal\_DRIFTPEAK\_E2DS\_spirou*: fix obtaining of lamp type with *hc\_hc (ext\_type == “HCONE\_HCONE” or “HCTWO\_HCTWO”)* [Neil Cook]
- *Cal\_extract\_RAW\_spirou.py*: better error message for no DPRTYPE in header (Issue #456) [Neil Cook]

#### 4.4.321 0.4.024 (2018-09-18)

- *Test\_recipe.py* - continue work on getting new input method to work. [Neil Cook]
- *SpirouStartup2.py* - continue work on getting new input method to work. [Neil Cook]
- *SpirouRecipe.py* - continue work on getting new input method to work. [Neil Cook]

- *Recipes.py* - add test recipe to test new definition method. [Neil Cook]
- *SpirouConst.py*: fix pep8 issue - brackets not needed. [Neil Cook]
- Merge branch 'master' into *input\_redo*. [Neil Cook]

#### 4.4.322 0.3.010 (2018-09-18)

- *Tellu\_test.run*: add actual non-hot stars to telluric test. [Neil Cook]
- *Tellu\_test.run*: add actual non-hot stars to telluric test. [Neil Cook]
- *Tellu\_test.run*: reset for full test. [Neil Cook]

#### 4.4.323 0.3.009 (2018-09-17)

- Test runs: update *tellu\_test.run*. [Neil Cook]
- Update *cal\_test.run*. [Neil Cook]
- *SpirouStartup.py*: extra check for no outputs in indexing (fixes crash) [Neil Cook]
- *SpirouPlot*: fix telluric plots (labels, titles, limits) [Neil Cook]
- *Obj\_mk\_tellu*: save SP to loc. [Neil Cook]
- *Obj\_fit\_tellu*: fix bug (blaze must be normalised to fit telluric) [Neil Cook]

#### 4.4.324 0.4.023 (2018-09-17)

- *Test\_recipe*: todo's added. [Neil Cook]

#### 4.4.325 0.4.022 (2018-09-14)

- Input update: *spirouStartup.\_\_init\_\_.py* aliases / imports to *spirouStartup2* (temporary) [Neil Cook]
- Input update: *recipes.py* - holder for recipe definitions. [Neil Cook]
- Input update: *spirouRecipe.py* - holder for new recipe classes. [Neil Cook]
- Input update: *spirouStartup2.py* - holder for new *spirouStartup*. [Neil Cook]
- Input update: *test\_recipe.py* - test recipe to test new input functions. [Neil Cook]
- Input update: add *input\_files.txt* - definition of input files. [Neil Cook]
- Merge pull request #453 from *njcuk9999/V0.3\_Cand*. [Neil Cook]  
V0.3 cand -> master. Confirm unit tests successful.

#### 4.4.326 0.3.008 (2018-09-13)

- *Version.txt*: update/check dependencies. [Neil Cook]
- *Drs\_dependencies.py*: fix for python 2 path. [Neil Cook]
- Update date/version/changelog. [Neil Cook]
- *Timings.txt*: For Neil reference only *unit\_test* timings. [Neil Cook]

#### 4.4.327 0.3.007 (2018-09-13)

- *Drs\_changelog.py*: undo pep8 name change (and redo properly) [Neil Cook]
- *Update\_notes.txt*: add unit tests to update (files and some explanation) [Neil Cook]
- *Pol\_spirou.py*: fix error with new input/output to *WriteImageMulti*. [Neil Cook]
- *SpirouWAVE.py*: hide testing "print" statements. [Neil Cook]
- *Unit\_tests*: update unit test + add polarisation test. [Neil Cook]
- *SpirouCDB.py*: fix bad call to *DATE\_FMT\_HEADER* (p not required) [Neil Cook]
- *Cal\_reset.py*: exit script *has\_plots=False*. [Neil Cook]
- *SpirouWAVE.py*: fix issue with pep8 update (*ll\_prev* defined in wrong place) [Neil Cook]
- *SpirouWAVE.py* (Issue #452): *wave\_catalog* is now initialised as a NaN array (instead of an array of zeros) [Neil Cook]

#### 4.4.328 0.3.006 (2018-09-12)

- *Off\_listing.py*: fix bug and add to index (if prompted by user) [Neil Cook]
- *SpirouStartup.py*: added Y/N question function. [Neil Cook]
- *Off\_listing.py*: fix to bug in code (rawloc -> list) [Neil Cook]
- *Off\_listing.py*: generic off listing that takes any directory as only input (no night name) and read's index.fits / *\_pp* fits file headers to get off listing for that directory. [Neil Cook]
- *SpirouStartup.py*: fix for not requiring night name in *load\_arguments*. [Neil Cook]
- *SpirouConst.py*: Added general off listing columns. [Neil Cook]
- Made *spirouTools* executable. [Neil Cook]
- Fix bad pep8 updates. [Neil Cook]
- Pep8 updates. [Neil Cook]

#### 4.4.329 0.3.005 (2018-09-11)

- Pep8 updates. [Neil Cook]
- *Update\_notes.txt*: update with new unit tests. [Neil Cook]
- Unit tests: update unit test -> add "*Tellu\_Test.run*" and modify "*Cal\_Test.run*", remove *test\_tellu.run*. [Neil Cook]
- *Recipe\_control.txt* -> add telluric and polarisation cases for *visu\_E2DS\_spirou*. [Neil Cook]
- *Obj\_fit\_tellu*, *obj\_mk\_tell\_template*, *obj\_mk\_tellu*: fix writing outputs to file. [Neil Cook]
- Update date/version/changelog/update notes. [Neil Cook]

#### 4.4.330 0.3.033 (2018-09-11)

- Added BJD# and MEANBJD to header of polar products. [Eder]
- Minor changes. [Eder]
- Minor changes. [Eder]
- Minor changes. [Eder]

#### 4.4.331 0.3.004 (2018-09-11)

- *Recipe\_control.txt* -> add cases (for fiber) for *visu\_E2DS\_spirou*. [Neil Cook]
- *SpirouFile.py* - fix bad error output {0} -> {1} [Neil Cook]
- *Cal\_test.run*: fix errors (typos ...f -> ...a) [Neil Cook]
- Update recipe control for *visu\_RAW* and *visu\_E2DS* recipes. [Neil Cook]
- Update notes with not done/finished. [Neil Cook]
- *SpirouWAVE* - re-add dict() -> OrderedDict() [Neil Cook]
- Config - merge fix - do NOT upload own config! [Neil Cook]
- *Cal\_WAVE\_E2DS\_EA* - extra imports. [Neil Cook]
- Merge branch 'dev2' into melissa2. [Neil Cook]
- **Conflicts:** *INTROOT/SpirouDRS/data/constants/recipe\_control.txt* *INTROOT/SpirouDRS/spirouConfig/spirouCons*  
*INTROOT/SpirouDRS/spirouTHORCA/spirouWAVE.py* *INTROOT/bin/cal\_WAVE\_E2DS\_EA\_spirou.py*
- *Cal\_exposure\_meter.py*: fix bad call to *get\_telluric* (p, loc -> loc) [Neil Cook]
- Updated changelog/date/version/update notes. [Neil Cook]
- Update unit tests. [Neil Cook]
- *SpirouUnitTests*: fix outputs of *manage\_run* (post H2RG removal) [Neil Cook]
- *SpirouTelluric.py*: fix kind when reading TAPAS file (was FLAT now TAPAS) [Neil Cook]
- *SpirouStartup.py*: fix indexing of files (add "*LAST\_MODIFIED*" column) [Neil Cook]
- *SpirouStartup.\_\_init\_\_.py*: fix aliases. [Neil Cook]
- *SpirouTable* - increase width of table (now 9999) [Neil Cook]
- *SpirouExposureMeter.py*: update where TAPAS file is taken from (now from telluDB) [Neil Cook]
- *SpirouConst.py*: update reduced output columns (need date and utc for drift) [Neil Cook]
- Update *master\_calib\_SPIROU.txt* for reset - now we don't need H2RG or TAPAS input. [Neil Cook]
- *Off\_listing\_RAW/REDUC\_spirou* - fix bug in adding unix time - now called "*last\_modified*" (to be more specific) [Neil Cook]

- *Cal\_FF\_RAW\_spirou*: fix bug in H2RG removal. [Neil Cook]
- *Cal\_exposure\_meter/cal\_wave\_mapper* - update location of telluric ref file (TAPAS) now via telluDB. [Neil Cook]

#### 4.4.332 0.3.003 (2018-09-10)

- Update notes - update. [Neil Cook]
- Unit test .run files - update after removing H2RG dependency. [Neil Cook]
- *SpirouUnitTests.py*: remove H2RG dependency (comparison not needed) [Neil Cook]
- *Unit\_test.py*: replace dict() -> OrderedDict() + remove H2RG dependency. [Neil Cook]
- *SpirouUnitTests.py*: replace dict() -> OrderedDict() + remove H2RG dependency. [Neil Cook]
- *SpirouUnitRecipes.py*: remove H2RG dependency (no comparison needed) + replace dict() -> OrderedDict() [Neil Cook]
- *SpirouUnitTests.\_\_init\_\_.py*: remove H2RG dependency (remove *check\_type* and *set\_comp*) [Neil Cook]
- *Drs\_tools*: replace dict() -> OrderedDict() [Neil Cook]
- *Drs\_documentation*: replace dict() -> OrderedDict() [Neil Cook]
- *Drs\_dependencies*: replace dict() -> OrderedDict() [Neil Cook]
- *Drs\_changelog*: replace dict() -> OrderedDict() [Neil Cook]
- *Calc\_berv*: replace dict() -> OrderedDict() and remove H2RG dependency. [Neil Cook]
- *SpirouWAVE*: replace dict() -> OrderedDict() [Neil Cook]
- *SpirouTHORCA.py*: remove H2RG dependency. [Neil Cook]
- *SpirouTelluric.py*: remove unused line (norm) [Neil Cook]
- *SpirouStartup.py*: remove H2RG dependency and add "UNIX" file column. [Neil Cook]
- *SpirouRV.py*: remove H2RG dependency. [Neil Cook]
- *SpirouPOLAR.py*: replace dict() -> OrderedDict() [Neil Cook]
- *SpirouLOCOR.py*: remove H2RG dependency. [Neil Cook]
- *SpirouImage.py*: remove H2RG dependency. [Neil Cook]
- *SpirouFITS.py*: remove H2RG dependency + replace dict() -> OrderedDict() [Neil Cook]
- *SpirouBERV.py*: remove H2RG dependency. [Neil Cook]
- *SpirouEXTOR*: replace dict() -> OrderedDict() [Neil Cook]
- *SpirouDB*: replace dict() -> OrderedDict() [Neil Cook]
- *SpirouPlot.py*: remove H2RG dependency. [Neil Cook]
- *SpirouConst.py*: update reduced output columns (remove obs date and utc from reduced products) [Neil Cook]
- *SpirouConfig.py*: replace dict() -> OrderedDict() [Neil Cook]
- *Main\_drs\_trigger*: remove H2RG dependency. [Neil Cook]
- *Constants\_SPIROU\_H2RG*: remove H2RG dependency (Delete file) [Neil Cook]
- *Off\_listing\_REDUC\_spirou* - add column for last modified (unix time) [Neil Cook]
- *Cal\_wave\_mapper*: replace dict() -> OrderedDict() [Neil Cook]
- *Cal\_SLIT\_spirou*: remove H2RG dependency. [Neil Cook]
- *Cal\_preprocess\_spirou*: remove H2RG dependency. [Neil Cook]
- *Cal\_loc\_RAW\_spirou*: remove H2RG dependency. [Neil Cook]
- *Cal\_FF\_RAW\_spirou*: remove H2RG dependency. [Neil Cook]
- *Cal\_extract\_RAW\_spirou*: remove H2RG dependency. [Neil Cook]
- *Cal\_exposure\_meter*: replace dict() -> OrderedDict() [Neil Cook]
- *Cal\_DARK\_spirou.py*: remove H2RG dependency. [Neil Cook]
- *Cal\_CCF\_E2DS\_spirou.py*: replace dict() -> OrderedDict() [Neil Cook]

#### 4.4.333 0.3.002 (2018-09-07)

- Added an *all\_order* plot of fitted gaussians (as discussed in #442) Saved additional values to loc in *spirouWAVE* functions that were required for *cal\_WAVE\_E2DS\_EA*. [melissa-hobson]
- *Fit\_emi\_line*: added check to not fit on lines with more than one zero- value (fix for #393) [melissa-hobson]

#### 4.4.334 0.3.000 (2018-09-06)

- Issue #418 *spirouStartup.py* - Make directory for *NIGHT\_NAME* in *TMP\_DIR*, *index.fits* saves to *TMP\_DIR*, files are now checked for RAW in *TMP\_DIR*. [Neil Cook]
- Issue #418 *spirouFile.py*: obtaining *tmppath* and *tmpfile* to check for raw files (instead of *rawpath* which now throws error when used) [Neil Cook]
- Issue #418 *spirouConfig*: added *TMP\_DIR* definition (as *DRS\_DATA\_WORKING* dir) [Neil Cook]
- Issue #418 *cal\_preprocess\_spirou.py*: made pp target raw folder but save to tmp dir. [Neil Cook]
- Updated notes. [Neil Cook]
- Updated the update notes. [Neil Cook]
- Added Update Notes. [Neil Cook]
- Update *20180805\_test1.run* to extract FP sequences and run DRIFT recipes (with extracted FPs) [Neil Cook]
- Update 20180409 test to include *off\_listing\_RAW/REDUC* and not include *pol\_spirou* (do not have the raw files needed) [Neil Cook]
- *Unit\_test.py*: Move Reset after set up (so errors reported before reset questions) [Neil Cook]
- Issue #429: *spirouUnitRecipes.py*: modify the outputs of *off\_listing* recipes (distinguish between RAW and REDUCED listing) [Neil Cook]
- Issue #429: *calc\_berv* - modify input/output of *WriteImage* (for handling p['OUTPUTS']) [Neil Cook]
- Issue #429: *spirouStartup.py* modify "*main\_end\_script*" to index outputs or pre-processing - via functions "*index\_pp*", "*index\_outputs*", "*indexing*" and "*sort\_and\_save\_outputs*" [Neil Cook]
- Issue #429: *spirouStartup.\_\_init\_\_.py*: alias *sort\_and\_save\_outputs* to *SortSaveOutputs*. [Neil Cook]
- Issue #429: *spirouLSD* - modify *WriteImage* to accept new input/output for writing p['OUTPUTS'] [Neil Cook]
- Issue #429: *spirouTable*: Add ways of making, reading and writing fits table (via *astropy.table.Table*) - functions added = *make\_fits\_table*, *read\_fits\_table*, *write\_fits\_table*. [Neil Cook]
- Issue #429: *spirouImage.py*: replace "*get\_all\_similar\_files*" function to look at header keys instead of file name (for *cal\_DRIFT* recipes) [Neil Cook]
- *SpirouFITS*: modify *write\_image* and *write\_image\_multi* to deal with writing output dict to p (via new function "*write\_output\_dict*") [Neil Cook]
- *SpirouFile*: add *DRS\_TYPE* to identify RAW and REDUCED recipes (and pass to output processing later) [Neil Cook]
- *SpirouImage.\_\_init\_\_*: add aliases for *make\_fits\_table*, *read\_fits\_table* and *write\_fits\_table*. [Neil Cook]
- *SpirouMath*: reformat exception on timestamp (to print the input -> helps with debugging) [Neil Cook]
- *SpirouConst*: add *OFF\_LISTING\_RAW\_FILE*, *OFF\_LISTING\_REDUC\_FILE*, *INDEX\_OUTPUT\_FILENAME*, *OUTPUT\_FILE\_HEADER\_KEYS*, *RAW\_OUTPUT\_COLUMNS*, *REDUC\_OUTPUT\_COLUMNS* functions. [Neil Cook]
- Modify *unresize.py* with the output to *WriteImage* (outputs management) [Neil Cook]
- Update *cal\_drift\_raw* for outputs (but not file list) [Neil Cook]
- Re-work *off\_listing* recipes to look at the index files first (Much faster) - and to update the index files. [Neil Cook]
- Modify *cal\_preprocess\_spirou* to sort out outputs and to skip index file. [Neil Cook]
- Issue #429 - Re-work "listfiles" to get files from the headers (and index files) + deal with outputs. [Neil Cook]
- Issue #429 - ReWork "WriteImage" to save to p['OUTPUTS'] and deal with *spirouStartup.End* dealing with outputs. [Neil Cook]

#### 4.4.335 0.2.128 (2018-09-06)

- *SpirouPlot*: updated *wave\_ea\_plot\_per\_order\_hcguess*: - plots stay open until manually closed - each plot shows only the gaussian fits corresponding to the order (Fixes #442) [melissa-hobson]

#### 4.4.336 0.2.124 (2018-09-05)

- Issue #429 - add output header key to identify output files (*KW\_OUTPUT*) - defined in *output\_keys.py* (*SpirouDRS/data*), and added the obtaining of *DPRTYPE* to add *EXT\_TYPE* key to header (extraction

- output id key -> giving DPRTYPE for extracted files) [Neil Cook]
- Added a new log output to split up files to help see progress. [Neil Cook]
- Issue #429 - add output header key to identify output files (*KW\_OUTPUT*) - defined in *output\_keys.py* (SpirouDRS/data) [Neil Cook]
- Issue #429 - re-worked file identification only using header keys (no filename identification) [Neil Cook]
- Issue #429 - added *kw\_OUTPUT* and *kw\_EXT\_TYPE* definitions for saving output header id and extraction output header id. [Neil Cook]
- Issue #429 - added TAGFOLDER and TAGFILE functions and modified all fits-file definition functions to accept tags. [Neil Cook]
- Issue #429 - added *get\_tags* function. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Issue #429 - re-work *recipe\_control.txt* to take into account added output keys (and check keys on start up) [Neil Cook]
- Issue #429 - definition of output header keys (based on output filename in *spirouConst.py*) [Neil Cook]
- Issue #429 - add output header key to identify output files (*KW\_OUTPUT*) - defined in *output\_keys.py* (SpirouDRS/data) [Neil Cook]
- Issue #429 - add output header key to identify output files (*KW\_OUTPUT*) - defined in *output\_keys.py* (SpirouDRS/data) [Neil Cook]
- Issue #429 - add output header key to identify output files (*KW\_OUTPUT*) - defined in *output\_keys.py* (SpirouDRS/data) [Neil Cook]
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- Issue #429 - add output header key to identify output files (*KW\_OUTPUT*) - defined in *output\_keys.py* (SpirouDRS/data) [Neil Cook]
- Issue #429 - add output header key to identify output files (*KW\_OUTPUT*) - defined in *output\_keys.py* (SpirouDRS/data) [Neil Cook]

#### 4.4.337 0.2.125 (2018-09-05)

- *Cal\_WAVE\_E2DS\_EA\_spirou*: updated HC section from *cal\_HC\_E2DS\_EA\_spirou.py*. [melissa-hobson]
- Merge remote-tracking branch 'origin/melissa' into melissa. [Melissa Hobson]
- *Visu\_E2DS\_spirou*, *recipe\_control*: fiber is now obtained from file. [melissa-hobson]
- *Visu\_E2DS\_spirou*, *recipe\_control*: fiber is now obtained from file (Fixes #437) [melissa-hobson]
- Commit local changes. [Melissa Hobson]
- Merge pull request #441 from *njcuk9999/master\_copy*. [melissa-hobson]  
update melissa from Master copy
- Merge branch 'melissa' into *master\_copy*. [melissa-hobson]
- Merge pull request #439 from *njcuk9999/dev2*. [Neil Cook]  
Dev2
- Merge remote-tracking branch 'origin/dev2' into dev2. [Neil Cook]
- Merge pull request #438 from *njcuk9999/dev2*. [Neil Cook]  
Dev2 -> Master (unit test complete and verified)
- Update version/changelog and date. [Neil Cook]

#### 4.4.338 0.2.126 (2018-09-05)

- Commit local changes. [Melissa Hobson]

#### 4.4.339 0.2.127 (2018-09-05)

- *SpirouRV* (for *cal\_DRIFTPEAK\_E2DS\_spirou*) - Fix repetition of warning messages in while loop. [njcuk9999]

#### 4.4.340 0.2.123 (2018-09-04)

- Move `cal_HC_E2DS_EA` constants to here. [Neil Cook]
- Prep `cal_HC_E2DS_EA` for recipe run (add main function, move constants etc) [Neil Cook]
- Updated date/version/changelog. [Neil Cook]

#### 4.4.341 0.2.121 (2018-09-04)

- Add placeholder marker for the new `cal_HC_E2DS_EA_spirou` work. [Neil Cook]
- Modify `generate_resolution_map` -> fixes for integrating etiennes hcpeak functions. [Neil Cook]
- Enter todo to rename variable. [Neil Cook]
- Add plot for `cal_HC_E2DS_EA_spirou` (`wave_ea_plot_line_profiles`) and worker function (`remove_first_last_ticks`) [Neil Cook]
- Modify the `gauss_fit_s` function (`cal_HC_EA_E2DS` usage) [Neil Cook]
- Separate input and output filename pseudo constant functions, added EA versions of `cal_HC` output filename definitions. [Neil Cook]
- Update leapsec log. [Neil Cook]
- Update to `cal_HC_E2DS_EA_spirou` - finish work on integrating Etienne's work. [Neil Cook]
- Fix for S1D spectra - there may be occasions when we cannot convert to S1D - print a warning if this is the case. [Neil Cook]
- Merge pull request #434 from njcuk9999/neil. [Neil Cook]  
Neil -> Dev 2

#### 4.4.342 0.2.122 (2018-09-03)

- Manually incorporated possibility to read wavelength solution from calibDB (from dev2) [melissa-hobson]
- `Cal_WAVE_E2DS_EA_spirou.py`: incorporated FP lines into solution, corrected checks `spirouWAVE.py`: corrections to new FP functions. [melissa-hobson]

#### 4.4.343 0.2.120 (2018-08-31)

- Update date and version. [Neil Cook]
- Script to manually add file to calibDB (from file in reduced folder) [Neil Cook]
- Update change log/version and date. [Neil Cook]
- Update master calibDB for reset. [Neil Cook]
- Reset `cal_CCF` set NaNs to zeros (Issue #389) [Neil Cook]

#### 4.4.344 0.2.117 (2018-08-31)

- Added new wavelength solution and deleted files in `data_example` (not needed - run `cal_reset` or `cal_validate`) [Neil Cook]
- Merge pull request #432 from njcuk9999/melissa-hobson-patch-1. [Neil Cook]  
TC3 initial wavelength solution

#### 4.4.345 0.2.116 (2018-08-30)

- Add `off_listing_REDUC_spirou` to recipes available for testing. [Neil Cook]
- Write a test for 18BQ01-Aug05 test files (`20180805_test1.run`) - Issue #400. [Neil Cook]
- Fix micro seconds = 1e-6 not 1e-3. [Neil Cook]
- Fix bug with PATH in bashrc file. [Neil Cook]
- Add the resolution map (work-in-progress) [Neil Cook]
- Fix bugs with `cal_HC_E2DS_EA`. [Neil Cook]
- Fix bug with timestamp in logging. [Neil Cook]
- Add writing of file for `off_listing`. [Neil Cook]



**4.4.346 0.2.114 (2018-08-29)**

- Added fixes to triplet fitting function. [Neil Cook]
- Added alias for the *get\_night\_dirs* function (GetNightDirs) [Neil Cook]
- Fixed number of *night\_name* dirs displayed on error. [Neil Cook]
- Added *night\_name* display limit (for when *NIGHT\_NAME* is not an argument) [Neil Cook]
- Fix to bad copy and paste in spirouPlot. [Neil Cook]
- Improvements to having no FOLDER name - now displays all available folders. [Neil Cook]
- Improvements to *off\_listing* - having no *night\_name* argument now displays all available *night\_names*. [Neil Cook]
- Improvements to *off\_listing* - having no *night\_name* argument now displays all available *night\_names*. [Neil Cook]
- Added *off\_listing\_REDUC\_spirou* to allow listing of reduced folders. [Neil Cook]
- Issue #428 - force calibDB wave solution - modify *get\_wave\_keys*. [Neil Cook]
- Issue #428 - force calibDB wave solution - modify *get\_wave\_solution*. [Neil Cook]
- Issue #428 - force calibDB wave solution - add constant switch. [Neil Cook]
- *Cal\_HC\_E2DS\_EA* - Set up for local running. [Neil Cook]

**4.4.347 0.2.115 (2018-08-29)**

- TC3 initial wavelength solution. [melissa-hobson]

**4.4.348 0.2.113 (2018-08-28)**

- First commit - Etienne's *cal\_HC* - added functions for *cal\_hc\_ea*. [Neil Cook]
- First commit - Etienne's *cal\_HC* - added call to spirouMath. [Neil Cook]
- First commit - Etienne's *cal\_HC* - moved *lin\_mini* to spirouMath. [Neil Cook]
- First commit - Etienne's *cal\_HC* - ReadTable/WriteTable/MakeTable correction when no formats. [Neil Cook]
- First commit - Etienne's *cal\_HC* - *wave\_ea\_plots*. [Neil Cook]
- First commit - Etienne's *cal\_HC* - gauss functions and *lin\_mini*. [Neil Cook]
- First commit - Etienne's *cal\_HC* - filename definition. [Neil Cook]
- First commit - Etienne's *cal\_HC*. [Neil Cook]
- Merge pull request #427 from njcuk9999/melissa. [Neil Cook]  
Melissa -> Dev
- Merge branch 'dev2' into melissa. [Neil Cook]
- Merge remote-tracking branch 'origin/melissa' into melissa. [Neil Cook]
- Set *pixel\_shift\_inter* and *pixel\_shift\_slope* back to zero (Issue #411) [Neil Cook]

**4.4.349 0.2.118 (2018-08-27)**

- Issue #399 - copied in extra files (*FILE\_B* and read me files) required by iers (but not currently linked to) [njcuk9999]
- Issue #399 - modification to iers to make offline (hopefully) given testing offline. [njcuk9999]
- Issue #399 - fix *astropy\_iers\_dir* to be the actual directory. [njcuk9999]
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- Merge pull request #426 from njcuk9999/neil. [Neil Cook]  
Neil -> master (confirm tested on 20180409all.run and *test\_tellu.run*)
- Merge pull request #424 from njcuk9999/neil. [Neil Cook]  
Neil -> Master

**4.4.350 0.2.119 (2018-08-27)**

- Added location to save astropy iers file (Issue #389) [Neil Cook]
- Possible fix for Issue #389: from @cusher - import astropy.utils.iers and set *iers\_table* [Neil Cook]

- Issue #399: barycorrpy offline file. [Neil Cook]

#### 4.4.351 0.2.112 (2018-08-27)

- Updated date, version and changelog. [Neil Cook]

#### 4.4.352 0.2.107 (2018-08-27)

- Updated date, version and changelog. [Neil Cook]
- Issue with changelog (Version.txt not updating) -> corrected. [Neil Cook]

#### 4.4.353 0.2.106 (2018-08-27)

- Set *pixel\_shift\_inter* and *pixel\_shift\_slope* back to zero (Issue #411) [Neil Cook]

#### 4.4.354 0.2.105 (2018-08-24)

- Fix for Issue #406 - *cal\_CCF* does not accept StokesI or e2dsff - fixed. [Neil Cook]
- Fix for issue #406 - CCF recipe does not accept Stokes I spectra -> replace '*\_A.fits*' with '*\_AB\_StokesI.fits*' [Neil Cook]
- Fix for Issue #406 -CCF recipe does not accept stokes I spectra -> replace '*\_A.fits*' with '*\_AB\_StokesI.fits*' [Neil Cook]
- Fix for Issue #423 - *cal\_reset* fails if folder does not exist. [Neil Cook]
- Changed blacklist functino to look at objnames (Issue #419) [Neil Cook]
- Changed blacklist file to object names (Issue #419) [Neil Cook]
- Moved blacklist check to after we have the OBJNAME (Issue #419) [Neil Cook]

#### 4.4.355 0.2.104 (2018-08-23)

- Add *check\_blacklist* and *get\_blacklist* functions (Issue #419) [Neil Cook]
- Add alias to check black list function (Issue #419) [Neil Cook]
- Add alias to raw text file function (Issue #419) [Neil Cook]
- Add blacklist filename (Issue #419) [Neil Cook]
- Add code to read raw text file (Issue #419) [Neil Cook]
- Add code to check for blacklisted file (Issue #419) [Neil Cook]
- Add blacklist file (Issue #419) [Neil Cook]
- Issue #389 - NaN values vauses error to be raised (Needs to be fixed properly) [Neil Cook]
- Update date version and changelog. [Neil Cook]

#### 4.4.356 0.2.110 (2018-08-23)

- Update *cal\_HC\_E2DS\_spirou.py*. [Neil Cook]  
correct indentation error
- Update *spirouMath.py*. [Neil Cook]  
update pep8

#### 4.4.357 0.2.103 (2018-08-23)

- Re-write of *median\_one\_over\_f\_noise* function (Issue #420) [Neil Cook]
- New alias for function re-write (Issue #420) [Neil Cook]
- Using new function (re-write) from issue #420. [Neil Cook]

**4.4.358 0.2.111 (2018-08-23)**

- *Cal\_WAVE\_E2DS\_EA\_spirou.py* update. [melissa-hobson]

**4.4.359 0.2.109 (2018-08-22)**

- *Cal\_WAVE\_E2DS\_EA\_spirou.py*: moved FP solution to spirouWAVE. [melissa- hobson]

**4.4.360 0.2.108 (2018-08-21)**

- *Cal\_WAVE\_E2DS\_EA\_spirou.py*: - check to remove double-fitted or spurious FP peaks - incorporation of FP lines (now working with no jumps) [melissa-hobson]
- Merge remote-tracking branch 'origin/melissa' into melissa. [Melissa Hobson]
- Removed test prints. [melissa-hobson]
- SpirouMATH.py, spirouTHORCA.py: redo pixel shift implementation. [melissa-hobson]
- *Cal\_HC\_E2DS\_spirou.py*: changed start and end orders of second pass to be min (max) of FP and HC start (end) orders. *spirouWAVE.py*: correctly defined orders for inserting FP lines to *all\_lines\_2* Fixes #411. [melissa-hobson]
- Merge pull request #414 from njcuk9999/master. [melissa-hobson]  
update melissa
- Update changelog. [njcuk9999]

**4.4.361 0.2.102 (2018-08-18)**

- Issue #411: reset *cal\_wave* changes from Melissa (not working with *unit\_test* 20180409all.run. [njcuk9999]
- Merge pull request #413 from njcuk9999/dev. [Neil Cook]  
Dev
- Update version. [njcuk9999]
- Update date version and changelog. [njcuk9999]

**4.4.362 0.2.099 (2018-08-18)**

- Fix to file name (allow e2ds and e2dsff by only replaceing “\_A.fits” [njcuk9999]
- Allow LSD process (now it is fixed) [njcuk9999]
- Merge remote-tracking branch 'origin/dev' into dev. [njcuk9999]
- Merge pull request #412 from njcuk9999/eder. [Neil Cook]  
Eder
- Merge branch 'master' into eder. [Eder]
- Merge pull request #410 from njcuk9999/melissa. [Neil Cook]  
Merge Melissa's branch with dev (for testing)
- Merge pull request #409 from njcuk9999/neil. [Neil Cook]  
Neil
- Update date, version, changelog. [njcuk9999]

**4.4.363 0.2.101 (2018-08-18)**

- Update spirouMath.py. [Neil Cook]  
fix pep8

**4.4.364 0.2.096 (2018-08-18)**

- Issue #382 - added a position to check for FLATFILE and DARKFILE (must agree with *recipe\_control.txt*) [njcuk9999]

#### 4.4.365 0.2.095 (2018-08-17)

- Issue #401 - Added check that number of *TELLU\_MAP* files > number of PCA components. [njcuk9999]
- Issue #392 change “PPVERSION” to “PVERSION” - header key too long. [njcuk9999]
- Issue #405 - add message when reset userinput is not “yes” [njcuk9999]

#### 4.4.366 0.2.098 (2018-08-17)

- Fixed memory issue by avoiding direct use of an  $n \times n$   $S^2$  matrix. [Eder]

#### 4.4.367 0.2.094 (2018-08-16)

- Issue #392: added per-processed version keyword. [njcuk9999]
- Issue #392: added version to outputs. [njcuk9999]
- Issue #392: added version to outputs. [njcuk9999]
- Issue #392: added version to outputs. [njcuk9999]
- Issue #392: added version to outputs. [njcuk9999]
- Issue #392: added version to outputs. [njcuk9999]
- Issue #392: added version to outputs. [njcuk9999]
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- Issue #392: added version to outputs. [njcuk9999]
- Issue #392: added version to outputs. [njcuk9999]
- Entries prepared ready to fix issues #394 and #406. [njcuk9999]
- Issue #407: fix bug where split lines not all printed to log file (only to screen) [njcuk9999]

#### 4.4.368 0.2.097 (2018-08-16)

- NaN-to-zero change moved from *obj\_fit\_tellu* to *cal\_CCF* - warning printed if there are NaNs in the e2ds input to *cal\_CCF* - Ref: #389, #390. [melissa-hobson]
- Pixel shift incorporated to all wavelength solutions - added to constants file - read from constants for *cal\_WAVE\_E2DS\_EA\_spirou.py* - added to *spirouMATH.get\_ll\_from\_coefficients* (and calls to it in *spirouTHORCA*) - warning is printed if the pixel shift is not zero. [melissa-hobson]
- *SpirouFITS.py*: removed *write\_s1d*. [melissa-hobson]
- Merge pull request #408 from njcuk9999/master. [melissa-hobson]  
update Melissa
- Merge pull request #404 from njcuk9999/dev. [Neil Cook]  
Dev - tested against unit tests 20180409all.run and *test\_tellu.run*
- Updated date, changelog and version. [njcuk9999]

#### 4.4.369 0.2.093 (2018-08-15)

- Update telluric unit test. [njcuk9999]
- Add *obj\_mk\_tellu* and *obj\_fit\_tellu* to the unit tests. [njcuk9999]
- Turn off the LSD analysis (until problem fixed) [njcuk9999]
- Added a telluric test (based on Neil’s files) [njcuk9999]
- Fix to issue #398: The first time running *obj\_mk\_tellu* fails with an I/O problem - *convolve\_file* was being saved to the wrong location (and hence *put\_file* was failing to copy it to telluDB) [njcuk9999]

- Updated descriptions (from Etienne) [njcuk9999]
- Updated date, changelog and version. [njcuk9999]
- Fixed import issue. [njcuk9999]
- Merge pull request #403 from njcuk9999/melissa. [Neil Cook]  
Merge Melissa's branch into Dev branch
- Merge pull request #402 from njcuk9999/eder. [Neil Cook]  
Merge Eder branch into Dev branch
- Update spirouConst.py. [Neil Cook]  
fix pep8 on doc string
- Merge pull request #396 from njcuk9999/cfht. [Neil Cook]  
Fixed `__NAME__` of `obj_fit_tellu`

#### 4.4.370 0.2.092 (2018-08-15)

- Update config.py. [Neil Cook]  
Revert `config.py` (Copying over a custom `config.py` file )
- Update spirouFITS.py. [Neil Cook]  
Todo added to remove `write_s1d` this should not be used - but keeps coming up in Melissa's branch
- Delete vcs.xml. [Neil Cook]  
should be ignored by github

#### 4.4.371 0.2.089 (2018-08-14)

- Implemented Least Squares Deconvolution (LSD) Analysis to polar module. [Eder]
- Merge branch 'master' into eder. [Eder]
- Implemented Least Squares Deconvolution (LSD) Analysis to polar module. [Eder]

#### 4.4.372 0.2.090 (2018-08-14)

- `Obj_fit_tellu.py`: re-add blaze, set NaNs to zero in final e2ds (UNTESTED), as per #389, #390. [melissa-hobson]
- `SpirouLOCOR.py` now prints name of localization file (Discussed in #387) [melissa-hobson]
- `SpirouStartup.py`: removed lines that caused exit if `DRS_PLOT` was not set even when `DRS_INTERACTIVE` was set. Fixes #395. [melissa-hobson]

#### 4.4.373 0.2.091 (2018-08-14)

- Fixed `__NAME__` of `obj_fit_tellu`. [Chris Usher]

#### 4.4.374 0.2.088 (2018-08-13)

- `Cal_WAVE_E2DS_EA_spirou.py`: began incorporation of FP lines (work in progress) [melissa-hobson]

#### 4.4.375 0.2.087 (2018-08-09)

- `Cal_WAVE_E2DS_EA_spirou.py`: incorporated extrapolation of Littrow solution for last two orders; added save to calibDB of good solutions. [Melissa Hobson]
- Merge remote-tracking branch 'origin/melissa' into melissa. [Melissa Hobson]  
**Conflicts:** INTROOT/SpirouDRS/spirouCore/spirouPlot.py INTROOT/SpirouDRS/spirouImage/spirouBERV.py  
INTROOT/SpirouDRS/spirouImage/spirouImage.py INTROOT/SpirouDRS/spirouTHORCA/spirouWAVE.py  
INTROOT/bin/cal\_FF\_RAW\_spirou.py INTROOT/bin/cal\_SLIT\_spirou.py INT-  
ROOT/bin/cal\_WAVE\_E2DS\_EA\_spirou.py INTROOT/bin/cal\_extract\_RAW\_spirou.py IN-  
TROOT/bin/cal\_loc\_RAW\_spirou.py INTROOT/config/constants\_SPIROU\_H4RG.py

- Merge pull request #386 from njcuk9999/cfht. [Neil Cook]  
Proposed fixes for minor issues
- Merge pull request #388 from njcuk9999/neil. [Neil Cook]  
Neil
- Update date, version and change log. [njcuk9999]

#### 4.4.376 0.2.083 (2018-08-08)

- Update spirouFITS.py. [Neil Cook]  
Made the warning handling more readable and added TODO, this should be handled properly not just ignored (i.e header cards should be corrected) - TODO will remind of this!

#### 4.4.377 0.2.072 (2018-08-08)

- Correctioned some constants and added value to loc. [njcuk9999]
- Added definitions from FP files and EA wave files. [njcuk9999]
- Updated *cal\_WAVE\_E2DS* files to check for. [njcuk9999]
- Part2 test and updated/corrected some constants. [njcuk9999]
- Added background subtraction. [njcuk9999]
- Title to the plots + action TODO to find the right FIBER type. [njcuk9999]
- Refinement of the cut of the left edge of blue orders for localisation - merge from @FrancoisBouchy. [njcuk9999]
- Use only the part of  $E2DS > 0$  to build the S1D spectra. [njcuk9999]
- Read the OBSTYPE before computing BERV - OBSTYPE should be OBJECT to derive the BERV (i.e. not for calibrations) - merge from @FrancoisBouchy. [njcuk9999]
- Some cosmetic / improvement for plot display - merged from @FrancoisBouchy. [njcuk9999]
- Updated constants + new definition for the blue window on DARK - *uc\_fracminblaze* = 16, new param to restrict the wings of spectral orders with flux lower than *flux\_at\_blaze* / 16, spectral order 0 is not taken into account. [njcuk9999]
- Correction of center of the blaze window - put to zero edge of the spectra hwere flux is too low (less than *flux\_at\_blaze* / *IC\_FRACMINBLAZE*) - merged from @FrancoisBouchy. [njcuk9999]
- Put to zero part of spectra where the blaze is not defined. [njcuk9999]
- Add the background subtraction - from @FrancoisBouchy. [njcuk9999]
- @melissa-hobson correct call to GetLampParams. [njcuk9999]

#### 4.4.378 0.2.084 (2018-08-08)

- Added fiber position identification from fiber type. [njcuk9999]
- First version *cal\_WAVE* developed by @eartigau, adapted to DRS format by @melissa-hobson added informational printouts - fixed figures - fixed asymmetry that allowed lines to be found in two windows - added *all\_lines* data structure, Littrow check and uncertainty calculation added possibility to set a pixel shift. [njcuk9999]

#### 4.4.379 0.2.085 (2018-08-08)

- *Cal\_WAVE\_E2DS\_EA\_spirou.py*: - added possibility to have a linear pixel shift when getting the initial wavelength solution (needed for TC2-TC3 change) - added QC - implemented storing of wavelength solution and tables (tables TBC) *spirouConst.py*: defined specific wave file names for outputs of *cal\_WAVE\_E2DS\_spirou.py* and *cal\_WAVE\_E2DS\_EA\_spirou.py*. [Melissa Hobson]

#### 4.4.380 0.2.086 (2018-08-08)

- Suppress warnings about truncating FITS comments. [Chris Usher]
- Prevent *measure\_background\_flatfield* from throwing error. [Chris Usher]

- Fixed scrambled FITS headers. [Chris Usher]

#### 4.4.381 0.2.082 (2018-08-07)

- *Cal\_WAVE\_E2DS\_EA\_spirou.py*: added possibility to set a pixel shift *recipe\_control.txt*: put correct DPRTYPE for *cal\_WAVE* checks. [Melissa Hobson]

#### 4.4.382 0.2.081 (2018-08-03)

- *Cal\_WAVE\_E2DS\_EA\_spirou.py*: - added informational printouts - fixed figures - fixed asymmetry that allowed lines to be found in two windows - added *all\_lines* data structure, Littrow check, and uncertainty calculation. [Melissa Hobson]  
*cal\_WAVE\_E2DS\_spirou.py*: test updates  
*visu\_WAVE\_spirou.py*: lines in adjacent orders are now plotted alternately in magenta or purple for visibility  
*constants\_SPIROU\_H4RG.py*: increased fit degrees, adjusted FP values  
*spirouPlot.py*: changed Littrow plot to rainbow colours to improve distinguishing x cuts  
*spirouWAVE.py*: small improvements
- Merge pull request #381 from njcuk9999/francois. [melissa-hobson]  
update Melissa from Francois

#### 4.4.383 0.2.080 (2018-08-01)

- *Cal\_WAVE\_E2DS\_EA\_spirou.py*: first version of *cal\_WAVE* developed by @eartigau, adapted to DRS format. [Melissa Hobson]
- Merge remote-tracking branch 'origin/melissa' into melissa. [Melissa Hobson]
- Merge pull request #379 from njcuk9999/master. [melissa-hobson]  
update melissa
- Merge remote-tracking branch 'origin/melissa' into melissa. [Melissa Hobson]
- Merge pull request #377 from njcuk9999/master. [melissa-hobson]  
update melissa
- Merge remote-tracking branch 'origin/melissa' into melissa. [Melissa Hobson]
- Merge pull request #365 from njcuk9999/master. [melissa-hobson]  
Melissa
- Merge remote-tracking branch 'origin/melissa' into melissa. [Melissa Hobson]  
**Conflicts:** INTROOT/SpirouDRS/spirouTHORCA/spirouTHORCA.py

#### 4.4.384 0.2.079 (2018-07-27)

- Title to the plots + Action TODO to find the right FIBER type. [FrancoisBouchy]
- Refinement of the Cut of the left edge of blue orders for localisation. [FrancoisBouchy]
- Use only the part of E2DS > 0 to build the S1D spectra. [FrancoisBouchy]
- Read the OBSTYPE Before computing BERV OBSTYPE should be OBJECT to derive the BERV (not for Calibrations) [FrancoisBouchy]
- Some cosmetic / improvemtn for plot display. [FrancoisBouchy]
- New definition for the blue window on DARK *ic\_fracminblaze* = 16 -> New parameter to restrict the wings of spectral orders with flux lower than *flux\_at\_blaze* / 16 Spectral order 0 is not taken into account for QC of the Flat QC of Flat can be reduce to 5% [FrancoisBouchy]
- Add the background correction. [FrancoisBouchy]
- Correction of center of the blaze window Put to zero edge of the spectra where flux is too low (less than *flux\_at\_blaze* / *IC\_FRACMINBLAZE*. [FrancoisBouchy]
- Put to zero part of spectra where the blaze is not define. [FrancoisBouchy]

#### 4.4.385 0.2.077 (2018-07-25)

- Improvement for the localisation. [FrancoisBouchy]
- Adaptation parameters for localisation. [FrancoisBouchy]
- Add the background subtraction. [FrancoisBouchy]
- Merge remote-tracking branch 'origin/francois' into francois. [FrancoisBouchy]

**Conflicts:** *INTROOT/SpirouDRS/data/ccf\_masks/gl581\_july18\_clean\_rec2.mas* *INTROOT/SpirouDRS/spirouBACK/spirouBACK.py* *INTROOT/SpirouDRS/spirouImage/\_\_\_init\_\_\_py*  
*INTROOT/SpirouDRS/spirouImage/spirouImage.py* *INTROOT/bin/cal\_FF\_RAW\_spirou.py*  
*INTROOT/bin/cal\_extract\_RAW\_spirou.py* *INTROOT/bin/visu\_WAVE\_spirou.py* *INTROOT/config/constants\_SPIROU\_H4RG.py*

#### 4.4.386 0.2.078 (2018-07-25)

- Inserted filename, MJD, and MJDEND keywords from exposures in polar sequence to the header of polarimetry products. [Eder]
- Merge branch 'master' into eder. [Eder]
- Merge pull request #378 from njcuk9999/neil. [Neil Cook]  
Neil
- Update date/changelog/version. [njcuk9999]
- Merge branch 'master' into eder. [Eder]
- Merge branch 'master' into eder. [Eder]
- Removed small comment – nothing really. [Eder]
- Fixed formatting of doc strings. [Eder]
- Merge branch 'eder' of [https://github.com/njcuk9999/spirou\\_py3](https://github.com/njcuk9999/spirou_py3) into eder Removing function duplicated function *calculate\_stokes\_I*. [Eder]

#### 4.4.387 0.2.071 (2018-07-20)

- Update test run. [njcuk9999]
- Misc functions. [njcuk9999]
- Fixed call to earth velocity correction function. [njcuk9999]
- Move *get\_good\_object\_name* function. [njcuk9999]
- Add aliases for getting obj name and airmass. [njcuk9999]
- Fix acquisition time naming. [njcuk9999]
- Added file iteration to plot. [njcuk9999]
- Fix acquisition time naming (julian not unix) [njcuk9999]
- Add tellu template file definition. [njcuk9999]
- Remove extra recipe control key. [njcuk9999]
- Move objname and airmass to functions. [njcuk9999]
- Fix naming conversion time is julian not unix. [njcuk9999]
- Correct filename bug. [njcuk9999]
- Fixed bug with convolve file not being read correctly. [njcuk9999]
- Fixed bug with *get\_param*. [njcuk9999]
- Fixed bug with *get\_param*. [njcuk9999]
- Fixed bug with *get\_param*. [njcuk9999]
- Fix bug in *get\_wave\_solution*. [njcuk9999]
- Fixed but with header key too long (9 > 8) [njcuk9999]
- Fix bug in assigned WAVEFILE. [njcuk9999]
- Fix bug in *get\_param* call. [njcuk9999]

#### 4.4.388 0.2.070 (2018-07-19)

- Add telluric database reset to *cal\_validate*. [njcuk9999]
- Tellu recipes - bug fix for plot. [njcuk9999]



- Fix bug with timestamp (telluDB only) [njcuk9999]
- Integrate telluric recipes with test runs: compressed + binned *tapas\_all\_sp* file. [njcuk9999]
- Integrate telluric recipes with test runs: updated after test runs. [njcuk9999]
- Integrate telluric recipes with test runs: updated error message in *get\_param*. [njcuk9999]
- *Cal\_preprocess* - DPRTYPE = None rows of *recipe\_control* should not be used to ID files. [njcuk9999]
- Integrate telluric recipes with test runs: fixes afer test runs. [njcuk9999]
- Integrate telluric recipes with test runs: updated aliases. [njcuk9999]
- Integrate telluric recipes with test runs: updated *TELL\_MOLE* file (.gz) [njcuk9999]
- Integrate telluric recipes with test runs: fixes afer test runs. [njcuk9999]
- Integrate telluric recipes with test runs: fixes afer test runs. [njcuk9999]
- Integrate telluric recipes with test runs: fixes afer test runs. [njcuk9999]
- Merge remote-tracking branch 'origin/neil' into neil. [njcuk9999]

#### 4.4.389 0.2.069 (2018-07-18)

- Integrate telluric recipes with test runs: updated after test runs. [njcuk9999]
- Integrate telluric recipes with test runs: added *get\_wave\_keys* function. [njcuk9999]
- Integrate telluric recipes with test runs: updated aliases. [njcuk9999]
- Integrate telluric recipes with test runs: test run only. [njcuk9999]
- Integrate telluric recipes with test runs: updated plots (corrected) [njcuk9999]
- Integrate telluric recipes with test runs: resorted *use\_keys* + added wave and telluric keys. [njcuk9999]
- Updated filename (*TELLU\_FIT\_OUT\_FILE*) [njcuk9999]
- Integrate telluric recipes with test runs: added constants from Etienne and corrected bug in *tell\_lambda\_max*. [njcuk9999]
- Integrate telluric recipes with test runs: update after running *fit\_tellu*. [njcuk9999]
- Integrate telluric recipes with test runs: update after running *fit\_tellu*. [njcuk9999]
- Integrate telluric recipes with test runs: test run only. [njcuk9999]
- Modified *cal\_extract* to save wavefile name and wave file dates (for telluric) [njcuk9999]

#### 4.4.390 0.5.038 (2018-07-17)

- Merge pull request #376 from njcuk9999/neil. [Neil Cook]  
Neil
- Update date/version/changelog. [njcuk9999]

#### 4.4.391 0.2.68 (2018-07-17)

- Copy (same) [njcuk9999]
- Update tellu recipes: fix bug with file name. [njcuk9999]
- Update tellu recipes: drs telluDB reset now resets telluDB not calibDB (fix typos) [njcuk9999]
- Update tellu recipes: fix after test run FWHM is function not object. [njcuk9999]
- Update tellu recipes: fix after test run - telluDB get database values are already split on spaces. [njcuk9999]
- Update tellu recipes: fix after test run - fix bug (needed enumerate(lines)) [njcuk9999]
- Update tellu recipes: fix after test run - add alias to *update\_datebase\_tell\_temp*. [njcuk9999]
- Possible bug fix: tried to separate out interactive options in *end\_interactive\_session* function. [njcuk9999]
- Possible bug fix: tried to reduce repetition of displayed warnings. [njcuk9999]
- Update tellu recipes: added AIRMASS header key. [njcuk9999]
- Bug fix: fix file name '*\_s1d\_{0}.fits*' -> '*\_s1d\_{0}.fits.format(p['FIBER'])*' [njcuk9999]
- Update tellu recipes: add required line in master telluDB. [njcuk9999]
- Update tellu recipes: add *obj\_mk\_tell\_template* to recipe control. [njcuk9999]
- Update tellu recipes: move *obj\_mk\_tell\_template* constantsto here and correct some bugs after test run. [njcuk9999]
- Update tellu recipes: fix after test run. [njcuk9999]
- Update tellu recipes: fix after test run. [njcuk9999]
- Updated date/changelog/version. [njcuk9999]
- Merge remote-tracking branch 'origin/neil' into neil. [njcuk9999]

- Merge pull request #375 from njcuk9999/neil. [Neil Cook]  
Neil

#### 4.4.392 0.2.67 (2018-07-16)

- Telluric integration: bug fixes (after move of functions) [njcuk9999]
- Updated call to plot. [njcuk9999]
- Moved debug plot back to main code. [njcuk9999]
- Updating integration of tellu files: added functions - *interp\_at\_shifted\_wavelengths*, *calc\_recon\_abso*, *calc\_molecular\_absorption* and *lin\_mini*. [njcuk9999]
- Updating integration of tellu files: added new function aliases. [njcuk9999]
- Updating integration of tellu files: added plot function “*tellu\_fit\_recon\_abso\_plot*” [njcuk9999]
- Updating integration of tellu files: Added abso output keyword. [njcuk9999]
- Updating integration of tellu files; Added filename pseudo constants. [njcuk9999]
- Updating integration of tellu files: added constants (need commenting!) [njcuk9999]
- Updating integration of tellu files. [njcuk9999]
- Updating integration of tellu files. [njcuk9999]
- Merge remote-tracking branch ‘origin/neil’ into neil. [njcuk9999]
- Merge pull request #374 from njcuk9999/neil. [Neil Cook]  
add new mask from Xavier
- Updated date and version and changelog. [njcuk9999]

#### 4.4.393 0.2.066 (2018-07-15)

- Add new mask from Xavier. [njcuk9999]
- Merge pull request #373 from njcuk9999/neil. [Neil Cook]  
Neil - runs with H4RG set up in data from 2018-04-09
- Changed encoding (copy/paste/revert) – ignore. [njcuk9999]
- Fixed log to not wrap this text - ONLY. [njcuk9999]
- Changed name of sub-module. [njcuk9999]
- Fixed cyclic imports (new sub-module - spirouBERV) [njcuk9999]
- Fixed cyclic imports. [njcuk9999]
- Added *character\_log\_length* pseudo constant. [njcuk9999]
- Added maximum log length (wraps to new row with a tab) wraps words but still problem with long filenames. [njcuk9999]
- Fixed typo in Merge from @FrancoisBouchy. [njcuk9999]
- Fixed cyclic importing and typos in keyword assignment. [njcuk9999]
- Fixed cyclic importing. [njcuk9999]
- Bring S1D (*cal\_extract*) in-line with rest of DRS (Fixing merges from @FrancoisBouchy) [njcuk9999]
- Bring S1D (*cal\_extract*) in-line with rest of DRS (Fixing merges from @FrancoisBouchy) [njcuk9999]
- Bring S1D (*cal\_extract*) in-line with rest of DRS (Fixing merges from @FrancoisBouchy) [njcuk9999]
- Bring S1D (*cal\_extract*) in-line with rest of DRS (Fixing merges from @FrancoisBouchy) [njcuk9999]
- Bring S1D (*cal\_extract*) in-line with rest of DRS (Fixing merges from @FrancoisBouchy) [njcuk9999]
- Bring S1D (*cal\_extract*) in-line with rest of DRS (Fixing merges from @FrancoisBouchy) [njcuk9999]
- Bring S1D (*cal\_extract*) in-line with rest of DRS (Fixing merges from @FrancoisBouchy) [njcuk9999]
- Added spirouTelluric to modules list. [njcuk9999]
- Fix pep8 issues (in-line comment should have at least two spaces between code and comment. [njcuk9999]
- Merge @FrancoisBouchy changes - still need fixing (PEP8 and integration) [njcuk9999]
- Merge @FrancoisBouchy changes - still need fixing (PEP8 and integration) [njcuk9999]
- Merge @FrancoisBouchy changes - still need fixing (PEP8 and integration) [njcuk9999]
- Merge @FrancoisBouchy changes - still need fixing (PEP8 and integration) [njcuk9999]
- Merge @FrancoisBouchy changes - still need fixing (PEP8 and integration) [njcuk9999]
- Merge @FrancoisBouchy changes - still need fixing (PEP8 and integration) [njcuk9999]
- Merge @FrancoisBouchy changes - still need fixing (PEP8 and integration) [njcuk9999]
- Fix needed commented code (commented for testing) -> uncommented now. [njcuk9999]
- Updated *construct\_convolution\_kernel2* function. [njcuk9999]

- Added telluric aliases. [njcuk9999]
- Added *tellu\_fit\_tellu\_spline\_plot* function. [njcuk9999]
- Update ConstructConvKernel2 function. [njcuk9999]
- Continued to merge Etienne's code. [njcuk9999]

#### 4.4.394 0.2.065 (2018-07-13)

- Add functions: *calculate\_absorption\_pca*, *get\_berv\_value*. [njcuk9999]
- Add telluric aliases. [njcuk9999]
- Add functions *get\_database\_tell\_template*, *update\_database\_tell\_temp*. [njcuk9999]
- Continue to integrate functions. [njcuk9999]
- Correct duplication of header is None. [njcuk9999]
- Added telluric alias. [njcuk9999]
- Added telluric pca plot. [njcuk9999]
- Corrected bad function call to GetNormalizedBlaze and duplicated call to loc=ParamDict() [njcuk9999]
- Moved getting berv to spirouTelluric. [njcuk9999]
- First attempt at integrating code (unfinished) [njcuk9999]
- Add keys defined in functions. [njcuk9999]
- Add new TDB aliases. [njcuk9999]
- Correct access to telluric database and update telluric database. [njcuk9999]
- First commit - direct integration of *mk\_template.py* from Etienne. [njcuk9999]
- First commit - blank. [njcuk9999]
- Updated where we get the telluric molecular file (now from database) [njcuk9999]
- Added getting of absolute path for telluric files. [njcuk9999]
- Added switch between telluric and calibration databases. [njcuk9999]
- Added aliases from TDB. [njcuk9999]
- Added get and update functions (wrapping generic functions in spirouDB) [njcuk9999]
- Added todo's to make general. [njcuk9999]
- First commit - generic functions for database management. [njcuk9999]

#### 4.4.395 0.2.076 (2018-07-13)

- New correlation Mask made by XD. [FrancoisBouchy]
- Background correction and set negative values to zero Read Blaze function Compute S1D spectra and archive it. [FrancoisBouchy]
- Background correction and negative values set to zero. [FrancoisBouchy]
- Typo correction to read the fitted lines. [FrancoisBouchy]
- New constant parameters for background correction and e2dstos1d. [FrancoisBouchy]
- Adaptation of function to measure the global background in the image. [FrancoisBouchy]
- Add the two new functions e2dstos1d and *write\_s1d*. [FrancoisBouchy]
- New function to write S1D spectra with the same format than HARPS. [FrancoisBouchy]
- New function to build S1D spectra. [FrancoisBouchy]

#### 4.4.396 0.2.064 (2018-07-12)

- First commit - added *obj\_mk\_tellu* functions. [njcuk9999]
- Added spirouTelluric aliases. [njcuk9999]
- Added wave param aliases. [njcuk9999]
- Added read and get wave param functions. [njcuk9999]
- Added plot for *obj\_mk\_tellu*. [njcuk9999]
- Added file name definitions for *obj\_mk\_tellu*. [njcuk9999]
- Added *obj\_mk\_tellu* to recipe control. [njcuk9999]
- Added *obj\_mk\_tellu* constants. [njcuk9999]
- Integrated *obj\_mmktellu* into spirou drs (read/write/constants etc) [njcuk9999]
- Added saving of wave parameters to header of E2DS. [njcuk9999]
- Remove. [njcuk9999]

- Copy of etiennes raw *mk\_tellu* code. [njcuk9999]
- Added imports to python local namespace (for embeded run after code finish) [njcuk9999]
- Blank files for telluric functions. [njcuk9999]
- First commit of the spirou visu GUI. [njcuk9999]
- First commit of *obj\_mk\_tellu* - processing the telluric files and adding them to telluDB. [njcuk9999]

#### 4.4.397 0.2.063 (2018-07-11)

- Add *master\_tellu\_spirou* file. [njcuk9999]
- Add *cal\_wave\_mapper* to recipe control file. [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Add reset tellu to *drs\_reset* functions. [njcuk9999]
- Adde *dcal\_wave\_mapper* to recipe list (and unit recipe) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) + added printing of tilt/wave/blaze/flat file used. [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Fixed bug: *hdr['KW\_X']* -> *hdr[p['KW\_X']][0]* [njcuk9999]
- Add telluDB constants. [njcuk9999]
- Add telluDB (for now a copy of spirouCDB - but will change) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Update *cal\_wave\_mapper* (as main function with returns to local) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
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- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]
- Rename calibDB module: spirouCDB -> spirouDB (to add telluric database) [njcuk9999]

#### 4.4.398 0.2.062 (2018-07-10)

- Added filename functions (*WAVE\_MAP\_SPE\_FILE* and *WAVE\_MAP\_SPE0\_FILE*) [njcuk9999]
- Added filenames in spirouConfig. [njcuk9999]
- Define todos. [njcuk9999]
- Fix bug: *night\_name* should only be a string (could be a int) [njcuk9999]
- Update to accept multiple fibers AB and C or A B and C or any combination. [njcuk9999]
- Change the files tested. [njcuk9999]
- Fix to a bug *ll\_line\_cat* -> *ll\_line\_fit*. [njcuk9999]
- E2ds back projection - first commit. [njcuk9999]
- Fix for choice of fiber(s) [njcuk9999]

#### 4.4.399 0.2.061 (2018-07-09)

- Removed berv calculation from RV module. [njcuk9999]
- Added *print\_full\_table* function. [njcuk9999]

- Updated aliases and `--all` [njcuk9999]
- Updated aliases and `--all` [njcuk9999]
- Updated aliases and `--all` [njcuk9999]
- Moved earth barycentric correction here. [njcuk9999]
- Test fitting versus interpolation. [njcuk9999]
- Updated test to only show “good” orders. [njcuk9999]
- Fixed a comment and updated the `berv` variable. [njcuk9999]
- Fixed logging all analysed files and printing to screen. [njcuk9999]
- Fixed `off_listing` printing only a few rows (now prints all) [njcuk9999]
- Moved `berv` calculation to extraction. [njcuk9999]
- Moved `berv` calculation to extraction. [njcuk9999]

#### 4.4.400 0.2.060 (2018-07-05)

- Fix and test of `find_lines`. [Neil Cook]

#### 4.4.401 0.5.033 (2018-07-04)

- Merge pull request #372 from njcuk9999/neil. [Neil Cook]  
Neil
- Update changelog/date/version. [Neil Cook]

#### 4.4.402 0.2.059 (2018-07-04)

- Update change log. [Neil Cook]
- Update change log. [Neil Cook]
- The output changelog. [Neil Cook]
- Added functionality to update VERSION.txt and the version in the `spirouConst.py` file. [Neil Cook]
- DRS version added to VERSION.txt. [Neil Cook]
- Recipe to get/update change log (moved to `spirouTools` - final location) [Neil Cook]
- Recipe to get/update change log. [Neil Cook]
- Output: the change log (backup) [Neil Cook]
- Recipe to update change log. [Neil Cook]
- Merge pull request #371 from njcuk9999/neil. [Neil Cook]  
Neil

#### 4.4.403 0.2.074 (2018-07-04)

- Removed duplicated function `calculate_stokes_I` in `spirouPOLAR.py`. [Eder]

#### 4.4.404 0.2.058 (2018-07-03)

- Add generic change log (not used but for history) [Neil Cook]
- Make sure object name is “good” with function: `get_good_object_name`. [Neil Cook]
- Correct typo. [Neil Cook]
- Rebuild pdfs. [Neil Cook]
- Remove change log. [Neil Cook]
- Add `user_dir` and `cal_reset` constants. [Neil Cook]
- Add `pp` mode variable. [Neil Cook]
- Update using the DRS with H4RG example. [Neil Cook]
- Update todo list (remove done + add new) [Neil Cook]
- Update quick installation. [Neil Cook]
- Update output keywords (not finished) [Neil Cook]
- Update installation. [Neil Cook]

- Update input keywords. [Neil Cook]
- Update date architecture. [Neil Cook]
- Removed old change log. [Neil Cook]
- Add *pp\_mode* (the way to switch on/off) file type suffix adding. [Neil Cook]
- Add output files to p (and thus sent back to main() function call) [Neil Cook]
- Update commentation. [Neil Cook]
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- Merge pull request #370 from njcuk9999/master. [Neil Cook]  
update to master
- Merge pull request #369 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge remote-tracking branch 'origin/dev' into dev. [Neil Cook]
- Updated doc strings to be consistent with rest of DRS. [Neil Cook]
- Merge pull request #368 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed runs + some very minor fixes to pep8
- Update *pol\_spirou.py*. [Neil Cook]  
fix to pep8
- Update *spirouPOLAR.py*. [Neil Cook]  
fix to pep8
- Merge pull request #367 from njcuk9999/eder. [Neil Cook]  
Eder
- Update *spirouPlot.py*. [Neil Cook]  
pep 8 fixes
- Improved polar continuum routine. [Eder]
- Improved polar continuum routine. [Eder]
- Swap exposure 3 and 4 to agree with actual SPIrou sequence, and added doc string to spirouPolar functions. [Eder]
- Swap exposure 3 and 4 to agree with actual SPIrou sequence, and added doc string to spirouPolar functions. [Eder]
- Fixed bugs in plot and added new keywords to polar products. [Eder]
- Fixed bugs in plot and added new keywords. [Eder]
- Updated module definitions in spirouPOLAR. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Updated date and version. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Added variable definitions to wave solution section and qulaity control section. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Updated date and version. [Neil Cook]
- Updated date and version. [Neil Cook]

#### 4.4.405 0.5.031 (2018-06-29)

- Merge pull request #366 from njcuk9999/neil. [Neil Cook]  
Neil - just document changes and some code clean up.
- Rebuild pdf. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Added variabels to *cal\_hc/cal\_wave* variable definitions. [Neil Cook]
- Added more *cal\_hc/cal\_wave* variable definitions. [Neil Cook]
- Removed old *cal\_hc* constants. [Neil Cook]
- Removed old *cal\_hc* code. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Update version, date and module root definitions. [Neil Cook]
- Update variable definitions. [Neil Cook]

#### 4.4.406 0.5.030 (2018-06-28)

- Merge pull request #364 from njcuk9999/neil. [Neil Cook]  
Neil

#### 4.4.407 0.2.057 (2018-06-28)

- Updated date and version and added new recipes. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Added more variable definitions. [Neil Cook]
- Update to variables - adding new ones. [Neil Cook]
- Update to comment. [Neil Cook]
- Tried to speed up plotting + fixed a bug with call to spirouTHORCA.GetLampParams (now requires header) [Neil Cook]
- Fix python 2/python 3 incompatibility with numpy change. [Neil Cook]
- Fix call to *fiber\_params* change (from circular import bug) [Neil Cook]
- Doc string update - requires spirouPOLAR command. [Neil Cook]
- Fix circulate import bug -> move *fiber\_params* from spirouLOCOR to spirouFile and update calls accordingly. [Neil Cook]

#### 4.4.408 0.2.075 (2018-06-28)

- *Visu\_WAVE\_spirou.py*: correct call to GetLampParams. [melissa-hobson]

#### 4.4.409 0.2.056 (2018-06-27)

- First commit of spirouPOLOAR module tex file. [Neil Cook]
- Update main init. [Neil Cook]
- Add spirouPOLAR to aliases. [Neil Cook]
- Doc string update. [Neil Cook]
- Doc string update. [Neil Cook]
- Doc string update. [Neil Cook]
- Move functions around and add todo/fixme. [Neil Cook]
- Doc string update. [Neil Cook]
- Update date and version. [Neil Cook]
- Rebuild pdf after doc string update. [Neil Cook]
- Update date and versions. [Neil Cook]
- Doc string update. [Neil Cook]
- Doc string update. [Neil Cook]
- Doc string update. [Neil Cook]
- Doc string update. [Neil Cook]
- Doc string update. [Neil Cook]
- Doc string update. [Neil Cook]
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- Merge pull request #361 from njcuk9999/neil. [Neil Cook]  
Neil
- Added new tool to calculate barycentric velocity and add it to the header of the input file. [Neil Cook]
- Added a skip check to *check\_file*. [Neil Cook]

#### 4.4.410 0.2.055 (2018-06-26)

- Added *cal\_hc* and *cal\_wave* to unit test definitions. [Neil Cook]
- Fix to *cal\_HC* and *cal\_WAVE* added to unit test runs. [Neil Cook]

- Added printout of max time for calibDB. [Neil Cook]
- Added *cal\_HC*, *cal\_WAVE* (and setup for *cal\_WAVE\_NEW*) to all run. [Neil Cook]
- We have FIBER therefore use FIBER not *FIB\_TYP*, modified error reporting give we use header keys. [Neil Cook]
- Fixed bug that allows reduced files to be None (should be found by file name or generate error) [Neil Cook]
- Added e2dsff files to recipe control for *cal\_HC* and *cal\_WAVE*, added *cal\_WAVE\_NEW* files (same as *cal\_WAVE*) [Neil Cook]
- Fixed typo (bug?) [Neil Cook]
- Updated to work with odometer identification (like rest of DRS) [Neil Cook]
- Merge pull request #360 from njcuk9999/melissa. [Neil Cook]  
Melissa
- Update *spirouTHORCA.GetLampParams* to identify lamp type from fiber position header key Update all functions using *GetLampParams* (*cal\_HC*, *cal\_WAVE*, *cal\_WAVE\_NEW*) *visu\_WAVE*) to pass the header. [melissa- hobson]
- *Visu\_WAVE\_spirou*: higher base level for lines. [melissa-hobson]
- Update for *visu\_WAVE\_spirou.py* - now working. [melissa-hobson]
- *Cal\_HC\_E2DS\_spirou.py*: added fiber position identification from fiber type *spirouTHORCA.decide\_on\_lamp\_type*: - changed to identify lamp from fiber position (for use w/odometer names) - previous version moved to *decide\_on\_lamp\_type\_old*. [melissa-hobson]
- *Cal\_HC\_E2DS\_spirou.py*: added fiber position identification from fiber type *spirouTHORCA.decide\_on\_lamp\_type*: - changed to identify lamp from fiber position (for use w/odometer names) - previous version moved to *decide\_on\_lamp\_type\_old*. [melissa-hobson]
- Update for use with e2dsff files as well as e2ds files. [Neil Cook]
- Merge pull request #357 from njcuk9999/neil. [Neil Cook]  
Neil
- Fixed bug in header key *berv\_max*. [Neil Cook]
- Add calibDB setup to *cal\_validate*. [Neil Cook]
- Add BERV corrections to header. [Neil Cook]
- Update *pol\_spirou.py*. [Neil Cook]  
code duplicated in bad merge @edermartoli
- Merge pull request #356 from njcuk9999/eder. [Neil Cook]  
Eder
- Reset config.py. [Eder]
- Merging changes. [Eder]
- Merge branch 'master' into eder. [Eder]
- Updates from master. [Eder]
- Update output name without *\_A*, save errors to output using *WriteImageMulti*. [Eder]
- Update output name without *\_A*, save errors to output using *WriteImageMulti*. [Eder]
- Update output name without *\_A*, save errors to output using *WriteImageMulti*. [Eder]
- Merged master and resolved conflict in *pol\_spirou*. [Eder]
- Implemented total flux (Stokes I) calculation. [Eder]
- Merge branch 'master' into eder. [Eder]
- Merge pull request #354 from njcuk9999/neil. [Neil Cook]  
Neil - confirmed test of H4RG
- Added *cal\_preprocess*, *off\_listing*, *visu\_raw*, *visa\_e2ds* and *pol\_spirou* to the unit testing. [Neil Cook]
- Modified a warning message to be slightly more descriptive. [Neil Cook]
- Merge pull request #353 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- Merge pull request #351 from njcuk9999/dev. [Neil Cook]  
Dev
- Revert changes to get wave solution from calibDB (errors were due to badly set up calibDB) [Neil Cook]
- Merged changes from @edermartoli: added alias to *calculate\_stokes\_I* and added aliases to *\_\_all\_\_* [Neil Cook]
- Merged changes from @edermartoli: Update output name with *\_A*, save errors to output using *WriteImageMulti*, Implemented total flux (Stokes I) calculation, implemented polarimetric error calculation. [Neil Cook]
- Merged changes from @edermartoli: added stokesI plot, spelling correction + polarisation is now percentage



- (bug was missing in conversion) [Neil Cook]
- Merged changes from @edermartioli: Update output name with `_A`, save errors to output using `WriteImageMulti`, Implemented total flux (Stokes I) calculation, implemented polarimetric error calculation. [Neil Cook]
- Added warning in `config.py` to not change PATHs here (todo in docs) [Neil Cook]
- Merged changes from @edermartioli: Update output name with `_A`, save errors to output using `WriteImageMulti`, Implemented total flux (Stokes I) calculation, implemented polarimetric error calculation. [Neil Cook]
- Merge pull request #350 from njcuk9999/neil. [Neil Cook]  
Neil
- Issue #348 - fixed definition of WLOG in `spirouPlot` (“sometimes” causes a crash sometimes doesn’t) [Neil Cook]
- Update date and version. [Neil Cook]
- Undo bad merge by @melissa-hobson. [Neil Cook]
- `Cal_HC_E2DS_spirou.py`: added fiber position identification from fiber type `spirouTHORCA.decide_on_lamp_type`: - changed to identify lamp from fiber position (for use w/odometer names) - previous version moved to `decide_on_lamp_type_old`. [melissa-hobson]

#### 4.4.411 0.2.073 (2018-06-26)

- `Cal_HC_E2DS_spirou.py`: added fiber position identification from fiber type `spirouTHORCA.decide_on_lamp_type`: - changed to identify lamp from fiber position (for use w/odometer names) - previous version moved to `decide_on_lamp_type_old`. [Melissa Hobson]
- `Cal_HC_E2DS_spirou.py`: added fiber position identification from fiber type `spirouTHORCA.decide_on_lamp_type`: - changed to identify lamp from fiber position (for use w/odometer names) - previous version moved to `decide_on_lamp_type_old`. [Melissa Hobson]
- Log calibDB match method. [melissa-hobson]
- `Cal_WAVE_NEW_E2DS_spirou.py`: first version (untested) [melissa-hobson]
- Merge pull request #347 from njcuk9999/master. [melissa-hobson]  
Melissa

#### 4.4.412 0.254 (2018-06-24)

- Update date and version. [Neil Cook]
- Fix for loggers being out of range. [Neil Cook]
- Merge pull request #345 from njcuk9999/neil. [Neil Cook]  
Neil - confirmed tested on H4RG files
- Fixed to run with new setup. [Neil Cook]
- Fix for warninglogger. [Neil Cook]
- Log handled exits! [Neil Cook]
- Fixed setup for badpix. [Neil Cook]
- Fix set up changes. [Neil Cook]
- Update set up begin function. [Neil Cook]
- Updated setup (use of `spirouStartup.Begin`) [Neil Cook]
- Dealt with recipe name handling better. [Neil Cook]
- Fix program with recipe name instead of `sys.argv` (unless not present) [Neil Cook]
- Fix recipe setup. [Neil Cook]
- Updated master time. [Neil Cook]
- Fixed system exit quitting automated run. [Neil Cook]
- Merge remote-tracking branch ‘origin/neil’ into neil. [Neil Cook]
- Now cleaning WLOG in `run_begin` (via `WLOG.clean_log()`), and added `main_end_script` (to push logging to p and run `clean_log`) [Neil Cook]
- Added function `write_image_multi` (aliased to `WriteImageMulti`) to save multiple extensions to filename - for @edermartioli and the `pol_spirou` code specifically. [Neil Cook]
- Defined logger function into class (allows storage or any errors/warnings/info and piping back into p at the end of recipe. Must clear WLOG at start and end of recipes! [Neil Cook]

- Fix for issue #337 - add e2dsff as well as e2ds (defaults to e2dsff if present) and added *log\_storage\_keys* pseudo variable. [Neil Cook]
- Updated trigger to add error and logger values to HISTORY.txt. [Neil Cook]
- Updated recipes main end script (to allow piping of logging into p - thus accessible outside via *ll['p']*['LOGGING\_ERROR']) for example. [Neil Cook]

#### 4.4.413 0.253 (2018-06-22)

- *Cal\_WAVE\_NEW\_E2DS\_spirou.py*: first version (untested) [melissa-hobson]
- Merge pull request #344 from njcuk9999/master. [melissa-hobson]  
Update
- Merge pull request #343 from njcuk9999/neil. [Neil Cook]  
Neil
- Fix to print out. [Neil Cook]
- Updated files for reset. [Neil Cook]
- Added new wavesolution to cal reset. [Neil Cook]
- Merge pull request #342 from njcuk9999/neil. [Neil Cook]  
Work on Issue #338
- Work on Issue #338 - added possibility to enter debug mode and added the table printed to screen. [Neil Cook]
- Update date and version. [Neil Cook]
- Merge pull request #341 from njcuk9999/neil. [Neil Cook]  
fix - spirouUnitRecipes.wrapper requires true python strings
- Fix - spirouUnitRecipes.wrapper requires true python strings. [Neil Cook]
- Merge pull request #340 from njcuk9999/dev. [Neil Cook]  
Dev
- Added catch of warnings with polyfit. [Neil Cook]
- Added catch warning for polyfit, fixed bug with *lamp\_type* in *decide\_on\_lamp\_type*. [Neil Cook]
- Added missing plot function (*wave\_fp\_wavelength\_residuals*), added iteration number to plots for *wave\_littrow\_check\_plot* and *wave\_plot\_final\_fp\_order*. [Neil Cook]
- Added doc string to *cal\_HC* main function. [Neil Cook]
- Merge pull request #339 from njcuk9999/francois. [Neil Cook]  
Merge Francois to Dev
- Work on issue #337: modified *decide\_on\_lamp\_type* function to accept *ic\_lamps* values as lists (and iterate through) - still must only have one of the two. [Neil Cook]
- Updated constants in H2RG to match H4RG. [Neil Cook]
- Work on issue #337: changed *ic\_lamps* values to be lists + cleaned up constants (pep8) [Neil Cook]
- Work on Issue #337: slight clean up of @FrancoisBouchy changes. Renamed part1b to part2 and commented out old part 2. [Neil Cook]
- Merge remote-tracking branch 'origin/francois' into francois. [FrancoisBouchy]
- Merge pull request #336 from njcuk9999/neil. [Neil Cook]  
Neil
- Part 1b created as a copy of Part 2 and Modified Part 1b repeats the Littrow extrapolation for the second pass The second Littrow extrapolation is used for to join orders Part 2 is no more useful and we do not need CCF. [FrancoisBouchy]
- Adaptation of all the parameters for *cal\_HC ic\_lamps* still need to be adapted for hc1 and hc2 exposures. [FrancoisBouchy]
- Change e2ds with e2dsff to define the wave filename but it will be useful to keep both possibility (e2ds and e2dsff) Correction on the format of the wave filename. [FrancoisBouchy]
- Define *ord\_start* and *ord\_final* for the first guess solution Compute correctly E2DS orders from echelle orders for the display LOG Display the right number of good lines Count the total number of good lines Add possibility to change Littrow fit degree for the two iterations For second iteration the initial catalog is used again Let the possibility to join extrapolated orders in the blue *ll\_free-span* set as a list of two parameters in COnstante File Require at least 4 points to fit a Gaussian Order limits are define with min and max of *ll\_lines*. [FrancoisBouchy]
- Merge remote-tracking branch 'origin/francois' into francois. [FrancoisBouchy]  
**Conflicts:** INTROOT/SpirouDRS/spirouEXTOR/spirouEXTOR.py INTROOT/bin/off\_listing\_RAW\_spirou.py

- Merge pull request #334 from njcuk9999/master. [melissa-hobson]  
update branch
- *Cal\_WAVE\_NEW\_E2DS\_spirou.py*: first version (untested) [melissa-hobson]
- Merge pull request #328 from njcuk9999/master. [melissa-hobson]  
Update Melissa branch
- Fitgaus - python version. [melissa-hobson]  
Python version of the fitgaus.f functions. - contains two versions of Gauss-Jordan algorithm, an exact copy of the fortran code with all loops (*gaussj\_fortran*) and an attempt to make it more efficient via numpy (*gaussj*, but is currently slower). - function *covstr* was omitted as it does nothing in our use case.
- Merge pull request #321 from njcuk9999/master. [melissa-hobson]  
Update branche
- Merge pull request #286 from njcuk9999/master. [melissa-hobson]  
update
- Merge pull request #273 from njcuk9999/master. [melissa-hobson]  
update melissa
- Merge pull request #269 from njcuk9999/master. [melissa-hobson]  
update melissa

#### 4.4.414 0.2.052 (2018-06-21)

- Implemented polarimetric errors calculation. [Eder]
- Implemented polarimetric errors calculation. [Eder]
- Changed polarimetry stuff to adapt changes made by Neil. [Eder]
- Config.py. [Eder]
- Merge branch 'eder' of [https://github.com/njcuk9999/spirou\\_py3](https://github.com/njcuk9999/spirou_py3) into eder. [Eder]  
No big changes, just testing a few things

#### 4.4.415 0.2.051 (2018-06-20)

- No main file. [Neil Cook]
- Must use unit test to run recipes. [Neil Cook]
- Undo print test. [Neil Cook]
- Updated chmod. [Neil Cook]
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- Merge pull request #335 from njcuk9999/neil. [Neil Cook]  
Neil
- Fixes to main raw trigger. [Neil Cook]
- Corrected bug where *OFF\_LISTING\_FILE* was missing. [Neil Cook]
- Corrected bug where no night name does give good error. [Neil Cook]
- Fixed bug that *arg\_night\_name* and files not checked any more. [Neil Cook]
- Fixed bug with no DRPTYPE assigned. [Neil Cook]
- Modified recipe control (added order and detector validity) [Neil Cook]
- First commit - raw file trigger (*cal\_dark* to *cal\_extract*) [Neil Cook]
- Merge pull request #333 from njcuk9999/neil. [Neil Cook]  
Neil

#### 4.4.416 0.2.049 (2018-06-19)

- Corrected bug in *night\_name* error reporting. [Neil Cook]
- Updated documentation (function definitions) [Neil Cook]
- Improved functionality in reset (allow reset of calibDB or reduced or log or all via user input) [Neil Cook]
- Improved reporting of bad night name. [Neil Cook]
- Removed old misc files. [Neil Cook]
- Add obj name to raw files if no other suffix added (for objects) [Neil Cook]
- Added preprocessed trigger (for automating pre-processing on *DRS\_RAW\_DATA* directory) [Neil Cook]
- Fixed bug with processed suffix. [Neil Cook]

#### 4.4.417 0.2.050 (2018-06-19)

- Changed config to my local paths. [Eder]
- Put config back. [Eder]
- Non. [Eder]
- Merge pull request #332 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge pull request #331 from njcuk9999/neil. [Neil Cook]  
Neil
- Update config.py. [Neil Cook]  
removed master need for user config file

#### 4.4.418 0.2.048 (2018-06-18)

- Rebuilt pdfs. [Neil Cook]
- Updated doc strings. [Neil Cook]
- Updated author list. [Neil Cook]
- Updated date and version and added spirouFile command. [Neil Cook]
- Updated some function descriptions. [Neil Cook]
- Issue #330 - fixed comment description. [Neil Cook]
- Issue #330 - fix WLOG message. [Neil Cook]
- Issue #330 - add *pol\_spirou* to recipe control. [Neil Cook]
- Issue #330 - fix entry value, set sources keys, and float(nexp) -> int(nexp) [Neil Cook]
- Issue #330 - change scatter -> plot. [Neil Cook]
- Issue #330 - add keyword *kw\_CMMTSEQ*. [Neil Cook]
- Issue #330 - fix constant value (run tested correction) [Neil Cook]
- Issue #330 - fix setup and a few other minor (run tested correction) [Neil Cook]
- Fix bug and cleanup the imports. [Neil Cook]
- Renamed and chmod files. [Neil Cook]
- Renaming file. [Neil Cook]
- Rename file. [Neil Cook]
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]  
**Conflicts:** INTROOT/SpirouDRS/spirouConfig/spirouConst.py
- Merge pull request #329 from njcuk9999/dev. [Neil Cook]  
Dev
- Issue #330 - Adding plots for polarimetry. [Neil Cook]
- Issue #330 - alaises for spirouPOLAR. [Neil Cook]
- Issue #330 - re-write of SPIROU polarimetry module (for DRS compatibility class -> functions) [Neil Cook]
- Issue #330 - Adding keywords for polarimetry. [Neil Cook]
- Updated date and version. [Neil Cook]
- Issue #330 - Adding file name definitions for polarimetry. [Neil Cook]
- Issue #330 - Adding constants for polarimetry. [Neil Cook]
- Issue #330: integrating *pol\_spirou* from @edermartoli into DRS format. [Neil Cook]

#### 4.4.419 0.2.046 (2018-06-15)

- Fixed hidden bug (formats should be allowed to be None - chosen by astropy. [Neil Cook]
- Fixed hidden bug. [Neil Cook]
- Added extra check for bad key in WLOG (dev issue only) [Neil Cook]
- Added some keys (OBJNAME, *SBCDEN\_P*) [Neil Cook]
- Updated date and version and added *OFF\_LISTING\_FILE* function. [Neil Cook]
- @FrancoisBouchy - Added commit: Creation of *off\_listing\_RAW\_spirou* - modified to conform with DRS standards + functions + keywords + parameters. [Neil Cook]
- @FrancoisBouchy - Added commit: Flux ratio display with 3 digit. [Neil Cook]
- @FrancoisBouchy - Added commit: Background correction of the ref file. [Neil Cook]
- @FrancoisBouchy - Added commit: Correction to avoid division by zero. [Neil Cook]

- Merge pull request #327 from njcuk9999/neil. [Neil Cook]  
verified - tested all recipes on H2RG and H4RG (except *cal\_HC*, *cal\_WAVE* - which just run through to end - untested + unverified)

#### 4.4.420 0.2.047 (2018-06-15)

- Flux ratio display with 3 digit. [FrancoisBouchy]
- Background correction of the ref file. [FrancoisBouchy]
- #300 Bug on the *fit\_ccf* on individual orders to investigate. [FrancoisBouchy]
- Correction to avoid division by zero. [FrancoisBouchy]

#### 4.4.421 0.2.045 (2018-06-14)

- Work on Issue #155 - fix for new single file return. [Neil Cook]
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- Merge pull request #326 from njcuk9999/neil. [Neil Cook]  
Neil
- Work on issues #167, #176 and #231 - first commit spirouWAVE file with *cal\_WAVE* (only) functions. [Neil Cook]
- Work on issues #167, #176 and #231 - renamed 'DATA' to 'HCDATA', moved *get\_ll*, *get\_dll* to spirouMath. [Neil Cook]
- Work on Issue #155 - modified *multi\_file\_setup* function and return of *single\_file\_setup* work on issues #167, #176 and #231 - modified custom getting of *args/load\_arguments* to help with *cal\_wave*. [Neil Cook]
- Moved *get\_dll* to spirouMath. [Neil Cook]
- Work on issues #167, #176 and #231 - added *read\_hcref*, fixed bug with NBFrames *append\_source* -> *set\_source*. [Neil Cook]
- Work on Issue #155 - fixing bugs for multi file setup (custom) [Neil Cook]
- Added aliases. [Neil Cook]
- Added aliases. [Neil Cook]
- Renamed *correct\_flat* to *get\_flat*. [Neil Cook]
- Added aliases. [Neil Cook]
- Work on issue #167, #176, #231 - added *wave\_plot\_instrument\_drift*, *wave\_plot\_final\_fp\_order*, *wave\_local\_width\_offset\_plot*, and *wave\_fp\_wavelength\_residuals*. [Neil Cook]
- Moved *get\_ll\_from\_coefficients* and *get\_dll\_from\_coefficients* here. [Neil Cook]
- Added aliases. [Neil Cook]
- Updated date and version. [Neil Cook]
- Modified comment. [Neil Cook]
- Work on Issue #176, #167, #231 - added constants. [Neil Cook]
- Work on Issue #176, #167, #231. [Neil Cook]
- Work on Issue #155 - modified return of recipe. [Neil Cook]
- Work on Issue #155 - modified return of recipe. [Neil Cook]
- Work on Issue #155 - modified return of recipe. [Neil Cook]
- Work on Issue #155 - modified return of recipe. [Neil Cook]

#### 4.4.422 0.2.044 (2018-06-13)

- Modified run order. [Neil Cook]
- Work on issue #176 - changes from variable names (in line with other recipes) [Neil Cook]
- Work on issue #155 - modified *initial\_file\_setup*, added *single\_file\_setup* and *multi\_file\_setup*, set todo's to remove now obsolete functions, added new *get\_file* function. [Neil Cook]
- Added aliases. [Neil Cook]
- Added rotate function, fix non pre-processed files function. [Neil Cook]
- Work on issue #155 - finished id checking functions. [Neil Cook]
- Added aliases. [Neil Cook]
- Updated date and version, shortened *log\_opt* (no suffix just program name) [Neil Cook]

- Shortened calibration -> cal. in log messages (for copying/not copying cal files) [Neil Cook]
- Work on issue #155 - added more files to control. [Neil Cook]
- Updated constant name. [Neil Cook]
- Added constants (preprocessing, exposuremeter, *cal\_hc*, *cal\_wave*) [Neil Cook]
- Fix for non pre-processed files. [Neil Cook]
- Fixed bug in gfkwards. [Neil Cook]
- Work on issue #155 - modified set up to accommodate checks via filename and header (via InitialFileSetup), fix for non pre-processed files. [Neil Cook]
- Made rotation a function based on a given rotation from constant. [Neil Cook]
- Work on issue #155 - modified set up to accommodate checks via filename and header (via InitialFileSetup), fix for non pre-processed files. [Neil Cook]
- Work on issue #155 - modified set up to accommodate checks via filename and header (via InitialFileSetup), fix for non pre-processed files, added H2RG compatibility fix. [Neil Cook]
- Work on issue #155 - modified set up to accommodate checks via filename and header (via InitialFileSetup), fix for non pre-processed files. [Neil Cook]
- Work on issue #155 - modified set up to accommodate checks via filename and header (via InitialFileSetup), fix for non pre-processed files. [Neil Cook]
- Work on issue #155 - modified set up to accommodate checks via filename and header (via InitialFileSetup), fix for H2RG compatibility, added H4RG kw objects needed for berv calculation. [Neil Cook]
- Work on issue #155 - modified set up to accommodate checks via filename and header (via SingleFileSetup + MultiFileSetup) [Neil Cook]
- Work on issue #155 - modified set up to accommodate checks via filename and header (via SingleFileSetup) [Neil Cook]
- Work on issue #155 - modified set up to accommodate checks via filename and header (via SingleFileSetup) [Neil Cook]
- Work on issue #155 - modified set up to accommodate checks via filename and header (via InitialFileSetup), fix for H2RG compatibility. [Neil Cook]
- Work on issue #155 - modified set up to accommodate checks via filename and header (via SingleFileSetup) [Neil Cook]
- Work on issue #155 - modified set up to accommodate checks via filename and header (via SingleFileSetup) [Neil Cook]

#### 4.4.423 0.2.043 (2018-06-12)

- Work on issue #155 - added recipe control file. [Neil Cook]
- Work on issue #155 - (un-finished) added new *initial\_file\_setup* and get file (now use *single\_file\_setup*) [Neil Cook]
- Work on issue #155 - modified *read\_header* to optionally return comments. [Neil Cook]
- Work on issue #155 - added ID functions. [Neil Cook]
- Work on issue #155 - reworked aliases and *\_\_ALL\_\_* [Neil Cook]
- Work on issue #155 - updated DPRTYPE comment. [Neil Cook]
- Work on issue #155 - added some required keywords. [Neil Cook]
- Work on issue #155 - rearranged some constants, added data constant directory. [Neil Cook]
- Work on issue #155 - changed import to deal with change in location of spirouFile. [Neil Cook]
- Work on issue #155 - test of ID-ing files. [Neil Cook]
- Work on issue #155 - added section to ID files and modify the header accordingly (based on filename OR header keys) [Neil Cook]
- Merge pull request #325 from njcuk9999/neil. [Neil Cook]  
updated date and version
- Merge pull request #324 from njcuk9999/neil. [Neil Cook]  
Neil

#### 4.4.424 0.2.041 (2018-06-11)

- Updated date and version. [Neil Cook]
- Continued work on *cal\_HC* (Issue #176) - added two masks for *cal\_HC*. [Neil Cook]

- Continued work on *cal\_HC* (Issue #176) - updated keywords, renamed some loc variables (for clarity) [Neil Cook]
- Continued work on *cal\_HC* (Issue #176) - added some fixes to coravelation (to accommodate *cal\_hc*) [Neil Cook]
- Continued work on *cal\_HC* (Issue #176) - added merge table and added some fixes to small bugs. [Neil Cook]
- Continued work on *cal\_HC* (Issue #176) - added alias to *spirouTable.merge\_table* (MergeTable) [Neil Cook]
- Continued work on *cal\_HC* (Issue #176) - added FWHM calculation (from sigma) [Neil Cook]
- Continued work on *cal\_HC* (Issue #176) - added keywords for *cal\_hc*. [Neil Cook]
- Continued work on *cal\_HC* (Issue #176) - added wave file output filename definitions. [Neil Cook]
- Continued work on *cal\_HC* (Issue #176) - added constants. [Neil Cook]
- Continued work on *cal\_HC* (Issue #176) - output to file + ccf calculation (from *cal\_CCF* mainly) [Neil Cook]
- Continued work on *cal\_HC* (Issue #176) - fixed value of FWHM from sigma. [Neil Cook]

#### 4.4.425 0.2.039 (2018-06-08)

- Continued work on *cal\_HC* (Issue #176) - test of fit gauss functions. [Neil Cook]
  - Continued work on *cal\_HC* (Issue #176) - modified *first\_guess\_at\_wave\_solution*, *detect\_bad\_lines*, *fit\_1d\_solution*, *calculate\_littrow\_sol*, *extrapolate\_littrow\_sol*, *second\_guess\_at\_wave\_solution*. Added *join\_orders*. [Neil Cook]
  - Continued work on *cal\_HC* (Issue #176) - added alias to *spirouTHORCA.join\_orders* (JoinOrders) [Neil Cook]
  - Continued work on *cal\_HC* (Issue #176) - added *wave\_littrow\_check\_plot* and corrected *wave\_littrow\_extrap\_plot*. [Neil Cook]
  - Continued work on *cal\_HC* (Issue #176) - corrected imports and a bug in fitgaussian functions. [Neil Cook]
  - Continued work on *cal\_HC* (Issue #176) - added how to compile fortran. [Neil Cook]
  - Continued work on *cal\_HC* (Issue #176) - python version of fitgaus by @melissa-hobson. [Neil Cook]
  - Continued work on *cal\_HC* (Issue #176) - added new constants. [Neil Cook]
  - Continued work on *cal\_HC* (Issue #176) - added new constants. [Neil Cook]
  - Continued work on *cal\_HC* (Issue #176) [Neil Cook]
  - Merge remote-tracking branch 'origin/neil' into neil. [njcuk9999]
  - Merge pull request #323 from njcuk9999/dev. [Neil Cook]
- Dev

#### 4.4.426 0.2.036 (2018-06-07)

- Find lines test (*cal\_HC* test) [njcuk9999]
- Continued work on *cal\_HC* - aliases for new THORCA functions. [njcuk9999]
- Continued work on *cal\_HC* - wave littrow plot. [njcuk9999]
- Continued work on *cal\_HC* - experimentation with fitting. [njcuk9999]
- Continued work on *cal\_HC*. [njcuk9999]
- Continued work on *cal\_HC* - constants for *cal\_HC*. [njcuk9999]
- Continued work on *cal\_HC*. [njcuk9999]

#### 4.4.427 0.2.037 (2018-06-07)

- Added default user config path. [Neil Cook]
  - Added my path. [Neil Cook]
  - Merge pull request #322 from njcuk9999/dev. [Neil Cook]
- Dev
- @FrancoisBouchy changes - merge confirmed, added some pe8 and comments and simplifications. [Neil Cook]
  - @FrancoisBouchy changes - merge confirmed. [Neil Cook]
  - @FrancoisBouchy changes - merge confirmed + added *ff\_rms\_plot* function. [Neil Cook]
  - @FrancoisBouchy changes - merge confirmed. [Neil Cook]
  - @FrancoisBouchy changes - merge confirmed + added *ff\_rms\_plot\_skip\_orders*. [Neil Cook]

- Added *ff\_rms\_plot\_skip\_orders* (blank for H2RG) [Neil Cook]
- @FrancoisBouchy changes - merge confirmed. [Neil Cook]
- @FrancoisBouchy changes - merge confirmed. [Neil Cook]
- @FrancoisBouchy changes - merge confirmed. [Neil Cook]
- @FrancoisBouchy changes - merge confirmed. [Neil Cook]
- @FrancoisBouchy changes - merge confirmed, moved plotting to *spirouPlot*. [Neil Cook]
- @FrancoisBouchy changes - merge confirmed, some pep8 and commenting. [Neil Cook]
- @FrancoisBouchy changes - merge confirmed. [Neil Cook]

#### 4.4.428 0.2.035 (2018-05-29)

- Fix matplotlib bug. [njcuk9999]
- Fix small bug. [njcuk9999]
- Update date and version. [njcuk9999]
- Merge pull request #319 from njcuk9999/neil. [Neil Cook]  
Neil
- Update config.py. [njcuk9999]
- Re-added BERV correction just for H4RG. [njcuk9999]
- Added masks to correct folder. [njcuk9999]
- Merge remote-tracking branch 'origin/neil' into neil. [njcuk9999]
- Merge pull request #318 from njcuk9999/master. [Neil Cook]  
update to master
- Merge pull request #317 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge pull request #316 from njcuk9999/cfht. [Neil Cook]  
new masks added on data
- New masks added on data. [Spirou DRS]
- Added new SpirouDRS data directories. [njcuk9999]
- Added new SpirouDRS data directories. [njcuk9999]
- Added new SpirouDRS data directories. [njcuk9999]
- Added new SpirouDRS data directories. [njcuk9999]
- Sorted SpirouDRS data folder. [njcuk9999]
- Barycorrpy leap sec files (moved to drs) [njcuk9999]
- Added constant for berv (ccf) [njcuk9999]
- Updated ccf function. [njcuk9999]
- Edited ccf. [njcuk9999]

#### 4.4.429 0.2.034 (2018-05-28)

- Updated for *cal\_hc*. [njcuk9999]
- Removed redundant comment. [njcuk9999]
- Added test from old drs. [njcuk9999]
- Merge remote-tracking branch 'origin/neil' into neil. [njcuk9999]
- Merge pull request #314 from njcuk9999/neil. [Neil Cook]  
updated date and version number
- Merge pull request #313 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge pull request #312 from njcuk9999/neil. [Neil Cook]  
Update *cal\_CCF\_E2DS\_spirou.py*
- Update value for speed of light, added *invert\_1ds\_ll\_solution*. [njcuk9999]
- Added new trial method to newbervmain (using barycorrpy) [njcuk9999]

#### 4.4.430 0.2.033 (2018-05-26)

- Updated date and version number. [njcuk9999]
- Update tests with CCF test. [njcuk9999]



- Update h2rg constant file (to be same as h4rg) [njcuk9999]
- Fix typos. [njcuk9999]
- Fix runtime errors on ccf test (set order to empty) [njcuk9999]
- Added ee. [njcuk9999]
- Removed fortran code. [njcuk9999]
- Update unit tests. [njcuk9999]
- Update fortran codes. [njcuk9999]
- Updated script doc string. [njcuk9999]
- Update unit tests (*cal\_FF\_raw* needs *flat\_flat*) [njcuk9999]
- Synced h2rg and h4rg. [njcuk9999]
- Correct the comments and indentation of the background. [njcuk9999]
- Merge branch 'francois' into neil. [njcuk9999]
- **Conflicts:** INTROOT/SpirouDRS/spirouConfig/spirouKeywords.py INTROOT/SpirouDRS/spirouRV/spirouRV.py  
 INTROOT/bin/cal\_CCF\_E2DS\_spirou.py INTROOT/bin/cal\_FF\_RAW\_spirou.py INT-  
 ROOT/config/constants\_SPIROU\_H4RG.py
- First wavelength solution added to SpirouDRS/data. [FrancoisBouchy]
- Telluric mask added on SpirouDRS/data. [FrancoisBouchy]
- Fortran module for BERV computation : Require f2py -c -m newbervmain -noopt -quiet newbervmain.f. [FrancoisBouchy]
- Update of *cal\_CCF\_E2DS* with target parameters and BERV computation from the fortran module newbervmain. [FrancoisBouchy]
- Update of *cal\_DRIFT\_E2DS\_spirou*. Results now comparable to *cal\_DRIFTPEAK\_E2DS\_spirou*. [FrancoisBouchy]
- Background correction is now an option. [FrancoisBouchy]
- *Cal\_FF\_RAW\_spirou* must run on *flat\_flat* and provide flat and blaze for A, B, AB and C fibers. [FrancoisBouchy]
- New recipes to display the full spectral range of an E2DS file. [FrancoisBouchy]
- Typo on the name corrected. [FrancoisBouchy]
- Added CFHT parameters and option for background correction on *cal\_DRIFT*. [FrancoisBouchy]
- Add targets keywords + Date of observations for *cal\_CCF\_E2DS\_spirou*. [FrancoisBouchy]
- All wavelength are in nm. [FrancoisBouchy]
- #300 Bug on the *fit\_ccf* on individual orders to investigate. [FrancoisBouchy]
- Merge remote-tracking branch 'origin/francois' into francois. [FrancoisBouchy]
- **Conflicts:** INTROOT/SpirouDRS/spirouCore/spirouPlot.py INTROOT/bin/cal\_DARK\_spirou.py INT-  
 ROOT/bin/cal\_DRIFTPEAK\_E2DS\_spirou.py INTROOT/bin/cal\_extract\_RAW\_spirou.py INT-  
 ROOT/bin/visu\_RAW\_spirou.py INTROOT/config/constants\_SPIROU\_H4RG.py
- @FrancoisBouchy change (merged by @njcuk9999) - why comment out this line? [njcuk9999]
- @FrancoisBouchy change (merged by @njcuk9999) - plot labels should be in nm not angstrom. [njcuk9999]
- @FrancoisBouchy change (merged by @njcuk9999) - added new required input HEADER keywords. [njcuk9999]
- @FrancoisBouchy change (merged by @njcuk9999) [njcuk9999]
- @FrancoisBouchy change (merged by @njcuk9999) [njcuk9999]
- @FrancoisBouchy change (merged by @njcuk9999) [njcuk9999]
- Update H2RG dependency flag. [njcuk9999]
- @ Francois Bouchy - fixed changes *dark\_flat/flat\_dark* -> *flat\_flat*. [njcuk9999]

#### 4.4.431 0.2.029 (2018-05-25)

- Update of *cal\_DRIFT\_E2DS\_spirou*. Results now comparable to *cal\_DRIFTPEAK\_E2DS\_spirou*. [FrancoisBouchy]  
 (cherry picked from commit 86ee03b)
- @FrancoisBouchy added *earth\_velocity\_correction*, newbervmain functions and modified coravelation. [njcuk9999]
- @FrancoisBouchy - added alias to *earth\_velocity\_correction*. [njcuk9999]
- @FrancoisBouchy added read star parameters and earth velocity calculation. [njcuk9999]
- Merge remote-tracking branch 'origin/neil' into neil. [njcuk9999]

#### 4.4.432 0.2.030 (2018-05-25)

- Worked on *fit\_1d\_solution* (complete?), added to doc strings (gparams) [njcuk9999]
- Added alias to *fit\_1d\_solution* (Fit1DSolution) [njcuk9999]
- Added new *cal\_hc* variables. [njcuk9999]
- Change FirstGuessSolution mode to new (to avoid needing fortran fitgaus code) [njcuk9999]

#### 4.4.433 0.2.031 (2018-05-25)

- Update *cal\_CCF\_E2DS\_spirou.py*. [melissa-hobson]  
Changed filetype to accept all E2DS files.
- Merge pull request #311 from njcuk9999/neil. [Neil Cook]  
Neil

#### 4.4.434 0.2.026 (2018-05-18)

- Update readme. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Fixed bug when config files only have one or zero lines. [Neil Cook]
- Reset constant back to default. [Neil Cook]
- Fix to Issue #232 - added *cal\_exposure\_meter* to unit tests. [Neil Cook]
- Fix to Issue #232 - added *cal\_exposure\_meter* to unit tests. [Neil Cook]
- Fix to Issue #232 - add file names for *cal\_exposure\_meter*. [Neil Cook]
- Fix to Issue #232 - add different outputs. [Neil Cook]
- Fix to Issue #232 - add different outputs. [Neil Cook]
- Fix to Issue #232 - bug in applying badpixmap. [Neil Cook]
- Commented out work-in-progress function. [Neil Cook]
- Fix to Issue #232 - added *get\_badpixel\_map* and modified *correct\_for\_badpix* functions. [Neil Cook]
- Fix to Issue #232 - added exposure-meter functions to new sub-module in spirouImage. [Neil Cook]
- Fix to Issue #232 - added alias to *get\_badpixel\_map* function (GetBadPixMap) [Neil Cook]
- Fix to Issue #232 - added output keywords to spirouKeywords. [Neil Cook]
- Fix to Issue #232 - added telluric exposure meter maps to calibDB. [Neil Cook]
- Fix to Issue #232 - added exposure-meter constants. [Neil Cook]
- Fix to Issue #232 - produce exposure-meter recipe (compatible with H2RG and H4RG) [Neil Cook]
- Work on *cal\_HC* (restore from bad merge) [Neil Cook]
- Merge pull request #310 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- Added wavelength solution file for H4RG. [Neil Cook]
- Added H4RG wavelength solution files to the calib DB default files (for resetting) [Neil Cook]
- @FrancoisBouchy - 4 digit to display the dark statistics. [Neil Cook]
- @FrancoisBouchy - new lower limit in dark level plot (with H2RG compatibility) [Neil Cook]
- Fix error message in *get\_database* (calibDB) [Neil Cook]
- Update default *master\_calib\_spirou* file (with H2RG and H4RG default wave solutions) [Neil Cook]
- Update date and version. [Neil Cook]
- @FrancoisBouchy - update to dark constants. [Neil Cook]
- @FrancoisBouchy - *visu\_RAW\_spirou* adapted for preprocessed files. [Neil Cook]
- @FrancoisBouchy - Use the wavelength solution from the calibDB, set all negative pixels to zero and update *ext\_sorder\_fit* upper limit. [Neil Cook]
- @FrancoisBouchy - Use the wavelength solution from the calibDB. [Neil Cook]
- @FrancoisBouchy - Quality control of the dark level on the blue part of the detector. [Neil Cook]
- Added recipe to reset (while in development only) [Neil Cook]

#### 4.4.435 0.2.027 (2018-05-18)

- 4 digit to display the dark statistics. [FrancoisBouchy]

- Range adjusted to display Dark frame Blue window displayed in White Cut parameter added in extract plotting function Wavelength solution used in extract plotting function. [FrancoisBouchy]
- Dark constant and Dark quality control adjusted. [FrancoisBouchy]
- *Visu\_RAW\_spirou* adapted for preprocessed files. [FrancoisBouchy]
- Negative pixels are set to zero Read wavelength solution on calibDB Set the cut to *max\_signal/10* to display the order location. [FrancoisBouchy]
- Use the first wavelength solution from the calibDB *spiro\_u\_wave\_H4RG\_v0.fits*. [FrancoisBouchy]
- Quality control of the dark level on the blue part of the detector. [FrancoisBouchy]
- Merge remote-tracking branch 'origin/francois' into francois. [FrancoisBouchy]
- Merge pull request #307 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge remote-tracking branch 'origin/francois' into francois. [FrancoisBouchy]
- Merge pull request #305 from njcuk9999/master. [FrancoisBouchy]  
Update README.md
- Merge remote-tracking branch 'origin/francois' into francois. [FrancoisBouchy]

**Conflicts:** INTROOT/SpirouDRS/spirouEXTOR/spirouEXTOR.py INTROOT/SpirouDRS/spirouImage/spirouImage.py  
 INTROOT/bin/cal\_BADPIX\_spirou.py INTROOT/bin/cal\_DRIFTPEAK\_E2DS\_spirou.py INT-  
 ROOT/bin/cal\_extract\_RAW\_spirou.py INTROOT/config/constants\_SPIROU\_H4RG.py

#### 4.4.436 0.2.025 (2018-05-17)

- Fix to Issue #227 - added *cal\_drift* and drift peak to tests. [Neil Cook]
- Fix to Issue #227 - added *cal\_drift* and drift peak to tests. [Neil Cook]
- Fix to Issue #227 - added *cal\_drift* and drift peak to tests. [Neil Cook]
- Work on issue #176 - Attempt to get First Guess solution working and detection of badlines. [Neil Cook]
- Work on issue #176 - Attempt to get First Guess solution working and detection of badlines (aliases) [Neil Cook]
- Work on issue #176 - added three *cal\_HC* constants. [Neil Cook]
- Work on issue #176 - Attempt to get First Guess solution working and detection of badlines. [Neil Cook]

#### 4.4.437 0.2.024 (2018-05-16)

- Removed dependency on *cal\_drift\_raw*. [Neil Cook]
- Updated test.run. [Neil Cook]
- Fix to Issue #227 - dealt with warnings for *cal\_driftpeak*. [Neil Cook]
- Updated date and version. [Neil Cook]
- Fake file comments added. [Neil Cook]
- Added fake *fp\_fp* files for drift (copies of *fp\_fp\_001*) [Neil Cook]
- Fix to Issue #227 - removed support for *cal\_drift\_raw\_spirou*. [Neil Cook]
- Fix to Issue #227 - removed *cal\_DRIFT\_RAW\_spirou*. [Neil Cook]
- Fix to Issue #227 - refactored warnlog. [Neil Cook]
- Fix to Issue #227 - added *cal\_drift* and drift peak to tests. [Neil Cook]
- Fix to Issue #227 - deal with warnings. [Neil Cook]
- Fix to Issue #227 - refactor warnlog (+ fix bug) [Neil Cook]
- Update date and version. [Neil Cook]
- Fix to Issue #227 - refactor warnlog. [Neil Cook]
- Fix to Issue #227 - apply H4RG fixes to drift codes. [Neil Cook]
- Enhancement - compare function gets *ARG\_NIGHT\_NAME* from ll, prints old and new file locations (for extra confirmation) [Neil Cook]
- Update oldpath (don't include path) [Neil Cook]
- Updated test run. [Neil Cook]
- Fix for bug when HEADER time not string (should always be string but can be interpreted as number and thus break function) [Neil Cook]
- Fix - removed unneeded comment. [Neil Cook]
- Merge pull request #306 from njcuk9999/neil. [Neil Cook]  
Neil

- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]

#### 4.4.438 0.2.023 (2018-05-15)

- Updated run. [Neil Cook]
- Fixed typo. [Neil Cook]
- Added runname to comparison table. [Neil Cook]
- Added run name to comparison table (to name table) [Neil Cook]
- Corrected bug with unit test (files were duplicated in list i.e. file1 file1 file2 file3. [Neil Cook]
- Tool file - clear out cached .pyc files (useful when rebuilding) [Neil Cook]
- H2RG compatibility - fitsfilename = *arg\_file\_names[-1]* and only adding SNR keys and EXTM/FUNC for H4RG, p returned to call. [Neil Cook]
- Fixed pep8 in *smoothed\_box\_mean\_image1* function. [Neil Cook]
- Updated date and version + rebuild pdfs. [Neil Cook]
- Updated date and version. [Neil Cook]
- H2RG compatibility - fitsfilename = *arg\_file\_names[-1]* and only adding SNR keys and EXTM/FUNC for H4RG. [Neil Cook]
- H2RG compatibility - fitsfilename = *arg\_file\_names[-1]* [Neil Cook]
- True on comparison in H2RG run. [Neil Cook]
- Fix to calling from python (bug introduced in last update) [Neil Cook]
- Fix to *unit\_test* comparison table. [Neil Cook]
- Fix to *unit\_test* comparison table. [Neil Cook]
- Fix to *unit\_test* comparison table. [Neil Cook]

#### 4.4.439 0.2.022 (2018-05-14)

- Update README.md. [Neil Cook]
- Merge pull request #304 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- Merge pull request #303 from njcuk9999/neil. [Neil Cook]  
Neil
- Updated date and versions. [Neil Cook]
- Fix for issue #296 - was mistake in argument to *test\_suffix* = *suffix.format* - called dictionary incorrectly. [Neil Cook]
- Fix for issue #302 - *IC\_COSMIC\_THRES* -> *IC\_COSMIC\_THRESH*. [Neil Cook]
- Updated test run. [Neil Cook]
- Fix for issue #302 - added *IC\_COSMIC\_SIGCUT* and *IC\_COSMIC\_THRES*. [Neil Cook]
- Fix for issue #302 - added *IC\_COSMIC\_SIGCUT* and *IC\_COSMIC\_THRES*. [Neil Cook]
- Fix to Issue #296 - added alias (CheckPreProcess) for *spiroStartup.check\_preprocess*. [Neil Cook]
- Fix to Issue #296 - added *IC\_FORCE\_PREPROCESS* and added all other preprocess constants to constants file. [Neil Cook]
- Fix to #296 - added .fits to suffix. [Neil Cook]
- Fix to Issue #296 - added call to CheckPreProcess - check for preprocessed files. [Neil Cook]
- Fix to #296 - added *check\_preprocess* function. [Neil Cook]
- Merge remote-tracking branch 'origin/neil' into neil. [Neil Cook]
- Merge pull request #301 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge pull request #293 from njcuk9999/neil. [Neil Cook]  
Neil
- Fix to *unit\_test* - bug in logic when file does not exist -> True to False. [Neil Cook]
- Fix to issue #292 - *get\_fiber\_type* modified to accept and require suffix to get fiber type. [Neil Cook]

#### 4.4.440 0.2.021 (2018-05-12)

- Fix to issue #300 - added *correct\_for\_badpix* function. [Neil Cook]

- Fix to issue #300 - alias to *correct\_for\_badpix* function. [Neil Cook]
- Fix to issue #298 - exit script should deal with new *DRS\_INTERACTIVE* parameter. [Neil Cook]
- Fix to issue #298 - *DRS\_INTERACTIVE* should be set to 1 by default. [Neil Cook]
- Fix to bug identified - no exit script in AB or C. [Neil Cook]
- Fix to issue #298 - set *DRS\_PLOT* to zero if *DRS\_INTERACTIVE* == 0 and if *DRS\_INTERACTIVE* == 0 do not prompt user at the end of recipes about exiting and plotting. [Neil Cook]
- Fix to issue #298 - set *DRS\_PLOT* to zero if *DRS\_INTERACTIVE* == 0 and if *DRS\_INTERACTIVE* == 0 do not prompt user at the end of recipes about exiting and plotting. [Neil Cook]
- Fix to issue #298 - added *DRS\_INTERACTIVE* to config.py. [Neil Cook]
- Fix to issue #297 - Unit test to display current files if no argument. [Neil Cook]
- Fixes to *unit\_tests* for internal bugs and to correct for issue #295. [Neil Cook]
- Fix to issue #294 - H2RG needs to return “bstats2” too (set to zero) [Neil Cook]
- Fix to Issue #295 - complete reworking of wrapper function (which is now called from recipes) [Neil Cook]
- Fix to Issue #295 - updated alias functions. [Neil Cook]
- Fix to Issue #295 - added *E2DS\_EXTM* and *E2DS\_FUNC* HEADER keys to report extract type and extract function. [Neil Cook]
- Fix for Issue #295 - removed *EXTRACT\_E2DS\_ALL\_FILES* - not needed any more. [Neil Cook]
- Fix to Issue #295 - change the way extraction is managed - modified *IC\_EXTRACT\_TYPE* and added *IC\_FF\_EXTRACT\_TYPE*. [Neil Cook]
- Fix to Issue #295 - change the way extraction is managed - now type *IC\_FF\_EXTRACT\_TYPE*. [Neil Cook]
- Fix to Issue #295 - change the way extraction is managed - now type 2. [Neil Cook]
- Fix to Issue #295 - change the way extraction is managed - now type 2. [Neil Cook]
- Fix to Issue #295 - change the way extraction is managed. [Neil Cook]
- Fix to Issue #294 - stats for *bad\_pixel\_map\_2* in *cal\_BADPIX\_spirou*. [Neil Cook]
- Fix to Issue #294 - stats for *bad\_pixel\_map\_2* in *cal\_BADPIX\_spirou*. [Neil Cook]
- Start of fix to issue #295 - Switch between extraction routines in *constants\_SPIROU* file - unfinished. [Neil Cook]
- Fix to issue #294 - stats for *bad\_pixel\_map\_2* in *cal\_BADPIX\_spirou*. [Neil Cook]
- Fix imports for python 2 and make runs sorted (again for python 2) [Neil Cook]
- Fix imports for python 2. [Neil Cook]
- Update units tests with new run names (sortable) - python 2 safe. [Neil Cook]
- Fix unit test import (should be inner call to function) [Neil Cook]
- Fix typo. [Neil Cook]
- Fix for typo. [Neil Cook]
- Fix to import statements (for python 2 compatibility) [Neil Cook]
- New *extraction\_tilt\_weight2cosm* with cosmic correction. Mode=2 is by default this new extraction. [Neil Cook]
- Display of bad pixels with 4 digits. [Neil Cook]
- *Ic\_blake\_fitn* set to 7 *ic\_ext\_sigdet* set to -1. [Neil Cook]
- ConvertToADU convert from ADU/s to ADU (not e-) Faction of dead pixels display with 4 digits Display the number of cosmic rays (bad pixels) detected by the extraction. [Neil Cook]
- Fake wavelength solution to run without WAVE fiel in the calibDB. [Neil Cook]
- Correction of the display of the image size. [Neil Cook]
- Merge remote-tracking branch ‘origin/neil’ into neil. [Neil Cook]
- Merge pull request #290 from njcuk9999/neil. [Neil Cook]
- Neil
- Merge pull request #288 from njcuk9999/neil. [Neil Cook]
- Neil

#### 4.4.441 0.2.019 (2018-05-09)

- Fitgaus fortan code (for testing only) [Neil Cook]
- Example in ipynb and tex format. [Neil Cook]
- Modified test run unit test. [Neil Cook]
- Added new unit test runs (all and minimum required) [Neil Cook]
- Removed old unit test runs. [Neil Cook]

- Added *cal\_extract\_RAW\_spirou* AB and C to unit tests. [Neil Cook]
- Fix problem with `reset = False`. [Neil Cook]
- Fix so wrapper extractions work with *unit\_tests* (and can be called from python) [Neil Cook]
- *Ic\_ext\_sigdet* should be -1. [Neil Cook]
- Fix to Issue #289 - was a problem with WLOG message (argument missing from format) [Neil Cook]

#### 4.4.442 0.2.020 (2018-05-09)

- Fraction of dead pixels display with 4 digits Display the number of cosmic rays (bad pixels) detected by the extraction. [FrancoisBouchy]
- Fake wavelength solution due to missing WAVE in calibDB. [FrancoisBouchy]
- Display of the format of the resized image. [FrancoisBouchy]
- Merge remote-tracking branch 'origin/francois' into francois. [FrancoisBouchy]
- **Conflicts:** *INTROOT/bin/cal\_BADPIX\_spirou.py* *INTROOT/bin/cal\_DRIFTPEAK\_E2DS\_spirou.py*  
*INTROOT/bin/cal\_extract\_RAW\_spirou.py*
- New *extraction\_tilt\_weight2cosm* with cosmic correction. Mode=2 is by default this new extraction. [FrancoisBouchy]
- Display of bad pixels with 4 digits. [FrancoisBouchy]
- *Ic\_blake\_fitn* set to 7 *ic\_ext\_sigdet* set to -1. [FrancoisBouchy]
- ConvertToADU convert from ADU/s to ADU (not e-) Fraction of dead pixels display with 4 digits Display the number of cosmic rays (bad pixels) detected by the extraction. [FrancoisBouchy]
- Fake wavelength solution to run without WAVE fiel in the calibDB. [FrancoisBouchy]
- Correction of the display of the image size. [FrancoisBouchy]
- Merge pull request #271 from njcuk9999/master. [Neil Cook]  
update to master

#### 4.4.443 0.2.018 (2018-05-07)

- Fix to latex format. [Neil Cook]
- Fix to install (cal validate from cmd line needs .py) [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Added retrun possibility to *list\_modules*, and added *find\_all\_missing\_modules* wrapper function. [Neil Cook]
- Completed doc string. [Neil Cook]
- Corrected *\_\_all\_\_* [Neil Cook]
- Added missing doc strings. [Neil Cook]
- Added missing doc strings. [Neil Cook]
- Added missing functions from tex files. [Neil Cook]
- Added tex and pdf versions of the examples (auto-generated from notebooks) [Neil Cook]
- Added unit tests and tools to *SpirouDRS \_\_all\_\_* list (and imported) [Neil Cook]
- Example 10 in html format. [Neil Cook]
- Example 10 - how to use spirou tools. [Neil Cook]
- Fixed bug in *display\_calibdb* (use LoadMinimum not LoadArguments) [Neil Cook]
- Updated date and version. [Neil Cook]
- Updated date and version. [Neil Cook]
- Updated variables (added CCF variables and missed *cal\_BADPIX* variabels) [Neil Cook]
- Update to *ic\_ext\_tilt\_bord* description. [Neil Cook]
- H4RG by default. [Neil Cook]
- Update to *unit\_test* file (post *unit\_test* changes) [Neil Cook]
- Fix to issue #287 - extra issue log statements with errors inside - print warnings first then internal errors after - set key after too (avoids printing errors inbetween warnings) [Neil Cook]
- Fix to issue #287 - extra issue of crash before config loads (*IC\_IMAGE\_TYPE*) missing from needed spirouKeyword *USE\_PARAMS*. [Neil Cook]
- Fix to issue #287 - deal with *DRS\_UCONFIG* warning printing. [Neil Cook]
- Update README.md. [Neil Cook]
- Merge pull request #285 from njcuk9999/neil. [Neil Cook]

- Merge pull request #284 from njcuk9999/neil. [Neil Cook] Neil

4.4.444 0.2.017 (2018-05-04)

- [illegible]

#### 4.4.445 0.2.016 (2018-05-03)

- Pep8 update all ParamDict constants to capitals. [Neil Cook]
- *Unit\_test* - added additional run files. [Neil Cook]
- *Unit\_test* fix - *DRS\_Reset* modification, loading arguments modification and *set\_type* -> *check\_Type* change. [Neil Cook]
- *Unit\_test* fix - *set\_type* doesn't work - just check type instead (and throw error) [Neil Cook]
- *Unit\_test* fix - rename *set\_type* to *check\_type*. [Neil Cook]
- *Unit\_test* fix - alias to *load\_minimum*. [Neil Cook]
- *Unit\_test* fix - *reset\_confirmation* modification and log successful completion. [Neil Cook]
- *Unit\_test* fix - do not require *night\_name*. [Neil Cook]

#### 4.4.446 0.2.015 (2018-05-02)

- Notebook additions - conversion to html. [Neil Cook]
- Notebook additions - added a quiet mode for notebooks (no user input needed) [Neil Cook]
- Notebook additions - added *unit\_test* alias to init file (for loading up from python) [Neil Cook]
- Notebook additions - test unit test for notebooks. [Neil Cook]
- Notebook additions - example 9 - unit tests. [Neil Cook]
- Notebook additions - example 8 - wlog. [Neil Cook]
- Notebook additions - code to convert. [Neil Cook]

#### 4.4.447 0.2.014 (2018-05-01)

- Rebuild pdfs. [Neil Cook]
- Updated date and versions. [Neil Cook]
- Redefining unit tests - example run files (for unit test) [Neil Cook]
- Redefining unit tests - first commit - slight changes (logging) [Neil Cook]
- Redefining unit tests - first commit - new recipe for unit test. [Neil Cook]
- Redefining unit tests - first commit - new functions for unit test. [Neil Cook]
- Redefining unit tests - first commit - new recipe definitions for unit tests. [Neil Cook]
- Redefining unit tests - added new function aliases. [Neil Cook]
- Redefining unit tests - moved old. [Neil Cook]
- Redefining unit tests - moved old. [Neil Cook]
- Redefining unit tests - moved old. [Neil Cook]
- Redefining unit tests - moved old. [Neil Cook]
- Redefining unit tests - moved old. [Neil Cook]
- Redefining unit tests - moved old. [Neil Cook]
- Redefining unit tests - allowing silent reset (not advised) [Neil Cook]
- Updating versions. [Neil Cook]
- Redefining unit tests - add function alias. [Neil Cook]

#### 4.4.448 0.2.012 (2018-04-30)

- Regarding issue #264 - change no longer needed - revert to earlier version. [Neil Cook]
- Fix to issue #267 - SNR saved in the headers - added keys to E2DS header. [Neil Cook]
- Fix to issue #267 - SNR saved in the headers - added new keyword to list. [Neil Cook]
- Fix to code dependency. [Neil Cook]
- Merge pull request #266 from njcuk9999/francois. [Neil Cook]  
Francois
- Update *cal\_FF\_RAW\_spirou.py*. [Neil Cook]  
keep compatibility with H2RG version
- Update *spirouLOCOR.py*. [Neil Cook]  
keep compatibility with H2RG



**4.4.449 0.2.013 (2018-04-30)**

- Update constant parameters for localization, flat-field and blaze. [FrancoisBouchy]
- Plot the central column threshold for *DRS\_DEBUG=0*. [FrancoisBouchy]
- Add the plot of the central column with miny and maxy for *DRS\_DEBUG=0*. [FrancoisBouchy]
- Plot values of *e2ds>0* and values of *blaze>1*. [FrancoisBouchy]
- Force the curvature of orders in case of no detection. [FrancoisBouchy]
- Merge pull request #265 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge pull request #260 from njcuk9999/neil. [Neil Cook]  
manually adding francois changes

**4.4.450 0.2.009 (2018-04-27)**

- Fix to issue #264 - spirouFLAT.MEasureBlazeForOrder now requires p (for H2RG dependency) [Neil Cook]
- Fix to issue #264 - stop blaze setting zero or negative values to 1. [Neil Cook]
- Update? [Neil Cook]
- Issue #263 and Issue #262 - tilt borders added and mask for negative pixel added to all functions. [Neil Cook]
- Added function to extract valid order numbers from *constants\_SPIROU* (via ParamDict) [Neil Cook]
- Added function to extract valid order numbers from *constants\_SPIROU* (via ParamDict) [Neil Cook]
- Added function to extract valid order numbers from *constants\_SPIROU* (via ParamDict) [Neil Cook]
- Addressing issues #225 and #226 - compatibility with both H2RG and H4RG by adding “method” (switch between average and median), pep8 fixes. [Neil Cook]
- Pep8 fixes and Issue #226 - compatibility with both H2RG and H4RG. [Neil Cook]
- Issue #263 - allowed tilt border to be changed in constants and first and last order to be selected. [Neil Cook]
- Issue #250 - average -> median and dependency with H2RG. [Neil Cook]
- Allowed valid orders to be changed in constants. [Neil Cook]
- Dealt with dependency of H2RG (Issue #266) and allowed valid orders to be changed in constants. [Neil Cook]
- Merge pull request #261 from njcuk9999/francois. [Neil Cook]  
Francois

**4.4.451 0.2.010 (2018-04-27)**

- Update constant parameters for flat-field and blaze. [FrancoisBouchy]
- Modification of spirouPlot to Display all orders with correct NBFIB parameter. [FrancoisBouchy]
- Start extraction from order 4th in *cal\_extract\_RAW\_spirou*. [FrancoisBouchy]
- Start extraction from order 4th in *cal\_FF\_RAW\_spirou*. [FrancoisBouchy]
- Merge pull request #259 from njcuk9999/neil. [Neil Cook]  
Neil

**4.4.452 0.2.011 (2018-04-27)**

- Manually adding francois changes. [njcuk9999]
- Manually adding francois changes. [njcuk9999]
- Merge pull request #258 from njcuk9999/master. [Neil Cook]  
update to master
- Merge pull request #256 from njcuk9999/revert-254-francois. [Neil Cook]  
Revert “Francois”
- Revert “Francois” [Neil Cook]
- Merge pull request #255 from njcuk9999/revert-254-francois. [Neil Cook]  
Revert “Francois”
- Revert “Francois” [Neil Cook]

- Merge pull request #254 from njcuk9999/francois. [Neil Cook]  
update accepted.
- Update config.py. [Neil Cook]
- Update *visu\_RAW\_spirou.py*. [Neil Cook]  
call to plt should come via sPlt i.e.: instead of: python import matplotlib.pyplot as plt  
use  
python from SpirouDRS.spirouCore import sPlt plt = sPlt.plt  
This avoids all errors with matplotlib backends.
- Change. [njcuk9999]
- Change. [njcuk9999]
- Update vcs.xml. [Neil Cook]
- Cleaning up files. [njcuk9999]
- Removed cached files. [njcuk9999]
- Reset to master. [njcuk9999]

#### 4.4.453 0.2.008 (2018-04-26)

- Reset paths to defaults (shouldn't have overwritten) [Neil Cook]
- Merge pull request #249 from njcuk9999/francois. [Neil Cook]  
Francois
- Merge branch 'dev' into francois. [Neil Cook]
- Merge pull request #248 from njcuk9999/master. [Neil Cook]  
update to master
- Merge pull request #247 from njcuk9999/neil. [Neil Cook]  
Neil
- Add files via upload. [Neil Cook]  
Added francois files manually (via direct upload)
- Add files via upload. [Neil Cook]  
Added francois files via direct upload

#### 4.4.454 0.2.007 (2018-04-25)

- Fix to *cal\_badpix* to allow use with H2RG (required bool mask for *bad\_pixel\_mask2*) [Neil Cook]
- Merge pull request #246 from njcuk9999/melissa. [Neil Cook]  
Melissa

#### 4.4.455 0.2.0097 (2018-04-25)

- *Cal\_DARK*: increased decimals shown *constants\_SPIROU\_H4RG*: adjusted dark cut limit  
*spirou\_PLOT*: added labels and titles to figures; changed histograms to normalised frequency  
*spirou\_IMAGE.measure\_dark*: changed histograms to density histograms, increased decimals. [melissa-hobson]
- Merge pull request #245 from njcuk9999/master. [melissa-hobson]  
update
- Merge pull request #244 from njcuk9999/neil. [Neil Cook]  
Neil
- Updated order of *cal\_BADPIX\_spirou* in the unit test functions. [Neil Cook]
- Fix for Issue #229 - added alias to *spirouImage.locate\_bad\_pixels\_full* (LocateFullBadPixels) [Neil Cook]
- Code to un-resize and un-flip the image (for back processing files created by the DRS) [Neil Cook]
- Fix for Issue #229 - full flat detector image from engineering data (required for badpix fit) [Neil Cook]
- Fix for Issue #229 - wrote *locate\_bad\_pixel\_full* to workout threshold from full flat engineering data. [Neil Cook]
- Fix for Issue #229 - added parameters to *constants\_spirou* file. [Neil Cook]
- Fix for Issue #229 - added parameters to *constants\_spirou* file. [Neil Cook]
- Fix to Issue #193 - try statement to import matplotlib and error output via WLOG (does not fix but catches exceptions) [Neil Cook]

- Fix for Issue #229 - added call to `spirouImage.LocateFullBadPixels`, plotted graph, added resizing and flipping the image to match other recipes. [Neil Cook]
- Merge pull request #243 from njcuk9999/master. [melissa-hobson]  
update branch
- Merge pull request #242 from njcuk9999/neil. [Neil Cook]  
Neil
- Re-built pdfs. [Neil Cook]
- Updated date and versions. [Neil Cook]
- Updated version in readme. [Neil Cook]
- Added alias to `load_other_config_file` (`LoadOtherConfig`) - used in tools. [Neil Cook]
- Fixed bug in `__all__` statement. [Neil Cook]
- Update to style. [Neil Cook]
- New tool - drs documentation - doc functions useful for keeping the docs up-to-date. [Neil Cook]
- Added % comments to doc (in variables) - needed to know which are missing. [Neil Cook]
- Fix to suggestion in Issue #229 - changed argument order around to avoid confusion. [Neil Cook]
- Merge pull request #241 from njcuk9999/neil. [Neil Cook]  
Neil
- Changed plot colour to “*gist\_gray*” and linetype to “red” to help ID fits better (pink on rainbow was bad) [Neil Cook]
- Updated preprocessor for use with H2RG. [Neil Cook]
- Fix for issue #220 - added alias to `InterpolateBadRegions` (call to `spirouImage.interp_bad_regions`) [Neil Cook]
- Fix for issue #220 - added `interp_bad_regions` function and added doc strings for other new functions. [Neil Cook]
- Fix for issue #220 - added `bad_region` constants. [Neil Cook]
- Fix for issue #220 - added call to `spirouImage.InterpolateBadRegions`. [Neil Cook]
- Merge pull request #238 from njcuk9999/master. [Neil Cook]  
update to master

#### 4.4.456 0.2.006 (2018-04-23)

- Corrected order of inputs in `cal_BADPIX` main definition. [melissa-hobson]
- Merge pull request #240 from njcuk9999/master. [melissa-hobson]  
Update branch
- Merge pull request #239 from njcuk9999/dev. [Neil Cook]  
Merge pull request #237 from njcuk9999/master
- Merge pull request #237 from njcuk9999/master. [Neil Cook]  
update to master
- Merge pull request #236 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge pull request #234 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge pull request #233 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge pull request #217 from njcuk9999/master. [melissa-hobson]  
Update branch melissa from master
- Merge pull request #216 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge pull request #213 from njcuk9999/master. [melissa-hobson]  
Update branch from master
- Merge pull request #211 from njcuk9999/dev. [Neil Cook]  
Merge pull request #207 from njcuk9999/master
- Merge pull request #207 from njcuk9999/master. [Neil Cook]  
update to master
- Merge pull request #210 from njcuk9999/melissa. [Neil Cook]  
Merge pull request #206 from njcuk9999/master
- Merge pull request #206 from njcuk9999/master. [Neil Cook]

update to master

- Merge pull request #209 from njcuk9999/neil. [Neil Cook]  
Neil

#### 4.4.457 0.2.005 (2018-04-20)

##### 4.4.457.1 Fix

- Exit script should only ask to close graphs if we have plots (see “*has\_plots*” keyword) [Neil Cook]

##### 4.4.457.2 Other

- Fix for issue #235 - added TODO to remove from *cal\_DARK* eventually. [Neil Cook]
- Fix for issue #235 changed BADPIX to *BADPIX\_OLD* for calibDB key. [Neil Cook]
- Added the *has\_plots=False* to exit script. [Neil Cook]
- Fix to issue #176 (unfinished) - avoids the importing of *cal\_HC* in unit tests running the code (currently doesn't have .main() for ease of debugging) [Neil Cook]
- Fix to issue #212 - *night\_name* now is allowed a backslash at the end and now gives error if incorrectly defined (before wasn't checked specifically) fix to issue regarding type of custom argument (was incorrect - big bug fixed - customarg recipes will now be able to run again) [Neil Cook]
- Updated date and versions. [Neil Cook]
- Fix for issue #218 - threshold in *find\_order\_centers* should be in constnats file - also updated documentation with new constant. [Neil Cook]
- Issue #219 - Added PP function aliases to spirouImage (called in *cal\_preprocess\_spirou*) [Neil Cook]
- Issue #219 - pre-processing add Etienne's code to recipe- added functions “*ref\_top\_bottom*”, “*median\_filter\_dark\_amp*”, “*median\_one\_over\_f\_noise*” [Neil Cook]
- Issue #219 - pre-processing add Etienne's code to recipe. [Neil Cook]
- Issue #219 - Add Etienne's pre-processing code to recipe. [Neil Cook]

#### 4.4.458 0.2.004 (2018-04-19)

- Fix to handling of custom arguments to accept only a list of filenames. [Neil Cook]
- New way to handle files (with wildcards built in) [Neil Cook]
- Dealing with Issue #219 - pre-processing - unfinished. [Neil Cook]

#### 4.4.459 0.2.003 (2018-04-18)

- Fix to Issue #215 - spirouImage.WriteImage do not use dtype='float64' [Neil Cook]
- Fix to Issue #215 - spirouImage.WriteImage do not use dtype='float64' [Neil Cook]

#### 4.4.460 0.2.001 (2018-04-17)

- Continuation of Issue #176 - writing *cal\_HC* - very stuck on replacing fitgaus.fitgaus. [Neil Cook]
- Fix for Issue #183 - now checks module and version. [Neil Cook]
- Merge pull request #208 from njcuk9999/master. [Neil Cook]  
update to master
- Merge pull request #205 from njcuk9999/neil. [Neil Cook]  
Neil
- Change to doc logo size. [Neil Cook]
- Change to doc logo size. [Neil Cook]
- Edit - test version needed main. [Neil Cook]
- Merge pull request #204 from njcuk9999/dev. [Neil Cook]  
Merge pull request #201 from njcuk9999/master

- Merge pull request #201 from njcuk9999/master. [Neil Cook]  
update to master
- Merge pull request #203 from njcuk9999/melissa. [Neil Cook]  
Merge pull request #202 from njcuk9999/master
- Merge pull request #202 from njcuk9999/master. [Neil Cook]  
update to master
- Merge pull request #200 from njcuk9999/neil. [Neil Cook]  
Neil
- Updated documentation and added example custom configs to config folder. [Neil Cook]
- Issue # 193 - matplotlib dependency. [Neil Cook]
- Merge pull request #199 from njcuk9999/master. [Neil Cook]  
merge
- Merge pull request #197 from njcuk9999/neil. [Neil Cook]  
Neil
- Issue # 194 - Fix to python version string parsing failing if format isn't as expected. [Neil Cook]
- Merge pull request #196 from njcuk9999/import-fixes. [Neil Cook]  
Import fixes
- Update spirouPlot.py. [Neil Cook]  
added `__test_smoothed_boxmean_image` temporarily to spirouPlot.py
- Update spirouLOCOR.py. [Neil Cook]  
remove `__test_smoothed_boxmean_image` from here (isn't needed)
- Update spirouPlot.py. [Neil Cook]

#### 4.4.461 0.2.002 (2018-04-17)

- Copied the matplotlib backend fix into spirouLOCOR.py. [Chris Usher]
- Only import IPython when it will be used. [Chris Usher]
- Prevent failed import for missing matplotlib backends. [Chris Usher]
- Merge pull request #192 from njcuk9999/revert-191-melissa. [Neil Cook]  
Revert "Melissa"
- Revert "Melissa" [Neil Cook]
- Merge pull request #191 from njcuk9999/melissa. [Neil Cook]  
Melissa - updated to master
- Merge branch 'master' into melissa. [Neil Cook]
- Merge pull request #190 from njcuk9999/isabelle. [Neil Cook]  
Merge pull request #188 from njcuk9999/master
- Merge pull request #188 from njcuk9999/master. [Neil Cook]  
update to master
- Merge pull request #189 from njcuk9999/francois. [Neil Cook]  
Merge pull request #187 from njcuk9999/master
- Merge pull request #187 from njcuk9999/master. [Neil Cook]  
update to master
- Merge pull request #182 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge pull request #181 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge pull request #180 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge pull request #179 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge pull request #178 from njcuk9999/neil. [Neil Cook]  
Merge pull request #177 from njcuk9999/master
- Preprocessing script (currently does rotation only) [melissa-hobson]

#### 4.4.462 0.1.037 (2018-04-16)

- Spirou tools addition - compare two files (plot images and diff in a user-friendly manner) [Neil Cook]
- Issue #176 - continued development of *find\_lines*. [Neil Cook]
- Issue #176 - Added FirstGuessSolution alias to init. [Neil Cook]
- Issue #176 - continued to build *cal\_HC\_E2DS*. [Neil Cook]
- Fix for bug introduced in last build - *night\_name* now set in *arg\_file\_names*. [Neil Cook]
- Merge from Melissa - H4RG *constants\_SPIROU* file (values set from Melissa) [Neil Cook]
- Merge from Melissa - update *constants\_SPIROU\_H2RG* with pep8 styling. [Neil Cook]
- Merge from Melissa - switch between constants in H2RG and H4RG now *constants\_SPIROU.py* is different for both. [Neil Cook]
- Merge from Melissa - pre-processing script for H4RG images (currently only rotation) [Neil Cook]

#### 4.4.463 0.1.036 (2018-04-13)

- Issue #176 - Added catalogue line lists to SpirouDRS data folder. [Neil Cook]
- Issue 176 - continued update of *first\_guess\_solution* (unfinished), added *find\_lines* function (unfinished), added *fit\_emi\_line* (unfinished) [Neil Cook]
- Fit gaussian moved to spirouCore.spirouMath. [Neil Cook]
- Read table modified to display number of columns on error. [Neil Cook]
- Issue #176 - read line list function modified. [Neil Cook]
- Added overwrite to hdu.writeto function in spirouFits.writeimage function. [Neil Cook]
- Issue #176 - alias for ReadLineList. [Neil Cook]
- Moved fit gaussian to spirouMath. [Neil Cook]
- Issue #185 and #186 - *kw\_ACQTIME\_KEY* and *kw\_ACQTIME\_KEY\_UNIX* are different between H2RG and H4RG. [Neil Cook]
- Issue #185 and #186 - *DATE\_FMT\_HEADER* now requires p to function. [Neil Cook]
- Issue #185 and #186 - *DATE\_FMT\_HEADER* now requires p to function. [Neil Cook]
- Issue #186 - added "*ic\_image\_type*", Issue #176 - modified *ic\_lamp* types. [Neil Cook]
- Issue #186 - modified *DRS\_UCONFIG* for H2RG/H4RG configs. [Neil Cook]
- Issue #176 - modified to allow running without function (temporarily) [Neil Cook]

#### 4.4.464 0.1.035 (2018-04-12)

- Issue #176 - added *get\_lamp\_parameters*, *first\_guess\_at\_wave\_soltuion* (unfinished), and *decide\_on\_lamp\_type* functions. [Neil Cook]
- Issue #176 - added GetLampParams alias. [Neil Cook]
- Issue #176 - renamed *cdata\_folder*. [Neil Cook]
- Issue #176 - created a *read\_line\_list* function (unfinished) [Neil Cook]
- Issue #176 - modified GetFile call (with required key) [Neil Cook]
- Issue #176 - added *correct\_flat* function. [Neil Cook]
- Issue #176 - added CorrectFlat. [Neil Cook]
- Issue #176 - renamed cdata folder - make it more clear it is a relative path. [Neil Cook]
- Issue #176 - modifications to *get\_file\_name*. [Neil Cook]
- Issue #176 - added some *cal\_HC* params. [Neil Cook]
- Issue #176 - added fiber getting, application of flat and start of first guess at solution. [Neil Cook]
- Update to version ready for new alpha release 0.1.035. [Neil Cook]
- Update to version ready for new alpha release 0.1.035. [Neil Cook]
- Update to version ready for new alpha release 0.1.035. [Neil Cook]
- Update to version ready for new alpha release 0.1.035. [Neil Cook]
- Update to version ready for new alpha release 0.1.035. [Neil Cook]

#### 4.4.465 0.1.0349 (2018-04-11)

- Added unit test for *cal\_HC\_E2DS\_spirou*. [Neil Cook]

- Added hcone extraction to unit test. [Neil Cook]
- Replacement of rawfile with *p['ARG\_FILE\_DIR']* [Neil Cook]
- Replacement of rawfile with *p['ARG\_FILE\_DIR']* [Neil Cook]
- Place holder function for flat correction. [Neil Cook]
- Replacement of rawfile with *p['ARG\_FILE\_DIR']* [Neil Cook]
- Replacement of rawfile with *p['ARG\_FILE\_DIR']* [Neil Cook]
- Fix to issue #176 - in progress - updating *cal\_HC\_E2DS*. [Neil Cook]

#### 4.4.466 0.1.0348 (2018-04-09)

- Fix to issue #152 - User/Custom *config.py* file - rebuilt pdfs. [Neil Cook]
- Fix to issue #152 - User/Custom *config.py* file - updated documentation. [Neil Cook]
- Fix to issue #152 - User/Custom *config.py* file - updated documentation. [Neil Cook]
- Fix to issue #152 - User/Custom *config.py* file - rebuilt pdfs. [Neil Cook]
- Fix to issue #152 - User/Custom *config.py* file - updated documentation. [Neil Cook]
- Fix to issue #152 - User/Custom *config.py* file - updated documentation. [Neil Cook]
- Fix to issue #152 - User/Custom *config.py* file - updated documentation. [Neil Cook]
- Fix to issue #152 - User/Custom *config.py* file - updated documentation. [Neil Cook]
- Fix to issue #152 - User/Custom *config.py* file. [Neil Cook]
- Fix to issue #152 - User/Custom *config.py* file. [Neil Cook]
- Fix to issue #152 - User/Custom *config.py* file. [Neil Cook]
- Fix to issue #152 - User/Custom *config.py* file. [Neil Cook]
- Fix to issue #152 - User/Custom *config.py* file. [Neil Cook]
- Fix to issue #152 - User/Custom *config.py* file. [Neil Cook]
- Fix to issue #152 - User/Custom *config.py* file. [Neil Cook]
- Fix to issue #152 - User/Custom *config.py* file. [Neil Cook]
- Merge pull request #177 from njcuk9999/master. [Neil Cook]  
merge with master
- Merge pull request #175 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge pull request #172 from njcuk9999/neil. [Neil Cook]  
Neil
- Merge pull request #153 from njcuk9999/francois. [Neil Cook]  
Merge pull request #151 from njcuk9999/dev
- Merge pull request #151 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #150 from njcuk9999/dev. [Neil Cook]  
same?
- Merge pull request #149 from njcuk9999/dev. [Neil Cook]  
removed new constant (test)

#### 4.4.467 0.1.0346 (2018-04-06)

- Fix to issue #173 - Need a versioned text file. [Neil Cook]
- Fix to issue #174 - License required. [Neil Cook]
- Fixed call to python (was python3 now python) [Neil Cook]
- Fix issue #170 - PYTHONPATH in installation - what happens if not defined? [Neil Cook]
- Fix issue #170 - PYTHONPATH in installation - what happens if not defined? [Neil Cook]
- Fix issue #170 - PYTHONPATH in installation - what happens if not defined? [Neil Cook]
- Fix issue #170 - PYTHONPATH in installation - what happens if not defined? [Neil Cook]
- Fix issue #170 - PYTHONPATH in installation - what happens if not defined? [Neil Cook]
- Fix issue #170 - PYTHONPATH in installation - what happens if not defined? [Neil Cook]
- Fix issue #165 - *cal\_extract* plotting issue with bounding edges. [Neil Cook]
- Fix issue #163 - *cal\_ff* plot fit edges error. [Neil Cook]
- Fix issue #161 - *cal\_SLIT* plot wrong offset - offset is now corrected. [Neil Cook]
- Fixed plots closing automatically in an interactive session → now user is asked. [Neil Cook]

- Fix to issue #159 - updated fix giving several allowed backends. [Neil Cook]
- Fix to issue #159 - matplotlib plots freeze on macOSX. [Neil Cook]

#### 4.4.468 0.1.0344 (2018-04-05)

- Fixed typo in call to *deal\_with\_prefixes* (requires filename if p not defined) and fixed `__NAME__` [Neil Cook]
- Removed call to calibDB (note needed) [Neil Cook]
- Added quick mention of startswith, contains and endswith method to documentation. [Neil Cook]
- Added contains and endswith methods to ParamDict. [Neil Cook]
- Moved blank recipe to spirouTools. [Neil Cook]
- Wrote some generic tools: list raw/reduced/calib files (with filter), display calibDB (with date filter) [Neil Cook]
- DRS reset moved to spirouTools. [Neil Cook]
- Dependencies corrected and moved to SpirouTools. [Neil Cook]
- Moved tools to separate package. [Neil Cook]
- Updated change log with changes to calibdb. [Neil Cook]
- Added quiet modes for *run\_begin* and *load\_arguments*. [Neil Cook]
- CalibDB now also contains humantime and unixtime accessible from dictionary call. [Neil Cook]
- Updated module descriptions (based on changes) [Neil Cook]
- Fix of issue #156 - Parameter dictionary source dictionary not case insensitive. [Neil Cook]
- Fix of issue #162 - *cal\_SLIT* save TILT to file using Add1Dlist - slight change. [Neil Cook]
- Fix of issue #162 - *cal\_SLIT* save TILT to file using Add1Dlist. [Neil Cook]
- Fix of issue #171 - fixed *cal\_validate\_spirou* -> *cal\_validate\_spirou.py*. [Neil Cook]
- Fix of issue #168 - Documentation: chapter installation weird <PATH> variable #168. [Neil Cook]
- Fix of issue #166 - *cal\_DRIFTPEAK* should accept hc or fp. [Neil Cook]
- Fix of issue #164 - *cal\_extract* kind is incorrect. [Neil Cook]
- Fix of issue #160 - too many decimal places in quality control - fixed. [Neil Cook]
- Fix of issue #157 (Unix time doesn't match human time for UT) bug was only in "fake" wave solution files. [Neil Cook]
- Fixed Issue #154 (Installation type update to config.txt and *constants\_SPIROU.txt* (now .py files) [Neil Cook]
- Same? [Neil Cook]

#### 4.4.469 0.1.0342 (2018-03-28)

- Removed new constant (test) [Neil Cook]
- Merge pull request #147 from njcuk9999/dev. [Neil Cook]  
added new constant
- Added new constant. [Neil Cook]
- Merge pull request #146 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #145 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #144 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #143 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #142 from njcuk9999/dev. [Neil Cook]  
Dev

#### 4.4.470 0.1.034 (2018-03-25)

- New unit test (not comp full run) [Neil Cook]
- Updated date and version. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]



- Added new test full run no compare. [Neil Cook]

#### 4.4.471 0.1.033 (2018-03-22)

- New example 7. [Neil Cook]
- New example 6. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Updated versions and dates. [Neil Cook]
- Moved examples to subfolder. [Neil Cook]
- Moved examples to subfolder. [Neil Cook]
- Moved examples to subfolder. [Neil Cook]
- Moved examples to subfolder. [Neil Cook]
- Moved examples to subfolder. [Neil Cook]
- Moved examples to subfolder. [Neil Cook]
- Spelling check. [Neil Cook]
- Spelling check. [Neil Cook]
- Spelling check. [Neil Cook]
- Spelling check. [Neil Cook]
- Updates to comments. [Neil Cook]
- Spelling check. [Neil Cook]
- Fixed error in call. [Neil Cook]
- Updates to comments. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Update date and versions. [Neil Cook]
- Spell check. [Neil Cook]
- Spell check. [Neil Cook]
- Spell check. [Neil Cook]
- Spell check. [Neil Cook]
- Spell check. [Neil Cook]
- Page split. [Neil Cook]
- Added parameters to record file. [Neil Cook]
- Added *return\_filename* for added functionality. [Neil Cook]
- Improvements to telluric file - added header keys. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Updated edit date and versions. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]

#### 4.4.472 0.1.032 (2018-03-19)

- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]

- Corrected spelling. [Neil Cook]
- Corrected spelling. [Neil Cook]
- Merge pull request #141 from njcuk9999/dev. [Neil Cook]  
Dev
- Examples 5 convert to html. [Neil Cook]
- First commit - common python 3 functions different from old python 2. [Neil Cook]
- Merge pull request #140 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #139 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #138 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #137 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #136 from njcuk9999/dev. [Neil Cook]  
Dev

#### 4.4.473 0.1.031 (2018-03-14)

- Updated image size. [Neil Cook]
- Update readme. [Neil Cook]

#### 4.4.474 0.1.030 (2018-03-13)

- Conversion to html. [Neil Cook]
- First commit - using custom arguments. [Neil Cook]
- Update date and version. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Updated date and version. [Neil Cook]
- Updated docs for GetCustomFromRuntime function. [Neil Cook]
- Added spacer. [Neil Cook]
- Reformatted customargs (to be like *cal\_CCF*) for consistency. [Neil Cook]
- Example3 in html format. [Neil Cook]
- First commit - the debugger. [Neil Cook]
- Rerun code. [Neil Cook]

#### 4.4.475 0.1.029 (2018-03-07)

- Ipython notebooks converted to html. [Neil Cook]
- First commit: ipython notebook example: “What is a parameter dictionary?” [Neil Cook]
- First commit ipython notebook example1: “Calling recipes from python” [Neil Cook]
- Added blank template file. [Neil Cook]
- Updated date and version. [Neil Cook]
- Modified *read\_config\_file* to be able to return just filename. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Set *config\_file* name so sources are correct. [Neil Cook]
- Updated date and version. [Neil Cook]
- Set debug to 0. [Neil Cook]
- Updated exit message. [Neil Cook]
- Updated exit message. [Neil Cook]
- Updated exit message. [Neil Cook]
- Updated exit message. [Neil Cook]
- Updated exit message. [Neil Cook]
- Updated exit message. [Neil Cook]
- Updated exit message. [Neil Cook]
- Updated exit message. [Neil Cook]

- Updated exit message. [Neil Cook]
- Updated exit message. [Neil Cook]
- Updated exit message. [Neil Cook]
- Updated exit message. [Neil Cook]

#### 4.4.476 0.1.028 (2018-03-06)

- Added note about using texteidter and smart speechmarks. [Neil Cook]
- Fixed importing issues. [Neil Cook]
- Fixed importing issues. [Neil Cook]
- Fixed importing issues. [Neil Cook]
- Fixed importing issues. [Neil Cook]
- Updated date and version. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Updated date and version. [Neil Cook]
- Updated dependencies. [Neil Cook]
- Added a test of text file having bad (illegal) characters (non letters, punctuation, whitespace, digits) as defined by python string module. [Neil Cook]
- Added *.bash\_profile* for mac install. [Neil Cook]
- Added *.bash\_profile* for mac install. [Neil Cook]
- Test of bad characters. [Neil Cook]
- Added a run time debug option and reformatted logging. [Neil Cook]
- Merge remote-tracking branch 'origin/master' [Neil Cook]
- Merge pull request #135 from njcuk9999/dev. [Neil Cook]  
Merge pull request #134 from njcuk9999/master
- Merge pull request #134 from njcuk9999/master. [Neil Cook]  
sync
- Merge pull request #133 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #132 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #131 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #130 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #129 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #128 from njcuk9999/dev. [Neil Cook]  
pep8 fixes + suppress known-required exceptions
- Merge pull request #127 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #126 from njcuk9999/dev. [Neil Cook]  
Dev - confirm docs built and code runs
- Merge pull request #125 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #124 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #123 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #122 from njcuk9999/dev. [Neil Cook]  
major changes to code
- Merge pull request #121 from njcuk9999/dev. [Neil Cook]  
Dev
- Updated unit test - py2 error is valueerror not importerror. [Neil Cook]
- Updated unit test - py2 error is valueerror not importerror. [Neil Cook]

- Updated unit test - py2 error is valueerror not importerror. [Neil Cook]
- Updated unit test - py2 error is valueerror not importerror. [Neil Cook]

#### 4.4.477 0.1.027 (2018-03-01)

- Rebuilt pdfs. [Neil Cook]
- Updated tabbing in TOC. [Neil Cook]
- Updated versions and dates. [Neil Cook]
- Modified *initial\_file\_setup* to include a “contains” keyword, to make sure all files (*arg\_file\_names*) contain this substring if contains is not None. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Added description. [Neil Cook]
- Added chagnes to *initial\_file\_steup*. [Neil Cook]
- Added placeholder sections and added setup and exit sections. [Neil Cook]
- Modified recipe description. [Neil Cook]
- Modified recipe description. [Neil Cook]
- Modified recipe description. [Neil Cook]
- Modified recipe description. [Neil Cook]
- Modified recipe description. [Neil Cook]
- Modified recipe description. [Neil Cook]
- Modified recipe description. [Neil Cook]
- Modified recipe description. [Neil Cook]
- Modified recipe description. [Neil Cook]
- Modified recipe description. [Neil Cook]
- Modified recipe description. [Neil Cook]
- Updated pep8 fixes + added sys info. [Neil Cook]
- Updated *display\_title* and *display\_system\_info* doc strings. [Neil Cook]
- Added DisplayTitle and DisplaySysInfo aliases in *\_\_init\_\_* [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Updated dependencies with python versions. [Neil Cook]
- Added DisplayTitle and DisplaySysInfo to spirouStartup public functions. [Neil Cook]
- Twaeked import. [Neil Cook]

#### 4.4.478 0.1.026 (2018-02-27)

- Changed printing in function + added warning that user will reset all processed files. [Neil Cook]
- Changed printing in function. [Neil Cook]
- Changed *display\_title* function. [Neil Cook]
- Modified printlog function and added printcolour function. [Neil Cook]
- Added printlog and printcolour aliases. [Neil Cook]
- Added dependencies and updated latest versions of py modules. [Neil Cook]
- Added printlog and printcolour functions. [Neil Cook]
- Tweaked display title. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Fixed bug: *set\_souce* -> *set\_source*. [Neil Cook]
- Updated date and version. [Neil Cook]
- Minor text change. [Neil Cook]
- Corrected *cal\_loc* example and call. [Neil Cook]
- Update date and version. [Neil Cook]
- Add *get\_folder\_name* function and fix file name of comparison results file (name it by input program) [Neil Cook]
- Update test comparison dir. [Neil Cook]
- Update test comparison dir. [Neil Cook]
- Same? [Neil Cook]

- First commit - get dependencies for the drs (and current versions) [Neil Cook]
- Added source to *arg\_file\_names*, *nbframes* and *fitsfilename*. [Neil Cook]
- Corrected BIG bug (NBframes not redefined when *arg\_file\_names* redefined) [Neil Cook]
- Corrected error statement (format missing) [Neil Cook]
- Support astropy < 2.0.1 bug in *astro.io.fits* *hdu.scale* (this fixes it) [Neil Cook]
- Updated plot *imshow* should not take True and False array (convert to ints) [Neil Cook]
- Removed use of *tqdm* (unnecessary dependency) [Neil Cook]
- Added new page break for TOC. [Neil Cook]
- Example - slight change to format. [Neil Cook]

#### 4.4.479 0.1.025 (2018-02-26)

- Small fixes to refix pep8 across module/suppressing known and required pep8 exceptions. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes + doc strings. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Updated date and version. [Neil Cook]
- Added summary of properties and graphs section. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]
- Pep8 fixes. [Neil Cook]

#### 4.4.480 0.1.024 (2018-02-23)

- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Cal ccf figure 3. [Neil Cook]
- Cal ccf figure 2. [Neil Cook]
- Cal ccf figure 1. [Neil Cook]
- First commit of cal ccf recipe doc (unfinished) [Neil Cook]
- Updated reffile to e2ds file. [Neil Cook]
- Updated date and version. [Neil Cook]
- First commit - new faster version of telluric mask generation - using polyderivatives. [Neil Cook]
- Updated telluric 2d mask. [Neil Cook]
- Updated date and version. [Neil Cook]
- Added ccf filenames to variables. [Neil Cook]
- Added calccf recipe to inputs. [Neil Cook]
- Changed reffile to e2dsfile. [Neil Cook]
- Take some things out loop to speed up. [Neil Cook]

- Fixes to tilt above and below central fit (untested) [Neil Cook]
- Moved setting of `fitsfilename` and `arg_file_names` (when files is not None) to a separate function to deal with run time vs call. [Neil Cook]
- Moved some constants outside a loop. [Neil Cook]
- Added cal driftpeak figure. [Neil Cook]
- Added cal driftpeak figure. [Neil Cook]
- Added cal driftpeak figure. [Neil Cook]
- Added cal driftpeak figure. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Updated the versions and date. [Neil Cook]
- Updated the versions and date. [Neil Cook]
- Updated examples and interactive mode figures. [Neil Cook]

#### 4.4.481 0.1.023 (2018-02-21)

- Cal drift raw plot files for docs. [Neil Cook]
- Cal drift raw plot files for docs. [Neil Cook]
- Cal drift e2ds plot files for docs. [Neil Cook]
- Cal drift e2ds plot files for docs. [Neil Cook]
- First commit - cal drift recipe (unfinished) [Neil Cook]
- Updated quick todo list. [Neil Cook]
- Moved the `arg_file_name/fitsfilename` setting when we have custom args to after we read from runtime. [Neil Cook]
- Updated date and versions. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Updated date and versions. [Neil Cook]
- Added drift filenames. [Neil Cook]
- Updated todo list. [Neil Cook]
- Input the caldrift section. [Neil Cook]
- Fix for loadcalibdb. [Neil Cook]
- Fix for loadcalibdb. [Neil Cook]

#### 4.4.482 0.1.022 (2018-02-20)

- Major changes to code. [Neil Cook]

#### 4.4.483 0.1.021 (2018-02-19)

- Rebuilt pdfs. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Added extract figure. [Neil Cook]
- Added extract figure. [Neil Cook]
- Added extract figure. [Neil Cook]
- First commit of verify recipe section. [Neil Cook]
- First commit of extract recipe section. [Neil Cook]
- Added ReadBlazeFile. [Neil Cook]
- Updated doc strings and minor code fixes (for no header in writeimage) [Neil Cook]
- Updated date and versions. [Neil Cook]
- Added function to convert waveimage to interpreted spectrum. [Neil Cook]
- Updated date and version. [Neil Cook]
- Added extract file variables. [Neil Cook]

- Changed order + added input for extract and validate. [Neil Cook]
- Changes to example code run. [Neil Cook]
- Changes to example code run. [Neil Cook]
- Fixed cmdbox typo. [Neil Cook]
- Changed some doc strings. [Neil Cook]
- Changed comment. [Neil Cook]

#### 4.4.484 0.1.020 (2018-02-16)

- Update README.md. [Neil Cook]
- Merge pull request #120 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed tested and all run
- Rebuilt pdfs. [Neil Cook]
- Added current default files (for reset) [Neil Cook]
- First commit - a reset switch - setting DRS back to default. [Neil Cook]
- Added `mainfitsdir` for when we are using custom arguments, resorted functions, added `get_custom_arg_files_fitsfilename` to deal with setting `arg_file_names` and `fitsfilename` with custom arguments. [Neil Cook]
- Fixed problem with plot (`wave_ll` only for CCF - so use `x` instead) normally want “wave” [Neil Cook]
- Moved `log_file_name` getting to constants file. [Neil Cook]
- Added `log_file_name` to constants. [Neil Cook]
- Fixed bug for `arg_file_names` from custom args. [Neil Cook]
- Updated doc string. [Neil Cook]
- Added `mainfitsdir` for custom loadarguments. [Neil Cook]
- Merge pull request #119 from njcuk9999/dev. [Neil Cook]  
Dev
- Rebuilt pdf. [Neil Cook]
- Readded `cal_slit` plots for interactive sessions (accidentally overwritten) [Neil Cook]
- Readded `cal_FF_raw` plots for interactive sessions. [Neil Cook]
- Added `cal_FF_raw` plots for interactive sessions. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Added `cal_FF_raw` file definitions. [Neil Cook]
- Updated `cal_FF_raw` change log. [Neil Cook]
- Fixed errors in default recipe. [Neil Cook]
- Added paths for example files, fixed example run. [Neil Cook]
- Added paths for example files. [Neil Cook]
- Added all sections (previously empty) [Neil Cook]
- Added paths for example files. [Neil Cook]
- Added path for example file. [Neil Cook]
- Updated date and version. [Neil Cook]
- Updated date and version. [Neil Cook]
- Replace use of `log_opt` (not valid in `load_arguments`) with `DPROG` (Defaults to `sys.argv[0]`) [Neil Cook]
- Renamed `GetKwValues` to `GetKeywordValues`. [Neil Cook]
- Renamed `GetKwValues` to `GetKeywordValues`. [Neil Cook]
- Renamed `GetKwValues` to `GetKeywordValues`. [Neil Cook]
- Added blaze to calibDB. [Neil Cook]
- Merge pull request #118 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #117 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #116 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #115 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #114 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed untested
- Merge pull request #113 from njcuk9999/dev. [Neil Cook]

- Dev - confirmed docs only and docs build
- Merge pull request #112 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #111 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #110 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #109 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #108 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #107 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #106 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #105 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #104 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #103 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #102 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #101 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #100 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #99 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #98 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #97 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #96 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #95 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #94 from njcuk9999/dev. [Neil Cook]  
added test data link
- Merge pull request #93 from njcuk9999/dev. [Neil Cook]  
link to logo change

#### 4.4.485 0.1.019 (2018-02-15)

- Corrected need for mainfitsfile to define *arg\_file\_names* and fitsfilename. [Neil Cook]
- Corrected doc string typo. [Neil Cook]
- Added *return\_header/return\_shape* options to readdata function, corrected readrawdata function. [Neil Cook]
- First commit of telluric mask file (currently a pseudo-recipe) [Neil Cook]
- Updated doc strings. [Neil Cook]
- Changed typo and updated some doc strings. [Neil Cook]
- Fixed needing mainfitsfile for custom files. [Neil Cook]
- Fixed needing mainfitsfile for custom files. [Neil Cook]
- Updated edit date and version. [Neil Cook]
- Updated edit date and version. [Neil Cook]
- Added calff. [Neil Cook]
- First commit - blank *cal\_ff* recipe. [Neil Cook]



- Added package descriptions (from CTAN) [Neil Cook]
- Updated keys (missed *order\_profile*) [Neil Cook]

#### 4.4.486 0.1.018 (2018-02-14)

- *Cal\_slit* graphs. [Neil Cook]
- *Cal\_slit* graphs. [Neil Cook]
- *Cal\_slit* graphs. [Neil Cook]
- First commit - recipe for *cal\_slit\_spirou*. [Neil Cook]
- Added labels to slit plot (were missed before) [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Updated date and version info. [Neil Cook]
- Updated date and version info. [Neil Cook]
- Commented TOC separator (may use later to clean up) [Neil Cook]
- Removed TOC separator. [Neil Cook]
- Removed use of caption in favour of capt-of (screwdriver vs hammer) [Neil Cook]
- Added some named labels, fixed typo namdlabels -> namedlabels. [Neil Cook]
- Added calslit include. [Neil Cook]
- Added labels to sections. [Neil Cook]
- Corrected errors in windows sections (ref links) [Neil Cook]
- Added Interactive mode section. [Neil Cook]
- Fixed program call typo and ref to calDARK. [Neil Cook]
- Fixed subsection title and some paths. [Neil Cook]

#### 4.4.487 0.1.017 (2018-02-13)

- Cal loc figures. [Neil Cook]
- Windows environment figures. [Neil Cook]
- Display system info, moved header bar to a constant. [Neil Cook]
- Modified logger to accept printonly and logonly inputs. [Neil Cook]
- Updated version and date. [Neil Cook]
- Changed the windows installation section. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Modified end of code section to reflect changes. [Neil Cook]
- Modified doc string for logger. [Neil Cook]
- Updated shebang, added *exit\_script* dealing with interactive sessions in `__main__` call. [Neil Cook]
- Updated shebang. [Neil Cook]
- Updated shebang. [Neil Cook]
- Updated shebang. [Neil Cook]
- Updated shebang. [Neil Cook]
- Updated shebang. [Neil Cook]
- Updated shebang. [Neil Cook]
- Updated shebang. [Neil Cook]
- Updated shebang. [Neil Cook]
- Updated shebang. [Neil Cook]
- Updated shebang. [Neil Cook]
- Updated shebang. [Neil Cook]
- Updated shebang. [Neil Cook]
- Updated shebang and `__main__` exiting. [Neil Cook]
- Updated shebang and `__main__` exiting. [Neil Cook]
- Updated shebang and `__main__` exiting. [Neil Cook]
- Updated shebang and `__main__` exiting. [Neil Cook]
- Updated shebang. [Neil Cook]
- Updated shebang and `__main__` exiting. [Neil Cook]

- Updated shebang and `--main--` exiting. [Neil Cook]
- Updated shebang and `--main--` exiting. [Neil Cook]
- Updated shebang and `--main--` exiting. [Neil Cook]
- Updated shebang and `--main--` exiting. [Neil Cook]
- Updated shebang and `--main--` exiting. [Neil Cook]
- Updated shebang and `--main--` exiting. [Neil Cook]
- Updated shebang and `--main--` exiting. [Neil Cook]
- Updated shebang and `--main--` exiting. [Neil Cook]

#### 4.4.488 0.1.016 (2018-02-12)

- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Updated date and versions. [Neil Cook]
- Updated date and versions. [Neil Cook]
- Fix for only one file name in `readimage_and_combine`. [Neil Cook]
- Changed rawfits to orderpfile (name change) [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Change back to doc class comment. [Neil Cook]
- Change to doc class? [Neil Cook]
- Made cmdboxprints special breakable. [Neil Cook]
- Added some named labels and some new file names. [Neil Cook]
- Input calloc. [Neil Cook]
- Edited receipe. [Neil Cook]
- Edited receipe. [Neil Cook]
- Edited receipe. [Neil Cook]
- Edited receipe. [Neil Cook]

#### 4.4.489 0.1.015 (2018-02-09)

- Rebuilt pdfs. [Neil Cook]
- Moved calibration database loading to separate function (for custom arg recipes), tweaked functions accordingly, added getting of multi arguments (as last param) + wrapper around `get_file` (`get_files`) [Neil Cook]
- Added new aliases. [Neil Cook]
- Tweaked `readimage_and_combine` and `math_controller` to be more generic. [Neil Cook]
- Removed Config Error from messages (shouldn't be an error unless `error=error`) [Neil Cook]
- Added to custom arg section + added setup summary. [Neil Cook]
- Added/edited section. [Neil Cook]
- Rewrote section. [Neil Cook]
- Edited/updated doc strings. [Neil Cook]
- Edited/updated doc strings. [Neil Cook]
- Designed basic layout (setup + sections) [Neil Cook]
- Updated ghost template. [Neil Cook]
- Added loading of calibDB. [Neil Cook]
- Update date and version numbers. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Updated TILT and WAVE fixes (with todo) [Neil Cook]
- Updated tolist. [Neil Cook]
- Added indents to minipages, added alias/internal function definition. [Neil Cook]
- Added titles to some code boxes. [Neil Cook]
- Added titles to some code boxes. [Neil Cook]
- Added titles to some code boxes, changes paths for print outputs. [Neil Cook]
- Added some new packages to dependencies, added that custom args can be added to code boxes. [Neil Cook]
- Added recipe and module reference sections and some titles for calibDB text file examples. [Neil Cook]

- Changed a bashbox to a cmdbox. [Neil Cook]
- Added example of addition to calibration database. [Neil Cook]
- Updated indentation of minipages. [Neil Cook]
- Updated indentation of minipages. [Neil Cook]
- Updated indentation of minipages. [Neil Cook]
- Updated indentation of minipages. [Neil Cook]
- Updated indentation of minipages. [Neil Cook]
- Updated indentation of minipages. [Neil Cook]
- Updated indentation of minipages. [Neil Cook]
- Updated indentation of minipages. [Neil Cook]
- Updated indentation of minipages. [Neil Cook]
- Updated indentation of minipages. [Neil Cook]
- Updated indentation of minipages. [Neil Cook]
- Updated indentation of minipages. [Neil Cook]

#### 4.4.490 0.1.014 (2018-02-07)

- First commit - move recipe to individual file. [Neil Cook]
- First commit - move recipe to individual file. [Neil Cook]
- First commit - move recipe to individual file. [Neil Cook]
- First commit - move recipe to individual file. [Neil Cook]
- First commit - move recipe to individual file. [Neil Cook]
- Updated date and version. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Updated date and version. [Neil Cook]
- Updated the highlight parameters for doc string. [Neil Cook]
- Moved individual recipes to indivudal files. [Neil Cook]

#### 4.4.491 0.1.013 (2018-02-06)

- First commit module description for thorca. [Neil Cook]
- First commit module description for startup. [Neil Cook]
- Updated doc strings with p and loc descriptions. [Neil Cook]
- Updated doc strings with p and loc descriptions. [Neil Cook]
- Updated doc strings with p and loc descriptions. [Neil Cook]
- Updated wave to *wave\_ll*. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Added startup and THORCA. [Neil Cook]
- Added doc strings to RV tex file. [Neil Cook]
- Changed wave to *wave\_ll* in loc. [Neil Cook]

#### 4.4.492 0.1.012 (2018-02-05)

- Added spirouRV and spirouTHORCA imports to init. [Neil Cook]
- Started updating doc strings (p and loc) [unfinished] [Neil Cook]
- Started updating doc strings (p and loc) [unfinished] [Neil Cook]
- Updated date and version. [Neil Cook]
- Started module writing (incomplete) [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Added inputs. [Neil Cook]
- Updated imports. [Neil Cook]
- Removed unneeded comment for alias. [Neil Cook]
- Modified some doc strings. [Neil Cook]
- Refactored “imageLocSuperimp” -> “ImageLocSuperimp” [Neil Cook]

- Modified comments for several functions (more concise) [Neil Cook]
- Modified *doc\_string* for writeimage. [Neil Cook]
- Modified *doc\_string* for warninglogger. [Neil Cook]
- Added to *\_\_all\_\_* [Neil Cook]
- Modified *get\_keywords doc\_string*. [Neil Cook]
- Added doc strings for ConfigError methods. [Neil Cook]
- First commit - added doc strings + sub-module func descriptions (based on spirouBLANK.tex) [Neil Cook]
- First commit - added doc strings + sub-module func descriptions (based on spirouBLANK.tex) [Neil Cook]
- First commit - added doc strings + sub-module func descriptions (based on spirouBLANK.tex) [Neil Cook]
- First commit - added doc strings + sub-module func descriptions (based on spirouBLANK.tex) [Neil Cook]
- First commit - added doc strings + sub-module func descriptions (based on spirouBLANK.tex) [Neil Cook]
- First commit - added doc strings + sub-module func descriptions (based on spirouBLANK.tex) [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Changed subsection and section size in nav bar menu. [Neil Cook]
- Added spirouCore and spirouFLAT to constants , modified paths for WLOG, ParamDict and ConfigError (to module file) [Neil Cook]
- Added blue to the special cmd colours. [Neil Cook]
- Added introduction. [Neil Cook]
- Added doc strings. [Neil Cook]
- Changed default module tex file template. [Neil Cook]
- Refactor imageLocSuperimp -> ImageLocSuperimp. [Neil Cook]

#### 4.4.493 0.1.011 (2018-02-02)

- First commit - module tex file. [Neil Cook]
- First commit - module tex file. [Neil Cook]
- First commit - module tex file. [Neil Cook]
- First commit - module tex file. [Neil Cook]
- Edited doc string. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Changed size of subsubsection. [Neil Cook]
- Added new package. [Neil Cook]
- Added docstring tcbox. [Neil Cook]
- Changing format input module tex files. [Neil Cook]
- Updated doc strings with parameter dictionary descriptions. [Neil Cook]
- Updated doc strings with parameter dictionary descriptions. [Neil Cook]
- Updated date and version. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Updated latest edit and version. [Neil Cook]
- Updated some constants descriptions. [Neil Cook]

#### 4.4.494 0.1.010 (2018-02-01)

- Updated doc strings with parameter dictionary descriptions. [Neil Cook]
- Updated doc strings with parameter dictionary descriptions. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Updated date and version. [Neil Cook]
- Updated date and version. [Neil Cook]
- Add res to loc (for *debug\_locplot\_fit\_residual*) [Neil Cook]
- Update doc string (p and loc) [Neil Cook]
- Update doc string (p and loc) [Neil Cook]
- Update doc string (p and loc) [Neil Cook]

- Updated doc strings. [Neil Cook]
- Update doc string (p and loc) [Neil Cook]

#### 4.4.495 0.1.009 (2018-01-31)

- Updated doc strings. [Neil Cook]
- Updated doc strings. [Neil Cook]
- Updated doc strings. [Neil Cook]
- Removed doc strings + added `__all__` functions. [Neil Cook]
- Removed doc strings. [Neil Cook]
- Removed doc strings. [Neil Cook]
- Removed doc strings. [Neil Cook]
- Removed doc strings. [Neil Cook]
- Removed doc strings. [Neil Cook]
- Removed doc strings. [Neil Cook]
- Removed doc strings. [Neil Cook]
- Removed doc strings. [Neil Cook]
- Removed doc strings. [Neil Cook]
- Removed doc strings. [Neil Cook]
- Removed doc strings. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Updated date and version. [Neil Cook]
- Updated todo list. [Neil Cook]
- Cosmetic change to comment. [Neil Cook]

#### 4.4.496 0.1.008 (2018-01-30)

- Added spacing. [Neil Cook]
- Edit of doc string (unfinished) [Neil Cook]
- Create `DEFAULT_LOG_OPT()` from `sys.argv[0]` [Neil Cook]
- Replace `sys.argv[0]` in logs with `spirouConfig.Constant.DEFAULT_LOG_OPT()` [Neil Cook]
- Added doc strings, moved gaussian function and added some error handling. [Neil Cook]
- Moved gaussian function here. [Neil Cook]
- Added doc strings. [Neil Cook]
- Added doc strings. [Neil Cook]
- Corrected error `"mean_background"` -> `"mean_backgrd"` [Neil Cook]
- Updated back to my data folder. [Neil Cook]
- Rebuild pdfs. [Neil Cook]
- Updated version. [Neil Cook]
- Updated `doc_strings` and error handling. [Neil Cook]
- Updated `doc_strings` and error handling. [Neil Cook]
- Updated `doc_strings`. [Neil Cook]
- Updated version and date. [Neil Cook]
- Updated version and date. [Neil Cook]
- Added `badpix_norm_percentile` constant constant. [Neil Cook]
- Added `badpix_norm_percentile` constant constant. [Neil Cook]

#### 4.4.497 0.1.007 (2018-01-29)

- Rebuild pdf. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Updated versions + dates. [Neil Cook]
- Updated versions + dates. [Neil Cook]
- Updated versions + dates. [Neil Cook]
- Doc strings and error handling (unfinished) [Neil Cook]

- Doc strings and error handling (unfinished) [Neil Cook]
- Doc strings and error handling. [Neil Cook]
- Updated doc strings [unfinished] [Neil Cook]

#### 4.4.498 0.1.006 (2018-01-26)

- Added test help file - for *cal\_DARK\_spirou*. [Neil Cook]
- Updated todo list with help files that are needed. [Neil Cook]
- Update doc strings. [Neil Cook]
- Update doc string. [Neil Cook]
- Update doc strings + help file management. [Neil Cook]
- Update doc strings. [Neil Cook]
- Update doc strings. [Neil Cook]
- Update doc strings. [Neil Cook]
- Update doc strings, remove `__main__` [Neil Cook]
- Update doc strings. [Neil Cook]
- Update doc strings. [Neil Cook]
- Update doc strings. [Neil Cook]
- Update doc. [Neil Cook]
- Rebuild pdfs. [Neil Cook]
- Update todo list with man files need writing. [Neil Cook]
- Modified MANUAL FILE (corrected) [Neil Cook]
- Updated date and version. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Updated the date and version numbers. [Neil Cook]
- Added/corrected some cal drift variables. [Neil Cook]
- Added descriptions. [Neil Cook]
- Added doc string for sPlt. [Neil Cook]
- Added constant for drift peak. [Neil Cook]
- Fixed plotting function calls. [Neil Cook]
- Updated descriptions (UNFINISHED) [Neil Cook]
- Updated descriptions and unix/string time getting. [Neil Cook]
- Updated descriptions and unix/string time getting. [Neil Cook]
- Added doc strings + math time functions. [Neil Cook]
- Added more formats (defaults + log), removed main code. [Neil Cook]
- Updated config error. [Neil Cook]
- Updated descriptions and unix/string time getting. [Neil Cook]

#### 4.4.499 0.1.005 (2018-01-24)

- Update versions + date. [Neil Cook]
- Rebuild pdfs. [Neil Cook]
- Version + date update. [Neil Cook]
- Updated `__all__` [Neil Cook]
- Added to warninglogger (funcname), changed end card colour. [Neil Cook]
- Added warnlog alias. [Neil Cook]
- Better error handling + reporting. [Neil Cook]
- Better error handling + reporting. [Neil Cook]
- Better error handling + reporting. [Neil Cook]
- Better error handling + reporting. [Neil Cook]
- Better error handling. [Neil Cook]
- Doc strings added. [Neil Cook]
- Doc strings added. [Neil Cook]
- Warnings added, better error handling. [Neil Cook]

- Update of code. [Neil Cook]
- Config param change (debug mode active) [Neil Cook]
- Submodule clean up and doc string writing. [Neil Cook]
- First commit of quick install guide. [Neil Cook]
- Added *DARK\_CUTLIMIT* to keyword used variables, added a hack to avoid not having config file *ICDP\_NAME* (will complain elsewhere) [Neil Cook]
- Added *DARK\_CUTLIMIT* to keyword used variables, added a hack to avoid not having config file *ICDP\_NAME*. [Neil Cook]
- Added logic for quick install guide (false) [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Fixed installDIR. [Neil Cook]
- Sorted out environment paths. [Neil Cook]
- Sorted out environment paths. [Neil Cook]
- Fixed debug mode. [Neil Cook]
- Fixed comment. [Neil Cook]
- Fixed init *\_\_all\_\_* call. [Neil Cook]
- Edited log to print message even if we cannot log to file. [Neil Cook]
- Updated version and latest edit date. [Neil Cook]
- Added additional way to read config file (slow using python open) or give good error message if cannot open. [Neil Cook]
- Allowed ConfigError “message” to take list as input. [Neil Cook]
- Streamlined config strings. [Neil Cook]
- Streamlined config strings. [Neil Cook]
- Fixed error with *DRS\_NAME*, *DRS\_VERSION*. [Neil Cook]

#### 4.4.500 0.1.004 (2018-01-22)

- Added test data link. [Neil Cook]
- Link to logo change. [Neil Cook]
- Merge pull request #92 from njcuk9999/dev. [Neil Cook]  
Merge pull request #91 from njcuk9999/master
- Merge pull request #91 from njcuk9999/master. [Neil Cook]  
merge
- Merge remote-tracking branch ‘origin/master’ [Neil Cook]
- Merge pull request #90 from njcuk9999/dev. [Neil Cook]  
Merge pull request #89 from njcuk9999/master
- Merge pull request #89 from njcuk9999/master. [Neil Cook]  
master to dev
- Rebuilt pdfs. [Neil Cook]
- Updated version. [Neil Cook]
- Added spacing to constants. [Neil Cook]
- Changed the cmd code boxes. [Neil Cook]
- Added a general section. [Neil Cook]
- Removed definevariablecmd variables. [Neil Cook]
- Added some namedlabels. [Neil Cook]
- Fixed typo in log message. [Neil Cook]
- Updated readme. [Neil Cook]
- Updated date and rebuilt. [Neil Cook]
- Added quick install chapter. [Neil Cook]
- Updated date + version. [Neil Cook]
- Rebuild pdfs. [Neil Cook]
- Updated version. [Neil Cook]
- Unchanged. [Neil Cook]
- Updated dirs. [Neil Cook]
- Fixed errors. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Updated log colouring. [Neil Cook]

- Updated paths. [Neil Cook]
- Added readme files. [Neil Cook]
- Added example data readme files. [Neil Cook]
- Added calibDB minimum files. [Neil Cook]
- Restructure of drs file. [Neil Cook]
- Merge pull request #88 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #87 from njcuk9999/dev. [Neil Cook]  
Merge pull request #86 from njcuk9999/master
- Rebuilt pdfs. [Neil Cook]
- Updated version. [Neil Cook]
- Added spacing to constants. [Neil Cook]
- Changed the cmd code boxes. [Neil Cook]
- Added a general section. [Neil Cook]
- Removed definevariablecmd variables. [Neil Cook]
- Added some namedlabels. [Neil Cook]
- Fixed typo in log message. [Neil Cook]
- Updated readme. [Neil Cook]
- Updated date and rebuilt. [Neil Cook]
- Added quick install chapter. [Neil Cook]
- Updated date + version. [Neil Cook]
- Rebuild pdfs. [Neil Cook]
- Updated version. [Neil Cook]
- Unchanged. [Neil Cook]
- Updated dirs. [Neil Cook]
- Fixed errors. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Updated log colouring. [Neil Cook]
- Updated paths. [Neil Cook]
- Added readme files. [Neil Cook]
- Added example data readme files. [Neil Cook]
- Added calibDB minimum files. [Neil Cook]
- Restructure of drs file. [Neil Cook]
- Updated version and date. [Neil Cook]
- Updated version and date. [Neil Cook]
- Merge pull request #86 from njcuk9999/master. [Neil Cook]  
merge

#### 4.4.501 0.1.003 (2018-01-16)

- Update README.md. [Neil Cook]
- Merge pull request #85 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed update
- Updated to alpha 0.1. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Updated to alpha 0.1. [Neil Cook]
- Merge pull request #84 from njcuk9999/dev. [Neil Cook]  
rotated speed table + rebuild pdf
- Rotated speed table + rebuild pdf. [Neil Cook]
- Merge pull request #83 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed doc + version updates
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Updated python module versions. [Neil Cook]
- Updated readme (quick manual out of date and useless - use pdfs) [Neil Cook]
- Updated dates and version. [Neil Cook]



- Updates architecture. [Neil Cook]
- Merge pull request #82 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed testing and doc
- *Cal\_ccf* fitting difference graph. [Neil Cook]
- *Cal\_dark* graph 3. [Neil Cook]
- *Cal\_dark* graph 2. [Neil Cook]
- *Cal\_dark* graph 1. [Neil Cook]
- Changed reporting of errors to “differences” [Neil Cook]
- First commit unit test including all current recipes (with comparison) + *cal\_drift\_raw* and *cal\_driftpeak\_e2ds*. [Neil Cook]
- Updated name of unit test 3. [Neil Cook]
- Updated name of unit test 2. [Neil Cook]
- Added new and old methods for calculating badpix normalisation constant (for testing purposes) [Neil Cook]
- Changed location of TOC page break. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Commented conflicting text (do not use memoir captions) [Neil Cook]
- Added new packages. [Neil Cook]
- Added new constants. [Neil Cook]
- Added named labels to some constants. [Neil Cook]
- Added calibdb section (unfinished) [Neil Cook]
- Updated todo list. [Neil Cook]
- Added caldark to recipes. [Neil Cook]
- Updated versions. [Neil Cook]
- Updated change log and moved around sections. [Neil Cook]
- Updated imports in placeholder file. [Neil Cook]
- Updated imports in placeholder file. [Neil Cook]
- Added reffilename to paramdict. [Neil Cook]
- Added to log printing in qc. [Neil Cook]
- Allowed norm median flat to be old or new method. [Neil Cook]
- Merge pull request #81 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #80 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed run and tested
- Merge pull request #79 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed doc changes
- Merge pull request #78 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed - *cal\_ccf* now runs
- Merge pull request #77 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed changes
- Merge pull request #76 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed tested
- Merge pull request #75 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed run
- Merge pull request #74 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed untested
- Merge pull request #73 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed *cal\_ccf* completed but not tested
- Merge pull request #72 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed *cal\_CCF* stuff
- Merge pull request #71 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed unfinished and untested
- Merge pull request #70 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #69 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #68 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #67 from njcuk9999/dev. [Neil Cook]

- Dev
- Merge pull request #66 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #65 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #64 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #63 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #62 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed checked for consistency and that codes run
- Merge pull request #61 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed *cal\_drift\_e2ds* not working
- Merge pull request #60 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed untested *cal\_badpix*
- Merge pull request #59 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed pdf build
- Merge pull request #58 from njcuk9999/dev. [Neil Cook]  
Dev - documentation edits: confirm pdf builds
- Merge pull request #57 from njcuk9999/dev. [Neil Cook]  
readme link update
- Merge pull request #56 from njcuk9999/dev. [Neil Cook]  
doc change - pdfs build correctly
- Merge pull request #55 from njcuk9999/dev. [Neil Cook]  
image change
- Merge pull request #54 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #53 from njcuk9999/dev. [Neil Cook]  
added pdf manuals to readme
- Merge pull request #52 from njcuk9999/dev. [Neil Cook]  
added pdf manuals to readme
- Merge pull request #51 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed documentation and cosmetic changes only
- Merge pull request #50 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #49 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #48 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #47 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #46 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #45 from njcuk9999/dev. [Neil Cook]  
Added latex gitignore
- Merge pull request #44 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #43 from njcuk9999/dev. [Neil Cook]  
updated links in table of contents
- Merge pull request #42 from njcuk9999/dev. [Neil Cook]  
Dev
- Delete fits2ramp.py. [eartigau]
- Add files via upload. [eartigau]  
latest version of fits2ramp
- Merge pull request #41 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #40 from njcuk9999/dev. [Neil Cook]  
Dev

- Merge pull request #39 from njcuk9999/dev. [Neil Cook]  
Dev - confirm run
- Merge pull request #38 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed cosmetic only
- Merge pull request #37 from njcuk9999/dev. [Neil Cook]  
Dev - confirm runs
- Merge pull request #36 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #35 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #34 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed checked runs and consistency
- Merge pull request #33 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed codes run + bug fixes are correct
- Merge pull request #32 from njcuk9999/dev. [Neil Cook]  
Dev - confirmed cosmetic nature - extract still not working (unfinished)
- Merge pull request #31 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #30 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #29 from njcuk9999/dev. [Neil Cook]  
readme update - confirmed
- Merge pull request #28 from njcuk9999/dev. [Neil Cook]  
confirmed consistency
- Merge pull request #27 from njcuk9999/dev. [Neil Cook]  
Confirm check of consistency
- Merge pull request #26 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #25 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #24 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #23 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #22 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #21 from njcuk9999/dev. [Neil Cook]  
added to general section, *cal\_dark* section and *cal\_loc* section
- Merge pull request #20 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #19 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #18 from njcuk9999/dev. [Neil Cook]  
confirmed runs and consistent
- Merge pull request #17 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #16 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #15 from njcuk9999/dev. [Neil Cook]  
cosmetic changes only - confirmed running
- Merge pull request #14 from njcuk9999/dev. [Neil Cook]  
Check runs and consistent (visually)
- Merge pull request #13 from njcuk9999/dev. [Neil Cook]  
checked they still run
- Merge pull request #12 from njcuk9999/dev. [Neil Cook]  
Tested consistency
- Merge pull request #11 from njcuk9999/dev. [Neil Cook]  
Confirmed still runs and same output

- Merge pull request #10 from njcuk9999/dev. [Neil Cook]  
Confirmed agrees with original code
- Merge pull request #9 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #8 from njcuk9999/dev. [Neil Cook]  
Tested and verified as consistent
- Merge pull request #7 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #6 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #5 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #4 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #3 from njcuk9999/dev. [Neil Cook]  
Dev
- Merge pull request #2 from njcuk9999/dev. [Neil Cook]  
push to master
- Merge pull request #1 from njcuk9999/dev. [Neil Cook]  
Commit to Master

#### 4.4.502 0.1.002 (2018-01-12)

- Updated progress. [Neil Cook]
- Rebuilt pdf file. [Neil Cook]
- Updated todo list. [Neil Cook]
- Added fortran python conversion (for test purposes only) [Neil Cook]
- Unignore fitgaus.so. [Neil Cook]
- Added fitgaus.f (for test purposes only) [Neil Cook]
- Added comparison + tests + nanstats in order to pass or fail found errors. [Neil Cook]
- Set a threshold for order of magnitude difference (in comparison) [Neil Cook]
- Added a *test\_fit\_ccf* to compare “fortran fit” with “python fit” [Neil Cook]
- Cosmetic comment fix. [Neil Cook]
- Added writeimage dtype fix. [Neil Cook]
- Added *kw\_drs\_QC* keyword. [Neil Cook]
- Cosmetic fixes. [Neil Cook]
- Moved qc and fixed header bugs. [Neil Cook]
- Fixed badpixelfits error. [Neil Cook]
- Added logs. [Neil Cook]
- Fixed header error. [Neil Cook]

#### 4.4.503 0.1.001 (2018-01-11)

- Updated progress. [Neil Cook]
- Fixed list not appending. [Neil Cook]
- First commit - comparison functions for old vs new test. [Neil Cook]
- Added ability to test outputs. [Neil Cook]
- Added aliases to utc. [Neil Cook]
- Added fiber definition to fiber loop. [Neil Cook]
- First commit *unit\_Test3* - testing the outputs. [Neil Cook]
- Added output assignment to all unit tests. [Neil Cook]
- Added output filename functions, reordered functions for better clarity. [Neil Cook]
- Removed output filenaming to spirouConfig.spirouConst. [Neil Cook]
- Removed output filenaming to spirouConfig.spirouConst. [Neil Cook]
- Removed output filenaming to spirouConfig.spirouConst. [Neil Cook]
- Removed output filenaming to spirouConfig.spirouConst. [Neil Cook]

- Removed output filenames to spirouConfig.spirouConst. [Neil Cook]
- Removed output filenames to spirouConfig.spirouConst. [Neil Cook]
- Added a question re fiber type for wave file. [Neil Cook]
- Updated version. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Modified date and version. [Neil Cook]
- Added *cdata\_folder* constant. [Neil Cook]
- Added spirouTHORCA placeholder section. [Neil Cook]
- Added *cal\_CCF* section. [Neil Cook]

#### 4.4.504 0.1.000 (2018-01-10)

- Readded *cal\_CCF* to unit test 2. [Neil Cook]
- Moved UrNe.mas to data folder. [Neil Cook]
- Added a *locate\_mask* function - to local file if filename is not a valid path and found by os.path.exists, make *ic\_debug drs\_debug==2*. [Neil Cook]
- Make *ic\_debug drs\_debug==2*. [Neil Cook]
- Corrected typo in debug plot. [Neil Cook]
- Added *CDATA\_FOLDER* constant. [Neil Cook]
- Added *get\_relative\_folder* function. [Neil Cook]
- Added aliases to init. [Neil Cook]
- Added removal of lockfile in generated error. [Neil Cook]
- Make *ic\_debug drs\_debug==2*. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Added spaces to some commands. [Neil Cook]
- Added listing style and tcolorbox to print out cmd prompt in colours red/yellow/green. [Neil Cook]
- Added to variables. [Neil Cook]
- Added to todo. [Neil Cook]
- Added coloured log section. [Neil Cook]
- Change log updated (ccf update needs doing) [Neil Cook]
- Debug mode explained in comments. [Neil Cook]
- Moved file. [Neil Cook]
- Make *ic\_debug drs\_debug==2*. [Neil Cook]
- Remove template logging (moved into spirouRv.GetCCFMask function. [Neil Cook]
- Removed *ic\_debug* and replaced with *drs\_debug*. [Neil Cook]
- Removed *ic\_debug* (replaced with *drs\_debug*) [Neil Cook]
- Added an option in *debug\_start* to allow no coloured text. [Neil Cook]
- Changed order to allow reading of config file (to access certain parameters without running recipe) [Neil Cook]
- First commit - config file reading (base level no drs imports allowed) [Neil Cook]
- Moved config file reading to new code. [Neil Cook]
- Removed *ic\_debug* (now *drs\_debug*) [Neil Cook]
- Added input keyword chapter for user. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Removed devguide if statements. [Neil Cook]
- Created named label command (to allow linking to individual text via phantom sections) [Neil Cook]
- Changed label to namedlabel. [Neil Cook]
- Changed label to namedlabel. [Neil Cook]
- Removed typo. [Neil Cook]
- Changed label to namedlabel. [Neil Cook]
- Changed label to named label. [Neil Cook]
- Made links to modules only for dev guide. [Neil Cook]
- Modified variables. [Neil Cook]
- Made most of input keywords section devguide only. [Neil Cook]
- Removed *ic\_debug* constant. [Neil Cook]
- Added *drs\_debug* and *coloured\_log* constants. [Neil Cook]
- Removed *ic\_debug* and replaced with *drs\_debug*. [Neil Cook]

- Removed *ic debug* and replaced with *drs debug*. [Neil Cook]

4.4.505 0.0.048 (2018-01-09)

- Fixed import and removed *cal\_CCF* (problem with code) from unit tests. [Neil Cook]
- Fixed import. [Neil Cook]
- Reformatted multi-line error message. [Neil Cook]
- Fixed comments. [Neil Cook]
- Better dealing with calibDB file. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Overhaul of define variable function. [Neil Cook]
- Overhaul of define variable function. [Neil Cook]
- Overhaul of define variable function. [Neil Cook]
- Overhaul of define variable function. [Neil Cook]
- Overhaul of define variable function. [Neil Cook]
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- Overhaul of define variable function. [Neil Cook]
- Overhaul of define variable function. [Neil Cook]
- Overhaul of define variable function. [Neil Cook]
- Overhaul of define variable function. [Neil Cook]
- Readdd *qc\_max\_signal*, added *calib\_db\_match* constant. [Neil Cook]
- Placeholder for *cal\_WAVE*. [Neil Cook]
- Placeholder for *cal\_HC*. [Neil Cook]
- Moved wave into fiber loop (now needs fiber) [Neil Cook]
- Added calibdb prefix (from update to V48) [Neil Cook]

4.4.506 0.0.046 (2018-01-08)

- Updated text for conversion from .txt to .py config files. [Neil Cook]
- Added *return\_locals* for debugging purposes. [Neil Cook]
- Added aliases for *unit\_test\_functions*. [Neil Cook]
- Added/modified renamed functions for setup, changed errors that span multiple lines to list argument for logger. [Neil Cook]
- Added/modified renamed functions for setup. [Neil Cook]
- Removed call to unused constant (update to V48) [Neil Cook]
- Corrected change for update to V48. [Neil Cook]
- Updated text for config files from .txt to .py conversion. [Neil Cook]
- Allow list log messages, coloured log messages, and launch debugger in DEBUG mode on error. [Neil Cook]
- Updated text for change of .txt config to .py. [Neil Cook]
- Added colour levels and debug pseudo constants. [Neil Cook]
- Fixed error with getting dictionaries from config files. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Added qc constants. [Neil Cook]
- Converts to py file (but still read as text file) + added some qc constants. [Neil Cook]
- Converts to py file (but still read as text file) [Neil Cook]
- Moved exit function to top, changed startup alias. [Neil Cook]
- Updated for V48 of old code. [Neil Cook]
- Updated for V48 of old code. [Neil Cook]
- Updated for V48 of old code. [Neil Cook]
- Modified startup functions. [Neil Cook]
- Modified startup functions. [Neil Cook]

- Modified startup functions. [Neil Cook]
- Modified startup functions. [Neil Cook]
- Added date and release type to codes for modules. [Neil Cook]
- Added date and release type to codes for recipes. [Neil Cook]
- Rebuilt pdfs after variables changes. [Neil Cook]
- Unit test 2 now uses *unit\_test\_functions*. [Neil Cook]
- Unit test 1 now uses *unit\_test\_functions*. [Neil Cook]
- Moved argument definitions of unit tests to functions file (can call from multiple files without having to update all) [Neil Cook]
- Modified *create\_drift\_file* (V48 update) [Neil Cook]
- Added fiber to 'WAVE' calib key (V48 update) [Neil Cook]
- Added *drift\_peak\_plot\_llpeak\_amps* function (V48 update) [Neil Cook]
- Added *calib\_prefix* const function. [Neil Cook]
- Updated descriptions of *drift\_peak* variables. [Neil Cook]
- Added and updated *drift\_peak* constants. [Neil Cook]
- Added 'ALL' fiber type option and error if *fiber\_type* is not understood. [Neil Cook]
- Updated to version 48 (untested) [Neil Cook]
- Updated to version 48 (untested) [Neil Cook]

#### 4.4.507 0.0.045 (2017-12-21)

- Added coravelation and sub functions, added ccf fit functions and misc functions. [Neil Cook]
- Added aliases for coravelation and fitccf. [Neil Cook]
- Added ccf plots. [Neil Cook]
- Added ccf keywords. [Neil Cook]
- Added ccf table and fits pseudo constants. [Neil Cook]
- Added ccf constants. [Neil Cook]
- Unchanged. [Neil Cook]
- Unchanged. [Neil Cook]
- Unchanged. [Neil Cook]
- Added correlation sections - code finished but untested. [Neil Cook]
- What. [Neil Cook]

#### 4.4.508 0.0.044 (2017-12-20)

- Temporarily put mask in bin folder (where does it go?) [Neil Cook]
- Corrected mistakes in *get\_e2ds\_ll*. [Neil Cook]
- Added aliases for getll and getdll. [Neil Cook]
- Added to coravelation function (not finished), added *calculate\_ccf* function (not finished), added *raw\_correlbin* function, added correlbin function (not finished) [Neil Cook]
- Added to coravelation function (not finished), added *calculate\_ccf* function (not finished), added *raw\_correlbin* function, added correlbin function (not finished) [Neil Cook]
- Fixed error in *read\_table* (with colnames != None) [Neil Cook]
- Added keyword. [Neil Cook]
- Updated configerror error message. [Neil Cook]
- Added constants. [Neil Cook]
- Added data to loc. [Neil Cook]

#### 4.4.509 0.0.043 (2017-12-19)

- Need to finish code. [Neil Cook]
- Redefined wave getting (GetE2DSll) and added a micron mask checking section. Code unfinished. [Neil Cook]
- First commit added *get\_e2ds\_ll*, *get\_ll\_from\_coefficients*, and *get\_dll\_from\_coefficients* functions. [Neil Cook]
- First commit added GetE2DSll alias. [Neil Cook]

- Need to finish coravelation function. [Neil Cook]
- Added *get\_ccf\_mask* function, added coravelation function (not finished) [Neil Cook]
- Added to *write\_table*, added *read\_table* function, added *update\_docs* function and call to function at end. [Neil Cook]
- Modified *read\_wave\_file*. [Neil Cook]
- Added ReadTable alias. [Neil Cook]
- Added keywords to use list. [Neil Cook]
- Added *cal\_CCF* keywords (input from *WAVE\_AB*) [Neil Cook]
- Added GetKwValues alias to *get\_keyword\_values\_from\_header*. [Neil Cook]
- Cosmetic changes to comments. [Neil Cook]

#### 4.4.510 0.0.042 (2017-12-18)

- First commit (similar to *cal\_drift\_e2ds*) – currently unfinished. [Neil Cook]
- Modified *get\_custom\_from\_run\_time\_Args* function (Added for function arguments) to allow more functionality, commented old function. [Neil Cook]
- Added start of *get\_ccf\_mask* function (not finished) [Neil Cook]
- Added alias to *get\_ccf\_mask* (GetCCFMask) [Neil Cook]
- Added ability to define x and y in *drift\_plot\_Selected\_wave\_ref*. [Neil Cook]
- Added two *cal\_CCF* constants. [Neil Cook]
- Added dividers between sections 2.7 - 2.10. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Updated progress. [Neil Cook]

#### 4.4.511 0.0.041 (2017-12-14)

- Rebuilt pdf. [Neil Cook]
- Updated *drift\_peak\_exp\_width* function calls. [Neil Cook]
- Changed hardcoded width to width from constant in *get\_drift()* [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Added TOC page divider. [Neil Cook]
- Added caldriftpeak command. [Neil Cook]
- Added drift peak section and constants. [Neil Cook]
- Updated constants. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Deep copy on speref in *create\_drift\_file* function, other modifications to correct errors. [Neil Cook]
- Corrected errors in *drift\_peak\_plot\_dtime\_against\_drift*. [Neil Cook]
- Added to change log. [Neil Cook]
- Added drift-peak constants. [Neil Cook]
- Fixes to *cal\_drift-peak* - now works in gaussfit and non-gaussfit mode. [Neil Cook]

#### 4.4.512 0.0.040 (2017-12-13)

- Rebuild pdf. [Neil Cook]
- Updated todo list. [Neil Cook]
- Updated progress in readme. [Neil Cook]
- Added drift-peak plot to documentation figures. [Neil Cook]
- Added RV aliases. [Neil Cook]
- Corrected some code, added warning catch, added *sigma\_clip* function, added *drift\_per\_order* and *drift\_all\_orders* functions. [Neil Cook]
- Added *drift\_peak* plot, *drift\_plot\_correlation\_comp* and working function. [Neil Cook]
- Added *drift\_peak* constants. [Neil Cook]
- Cosmetic change to logging. [Neil Cook]
- Cosmetic change to logging. [Neil Cook]
- Added many sections (code finished - untested) [Neil Cook]



#### 4.4.513 0.0.039 (2017-12-12)

- Corrected `cal_drift_e2ds` test (file was wrong) [Neil Cook]
- First commit - copy of `cal_drift_e2ds` - in process of modifying - not tested. [Neil Cook]
- Added global `c` constant, added `create_drift_file`, `gauss_function`, `remove_wide_peaks`, `remove_zero_peaks`, `get_drift`, `pearson_rtest` functions (not tested) [Neil Cook]
- Rearranged function aliases, added `drift_peak` function aliases. [Neil Cook]
- Change MeasureMinMax function name. [Neil Cook]
- Added `append_source`, `append_sources`, `append_all` methods to ParamDict. [Neil Cook]
- Changed doc string of `measure_box_min_max`. [Neil Cook]
- Added drift constants. [Neil Cook]
- Change MeasureMinMax function name. [Neil Cook]
- Change MeasureMinMax function name. [Neil Cook]
- Cosmetic changes. [Neil Cook]
- Cosmetic changes. [Neil Cook]

#### 4.4.514 0.0.038 (2017-12-11)

- Updated readme progress. [Neil Cook]
- First commit unit test 2. [Neil Cook]
- Updated latest edit date. [Neil Cook]
- Updated todo list. [Neil Cook]
- Removed unneeded comment. [Neil Cook]
- Checked against old versions and updated edit date. [Neil Cook]
- Checked against old versions and updated edit date. [Neil Cook]
- Checked against old versions and updated edit date. [Neil Cook]
- Checked against old versions and updated edit date. [Neil Cook]
- Checked against old versions and updated edit date. [Neil Cook]
- Checked against old versions and updated edit date. [Neil Cook]
- Checked against old versions and updated edit date. [Neil Cook]
- Checked against old versions and updated edit date. [Neil Cook]
- Checked against old versions and updated edit date, added `badpix` key. [Neil Cook]
- Checked against old versions and updated edit date. [Neil Cook]

#### 4.4.515 0.0.037 (2017-12-08)

- Rebuild pdfs. [Neil Cook]
- Updated readme. [Neil Cook]
- Updated readme. [Neil Cook]
- Added description of some variables. [Neil Cook]
- Added to changelog. [Neil Cook]
- Fixed `fibertype` function (now got from constants) [Neil Cook]
- Fixed bug with `LOC_FILE` not being used. [Neil Cook]
- Added `root` to copy root keys - now works as supposed to (only copies keys with `root` not all keys) [Neil Cook]
- Moved `ww` calc to function and calculating for all unique combinations (up to 4) of `ww0` and `ww1` (caused by rounding) [Neil Cook]
- Added `closeall` function, modified `ext` and `drift` functions. [Neil Cook]
- Changed `root_drs` keywords (now used in code) [Neil Cook]
- Rebuild pdfs. [Neil Cook]
- Updated date. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Added `DRIFT-E2DS` and changed `rootdrs` keywords. [Neil Cook]
- Updated todo list. [Neil Cook]
- Removed duplicate sections (i.e. drifts should all be in one section etc), renamed placeholder sections. [Neil Cook]

- Added new extract and drift constants, added spacing. [Neil Cook]
- Added new extract and drift keywords. [Neil Cook]
- Added *fiber\_types*, reworked extract and drift constants. [Neil Cook]
- Added return locals. [Neil Cook]
- Added return locals. [Neil Cook]
- Added return locals. [Neil Cook]
- Added return locals. [Neil Cook]
- Added return locals, added extra input to make like old extractrawC. [Neil Cook]
- Added return locals, added extra input to make like old extractrawAB. [Neil Cook]
- Added return locals, fixed changes from old to new. [Neil Cook]
- Added return locals, fixed minor differences. [Neil Cook]
- Added return locals, fixed minor differences between old and new code. [Neil Cook]
- Added return locals. [Neil Cook]
- Returned locals. [Neil Cook]

#### 4.4.516 0.0.036 (2017-12-07)

- Added *get\_fiber\_type* function. [Neil Cook]
- Added Get Fiber type function. [Neil Cook]
- Modified *get\_all\_similar\_files*. [Neil Cook]
- Added readdata function and modified readimage, added *read\_flat\_file* function. [Neil Cook]
- Added MakeTable and WriteTable to init. [Neil Cook]
- Made sure we dont get filename unless we need it in *get\_acquisition\_time*. [Neil Cook]
- Added extra drift constants. [Neil Cook]
- Updated. [Neil Cook]
- First commit (no working) [Neil Cook]
- Changed *\_\_main\_\_* to *main()* in sources. [Neil Cook]
- Updated readme with badpix section. [Neil Cook]
- Corrected typo in wmed - in *normalise\_median\_flat* function (*flat\_median\_width* to *badpix\_flat\_med\_wid*) [Neil Cook]
- Corrected type (comma) in *USE\_KEYS*. [Neil Cook]
- Rebuild pdfs. [Neil Cook]
- Added numbered pdf bookmarks + contents to bookmarks. [Neil Cook]
- Added TOC commands to change spacing in TOC. [Neil Cook]
- Added tocloft package. [Neil Cook]
- Added calbadpix constant. [Neil Cook]
- Added badpix section. [Neil Cook]
- Updated todo section. [Neil Cook]
- Added badpix section. [Neil Cook]
- Added badpix section. [Neil Cook]
- Added badpix constants. [Neil Cook]
- Fixed badpixelfits construction. [Neil Cook]

#### 4.4.517 0.0.035 (2017-12-06)

- Moved *unit\_Test1* to unit test module. [Neil Cook]
- First commit if unit test init file. [Neil Cook]
- Modified *run\_time\_custom\_args* (now works and tested), added *get\_custom\_from\_run\_time\_args* and *get\_file* functions, modified *display\_custom\_args* function. [Neil Cook]
- Added GetCustomFromRuntime and GetFile aliases. [Neil Cook]
- Added *normalise\_median\_flux* and *locate\_bad\_pixel* functions. [Neil Cook]
- Added functionality to readimage. [Neil Cook]
- Added LocateBadPixels and NormMedianFlat aliases. [Neil Cook]
- Added badpix keywords. [Neil Cook]
- Added startswith function to ParamDict. [Neil Cook]
- Rebuilt pdf. [Neil Cook]

- Cosmetic changes to commenting. [Neil Cook]
- Commented packages. [Neil Cook]
- Updated to-do list. [Neil Cook]
- Added placeholder module sections. [Neil Cook]
- Added badpix constants. [Neil Cook]
- Fixed Addkey not assigning to hdict. [Neil Cook]
- First commit *cal\_BADPIX*. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Added to question. [Neil Cook]
- First commit to do list chapter. [Neil Cook]
- First commit documentation chapter. [Neil Cook]
- Added todolist and documentation chapters to main tex. [Neil Cook]
- Added package ulem (For strikethrough) removed duplicate packages. [Neil Cook]
- Removed visibility level from pseudoparamentry. [Neil Cook]
- Added latexbox (and latexbox1) [Neil Cook]
- Removed visibility level for pseudo code (should be all private) [Neil Cook]
- Added new code sections. [Neil Cook]
- Added latex code example. [Neil Cook]

#### 4.4.518 0.0.034 (2017-12-05)

- First commit of *output\_keywords* chapter (filled and completed) [Neil Cook]
- Added *output\_keywords* chapter. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Added keyword aliases. [Neil Cook]
- Added keywordentry command (similar to parameterentry) [Neil Cook]
- Added escaping to inline python text. [Neil Cook]
- Added text. [Neil Cook]
- Readme link update. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuild pdf. [Neil Cook]
- Cosmetic change. [Neil Cook]
- Added *EXIT\_LEVELS* definition. [Neil Cook]
- Changed exit vairable to *log\_exit\_type*. [Neil Cook]
- Added main init paramdict commands and move mac command. [Neil Cook]
- Changed title size to tiny. [Neil Cook]
- Changed title size to tiny. [Neil Cook]
- Modified sections. [Neil Cook]
- Added section. [Neil Cook]
- Removed sections added intro paragraph. [Neil Cook]

#### 4.4.519 0.0.033 (2017-12-04)

- Image change. [Neil Cook]
- Image change. [Neil Cook]
- Added pdf manuals to readme. [Neil Cook]
- Added pdf manuals to readme. [Neil Cook]
- Added pdf manuals to readme. [Neil Cook]
- Added pdf manuals to readme. [Neil Cook]
- Cosmetic changes only. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Removed *.py* from recipe command added more hskips for module commands. [Neil Cook]
- Added psuedoparamentry command. [Neil Cook]
- Added blank pythonbox tcblisting. [Neil Cook]

- Added sections. [Neil Cook]
- Changed note to dev note. [Neil Cook]
- Wrote section (from readme) [Neil Cook]

#### 4.4.520 0.0.032 (2017-12-01)

- Rebuilt pdf. [Neil Cook]
- Corrected syntax errors and line breaking. [Neil Cook]
- Rebuilt pdf files. [Neil Cook]
- Changed coi to *os\_fac* and called from *ic\_tilt\_coi*. [Neil Cook]
- Added getting *DRS\_NAME* and *DRS\_VERSION* from *spirouConfig.Constants*. [Neil Cook]
- Moved the internal hyperlink setup out of preamble. [Neil Cook]
- Moved the internal hyperlink setup out of preamble. [Neil Cook]
- Added module aliases, added *hslip 0pt* for long variable names (so they can split on line break) [Neil Cook]
- Moved colour definitions to commands, modified *ParameterEntry* to add called from form (for devguide only) [Neil Cook]
- Moved colour definitions to commands. [Neil Cook]
- Reformatted *ParameterEntry* (added call from for devguide), added many new variables (still not complete) [Neil Cook]
- Added error if *calibDB* file does not exist (and proper exception + log/print message) [Neil Cook]
- Corrected typo. [Neil Cook]
- Added sources for some constants, renamed coi to *ic\_tilt\_coi*. [Neil Cook]
- Added source for *fib\_type*. [Neil Cook]

#### 4.4.521 0.0.031 (2017-11-30)

- Cosmetic change to spacing. [Neil Cook]
- Added placeholder sections. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Changed the user manual from yellow to red (and updated the margin label) [Neil Cook]
- Changed the level of green on the dev margin. [Neil Cook]
- Added new constants. [Neil Cook]
- Modified *ParameterEntry* command. [Neil Cook]
- Added a python inline style. [Neil Cook]
- Added variable file locations section, image variable section, fiber variable section, dark calibration section. [Neil Cook]
- Minor spelling changes to comments. [Neil Cook]
- Rebuilt pdfs. [Neil Cook]
- Now getting *DRS\_NAME* and *DRS\_VERSION* from *spirouConfig.Consants*. [Neil Cook]
- Added a *NAME* function constant. [Neil Cook]
- Added *spirouCONST* and *spirouKeywords* constants. [Neil Cook]
- Added minipage to parameter definition (to force items on one page) [Neil Cook]
- Modified *drs\_name* and *drs\_version* - only in dev version. [Neil Cook]
- Removed *drs\_name* and *drs\_version* from *config.txt* (now in *spirouConst*) [Neil Cook]

#### 4.4.522 0.0.030 (2017-11-29)

- Rebuilt pdf files. [Neil Cook]
- Renamed preamble to preamble. [Neil Cook]
- First commit of preamble file. [Neil Cook]
- First commit of packages file. [Neil Cook]
- First commit of merged variables file. [Neil Cook]
- First commit of merged recipes file. [Neil Cook]
- First commit of merged intro file. [Neil Cook]
- Updated folder path for figures in readme. [Neil Cook]
- Rebuilt pdf files. [Neil Cook]

- Moved bulk of same code to packages file and preamble file, added ifdevguide (to distinguish between dev and user) added coloured border, moved chapters around after merges. [Neil Cook]
- Added masterclibddbfile, configtxtfile, acqtimekey, folderdateformat constants. [Neil Cook]
- Added paraeter command and devnote devsection (all dependent on devguide or userguide) [Neil Cook]
- Attempted breakable tcolorbox. [Neil Cook]
- First full commit - wrote section. [Neil Cook]
- Corrected spelling and added command in place of filename. [Neil Cook]
- Added from old manual. [Neil Cook]
- Added more sections. [Neil Cook]
- Deleted (not used) [Neil Cook]
- Deleted and merged dev and user. [Neil Cook]
- Deleted and merged dev and user. [Neil Cook]
- Deleted. [Neil Cook]
- Deleted and merged dev and user. [Neil Cook]
- Deleted and merged dev and user. [Neil Cook]
- Deleted and merged dev and user. [Neil Cook]
- Deleted and merged dev and user. [Neil Cook]
- Deleted and merged dev and user. [Neil Cook]

#### 4.4.523 0.0.029 (2017-11-28)

- First commit of user version of *data\_architecture* (not to be kept - use if statements?) [Neil Cook]
- First commit of dev version of *data\_architecture* (not to be kept - use if statements?) [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Rebuilt pdf. [Neil Cook]
- Added packages, modified abstract (noindent) [Neil Cook]
- Added packages, modified abstract (noindent) [Neil Cook]
- Ignored .listing files. [Neil Cook]
- Added recipe constants. [Neil Cook]
- Added a definevariablecmd function (cyan instead of blue for definevariable) [Neil Cook]
- Complete redo of code formatting (using newtcblistings) [Neil Cook]
- Updated label for chapter. [Neil Cook]
- Updated label for chapter. [Neil Cook]
- Updated label for chapter. [Neil Cook]
- Added code blocks section. [Neil Cook]
- Added code block sections. [Neil Cook]
- Updated notes to environment, code to code environments. [Neil Cook]
- Added folder layout section, installation root dir section, bin dir section, spirou module directory section. [Neil Cook]
- Renamed *cal\_validate\_drs* to *cal\_validate\_spirou*. [Neil Cook]

#### 4.4.524 0.0.028 (2017-11-27)

- Added latex gitignore. [Neil Cook]
- Memoir chapter styles (for pdf building) [Neil Cook]
- First commit dev guide. [Neil Cook]
- First commit user guide. [Neil Cook]
- Added logo to figures. [Neil Cook]
- Added constants first commit. [Neil Cook]
- Added commands (from old manual) [Neil Cook]
- Added coding formats (using new styles) [Neil Cook]
- Added installation process (first commit) for linux+mac and windows. [Neil Cook]
- What. [Neil Cook]
- Added placeholder first commit tex files (empty other than title) [Neil Cook]
- Updated progress in readme (with documentation needs) [Neil Cook]

- Added a function to check write level, corrected bug in logging (was *print\_level* needed to be *log\_level*) [Neil Cook]
- Added logo to documentation files. [Neil Cook]
- Edited comments. [Neil Cook]
- Added validation code (to test imports and display user setup) [Neil Cook]
- Updated links in table of contents. [Neil Cook]

#### 4.4.525 0.0.027 (2017-11-24)

- Updated section naming in readme. [Neil Cook]
- Added installation process to readme. [Neil Cook]
- Added *ic\_ext\_all* constant. [Neil Cook]
- Added timing to debug run. [Neil Cook]
- Added possibility to save all extraction types to file (simple, tilt, tiltweight, weight) [Neil Cook]
- Added timed unit tests sections. [Neil Cook]
- Corrected unit test. [Neil Cook]

#### 4.4.526 0.0.026 (2017-11-23)

- Made unit test compatible with python 2 (ordered dict) [Neil Cook]
- Updated progress in readme. [Neil Cook]
- Added to table of contents, added section 2.3 (to be filled out like section 2.2) [Neil Cook]
- Imported division from *\_\_future\_\_* (to make sure all division is float division not int), cleaned up code, applied pep8 conventions. [Neil Cook]
- Removed debug timing stuff. [Neil Cook]
- Update readme with *cal\_extract* and *cal\_drift* sections, added unit test timing section. [Neil Cook]
- Renamed *run\_inital\_startup* to *run\_initial\_startup*. [Neil Cook]
- Wrapper around *cal\_extract\_RAW\_spirou* to allow *fiber\_type* defined as 'C' [Neil Cook]
- Wrapper around *cal\_extract\_RAW\_spirou* to define AB as the fiber type. [Neil Cook]
- First commit - unit test for all tested files (with timings) [Neil Cook]
- Modified *run\_inital\_startup* function to allow *night\_name* and files arguments to be passed from main function calls. [Neil Cook]
- Moved *measure\_dark* function here from *cal\_DARK\_spirou*, added 'human'/'unix' time to *get\_acqtime*. [Neil Cook]
- Added alias to MeasureDark function. [Neil Cook]
- Cosmetic change to *\_\_all\_\_* [Neil Cook]
- Added *drift\_plot\_dtime\_Against\_mdriфт* function. [Neil Cook]
- Added *kw\_ACQTIME\_KEY\_UNIX*. [Neil Cook]
- Modified *ARG\_FILE\_NAMES* and *ARG\_NIGHT\_NAME* to accept value already in p (from function call over command line arguments) [Neil Cook]
- Added human/unix acqtime getting. [Neil Cook]
- Added *ic\_drift\_n\_order\_max* parameter, cosmetic changes (spaces between sections increased) [Neil Cook]
- Moved *\_\_main\_\_* code to main function. [Neil Cook]
- Moved *\_\_main\_\_* code to main function. [Neil Cook]
- Moved *\_\_main\_\_* code to main function. [Neil Cook]
- Moved *\_\_main\_\_* code to main function. [Neil Cook]
- Moved *\_\_main\_\_* code to main function, added rv properties section, added plot section, added save drift values to file section. [Neil Cook]
- Moved *\_\_main\_\_* code to main function. [Neil Cook]

#### 4.4.527 0.0.025 (2017-11-22)

- Cosmetic changes to layout. [Neil Cook]
- Fixed some bugs, added compute cosmic+renorm section, added calculate RV drift section. [Neil Cook]
- Changed *mask1* and *mask* to flag in *delta\_v\_rms\_2d*, added *renormalise\_cosmic2d* and *calculate\_RV\_drifts\_2D* functions. [Neil Cook]

- Added aliases for ReNormCosmic2D and CalcRVdrift2D. [Neil Cook]
- Fixed error in *get\_all\_similar\_files* (filelist not returned) [Neil Cook]
- Fixed error in *drift\_plot\_photon\_uncertainty* ('number\_orders' in loc not p) [Neil Cook]
- Added *ic\_drift\_cut*, renamed *ic\_dv\_maxflux* and *ic\_dv\_boxsize*. [Neil Cook]

#### 4.4.528 0.0.024 (2017-11-21)

- Modified readme with change in plot function. [Neil Cook]
- Added imports, added startup section, read ref image section, get basic ref props section, resize ref image section, get loc/tilt/wave sections, merge coeffs section, extract ref section, computer dvrms section, plot ref section, get all files section, started all file loop (not finished) [Neil Cook]
- First commit, added *delta\_v\_rms\_2d* function. [Neil Cook]
- Added *get\_all\_similar\_files* function, modified *correct\_for\_dark* function (now can return dark for use later), modified *get\_exptime*, *get\_gain*, *get\_sigdet*, *get\_param*, added *get\_acqtime*. [Neil Cook]
- Redefined readimage (no combining) and added *readimage\_and\_combine* (to do reading and combining), updated readimage functions throughout. [Neil Cook]
- Updated *\_\_all\_\_* [Neil Cook]
- Added GetAllSimilarFiles, GetAcqTime, ReadImage and ReadImageAndCombine functions. [Neil Cook]
- Modified extract functions to have and look for keywords in function calls before using defaults (allows customisation) [Neil Cook]
- Renamed plots for clarity, added *drift\_plot\_selected\_wave\_ref*, *drift\_plot\_photo\_uncertainty*. [Neil Cook]
- Added filename arg to *get\_acquisition\_time* and code to deal with it. [Neil Cook]
- Added *ic\_ext\_d\_range\_fpall*, *ic\_drift\_noise*, *ic\_dv\_maxflux*, *ic\_dv\_boxsize*, *drift\_nlarge*, *drift\_file\_skip*, modified *ic\_ext\_range\_fpall*. [Neil Cook]
- Renamed ReadImage to ReadImageAndCombine for clarity and renamed plotting functions (for clarity) [Neil Cook]
- Renamed ReadImage to ReadImageAndCombine for clarity and renamed plotting functions (for clarity) [Neil Cook]
- Renamed ReadImage to ReadImageAndCombine for clarity, changed fiber to p['fiber'], and renamed plotting functions (for clarity) [Neil Cook]
- Renamed ReadImage to ReadImageAndCombine for clarity. [Neil Cook]
- Renamed ReadImage to ReadImageAndCombine for clarity. [Neil Cook]

#### 4.4.529 0.0.023 (2017-11-20)

- Updated progress section. [Neil Cook]
- Added function *copy\_root\_keys* function, modified *read\_header* function. [Neil Cook]
- Added alias for CopyRootKeys to init and *\_\_all\_\_* [Neil Cook]
- Modified *extract\_AB\_order*, *extract\_order*, *extract\_tilt\_order*, *extract\_tilt\_weight\_order*, *extract\_tilt\_weight\_order2*, *extract\_weight\_order*, *extract\_const\_range*, *extract\_const\_range\_fortran*, *extract\_const\_range\_wrong* and *extract\_wrapper* added code for *extract\_tilt*, *extract\_weight*, *extract\_tilt\_weight2*, *extract\_tilt\_weight*, *extract*, *check\_for\_none*, *get\_tilt\_matrix*. [Neil Cook]
- Updated *\_\_all\_\_* [Neil Cook]
- Added alias to ExtractTiltWeightOrder2. [Neil Cook]
- Added *cal\_extract* plot functions. [Neil Cook]
- Moved EXIT definition to constants. [Neil Cook]
- Added *kw\_LOCO\_FILE* keyword. [Neil Cook]
- Added EXIT function (to return exit statement based on *log\_exit\_type()*) [Neil Cook]
- Added *ic\_ext\_range\_fpall*, modified *ic\_ff\_plot\_all\_orders*, added *ic\_extmeanzone* constants. [Neil Cook]
- Renamed extracttiltweightorder function to extracttiltweightorder2. [Neil Cook]
- Added timing to extraction comparison, corrected noise calculation, added plot section, added saving e2ds to file. [Neil Cook]

#### 4.4.530 0.0.021 (2017-11-17)

- Added p to spiouCDB.GetDatabase (for *max\_time* constants) [Neil Cook]

- Added p to `spiouCDB.GetDatabase` (for `max_time` constants), added read out of `max_time` in error (helps to identify why error was caused) [Neil Cook]
- Fixed call to `spirouEXTOR.ExtractABOrder`, added p to `spiouCDB.GetDatabase` (for `max_time` constants) [Neil Cook]
- Fixed error in `add_key_2d_list`. [Neil Cook]
- Fixed `selected_order_fit_and_edges`, added function `all_order_fit_and_edges`. [Neil Cook]
- Added `stringtime2unixtime` and `unixtime2stringtime` functions (fixed from `spirouCDB`) [Neil Cook]
- Added `DATE_FMT_HEADER` and `DATE_FMT_CALIBDB` constants. [Neil Cook]
- Added `ic_ff_plot_all_orders` constant, fixed `loc_file_fpall` and `orderp_file_fpall`. [Neil Cook]
- Fixed `acqtime` key error, fixed time getting error (inconsistent times), made check that times are consistent, added `max_time_human` and `max_time_unix` to p. [Neil Cook]
- Added due test mode. [Neil Cook]
- Added due test mode, added plot all orders (instead of just selected) - slower, added flat to `calibDB`. [Neil Cook]
- Modified imports, added version/author from constants. [Neil Cook]
- Modified imports, added version/author from constants, and added `__all__` function. [Neil Cook]
- Modified imports, added version/author from constants, changed `lloc` to `loc`, added functions for `extract_order`, `extract_order_0`, `extract_tilt_order`, `extract_weight_order` (None currently working) - will need to edit `extract_wrapper` to make work. [Neil Cook]
- Modified imports, added version/author from constants and interactive plot constant. [Neil Cook]
- Modified imports, added version/author from constants, added `TRIG_KEY`, `WRITE_LEVEL`, `EXIT` and `WARN` from constants, added `CONFIG_KEY_ERROR` warning. [Neil Cook]
- Added constants `PACKAGE()`, `VERSION()`, `AUTHORS()`, `LATEST_EDIT()`, `CONFIGFOLDER()`, `CONFIGFILE()`, `INTERACTIVE_PLOT_ENABLED()`, `LOG_TRIG_KEYS()`, `WRITE_LEVEL()`, `LOG_EXIT_TYPE()`, `LOG_CAUGHT_WARNINGS()`, `CONFIG_KEY_ERROR`, add set version and author from constants. [Neil Cook]
- Modified imports, added version/author from constants, added package `config_file`, `configfolder` and `trig` key from Constants. [Neil Cook]
- Modified imports, added version/author from constants. [Neil Cook]
- Modified imports, added version/author from constants. [Neil Cook]
- Modified imports, added version/author from constants. [Neil Cook]
- Modified imports, added version/author from constants, added `__all__` aliases, added printing of sub-package names. [Neil Cook]
- First commit, modified imports, added version/author from constants, added `__all__` aliases, moved `RunInitialStartup` and `RunStartup` here (from `SpirouCore`) [Neil Cook]
- Modified imports, added version/author from constants, added `__all__` aliases. [Neil Cook]
- Modified imports, added version/author from constants, added `__all__` aliases, added aliases for different extraction types. [Neil Cook]
- Modified imports, added version/author from constants, added `__all__` aliases, moved `RunInitialStartup` and `RunStartup` to `spirouStartup` module. [Neil Cook]
- Modified imports, added version/author from constants, added `__all__` aliases. [Neil Cook]
- Modified imports, added version/author from constants, added `__all__` aliases. [Neil Cook]
- Modified imports, added version/author from constants, added `__all__` aliases. [Neil Cook]
- Edited comments for `ic_extopt`. [Neil Cook]
- Modified imports, moved `spirouStartup` to own module, added calls to extract functions. [Neil Cook]
- Modified imports, moved `spirouStartup` to separate module. [Neil Cook]
- Modified `get_loc_coefficients` to look for keyword '`LOC_FILE`' [Neil Cook]
- Added key to arguments of `read_tilt_file` function, added `read_wave_file` function, modified `read_order_profile_superposition` to look for keyword '`ORDERP_FILE`' [Neil Cook]
- Added `ReadWaveFile` alias. [Neil Cook]
- Added A and B to fiber type parameters, added `loc_fil` and `orderp_file` parameters. [Neil Cook]
- Moved `dprtype` from header getting section, added fiber A B and AB replacement for AB (in merging coefficients) [Neil Cook]
- Added read image section, added basic image properties section, added correction of dark, added resize image, added the logging of dead pixels, added minmax `max_signal` section, added background computation section, added tilt reading section, added wave solution reading section, added localaization coefficient getting section, added order profile getting section, added order loop, added noise/flux/SNR calculation, added saturation warning section, added quality control section. [Neil Cook]



#### 4.4.531 0.0.020 (2017-11-16)

- Add calibDB to p in startup if calibdb required (should be faster than reloading it each time) [Neil Cook]
- Corrected *cal\_ff* extractiltweightorder spelling mistake. [Neil Cook]
- Added check for calibDB in p. [Neil Cook]
- Added check for 'calibDB' in p. [Neil Cook]
- Moved *forbidden\_copy\_keys* to constants, added *get\_type\_from\_header* function, added *read\_raw\_header* function. [Neil Cook]
- Added GetTypeFromHeader alias to init. [Neil Cook]
- Added dealing with customargs and added *run\_time\_custom\_args* + *display\_custom\_args* functions. [Neil Cook]
- Added *kw\_DPRTYPE*. [Neil Cook]
- Added *FORBIDDEN\_COPY\_KEYS* constant. [Neil Cook]
- Added tests for calibDB in p. [Neil Cook]
- Reformatted comments on variables. [Neil Cook]
- Added dprtype find from header, modified test code. [Neil Cook]
- Added dprtype find from header, modified test code. [Neil Cook]
- Added dprtype find from header, modified test code. [Neil Cook]
- Added dprtype find from header, added test code, added *\_\_NAME\_\_*, added setup section. [Neil Cook]
- Added dprtype find from header, added test code. [Neil Cook]

#### 4.4.532 0.0.019 (2017-11-15)

- Added *cal\_FF\_RAW* summary of changes section, updated progress. [Neil Cook]
- Added *add\_key\_1d\_list* function, updated *add\_key\_2d\_list* to be more generic (with header comment) [Neil Cook]
- Added AddKey1DList alias to init. [Neil Cook]
- Added *selected\_order\_fit\_and\_edges*, *selected\_order\_tilt\_adjusted\_e2ds\_blaze* and *selected\_order\_flat* plot functions. [Neil Cook]
- Added *kw\_EXTRA\_SN* and *kw\_FLAT\_RMS*. [Neil Cook]
- Added *ic\_ff\_order\_plot* constant. [Neil Cook]
- Cosmetic change. [Neil Cook]
- Added plot section, added saving blaze and flat field section. [Neil Cook]

#### 4.4.533 0.0.018 (2017-11-14)

- Added *convert\_to\_adu* function, fixed *get\_gain/get\_sigdet/get\_param* functions. [Neil Cook]
- Removed reducedfolder call and fixed *order\_profile* key. [Neil Cook]
- Added ConvertToADU alias to init. [Neil Cook]
- First commit *spirouFLAT.py* added *measure\_blaze\_for\_order* function. [Neil Cook]
- First commit spirouFLAT init (added MeasureBlazeForOrder alias) [Neil Cook]
- Modified *extract\_tilt\_weight\_order* and *extract\_wrapper* functions, added *extract\_tilt\_weight* function and *extract\_tilt\_weight\_old* function. [Neil Cook]
- Fixed error in gain/exptime keyword. [Neil Cook]
- Fixed hard coded key in *get\_file\_name* function. [Neil Cook]
- Cosmetic change. [Neil Cook]
- Added *ic\_ff\_sigdet*, *ic\_extflaz*, *ic\_blaze\_fitn* constants. [Neil Cook]
- Added storage set up for extraction, added extract with tilt+weight loop, added skip for *max\_signal* QC. [Neil Cook]

#### 4.4.534 0.0.017 (2017-11-13)

- First commit, added some well used constants (constants but need input and functions so not formed from basic string/int/float/list) [Neil Cook]
- Reworked *fiber\_params* to get dictionaries of constants with particular suffix, added more logging to *get\_loc\_coefficients*, added *merge\_coefficients* function. [Neil Cook]

- Added mergecoefficients alias. [Neil Cook]
- Added masterfile constant, added *get\_gain*, *get\_sigdet*, *get\_param* functions. [Neil Cook]
- Moved bulk of getting file name from calibDB to spirouCDB, added *read\_order\_profile\_superposition* function. [Neil Cook]
- Added GetSigdet, GetExptime, GetGain and ReadOrderProfile aliases to init. [Neil Cook]
- Added *extract\_tilt\_weight\_order* function (not finished), added *extract\_tilt\_weight* skeleton code, changed *extraction\_wrapper* to fit changes of other functions. [Neil Cook]
- Added ExtractTiltWeightOrder alias to init file. [Neil Cook]
- Added reduced folder constant, fixed *calibdir* path on line 150 (now 149) [Neil Cook]
- Fixed logging to file (date wasn't working) [Neil Cook]
- Added sigdet, exptime and gain keywords, moved acqtime to "required header keys" section. [Neil Cook]
- Added *extract\_dict\_params* function. [Neil Cook]
- Added ExtractDictParam to init. [Neil Cook]
- Added raw and reduced dir constants, added new function *get\_file\_name*, added *lock\_file* and master file constants. [Neil Cook]
- Added GetFile command to init. [Neil Cook]
- Changed fiber param variables to dictionaries. [Neil Cook]
- Changed getting sigdet, exptime and gain to functions, added reduced folder constant, added new fiber params command. [Neil Cook]
- Changed getting sigdet, exptime and gain to functions, added reduced folder constant. [Neil Cook]
- Changed getting sigdet, exptime and gain to functions, added reduced folder constant, added read tilt slit angle, added start of fiber extract loop (not finished) [Neil Cook]
- Changed getting sigdet, exptime and gain to functions, added reduced folder constant. [Neil Cook]
- Added pep8 cosmetic corrections. [Neil Cook]
- Added pep8 cosmetic corrections. [Neil Cook]
- Added filename option to readimage function, added *read\_tilt\_file* function. [Neil Cook]
- Added ReadTiltFile to init. [Neil Cook]
- Added image to doc string for *extract\_AB\_order*. [Neil Cook]
- Added *ic\_tilt\_nbo* constant. [Neil Cook]
- Added space between comma. [Neil Cook]
- Added read tilt slit angle section. [Neil Cook]

#### 4.4.535 0.0.016 (2017-11-10)

- Added *fib\_type* to fiber types constants, added *cal\_ff* params, added a qc param. [Neil Cook]
- Moved *measure\_box\_min\_max* and *measure\_background\_and\_get\_central\_pixels* to spirouBACK. [Neil Cook]
- Added *measure\_background\_and\_get\_central\_pixels*, *measure\_box\_min\_max* to spirouBACK *measure\_background\_flatfield* (not finished) to init. [Neil Cook]
- Moved *measure\_background\_and\_get\_central\_pixels*, *measure\_box\_min\_max* to spirouBACK, added *measure\_background\_flatfield* (not finished) [Neil Cook]
- Moved *measure\_background\_and\_get\_central\_pixels*, *measure\_box\_min\_max* to spirouBACK. [Neil Cook]
- Moved MeasureBkgrdGetCentPixs to spirouBACK. [Neil Cook]
- Added setup section, added read image section, added correction of dark section, added resize image section, added *max\_signal* section. [Neil Cook]
- Changed ccdsigdet to sigdet, added test (no need to specific files) [Neil Cook]

#### 4.4.536 0.0.015 (2017-11-09)

- Added *cal\_slit* section. [Neil Cook]
- Stricked done progress. [Neil Cook]
- Added hlines. [Neil Cook]
- Edit table of contents, added back to top, added future sections. [Neil Cook]
- Added table of contents. [Neil Cook]
- Section numbering. [Neil Cook]
- Added WLOG update. [Neil Cook]

- Added WLOG update, and configError update. [Neil Cook]
- Added jpg py3 logo. [Neil Cook]
- Added picture as jpg. [Neil Cook]
- Changed path for plot. [Neil Cook]
- Correlation with a box test plot. [Neil Cook]
- Change test function for *smoothed\_boxmean\_image*. [Neil Cook]
- Added to general section, *cal\_dark* section and *cal\_loc* section. [Neil Cook]
- Moved *kw\_TILT* to own section. [Neil Cook]
- Edited description of slit param. [Neil Cook]

#### 4.4.537 0.0.014 (2017-11-08)

- Added doc string for extract and added ExtractABorder alias to init. [Neil Cook]
- Added FitTilt and GetTilt to init. [Neil Cook]
- Moved *extract\_AB\_order* here (from *cal\_SLIT\_spirou*) [Neil Cook]
- Removed *get\_tilt* and *fit\_fit* functions (to spirouImage) [Neil Cook]
- Moved *get\_tilt* and *fit\_fit* functions here. [Neil Cook]
- Added doc strings for slit plotting functions. [Neil Cook]
- Updated *USE\_KEYS* list formatting. [Neil Cook]
- Updated readme. [Neil Cook]
- Reworked *get\_tilt* function, added extract AB order function and fit fit function, added plotting section, added tilt calculation section, added todo quality control section, added update calibDB section. [Neil Cook]
- Added coi *ic\_tilt\_fit* and *ic\_slit\_order\_plot* constants. [Neil Cook]
- Added *kw\_TILT* keyword. [Neil Cook]
- Added slit plotting functions: *selected\_order\_plot* and *slit\_tilt\_angle\_and\_fit\_plot*. [Neil Cook]
- Added doc string for *extract\_wrapper*, *extract\_const\_range*, added test functions *extract\_const\_range\_fortran* and moved *extract\_const\_range* to *extract\_const\_range\_wrong* (updates former) [Neil Cook]
- Changed plt.ion to sPlt controller function. [Neil Cook]

#### 4.4.538 0.0.013 (2017-11-07)

- Added doc for *get\_loc\_coefficients*, *initial\_order\_fit*, *sigmaclip\_order\_fit* and *image\_localization\_superposition* added *calcualte\_location\_fits* function. [Neil Cook]
- First commit - added extract wrapper alias. [Neil Cook]
- First commit - added extract wrapper and first attempt at extract code. [Neil Cook]
- First commit - added fast polyval function. [Neil Cook]
- Added doc string comments for all functions. [Neil Cook]
- Edited *kw\_loco\_ctr\_coeff* and *kw\_loco\_fwhm\_coeff*. [Neil Cook]
- Allowed *max\_time* to be None and get *max\_time* from p['fitsfilename'] [Neil Cook]
- Added some slit parameters. [Neil Cook]
- Added extract function. [Neil Cook]
- Added test via sys.argv. [Neil Cook]
- Added *get\_loc\_coefficients* function. [Neil Cook]
- Added GetCoeffs to init. [Neil Cook]
- Called GetAcqTime in *correct\_for\_dark* function. [Neil Cook]
- Added *read\_header*, *read\_key* and *read\_key\_2d\_list* functions. [Neil Cook]
- Added ReadHeader, ReadKey, Read2Dkey to init. [Neil Cook]
- Added CopyCDBfiles call to *run\_startup* function. [Neil Cook]
- Added *get\_acquisition\_time* and *copy\_files* function. [Neil Cook]
- Added CopyCDB and GetAcqTime to init. [Neil Cook]
- Updates *cal\_SLIT* with *\_\_NAME\_\_* and new functions, updated startup section, added read image section, correction of dark section, resize image section, get coefficients section. [Neil Cook]
- Removed unused code from *cal\_loc\_RAW*. [Neil Cook]

#### 4.4.539 0.0.012 (2017-11-03)

- Updated comments in *constants\_SPIROU*. [Neil Cook]
- Added a label to *locplot\_order*. [Neil Cook]
- Changed splT to sPlt. [Neil Cook]

#### 4.4.540 0.0.011 (2017-11-02)

- Added timer, moved plots to spirouPlots, moved functions to spirouLOCOR, updated AddNewKey -> AddKey, added quality control section and add to calibDB section. [Neil Cook]
- Added timer, moved plots to spirouPlots, updated AddNewKey-> Addkey, [Neil Cook]
- Added *\_\_getitem\_\_*, *\_\_contains\_\_*, *\_\_delitem\_\_* functions, forced all keys to uppercase (now ParamDict is case-insensitive), added *source\_keys*, *\_\_capitalise\_keys\_\_*, *\_\_capitalise\_\_key\_\_* functions, added list to set of evaluate allowed types. [Neil Cook]
- Reloaded keywords *USE\_KEYS*, added ParamDict call, added *kw\_LOC* keys, added source to overwritten warning. [Neil Cook]
- Renamed AddNewKey to AddKey. [Neil Cook]
- Added wrapper function for *add\_new\_key* (*add\_new\_keys*), [Neil Cook]
- Renamed *image\_localization\_superposition* to *image\_localization\_superposition*. [Neil Cook]
- Added functions from *cal\_loc* -> spirouLOCOR, added *image\_localization\_superposition* function. [Neil Cook]
- Added functions from *cal\_loc* -> spirouLOCOR to init. [Neil Cook]
- Moved fiber variables to own section, added qc for *cal\_loc*. [Neil Cook]
- Changed keys as now param dict all uppercase. [Neil Cook]
- First commit - all plotting functions moved here. [Neil Cook]

#### 4.4.541 0.0.010 (2017-11-01)

- *Set\_source* for param dicts. [Neil Cook]
- *Set\_source* for param dicts. [Neil Cook]
- Renamed *set\_source* function to *set\_source\_for\_defaulting\_statements* (to avoid confusion) [Neil Cook]
- Added *set\_source*. [Neil Cook]
- Added documentation to ConfigException, added new class ParamDict (custom dictionary), added *set\_source* to param dicts and a *set\_source* function for dealing with default values from *check\_params()* [Neil Cook]
- Added ParamDict to init. [Neil Cook]
- Added set source + *c\_Database* -> ParamDict. [Neil Cook]
- Added set source + fparam -> ParamDict. [Neil Cook]
- Added set source + updated keywords to match spirouKeywords. [Neil Cook]

#### 4.4.542 0.0.009 (2017-10-31)

- Modified *measure\_background\_and\_get\_central\_pixels* to accept and return loc made a copy of data2 (data2o) for localisation with 0 on fit data dump added code for “Save and record of image of localization with order center and keywords” section added code for “Save and record of image of sigma” section placeholder code for “Save and Record of image of localization” section. [Neil Cook]
- Added empty holder for *image\_localization\_super* function (not finished) [Neil Cook]
- Updated call for *ACQTIME\_KEY* to *kw\_ACQTIME\_KEY*. [Neil Cook]
- Moved functions into sections added function “*add\_new\_key*” and “*add\_key\_2d\_list*” [Neil Cook]
- Updated init file. [Neil Cook]
- Updated call to spirouConfig moved *check\_params* moved *load\_other\_config\_file* (kept wrapper function for logging) [Neil Cook]
- Removed log constants (to spirouConfig) [Neil Cook]
- Updated spirouCore init. [Neil Cook]
- First commit moved from config/keywords. [Neil Cook]

- Moved some constants to here (*TRIG\_KEY*, *WRITE\_LEVEL*, *EXIT*) added config exception class added config error class moved *load\_config\_from\_file* from startup functions to spirouConfig added doc for *check\_config* moved *check\_params* from startup to spirouConfig created *get\_default\_config\_file* function. [Neil Cook]
- First commit for spirouConfig ini - moved config and keyword function calls to here. [Neil Cook]
- Added *ic\_locfitp*, *ic\_loc\_delta\_width*, *ic\_locopt1* to config file. [Neil Cook]
- Added *SPECIAL\_NAME* back to config. [Neil Cook]
- Updated function calls. [Neil Cook]
- Updated function calls. [Neil Cook]
- Added call to AddNewKey. [Neil Cook]

#### 4.4.543 0.0.008 (2017-10-30)

- File migration and new imports. [Neil Cook]
- File migration and new imports. [Neil Cook]
- File migration and new imports. [Neil Cook]
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- File migration and new imports. [Neil Cook]
- File migration and new imports. [Neil Cook]
- Tmp file for keyword args? - sort this out. [Neil Cook]
- File migration and new imports plot order num against rms. [Neil Cook]
- File migration and new imports. [Neil Cook]
- File migration and new imports. [Neil Cook]
- Reordered files. [Neil Cook]

#### 4.4.544 0.0.007 (2017-10-27)

- Reworked fit order into “initial order fit” and “*sigmaclip\_order\_fit*” added and tested order fitting sections. [Neil Cook]
- Added some more location parameters. [Neil Cook]
- Updated locate center order position into two functions. [Neil Cook]
- Return header from last “added” fits and set fitsfilename to last file (as in original code) - not sure it this is wanted but it is how it is. [Neil Cook]
- Changed *locate\_center\_order\_positions* to two functions one for center finding one for center + width of individual (subtle differences) [Neil Cook]

#### 4.4.545 0.0.006 (2017-10-26)

- Revert “added example of BoxSmoothedImage with mode ‘convolve’ vs ‘manual’” This reverts commit f7637bf. [Neil Cook]
- Changed the logged to exit via sys.exit. [Neil Cook]
- Added a minimum width requirement and return widths in “*locate\_center\_order\_position*” functions. [Neil Cook]
- Closed the hdu and added a header extension argument (default = 0) [Neil Cook]
- Changed name of *locate\_central\_position* alias. [Neil Cook]
- Added constants from *cal\_loc\_RAW\_spirou*. [Neil Cook]
- Added to position and width finding (incomplete + untested) [Neil Cook]
- Fixed formatting. [Neil Cook]
- Reformatted BoxSmoothedImage and LocateCentralPosition descriptions in change log. [Neil Cook]

- Wrapped for *locate\_order\_positions* to go between manual and convolve versions. [Neil Cook]
- Added more documentation for *smoothed\_boxmean\_image*. [Neil Cook]
- Added BoxSmoothedImage ‘convolve’ vs ‘manual’ change to change log. [Neil Cook]
- Added BoxSmoothedImage with mode ‘convolve’ vs ‘manual’ [Neil Cook]

#### 4.4.546 0.0.005 (2017-10-25)

- Added *locate\_central\_positions* function. [Neil Cook]
- Added some code for locating central positions. [Neil Cook]
- Removed sys.exit (now in WLOG for key=’error’) add a warning that parameter dictionary key is duplicated and overwrite when loading other config file. [Neil Cook]
- Added keys argument to *write\_file\_to\_master* added log statement to log updated calibDB. [Neil Cook]
- Moved *smoothed\_boxmean\_image* function to spirouLOCOR added function *measure\_box\_min\_max*. [Neil Cook]
- Moved *smoothed\_boxmean\_image* function to spirouLOCOR. [Neil Cook]
- Corrected typo ‘Adding’ -> ‘ADD’ [Neil Cook]
- Updates init with boxsmoothedminmax moved boxsmoothed image to spirouLOCOR. [Neil Cook]
- Added config readme at top added some *cal\_loc* variables added -[code] tag to comments to show where constant is used (currently) [Neil Cook]
- Added measure background function and *plot\_y\_min\_y\_max* and *plot\_min\_ycc\_loc\_threshold* updated data2 to be a copy of *order\_profile*. [Neil Cook]
- Changed updatemaster key to variable instead of hardcoded string. [Neil Cook]
- Added *cal\_loc\_RAW\_spirou* section to changelog. [Neil Cook]
- First commit of spirouLOCOR (empty) [Neil Cook]
- Added *flip\_image*, *convert\_to\_e*, and *smoothed\_boxmean\_image* functions. [Neil Cook]
- Added ‘BoxSmoothedImage, ConvertToE and FlipImage functions. [Neil Cook]
- Added *loc\_box\_size* constant and localisation parameters section. [Neil Cook]
- Added construct image *order\_profile* section and write *order\_profile* to file/calibDB sections. [Neil Cook]
- Updated comment with spelling correction. [Neil Cook]

#### 4.4.547 0.0.004 (2017-10-24)

- Set out plan for code. [Neil Cook]
- Move config file. [Neil Cook]
- Add warning logger and remove sys.exit from all but logger. [Neil Cook]

#### 4.4.548 0.0.003 (2017-10-16)

- Added nbframes as a parameter to get in *run\_startup* function. [Neil Cook]
- Changed *ACQTIME\_KEY* to getting from config file added checks for *ACQTIME\_KEY*. [Neil Cook]
- Allow *math\_controller* arg “framemath” to be None -> pass straight through. [Neil Cook]
- Added *correct\_for\_dark* function changed raise value errors to WLOG + sys.exit(1) [Neil Cook]
- Added CorrectForDark to init. [Neil Cook]
- Added *ACQTIME\_KEY* constant. [Neil Cook]
- Added read image file section added call to CorrectForDark function added resize image section. [Neil Cook]
- Added rotation and conversion to e- (commented out currently) [Neil Cook]
- Added *fiber\_params* function added startup.RunInitialStartup call added custom startup.RunStartup call (with parameters to add for each prefix case) [Neil Cook]
- Added a requirement that calibdb is defined in *run\_startup* function. [Neil Cook]
- Updated the README with summary of changes to *cal\_DARK\_spirou.py*. [Neil Cook]

#### 4.4.549 0.0.002 (2017-10-13)

- Added check for reduced directory (and make if needed) added check from calib directory (and make if needed) [Neil Cook]

- First commit added *update\_database* and *put\_file* functions added *get\_check\_lock\_file*, *write\_files\_to\_master*, and *time2unixtime* functions. [Neil Cook]
- Added *PutFile* and *UpdateMaster* functions. [Neil Cook]
- Added *writeimage* and *copy\_original\_keys* functions. [Neil Cook]
- Added *readimage* and *writeimage* function to *init*. [Neil Cook]
- Added dark quality control parameters added *calibDB* parameters. [Neil Cook]
- Added short name to *measure\_dark* function added *dadead\_{0}* to parameter dictionary (p) added comments dictionary from *ReadImage* added quality control section added save dark to fits section added save bad pixel mask added *calibDB* update. [Neil Cook]
- Added more TODO's regarding user defined config file. [Neil Cook]
- Added *DRS\_PLOT* variable. [Neil Cook]
- Added image region plot added datacut plot added histogram plot. [Neil Cook]
- Added dark histogram variables. [Neil Cook]
- Added measure dark function changed pp -> p added dark measurement section added identification of bad pixels section. [Neil Cook]

#### 4.4.550 0.0.001 (2017-10-12)

- Added evaluate value function to try to interpret the value in a config file (i.e. set to float/int/bool before setting to a string) [Neil Cook]
- Added line separator. [Neil Cook]
- Added *\_\_version\_\_* [Neil Cook]
- Added *keylookup* function added *numpy* import. [Neil Cook]
- First commit added *resize* function. [Neil Cook]
- Added *GetKeys* + *ResizeImage* function to *init* added *\_\_version\_\_* [Neil Cook]
- Added *ic\_cc(x/y)\_ (blue/red)\_ (low/high)* variables added *qc\_dark\_Time* variable. [Neil Cook]
- Added read image and *resize* iamge sections. [Neil Cook]
- Modified *run\_startup* to deal with no fitfilename file. [Neil Cook]
- Updated *DRS\_ROOT* path. [Neil Cook]
- Added *readimage+read\_raw\_Data* documentation and *keylookup+math\_controller* function. [Neil Cook]
- Added *ReadImage* and *GetKey* to *init*. [Neil Cook]
- Added *ReadImage* functions and got keys from header. [Neil Cook]
- Added initial files, added *readimage* and *read\_raw\_data* functions. [Neil Cook]
- Added initial files. [Neil Cook]
- Updated title of *readme*. [Neil Cook]