

example9

May 7, 2018

1 Using the SPIrou unit test

Mainly for use as a testing aid, the `unit_test.py` allows one to run a set of predefined files through the DRS recipes quickly.

These predefined files are written in text files with the extension `.run` (By default these are located in the `./Runs/` directory).

To run the unit test from the command line we do the following:

- Change to the `unit_test` folder i.e. `.../INTR00T/SpirouDRS/spirouUnitTests/`)
- Run the `unit_test` recipe:

```
unit_test.py run_name.run
```

Or from python:

```
In [6]: from SpirouDRS import spirouUnitTests
```

```
# trick sys.argv (notebook only)
```

```
import sys
```

```
sys.argv = ['unit_test.py']
```

```
# Note quiet = True just for notebook (avoids user input for reset check)
```

```
ll = spirouUnitTests.UnitTest.main(runname='None', quiet=True)
```

```
12:31:15.0 - |unit_test|Now running : unit_test with:
```

```
12:31:15.0 - |unit_test|      -- runname=None
```

```
12:31:15.0 - |ipykernel_launcher|ICDP_NAME loaded from:
```

```
12:31:15.0 - |ipykernel_launcher|      /scratch/Projects/spirou_py3/spirou_py3/INTR00T/config/c
```

```
12:31:15.0 - ! |unit_test|Unit test run file "/scratch/Projects/spirou_py3/spirou_py3/INTR00T/Sp
```

An exception has occurred, use `%tb` to see the full traceback.

```
SystemExit: 1
```

```
/scratch/bin/anaconda3/lib/python3.6/site-packages/IPython/core/interactiveshell.py:2918: UserWarning: warn("To exit: use 'exit', 'quit', or Ctrl-D.", stacklevel=1)
```

1.1 Setting up the .run files

Other than running the `unit_test.py` file one also needs to set up the `.run` files.

These are very simple to set up and just require a file with `variable=value`.

The values required are as follows:

- `type`: string, the type of detector (i.e. H2RG or H4RG or the path to a custom config folder (i.e. the `DRS_UCONFIG` path))
- `comparison`: bool, True or False. This is whether one wants to compare these files with identical files from the old DRS (Default is False unless you have the old DRS installed and have run these files on the DRS (and have modified the paths in `spirouUnitsTests.spirouUnitTests.py`))
- `runX`: list for each run, list should be in order: `recipe`, `night_name`, `argument1`, `argument2`, `argument3`, where:
 - `recipe`: string, the recipe name (i.e. `cal_DARK_spirou`) without the extension
 - `night_name`: string, the directory in `DRS_DATA_RAW` which contains the raw files
 - `argument1`, `argument2`, `argument3`, ... : the arguments used after `recipe night_name` when calling the recipe from the command line

The following shows a valid `.run` file (assuming one has the files in `DRS_DATA_RAW/night_name/`)

```
In [3]: # -----
# File : 20170710.run
# -----

# define detector type (default = H4RG)
type = "H2RG"

# define whether we run the comparison with old drs (default = False)
comparison = False

# define run
# (Format = [recipe, night_name, argument1, argument2, argument3, ...])
run0 = ['cal_DARK_spirou', '20170710', 'dark_dark02d406.fits']
run1 = ['cal_BADPIX_spirou', '20170710', 'flat_flat02f10.fits', 'dark_dark02d406.fits']
run2 = ['cal_loc_RAW_spirou', '20170710', 'flat_dark02f10.fits', 'flat_dark03f10.fits',
run3 = ['cal_loc_RAW_spirou', '20170710', 'dark_flat02f10.fits', 'dark_flat03f10.fits',
run4 = ['cal_SLIT_spirou', '20170710', 'fp_fp02a203.fits', 'fp_fp03a203.fits', 'fp_fp04a203.fits']
run5 = ['cal_FF_RAW_spirou', '20170710', 'flat_dark02f10.fits', 'flat_dark03f10.fits',
run6 = ['cal_FF_RAW_spirou', '20170710', 'dark_flat02f10.fits', 'dark_flat03f10.fits',
run7 = ['cal_extract_RAW_spirou', '20170710', 'fp_fp02a203.fits']
run8 = ['cal_extract_RAW_spirou', '20170710', 'fp_fp03a203.fits']
run9 = ['cal_extract_RAW_spirou', '20170710', 'fp_fp04a203.fits']
```

```

run10 = ['cal_extract_RAW_spirou', '20170710', 'hcone_hcone02c61.fits']
run11 = ['cal_extract_RAW_spirou', '20170710', 'hcone_hcone03c61.fits']
run12 = ['cal_extract_RAW_spirou', '20170710', 'hcone_hcone04c61.fits']
run13 = ['cal_extract_RAW_spirou', '20170710', 'hcone_hcone05c61.fits']
run14 = ['cal_extract_RAW_spirou', '20170710', 'hcone_hcone06c61.fits']
run15 = ['cal_DRIFT_E2DS_spirou', '20170710', 'fp_fp02a203_e2ds_AB.fits']
run16 = ['cal_DRIFTPEAK_E2DS_spirou', '20170710', 'fp_fp02a203_e2ds_AB.fits']
run17 = ['cal_CCF_E2DS_spirou', '20170710', 'fp_fp02a203_e2ds_AB.fits', 'UrNe.mas', 0, 1]

```

and here is a short version:

```

In [4]: # -----
# File : test.run
# -----

# define detector type (default = H4RG)
type = "H2RG"

# define whether we run the comparison with old drs (default = False)
comparison = False

# define run
# (Format = [recipe, night_name, argument1, argument2, argument3, ...])
run0 = ['cal_DARK_spirou', '20170710', 'dark_dark02d406.fits']
run1 = ['cal_BADPIX_spirou', '20170710', 'flat_flat02f10.fits', 'dark_dark02d406.fits']

```

This will run the DRS as follows:

```

In [5]: ll = spirouUnitTests.UnitTest.main(runname='test.run', quiet=True)

12:28:34.0 - |unit_test|Now running : unit_test with:
12:28:34.0 - |unit_test|      -- runname=test.run
12:28:34.0 - |ipykernel_launcher|ICDP_NAME loaded from:
12:28:34.0 - |ipykernel_launcher|      /scratch/Projects/spirou_py3/spirou_py3/INTROOT/config/c
12:28:34.0 - |unit_test|
12:28:34.0 - @ |unit_test| *****
12:28:34.0 - @ |unit_test| START OF UNIT TESTS
12:28:34.0 - @ |unit_test| *****
12:28:34.0 - |unit_test|
12:28:34.0 - |unit_test|
12:28:34.0 - @ |unit_test| *****
12:28:34.0 - @ |unit_test| RUN0:cal_DARK_spirou
12:28:34.0 - @ |unit_test| *****
12:28:34.0 - |unit_test|
12:28:34.0 - || *****
12:28:34.0 - || * SPIROU @(#) Geneva Observatory (0.2.002)
12:28:34.0 - || *****
12:28:34.0 - ||(dir_data_raw)      DRS_DATA_RAW=/scratch/Projects/spirou_py3/data/raw
12:28:34.0 - ||(dir_data_reduc)    DRS_DATA_REduc=/scratch/Projects/spirou_py3/data/reduced

```

```

12:28:34.0 - |(dir_drs_config) DRS_CONFIG=/scratch/Projects/spirou_py3/spirou_py3/INTROOT/
12:28:34.0 - |(dir_drs_uconfig) DRS_UCONFIG=/home/cook/spirou_config_H2RG/
12:28:34.0 - |(dir_calib_db) DRS_CALIB_DB=/scratch/Projects/spirou_py3/data/calibDB
12:28:34.0 - |(dir_data_msg) DRS_DATA_MSG=/scratch/Projects/spirou_py3/data/msg
12:28:34.0 - |(print_level) PRINT_LEVEL=all %(error/warning/info/all)
12:28:34.0 - |(log_level) LOG_LEVEL=all %(error/warning/info/all)
12:28:34.0 - |(plot_graph) DRS_PLOT=1 %(def/undef/trigger)
12:28:34.0 - |(used_date) DRS_USED_DATE=undefined
12:28:34.0 - |(working_dir) DRS_DATA_WORKING=/scratch/Projects/spirou_py3/data/tmp
12:28:34.0 - || DRS_INTERACTIVE is not set, running on-line mode
12:28:34.0 - |RUN0:cal_DARK_spirou|Now running : RUN0:cal_DARK_spirou on file(s):
12:28:34.0 - |RUN0:cal_DARK_spirou|On directory /scratch/Projects/spirou_py3/data/raw/20170710
12:28:34.0 - |ipykernel_launcher|ICDP_NAME loaded from:
12:28:34.0 - |ipykernel_launcher| /scratch/Projects/spirou_py3/spirou_py3/INTROOT/config/c
12:28:34.0 - * |RUN0:cal_DARK_spirou|Correct type of image for dark (dark_dark)
12:28:34.0 - * |RUN0:cal_DARK_spirou|Now processing Image TYPE UNKNOWN with RUN0:cal_DARK_spirou
12:28:34.0 - |RUN0:cal_DARK_spirou|Reading Image /scratch/Projects/spirou_py3/data/raw/2017071
12:28:34.0 - |RUN0:cal_DARK_spirou|Image 2048 x 2048 loaded
12:28:34.0 - * |RUN0:cal_DARK_spirou|Dark Time = 597.489 s
12:28:35.0 - |RUN0:cal_DARK_spirou|Doing Dark measurement
12:28:35.0 - * |RUN0:cal_DARK_spirou|In Whole det: Frac dead pixels= 14.659 % - Median= 0.35 ADU
12:28:35.0 - * |RUN0:cal_DARK_spirou|In Blue part: Frac dead pixels= 0.997 % - Median= 0.15 ADU/
12:28:35.0 - * |RUN0:cal_DARK_spirou|In Red part : Frac dead pixels= 20.534 % - Median= 2.11 ADU
12:28:35.0 - * |RUN0:cal_DARK_spirou|Frac pixels with DARK > 100.00 ADU/s = 4.257 %
12:28:35.0 - @ |python warning Line 143 warning reads: invalid value encountered in greater|
12:28:35.0 - * |RUN0:cal_DARK_spirou|Total Frac dead pixels (N.A.N) + DARK > 100.00 ADU/s = 18.9
12:28:36.0 - * |RUN0:cal_DARK_spirou|QUALITY CONTROL SUCCESSFUL - Well Done -
12:28:36.0 - |RUN0:cal_DARK_spirou|Saving Dark frame in 20170710_dark_dark02d406.fits
12:28:36.0 - @ |python warning Line 980 warning reads: Card is too long, comment will be trunca
12:28:36.0 - |RUN0:cal_DARK_spirou|Saving Bad Pixel Map in 20170710_dark_dark02d406_badpixel.f
12:28:37.0 - @ |python warning Line 980 warning reads: Card is too long, comment will be trunca
12:28:37.0 - * |RUN0:cal_DARK_spirou|Updating Calib Data Base with DARK
12:28:37.0 - * |RUN0:cal_DARK_spirou|Updating Calib Data Base with BADPIX_OLD
12:28:37.0 - * |RUN0:cal_DARK_spirou|Recipe RUN0:cal_DARK_spirou has been successfully completed
12:28:37.0 - |unit_test|
12:28:37.0 - @ |unit_test| *****
12:28:37.0 - @ |unit_test| RUN1:cal_BADPIX_spirou
12:28:37.0 - @ |unit_test| *****
12:28:37.0 - |unit_test|
12:28:37.0 - || *****
12:28:37.0 - || * SPIROU @(#) Geneva Observatory (0.2.002)
12:28:37.0 - || *****
12:28:37.0 - |(dir_data_raw) DRS_DATA_RAW=/scratch/Projects/spirou_py3/data/raw
12:28:37.0 - |(dir_data_reduc) DRS_DATA_REDUCE=/scratch/Projects/spirou_py3/data/reduced
12:28:37.0 - |(dir_drs_config) DRS_CONFIG=/scratch/Projects/spirou_py3/spirou_py3/INTROOT/
12:28:37.0 - |(dir_drs_uconfig) DRS_UCONFIG=/home/cook/spirou_config_H2RG/
12:28:37.0 - |(dir_calib_db) DRS_CALIB_DB=/scratch/Projects/spirou_py3/data/calibDB
12:28:37.0 - |(dir_data_msg) DRS_DATA_MSG=/scratch/Projects/spirou_py3/data/msg

```

```

12:28:37.0 - |(print_level)      PRINT_LEVEL=all          %(error/warning/info/all)
12:28:37.0 - |(log_level)        LOG_LEVEL=all           %(error/warning/info/all)
12:28:37.0 - |(plot_graph)       DRS_PLOT=1              %(def/undef/trigger)
12:28:37.0 - |(used_date)        DRS_USED_DATE=undefined
12:28:37.0 - |(working_dir)      DRS_DATA_WORKING=/scratch/Projects/spirou_py3/data/tmp
12:28:37.0 - ||                DRS_INTERACTIVE is not set, running on-line mode
12:28:37.0 - |RUN1:cal_BADPIX_spirou|Now running : RUN1:cal_BADPIX_spirou with:
12:28:37.0 - |RUN1:cal_BADPIX_spirou|      -- flatfile=flat_flat02f10.fits
12:28:37.0 - |RUN1:cal_BADPIX_spirou|      -- darkfile=dark_dark02d406.fits
12:28:37.0 - |ipykernel_launcher|ICDP_NAME loaded from:
12:28:37.0 - |ipykernel_launcher|      /scratch/Projects/spirou_py3/spirou_py3/INTROOT/config/c
12:28:37.0 - * |ipykernel_launcher|Correct type of image for FLAT (flat_flat)
12:28:37.0 - * |RUN1:cal_BADPIX_spirou|Now processing Image TYPE FLAT with RUN1:cal_BADPIX_spiro
12:28:37.0 - * |ipykernel_launcher|Correct type of image for DARK (dark_dark)
12:28:37.0 - * |RUN1:cal_BADPIX_spirou|Now processing Image TYPE DARK with RUN1:cal_BADPIX_spiro
12:28:37.0 - |RUN1:cal_BADPIX_spirou|Reading FLAT Image /scratch/Projects/spirou_py3/data/raw/
12:28:37.0 - |RUN1:cal_BADPIX_spirou|FLAT Image 2048 x 2048 loaded
12:28:37.0 - |RUN1:cal_BADPIX_spirou|Reading DARK Image /scratch/Projects/spirou_py3/data/raw/
12:28:37.0 - |RUN1:cal_BADPIX_spirou|DARK Image 2048 x 2048 loaded
12:28:37.0 - |RUN1:cal_BADPIX_spirou|Normalising the flat
12:28:38.0 - |RUN1:cal_BADPIX_spirou|Looking for bad pixels
12:28:39.0 - |RUN1:cal_BADPIX_spirou|Fraction of hot pixels from dark: 3.01 %
12:28:39.0 - |RUN1:cal_BADPIX_spirou|Fraction of bad pixels from flat: 1.66 %
12:28:39.0 - |RUN1:cal_BADPIX_spirou|Fraction of non-finite pixels in dark: 20.76 %
12:28:39.0 - |RUN1:cal_BADPIX_spirou|Fraction of non-finite pixels in flat: 14.66 %
12:28:39.0 - |RUN1:cal_BADPIX_spirou|Fraction of bad pixels with all criteria: 24.87 %
12:28:39.0 - |RUN1:cal_BADPIX_spirou|Image format changed to 1930x2035
12:28:39.0 - * |RUN1:cal_BADPIX_spirou|QUALITY CONTROL SUCCESSFUL - Well Done -
12:28:39.0 - |RUN1:cal_BADPIX_spirou|Saving Bad Pixel Map in 20170710_flat_flat02f10_badpixel.
12:28:40.0 - @ |python warning Line 980  warning reads: Card is too long, comment will be trunca
12:28:40.0 - * |RUN1:cal_BADPIX_spirou|Updating Calib Data Base with BADPIX
12:28:40.0 - * |RUN1:cal_BADPIX_spirou|Recipe RUN1:cal_BADPIX_spirou has been successfully compl
12:28:40.0 - |unit_test|
12:28:40.0 - |unit_test| *****
12:28:40.0 - |unit_test| TIMING STATS
12:28:40.0 - |unit_test| *****
12:28:40.0 - |unit_test|
12:28:40.0 - |unit_test|      RUN0:cal_DARK_spirou      Time taken = 2.829 s
12:28:40.0 - |unit_test|      RUN1:cal_BADPIX_spirou     Time taken = 2.505 s
12:28:40.0 - |unit_test|
12:28:40.0 - * |unit_test|Recipe unit_test has been successfully completed

```