Documentation for check_subarrays.pro

Abstract:

This document describes the purpose and usage of the check_subarrays.pro procedure. We also list the prerequisites necessary to run the program and provide a listing of its arguments and keywords.

1   INTRODUCTION

This document describes the `check_subarrays.pro` procedure and how it is run and used. The intended use of `check_subarrays.pro` is to inspect the locations of sub-arrays for the two NIRSpec SCAs as commanded in the test procedure csv files in order to identify discrepancies and/or typos in the sub-array definitions before the procedure is run during instrument testing. To achieve this, the sub-arrays are overlaid on full frame exposures from the NIRSpec database that were obtained with as similar as possible settings regarding FWA, GWA, light source, and so on.

In section 2 we list the necessary software to run the program. In section 3 we show how the procedure is run by means of an example. In appendix A a brief description of all the arguments and keywords of the procedure is given.

2   PREREQUISITES

In order to run `check_subarrays.pro` the latest version of the NIRSpec Calibration Software and Database must be installed and correctly configured on your system. Please see Birkmann (2011) and Giardino & Sirianni (2011) for details on how to do this. Also make sure to have checked out the `Software/JWST_IDL/lib/nirspec/` folder recently to have the latest version of the program.

The program makes use of the NIRSpec database and the exposures therein, therefore it needs to have access to both.

As the program displays both SCAs simultaneously using DS9, a computer screen with decent size and resolution (≥ 1080 pixels in vertical direction) is recommended.

3 RUNNING THE PROGRAM

Before running the program itself, please identify the test procedure(s) for which the subarrays are to be checked and open the corresponding Excel file(s). Export the test sequence to csv format by selecting "Save As" from the "File" menu in Excel and choose "Comma Separated Values (.csv)" from the format list, then hit "Save". In the following dialog select "Save Active Sheet" and ignore the features warning by clicking "Continue". Then move the resulting csv-file to a working directory.
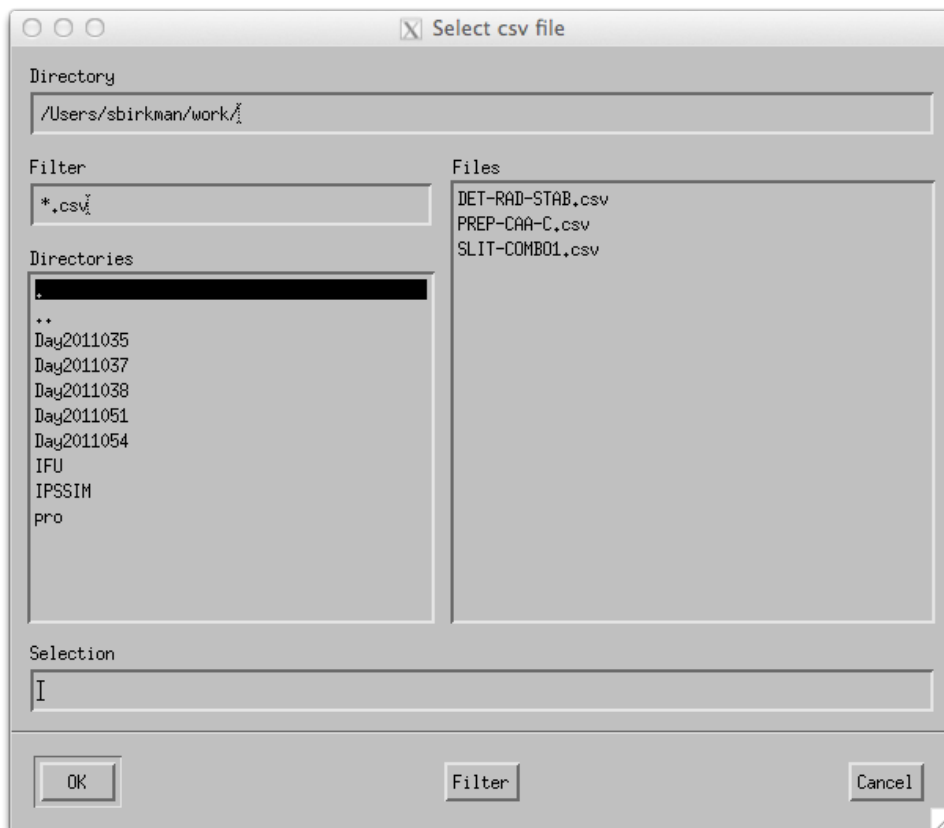
Go to to this working directory ("work" in this example) and start up the NIRSpec IDL environment by typing

```
/> cd work
/> start_nirspec
```

You should now see the NIRSpec> prompt. Now, run check_subarrays:

```
NIRSpec> check_subarrays
```

You will see a dialog popping up prompting you to select a csv-file similar to the picture below:

Select the file of interest (in this example we use "SLIT-COMBO1.csv") and hit OK. More than one file can also be selected within the dialog box. The program will then read the (first)

csv file, go through all the lines (commanded exposures), and whenever it encounters a line with a detector configured for sub-array or stripe mode, it will overlay the specified window on top of a suitable full frame exposure using DS9.

If DS9 is not already running it will start up and the images plus sub-arrays will be displayed as in the following picture:
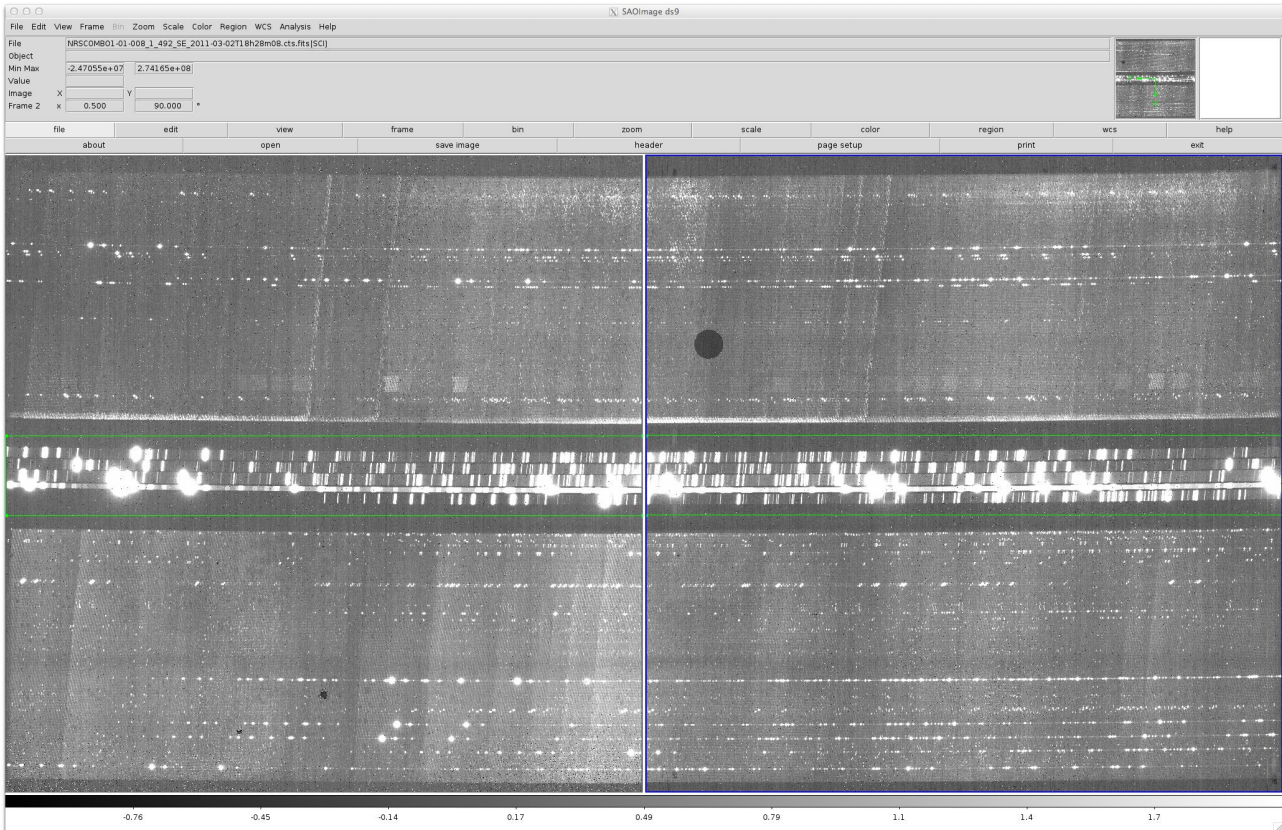

Another dialog window will pop up giving information about the configuration displayed (e.g. OBS_ID, FWA and GWA settings, lamps, etc.) and asking whether the displayed sub-arrays are OK, i.e. located where the test sequence creator intended. This dialog will look similar to the one shown below:
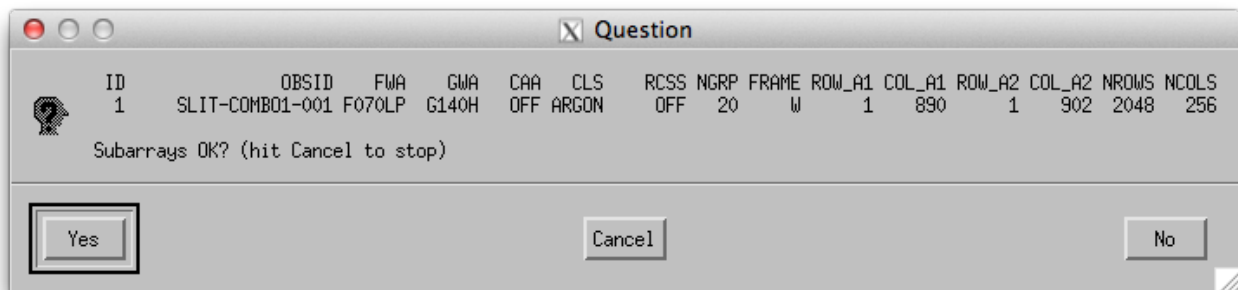
Hit "Yes" if you regard the displayed sub-array as good, hit "No" if you think it is wrong (e.g. misplaced or too small). Your answer will be recorded and in either case the program will

continue to the next line containing a sub-array in the csv file if there are any. Hit "Cancel" if you do not want to continue, the program will give a short report and then terminate (see below).

Let us assume that we checked all sub-arrays the way described above, and we found that the configurations in lines 10 to 13 were faulty and clicked "No" for these in the dialog. Once the end of the csv file is reached (or we aborted by clicking "Cancel") a warning window will be displayed:
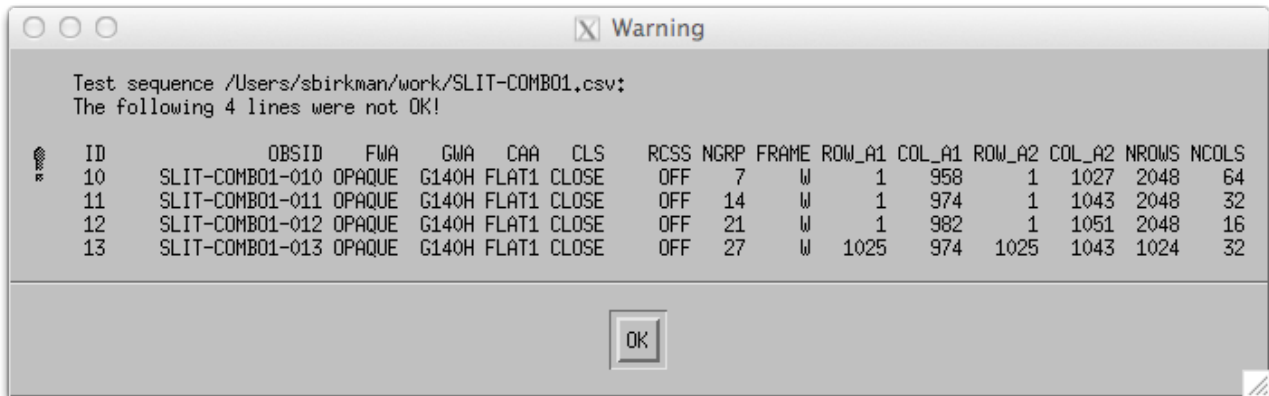
The same information will also be displayed in the NIRSpec IDL window. Once you acknowledge the message by clicking "OK" the program will end (or go to the next csv file if you selected more than one at the beginning). If there were no faulty sub-array configurations identified (you never clicked "No") then this outcome will be reported as well.

It is now to the user to fix the sub-array configurations in question (if there are any) in the Excel test sequence and, preferably, test the modified sequence again.

4 REFERENCES

Birkmann, S. 2011, Installing the NIRSpec Calibration Software and Database on Mac OS X 10.7 (Lion), NIRSpec Technical Note NTN-2011-007, ESA/ESTEC

Giardino, G. & Sirianni, M. 2011, NIRSpec Archive and Database, NIRSpec Technical Note NTN-2011-003, ESA/ESTEC

A   REFERENCE GUIDE

Syntax | Arguments | Keywords | Examples

check_subarrays

The check_subarrays procedure allows the user to visibly check that the sub-arrays specified in a NIRSpec test sequence are OK, i.e. the sub-arrays are located where they are meant to be.
This procedure needs a csv file (generated from the Excel sheet) as input. Each line is scanned and the NIRSpec database is searched for a full frame exposure with settings (FWA, GWA, CAA, CLS, and so on) as close as possible to the specified ones. This exposure is displayed (two SCAs) and the specified sub-array overlaid in DS9.
The procedure needs the start_nirspec environment and access to the NIRSpec data base and exposures.
This routine is written in the IDL language. Its source code can be found in the file `check_subarrays.pro` in the `Software/JWST_IDL/lib/nirspec/misc/` subdirectory of the NIRSpec Calibration Software and Database installation.

Syntax

check_subarrays [, csvfile] [, NID_MIN=value] [, NID_MAX=value] [, OBS_ID=string] [, /FULL]

Arguments

csvfile

A string or a vector of strings holding the complete path to the csv files to be checked. If not given, the user will be prompted to select one or multiple files via a file select dialog.

Keywords

NID_MIN

Set this keyword to a scalar integer value giving the minimum NID to be considered when looking for exposures to overlay the sub-arrays onto. If equal to NID_MAX, the exposure with this NID will be used, no checks are being made that it represents the wanted configuration.

NID_MAX

Set this keyword to a scalar integer value giving the maximum NID to be considered when looking for exposures to overlay the sub-arrays onto. If equal to NID_MIN, the exposure with this NID will be used, no checks are being made that it represents the wanted configuration.

OBS_ID

Set this keyword to a string containing the OBS_ID to be considered when looking for exposures to overlay the sub-arrays onto. This can also be a list of OBS_IDs using the format OBS_ID='[obs_id1,obs_id2,...]'

Note: If the values given for OBS_ID and/or NID_MIN/MAX constrain the selection of exposures so much that no match can be found at all, they will be ignored.

FULL

Set this keyword in order to also display full frame exposures in the input csv file.

Examples

This example displays the sub-arrays found in the `SLIT-COMBO1.cvs` test sequence for verification, using only exposures with an OBS_ID containing "IFU-COMBO1" to overlay the sub-arrays on.

```
NIRSpec> check_subarrays, 'SLIT-COMBO1.csv', OBS_ID='IFU-COMBO1'
```