IAC 2010 VO Werkcollege: **Astro-WISE**

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1 Astro-WISE and exercises overview

These exercises will familiarize you with the Astro-WISE system. You will start with a single raw exposure and remove instrumental effects from that image. Next you will obtain an astrometric solution for the image, create an image of which the pixels are resampled to a predefined pixel grid on the sky, and then add the different CCD detectors that comprise the WFI instrument onto that grid. Finally you will create a source list, which is a catalog of all sources in your frame and their properties.

In the course of this process the different aspects of the Astro-WISE system will be addressed.

2 Exercise 1

You have been given a DATE-OBS. This is the observation date for a particular exposure made with the Wide-Field Imager (WFI) on the MPI2.2m telescope on the mountain La Silla in Chili. Find your exposure in the database using the Database Viewer, and have a look at it.

Explanation Go to the Database Viewer web page:
http://dbview.astro-wise.org

1. *Log in to the DBViewer by clicking on "DBuser".*
2. *Select project "STUDENTWISE"*
3. *Select "raw science", then fill in a narrow-enough DATE_OBS range (separated with a ",").*
4. *Click on "(image)" in the resulting table to display the image in the browser*

3 Exercise 2

In order to remove instrumental effects from your image, several so-called calibration files are required. Check whether the necessary calibration files are present in our database. For the benefit of calibration scientists who use Astro-WISE a webservice ("CalTS") has been created. Each calibration file (if it exists) is either valid for a certain period or it is invalid. With CalTS you can inspect, invalidate, comment or change the valid range of calibration files.

Explanation
Go to the CalTS web page:
http://calts.astro-wise.org
and find the night your observation was taken.

1. *Log in to the Calibration Timestamp service by clicking on the name below "DB User" at the top left.*
2. *Select project "STUDENTWISE", instrument "WFI" and filter #843 (V). Further, select the observing night for your exposure.*
3. *A typical calibration exposure used in optical astronomy is a bias. Is there a valid master bias for your exposure?*
   (a) *Select "Master Bias".*
   (b) *What do you think is displayed in the table?*
   (c) *You can click on the "I" to display the image in the browser.*
4. *Same question for "Master Flat".*

4 Exercise 3

Use the Target Processor webservice:

http://process.astro-wise.org
to derive a Master Bias for you night of observations.

Explanation

1. *Log in to the Target Processor by clicking on the name below "DB User" at the top left. Select project "STUDENTWISE" and instrument "WFI".*
2. *In order to process data follow the steps under "State". That is, click on "Preselect target" and select "MasterBias".*
3. *Under "Options" (lower left) open "Process Parameters", fold out BiasFrame and BiasFrameParameters, then tag the box for "OVERSCAN_CORRECTION". Finally hit "Submit".*

4. *Select the year and month belonging to your exposure. Note the graph displayed at the top of the screen. This is a graphical representation of the potential raw bias exposures that may be used to create a MasterBias. Hover the mouse over the boxes, and click on the box belonging to your night.*

5. *Select all raw biases, then hit "Process"*

6. *Hit "Submit" in the Job Submit page that you now get. The job will be submitted to the HPC compute cluster at the University of Groningen.*

7. *You can monitor the progress of the job by clicking on "view"*

8. *Wait for the process to finish before continuing with the next exercise*

5 Exercise 4

Use the Target Processor webservice to derive the following targets for your exposure (in this order):

1. ReducedScience
   (a) *Log in to the Target Processor by clicking on the name below "DB User" at the top left. Select project "STUDENTWISE" and instrument "WFI".*
   (b) *In order to process data follow the steps under "State". That is, click on "Preselect target" and select "ReducedScience".*
   (c) *Locate your exposure by filling in the night your exposure was observed as well as the filter used (V or #843). You will see a graphical representation of observed data. Hover the mouse over the blocks to see the night of observation and the telescope's pointing.*
   (d) *Click on the block belonging to your night of observations and your object. Remember that your exposure may have been observed past midnight so it may be found in the night which seems to precede the exposure.*
   (e) *Tag your exposure in the list and hit "Query" at the bottom*
   (f) *In the "Query results" screen your prospective target is displayed. In particular it shows if the data has been processed before and if so, whether is up to date. In other words, if a calibration scientist creates a new calibration file, all ReducedScienceFrames created with the old calibration file will become outdated. Such an outdated calibration file will be indicated with a red shading in this screen.*
   (g) *Click on "Process", then "Submit" to start the data-reduction*
   (h) *Wait for the process to finish before continuing with the next step.*

2. Astrometric

   (a) *Select as target "Astrometric" then follow the above procedure. If there is an existing AstrometricParameters object, why is it outdated?*

3. RegriddedFrame

   (a) *Select as target "RegriddedFrame" then follow the above procedure*

4. SourceList

   (a) *Select as target "SourceList" then follow the above procedure. However, first set under "Options" → "Preferences" → "Attribute" → "SourceList.frame" to "RegriddedFrame" (Submit).*

6 Exercise 5

Now that you have created a RegriddedFrame, find your data again in the database using the Database Viewer.