Req 5.5.6

Title:

The Astrometric solution for Guide CCD's

Objective:

Perform astrometric solutions for the Guide CCD's and hand over the solution to the Instrument S/W for locating Guide stars.

Note, the Guide CCDs can be read out separately and 'stand alone'. For this task INS should stream the FITS images of the Guide CCD's to the hard disk.

Fulfilling or fulfilled by:

Selfstanding

When performed/frequency:

Commissioning.

Sources, observations, instrument configurations:

Special readout (manual command) of the Guide CCD's into FITS files

Inputs:

Reference position catalog (see A4)

Outputs:

CalFile– 556 *Guide CCD guide star signal and offset*
astrometry solutions inserted into the descriptors; handed over manually to instrument S/W responsible

Required accuracy, constraints:

1 arcsec rms for the accuracy with respect to the external standard;

External precision is driven by the position reference catalog. This is in the case of the USNO-A2 catalog of the order 0.3" with possible systematic excursions to 1".

Estimated time needed:

The images used are the Guide CCD images. For this the exposure time of the Guide CCD needs to be comparable to the Science CCD to ensure enough (gt 40) stellar images for astrometric calibration. Total time during Comm is about 1 hour.

Priority:

Essential

Needed functionality:

catalog - source extraction; catalog - association; catalog - astrometric solution

1

CA:

The parameters to be derived are extracted using the standard astrometric calibration procedure. The images that are input to this procedure are nowthe Guide CCD images instead of the usual Science CCD images. For this the exposure time of the Guide CCD needs to be comparable to the Science CCD to ensure enough (gt 40) stellar images for astrometric calibration (see **seq.− 634**).

See **req.**555.

Here, the required accuracy is not as high as for the science images. Therefore it suffices to restrict the degrees of freedom to incorporate linear effects per CCD only.

CAP:

```
input flat_fielded_images, reference_cat
foreach image in flat_fielded_images
  extract_cat = image.source_extract()
  pairs_cat   = extract_cat.pattern_match(reference_cat)
  astrom_solv = pairs_cat.solve(PDeg=n, Iter=m)
  calib_image = image.head(astrom_solv)
done
output calib_images
```