

# AGW Commissioning Run August-September 2008

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Please double check that the cooling water is running and that the pressurized air has been turned up.

## 1 Redetermine the optical axis location

As the unit has been dismantled it is necessary to reestablish the location of the optical axis.

1. Preset to a star field (outskirts of a globular cluster)
2. Move the guide-probe to (0,612.5)
3. Make an image while the rotator is being rotated by 270 degrees
4. Measure the proper on-axis position
5. Compute the corrections to the encoder limits to maintain (0,612.5) as the optical axis location
6. Update `oacontrol.conf` accordingly
7. Redo the measurement to confirm the new set-up
8. Compare to the values used previously and evaluate if this step is always necessary when the unit has been dismantled

For each image write down imageID, X(gp), Y(gp), PA, RA, DEC, rotator angle at start and end.

## 2 Recalibrate the CCD coordinate system.

Follow 481g221 Sec.3.

Make an image of the M92 field with the following coordinates:

RA: 17:16:47.9 DEC: +43:06:21.9; Finding chart finderM92.jpg

Adjust the exposure time to avoid saturation and obtain some  $\approx 10$ sec of data.

Record image ID, X(GP), Y(GP), RA, DEC, PA, best observed on-axis PA=0.0

Redo with PA=+30.

### **3 Recalibrate the guide probe coordinate system**

Follow 481g221 Sec.2.

### **4 Determine the focus offsets between IRTC, guider and WFS**

Due to the very different sensitivities of IRTC and guider it has turned out to not be feasible to try to focus on the same star. It is thus better to get a bright star on the IRTC and a fainter star on the guider. For the WFS we will of course have to integrate significantly longer than for the guider so the guider should collect a sequence of frames while the WFS integrates.

1. Preset to one of the bright stars with charts in the binder in the control room (Ceranski list).
2. Move the guide-probe to one of the guide stars
3. Place the  $r'$ -filter in the beam
4. Collimate the telescope
5. Focus the telescope on the IRTC
6. Estimate the approximate good guider focus and obtain a 7 step focus sequence around this value with steps of 2mm on the guide probe focus stage. (Guider exposure times of at least 1sec!)

### **5 Check reproducibility of guide probe positioning.**

Use reference guide star for AGW from binder in the control room

1. Preset to a star
2. Move guide probe to guide star
3. Start guiding and record IRTC images
4. Stop guiding after about 30 secs
5. Move guide probe to center field

6. Move guide probe to the same coordinates as before and restart guiding without moving the guide probe *Is this possible?*
7. Repeat this 5 times and determine the RMS of the position of the target on the IRTC images

Redo this check for a total of four different PA's.

## 5.1 Flexure

We can in principle measure the flexure with respect to the IR test camera, however several other effect will contribute to any shifts observed.

1. Acquire a star 20 minutes east of the meridian at low airmass with an associated guide star (preferable from the Ceranski compilation).
2. Start guiding and let the star pass the meridian by 20minutes
3. Evaluate the guiding accuracy

Redo at different altitudes to investigate the reasonable limits.

## 6 Photometric efficiency

Compare the guider and wavefront sensor transmission by obtaining guider and wavefront sensing data simultanously and sum up the guider frames for the exposure time of the wavefront sensor image. This can be done at any time when the unit is guiding and wavefront sensing.

If time is avalaible, it would be nice to do several standard stars with different colors to get color terms for the filters but this is low priority.

## 7 Active optics issues

### 7.1 Calibrate the WFS coordinate system

This will be taken care of under active optics commisioning.

### 7.2 Determine the focus variation over the field

This will be taken care of under active optics commisioning.

### **7.3 Determine the pupil location**

This will be taken care of under active optics commissioning.

### **7.4 Determine the rotation of the wavefront sensor with respect to M1**

This will be taken care of under active optics commissioning.

## **8 GCS issues**

These are not really AGW issues and might be better covered somewhere else.

### **8.1 Check the accuracy of the transformation**

### **8.2 Check the guiding speed**

This is to check that the network performs sufficiently fast and to see what is a realistic guide frequency which can currently be maintained.

Set the binning of the guider to 4x4 (about 0.25arcsec pixels).

Starting guiding on a field using a number of different integration times between 3 sec and 0.1sec integration time and let the guider run for about a minute. Check the time stamps on the image files or count how many files have been obtained within the specified period of time and compute the effective cadence. The suspicion is that the network is a bottleneck, but possibly the protocol issue (UDP vs TCP) for the PMAC could have caused trouble here in the past.

### **8.3 Closed loop guiding**

Check that closed loop guiding works for different position angles as well as for different positions in the sky