

GROND 2006-02-15 - 2006-02-16 Technical nights report

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In this page you can find the description of the technical tests performed at the 2p2 during the nights of 2006-02-15 and 2006-02-16.

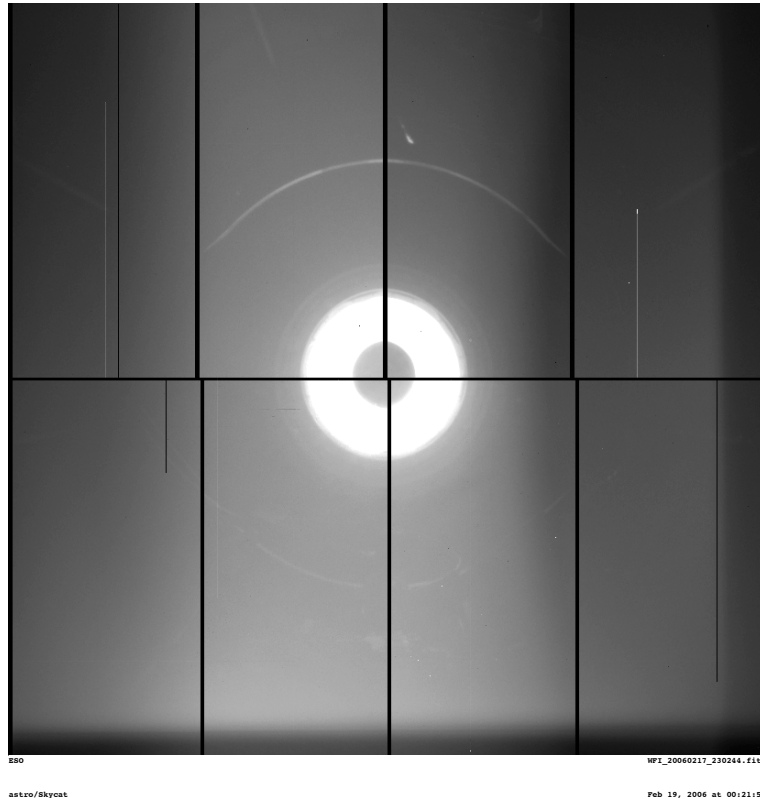
All the tests described here were done using the WFI camera and covered:

1. GROND M2 Baffle and pinhole
2. Telescope balance and tracking.
3. Moon reflections map

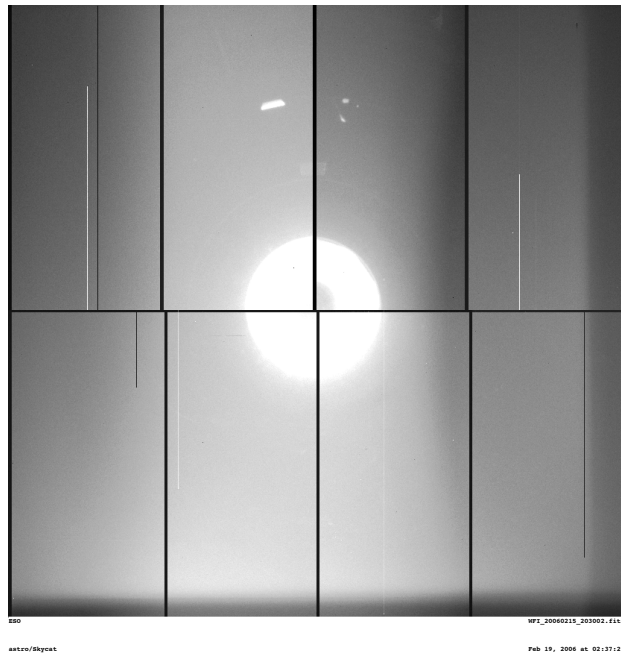
In the following each kind of test is described in detail.

M2 baffle and pinhole images

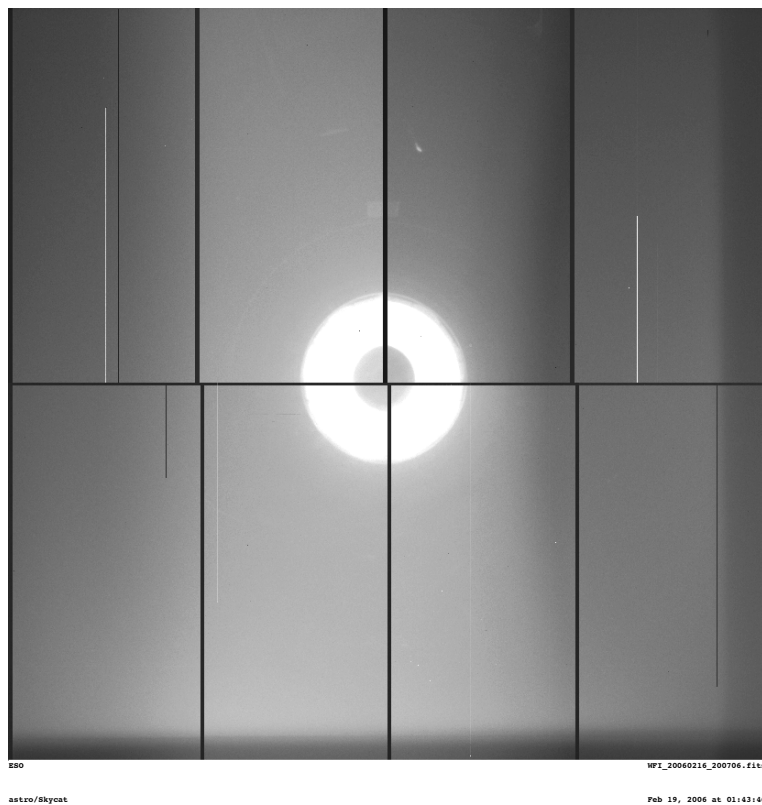
It is confirmed that the new M3 baffle generates less reflections than the old one (i.e. the one mounted during normal operations of the 2p2). The pictures below show the pinhole image taken with the reinstalled old baffle. However, only the smaller one of the 2 spots seen with the pinhole on 2005-12-15 tech night is now still visible (see <http://www.lis.eso.org/lasilla/sciops/2p2/E2p2M/baffle/Report-2005-12-22/>).



The first pinhole images taken with the GROND baffle showed a new feature that was not detected during the December tests. These new feature, visible in the image below, was produced by an unmounted cover of the hole to reach the tuning screw of the mirror inclination.



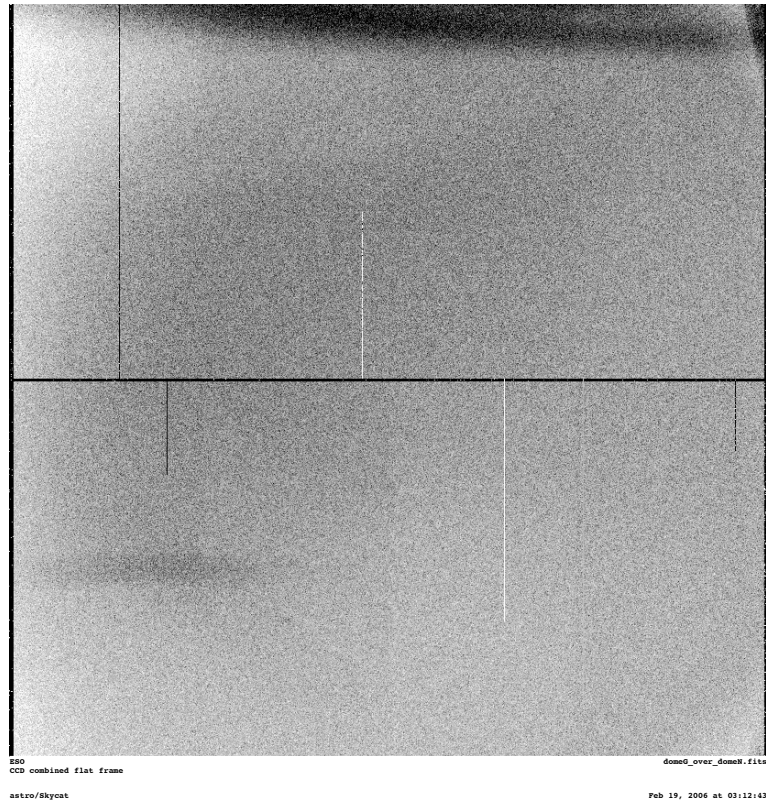
The final pinhole image with the GROND M3 baffle installed and taken after mounting the cover is reported below. Comparison with the pinhole image taken with the OLD baffle shows that the new GROND baffle generates less reflections than the OLD one.



Other tests were done to detect possible new reflections introduced by the GROND baffle, making the ratio between two different Flat Fields. All the images were taken using the Rc filter and are here represented with cuts (min, max) = (0.98, 1.02)

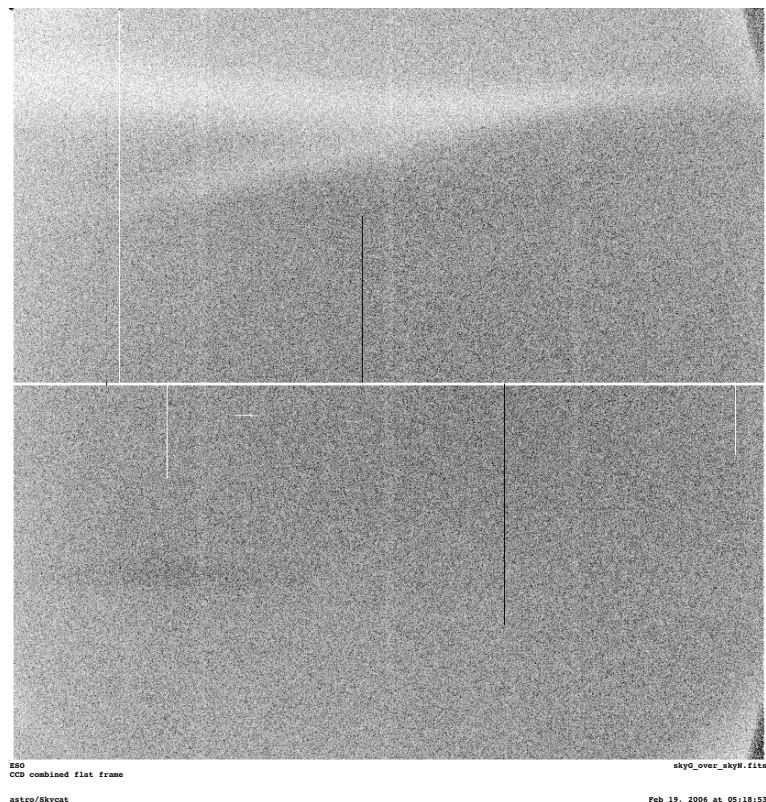
Dome FF with GROND baffle over Dome FF with OLD baffle

Maximum peak to valley variations in this frame are of the order of 4% at the top of the



frame, while most of the field shows variations within 2%.

Sky FF with GROND baffle over Sky FF with OLD baffle



This frame shows even less difference between the two configurations. Maximum variation is around 3% and a variation of 2% over most of the field.

Sky FF with GROND baffle at ZD = 0° over Sky FF with GROND baffle at ZD = 60°

Aim of this test was to look for vignetting at the edges of the field. If the new baffle is introducing vignetting, than it should produce different patterns on sky flat taken at different distance from the zenith due to different flexions. No such effect is evident.



Telescope balance and tracking

We wanted to test if the new instrument applied to the telescope may interfere with the pointing, dithering and guiding of the telescope itself. We thus defined a grid of 12 positions to be reached by the telescope and at which the status should have changed to Guide. The grid was composed by the following positions: N, S, NE, SE, SW and NW each observed at ZD = 30 deg and 55 deg. At those positions, 5 dithered images of 3 minutes exposure time were taken in order to check for the quality of the tracking, the correct execution of the combined offset and that the final position of the telescope did not differ from the initial one.

Observations at the following positions were executed (Az, Alt): (0, 60), (0, 35), (180, 60), (180, 35) and (40, 30). For lack of time it was not possible to complete the coverage of the other positions, which thus still need to be checked.

The telescope showed no problems in reaching the desired position and changing its status to Guide; the PSF of the stars showed circular shape except for the field at (180, 35), which showed slightly elongated stars. This is a known effect which depends on the polar axis misalignment, which prevents the telescope from good tracking when close to the south pole. The images also showed no evidence of tracking malfunctioning and the telescope returned to the initial position within a box of 10 arcsec in the worst case.

It must be mentioned that at positions (0, 35) and (180, 30) the OB was aborted. In the first case, the telescope was not able to do the offsets to reach the position for the 4th observation.; in the second case, the AG lost the star. It is my opinion that these malfunctions were caused by a non perfect telescope balance, since during the same night we also had a delta interlock error at airmass = 1.2

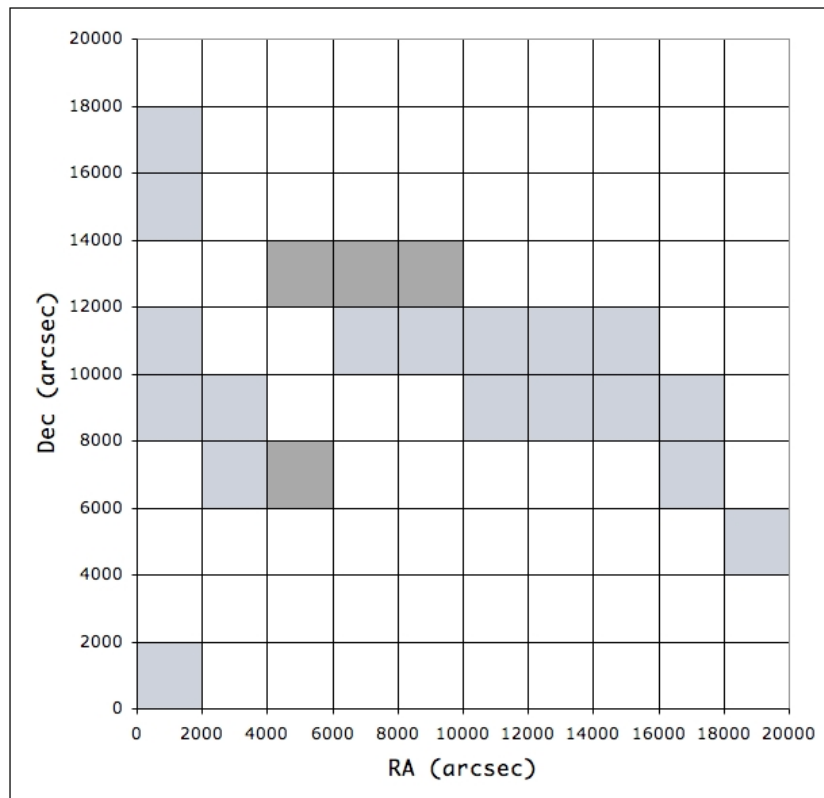
Moon reflections

A 5.5x5.5deg region centered ~7 deg NE of the moon was imaged through a mosaic of 100 images taken in binning 3, 1 sec exposure time each and no filter (White).

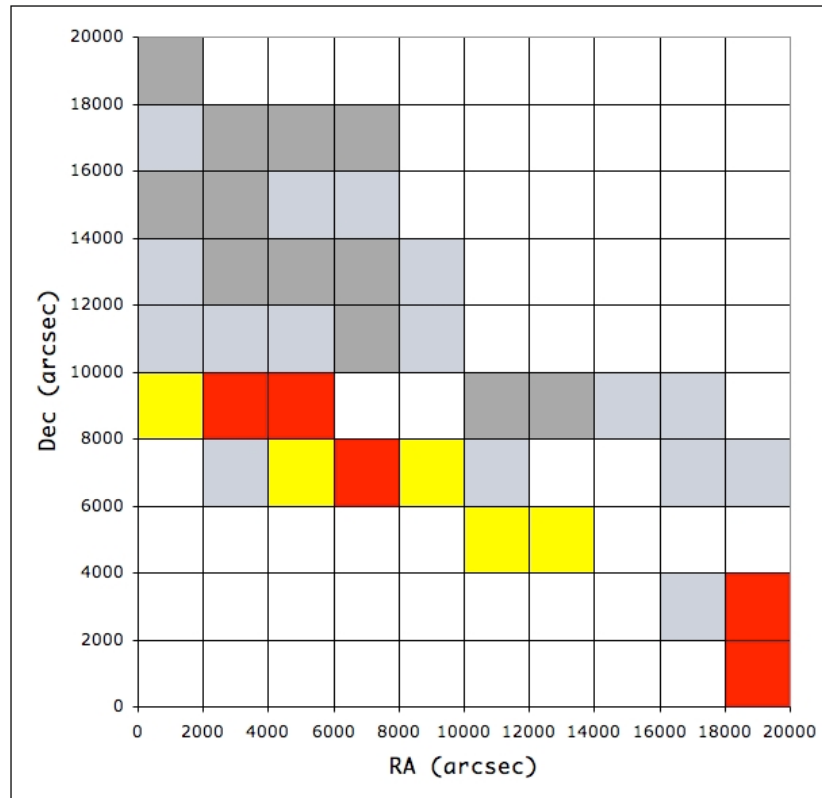
The same test was performed the following night with the OLD M2 baffle mounted.

The map of the reflections with the GROND baffle is reported below. Each pointing is represented by a square. The color of the square is related to the relative intensity of the feature detected on the image according to the following rules:

- peak intensity of the reflection / background > 10: red square
- $5 < \text{peak intensity of the reflection / background} < 10$: yellow square
- $2 < \text{peak intensity of the reflection / background} < 5$: dark grey square
- peak intensity of the reflection / background < 2 light grey square
- No reflection visible on the entire chip: white square



A similar plot of the same quadrant, but with the OLD baffle, was derived the following night and it is presented in the next page.



By the comparison of the two plots it is easily seen that also in this case the GROND baffle has a higher efficiency in the prevention of reflections than the OLD baffle.

Also, the conditions during which the two tests were performed were slightly in favor of the OLD baffle, since the $FLI(GROND \text{ baffle}) = 0.92$, while $FLI(OLD \text{ baffle}) = 0.79$

Appendix: List of analyzed images

2006-02-15/WFI_20060215_220315.fits : Pinhole with GROND baffle and new features

2006-02-15/WFI_FlatSkyIma.20.fits to 24: Rc Sky FF with GROND baffle and ZD = 60

2006-02-15/WFI_FlatSkyIma.25.fits to 29: Rc Sky FF with GROND baffle and ZD = 0

2006-02-16/WFI_FlatDomeIma.fits to WFI_FlatDomeIma.4.fits : Rc DomeFF w/ GROND

2006-02-16/WFI_20060216_200706.fits : Final pinhole with GROND baffle

2006-02-16/WFI_Ima.fits to WFI_Ima.99.fits : Q1 moon reflections with GROND baffle

2006-02-16/WFI_Ima.101.fits to 126 : telescope tracking tests

2006-02-17/WFI_FlatDomeIma.11.fits to 15 : Rc DomeFF with OLD

2006-02-17/WFI_Ima.129.fits to WFI_Ima.228.fits : Q1 moon reflections with OLD baffle