Period 30
AiC Report to the NOT Council and STC

42^{nd} STC meeting, April 21, 2005
&
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Contents

1 Introduction

This report covers the operations of the Nordic Optical Telescope for period 30: 2004-10-01 to 2005-04-01.

2 Down Time

The down time statistics are based on individual fault reports. In Table 1 I give the general down time statistics for period 30.

A total of 84 fault reports were submitted, with an average time lost of 16 min per fault, for a total down time of 1.2% (0.9% on scheduled observing nights). Of these, 58 reported no time lost, 24 reported < 2 hrs lost, and 2 reported 2 or more hrs lost.

Table 1: Technical down time statistic period 30: 2004-10-01 to 2005-04-01

Night included	Time lost	Nights	Percentage[a]	Last period
All nights	1340 min	182	1.2%	1.3%
Scheduled observing nights[b]	735 min	141	0.9%	1.6%
Technical nights	560 min	23	4.1%	0.3%
Service nights[c]	225 min	11	3.4%	1.0%
Visitor instruments	45 min	20	0.4%	0.6%

[a] Assuming an average of 10 hr per night
[b] Excluding technical nights and visitor instruments
[c] Excluding service nights with SOFIN

This compares to a down time of 1.3% over all nights (1.6% on scheduled observing nights) in period 29. For that period 77 faults reports were submitted with an average time lost of 15 min per fault. Of these, 64 reported no time lost, 11 reported < 2 hr lost, and 2 reported 2 or more hrs lost.

Comparing the last few periods the general thing to note is that there are little changes in the overall down time. The main difference with last period is that the 2 main problems occurred on a technical and a service night, respectively, which caused the down time for technical and service nights to be rather high. The down time during schedule observing time is the lowest ever reported.

2.1 Main problems

Below are listed those faults for which 2 or more hours were lost.

- **2004-11-02/03: ALFOSC aperture wheel timeout**: 2 hr 30 m

The ALFOSC aperture wheel got stuck. After visual inspection it was noted that the 1"0 slit was partly out of it's slot causing the timeout of the aperture wheel. It was found that the slit mask was loose in the holder even after tightening the screws on the holder as much as possible. Several other positions were tried, but in none of them the slit mask could be fixed properly. In the end, some tape was put on the edges of the slit mask after which it could be properly fixed. The general idea is that because of continuous use (this is probably the most requested slit) the edges of the slit mask have worn thin. As a precaution, we are currently checking the masks and the aperture holders to be sure that there will not be similar problems in the future.

- **2004-12-01/02: Building Power amplifier**: 6 hr

  After pointing to a target one of the SOFIN CCD camera did not respond. The earth leakage breaker for the instrument was found to be tripped and was switched on. After this the telescope was found not to respond anymore, and subsequent reboots gave repeated "Building Power-on Failed". The next day it was found that one of the fuses for the building power supply unit was broken and it was replaced.

  It was noted that the earth leakage breaker for the power to the instrument actually cuts the power to the whole adapter. This has caused the telescope to switch off and probably caused the fuse to break. This has been modified such that the power supply for the instrument is separate from the rest of the adapter, and a failure of the instrument will not cause a problem with the telescope.

2.2 General overview

The fault data base allows a more detailed overview of the faults that are reported. In Table 2 the number of faults and total time lost as a function of the system and kind of fault is presented together with the overall numbers for the last period (29).

Table 2: Down time statistics for period 30[a]

Syst/Type	Soft		Elec		Optics		Mech		Others		Total		P29	
Telescope	5	02:10	12	08:40	1	00:00	7	01:35	1	00:00	26	12:25	17	02:10
Building	1	00:00	3	00:30	1	00:00	6	00:00	4	00:00	15	00:30	8	00:00
Computers	8	00:30	4	01:15	0		1	00:00	2	00:00	15	01:45	19	00:25
ALFOSC	3	00:30	1	00:30	0		4	04:55	1	00:00	9	05:55	10	00:45
MOSCA	0		0		1	00:00	1	00:00	0		2	00:00	0	00:00
NOTCam	2	00:00	0		0		3	01:05	1	00:30	6	01:35	13	14:10
StanCam	1	00:10	0		1	00:00	3	00:00	0		5	00:10	5	00:30
Others	0		1	00:00	0		2	00:00	3	00:00	6	00:00	5	01:00
Total	20	03:20	21	10:55	4	00:00	27	07:35	12	00:30	84	22:20	77	19:00
P29	30	01:25	18	02:30	10	01:30	14	13:20	5	00:15	77	19:00		

[a]For each system-type category the total number of faults and total time lost are given

3 Instrument use

Table 3 lists the number of scheduled observing nights and technical nights for each instrument. This covers all nights, including CAT, CCI and guaranteed time. In this table I have also included the number of observing runs, and the number of nights per observing run for each instrument.

Table 3: Instrument use

Instrument	No. of nights		No. of runs	Nights/run
	Scheduled	Technical		
ALFOSC	137	16	42[a]	2.7
NOTCam	17	4	4[b]	2.5
MOSCA	6	1	1	5
SOFIN	19	2	5	3.5
IACUB	3	–	1	3

[a] Excluding 8 service nights
[b] Excluding 3 service nights

4 Comments recorded in End-Of-Night & End-Of-Run reports

As before, most comments written in the reports during period 30 were very positive, especially about the support from the staff.

Apart from comments related to problems that were also separately entered in the fault data base and comments about the weather (including a request to install a fog removing device) there were only a few specific remarks. As before, the need to be able to fully script ALFOSC observations was noted which is something that will be addressed by the sequencer program that is being developed. Also, it was requested to add an alarm to the autoguider system when reaching the limits while tracking on a moving object. The way the telescope will track moving objects will be somewhat different in the new TCS, and this feature can be added. It was also commented that the observer should be better informed about the circumstances when they can open the telescope under icy conditions. The installation of the NOTCam focus pyramid was noted with pleasure.

5 Operations

5.1 Weather

The weather has been very bad during the past winter, with February being nearly completely lost. There were 2 periods with very heavy snow fall after which the snow remained for a long time and we could not access the telescope for extended periods. A lot of time was lost due to delays and extra work caused by the weather, and many (day and nighttime) technical tests could not be done. However, considering the extreme weather situation and problems caused by bad weather in the past, very few problems have resulted and in general the telescope and instruments have apparently survived this rather well.

5.2 Safety

As discussed in the last STC meeting, for safety reasons a system was set-up to monitor travel of the staff to and from the observatory. This is a web page where people can register when they leave either from the office or the observatory with an estimate of the time before arrival. Depending on how much time has elapsed, emails will be send as reminder to the person to switch off the system, followed by warning messages to an extended list of people requesting to check the whereabouts of the person with some info (which car and number plate, etc) and a list of phone numbers to contact. Especially during the bad weather periods during the winter this system turned out to be very useful and easy to use.

We also have looked at systems to track the location of the cars using the mobile phones. However, the main problem is the lack of coverage over a large part of the road. Recently an improved system for the reception of radio signals has been installed and the current plan is to equip all cars with radios so they can be contacted at all times.

Safety when traveling from or to the observatory was also discussed extensively in the CCI Observatory Sub-Commission meeting. One issue is that the roads to the observatory are often officially closed when they are in principle passable and can be used by the staff from the observatories, where the question arises what the legal implications are if one does drive up and has an accident. This is still not properly defined..

The automatic reminder that is send out to observers one month before their observing run was also updated to highlight safety issues when traveling to and from the mountain and when working at the telescope.

5.3 Additional services

5.3.1 Service observing

A total of 11 nights of service observing were made, excluding the 17 SOFIN nights done in service mode by Dr. Ilya Ilyin. This also does not include a fairly extensive number of observations done for the various ToO and service programs which were executed during technical nights. The service nights consisted of various more or less isolated observing nights spread throughout the semester.

5.3.2 Service Observing Program

As decided by the STC, and in collaboration with the head of the OPC, a Service Observing Program has been set-up which has become operable at the start of period 31. The Service Observing Program offers the opportunity to propose short programs on a running basis and with a short lead time from proposal to execution. Only short programs are accepted for the service program, with a maximum total length of four hours. Proposals may concern short, self-contained projects, pilot projects, or observations needed to finish projects which were, e.g., cut short by bad weather or interrupted by ToO observations. The service program is open to anybody, and the evaluation criteria are only scientific quality and technical feasibility.

A brief description of the program is provided at http://www.not.iac.es/observing/service/ with links to the service proposal form and a page providing instructions on how the details of the observations can be defined after a proposal has been accepted.

A limited number of service nights will be reserved for the service program in each semester. To offer a broad set of observing capabilities, but at the same time provide a system that allows both flexibility and the highest possible rate of completion of the proposed observing programs, the instruments that will be available are ALFOSC and NOTCam in imaging, spectroscopic and polarimetric mode, and StanCam in imaging mode.

5.4 Publications

The list of publications that use NOT data was updated and reviewed going back to 1996. The publications are now separated in “refereed journal publications” and “other (refereed) publications” (see http://www.not.iac.es/news/publications/). All lists are now presented in alphabetical order.

5.5 Observing schedule

Starting with the schedule for period 31, the publicly available observing schedule is being generated on-the-fly from the schedule database. As opposed to before, the schedule information is now always kept up-to-date.

5.6 Observing conditions

Nothing has been heard from the IAC concerning the OPTICON network activity on 'Site Characterization'. We have send a message detailing possible locations and the requirements for the installation of a dust meter the IAC intended to installed at the NOT, but not reply was received.

5.7 Building

5.7.1 Cooling system

Tests with the new rotary valve were made which showed that the flexible tubes and their connection to the valve did not work as intended, only allowing a limited amount of rotation of the telescope insufficient for normal operations. A new design was made for the connection of the tubes to the valve, which is being implemented at this moment.

Work on the cooling system itself was heavily affected by the bad weather. At the moment most of the preparations have been made to allow to switch over from the old to the new system without interruption, but a significant amount of work remains to finish the new system.

5.8 Telescope

5.8.1 New TCS

With with most of the programming having finished the main work at the moment is testing the new TCS with the hardware. Some problems were encountered during the tests, where some work remains to be done. Furthermore, some hardware should be build for the adapter and mirror control.

The functioning of the autoguider in the new TCS was defined, where the main differences with respect to the old system is that no mouse is required for positioning the guide boxes, which can be done with commands and function keys. The detection and positioning of the boxes on the guide star and the background will be done fully automatically in connection with an improved guide star service.

The User Interface for the new TCS has been defined and development has started. It will look very much like the old one with a number of improvements like log file listing, command recall and editing. It will also be possible to run a user interface remotely.

5.8.2 Aluminization

Preparations were made for the aluminization of the main mirror coming June. Arrangements were made for the transport of the mirror to the aluminization plant at the William Herschel telescope, and for a check-up of the specialized tools to be used.

It was noted that people also should consider things that can/should be done during this period. Specifically, work that can be done more easily when the mirror is not installed (e.g., installation of humidity and/or temperature sensors, modifications to make mirror washing easier, etc.).

There is still the issues of the alignment of the main mirror after the last aluminization. Data were obtained and analyzed, but the implied tilt of the focal plane seems much to big (and the same is true for the implied tilt of ALFOSC which was used to perform the test). Currently Anton Norup in Copenhagen is looking at the data.

5.8.3 Wavefront sensing

Analysis of WFS measurements last year concluded that a zenith angle correction of the telescope astigmatism could improve the image quality. Tests were planned to see if the predicted corrections are right, but this was affected by the weather and the acquisition and analysis of this data is still on going.

5.8.4 Mirror cleaning

CO_2 cleaning has been done every now and then, and regular ($\sim$monthly) reflectivity & scattering measurements with the ING reflectometer are being made as a comparison to our own measurements. Several attempts were made to wash the mirror, but the weather did not really help.

5.8.5 AltAz power supply

As in the last semester, we had various ($\sim$10) reports throughout the semester which noted problems during telescope power-on and possibly in a few cases caused an automatic power-off of the telescope which all appear to be related to errors of the power supply of the AltAz motors. In general these problems caused little (or no) down time. The total amount of down time caused by this over the whole semester is difficult to estimate precisely as in some cases the error occurred when the telescope had to be powered-off and -on for some other reason that caused the bulk of the down time in the specific report, but is not more than 2 hrs. In general, it seems that these errors only occur when powering-on following a power-off after the telescope has been powered-on for some time. However, it is also not entirely clear that all these problems have the same cause as, e.g., a building crash can also cause this type of error. Further tests are being planned in the near future.

5.8.6 Tracking

Some tests were made with the telescope blind tracking (i.e., not using the autoguider) where a drift was found of 0.17 arcsec per minute at hour angle of zero hours close to zenith, and of 0.6 arc sec per minute an an hour angle of 8 hours near the horizon. I.e., one can generally integrate a minute or more not using the autoguider without affecting the star images significantly.

5.8.7 Pointing

The cause of the pointing variations are still being investigated. The hydrostatic bearings of the telescope were tested. No change ($<< 10\mu m$) in the height of the hydraulic pads was detected, while the movement corresponding to the observed variations in the pointing would be 0.19 mm.

The pointing variations are very stable and we have been operating with the same pointing model for a long time with no complaints, and we hope that we will be able to improve the pointing by applying corrections to the current pointing software.

5.9 Autoguider

A new third generation intensified TV camera was purchased to replace the aging existing guide camera. The camera was installed and commissioned in March 2005. A rough estimate of its performance indicates it to be at least 3 mag better than the old camera. For many of the guide stars selected for our guide star catalog a gray filter (-5 mag) is needed and under good conditions we should be able to use guide stars down to 17 mag. In fact, this is significantly deeper than the guide star catalog we are currently using and we are looking to replace the old (from 1989) guide star catalog with a new version which will drastically increase the number of stars available. This will also make it feasible to find suitable guide stars when FRED is mounted. Currently we are also transporting the guide star server software to a none IDL version.

5.10 Filters

The information on the optical filters have been updated and improved, providing the cosmetic quality, the central wavelength and passband width and transmission curve for practically all filters, and telescope focus offsets when available (including some filters from the IAC that have been used at the NOT).

5.11 ALFOSC

5.11.1 Detector

Tests were planned using the BIAS CCD control program in the normal observing set-up with the CCD control card for the multi-window photometry program to look at the remaining problems with some of the commands, but the weather did not allow to even reach the telescope. The tests are now planned for the beginning of May.

5.11.2 Spectroscopy

With the help of Michael Andersen some investigations were made in the possibility of acquiring other high-efficiency VPH grisms. According to estimates by Michael, new VPH grisms with a peak efficiency of ∼85% can be purchased for about 2000 Euro a piece. It would be possible to replace the R∼700–1000 grism set (#7,#8,#14 and #16) and the current Echelle mode (R∼2000) but it is not yet clear how the efficiency (and therefore the relative gain) of these grisms vary as a function of wavelength.

The VPH grism that was purchased is square and needs a special holder. Discussion have been going on with CUO about the design.

Various parts of the spectroscopic calibration plan have been implemented during the semester to monitor the instrument and help with setting-up the instrument. Part of these results will also be used to improve the quick-look reduction provided at the telescope. Related to the monitoring of the instrument, a new automated interactive data reduction for spectroscopic flux-standards was made.

Instructions on balancing the grism wheel when mounting grisms were made to avoid possible problems with the wheel.

5.12 NOTCam

5.12.1 Detector

The performance of the detector seems to have deteriorated further over the last few months, though that might partly be due to the detector heating-up to -80°C during the time we had no access to the telescope due to the weather. We will investigate this further after the current observing run.

Further improvements such that an 'ABORT' command can be implemented in the BIAS detector control program and to increase the readout speed will have to wait until the new controller for the detector array is available.

5.12.2 Spectroscopy

The aperture wheel of NOTCam was moved by 2mm to be able to get slits in focus with the High Resolution Camera. With this modification it is now possible to do R$\sim$6000 spectroscopy using the HRC in the J, H and K filters, but Z band spectroscopy with HRC will not be possible as the focus mechanism does not have enough range. Again, mostly the weather has prevented first light and commissioning of HRC spectroscopy with NOTCam. The overall efficiency (atmosphere, telescope, instrument, detector) for spectroscopy with the grism using the Wide Field Camera was found to range from $\sim$3% in the Z filter to $\sim$6% in K.

Various parts of the spectroscopic calibration plan have been implemented during the semester to monitor the instrument and help with setting-up the instrument.

5.12.3 Calibration unit

A new calibration unit was installed in the lid of the Cassegrain baffle with Xe, Ar and Halogen lamps which can be operated from the control room. First tests have been made and the system will be commissioned in the near future.

5.12.4 Focus pyramid

After mounting the focus pyramid in a holder it was shipped from Copenhagen to La Palma. It was installed in the grism wheel of NOTCam, and has already been tested and commissioned with the WFC.

A post-processing script was made to evaluate NOTCam focus pyramid images. At the moment it only works with the WFC.

5.13 MOSCA

5.13.1 Data format

Bad pixel masks and files needed to convert data to World Coordinate System are now provided on the MOSCA webpage (see http://www.not.iac.es/instruments/mosaic/)

5.14 StanCam

5.14.1 Image drift

The image drift reported by an observer was investigated in detail and it was found that the drift was just due to not using the autoguider and not any flexure of the instrument.

5.15 FASU

5.15.1 FAPOL

The 18V power supply cable for the motor and the 5V power supply cable for the motor drive board have been changed and extra decoupling put on the drive boards. This to avoid that turning on and off of the 18V motor supply causes droops on the 5V line which sometimes resulted in the motor drive board to reset. A modified code for the FAPOL drive board to detect malfunctioning of the unit was provided by Jens Klougart (CUO) and has been installed and tested. The user interface of FAPOL was modified to detect the error and notify the observer.

5.15.2 Calibration mirror

The pick-off mirror for the calibration unit in FASU was re-aluminized which improved its reflectivity by $\sim$30% with a corresponding decrease in the required exposure times for calibrations.

5.16 FRED

5.16.1 Trolley

No further information was received about the precise dimensions of FRED+FRAME which is needed to make a trolley to be able to move, and mount and dismount the instrument.

5.17 FIES

5.17.1 Building

Finally the building permit was obtained and a company was contracted to start building. There was some hope to start preliminary work on the building before the Spring, but also here the weather did not cooperate and work on the building is only being started now.

5.17.2 Optical elements, Fibers, Calibration unit

A new fiber unit has been ordered. The plan is to test the fibers at ESO before the unit is brought to the NOT. All pieces (small mirrors, micro lenses) needed have been acquired.

The front lens of the camera is being coated by a company in Denmark using a cold coating to avoid risks of breaking the lens. The front window of the CCD camera was send to the same company and, together with some other items, is being coated by normal procedures.

A new design for the ADC unit was made and checked for vignetting.

5.17.3 Mirrors and prism

The main issue remaining is coating the mirrors and the prism. Tests are being made to produce high quality mirrors by a danish company. The offer for the anti reflective coating of the prism should be checked to see if it safe and reliable. If so, the prism will be shipped to this company for coating.

5.17.4 Pick-off mirror unit

To be able to accurately and repeatably position the optics that images the target on the fiber head a proper positioning mechanism for the pick-off mirror unit is being designed.

5.17.5 Reduction software

A first version of an interactive interface for automated reduction of echelle data is available at the observatory. The software, written in Python, wraps around standard IRAF routines with parameters that are adapted specifically for FIES data. The core of the software is object-oriented, which means it is very easy to add reduction steps or provide additional functionality. The reduction routines are modular, allowing easy modification and improvement of the individual routines.

The current version of the interface is able to automatically reduce FIES data in several different formats, such as windowed, binned or interlaced spectra. Future steps include testing of the interface under realistic conditions, fine-tuning and improvement of the reduction routines and documenting the software.

5.17.6 Documentation

A review was made of the available documentation at NOT and in Aarhus was made. At NOT this consists mostly of some circuit diagrams, schematics, data sheets (some only in Danish). It is not clear what documentation is precisely available in Aarhus and what is missing.

It was agreed with Søren Frandsen that we will get a copy of the FIES web pages available in Aarhus.

5.18 Data flow

5.18.1 Data archive

The listing of the archive available on the web has been extended to include all the data back to the start of the archive in March 1997. We also have started on a permanent basis to write the data on DVD.

5.18.2 Data format

A post-processing routine was made which converts data to Multiple Extension FITS and provide Nominal World Coordinate System information for all imaging instruments (ALFOSC, NOTCam, StanCam, MOSCA). This routine will be made available to users and can be applied retroactively to data from previous periods, which might be especially interesting for NOTCam & MOSCA data.

5.18.3 FITS headers

As it is vital for post-processing and future archive usage of data that unique names and identifiers are used in the FITS headers for any changeable optical element a set of unique names for the filters, grisms and apertures were defined, and a graphical user interface is being developed (starting with ALFOSC) to edit the definition files based on these lists.

5.18.4 Data bases

An integral part of the data flow system are data bases. The access to modify a data base itself will be limited to the manager(s) of the data base. The manager(s) should provide a proper interface to access the data base and define the format of information for the data base. As all the different subsystems (TCS, instruments, detector, etc.) will interact with the data bases an overview will be made of the kind of information that is required for the data base in relation with things like calibration plans, reduction pipelines, etc., from the different subsystems and the way and/or format in which this should be provided.

5.19 Computers and software

5.19.1 Data acquisition system

There was a problem with the new instrument computers that can not use the ISA interface cards needed to communicate with the detector controllers. As a solution a piggy-back board has been developed that can plug into the existing interface board. A prototype board was designed, built and tested and found to work and so we are know proceeding to get several boards made for all the interface cards plus spares.

A new RAID server with a hard disk with a capacity of nearly 1Tb was installed, configured and tested. At a later stage this will also host the image reduction pipeline.

5.19.2 Data archive

As the staff does not have much experience with the DVD robotic system little progress was made. Currently we are using a temporary system made of a stack of DVD burners that write disks for the observers and the archive. Up to now, all observers have been happy with receiving DVDs instead of CDs or DAT tapes.

5.19.3 Mail server

A new and faster mail server was installed and implemented. The system now includes an anti-spam filter.

5.19.4 Network connection

The microwave network connection between the SLO and ORM was finished and a new network router was installed. This provides a ∼16 Mb link compared to the 2 Mb link provided by Telefonica. At the moment also negotiations are ongoing via the IAC with Telefonica to get an improved network connection both between the SLO and ORM, and further out to Tenerife. The current offer looks very attractive providing 34 Mb over the whole network out to Tenerife.

6 Looking ahead

6.1 Telescope and building

6.1.1 Cooling system

The new cooling system is expected to be finished in the near future, and when we change to the new system the modified rotary valve will be installed as well.

6.1.2 New TCS

The new TCS software will be finished in this semester and tested with all of its components. The remaining task will be the development and implementation of the user interface.

6.1.3 Mirror aluminization

The mirror will be aluminized on the 21st of June. We have schedule a 4 night stand-down period followed by 3 test nights to serve as contingency and to be able to test and align the mirror. Anton Norup from CUO will come out to assist us.

As we now have a program to monitor the performance of the telescope regularly, the aluminization will also serve as a good benchmark for the mirror cleaning procedures we employ (if weather permits...).

6.1.4 Wavefront sensing

The latest tests should be evaluated and the resulting active optics correction should than be implemented in the (new) TCS.

6.2 Autoguider

The guide-star server should be changed for the (Pyraf) version that does not use IDL. Also, the guide star catalog used should be upgraded to a new version which is complete down to $\sim$18.5 mag to be able to fully profit from the improved sensitivity of the new camera. We also intend to improve the server such that it automatically finds a new star in case the current guide star moves out of the field of view when doing a combined telescope offset.

6.3 Calibration plans

The final part missing is a calibration plan for imaging with NOTCam which will be developed and implemented in this semester.

6.4 ALFOSC

6.4.1 Camera

The new optics are close to being ready, and plans should be made to take out the camera from ALFOSC and send it to CUO for the optics to be mounted and tested, before being send back.

6.4.2 Spectroscopy

Based on the study of VPH grisms made by Michael Andersen we should define specific grisms that are of interest and decide if there are ones we want to purchase.

6.4.3 Polarimetry

A quick-look post-processing script will be developed and implement for linear polarimetry observations.

6.4.4 Detector

We still hope the that control card for multi-window photometry can be modified (by Roy Østensen) so it can be used with the BIAS CCD control program in the normal observing set-up. In this way, this card can be installed permanently for use with either the normal set-up or for multi-window photometry.

We are looking at the possibility of reading out the CCD using two amplifiers to half the read-out time. Some tests were already made, but we should investigate this option more before we offer it as a standard option.

6.4.5 Multi Object Spectroscopy

No progress was made and the CNC machine still needs to be tested. If it works properly, we can also use it to sort-out the problems with the flipping of the masks made using the new distortion map.

6.5 NOTCam

6.5.1 Detector

The apparent further deterioration of the detector is one more reason to consider changing to the science grade array, but we would need to make a proper planning to fit it in the schedule and arrange for support from Preben Nørregaard (CUO).

6.5.2 Focus pyramid

The focus pyramid will be calibrated for the HRC, and the post-processing script to evaluate NOTCam focus pyramid images will be modified to also include the HRC.

6.5.3 Spectroscopy

Spectroscopy with the HRC will be tested and commissioned.

The calibration unit will be commissioned for both the WFC and the HRC. In the longer-term we should look at getting a new calibration unit with proper interface to the lamps with the corresponding header information. The final design will likely include a lid separate from the mirror cover petals which can be closed and opened quickly.

6.5.4 Filters

With the NOTCam calibration unit is in place, most of the NOTCAM filters can be scanned using NOTCam spectroscopy. This will provide filter transmittance plots.

6.6 MOSCA

6.6.1 Detector

MOSCA is scheduled to be mounted in September. Some more test should be made to check the change in gain that was detected for one of the CCDs and we should consider changing a resistor in the pre-amp of the CCD to get (back) a similar gain to the one for the other CCDs.

6.7 StanCam

6.7.1 Pick-off mirror

As the pick-off mirror could not be aluminized because of the coating we are considering buying an new mirror and aluminize it. This should gain us $\sim$30% in reflectivety compared to the present situation.

6.7.2 Possible improvements

A study was made of possible improvements to the imaging standby facility and a draft report was prepare which is currently being studied.

6.8 FIES

6.8.1 Building

Work on the building is being started and the construction work is expected to take a few weeks, but that depends in part on the weather. Some additional work will be needed to prepare the building to receive the instrument but it should be possible to move the instrument to the building before the summer.

6.8.2 Instrument

Arrangements should be made to tests the fibers at ESO. At the moment it is not clear when coating the mirrors and the prism will be ready. The pick-off mirror unit will be modified to be able to position the optics that images the target on the fiber head accurately. The ADC unit and its control are at the moment considered a low priority.

6.8.3 Software

All the software (instrument control software, data acquisition [the sequencer] and the reduction software) are basically ready, but they need to be tested with the instrument itself.

6.8.4 Testing and commissioning

It should be possible to move the instrument and install it in the new building at the start of the Summer. However, considering the time it probably will take to get the different optical components tested, coated and aluminized I expect the instrument to be only fully ready for testing and commissioning at the end of the semester.

6.9 SOFIN

The new cross-dispersing prism is expected to be ready this summer. The plan is to re-coat and installed it in July.

6.10 Computers and software

6.10.1 Data flow

Work will continue on integrating the different aspects (data archiving, observing logs, observing schedule, technical schedule, etc) in a single system.

6.10.2 Data acquisition system

As the problems with the ISA interface cards have been solved, we can continue with upgrading the instrument control computers. This will also allow us to installed the gigabit switch and together with the new RAID server that was installed this will conclude the hardware upgrade of the data acquisition system.

The next step will depend on the arrival of the new detector controllers.

6.10.3 Data saving

As part of the upgrade of the data acquisition and archiving system we need to define the way the data is being saved. Currently the data for all the different instruments are saved in different directories but using the same prefix and images with the same name (but taken by different instruments) can exist. The current plan is to define separate file names for images from different instruments (e.g., ALob250001.fits for image taken with ALFOSC). One of the points to consider in any system are data reduction pipelines, calibration plans and service observing. E.g., do we provide a sub-directory for the reduce data, do we copy data taken as part of the calibration plan in separate directories, how do we provide the data on the ftp site for the service program, etc.

6.10.4 Service program

A major part of the work in the coming semester will be to further develop, test and implement tools to schedule and administer the service observations and the resulting data. This includes the managing of the service proposals and the related Observing Blocks, but also the automatic notification of PIs if data is taken and providing the data and the related calibrations to the PIs (which we plan to do via our ftp site).

6.10.5 Various

Various software and computer developments are planned. Below I list the most relevant things.

- *The Sequencer*: Development will continue of the Sequencer with the commissioning of the system for StanCam + FIES. The next step would be to incorporate ALFOSC in the system.
- *Data archiving*: Experience will have to be gained with the DVD robot to develop and automatize the data saving and archiving system.
- *User account backup system*: A proper backup system for the staff user accounts should be defined and implemented.
- *User account disk space*: The disk space available for the user accounts will be upgraded.