SPINOR Spring 2005 Observing Log

27 April, 2005

There have been several changes to the DST since November. The tube has been at atmospheric pressure for 11 days. Previously the mirrors had been exposed to 7 days at atmospheric pressure. The port 4 exit window had an air bubble and a chip that were affecting the adaptive optics. This exit window was swapped for another exit port window without defects and both were thoroughly cleaned and needed it. The horizontal spectrograph stepper motor driver failed. Since it and the motor are no longer made, both were replaced. The scale per step is the same. Tony Spence set up the new motor and driver for smooth micro-stepping between the major steps.

In the evening Hagrid and Hogwarts (Oscar) were unpacked, mounted in the ASP rack, connected to peripherals and successfully booted.

28 April, 2005

Connected Sarnoff camera to Hagrid and Pluto camera to Hogwarts. Sankar had set up a mock DLSP on the HSG bench. Images were recorded using a 12μm pixel front illuminated Dalsa camera, the 12μm pixel back illuminated Pluto camera and the 16μm pixel Sarnoff camera. Spectral resolution was around 3pm with the Dalsa and a little less than 4pm with the back illuminated cameras. Since there were about 2 pixels per line width, this means there is about ½ pixel of charge smearing at 632.8nm with the back illuminated devices.

Hogwarts connected to the NSO network easily, data were transferred to ~elmore at NSO where Sankar picked them up for analysis. Hagrid crashed on the re-boot following changing of network parameters with a missing file c:/WINNT/system32/config/SYSTEMced. The operating system could not be rebuilt using the Windows 2000 distribution disk as no windows operating system was recognized so a new OS was created on WINNTNEW. There is no file called SYSTEMced in the new tree! The d: partition was OK so all the Sarnoff development code was still on Hagrid. After the OS, one must load the Intel board support package, the Matrix graphics package, Microsoft Developer's Studio, the Sarnoff drivers, and Record Now. All were loaded and Hagrid is running.

The ASP cameras were connected and powered up and the ASP system turned on. Everything starts OK with images seen on the ASP cameras and demodulated Stokes images on the Sarnoff and Pluto cameras when commanded locally. Commands to tell Hagrid and Hogwarts when to collect Stokes images are failing. Cookie reports lots of network connection errors to Harry, Hagrid, and Hogwarts.

The Sarnoff camera "L" was mounted upside down on the former Pluto hinged mount to achieve the right height. Doug Gilliam had Scott Gregory fabricate a new 'L' that would fit on top of one of the NSO jack stands and hold the Pluto camera sideways (its required orientation). Scott came up with a wonderful mechanical solution for mounting the new half wave retarder in front of the polarizing beam splitter. The mount takes up little room and allows the wave plate to be rotated in place. David mounted the polarizing beam splitter with new half wave retarder attached into the spectrograph. Doug found large screws to hold the new parallel port break out panel in place. There is just enough room for the panel.

29 April, 2005

Modified ASP Old/Save Settings code so that modulator rate is saved and restored. This will be useful since we will be running for more than a month at the non-standard rate of 20 frames/second (3/60 sec per frame). Worked on TCP/IP command interface from ASP to Hagrid and Hogwarts. All addresses had to be changed to match NSO. There were some handshaking issues with cmd_out_stream code. Both Hagrid and Hogwarts now collect data when commanded from the ASP. Hogwarts, the Pluto machine takes too long converting Stokes data to IQUV data and writing to disk. Spent most of the morning in a DLSP meeting.

30 April, 2005

Hector and Rebecca arrived.
Worked on details of Hogwarts and Hagrid operation with ASP. Hogwarts runs rapidly when the Number Out is large and the camera is commanded manually. Sixteen accumulations take 7.2 seconds. Frames alone require 6.4 seconds. The reason for accumulate overruns is not yet known. File names and directories were cleaned up.
Bruce and Sankar gave up at about 10:30 so we started cleaning up the setting up the HSG. First was location of a pick off mirror as close as possible to the beam at the end of the 'L' on the narrow side of the HSG. Half 1083.0nm was used for setup on the Sarnoff camera first using the Tamron 500mm lens. It was then replaced with the SPINOR IR 1-meter fl lens. With a 1083.0nm filter, that line could be seen with the Sarnoff. There is a lot of fringing at long wavelengths with that CCD. Next we picked off 587.6nm with a mirror just on the other side of the collimated beam and used the Tamron lens on the Pluto to locate the spectral region. Next was use of 512.5, an overlapping order for 849.8 to position the straight through ASP camera. Doug and Joe then positioned a small pick off mirror for 854.2. Meanwhile David set up the 866.2nm fold mirror near the 1219mm fl camera lens for the ASP cameras. The 8500nm filter with the long red transmission profile is missing so we used an RD750 on the Sarnoff camera to find the IRT line.
The Rockwell computer 'rock' was set up. Networking parameters were changed for NSO and the computer renamed 'Harry'. The Rockwell camera was set up with strobe signal, CameraLink to Harry, and Power. The ASP strobes are narrow positive going pulses so the signal generator was not needed in the strobe line to narrow the pulses. The Rockwell data acquisition programs do not run so something must still be amiss in the setup.
Towards the end of the day Doug and Joe worked on setting up the UBF with SI 804 camera and a first cut at balancing the ASP cameras was performed. ND 0.3 was added to the Pluto camera to bring signals into range. Even more ND may be required with full Sun.

1 May, 2005

Joe Elrod completed the UBF setup including tuning and determination of scale factor, 0.097 arcseconds/pixel. The SI 804 camera is 1024x1024.
A successful test Map was run including the UBF on and off band H-α. The Rockwell camera was not included.
Tony Darnell called in with a fix for the SPINOR Camera Test.vi routine. The clue to getting the camera to run at all was use of exposure times <34msec. The SPINOR routine produced summed images with each frame shifted by four rows when exposures were longer than 16 msec. The ASP camera strobe sent to the Pluto, Sarnoff, and Rockwell was not clean enough for the Rockwell. When connected to its own output on the ASP rack, images were properly summed for exposures up to 34 msec. The camera freezes for exposure times slower than that (the free run frame rate). This is a feature.
We saw astigmatism in the Pluto 587.6nm image. Hairlines and spectrum line came into focus at vastly different camera lens positions. The camera lens was 2 cm to 3 cm offset from the line from the center of the fold mirror to the camera CCD. By positioning the lens in line, the astigmatism went away. I lined up the Sarnoff and Rockwell camera lenses as well, but gathering overcast prevented perfect adjustment of the spectral position (using the mirror) and focus (using the lens). By the way the lens control box designed by Mark Komsa works very well. It can also be connected to the network.
The new polarization modulator was dirty including a fingerprint on the inside. Joe removed the optic and cleaned it first with ethanol, then with Ivory soap. Except for a small scratch and the 80/60 sapphire surface polish, the optic looks great. David aligned the tilt of the optic in its mount using the three nuts and the return position using stage tilt and rotation. The reflection of the pin hole falls back on itself to < ½ of a spot diameter.
A late afternoon test map with all three SPINOR cameras uncovered several software issues to clean up - another day.

2 May 2005

Clouds filled the sky all day long. There were some breaks and thinner places allowing for alignment and test data collection.

We worked on focus for a long time. We concluded that the solar image in focus on the slit at Hα worked ok. The HSG collimator is at 75. Formerly it was at 69 with the difference being attributed to a larger polarizing beam splitter. All cameras were focused. The ASP bert and ernie cameras were balanced. The chevron shape to the spectrum lines due to the polarizing beam splitter is very obvious.
A versalight polarizer was mounted and a square used to set its axis vertical. With the HSG door open and creating a pseudo slit with fingers, the ½ wave retarder could be rotated in its mount to extinguish one of the two beams. What a wonderful design by Scott.
The correlation tracker for the tip-tilt mirror failed. The computer had problems and one axis of the mirror was not working. Doug and Steve worked on the guider for much of the day.
The normal phasing procedure was followed (using Map, not Phase). ASP wound up at hex 500, index 700. Hogwarts/Pluto was 2. Hagrid/Sarnoff was 1.
We ran a couple of calibrations through the clouds. Rockwell camera data were ftp'd to /scr3 and Hector was able to pick them up and determine a modulation efficiency of about 50%.
A Map of 200 steps failed about half way through due to entering a comment while ASP was running. This is a bug to fix.
Another 200 step map failed on Hagrid and Hogwarts when both of them quit responding to commands at different positions about 140 steps through. After this a long undisturbed Map was run to see how long they would run. After an hour and a half, Hagrid was checked and it reported a missing system file, attempted to reboot and failed similar to previous failures.
After hours, David attempted to rebuild Windows 2000 on C: to recover the data on D: Unfortunately the disk failure ate both disk partititions, c: and d: This meant all Sarnoff data for the day were lost.
After hours the disk was replaced with one Ron had shipped overnight (4 days) just in case. The replacement from the Prominence Magnetometer had most components already installed. It took longer to uninstall Visual Studio.NET than to Install Visual Studio 6.0, the version for which we have disks.

3 May, 2005

Partly cloudy most of the day with some patches of clear sky. Seeing was fair to good much of the day.
We ran a 200-step map early then attempted a calibration. With clouds and mistakes it took until afternoon to complete a good one. We then did a time series of 400 repeats and another map. The entire system worked fairly well though we had to keep an eye on Hagrid/Sarnoff who occasionally would try to access an illegal address. Some scan positions were dropped while the application was restarted. Twice the Rockwell computer asked to overwrite a nonsense file name and paused waiting for a reply.
The Rockwell camera seems to need very little LN_2. A top off late in the day took nearly no LN_2.
After hours the Sarnoff code was modified so that it cannot attempt to accumulate when already accumulating. Perhaps this will fix the addressing issue?

4 May 2005

Sarnoff camera is using new 870nm filter. Contrast looks much better due to better order isolation. The software patch changed the symptoms from illegal addressing to hanging up.
Doug started up SPINOR computers as well as ASP.
We started with a long time sequence, did a map and some more time sequences. There is a problem with the ASP data tapes. There is no file mark at the beginning. Reading these make take some work.
Worked on hang up and file names on PCs. New code to try on 5 May.
We discovered that if the linear polarizer rotation is at 45º at the start of a calibration, the first linear polarizer position of the calibration is OK, otherwise it could be out of place. When observers phase first thing the polarizer could wind up out of place. At the end of a normal calibration, the polarizer is in the correct position.
We set up the Sarnoff camera with the Tamron 500mm lens with a weak prism as cross disperser. The slit decker is reduced so that the orders are separate. Slit width is 50μm. Orders seen on the Sarnoff camera are in the following table. Hector put the 870nm filter in front of the slit to verify identification that second to the end is order 6. This is with the 308.57 l/mm grating. All of these can be seen on the Sarnoff. There are still cameras at 587.6nm, 854.2nm, 849.8nm, and 1083.0nm.

5	10394.40
6	8662.00
7	7424.57
8	6496.50
9	5774.67
10	5197.20
11	4724.73
12	4331.00

Another interesting test Hector wanted was to put the calibration linear polarizer in the beam, then an additional polarizer just before the modulator with its transmission axis parallel to the slit. The beam was extinguished indicating the polarimeter response coordinate frame is perpendicular to the slit.
The window polarizer was installed on the telescope in the afternoon and we ran one test Telescope operation in preparation for the next day.

5 May 2005

Cirrus was too thick most of the morning. Afternoon saw cumulus and a little rain.
The window polarizer home sensor was not working. It took until 5:00PM to discover and fix the connector on the back of the driver board. No data collected during the day are any good since the position of the polarizer was entirely unknown.

6 May 2005

A full day of window polarizer observations. It was continuously clear until about 2:00PM, cirrus until about 4:00PM and cumulus until we quit at 5:30PM. Not every header or data command was being sent to the Pluto, Sarnoff, and Rockwell cameras. Therefore there are missing positions. Some times during the day all commands got through, but most of the time they did not. Bert quit listening to commands shortly after the beginning of the run, then later in the day started listening again.
There are now scripts on Harry, Hagrid, and Hogwarts to write data to the san. To write data execute 'tosan datadir' where datadir is the directory on the d: disk to be saved. Sometimes the scripts fail when writing the .ready files. If this happens there is a script 'readytosan datadir' to just transfer those files.

7 May 2005

Thick cirrus all day long prevented any observing.
The entrance window polarizer was removed early and the 'spoon' replaced.
Work was done on software to transfer data files to the SAN. The first attempt failed because of too many files queued and an illegal character in the .ready files. Reliability of the Sarnoff and Pluto computers was improved by adding a time out to the camera collection on the Sarnoff and by increasing the priority of the command receiving task on both.

8 May 2005

There was not a cloud to be seen all day. Seeing was fair to good in the morning and fair to poor in the afternoon.
The calibration linear polarizer assembly was sometimes failing to lock at a position. The home switch spring was not pulling the actuator away from the micro-switch. The spring was bent slightly and home now works.
After fixing the polarizer stage we ran a calibration with the cross disperser still in place using a 35μm slit width to avoid saturation.
The Sarnoff camera was returned to 866.2nm without the cross disperser.
Various observations. First were spicule north and south time series with the slit parallel to the limb at a fixed height a few arc seconds above the limb. A glass slide with an artificial spot was used for the correlation tracker to remove the modulator wobble.

A couple of maps of AR 0758 centered on the trailing spot. MDI is observing this region in high resolution mode today for Mandy.
A polarization calibration with a functioning polarizer stage was successfully completed. This may be the first genuinely good calibration of the run.
A 30 arc second scan of a prominence in the NW was repeated several times.
Just in case, we did a flat field.
Hagrid/Sarnoff reported illegal memory errors and dropped the data for the first step of many of the maps. This will get fixed. Cookie crashed twice, once when trying to abandon a Map during the dialog phase, once during a comment. It will no longer be possible to enter excessively long comments that crash cookie.
During the last map, cookie quit sending commands to Harry/Rockwell. Some scans were lost.

After hours, the file naming procedures for the Rockwell camera were modified. Until now, data files should be attached to operations and scans by time as the operation number and scan number were not used to create file names. After this time, they will have accurate operation and file numbers. The Pluto and Sarnoff cameras have used the correct numbers except for the first couple of data sets. Also, the Rockwell scan headers had the wrong scan header number. This was fixed.

There was a successful transfer of the Sarnoff cross dispersed telescope calibration data set to the SAN. All of the remaining Sarnoff data are queued for transfer as soon as possible. With that done, the next two cameras can be transferred. TheSAN is set up to save data to different DLTs for different cameras.

Also after hours, I learned that network transfer of data from the ASP directly to the SAN is too slow to be practical. Going to the SAN instead of 8-mm tape adds an extra 3 seconds per scan position with just one camera demodulator computer doing a transfer. It would be even slower with both bert and ernie. This is not an option.

9 May 2005

Clear all day long. Seeing was good, excellent at times in the morning. After about 10:00AM seeing deteriorated to very poor in mid afternoon.
Operations performed were calibration, time series at the limb and various radius vectors, maps of the AR near disk center, and another calibration. We quit early due to the terrible seeing.
There were some communication problems early between ASP and NSO cameras. There were no clear fixes, other than taking care setting up both for observations and not progressing too far in the ‘Map’ dialog on the ASP before setting up the NSO camera.

10 May 2005

Long day. Calibration early.
Fixed slit time series at various distances from the North limb
Maps of AR 0758.
Some communication problems from cookie to Harry and Hagrid.
Window cooling not working.

11 May 2005

Long day. Calibration early.
Fixed slit time series at various distances from North limb, closer to the center of the disk than on the previous day.
Maps of new AR near the center of the disk.

12 May 2005

Long day. Calibration early.
Fixed slit time series at various distances from North limb, closer to the center of the disk than on the previous day, yet again.

13 May 2005

Fixed slit time series at various distances from North limb, near disk center. Seeing excellent at times.

15 May 2005

The backups to T691, T691R, T691P, T691S seemed to work OK on Saturday. I was asked to keep you guys informed as to the status. Seems like Chris has done lots of work and between David's and Mike's great documentation - everything went well.

Chris and Brady - you all might want to check the system on Monday to make double sure that I have made no errors or messed anything up.

16 May 2005

Here is an update of the morning.

1. UBF slit jaw imaging changed out for Gband.
2. Focus issue with Gband image.
3. We opt to go with field in focus on SI 805 camera in hopes of taking advantage of some good seeing.
4. Running 99 repeats of 3 step maps with .375 step size.
5. Bert and Ernie tape drive 'write errors' cause problems during two of the three series taken.
6. My error on selecting 'file' mode instead of 'movie' mode appears to have caused problems with ICC. We crashed at 28 of 99 repeats with communications between ICC and our camera GUI the main issue. This would not have happened if I had been in the correct 'Movie mode'.
7. HAGRID, HARRY and HOGWART are all doing well. (no real problems to report here).
8. Window cooling is not working currently.
9. Observing on quiet sun will most definitely require two observers. Someone must man tracking systems at all times when operating on quiet sun.

We noticed today on Bert and Ernie that the Air Force Resolution target was very soft in focus. This means that the solar field is also probably not in good focus. We have spent most of the afternoon looking at issues reguarding the various focus issues. We have returned to the same 780mm HSG feed focus position of 529.5.
We have also returned to the same collimator position of 75.5. There are some issues here that do not make much sense at the moment. Hair lines seem to be in good focus on all SPINOR cameras BUT the target and grid appear to look "soft" on all SPINOR cameras. The 780 lens position had not been touched through this morning. The collimator lens position had not been touched through this morning. I have had several people come in and look at these issues (Steve Hegwer and Sankara) - We all feel that there is some issue here that is not correct.
Never in the past have we had a hairline and primefocal plane difference of more than 10mm on a slit jaw camera. My experience is limited with this situations but this information in itself raises a flag. I don't want to find out at the end of Anna's run that there is a bad positioning of any lenses.

David - I will talk with Anna concerning weather or not we should return to the UBF.

We looked at collimation of the 3000 HSG lens today. We auto-collimated back through the system using a mirror and came up with a collimator position of 53. We then checked this collimation position by placing a lens of known focal length down stream of the collimator. At this position of 53 the 605mm lens that we used reimaged the slit 605mm away. Is it possible that the 1/2 waveplate is introducing some sort of lens effect to the system. This is a thought which Steve Hegwer brought up as we were looking at the telecentriciy of various parts of the system.
Doug

The decision for the next day is to a) return to H-α slit jaw on and off band. Focus the resolution target on the slit and verify using H-α. If there were more time, use an 850nm filter and a second beam off the entrance slit to check focus.
The spectrograph will be left alone as the hairlines and spectrum lines are both in focus on all the cameras. Hector and Anna have been consulted on this plan.

17 May 2005

Thanks for the phone calls and all the help. We have went back to H-alpha and have a good image with both hairlines and resolution target in focus. This is a huge difference from what we had with the Gband. I think both of you were a bit worried that we might get off on a trouble shoot and forget about observations. We will make sure that this does not happen. Today's conditions have been mostly cloudy with low light levels - this has been a good time to return the UBF to the setup.

The HSG and camera focuses have been left unchanged. The HSG is 'untouched'.

A change that has been made is the 780 HSG feed lens position. This position has changed from 528.5 to 536. This move is 7.5 mm going away from the slit. This seems to have improved all spatial focuses and solved the focus issues on the slit jaw image. Maybe it is possible that this lens was bumped sometime after David left.

At any rate we are ready for observations. I am sorry for the alarm and panic yesterday. I tend to think the worst when things like this happen.

We will keep you informed with the observation progress. Thanks a bunch Hector and David.

Doug

After a day of observing (through partly cloudy skies) Mike noticed that data files were not being written to disk by the Rockwell camera. Also, scan numbers were wrong on the Sarnoff and Pluto cameras. David installed a patch in Accumulate.c on cookie to check for a “FLAT” and correctly load the scan number into the packet sent with accumulations. This solved the problem.

18 May 2005

The same problem seemed to have returned when running a Map in Movie mode. Removing the patch from yesterday did not change the symptoms so it was put back. This happens only in Movie mode, not for a normal Map.

19 May 2005

Mike caught the calibration mechanisms changing position while at least the Sarnoff and Rockwell cameras were still accumulating data. A 3 second delay was inserted into the code before changing calibration optical configurations and another calibration was run (the last of the day). This one eliminated the problem. The signature of a failure in the data is a ‘dark’ that isn’t really dark. We don’t know how often this was happening in the past, but all calibrations between 8 May and the last one today should be viewed with suspicion. First check the dark for being really dark, then check for consistency of the polarimeter response.

20 May, 2005

The accumulation overrun problem returned even with the delay in the code. It appears that the first time bert, ernie, are booted, network commands are sent to all five computers (harry, hagrid, and Hogwarts too) at the same time. The next attempt to perform a calibration results in commands going to bert and ernie, then some significant time later, like 5 seconds commands to the SPINOR computers. No logic has been able to explain this so a pop up window was inserted into calibrations. At each calibration configuration, the observer must dismiss the window before the calibration will proceed to the next configuration. This

way the observer can make sure all cameras have completed accumulations before moving on to the next optical configuration.

21 May, 2005

Anna's run ended at noon today.
Setting up using the 600l/mm grating at 73º. There is some confusion about which side should be up in order to get the most efficiency at this angle and have the face of the grating clockwise of the input beam when looking down on the top.

22 May, 2005

As of Sunday morning (22nd) this is where we stand.

1. Grating (600 line) is mounted and run-out has been checked. The grating is positioned in the mount up-side down. The rotation of the grating is clockwise to the incoming beam. I guess a better way to put this is the face of the grating points to the right of the incoming beam. We have a current grating position set roughly at 286.5 degree.

2. Loss of time (2 hours) yesterday is mostly impart to my inexperience with gratings in negative configuration.
We have had Sankara verify our positioning with this 600 line grating. Its better safe than sorry.

3. We have located the 6302 line on the Sarnoff camera. The lens in front of the camera has been checked for good center location and is square to the incoming beam. The Sarnoff chip has also been squared on to the incoming beam (with blocker removed). The 6302 blocker is the blocker that we normally use with the ASP Photospheric camera. This blocker is mounted in reverse with reflective side in. We do have a concern about the 6302 lens being positioned with the curved side of the lens pointing towards the camera(??).

4. The Rockwell camera lens has been squared with respect to the incoming beam using a green overlapping line filter. The Rockwell chip has also been squared on with respect to the incoming beam. The lens is centered with respect to the beam. This lens is also positioned with the curved side towards the Rockwell camera(??). The blocker has been mounted in reverse at David's request (same as 6302). We have located the 1564 line (late yesterday). The 1564 blocker that we are currently using is the DST 1.56 (A filter of the same lot# as the one we recently lent to David). We find no 1564 blocker in the SPINOR cabinet.

5. Goal for this morning is to verify the 1564 line and make sure that we understand the focuses on both cameras. Once this is done we will verify phase with the Sarnoff camera. If we understand David correctly we will use circular polarization in normal fashion (same as Bert and Ernie). The point of zero cross must also be approximated with circular polarization (no index setting) (?).

Based upon the above. The lenses will be oriented correctly and marked! This means that for all the chromospheric run, the lenses for the SPINOR cameras were backwards. The implication for focus will be analyzed by David.

Ita needs to see chromospheric network so Doug will set up a G-band slit jaw camera.

Note: The following phasing technique changed the ASP phases and was performed by setting values in the ASP GUI. This changes the phase of *all* cameras. There was not a change, thank goodness. To check for the Sarnoff (or Pluto) alone, phase needs to be adjusted on Hagrid (Hogwarts). The Sarnoff phase setting was and is 1.

We have checked phase using David's instructions sent in earlier this morning.

Using only circular polarization for phasing (retarder in and set to 0) (polarizer in and set to 45):

Watching only the left side of the V display - we see the following:

Hex =1 (left side of V display is bright)
Hex =2 (left side of V display is bright - a bit darker than Hex = 1)
Hex =3 (left side of V display is less bright, darkening more)
Hex =4 (left side of V display is less bright, darkening more)
Hex =5 (left side of V display continues to darken)
Hex =6 (left side of V display is about the same as in Hex = 5)
Hex =7 (left side of V display is brighter)
Hex =8 (left side of V display is brighter)

The right side of the display consistently opposes the above (which is good)

The above notes are not real helpful but what we see tells us that there is not much change from David's previous setting of Hex = 5.

23 May 2005

Maps, time series, cal, and flats. Focus was attempted on 1564.8 with a wide slit and focusing on the hairlines. Focus on 630.2nm was not obvious. Analysis showed a slightly less accurate spectral focus. Phasing of the Sarnoff using the Sarnoff GUI showed that Hex 1 is indeed correct when ASP is phased at 5.

24 May 2005

Today Doug Gilliam and Mike Bradford, with help from Steve Hegwer worked on the Photospheric spectrograph set up.
1. The grating was changed to the correct one. The previous grating had an 8º 38' blaze angle. The correct one has a 17º blaze angle and is used upside down at 73º. The predicted transmission improvement for 630.2 is about a factor of 4 and about 50% for 1.5648μm. The transmission went up so much at 630.2 that a neutral density filter was added.
2. The spectrograph collimator lens was in the wrong position. This was known and it was assumed that it could be corrected using the camera lenses. This is in fact not the case and with the correct collimator lens position, spatial and spectral focus should be better.
3. The spectral and spatial focus positions happened at different camera lens positions. This was due to mis-alignment of the optical path from grating to cameras. With correct alignment spectral and spatial focus is now good at a single camera lens position and both cameras have good spatial and spatial focus (as best as could be achieved in the cloudy sky). This re-alignment also further increased the flux level on the 1.5648 μm camera.

None of these changes should affect polarization modulation efficiency but the signal level will be higher and the image sharper.

25 May 2005

A good map was recorded in the morning with good seeing. Flux at 630.2nm and 1.5648μm are much improved.
Spectral resolution at 630.2nm was not as good as expected, a line depth of 48% compared to 40% for DLSP. A LASER spectrum was recorded through various neutral density filters. The focus was adjusted on the LASER line and another set of spectra recorded.
Analysis of the 1.5648μm calibration configurations indicate a poor modulation efficiency, only 15% whereas it is about 50% for Q/U. This is not understood.

26 May 2005

May 26, was recorded at 12 hours overcast. We had some openings in the clouds but they were few and small. Some optical tests were run during this time with the understanding that nothing

be moved on the HSG. The slit was not touched nor anything downstream of the slit. Camera focuses are in last position of the Laser profile. Nothing has been moved (David's request).

The first test run was a re-verification that the beam coming out onto the bench was truly collimated. The two 300mm lenses in the AO system image the solar field and then re-collimate it. A simple method for this test is to put a lens of known focal length into the beam and see if the field comes to focus the focal length of the lens away. We know from this test that we have a collimated beam. This can be reaffirmed by measuring the distance between the WFS 800mm field imaging lens and the square field stop on the wave front sensor. This distance is 800mm. I hope I am making sense here! Anyways - we know the beam coming out onto the bench is collimated.

The next issue was the focal length of the newly coated 780mm HSG feed lens. I told David several days ago that this focal length had changed substantially. This was wrong. The laser that I used to test this previously was not truly collimated. The tests from yesterday show a focal length of approximately 775 with this lens. Testing the old HSG feed lens that is normally used for standard ASP setups we see a focal length of about 780mm to 785mm.

The distance from the pupil plane formed by the second 300mm lens in the AO feed optics (The first pupil plane out on the bench) and the 780 HSG feed lens is very close to 778mm-780mm. The mirrors were readjusted to insure good auto-collimation from the HSG feed lens. This was done on about the 12th or 13th of May.

The next test was to block the position of the 780 HSG feed lens at its current position and replace it with the older 780 HSG feed lens used in standard ASP setups. Our reason for doing this was to try and get a better understanding of the large variation in field focus vs. slit focus between the H-alpha and Gband images. With the current setup we see a 2 to 3mm difference between hairline and field focus in the UBF H-alpha image. At this position we see an 11 to 12mm difference between hairline and field focus in the Gband.

With the standard ASP HSG imaging lens placed in the beam I am fairly sure we saw a substantial improvement
in these focus differences. I say 'fairly' because it was hard running these tests in the clouds. I do know that we were able to achieve a fairly good focus on both UBF H-alpha and Gband images. (Both images having about the same focal difference between solar filed and hairlines. BUT - what further confused the issue was that we were also able to acquire better focuses with the new 780 lens by adjusting it slightly (don't worry the blocks never moved).

Another question would be our method of setting up? If the 6302 spectral lines are the most important part of this setup, maybe we should tune the UBF to 6302 and verify that the slit and solar field are in focus together. Maybe for the return to Chromospheric we should decide which spectral line is the most important and make sure that we check this image on the slit at that wavelength.

27 May, 2005

From our findings yesterday, we have decided that certain issues will have to be looked at closely before the conversion back to the Chromospheric setup starts. We will try and address these issues in a timely fashion keeping in mind that we are running out of days. Steve Hegwer has stressed to me the importance of these issues.

We need to determine if the HSG imaging lens in the current setup has problems.

We need to verify all spectral line beam paths with the zero order in relavance to the anchor position.

These issues will be checked closely and in a timely fashion. I will stay in communication with everyone through-out the holiday weekend.

The Photospheric setup has one morning remaining. My error with the grating and the current weather conditions are now critical to this observation run.

Doug

28 May 2005

Clouds and rain for the end of the photospheric run.

29 May 2005

Clouds. Checked focal length of 780mm lenses. They are not achromatic. The newly recoated lens is the same as the old lens. At short wavelengths the focal length changes the most. We have no choice but to use what we have.

30 May 2005

Setup Status as of 14:30 UT is as follows:

Chromospheric conversion is done.

All 6 HSG cameras are verified with the zero order.
Bert and Ernie did not need to be moved "we swung" the zero order on this.

6th HSG camera is SI 561 positioned on 5576.

PROBLEMS with HOGWARTS/PLUTO software interface. When we start the computer and log on - We select on "Adjust Stuff" and then go to "Commands" and select on "Camera Run". Immediately upon clicking on "Camera Run", we get an error message "Time Out Waiting For Frame Complete". This message will not go away and if we click 'OK' on it enough times the computer auto reboots.

Other than this issue, we are ready to go. We have concentrated on the 8500 focus range. This focus has been verified on the slit as an extra precaution. This was done using the slit jaw reflection, 8500 blocker and camera.

1530 - David - we found the problem with PLUTO. Loose connector. The trigger line connector 'T' was not seated on the back of the camera.

CURRENT CAMERA CONFIGURATION IS:

ASP BERT 8498
ASP ERNIE 8542
SPINOR HAGRID 8662
SPINOR HOGWARTS 5876
SPINOR HARRY 10830
CCD1 SI805 UBF (H-alpha)
CCD2 SI805 Gband
CCD3 SI561 5576 spectral line

We do not have 3 tape marks on the entrance window in which to determine - perpendicular to the horizon. We use P-Ang plus guider of 13.3. Our current

guider position is 29.5. We verify this by letting the telescope drift while on a spot. The spot drifts perpindicular to the slit.

ASP BERT A and B have a good focus of both slit and field
ASP ERNIE A and B have a good focus of both slit and field
SPINOR HAGRID camera has a good focus of both slit and field

SPINOR HOGWARTS - We focus on the field - pay no attention to hairline
SPINOR HARRY - We focus on the field - pay no attention to hairline
SI561 5576 spectral focus - We focus on field paying no attention to hairline

SI805 UBF H-alpha camera - We focus on the field - no attention to slit
SI805 G-band - We focus on the field - no attention to slit (hairline)

The G-band image shows "by far" the largest difference between slit and field focus. With the field in focus the slit/hairlines are a "blur".

Camera alignments for all spectral lines are good. On any camera, one can use the zero order to image the slit on the chip. On any camera (with slit on chip), the zero order is very centered on the lens which images onto the camera. These alignments have been checked and rechecked. The same can be said with respect to each fold mirror - we are centered on chip, lens and mirror.

31 May 2005

Starting off great today so far only 3 reboots
of cookie and 2 of the easp computers won't connect
After contacting David and rebooting the hagrid
computer, the Sarnoff camera started working.
It had previously run ok but for some reason started
giving no images.

05/31/05/ 14:33:47 -- Operation 2 Map: 510 steps of .00 arcsec each

Seeing fair to poor during this stationary
All cameras except for the pixel vision looked
ok...Display seems a little dark but the data is
recording OK
Possible data loss on ccd2 during this map.
There are files, but the camera hung up during
the map. Steve Fletcher restarted the GUI and
the cameras all seem ok.

05/31/05/ 18:32:46 -- Operation 4 Map: 510 steps of .00 arcsec each

Cookie crash after 3 steps. Will reboot cookie and see
what other problems there are

05/31/05/ 19:00:41 -- Operation 6 Map: 510 steps of .00 arcsec each

reboot(s) of cookie. Quit all easp camera applications and
restarted. Seems to work now but the pixel vision was slow to
respond. Does seem to be taking data.
Several attempts at the reboot were very puzzling. After
normal reboot, the "NoOp" command gave different results.
One time it would see all cameras but Sarnoff. other times
it would not see Rockwell but all others.

Ended map due to problems with the easp/dst
camera communication. The dst cameras did not
record any data but were actively running,and
display like they were running correctly.

1 June 2005

06/01/05/ 11:55:59 -- Advanced Stokes Polarimeter Observer's Log
oscar:/d/asp/Logs/05.06.01
Operator: Bala, Elmore, Socas-Navarro
Other observers: Gilliam, Elrod
Bert wavelength: 849
BERT DET_A Tape: vtt4036
BERT DET_B Tape: vtt4037
Ernie wavelength: 854
ERNIE DET_A Tape: vtt4038
ERNIE DET_B Tape: vtt4039
Project Number: T692

Slit Width checked at 50 micron.

ASP Hex = 5
ASP Index = 700
Sarnoff Hex = 1
Pluto Hex = 2

No Window Cooling (still down).

HARRY Rockwell = 10830
HAGRID Sarnoff = 8662
HOGWARTS Pluto = 5876

CCD1 SI805 = UBF (H-alpha) slit jaw reflection.
CCD2 SI805 = G-band slit jaw reflection.
CCD3 SI561 = 5576 spectral.

Focus on all cameras is checked (12:40 - 12:55).
Focus on 849, 854 and 866 lines looks real nice (I hope).

Solar coordinates set at EL = 13

06/01/05/ 13:21:31 -- Operation 1 Map: 510 steps of .00 arcsec each
EASP/SPINOR map 510 steps
Starting position South 19.1, East 40.2
Guider is set so slit is 90 degrees from Earth Horizon
Guider of 298.7
PAH 117.7
RV 0.690
ACTIVE REGION 0772
Seeing at the start of this stationary map is good.
Tracking rotation
CTK in use
HOAO in use
Only problems thus far are HOGWARTS (Camera acquisition for Pluto is not consistent).
NOTE - There is an ND of 0.2 in front of the Pluto camera plus HA30.
NOTE - There is an HA30 in front of the SI561 5576 spectra.
The Pluto camera takes data 'every other' step ?
Step 271 - Sarnoff 'memory errors'.
14:15 Ernie A tape has 15 Meg more than other 3 tapes (?)
14:32 Steps 350 to 371 - moth in port. We lose lock several times

during this period.
06/01/05/ 14:58:35 -- Comment
This is a fair to good seeing map.
We again lose HAGRID at step 504 of 510 .
Same error message 'could not read memory'.
We will stay at same position and repeat the map.
Flats for CTK and HOAO first.

06/01/05/ 15:07:18 -- Operation 2 Map: 510 steps of .00 arcsec each
06/01/05/ 15:10:27 -- Comment
Ending this map at 14th step of 510
Rockwell not responding
Sarnoff camera continues to report that it cannot read memory
06/01/05/ 15:12:01 -- Comment
Ernie tape drive A is now 34 Meg ahead of the other three drives ??

06/01/05/ 15:13:12 -- Operation 3 Map: 510 steps of .00 arcsec each
ASP map of same AR 0772 (Stationary)
South 19.1, East 39.3
Seeing at start is fair at best.
Before starting map we NoOp status SPINOR cameras (ASP sees all 3).
At start of map we get 'memory errors from Hagrid' and Hogwarts does not respond.
We are able to 'NoOp' and get all camera connections re-established by 19th step.
We lose CTR camera and switch to HOAO tip/tilt
When this switch is made, it causes a field shift with respect to the slit.
We do not stop map but re-adjust for this using the guider. This adjustment is not complete until step 60 of 510. One must keep in mind that even though we tracked rotation through out this problem - we are probably not on the exact same position of the spot as with the previous stationary map.
PROBLEM with CTK camera is not known. It keeps going dark on the display.

Seeing is bad at 238 of 510 steps. Seykora seeing monitor reads 0.5 but there is upper level stuff that puts the seeing more in the order of 3 to 4 arcsec. (16:02)

CCD3 SI561 camera shows saturation to the right side of chip (LL=5.7).
CCD3 Focus also looks different from this morning.

Region is changing quickly. Rotation track has been maintained since the start of the map but the center of the spot appears to have moved to the right of the slit.
06/01/05/ 16:55:49 -- Comment
Lost port lock at step 500 of 510 (moth)
Seeing for the last 150 steps of map is OK.
Saturation problem of 5576 SI561 gets worse with increasing LL.
Due to evolution of the region, we are on the edge of the umbra at the end of the map.

06/01/05/ 17:12:09 -- Operation 4 Cal: 69 configurations
06/01/05/ 17:12:25 -- Comment
Cirrus moving in from the West.
Try and complete a Cal before it gets here.

06/01/05/ 17:13:31 -- Operation 4 Cal: 69 configurations
06/01/05/ 17:45:34 -- Comment
ASP calibration

Light level 5.73
No clouds during cal.
With the stop boxes in Hagrid and Hogwarts go first with Harry starting his accumulations when Hagrid and Hogwarts are 'just about' done.
Good calibration

06/01/05/ 17:59:44 -- Operation 5 Flat Field: 32 configurations
06/01/05/ 18:07:08 -- Comment
Flats for SPINOR - EASP cameras
Hairlines out
Focus 675
Random Guide
Suncenter (no activity)
Good flat

06/01/05/ 18:21:44 -- Operation 6 Map: 300 steps of .37 arcsec each
Scan of Active Region
The spot we were centered on for the stationary maps has been moved over a bit.
Region is on the down side of flare activity which started about 20 minutes before the start of the map.
ACTIVE REGION 0772
South 18.3, East 38.1
Guider is maintained at 298.7
PAH 117.6
RV .660
Seeing ranges from 0.2 to 3.5 at start of map
At times seeing is very good at times it is real bad.
Exposure time for CCD3 5576 camera has been changed from 800ms to 600ms
06/01/05/ 18:58:15 -- Comment
Ending map at 181 of 300 steps
We have lost communication with all three SPINOR cameras
NoOp commands will not work
Harry is now asking us if we want to replace or overwrite files??
The D drive is not full
Ernie A tape drive now has close to 100 Meg more data than the other 3 drives
We will stop, replace tapes, quit out of each GUI and get back in.
06/01/05/ 19:11:41 -- Comment
New tapes loaded on both Demod computers
Bert A VTT4040
Bert B VTT4041
Ernie A VTT4042
Ernie B VTT4043

06/01/05/ 19:15:15 -- Operation 7 Map: 300 steps of .37 arcsec each
Active Region 0772
South 18.3, East 37.6
Guider is 298.7
RV .657
PAH 117.8
A closer look a Hogwarts data files shows that all headers are being recorded but not all data is with each header. Approx. every other step is being missed (headers only).

Called David

Check to see if any other applications are running. The Hogwarts process manager

is telling us that the SPINOR computer interface is the only application running.
06/01/05/ 20:12:58 -- Comment
Because of seeing this map is not a good map.
Seeing range during the series was 0.5 to 5.0
The issue of the Pluto camera accumulating images every other step or every other third step is very evident when one looks at the data files.

06/01/05/ 20:56:46 -- Operation 8 Cal: 69 configurations
06/01/05/ 21:04:05 -- Comment
ASP calibration ended
Hogwart camera is not seeing anything
Stop to find out what the cause of this is

ASP Demod computers show Meg counts in negative numbers.
We have seen this before, No problem.

06/01/05/ 21:06:24 -- Operation 9 Cal: 69 configurations
06/01/05/ 21:32:08 -- Comment
End of AZ-TA 15.0 position
The 'fail safe' or continue boxes that David has put in are a big help.
BUT something strange is going on during this cal that did not happen with the cal ran this morning. I will finish all cal positions and then put in a brief comment on what we are seeing.
06/01/05/ 21:52:14 -- Comment
Calibration is finished.
Good calibration - no clouds.
NOTE: For the first SPINOR cal ran this morning - we saw a camera accumulation order of:
-Sarnoff would go first.
-Just after the Sarnoff the Pluto would go.
-The Rockwell would start its frames just before Sarnoff and Pluto would complete.
-At the end of the Rockwell accumulation we would get our 'fail safe' box.

NOTE: For the cal ran later in the day, we see a much differet series (as follows):
-Pluto would go first.
-Sarnoff will start when Pluto is near completion of accumulation.
-Rockwell goes last (starting near the middle of the Sarnoff accumulation).
-Fail safe box will show up about the time Sarnoff is half way through its accumulation.
-WARNING to operators: Do not click the fail safe until the Rockwell is finished accumulating. The optics will move before Pluto and Rockwell are finished with their accumulations. Need to pay close attention to this - don't get used to a previous operation.

3 June 2005

06/03/05/ 12:34:58 -- Advanced Stokes Polarimeter Observer's Log
oscar:/d/asp/Logs/05.06.03
Operator: Bala, Elmore, Socas-Navarro
Other observers: Gilliam
Bert wavelength: 849
BERT DET_A Tape: VTT4044
BERT DET_B Tape: VTT4045
Ernie wavelength: 854
ERNIE DET_A Tape: VTT4046
ERNIE DET_B Tape: VTT4047
Project Number: T692

Slit width at 50 micron

Hagrid/Sarnoff - 8662
Hogwarts/Pluto - 5876
Harry/Rockwell - 10830

CCD1 SI805 - UBF H-alpha slit jaw reflection
CCD2 SI805 - Gband slit jaw reflection
CCD3 SI561 - 5576 Spectra

Window cooling is down for remainder of observation run

06/03/05/ 13:56:11 -- Operation 1 Map: 300 steps of .37 arcsec each
File Mark
06/03/05/ 14:54:07 -- Comment
SPINOR map
South 18.7, East 14.7
Active Region 0772
PAH 142.8
RV .396
Seeing (local) on Seykora meter shows 0.3 at start (0.3 - 0.9)
Lots of upper level (big waves in the seeing)
This is a fairly good map
The PLUTO header and data issue is still there but not as bad.
06/03/05/ 15:00:11 -- Comment
The Pluto problems is a big improvement from yesterday.
Problem is still there but much better.

06/03/05/ 15:08:45 -- Operation 2 Map: 300 steps of 0.07 arcsec each
File Mark
06/03/05/ 15:12:54 -- Comment
This is the start of a stationary map on same region
The slit moved off the spot (step size set to 0)
This must be my error (not for sure what at the moment)
We will rehome HSG and start again.
Cause is that I went back and changed to 0 step size after selecting on DST camera file status.

06/03/05/ 15:16:32 -- Operation 3 Map: 510 steps of .00 arcsec each
File Mark
06/03/05/ 16:53:42 -- Comment
South 19.5, East 13.5
Guider 298.0
Seeing at start of series is fair
Seeing from step 250 on is good
Ending position at PAH 147.9 (end of map)
RV .387 (end of map)
Correlation tracker is back in use today
QUESTION: This is a stationary slit map. The cameras seem to be accumulating data when the step number is advancing.
We are not sure if this was happening during the first scan of the day.

We have tried to reset Cookie (Synchro) and put old code back <synchro.050521 - getting a reply back that the file cannot be located.

The command has been issued from the boot prompt and did not work.
The command was also issued from the sychro prompt and did not work.

06/03/05/ 17:14:44 -- Operation 4 Map: 510 steps of .00 arcsec each
File Mark
06/03/05/ 17:17:26 -- Comment
Starting another 510 stationary map
Abort just after starting
Lost Hogwarts and NoOp commands will not bring him back

06/03/05/ 17:32:50 -- Operation 5 Map: 510 steps of .00 arcsec each
South 19.7, East 12.2
guider 298.0
RV .387
PAH 149.0
Seeing is poor for most of this map (1.0 - 6.0 arcsec)
Hogwarts is putting data with about every third header.
Hagrid is now showing the same problem. (taking data every other step)
We have lost all three SPINOR computers during this series.
NoOps work but when communication is restarted things are not good.
We will let this map end and regroup.
Seeing is very bad for this series.

Harry keeps prompting us "Do you want to overwrite existing file?"
If we look at the header count it looks like that it tries to repeat
a header count that has already been written.

date_005_470.hdr
date_005_470.dat
date_005_471.hdr
date_005_471.dat
date_005_472.hdr
date_005_472.dat
date_005_473.hdr
date_005_473.dat
date_005_470.dat
date_005_470.dat

When it tries to overwrite and existing header/data file, the camera times
out. This is associated with using NoOp commands to try and reconnect with
other computers.

We will try to return to the old version <synchro.050521 at the end of
this map. The command will be issued at the boot prompt.
File Mark
06/03/05/ 19:12:06 -- Comment
Reset Synchro computer
Enter the <synchro.050521
Synchro boots

06/03/05/ 19:41:49 -- Operation 6 Cal: 69 configurations
File Mark
06/03/05/ 20:19:02 -- Comment
SPINOR Calibration

Back to <synchro.050521 code
Reason the code did not load the first time is because I used a capital S in the command.
This is a good cal.
No clouds, with light level of 5.8 at start.
Focus is 675
Hairlines out
We are not at suncenter because of activity.
The cal is run tracking rotation at North 5.3, West 7.6
David has asked us to watch things as close as we can.
The only difference we see in this cal and the ones ran yesterday is that all three SPINOR cameras start their accumulations at approximately the same time. The 'fail safe' boxes work well.
The boxes come in at the end of the accumulations.

06/03/05/ 20:24:53 -- Operation 7 Flat Field: 32 configurations
File Mark
06/03/05/ 20:32:05 -- Comment
SPINOR FLAT
5.634 light level
Focus is set at 675
Random guide (dither)
A bit of a concern here is that we are positioned near suncenter and very close to an active region. We may go back for another cal and move off a bit more.
06/03/05/ 20:35:35 -- Comment
For previous cal we tracked solar rotation at N5.4, W7.4

06/03/05/ 20:43:04 -- Operation 8 Cal: 69 configurations
File Mark
06/03/05/ 20:50:14 -- Comment
06/03/05/ 20:50:30 -- Comment
The reason for the Synchro is that the MCC went down.
Power has been cycled on the Mechanism Control Computer.
06/03/05/ 20:54:19 -- Comment
GetNetStat and FixIcc needed to reconnect on Synchro reset
MCC is back.

06/03/05/ 20:55:34 -- Operation 9 Cal: 69 configurations
File Mark
06/03/05/ 21:25:05 -- Comment
2nd calibration
Tracking rotation at North 14.6, West 11.0
The first calibration was closer to the Active Region.
With the bad seeing we used the time for another cal further away from the Active Region.

06/03/05/ 21:27:50 -- Operation 10 Flat Field: 32 configurations
File Mark
06/03/05/ 21:34:40 -- Comment
2nd SPINOR flat
This flat is done in focus (517)
Previous SPINOR flat was done out of focus (675)
Both flats are with random guide (dither)
The request for in focus SPINOR was made during the first flat.
This is a good flat

No clouds
Light level 5.5
06/03/05/ 22:32:15 -- Comment
This is a test map for David
Reset on Sychro with a <synchro at boot prompt

06/03/05/ 22:36:29 -- Operation 11 Map: 40 steps of .30 arcsec each
File Mark
06/03/05/ 22:44:58 -- Comment
Problems during map are all with ogwarts.
Will try one more map and then report problems.

06/03/05/ 22:48:22 -- Operation 12 Map: 40 steps of .37 arcsec each
File Mark
06/03/05/ 22:51:42 -- Comment
We could never get all three SPINOR cameras to run with the code change.
We will stop, remove DST camera files
Quit out and get back in to each SPINOR GUI and try again.
06/03/05/ 22:57:42 -- Comment
Quit out of all SPINOR camera GUIs
Reset of Synchro
Start all SPINOR camera GUIs
No DST camera files

06/03/05/ 22:59:37 -- Operation 13 Map: 40 steps of .00 arcsec each
File Mark
06/03/05/ 23:01:38 -- Comment
Results are the same
Hogwarts is writing mainly headers - no data
The previous code <synchro.050521 seemed to do much better.
This new code was tested for three maps.
All three maps showed multiple problems.

4 June 2005

Final version of synchro code lowers priority of status tasks. Calibrations and Flats are OK on all cameras. Still during Maps, Hogwarts/Pluto is missing data commands but getting all header commands. Hagrid/Sarnoff is getting all commands. Harry/Rockwell has been OK most of the time except when it starts getting what it calls duplicate file names.

5 June 2005

A fairly smooth day operationally. Hogwarts still missing data files.

06/05/05/ 12:16:34 -- Advanced Stokes Polarimeter Observer's Log
oscar:/d/asp/Logs/05.06.05
Operator: Bala
Other observers: Joe
Bert wavelength: 849
BERT DET_A Tape: vtt4152
BERT DET_B Tape: vtt4153
Ernie wavelength: 854
ERNIE DET_A Tape: vtt4154
ERNIE DET_B Tape: vtt4155
Project Number: t692

06/05/05/ 13:18:41 -- Operation 1 Map: 510 steps of .00 arcsec each

06/05/05/ 14:54:58 -- Comment
500 step @ 0 step size
557 camera out due to high dark count level
good seeing most of map
s 18.0 w 11.1
gdran 297.1

06/05/05/ 15:00:54 -- Operation 2 Map: 510 steps of .00 arcsec each
06/05/05/ 16:38:29 -- Comment
same map of region
s 18.0 w 12.4 rv .370

06/05/05/ 16:45:14 -- Operation 3 Map: 510 steps of .00 arcsec each
06/05/05/ 18:21:31 -- Comment
The Sarnoff camera had an error message during
the scan. Restarted
Same region stationary map.
Seeing getting poor during the
last part of map

06/05/05/ 18:26:09 -- Operation 4 Map: 300 steps of .37 arcsec each

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06/05/05/ 19:29:18 -- Operation 5 Cal: 69 configurations

06/05/05/ 19:35:24 -- Operation 6 Cal: 69 configurations

06/05/05/ 20:03:17 -- Operation 7 Flat Field: 32 configurations

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06/05/05/ 20:44:44 -- Operation 8 Map: 300 steps of .37 arcsec each
File Mark
06/05/05/ 21:43:46 -- Comment
300 step map .375
mostly poor seeing
same region
06/05/05/ 21:45:26 -- Operation 9 Map: 510 steps of .00 arcsec each

6 June, 2005

A couple of maps in poor seeing.
Disassembly of SPINOR setup. Rockwell and Pluto cameras and computers were packed for shipment to Boulder. To transport these back to Boulder, on 8 June, Bala met Hector in Las Vegas to swap equipment.

- Pau-