

SPINOR Nov. 2004 Engineering Observing Run Log

What we learned about optics

IR camera works. IR optics work, polarization is seen at 1.5648 microns. Yes, with the current modulator there are fringes in 'V'.

What we learned about computers

Network disconnects between oscar and cookie have vanished without any changes to network connections or software.

Cookie did freeze a few times though ran some days with no problem.

Ernie AC power problem was fixed, with a power supply filter and securing connectors to the power switch.

Ernie dropped frames was fixed by cleaning fiber optic cable at camera end.

ASP hardware camera triggers are now recognized by the DST camera software. This is the way to operate DST cameras.

17 November

Drove to Sunspot as did Tony Darnell with the Rockwell camera and Anna Pietarila (with spouse Jonathan Graham).

18 November

Unpacked all electronics. Set up three computers, Oscar for the Pluto camera, Rock for the Rockwell camera, and Hagrid for the Sarnoff camera. Camera cables are long enough for Pluto and Rockwell to mount computers in ASP rack. Hagrid reported an error while booting about not finding autocheck. The OS was repaired using the XP installation disk. All cameras work. Hagrid has only one serial port. It needs two one to set up the camera and one to receive commands. I will have to program around this. Rock was set up on the inside of the HSG so that cables will reach.

Previously ASP computers have had problems. The network disconnect problem with cookie is unfixed. Ernie has been losing AC power. He has also been dropping frames to the point recently ernie has not been used. The power switch on the back of the chassis is welded in the 'on' position. This will be checked. During the day, ernie lost AC power once. Cookie mysteriously hung up twice. This was not the network disconnect problem, in fact no network disconnects happened.

The adaptor plate for the Pluto camera to its base plate is missing. This is the same plate used for the CPA installation and is being sent overnight.

Some work on putting uncoated optics into the AO system needed for IR transmission. Bert and Ernie cameras were placed on the bench at their approximate location.

19 November

Condensing fog. Even with some sunshine opening the telescope is not possible. Clearing in the afternoon so some alignment was possible.

Ernie power supply had 350mv of ripple. The power switch had long ago been removed from the circuit. Tony Spence added a capacitor to the output to smooth this out. Wires connecting power to the front panel switch were loose at the lugs. These were tightened. No Ernie crashes today.

Mounted bicrystalline achromatic retarder and modulator. In removing the polymer retarder from its very tight mount, the surface chipped. It may be large enough to affect the pupil. The achromat was mounted in the bottom of the cavity with an 'O' ring underneath it. With the Teflon spacer the top ring no longer bottoms out so that the modulator will no longer rotate in the mount.

Software to send serial commands out three ports was completed. Tony has the IR camera taking doing accumulations. Quickspin works so Pluto camera is taking images. Image quality on the Pluto does not look good and there are missing rows in the center and quadrant 0 is very noisy.

Mounted the Ross 1000mm focal length achromats, two visible and one IR coated. Set up 1219 fl lens for average of 8498 and 8542 in lower order. Pluto base plate arrived and camera was mounted. Lenses and cameras were positioned using ZEMAX prescription (coordinates relative to the center of the grating). This works quite well.

No network disconnects, but cookie froze once.

20 November

There were some holes between clouds in the morning.

Worked on alignment of all cameras. We have seen the 849.8nm on bert, 854.2nm on ernie, 866.2nm on Pluto, and the 1.5648 line on the Rockwell camera. Focusing hairlines on the cameras and the prime focus on the slit was in progress when clouds got too thick.

Ernie dropped frames were due to poor fiber optic connections at the camera end. Reseating the cables dislodged whatever was blocking the light. This has been bothering ASP users for some months.

The Pluto camera was not showing all four quadrants cleanly in quickspin, but it does look OK in PixelView using the DFE fast high library (that uses an external gate). Quadrant zero was always very noisy. Attempting to change parameters in Quickspin often resulted in a black or blue screen either when running Quickspin, Visual C++, or less frequently PixelView. I did a system restore of Windows 2000 similar to what was done to fix the boot problem on Hagrid. I did not have Norton so that application has been lost. The crashing problem was not fixed either. The first crash after the repair precipitated a long disk check. Visual C++ then gave memory errors when attempting any rebuilds. I re-installed Visual C++ to no avail. The VC problem was with a corrupted quickspin workspace. I created a new workspace using a copy of the June

backup with new cpp files (the ones edited since last June). VC now works, but there are Oscar crashes and quickspin still has a bad quadrant.

The Pluto camera had condensation at the center of the CCD. PixelView DFE library and Quickspin are now programmed for 278K. No condensation at this temperature. If the camera is powered on and one of these applications is not run soon, the camera will go to its coldest possible temperature – not good.

ASP can no longer control DST cameras via the programmed interface via the ICC. But it can now control cameras via the trigger signal. A half second delay was put into the code after the spectrograph is stepped and a strobe is sent to the camera. This will be the mode we will use.

We got a little sunlight late, enough to get 849.8 and 854.2 (bert and ernie) balanced. Later ernie dropped its green channel on camera A. It came back before we got the side off the camera.

Some IR data were recorded between clouds. The accumulation of data was not working correctly – all frames looked alike. Tony is working on this Saturday night.

Ernie worked perfectly (bert too). Cookie froze once. No network disconnects. Dozens of oscar black and blue screens.

21 November

Freezing temperatures outside. Clouds rolling over the ridge.

Tony discovered why frames were not being collected correctly (failure to uniquely name each buffer). He worked all day on a new routine.

Worked on quadrant three excess noise on Pluto when running quickspin (but not PixelView). No solution. I did set up two versions of quickspin, 60Hz, and 15Hz indicating the maximum frame rate. The 15Hz version does not show quadrant 3 noise.

Changed the size of the swap space on oscar's \c drive so that it was not nearly so close to the maximum size allowed. Black and blue screens have diminished by about a factor of 10.

22 November

Three layers of scattered clouds, turning to thunder snow.

I worked on Sarnoff camera control. Quickspin on Hagrid now initializes the Sarnoff camera. Tony has the Rockwell correctly collecting images into the 8 Stokes buffers and an application to convert buffers to Stokes parameters.

The lamp source and 500 micron slit width were used for setting polarization set up. The 'KELP' 1 micron half wave plate was adjusted using the spare versalight in front of the

slit and minimizing one beam on the Pluto camera image using PixelView. The Pluto and ASP cameras were phased. New phase is Hex 2, Index 108. Phase and Map give the same results when running at 15Hz.

23 November

Thick clouds and 10cm of new snow to start the day.

Did a dry run including slit jaw camera. Everything seems to work.

Worked on Sarnoff software and had a frustrating day.

24 November

Telescope is frozen solid though only some surface clouds remain. It is absolutely gorgeous outside. Acquired the Sun but ice is still on window preventing AO alignment. Low clouds in the AM kept the telescope closed.

Flux level is really high at 15Hz. Rockwell exposure time was reduced to 20msec and there is still a digital wrap around. This should not be possible, something is wrong with accumulations. Tweaked up ASP camera wavelength and balances. Put 866.2 into 'good' quadrants of the Pluto.

Cleared out about an hour after noon. Joe went to the turret and removed ice clumps. The Sun took care of the last ice on the window. With ice no longer obscuring the pupil Doug and Mike aligned the AO. Took field of view reference images on all cameras including slit jaw, a pinhole and a 0.5mm grid. Took a small map on AR 704 in poor seeing. Performed a polarization calibration and a flat.

IR data do show good signal to noise even when data are digitally wrapped. V polarization is no greater than .005 in raw data. It is hard to see the splitting in the line due to noise. The spectral resolution is not very good. This is disappointing.

Sarnoff software was not so frustrating. Images are now being collected and displayed. Scaling looks funny.

25 November

Thanksgiving. It is beautifully clear at dawn. Seeing hideous.

Polarization calibration after the Sun got above 10 degrees. Ran Maps of AR 704. Mounted window polarizer late morning and ran from noon until Sun was about 10 degrees above the horizon. Removed window polarizer late. Window polarizer data recorded in single beam mode but without cross disperser. We will get 850nm and 1.5648 micron telescope profiles. Set up in dual beam mode for Friday.

26 November

Oscar lost Windows 2000 boot again. This time the OS could not be repaired from the CD. The Pluto camera is lost for the run.

The sky is clear but seeing is as bad as it gets.

Set up 614.9nm on bert. Ran a 50 step map on AR 707. This is a good target for this line that shown no linear polarization since the strong line of sight fields are at the edge of the spot and for FeII, the line disappears in the umbra. Ran a calibration but the last few configurations of the last table position were hit by clouds. Ran another calibration but bert lost communications with cookie. Started a new set of tapes. Ran another calibration OK. Ran a flat, but bert lost contact again and started yet another set of tapes. Clouds.

Backed up all Pluto data to CD via the Rockwell computer (1 DVD).
Backed up all Rockwell data to date on the Rockwell computer (4 DVDs).
Packed up oscar, hagrid, Pluto camera, and Sarnoff camera.

27 November

Clear at dawn. Seeing is hideous.

The bi-crystalline achromatic modulator blocks Calcium K by a factor of 40. This makes narrow band imaging at that wavelength impossible. At .12nm spectral resolution, the SI camera was recording only 160 counts above dark for a 2500msec exposure while it was recording 1200 counts in 500msec with the modulator out of the beam. For comparison, the same camera through a G-band interference filter gets 7000 counts in 20msec.

Seeing improved enough to observe. It varied widely but was sometimes good. Did a calibration, map, time series, map, and flat. Rockwell camera computer started missing frames on second map. Application was stopped and exited which crashed the computer. After the reboot some steps were picked up near the end of the map.

Did slit jaw camera flat fields. Backed up data and disassembled everything.

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