OSURC Nightlog 20220210 UT

Observer*: Olga Kuhn
Lead Partner Observer*: Patrick Vallely (OSU)
Other Partner Observers*: Tharindu Jayasinghe (OSU), Subhash Bose (OSU), Dominick Rowan (OSU)
Special Assistants*: none
Telescope Operator: Josh Williams
*** = from home**

Plan:

	Program/Target	Planned Time	Actual Completion Time
☑	~~OSU_monitor/N2403~~	~~02:15 – 02:30~~	~~02:30~~
☑	~~OSU_monitor/M81~~	~~02:35 – 02:50~~	~~02:54~~
☑	~~OSU_monitor/M82~~	~~02:55 – 03:10~~	~~03:14~~
☑	~~OSU_monitor/I2574~~	~~03:15 – 03:35~~	~~03:51~~
☑	~~OSU_monitor/N3077~~	~~03:40 – 03:55~~	~~04:14~~
☑	~~OSU_monitor/N2903~~	~~04:00 – 04:45~~	~~05:04~~
☑	~~OSU_monitor/N4236~~	~~04:50 – 05:05~~	~~05:26~~
☑	~~OSU_monitor/N4605~~	~~05:10 – 05:30~~	~~05:49~~
☑	~~OSU_monitor/N4258~~	~~05:35 – 06:20~~	~~06:34~~
☑	~~OSU_monitor/N5194~~	~~06:25 – 07:10~~	~~07:28~~
☑	~~OSU_monitor/N5474~~	~~07:15 – 07:55~~	~~08:23~~
☑	~~OSU_monitor/M101~~	~~08:00 – 08:35~~	~~09:00~~
☑	~~OSU_monitor/N4736~~	~~08:40 – 09:00~~	~~09:25~~
☑	~~OSU_monitor/N4395~~	~~09:05 – 09:20~~	~~09:48~~
☑	~~OSU_monitor/N4214~~	~~09:25 – 09:40~~	~~10:17~~
☑	~~OSU_monitor/N3489~~	~~09:45 – 10:30~~	~~11:14~~
☑	~~OSU_monitor/N4826~~	~~10:35 – 11:20~~	~~12:11~~
☑	~~OSU_monitor/N4449~~	~~11:25 – 11:40~~	~~12:43~~
☐	OSU_monitor/N3627	11:45 – 12:30	

Could add N3344 back to the sequence if we get ahead of schedule

Summary:

We stayed with the LBCs all night and observed the 18 OSU_monitor targets that have been checked off the plan, above.
The skies looked clear except around 09-10 UT, around when the moon set, when a thin band of cirrus passed over from the NNW and there were wisps of cirrus visible in the allsky images. The seeing was pretty good for most of the night <~1", however it blew up around 10 UT, as ALTA had predicted. The temperature also fluctuated and this caused some trouble for collimation, particularly around 10-12 UT.

The LBC image quality log is here: 20220210.log

Issues:

- Focus OBs:
  - I2574 — use I2574focus.old.ob and not I2574focus.ob — despite background contamination by a pupil ghost, it is ok
  - N2903 – use N2903focus.ob and not N2903focus.old.ob.
  - N4214 - N4214focus.ob - the field has only 1-2 stars bright enough to be used by dofpia. Without a good sample of stars, the fit results are noisy and convergence is slow.
- dofpia hung waiting for images (obs5) IT8509
  - One time the images had not yet been taken and there was a popup from the LBC UI saying that the command was rejected because one was already in progress.
  - all other times, the images had been taken and were in newdata.
- robs: as user osurc, I got a display error when trying to launch an xgterm.
- LBC collimation is slow - the temperature was fluctuating between -0.5 and -1.5 and when it dipped down to -1.5 and rose again to -0.5 it took FPIA 7 iterations with the help of manual adjustments.

Weather:

Clear skies except for some wisps of cirrus that passed through in the morning. The seeing was ~1" for most of the night although it blew up to ~2 around 3am.

Preparations:

luci[1|2].20220210.0NNN.fits
mods[1|2][b|r].20220210.NNNN.fits

lbc[b|r].20220210.HHMMSS.fits

LBCs run up and 2 checkout biases taken.
MODS sieve & imaging snaps taken (MODS1B is behaving for now)

Closed Dome Calibrations

MODS

I tried to get a good set of comparison lamp spectra, with Ne working. Finally, it came on for MODS2 mods2r.20220210.0008 and mods2b.20220210.0008; use these.

	m1b	m1r	m2b	m2r	Comments
dual grating lamps	3-5	3-5	3-5 6,7 x 8 Hg+Ne	3-5 6,7 x 8 Hg+Ne	MODS2: Ne lamp did not come on for b3-7, r3-7. Worked for b8,r8
dual 5" slit flats	6-8 9-11	6-8	9-11 12-14	9-11 12-14	
bias 8K	12-16	9-13	15-19	12-16	
bias 1K	17-21	14-18	20-24	17-21	

LBC

25 biases taken in the morning, ~14:15 UT.

Overview (times are given in UT):

01:03 sunset

01:03 Josh opened the chamber

LBC evening twilight sky flats

01:10 I sent the preset to blank field 4h42m 25d
There is a warning: problem with tip-tilt request for PSF left,right side. Josh removed pointing corrections, but when I sent the preset, they got put back in and the warning came up again. Josh restarted PCS, and then removed the pointing offsets
, which seemed to do the trick.

01:24 Starting Uspec & R flats at PA=0 with 0.7 scale factor (so Uspec flats are 2.7 sec). First pair have 31k (LBCB) and 40k (LBCR). Repeat with 1.2 scale just to get a few more.

01:30 Starting B & R at PA= 180 with 2.0 scale factor.

01:37 Starting V & R at PA=180 with 10.0 scale factor.

LBCB 013725 is "scrambled".

We got at least 5 good Us, B & V flats and about a dozen good R flats.

We took more flats in the morning.

This link contains tables of good sky flats:
https://wiki.lbto.org/Instrumentation/LogOfLBCTwilightSkyFlats

Waiting…

01:54 12-deg twilight
02:23 18-deg twilight

OSU_monitor/N2403

01:51 Slewed to the N2403 focus
01:58 Running dohybrid - the red side is taking time to converge, at est seeing ~1.2", but the blue side has an unrealistically large est seeing (~1.8-2") as there is a fuzzy edge to the out-of-focus star image, and has already converged to its more relaxed (scaled by est seeing) convergence criteria.

02:09 copoint - 1.2" on blue and 1.05" on red on copointing images.

02:15 repeating dofpia since we are before 18-deg and the blue side used relaxed criteria. Looks like the convergence is pretty good - though blue side's est seeing is still being thrown off by the fuzzy-edged pupil image (seen before - having to do with mirror ventilation? - hoping it calms down).

02:22 Starting science.
3.2 pix FWHM (0.72") on LBCB and ~3 pix (0.68") on LBCR

OSU_monitor/M81

02:31 Slewing to focus field
02:32 dofpia - took 4 iterations
02:40 copointing - very small change
02:42 Starting science - 34 deg elevation - guide star FWHM 1.5/1.2"
LBCB ~ 5-5.6 (some elongation,1.13-1.3") and LBCR ~ 4.7-5 pix (1.06-1.13")
Seeing improved for 2nd pair, but the blue side does have some aberration.
LBCR ~ 3.5 pix (0.8") on 024844

OSU_monitor/M82

02:55 Slewing to focus field
dofpia - took 2 iterations, giving +z4 on Blue and not much on red, though 2nd sent +460nm z4.
02:59 Starting science - 36 deg elev - guide star FWHM 1.3/1.1"
LBCR ~ 3.5 pix
LBCB ~ 4.5 pix

OSU_monitor/I2574

Use focus field I2574focus.old.ob and not I2574focus.ob

03:15 Slewing to focus field I2574focus.ob
03:15 dofpia
obs5 is slowing to a crawl… and became unresponsive. It was running LUCI, MODS and the LBCs, plus LBTplot and PMC, PCS GUIs. I opened an x2go onto robs.
This I2574focus.ob is not good - there is only one pupil selected. shift-S to gracefully exit dofpia

03:23 Slewing to I2574focus.old.ob
03:27 dofpia —- this field is better, despite the ghost.

03:33 copointing - I am having an error opening the xgterm on robs:

osurc@robs iraf]$ xgterm
/usr/local/stow/iraf-2.16/vendor/x11iraf/bin.linux/xgterm Xt error: Can't open display: :50

We're at low elevation and close to the previous set of targets, so we can skip the copointing correction.
03:38 Starting science

Image quality is not so good - LBCB ~ 5.8 and LBCR 4.7 pix

OSU_monitor/N3077

03:53 Slewing to focus field
03:53 dofpia
04:00 copointing
04:03 Starting science
LBCB ~4.1 pix and
LBCR ~3.5 pix

OSU_monitor/N2903

Here, there are two focus OBs, but I noted last month that N2903focus.ob worked well.

04:15 Slewed to N2903focus.ob and started dofpia
04:21 Copointing
04:23 Starting science
Image quality looks better:
LBCB ~ 4.1 pix and
LBCR ~3.5-4pix (0.8-0.9")
though at 0435, a bit worse: 4.8-5 pix
at 0441, red has developed some aberration ~6 pix FWHM vs blue ~ 5.5 pix
We're going to let it continue, with only 2 exp per side to go

IQ is degrading, but the seeing also seems to be getting a little worse - DIMM is up to 1.1 where it was subarcsec at the start of the night.

OSU_monitor/N4236

05:05 Slewing to focus field
05:07 Starting dofpia - converged in 2 iterations, but z4 corrections were large: -4500 nm on SX and about -2500 nm on DX.
05:11 copointing
05:14 Starting science

on LBCB ~ 6 pix and on LBCR ~ 5 pix FWHM.

OSU_monitor/N4605

05:27 Slewed to focus field, starting dofpia
 Converged in 2 iterations. On DX, Z4 needed a negative correction (temperature change?) but the first blue pupil image was already collimated.
05:32 copointing
05:34 Starting science
FWHM ~ 6 pix on LBCB and 5 pix on LBCR
On 2nd R image, FWHM ~ 5.5-5.6 pix

OSU_monitor/N4258

05:50 Slew to focus field, starting dofpia now
Converged in 2 iterations - giving +900, +1000 z4 on both sides. DX face-back temp is sort of large, diff=-0.124 (but a few minutes later 0.02), and on SX it is -0.088.
05:55 copointing
05:57 Starting science
FWHM ~ 5.7 on LBCB and 4.7 pix on LBCR.

0610 - image quality improved on LBCR, from 4.7 to 3.7 pix, but later on back up to 4.7

0626 - but at 06:26, FWHM up to about 5.5 on LBCR

OSU_monitor/N5194

06:35 Slewing to focus field - elevation is 29:51. The shell RIP'd - we had to slew to a higher elevation to reset the shell.
06:42 Slewed again after cancelling the presets.
06:43 dofpia — converged in 2 iterations
06:47 copointing

06:49 Starting science
FWHM 5.5 pix on B and 4.5 (1") on R
07:25 The blue images look aberrated, but the red are holding up well.

OSU_monitor/N5474

07:29 Slewing to the focus field

07:30 Starting dofpia
dofpia hung while waiting for files to appear. The files were not taken (there was a popup about about a 'command rejected because another is running' that I OK'd). The last set of files had already been analyzed and the corrections sent to the primaries. I pressed play to take the new set of files, then at the prompt from dofpia (hit Q to exit or any other key to continue), I pressed <CR> and the new files were analyzed.

07:44 copointing just finished
07:45 Starting science
FWHM ~ 4.5 on LBCB & 3.5 pix on LBCR
The image quality, at least on LBCR, remained pretty stable throughout.

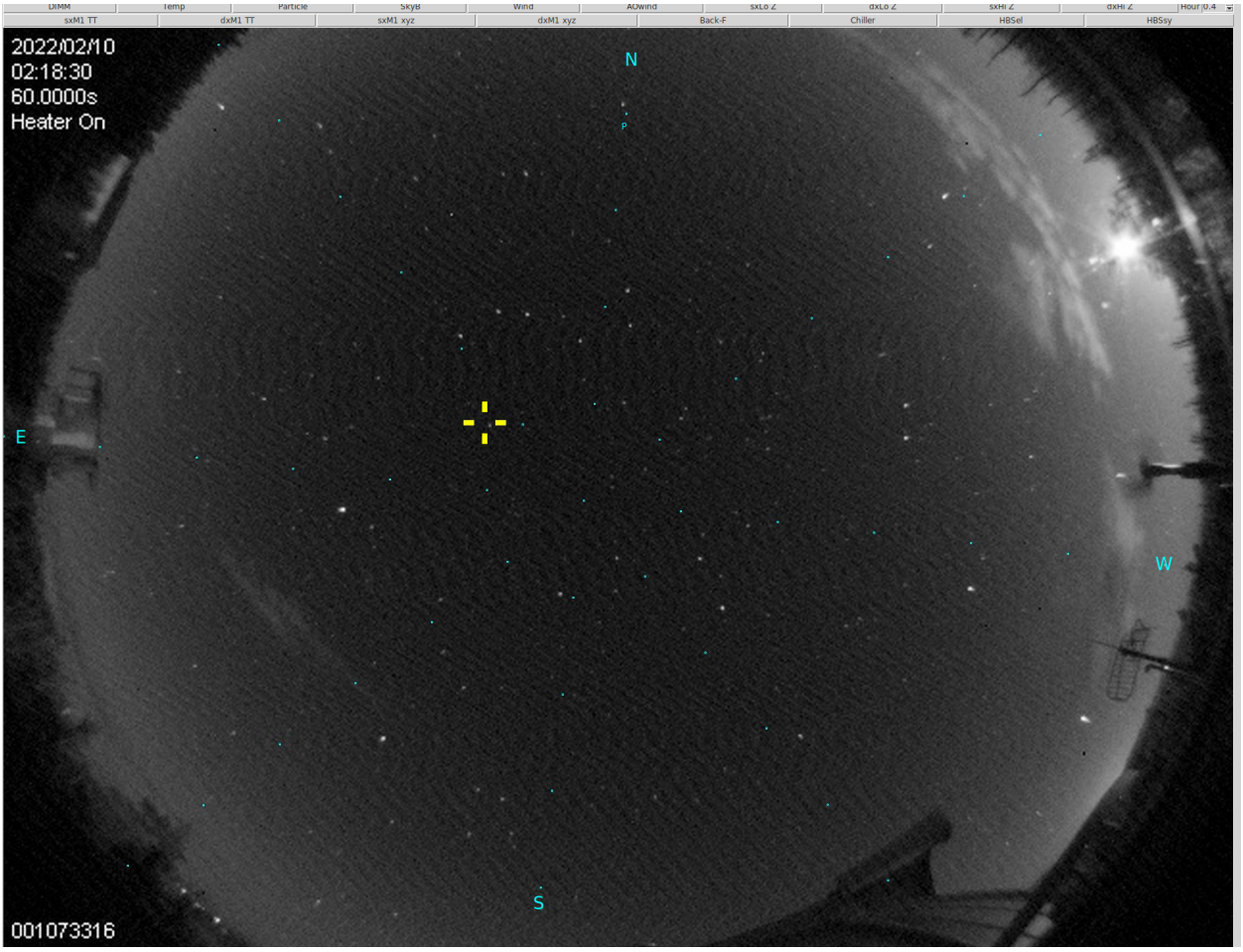
OSU_monitor/M101

08:23 Slewing to the focus field
08:26 Running dofpia
08:28 copointing - stars were about 4 & 6" from the rotator centers of LBCB & LBCR (this has been typical for tonight).
08:31 Starting science
FWHM ~ 4.2 on LBCB & 3.3 on LBCR

OSU_monitor/N4736

09:02 Slewing to focus field
09:03 dofpia
09:07 copointing
09:09 Starting science
FWHM ~ 3.7-3.9 LBCR and about the same or a bit worse on LBCB (4.2 pix on 091812).

09:23 It has seemed pretty clear from the allsky, but now as the moon is setting, we see a bit of cirrus in the W and a few wisps in the SE.



OSU_monitor/N4395

09:25 Slewing to focus field
09:27 dofpia - 4 iterations were needed; this was driven by LBCR where z4 ~ 1200nm was needed
09:33 copointing - the stars were only 2.6 and 3.5" from the LBCB and LBCR rotator centers.
09:36 Starting science
FWHM ~4.8 on LBCB & 4.6 (1.04") on LBCR

OSU_monitor/N4214

The focus field N4214focus.ob doesn't have many stars above the threshold for FPIA. Only 1 or 2 for LBCB with 2x the usual exposure time.

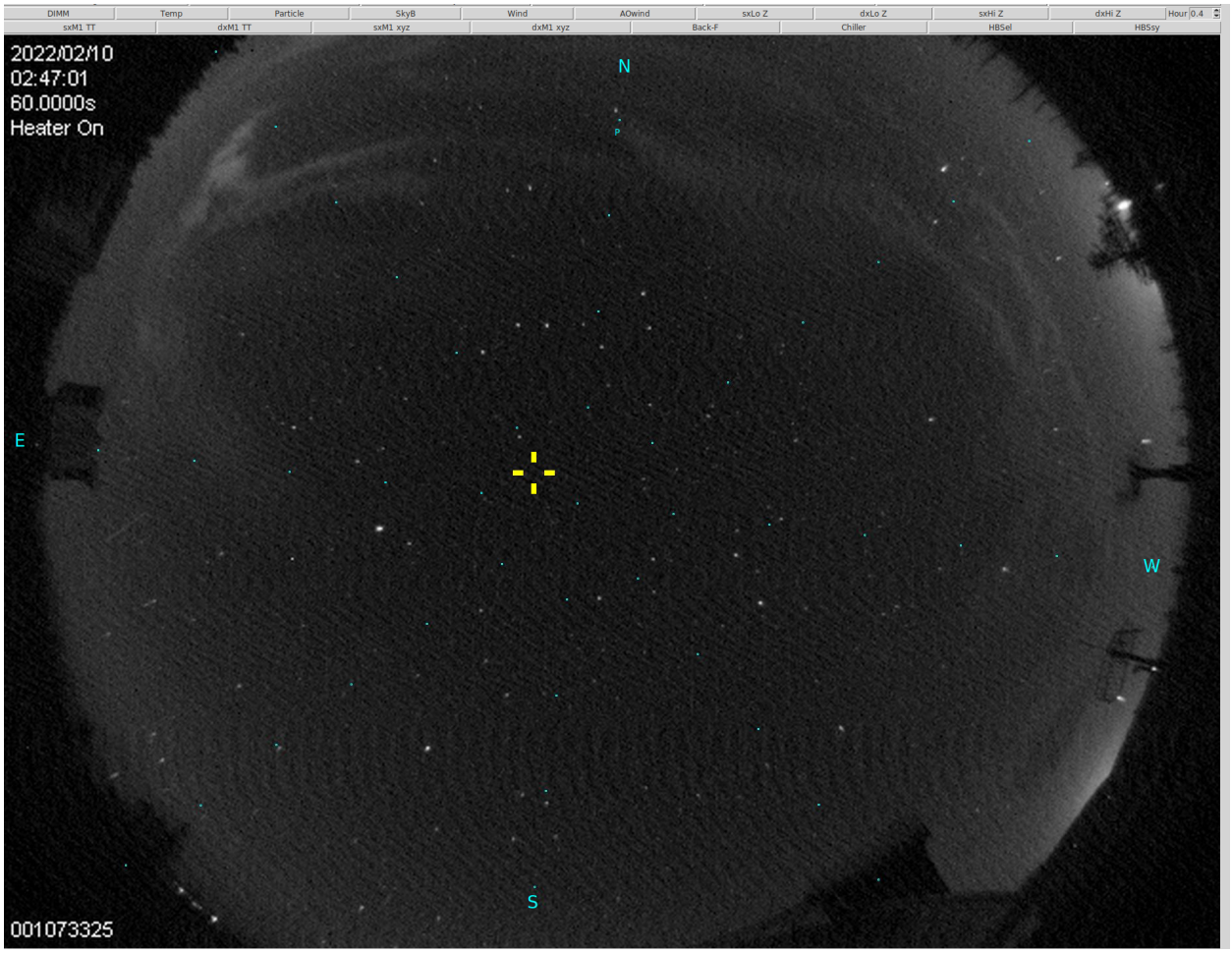
09:49 Slewing to focus field.

09:49 dofpia - there are not many stars in the focus region. On LBCR, only 2 were found and on LBCB, there were no good pupils found. Increasing exposure time by a factor of 2.
09:52 dofpia, /x2 - still only 2 pupils in the blue image. After 6 iterations, red had converged but blue had not, though it was close, so I used "shift-S" to gracefully exit dofpia.

10:04 copointing (elevation 84 deg) - stars were 9.7" and 8.4" from the rotator centers on LBCB and LBCR, respectively.
10:07 Starting science

There is a band of cirrus moving down from the NNW. It may be crossing where we are pointing.

Blue images all have very elongated stars - FPIA did not converge but threw in a lot of z4. First red image has FWHM ~ 5 pix



OSU_monitor/N3489

10:18 Slewing to focus field - a large slew in azimuth.
10:21 dofpia
dofpia hung, waiting for images, however this time the images had appeared in newdata. 5 iterations needed.
Added -3000nm Z4 on LBCB and -1500 z4 on LBCR.
10:31 copointing, star was 19" and 7" from the rotator centers on LBCB and LBCR, respectively
10:34 Starting science
FWHM ~ 5.3 (1.2") and 5 pix on LBCB and LBCR.

10:47 The DIMM seeing has shot up to 1.5-2", just as ALTA had predicted.

FWHM is around 6 pix (1.35") on LBCB and 5.3-5.5 (1.2-1.3") on LBCR

10:55 Images taken at this time have larger FWHMs 9 (LBCB) and 7 pix (LBCR).

OSU_monitor/N4826

11:15 Slewed to the focus field and started dofpia. It took 7 iterations. The temperature just went up by almost a degree. There were one or a few times that the FPIA loop hung waiting for images, but the images were already in/newdata.
11:29 copointing. Corrections ~14"
11:31 Starting science - guide star images have FWHM ~1.5-1.6"
On the first pair of images, the FWHM on LBCB (B) is better than on LBCR, 7 pix vs 8 pix.
On DX, glass:ambient temp is -1.25:-0.97 and on SX, it is -1.25:-1.15.

FWHM on LBCB 6.8 pix, on LBCR about 7.5 pix.

11:54 Now FWHM on the LBCR image is ~7 pix and it is tighter and rounder on LBCB, ~6.5 pix

12:09 Seeing improved - FWHM 4.8 and 6.2 on the next to last exposures.

OSU_monitor/N4449

12:12 Slewed to focus field; starting dofpia.
dofpia is hanging, needs intervention.

LBCR is now driving in a lot of spherical and it's no longer correctly fitting the outer diameter.
Josh sent Z11 = 1000nm and Z22 = 100nm to DX which helped (temperatures settling down may also have helped) and it converged in 4 more iterations (7 in all).

12:28 copointing - star was 14" and 6.7" from the rotator centers on LBCB & LBCR.

12:31 Starting science - guide stars have FWHM ~1.2"
Images are looking pretty good —
FWHM 4.6 pix (LBCB) 3.6 pix (LBCR)

12:43 We're repeating this script. It is just 18-deg twilight and we don't have time for another target.

12:44 18-deg twilight

LBC Morning Twilight Sky Flats

12:57 Slewing to field for morning twilight flats: *Note that blank field 13+63 has a bright star in it; it would be best to avoid it in the future. The flats were dithered with large throws, however.*

13:13 12-deg twilight

13:25 Starting V+R flats at PA=0 5-sec - not good
13:31 V+R flats with 2-sec exptime and PA=0 - a bit low but 2 B & 2 R have 10-14k counts
13:35 V+R at PA=180 and 1-sec.

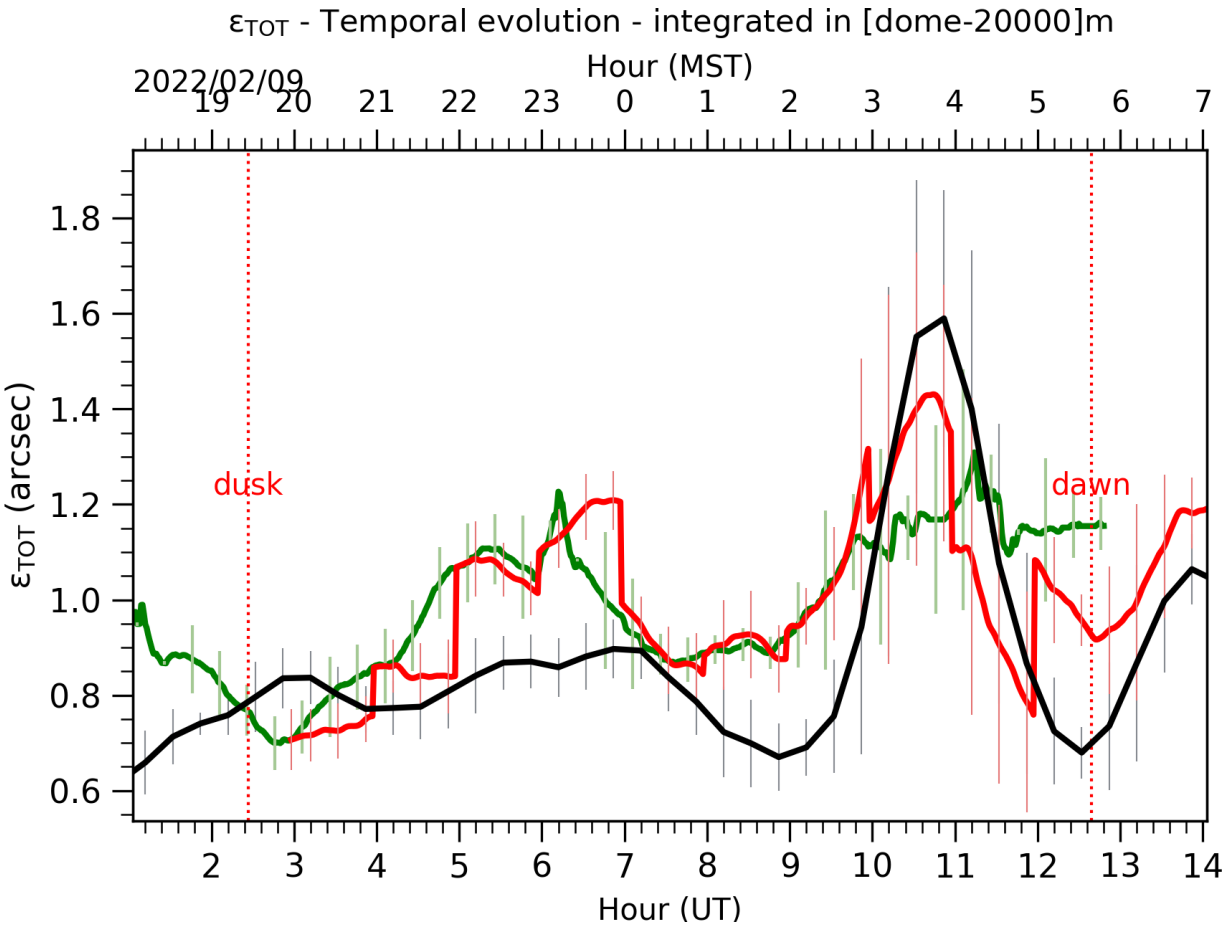
13:40 Starting B + R at PA=180 and 1-sec, then 0.5 sec 134304 is scrambled

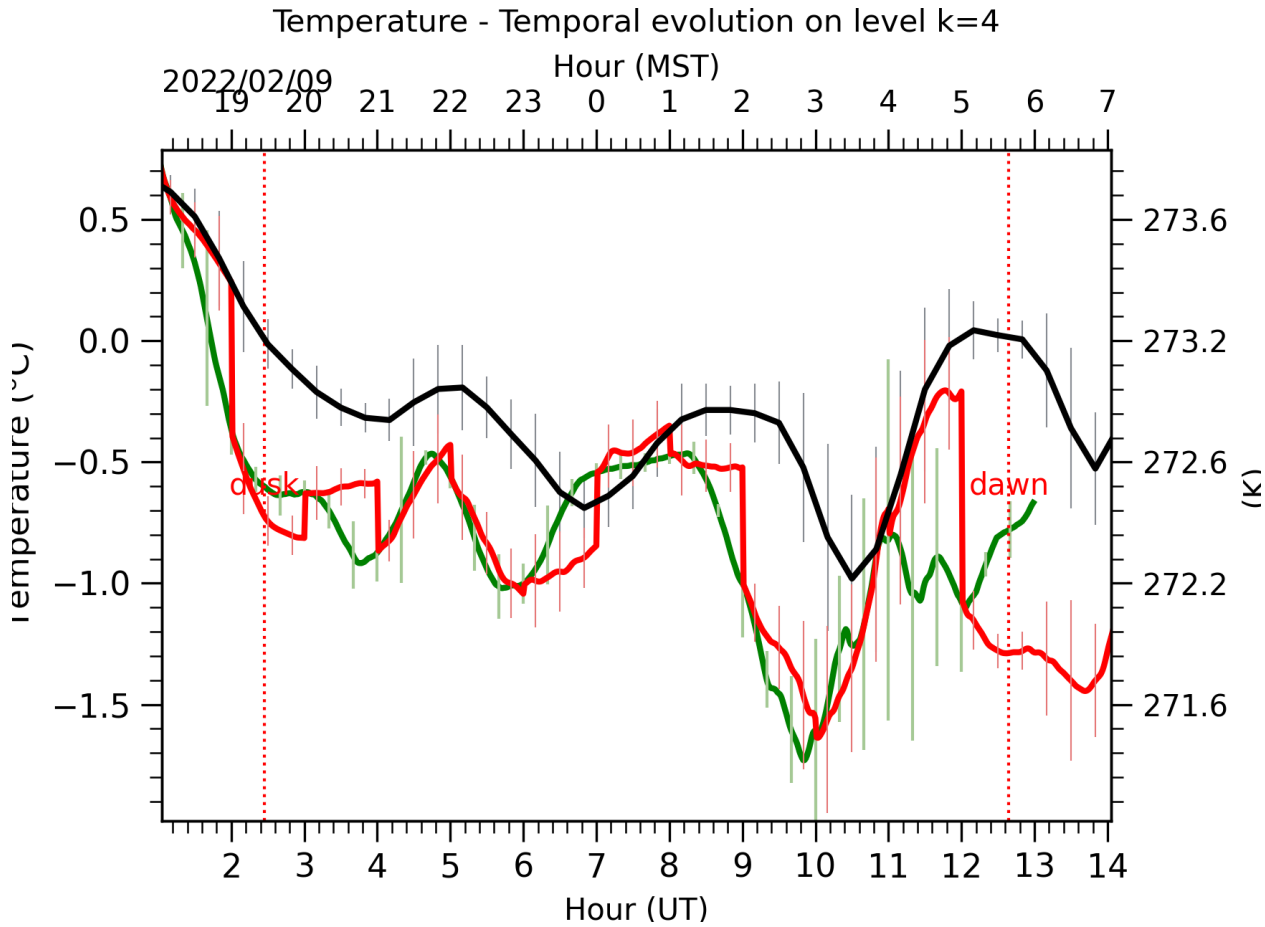
13:45 Starting S + R at PA=180 and 0.4 scale factor.

~13:55 Josh closed the chamber

14:04 sunrise

ALTA predictions


εTOT - Temporal evolution - integrated in [dome-20000]m
2022/02/09
Hour (MST)
19 20 21 22 23 0 1 2 3 4 5 6 7
dusk
dawn
εTOT (arcsec)
1.8
1.6
1.4
1.2
1.0
0.8
0.6
2 3 4 5 6 7 8 9 10 11 12 13 14
Hour (UT)


Temperature - Temporal evolution on level k=4
2022/02/09
Hour (MST)
19 20 21 22 23 0 1 2 3 4 5 6 7
0.5
0.0
−0.5
−1.0
−1.5
273.6
273.2
272.6
272.2
271.6
(K)
dusk
dawn
2 3 4 5 6 7 8 9 10 11 12 13 14
Hour (UT)