OSURC Nightlog 20220323 UT

Observer*: Olga Kuhn
Lead Partner Observer*: Don Terndrup (OSU)
Other Partner Observers*: Evan Skillman (UM), Noah Rogers (UM)
Special Assistants*:
AO Operator*:
Telescope Operator: David Gonzalez Huerta
*** = from home**

Plan:

MODS all night

✓ HZ44 (2x)
✓ OSU_XMDs_MODS/HS1028
✓ OSU_ASASSN_SN22ci
✓OSU_ASASSN_J1430
✓UVa-FRAGN-1514p40
✓UM_V1674Her
✓OSU_ASASSN_J190107

Summary:

The conditions were very good and several high priority programs were completed: OSU_XMDs_MODS/HS1028, OSU_ASASSN/ASASSN22ci and SDSSJ1430, UVa_FRAGN/J1510+40, UM_V1674Her and finally OSU_ASASSN/J190107. The seeing varied from about 0.6" to 1", with some excursions above 1", but overall it was good. There were no clouds visible on the all-sky camera.

Issues:

- The most serious issue was the collimation with MODS. The WFS cutout seems to be misplaced - the pupil appears too high or too low and the top or bottom row may be cut off. The wavefront error bounced above 400 nm at times and it look longer than usual to

converge. I added notes to IT 8472 - which was opened in Sep 2021 and thought to be resolved, although some work was done on the GCS parameter files recently for IT 8315.

- During morning calibrations, I noticed some structure in the slit flats. Dark horizontal lines along the dispersion axis, particularly in the MODS2 1" slit flats, which are consistent with debris on the slit, but also a bright (+100 counts) region extending above Y ~ 2500 on MODS1 blue and red.

Weather:

Clear at sunset. 10% humidity, winds from N to NNW 3-6 m/s. Initial seeing about 1.0”.

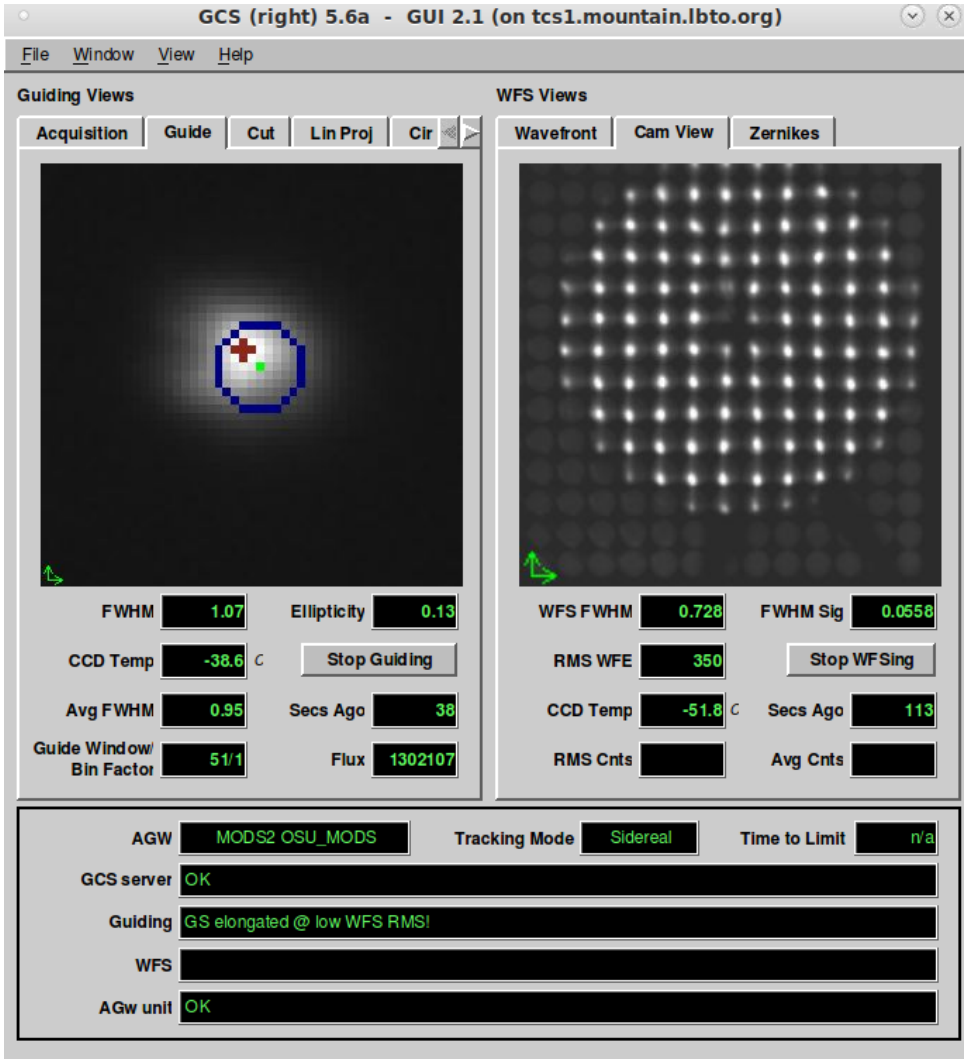
Preparations:

mods[1|2][b|r].20220430.NNNN.fits

Overview (times are given in UT):

02:22 David opened the enclosure

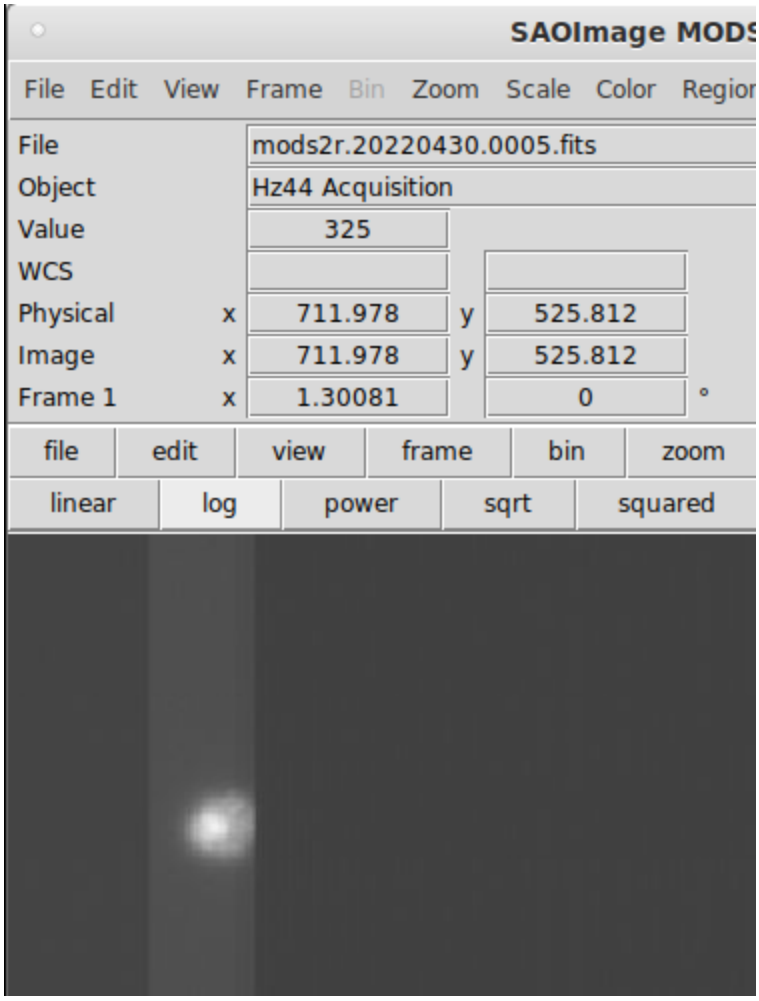
02:37 Pointed and collimated. The average FWHM is ~0.9". On the DX, side, the WFE is low and the FWHM of the Shack spots is 0.6", but the guide star has FWHM ~ 1". See, e.g. the guide images at 19:39.



HZ44

~02:38 acqBinoMODS hz44.acq

m1r: 3 → offsetxy 0.458 10.537 rel → 4
m2r: 3 → offsetxy 5.225 7.463 rel → 4 (poor coll) → another offset →5 (also poor coll - see below)



David cleared active optics on DX and let it recollimate.
On both sides, the WFE has gone up.

The pupil is high on the WFS images and the top row is being cut off - is that the problem (same for SX and DX)? or is it something else?
The guide star is near the left edge of the patrol field which explains why the pupil is high, but it should not be cut off.

02:54 David is going back on-axis to collimate. We'll see if collimation converges or diverges. On-axis it seems to hold collimation better, though DX is still a bit worse than SX - which could be dome seeing.

02:57 12-deg twilight

03:06 acqBinoMODS hz44.acq
Again, it looks like collimation is struggling. I switched to a guide star further from the left edge. (hz44_newgs.acq).

The top row is also close to the edge, but the seeing is really getting bad, so it's harder to assess collimation.

m1r: 7 → offsetxy -0.963 10.419 rel → 8 looks well-centered.
m2r: 7 → offsetxy 4.168 7.157 rel → 8 → offsetxy -1.056 -0.120 rel → 9

Seeing is ~1" on the guiders

03:23 execBinoMODS

UT	m1b	m1r	m2b	m2r	airmass
03:23	3-5	9-11	3-5	10-12	1.2

20:30 18-deg twilight

OSU_XMDs_MODS/HS1028

03:37 acqBinoMODS HS1028_UT330.acq

FWHM is 0.5"-0.6" during the acquisition. There are stray light arcs on both field images.

m1r: 12 & 13 → offsetxy -0.785 11.229 rel → 14, dx=-0.246 → 15
m2r: 13 & 14 → offsetxy 3.333 8.214 rel → 15 , looks well-centered

03:55 execBinoMODS HS1028.obs

UT	m1b	m1r	m2b	m2r	seeing SX/DX
03:55	6-8	16-18	6-8	16-18	0.44/0.64"

The seeing is very good. The wind is coming from the NE-NNE and we are pointing NW so possibly there is some dome seeing on DX - or it could be collimation.

H_alpha is saturated in the peak in MODS2R, but none of the other lines are saturated in the peak. The closest is [OIII]5007 which has about 55k counts in the peak in MODS2B.

Very nice spectra - the quick reduced spectra are on robs.mountain.lbto.org in ~/Scratch/20220430/

OSU_ASASSN/ASASSN22ci

The original script used PA=85, but the parallactic angle around the midpoint of the observation will be ~150 deg. We edited the script to change the PA and the guide star.

05:03 acqBinoMODS ASASSN22ci_edit.acq

m1r: 19 & 20 → offsetxy -1.189 11.345 rel → 21 dx= -0.123" → 22, well-centered
m2r: 19 & 20 → offsetxy 3.033 8.015 rel → 21, dx = -0.123" → 22, now a tad to the left, but ok

Average FWHM 0.6" during the acquisition.

05:20 execBinoMODS ASASSN22ci.obs

UT	m1b	m1r	m2b	m2r	FHWM SX/DX
05:22	9-13	23-27	9-13	23-27	0.53/0.66"

06:17 The seeing blew up

OSU_ASASSN/SDSSJ1430

While checking the PA against the predicted parallactic angle at the midpoint (-20 deg), we noticed that the original guide star in the 0700UT script was a galaxy. We had to rotate by 180 to get a star - new PA = 160 deg - SDSSJ1430_UT0700_edit.acq

06:24 acqBinoMODS SDSSJ1430_UT0700_edit.acq

The seeing is ~0.7"-0.8" during the acquisition.

m1r: 28 & 29 → offsetxy -0.825 11.084 rel → 30, looks centered
m2r: 28 & 29 → offsetxy 3.607 8.019 rel → 30, looks centered

The bright star below the bottom edge of the MODS2R acq image is leaving a trail of elevated dark counts - fortunately the spectrum will be in the top quadrants and unaffected.

06:39 execBinoMODS SDSSJ1430.obs

UT	m1b	m1r	m2b	m2r	seeing SX/DX
06:40-07:28	14-17	31-34	14-17	31-34	1.04/1.06"

UVa_FRAGN/J1514+40

07:28 acqBinoMODS J1514+40.acq

m1r: 35 & 36 →offsetxy -0.881 11.298 rel → 37 looks well-centered
m2r: 35 & 36 →offsetxy 3.619 7.928 rel → 37 a tad to the right but pretty well-centered

07:42 execBinoMODS J1514+40.obs

UT	m1b	m1r	m2b	m2r	seeing SX/DX
07:45	18-20	38-40	18-20	38-40	1.16/1.26"

At first glance, the spectra looks pretty featureless.

Hz44

08:24 acqBinoMODS hz44_newgs.acq

m1r: 41 → offsetxy -1.415 11.119 rel → 42, good
m2r: 41 → offsetxy 3.512 7.692 rel → 42 → offsetxy -0.434 -0.163 rel → 43, good

08:33 execBinoMODS hz44.obs

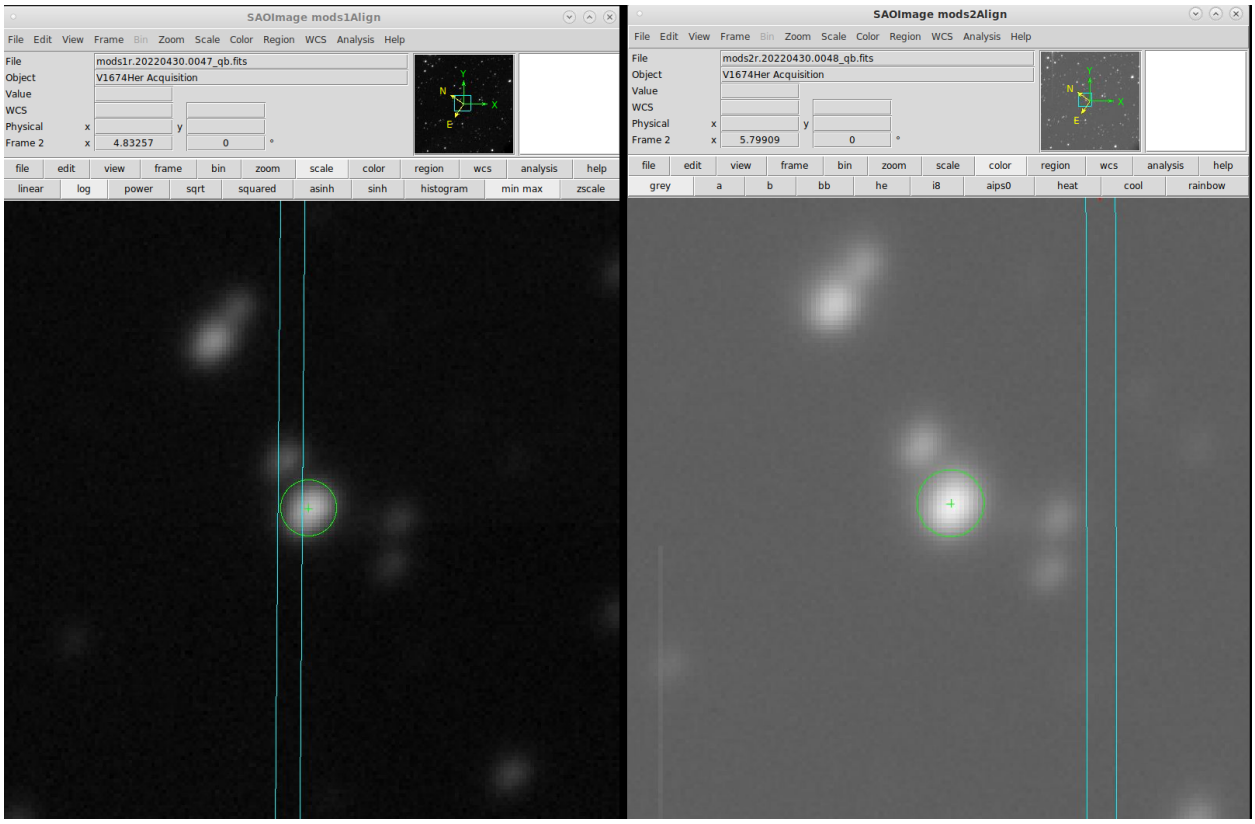
UT	m1b	m1r	m2b	m2r	seeing SX/DX	aimrass
08:35	21-23	43-45	21-23	44-46	0.9/0.97"	1.152

UM_V1674Her

08:48 acqBinoMODS UM_V1674Her.acq

m1r: 46 & 47 →offsetxy -0.509 12.365 rel → 48, dx = -0.246"
m2r: 47 & 48 → offsetxy 4.067 8.391 rel → 49, OK

The WFS pupil is now too low in the cutout. Collimation is not converging well, especially on MODS1 where the WFS error is ~500-800 nm. By the time we started the observation, the WFE on both sides had gone below 400 nm, however the position of the WFS cutout relative to the pupil is odd. The guide star is on the right side of the patrol field, though it is not too close to the edge.



02:08 execBinoMODS UM_V1674Her.obs

UT	m1b	m1r	m2b	m2r	seeing	AM
02:08	24-48	50-74	24-49	50-75	1.06/0.94"	1.27

We see HeII 4686 and H alpha in the individual spectra, though the lines are fairly weak.

03:19 Average FWHM on the SX/DX guiders: 0.97/0.92"
03:26 Seeing is improving - avg FWHM now: 0.74/0.73".

03:30 MODS1 blue fitsflush to transfer image 43.

Taking an extra pair of blue/red exposures with MODS2 while waiting for MODS1B.

OSU_ASASSN/J190107

Edited the acquisition script to set the PA to -107. The original guide star can be used.

10:49 acqBinoMODS J190107_edit.acq
m1r: 75 & 76 → offsetxy -0.175 12.188 rel → 77 - a tad to the left, but ok (the object looks elongated in through-slit image - collimation was taking a while to converge)
m2r: 76 & 77 → offsetxy 4.328 8.402 rel → 78, good

11:00 execBinoMODS J190107.obs

UT	m1b	m1r	m2b	m2r	seeing
11:00	49-51	78-80	50-52	79-81	0.76/0.63"

11:03 18-deg twilight

The first pair of spectra look good, though the counts peak ~ 48k in MODS2R. The counts are up to 54k in mods2r 80 (FWHM 0.6"). In MODS1R, the counts are only <~10k in the peak.

11:22 We're repeating the set of 3 exposures since there is no time to do anything else, but we modified the exposure times for MODS2 B & R to 180-sec.

11:36 12-deg twilight

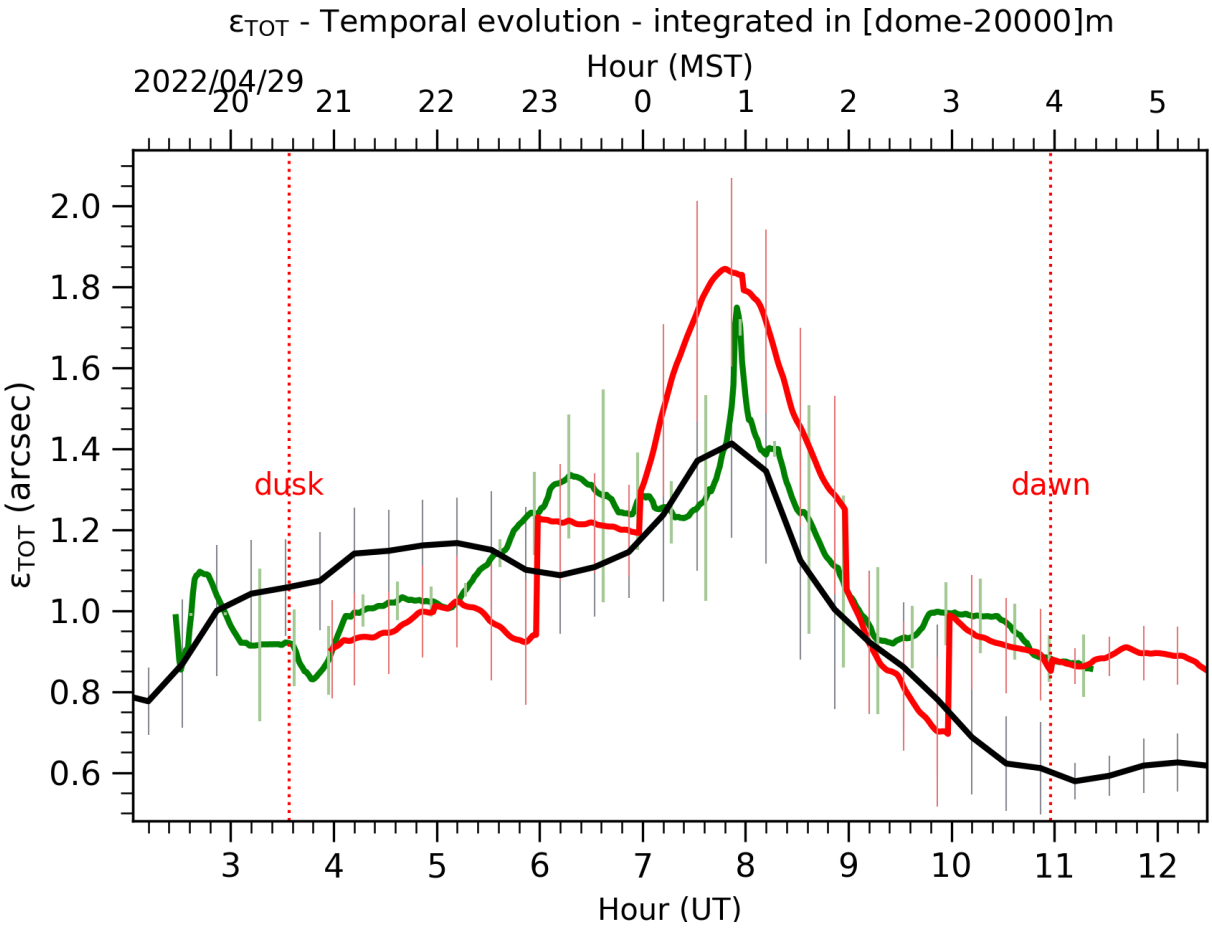
11:41 Done with the exposures.

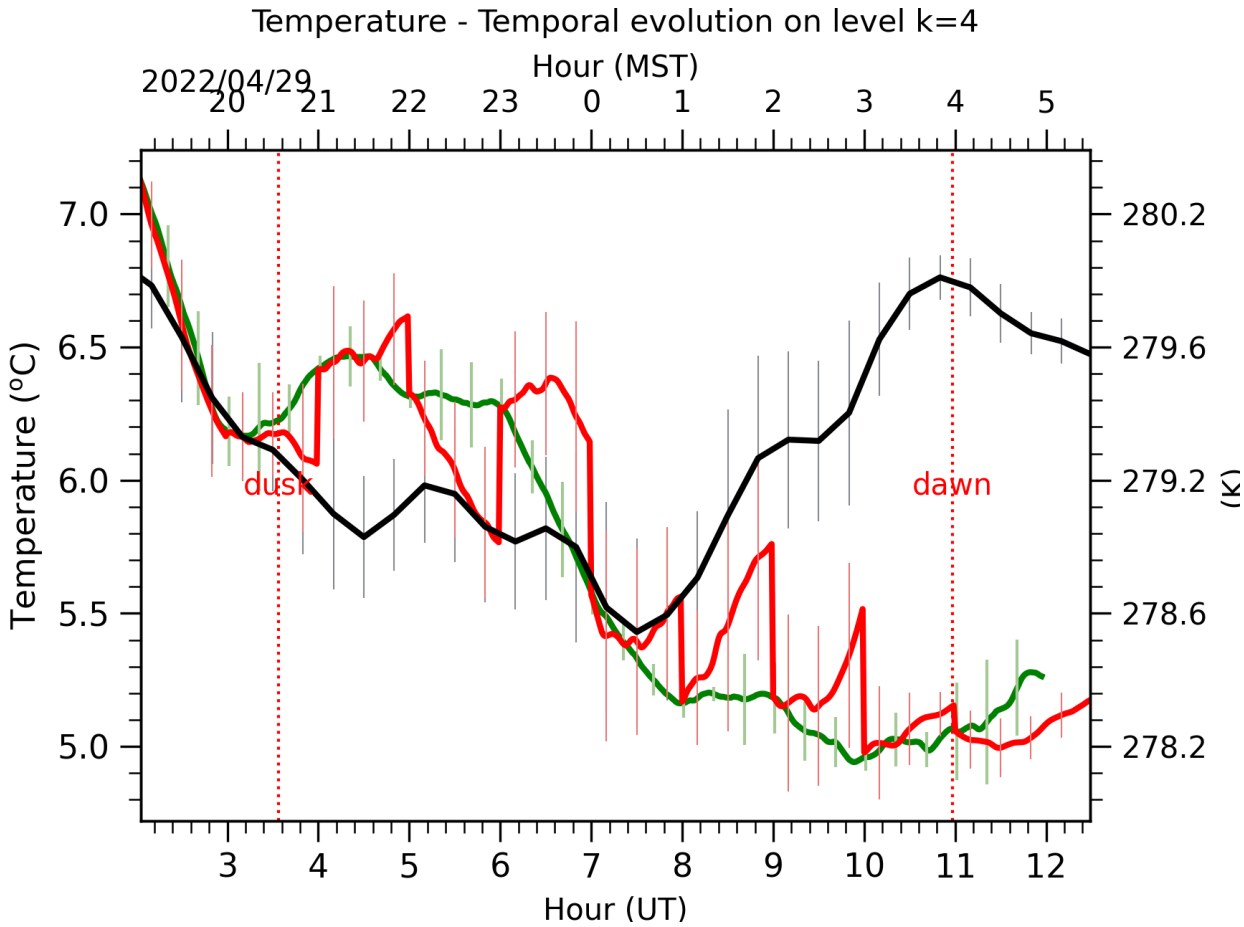
11:42 David is closing up.

Closed Dome Calibrations

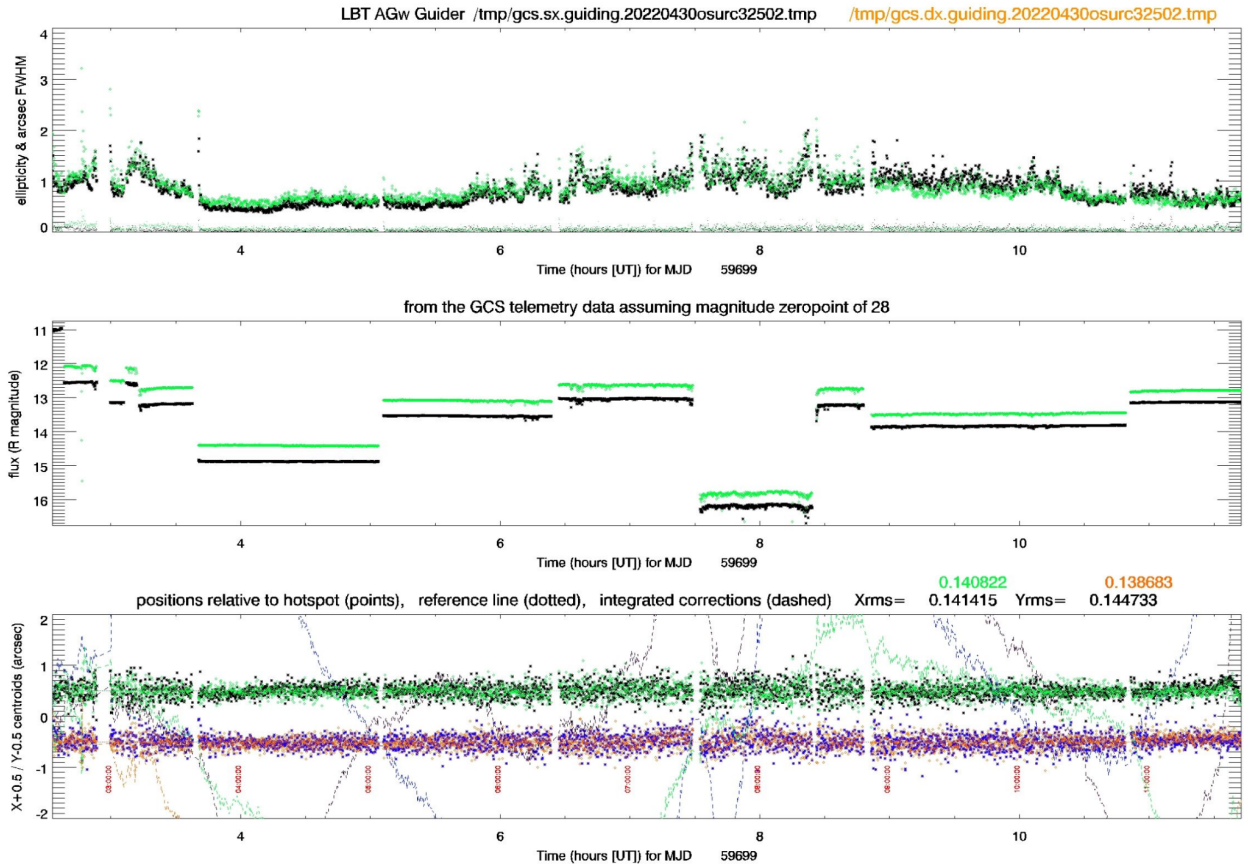
	m1b	m1r	m2b	m2r	comments
pixflats	55-59 60-64	84-88	56-60 61-65	85-89	
comparison lamps	65,66,67	89,90,91	66,67,68	90,91,92	
1" slit flats*	68-70 71-73	92-94 95-97	69-71 72-74	93-95 96-98	On mods1b & mods1r, the 1000 rows above Y=1545 are about 100 counts darker than the rest. On mods2, there are a lot of dark lines along the disp axis - debris on slit?
0.8" slit flats	74-76 77-79	98-100 101-103	75-77 78-80	99-101 102-104	
1.2" slit flats	80-82 83-85	104-106 107-109	81-83 84-86	105-107 108-110	

ALTA predictions


εTOT - Temporal evolution - integrated in [dome-20000]m
2022/04/29
Hour (MST)
20
21
22
23
0
1
2
3
4
5
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
εTOT (arcsec)
dusk
dawn
3
4
5
6
7
8
9
10
11
12
Hour (UT)


Temperature - Temporal evolution on level k=4
2022/04/29
Hour (MST)
20
21
22
23
0
1
2
3
4
5
7.0
6.5
6.0
5.5
5.0
Temperature (°C)
280.2
279.6
279.2
278.6
278.2
(K)
dusk
dawn
3
4
5
6
7
8
9
10
11
12
Hour (UT)

LBTplot


LBT AGw Guider /tmp/gcs.sx.guiding.20220430osurc32502.tmp /tmp/gcs.dx.guiding.20220430osurc32502.tmp
ellipticity & arcsec FWHM
Time (hours [UT]) for MJD 59699
from the GCS telemetry data assuming magnitude zeropoint of 28
flux (R magnitude)
Time (hours [UT]) for MJD 59699
positions relative to hotspot (points), reference line (dotted), integrated corrections (dashed) Xrms= 0.141415 Yrms= 0.144733
0.140822
0.138683
X+0.5 / Y-0.5 centroids (arcsec)
Time (hours [UT]) for MJD 59699