OSURC Nightlog 20220213 UT

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

Plan:

- [x] ~~**Start with MODS** 01:30 - 01:55~~
- [x] ~~ND_lamost/lamost 02:00 - 04:20~~
- [x] ~~OSU_ASASSN/BD50943mods 04:25 - 04:45~~
- [x] ~~MODSPhotCal/feige34 04:50 - 05:05~~
- [x] ~~**Switch to LUCI** 05:10 - 05:35~~
- [x] ~~UVa_nirjets_AO/S255AO 05:40 - 06:25~~
- [x] ~~UM_XMDs_LUCI/UGC6456 06:30 - 07:45~~
- [x] ~~**Switch to MODS** 07:50 - 08:15~~
- [x] ~~UM_XMDs_MODS/UGC6456 10:15 - 11:35~~
- [x] ~~OSU_ASASSN/AT2021biy 11:40 - 12:40~~
- [x] ~~MODSPhotCal/feige67 12:45 - 01:00~~

Summary:

The night went pretty well: We started with MODS to observe ND_lamost and then the bright OSU_ASASSN target, BD50943, followed by the standard, Feige 34.
We switched to LUCI to try again the UVa_nirjets_AO target, S255, which could not be completed during the previous night. The AO system worked better, conditions were better and more stable, and the full dataset at Ks, BrG and H2 was collected tonight. There were some issues, outlined below. Then we observed the UM_XMDs_LUCI target UGC6456.
After that we reconfigured for MODS to observe that same target in the optical. Emission lines were easily visible in both LUCI & MODS data.
Initial plans to switch to PEPSI were changed (the nirjets observation took longer than expected) and we observed OSU_ASASSN/AT2021biy and Feige67 to end the night.

Before closing we attempted sky flats for the UVa AO program. The counts per pixel in the N30 camera were low and we pushed beyond sunrise to collect a few integrated flats with ~10000 counts in BrG and H2 and over 20 individual 5-sec flats with counts ~3000-4000) at Ks. Darks using the same DIT were taken for the sky flats.The sky flats may be useful but we also obtained lamp off/on imaging flats with the calibration unit.

The bin12 MODS calibrations were taken at the end of the night. The unbinned MODS calibrations were taken at the beginning of the run.

Issues:

With MODS:

- DX collimation on-axis has been looking poor night after night. There is always some elongation from bottom-left to upper-right.
- mods1 red IMCS failed to lock within timeout at low elevation (dual grating). Tonight this happened at elev/rotangle 43/391 and again at 50/87

With the AO system, it all was so much smoother than last night, but:

- On the first image, there was a significant zig-zag jump, as if the exposure started before the offset was complete. This script had a preset and non-zero first offset all in the first item.
- We had at least 3 images which showed a jump, always up-down and of magnitude about 0.1".

LUCI: No real instrument problems tonight

- On the telluric for UGC6456, one offset failed - the star may be close to the edge of the patrol field (did not check - observed unguided and the next offset worked)
- For the AO - observer error in leaving the detector unblinded when the pointing & collimation check was done. I apologize for that - hopefully the data will be useful.

Weather:

The conditions were excellent - clear skies, not too high wind speeds, low humidity and stable seeing under 1".

Preparations:

luci[1|2].20220212.0NNN.fits
mods[1|2][b|r].20220212.NNNN.fits

Checked and adjusted the pupi & field stop alignment for LUCI1, since when preparing for morning flats, my recovery from a camera wheel error seemed to have doubled up the FM4 (flexure compensation mirror) offsets.
23:51 - I found that the pupil was really quite well aligned already, but since I had taken the set of images needed to make an adjustment, I did so. It was very small.

Prepared PEPSI OB which includes the 2 LowZAbund targets that we did not get to last night, 3 with low SNR (~50 in CD2), the 5 Exoplanet targets & the BD+50 with CD2 & 4 (vs 3 & 5 which was done earlier).

MODS - woke up mods and took the test images.

Closed Dome Calibrations

LUCI Darks

Before we started to observe and after the detector had been idle for the morning & afternoon, I took the darks for the OSU_XMDs_LUCI program. I didn't take the darks for UVa_nirjets, however, so I will see if I can take them this afternoon.

	L1	L2	DIT	NDIT	readmode	savemode
OSU_XMDs_LUCI	1-10	51-60	2.5	2	LIR	integrated
	11-15	61-65	15	4	LIR	integrated
	16-20	66-70	600	1	MER	integrated
UVa_nirjets sky flats *	192-211	—------	5	1	LIR	integrated
UVa_nirjets sky flats NB *	212-214	—------	5	20	LIR	integrated
UVa_nirjets*	215-220	—-----	2.5	20	LIR	integrated
UVa_nirjets*	221-225	—-----	10	6	LIR	integrated

* Usually it's good to let the detector idle, to allow persistence from the night's observing to fade. This is more notable in long darks than in short ones. Since all of these darks are short and I see no sign of persistence, I went ahead and ran the script this morning. It may be repeated if needed..

LUCI flats (N30 imaging)

Twilight Sky Flats

We tried some twilight sky imaging flats in the morning (see the end of the log). Separate darks were taken for these.

Closed Dome Lamp off/on Imaging Flats

Program	lamp on/off DIT x NDIT (LIR/Integrated)	filter	L1
UVa_nirjets_AO N30 camera N30 Fieldstop	lamp off 8.5s x 2	Ks	162-166
	lamp on 8.5s x 2	Ks	167-171
	lamp off 5.5s x 2	BrG	172-176
	lamp on 5.5s x 2	BrG	177-181
	lamp off 4.5 x 2	H2	182-186
	lamp on 4.5 x 2	H2	187-191

PEPSI

Calibrations: ThAr and traces for the following configurations were taken in the afternoon (starting at 00:28 UT), in anticipation of using PEPSI. We did not end up using it, however.
100 mic fiber, CDs 2 & 4
200 mic fiber, CDs 3 & 5
300 mic fiber, CDs 2 & 4

MODS

We obtained bin12 biases, pixel flats, 0.8" slit flats for the ND_lamost program at the end of the night.

	m1b	m1r	m2b	m2r
bin12 pixflats	56-60 61-65	77-81	56-60 61-65	78-82
bin12 0.8" slitflats	66-68 69-71	82-84 85-87	66-68 69-71	83-85 86-88
bin12 biases	72-76	88-92	72-76	89-83

Overview (times are given in UT):

01:04 Josh opened the shutter doors

01:06 sunset

01:20 Josh is sending a pointing preset to a star near the first target.
01:31 … and the collimation preset now that it is darker.

ND_lamost/lamost

01:40 acqBinoMODS lamost_pa60.acq

FWHM on guiders ~ 0.8" during the acquisition
m1r: 3,4 → offsetxy -0.184 10.722 rel → 5, dx=-0.18" → 6, dx = 0.061" → 7, 0.061 → 8
m2r: 3,4 → offsetxy 3.773 8.551 rel → 5, dx = +0.123" → 6, dx = 0.123" → 7, -0.05" → 8

01:57 12-deg twilight

02:00 obs5 is slowing to a crawl - or my x2go session onto obs5.
Just before starting exposure 8, the guide star on DX jumped off the hotspot, but it came back.

02:05 execBinoMODS lamost.obs

UT	m1b	m1r	m2b	m2r	airmass	seeing
02:06-04:22	3-34	9-40	3-34	9-40	1.07-1.7	0.8"- ~1.2"

02:26 18-deg twilight

02:26 Issued red expdone on MODS2R. It hung at "Exposure Done, Cleaning up…"
03:09 avg FWHM on the guiders is ~0.94/0.90" and on the WFS Shack spots, 0.73/0.71".
03:29 avg FWHM on guiders is ~0.86/0.83" and on the WFS Shack spots, 0.64/0.67"

03:36 Issued blue fitsflush on MODS1

03:55 avg FWHM on guiders ~ 1.02/0.95" and on the WFS, ~0.8"
04:10 avg FWHM on guiders ~ 1.13/1.03 and on the WFS, ~0.88/0.84 — elevation 39 deg.

04:26 Finished

OSU_ASASSN/BD50943

04:26 acqBinoMODS BD50943.acq

m1r: 41 & 42 → offsetxy -0.479 11.145 rel → 43, ok
m2r: 41 & 42 → offsetxy 3.828 8.744 rel → 43, dx = -0.123" → 44, ok

The 10-sec field images (42), were heavily saturated, thru-slit confirmatory images also saturated at 2 or 3s, used 1s for checks (44).

04:36 execBinoMODS BD50943.obs
Saturated at 90s on mods2r

04:44 execBinoMODS BD50943.obs - using 45-sec now. This gives about 43k counts in the peak for MODS2R - peak counts in other channels are lower.

UT	m1b	m1r	m2b	m2r	AM	FWHM on guiders
04:45	36-41	46-51	36-41	46-51	1.227	0.73/0.81"

05:02 Finished

Feige34

05:02 acqBinoMODS feige34.acq

m1r: 52 offsetxy 0.069 10.115 rel → 53 offsetxy -0.244 0.169 rel → 54, ok
m2r: 52 offsetxy 5.490 7.258 rel→ 53 offsetxy -1.310 0.021 rel → 54, ok

05:13 execBinoMODS feige34_dualGrating.obs

UT	m1b	m1r	m2b	m2r	AM	seeing
05:14	42-44	55-57	42-44	55-57	1.28	0.86/0.93 on guiders 0.68/0.74 on WFS

05:26 Finished

Reconfiguring to LUCI

05:26 Josh is slewing the telescope to zenith to reconfigure.

At zenith, I am checking the position of the N30 Field Stop in the N30 camera, and adjusting it slightly.

obs5 froze - or my x2go to obs5 froze. I opened the LUCI1 GUIs on robs.

UVa_nirjets_AO/S255

05:49 Sending the script
SOUL thinks the AO ref star's magnitude is 14.8
05:55 Greg closed the loop and the script continued! Yay!

I see some persistence which is from the pointing and/or collimation star. It is low level, just a few counts above the background but easy to see it on the sky images and NB images. I'm sorry - this is my fault. I neglected to put in the blind.

filter	L1	DIT x NDIT savemode	Comments

Ks	29-39	2.51 x 20 cube	29 has a jump as though the exposure started before the offset completed. The initial offset is 0.92" 0.03".
BrG	40-61	30 x 2 cube	5 pix FWHM
H2	62-	30 x 2 cube	still ~5 pix FWHM 70 - there was a jump (0.075") up/down), also on 77 (0.11" up/down). Also on 82 (0.09") and 83**

Image 32 has 4.9x4.4 pix FWHM, 0.07"

06:26 Greg says that we are at about 0.2 Strehl..

07:26 Finished

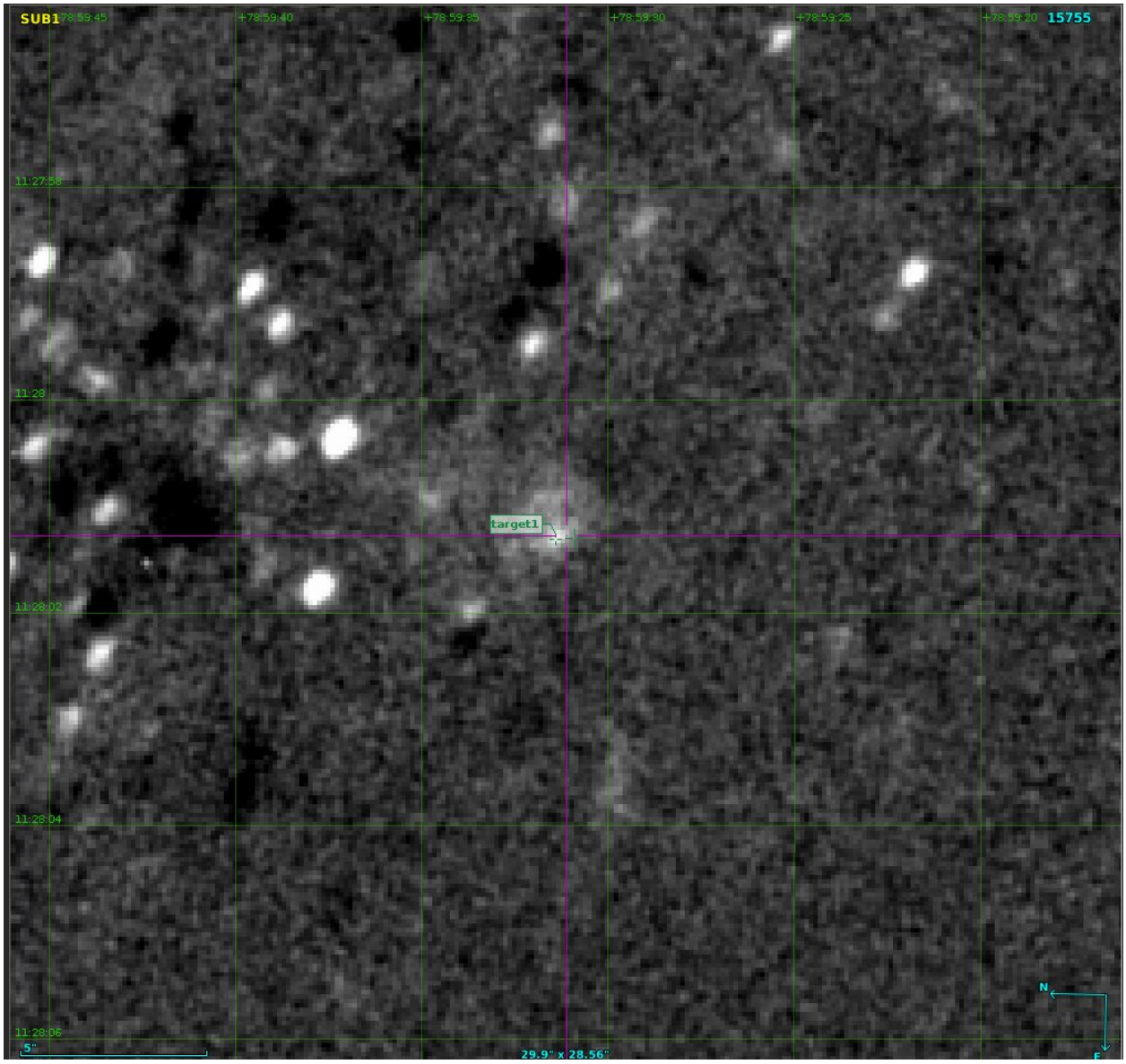
UM_XMDs_LUCI/UGC6456

UGC6456 - target

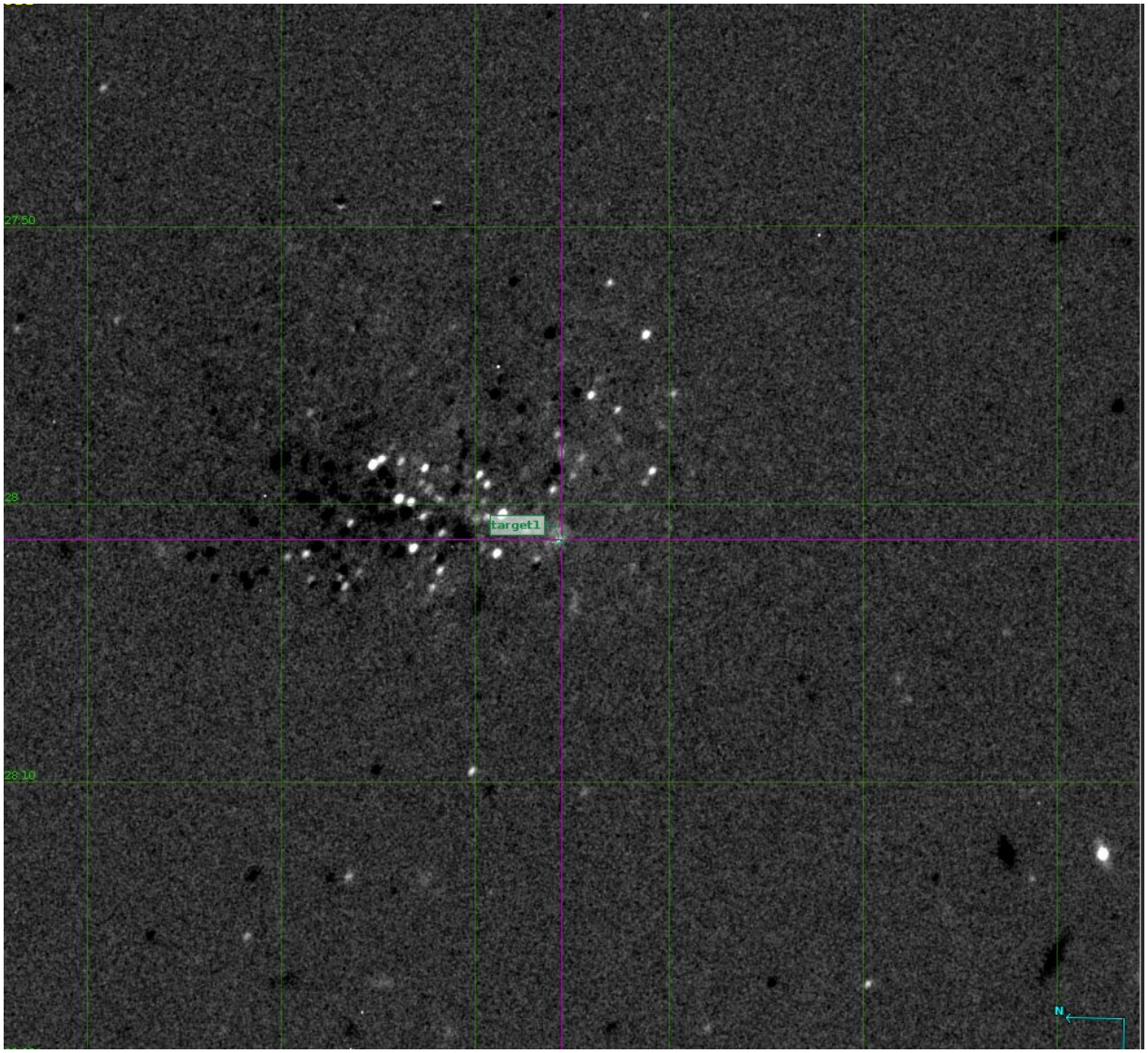
07:31 Josh is checking pointing and collimation. Blind filters in place. I'm moving to the 1" slit.

07:39 Slewing to UGC6456 — need to unwrap the rotators.
07:44 Resent the preset - slow to collimate on L1 and the image was taken regardless, but it the sky image. (May have gotten LUCI-IIF into a state)

L1: 84 & 85, 86 dx, dy =-0.4971, 0.2062 to put object at 1034.99, 1036.56 → 87, dx=0.06 → 88
L2:71 & 72, 73 dx, dy = 0.4463, -0.0214 to put object at 1003.96, 1041.19 → 74, dx=-0.06 → 75, dx=-0.06" → 76, ok



A closeup of what we centered up on



Some problems with image sub on L1 RTD (15800 counts) - newer version of RTD may fix this.

08:16 Starting the observation — FWHM on guiders is 0.7"

UT	L1	L2	AM	seeing
08:18	89	77	1.45	0.7"

08:30 - First spectra finished. They both show emission lines.
08:55 FWHM on guiders is 0.67/0.69 on average.
09:20 Finished

HIP31922 - telluric

09:21 Slewing

L1: 95, 96 dx,dy = -10.0554, 1.2758 to put star at 1034.79, 1055.7 → 97
L2: 83, 84 dx, dy = -7.6565, 2.3883 to put star at 998.94,1060.38 → 85

09:32 Starting
Guide star is gone on the SX side, this happened on the 00 -10 offset.

02:36 Resending the preset
L1: 98, 99 dx,dy = -10.05, 1.137
L2: 86, 87 dx, dy = -7.5, 2.0766

Again - we lost the guide star of the left side

UT	L1	L2	
09:46	101	0099	0 -10, not guiding on SX - lost star
	102	90	0 +10, guiding

I suspect the off-axis guide star was close to the edge of the patrol field, but will check the OT.

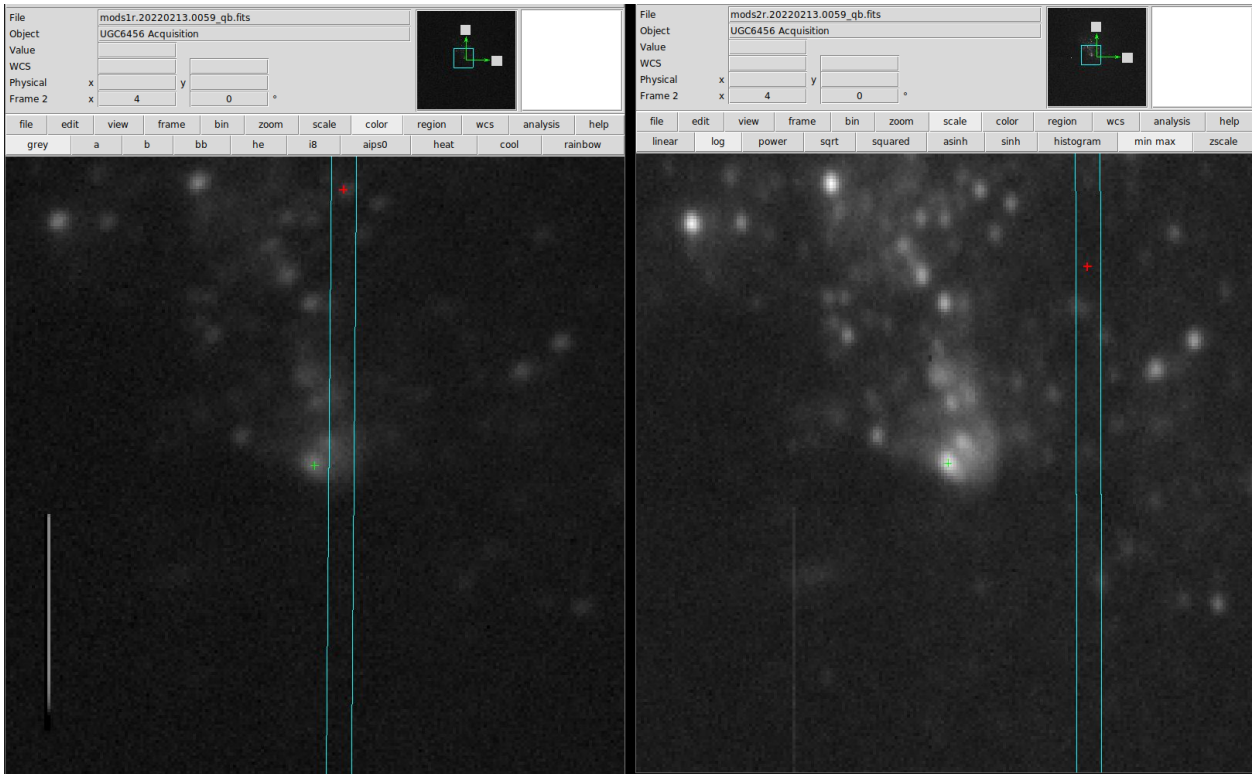
Reconfiguring to MODS

09:53 Josh is slewing to the zenith to reconfigure
10:05 Josh is sending the pointing preset
10:10 … and now the collimation preset.

UGC6456

10:14 acqBinoMODS UGC6456_UT1030.acq

m1r: 58, 59 → offsetxy 1.154 10.931 rel → 60, dx=-.06
m2r: 58, 59 → offsetxy 5.554 7.797 rel → 60



The green crosses in these alignment images (mods1, left and mods2, right) indicate the region we centered up on the slit.

10:30(?) execBinoMODS UGC6456.obs

UT	m1b	m1r	m2b	m2r	AM	seeing
10:33(?)	45-47	61-63	45-47	61-63	1.46	0.78/0.87

10:32 MODS1 red IMCS failed to lock within timeout. elevation 43 deg, rotator angle 391 deg

mods_quickreduce - in osurc@obs5:~/Scratch/20220213/

11:16 Starting the 3rd exposure. The avg FWHM on the guiders is still very good 0.75/0.82"

11:38 Finished

OSU_ASASSN/AT2021biy

11:39 acqBinoMODS AT2021biy.acq
seeing ~ 0.44/0.55" during the acq

m1r: 64 & 65 →offsetxy -0.018 9.668 rel → 66

m2r: 64 & 66 →offsetxy 4.119 7.471 rel → 66

11:53 execBinoMODS AT2021biy.obs

UT	m1b	m1r	m2b	m2r	AM	seeing
11:56	48-52	67-71	48-52	67-71	1.053	0.045/0.055 on guiders 0.43 on WFS

very red
mods_quickreduce run on the first mods1 spectra
12:41 4th set of spectra are reading out
12:41 18-deg twilight

12:41-44 Starting a 5th set of spectra
12:55 Finished

Feige67

12:56 acqBinoMODS feige67.acq

m2r: 72 offsetxy -0.095 10.936 rel → 73
m2r: 72 offsetxy 5.328 7.466 rel → 73, offsetxy -1.182 0.056 rel → 74

13:05 execBinoMODS feige67_DualGrating.obs

	m1b	m1r	m2b	m2r	AM	seeing
13:05	53-55	74-76	53-55	75-77	1.29	0.75" guiders; 0.55" on the WFS

~13:07 m1r red imcs failed to lock within timeout. Elevation 50, rotator angle 87
13:10 12-deg twilight

13:18 Finished - the sky background is pretty high in at least the 2nd and 3rd spectra.

LUCI1 N30 twilight sky flats

13:37 Slewing to Blank13+63 skyflat field

The N30 Field stop has shifted a few pixels to the right. Realigned it to match the data.

Need to take darks & flats for nirjets program - corrected OT and skyflat scripts are in ~osurc/OBs/UVa_nirjets_AO_v20220209_233300UT/UVa_nirjets_AO/
The skyflat scripts were corrected to use the N30 field stop.

13:47 5s gives only 400 cnts

UT	filter	L1	DIT x NDIT	counts
13:47-13:53	Ks		5 x 1	400 ADU - 1400 ADU
13:58		128	5 x 1	2500
14:07	Ks	132	5 x 1	3500

14:10 There are some tip/tilt errors - the M2 hexapod is out of position. We'll just go to zenith, park the telescope there.

14:01 sunrise

14:13 at Ks, 134-153 starting 20 exposures of DIT x NDIT = 5 x 1. 3800-4400

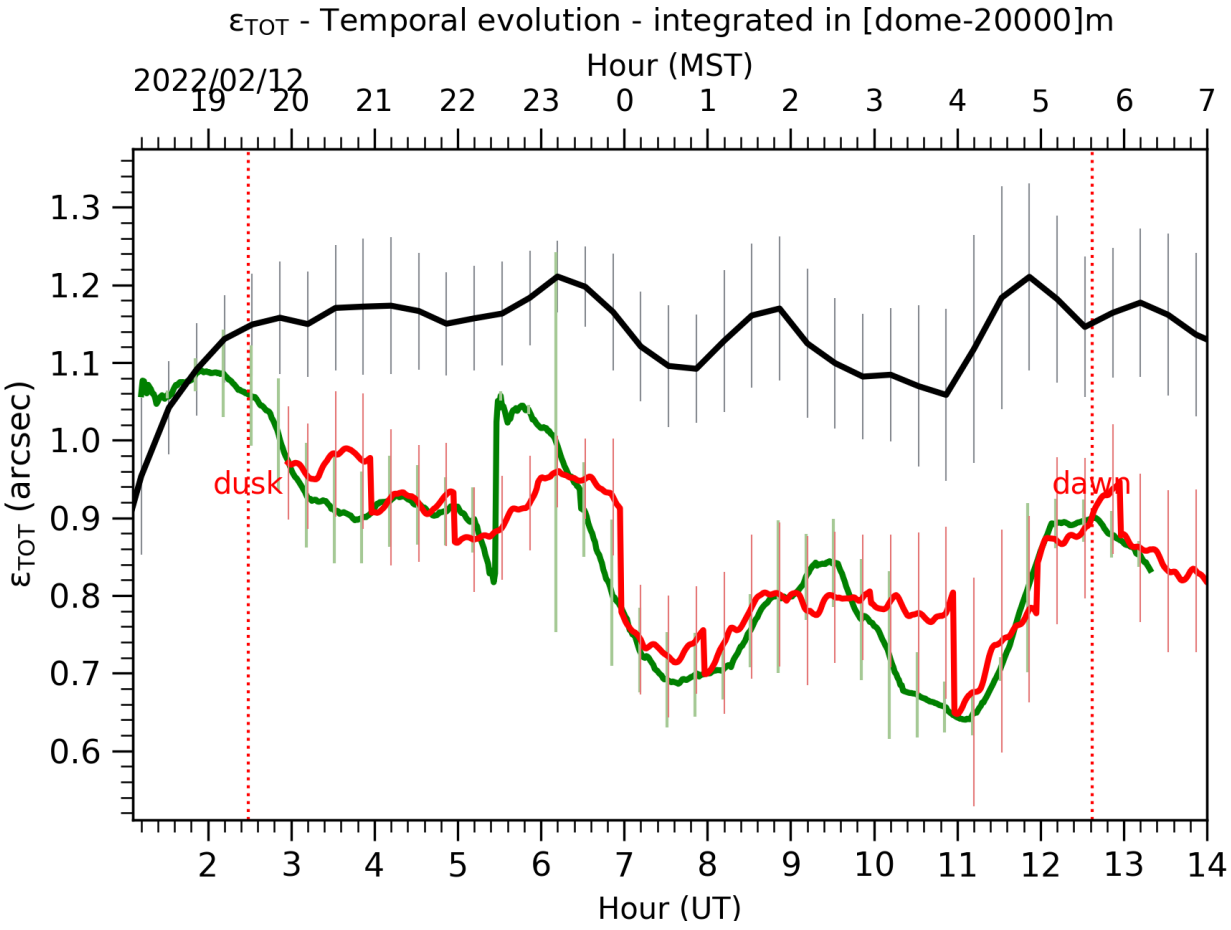
14:23 at BrG, 155-157, 3 exposures of DIT x NDIT = 5 x 20 in integrated mode, 9000 ADU

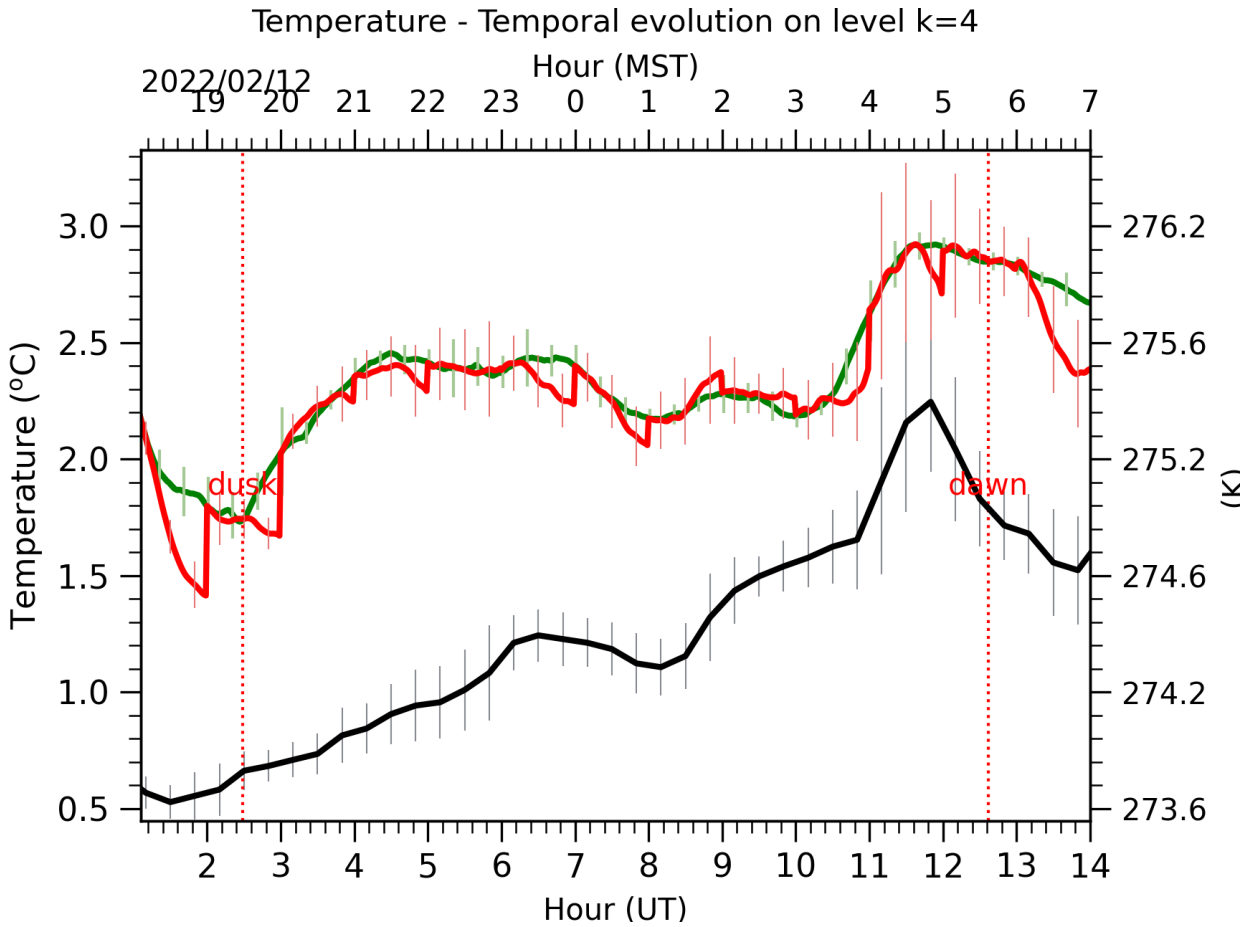
14:29 at H2, 159-161, 3 exposures of DIT x NDIT = 5 x 20 in integrated mode, 12000 ADU

14:36 Josh is closing up.

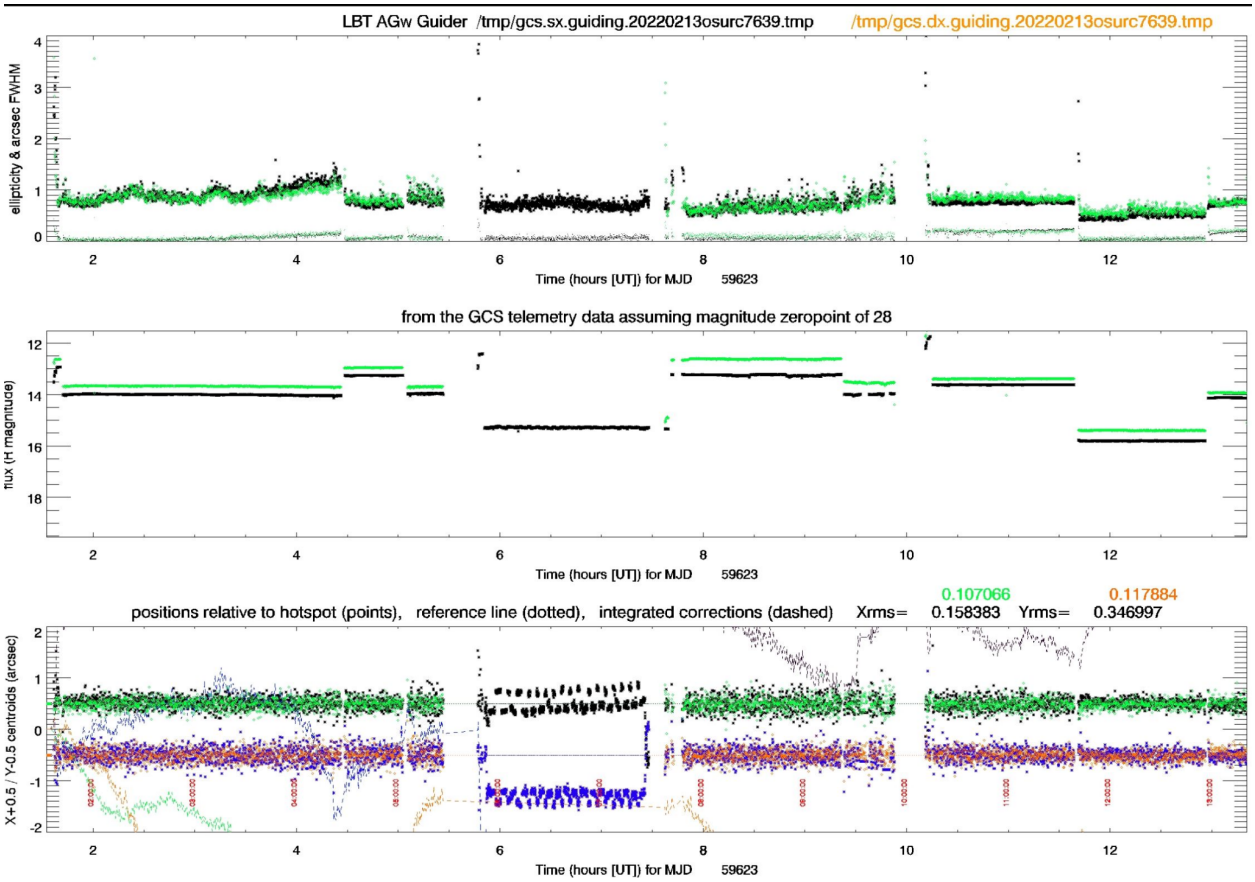
Darks for the flats (see calibrations section above)
(TBD)
L1 162-181 20 darks with DIT x NDIT = 5 x 1
L1 182-184 3 darks with DIT x NDIT = 5 x 20

ALTA predictions




Temperature - Temporal evolution on level k=4
2022/02/12
Hour (MST)
19 20 21 22 23 0 1 2 3 4 5 6 7
Temperature (°C)
3.0
2.5
2.0
1.5
1.0
0.5
276.2
275.6
275.2
274.6
274.2
273.6
(K)
dusk
dawn
2 3 4 5 6 7 8 9 10 11 12 13 14
Hour (UT)

LBTplot


LBT AGw Guider /tmp/gcs.sx.guiding.20220213osurc7639.tmp /tmp/gcs.dx.guiding.20220213osurc7639.tmp
ellipticity & arcsec FWHM
Time (hours [UT]) for MJD 59623
from the GCS telemetry data assuming magnitude zeropoint of 28
flux (H magnitude)
Time (hours [UT]) for MJD 59623
positions relative to hotspot (points), reference line (dotted), integrated corrections (dashed) Xrms= 0.158383 Yrms= 0.346997
0.107066
0.117884
X+0.5 / Y-0.5 centroids (arcsec)
Time (hours [UT]) for MJD 59623