LBT Observing Log for 2023 Dec 5/6 (MST)

C19 Observer: Olga Kuhn, Jason Chu
Partner Observer(s): Jennifer Johnson
Telescope Operator: Steve Allanson

Plan:

PEPSI: OSU_BHBinaries, UVa_Multistar, ND_ChemPec (carbon),OSU_Pinsonneault(POL)

Observed and completed:

Summary:

We observed PFU targets from OSU_BHBin, UVa_Multistar, ND_ChemPec(or carbon) programs and POL targets from OSU_Pinsonneault

PEPSI log: OSURC_PEPSI_Log20231205.txt

LBT Observing Log for 2023 Dec 5/6 (MST)
- Plan:
- Observed and completed:
- Summary:
- Issues:
- Overview (times are given in UT):
- OSU_BHBin/HD346227
- ND_ChemPec/J0158
- OSU_BHBin/2MASS J22014363+4741118
- UVa_Multistar/TIC 470710327
- UVa_Multistar/TIC 52856877
- UVa_Multistar/TIC 328181241
- UVa_Multistar/TIC 454140642
- OSU_BHBin/ Gaia DR3 3234582511052921088
- UVa_Multistar/TIC 391620600
- OSU_BHBin/J0628+0607
- OSU_BHBin/Gaia DR3 3383631280821336448
- OSU_BHBin/Gaia DR3 3381217539262727936
- OSU_BHBin/Gaia DR3 3157581134781556480
- OSU_BHBin/2MASSJ06024026-1646042

OSU_BHBin/Gaia DR3 2949272716964862720
UVa_Multistar/TIC 78568780
OSU_BHBin/2MASS J07243768-1729190
UVa_Multistar/TIC 348651800
OSU_BHBin/Gaia DR3 3072979835351666304
UVa_Multistar/TIC 200094011
UVa_Multistar/TIC 239872462
UVa_Multistar/TIC 336882813
OSU_Pinsonneault/HD52711
OSU_Pinsonneault/HD103095
OSU_Pinsonneault/HD90508
Calibrations (PEPSI POL+PFU)

Issues:

- Bright and relatively broad line in CD4 which really puzzled us. Discussed it with Ilya later and he noted he saw a similar feature that comes and goes at 6117 angstroms - last seen in May 27 2023 UT. Unknown origin - maybe auroral.
- While searching for sources of stray light, we noticed the green LED on LUCI1 pressure gauge which had been taped over, but needs to be re-taped. Requested that Chris cover it up in the day.
- On SX, a loss of signal caused the hotspot to go 'outside the CCD'. We read out the exposure, Steve restarted GCS left and we resent the preset. IT 6541.
- Rangebal during observation caused the star to move off the pinhole, but it settled back in about a minute. This occurred about 2x. Known issue IT 8470.

Overview (times are given in UT):

OSU_BHBin/HD346227

01:01 UT

300 mic fiber: CDs 3 & 5
SNR ~ 184/3 and 224/5

ND_ChemPec/J0158

LAMOST J015857.38+382834.7

V=14.95 3 hrs on-source with
300 mic fiber: CDs 2 & 4

Seeing is 0.75/0.87 on SX/DX guiders. Using BS1 to start, as we have sufficient counts in guider and WFS, though will keep an eye on things.

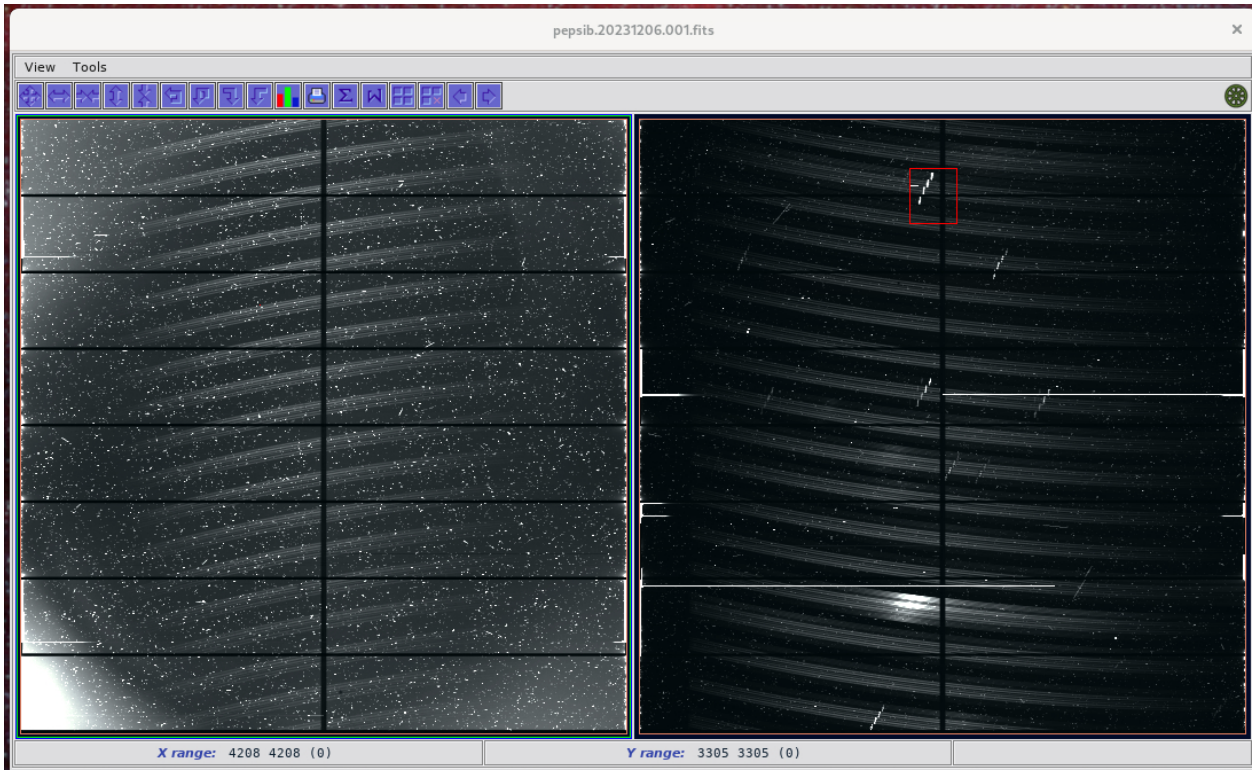
01:21 UT exposure started - it will be 3 hrs long.

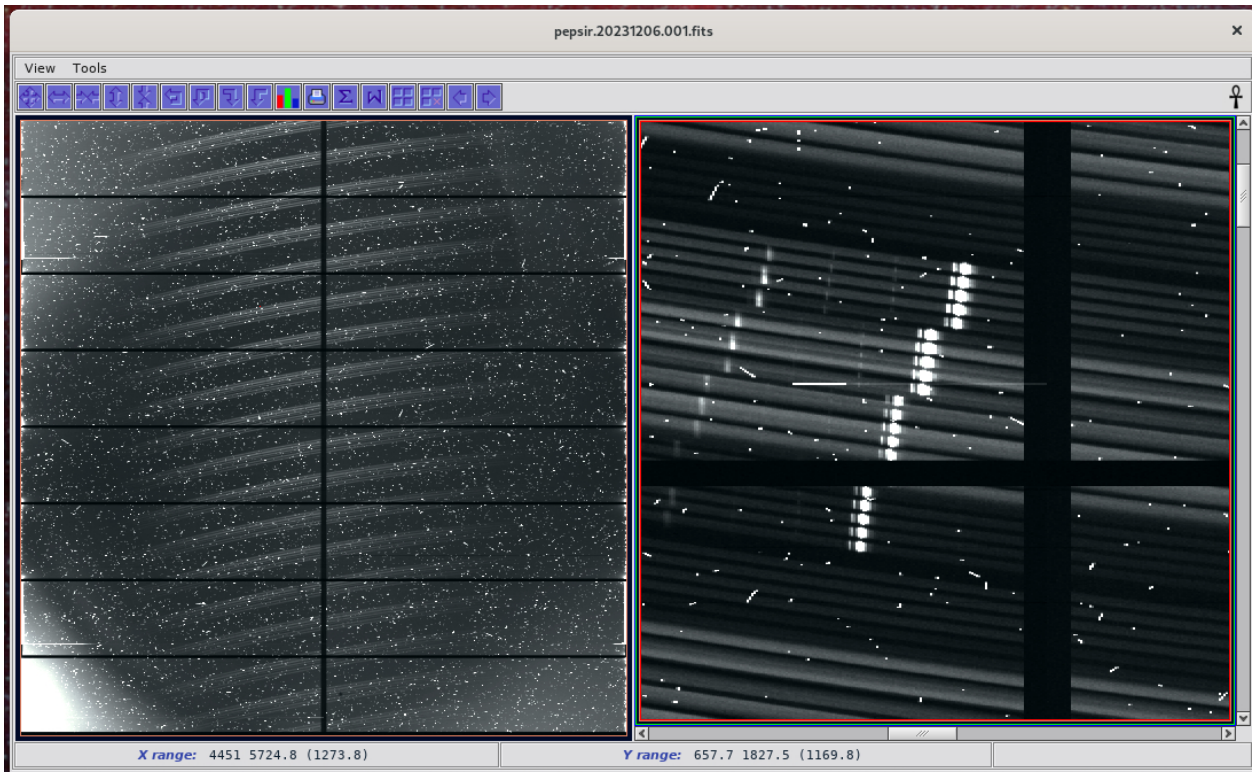
02:40 UT so far, so good. Seeing 0.84/0.92 on the guiders. Skies look pretty clear, with a little bit of cirrus.

Noticed that the readme actually indicated a desire for 6x1800-s, though put the OB together quickly and gave the single exposure 3 hrs, consistent with what Ilya has advised (single long exposure vs multiple shorter ones)

03:24 On SX, the star went off the pinhole. Resent the preset on SX, and that did not help, so I readout the blue/red exposures. 2 hrs. SNR ~ 92 on CDII, but the red CD4 spectrum looks odd. We expect 3 slices per each object and sky fiber, but there are more. Wondering if the spectrograph configuration might have changed midway through, though not sure how that could have happened. When I stopped the exposure, I also noticed that the PEPSI guiding on DX was already stopped, though I did not intentionally do this (note that even if PEPSI were not guiding, GCS was and we watched to make sure that the star was on the fiber). Would be good if Ilya could check the PEPSI log. Also good that we did stop and started a new exposure.

~~Looks like broad emission appears between 5460 - 5560 angstroms~~ (order/wavelength id ok?) No, after the CCD replacement last summer, the orientation of the spectrum on the detector has changed - now red reads up to down from low to high wavelength.





67

03:32 Starting a 1hr exposure. Seeing FWHM 1".

The spectra look very similar to the previous ones. No lights in dome. Odd. We did not see this in the previous target (BHBin), but it used CDs3 & 5.

04:38 We'll take a quick exposure on the next target using CDs 2 & 4 - as a sanity check.

04:38 Slewing to 2MASS J22014363+4741118 —
04:40 Steve checking pointing - we slewed from 80 deg to 40 deg elevation.

On the CD4 spectrum, we also see these sets of 5 lines at the same position as for the previous 2 CD4 spectra on J0158.

When Ilya came online we discussed this. He doesn't know what is causing the broad emission in both sky and object and also pointed out that the background was higher than usual in the red. However, he recognized the sets of 5 lines (look closely and there are also sets of 7 lines) which are produced by scattered light from bright sky lines reflecting off the 200-mic and 100-mic image slicers. He noted that in past spectra that there was an emission line and elevated background at 6118 angstroms that came and went - from object-to-object on a night and on two nights separated by 8 months (Sep 2022 and May 2023), speculating it might be related to auroral activity. He said the wavelength of the line we see is the same. The last time Ilya noticed it was in the 2023-05-27 UT SN ixf spectrum.

OSU_BHBin/2MASS J22014363+4741118

04:49 Starting the exposure in CDs 3 & 5
CDs 3/5 – SNR 85/116

UVa_Multistar/TIC 470710327

04:54 Pointing check needed.
04:57 Preseting again to the target

CDs 2/6 – SNR 94/128

04:58 Starting the exposure

UVa_Multistar/TIC 52856877

05:03 Slewing
05:05 Starting exposure
CDs 2/6 – SNR 64 & 87

UVa_Multistar/TIC 328181241

05:11 on-target (long slew)
05:12 Starting exposure
CDs 2/6 -— SNR 64/94

UVa_Multistar/TIC 454140642

CDs 2/6 — SNR 75/97

OSU_BHBin/ Gaia DR3 3234582511052921088

5:22UT Starting exposure

Steve is checking the chamber for any lights - there is a green LED, which is the LUCI cal unit sensor, but he has noted that before and taped over it (though it impedes functionality of the LUCI cal unit). IT 3233 (SA - my mistake, from 3233 the green LED is the LUCI1 pressure gauge, the yellow LED was the position sensor. We could probably cover the green one OK)

Steve is back - he says it is very dark and there are no obvious light sources or blinking lights.

CDs 3 / 5 — SNR 87/127

UVa_Multistar/TIC 391620600

05:34UT Slewing - a pointing check was needed
05:40UT Slewing
05:43UT Starting the exposures

CDs 2 /6 – SNR 72/91

OSU_BHBin/J0628+0607

05:55UT Exposing

CDs 3 /5 – SNR 86/126

OSU_BHBin/Gaia DR3 3383631280821336448

CDs 3/ 5 – SNR 85/118

OSU_BHBin/Gaia DR3 3381217539262727936

06:13 Slewing
06:14 Starting the exposure

CDs 3/ 5 – SNR 77/128

OSU_BHBin/Gaia DR3 3157581134781556480

06:24 Slewing
Taking a while for the WFS to settle. Seeing has really gotten worse - FWHM ~ 2.3/2.5
SMT turned their lights on and the chamber is open — Steve is trying to reach them.
We aren't facing SMT now and the vent doors are closed - taking an exposure
06:33UT Starting -

CDs 3/ 5 — SNR 75/109

The spectra look normal -hard to see any background light.

OSU_BHBin/2MASSJ06024026-1646042

06:41 Pointing check needed.
06:45 Starting exposure
06:49 - SMT answered the radio and turned their lights off.

CDs 3/ 5 – SNR 65/ 116

OSU_BHBin/Gaia DR3 2949272716964862720

CDs 3/ 5 – SNR 73/118

UVa_Multistar/TIC 78568780

Object is low, but accessible. Airmass 2.1, Seeing FWHM here ~ 2.5"
We ran out of BHBin and Multistar targets in this RA range, so are going back to reobserve some earlier Multistar targets from 20231101.ob. This is one.

CDs 2/6 – SNR 56/64

OSU_BHBin/2MASS J07243768-1729190

CDs 3/ 5 – SNR 64/83

UVa_Multistar/TIC 348651800

Another from 20231101.ob
Airmass 2.11, FWHM ~ 2.3"
CDs 3/ 5 – SNR

OSU_BHBin/Gaia DR3 3072979835351666304

Airmass 1.79, FWHM 2.2"
CDs 3/ 5 – SNR 67/95

This wrapped up the BHBin targets accessible. I asked Ilya whether he might be available to support POL targets. Until hearing back, we'll continue to pull TIC Multistar targets from the master target table.

UVa_Multistar/TIC 200094011

07:51 Slewing
Airmass 1.187, FWHM ~ 2.5"

UVa_Multistar/TIC 239872462

08:05 Slewing
Airmass 1.00, FWHM ~ 1.9"

UVa_Multistar/TIC 336882813

08:21 Slewing
Airmass 1.05, FWHM ~ 1.9"

08:33 - We've been selecting random Multistar targets from previous runs because of the gap in RA coverage, and there are more POL targets in the OB. Tried to contact Ilya to see if he could come online, but did have some exposure to executing the POL observations, so we'll try.

08:51 Checking pointing near the first target, HD52711

OSU_Pinsonneault/HD52711

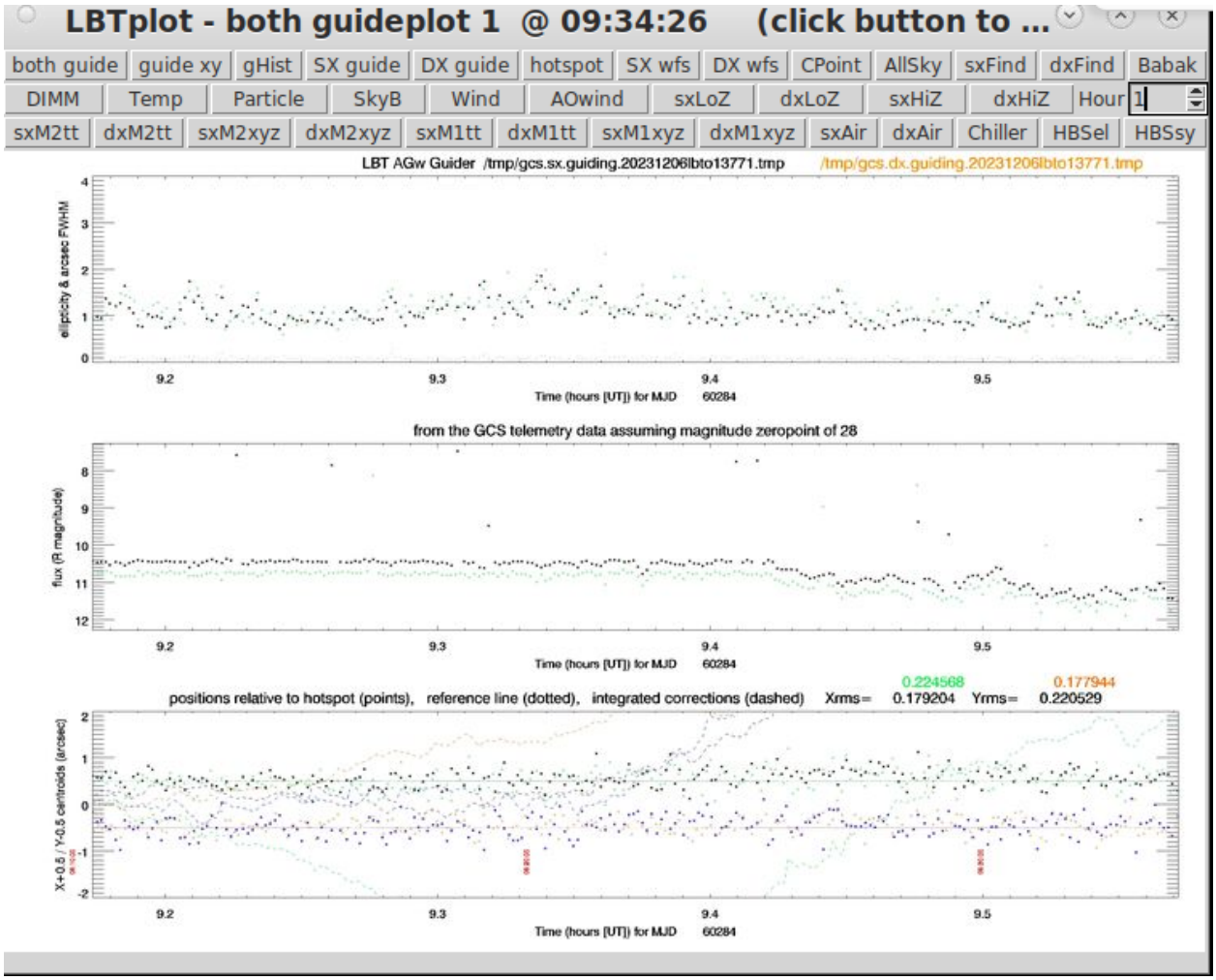
Had to increase the exposure on the POL Fiber Viewing camera from the default up to 250000 to see the star (V=5.93).

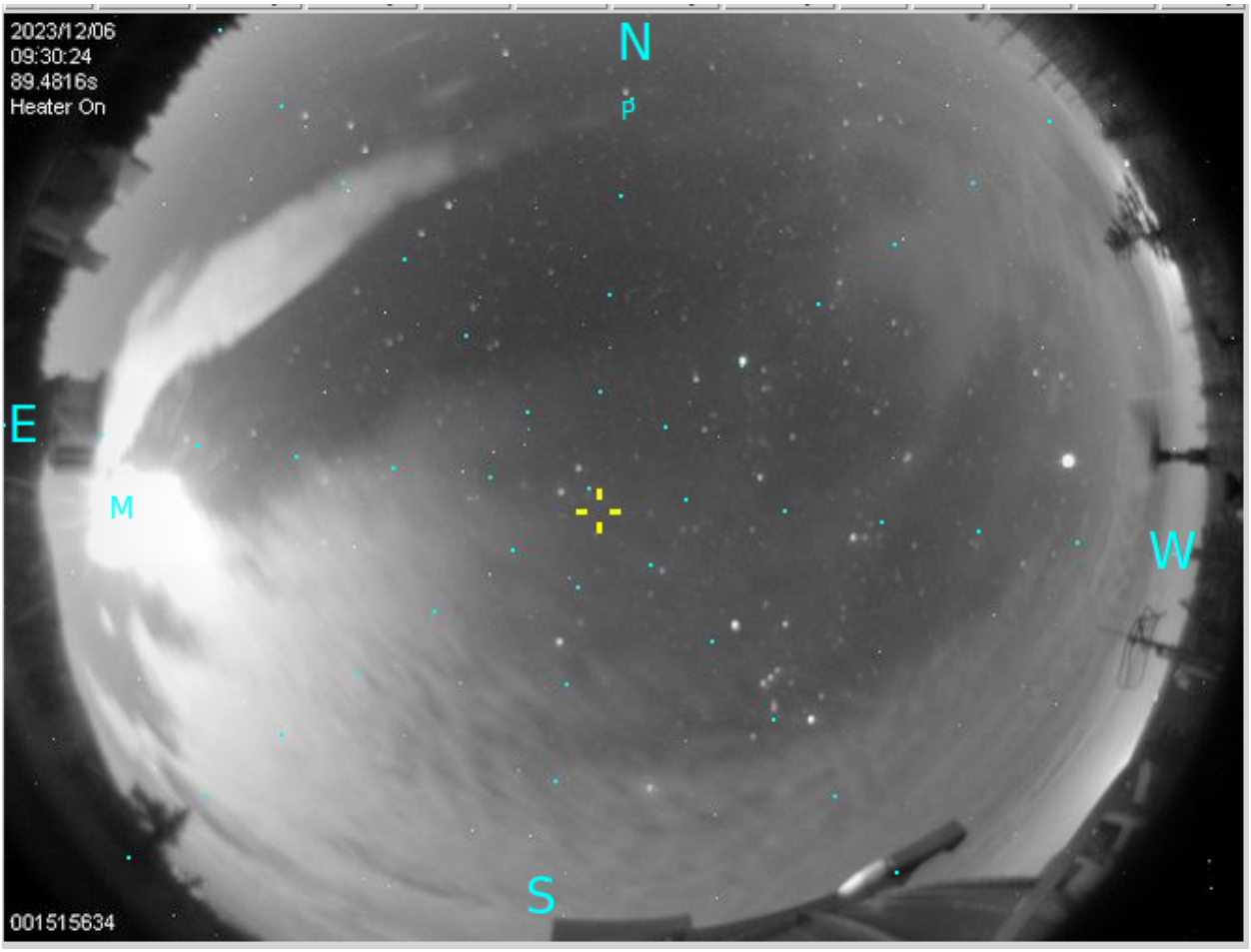
09:06 - starting…
Taking 3 exposures, each one 12-min (720-sec) at each of 2 retarder angles.

09:15 seeing is varying but trending down. Avg FWHM now 1".

09:19 On DX, the WFS image shows spots off the center of the lenslets and aberrations may be growing, though Steve is keeping an eye on these. FWHM on guiders still decent - SX/DX 1.12/1.2"

Clouds are coming in and guide signal has just started to dip.





09:51 DX guide star jump. Clouds are really getting thicker, so we are going to abandon this target and move on. Unfortunately, we only got one pair of spectra at retarder angle 135, but 3 at 45 deg. I should have set it up to do 3 cycles (bottom right corner of GUI) with Nexp = 1, as that would have alternated 45, 135 deg.

Ilya has come online

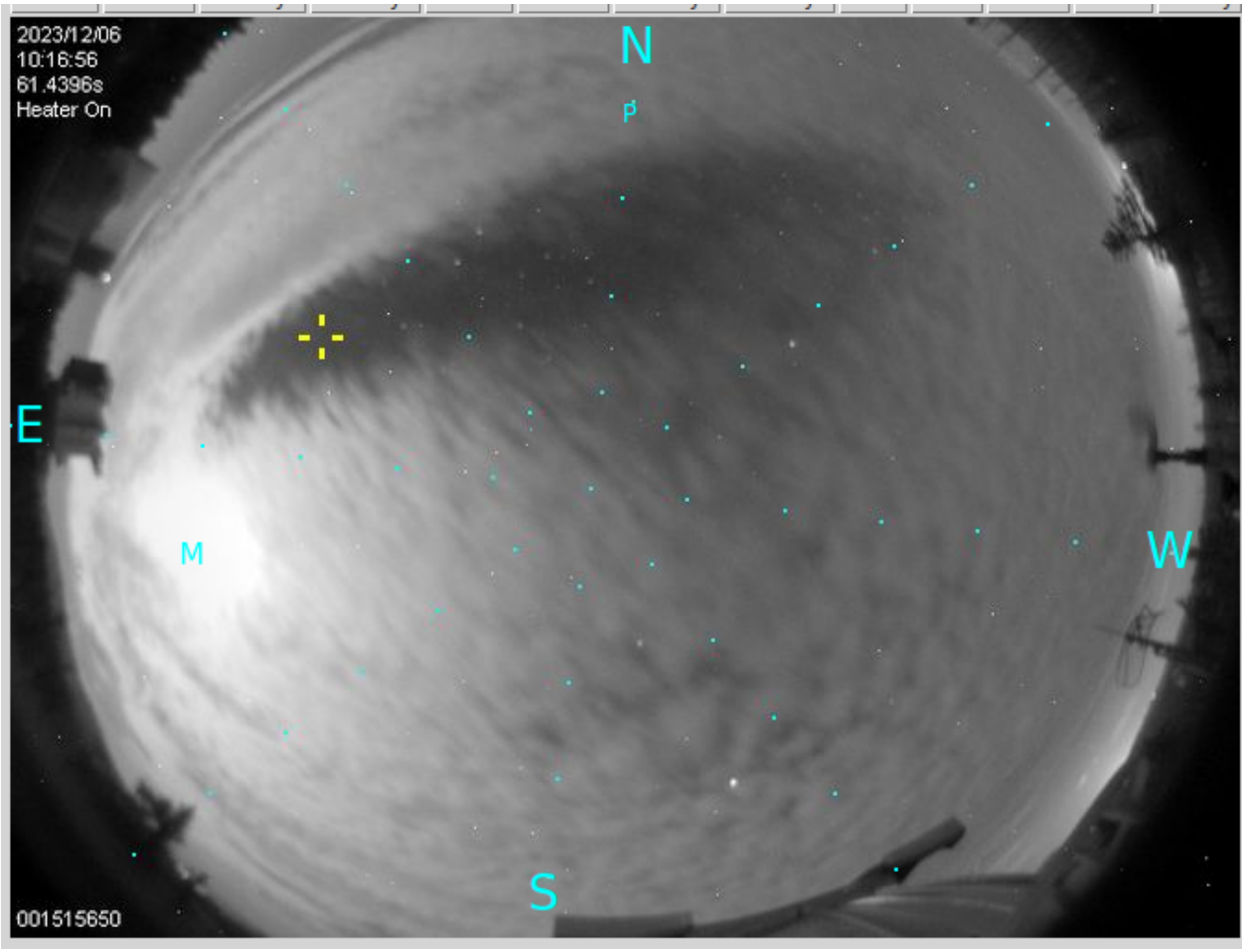
OSU_Pinsonneault/HD103095

09:58 Slewing, but telescope complains guide star is out of range (field should have radius 5.8', so we're puzzled)

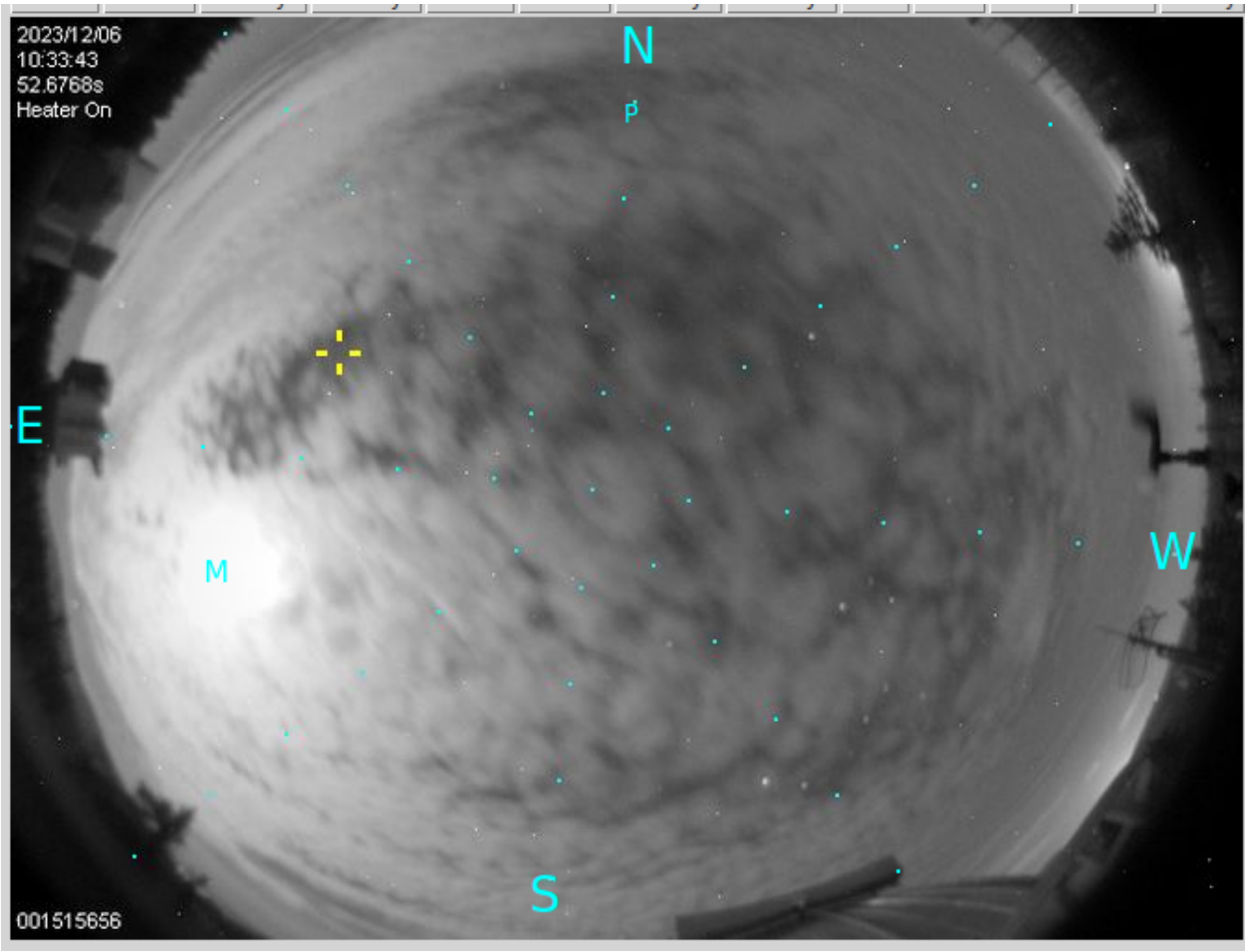
06/12/2023 02:58:35 left PresetTelescope: PresetTelescope result status: Error Stop{FLAO}[541] AGw command status: AGW3: Requested position is Out of Range isPosAccessible: probe cannot move to requested position (SFP) (x,y): 68.0738, -7.78899 mm. guidestar list successfully changed but failed moving probe to position.
right PresetTelescope: PresetTelescope result status: Error Stop{FLAO}[522] AGw command status: AGW4: Requested position is Out of Range isPosAccessible: probe cannot move to requested position (SFP) (x,y): 68.0738, -7.78899 mm. guidestar list successfully changed but failed moving probe to position.

Ilya has been trying different guide stars, but no success until we reached the star at distance 4.181' az=124.55

We've been in a gap in the clouds for a while (lucky object):



10:37 The gap in the clouds has diminished -



11:04 The clouds are clearing again around the target.

11:12: DX guide star & target jumped off the pinhole - corrected on its own in ~ 1 minute. Spontaneous range-balancing issue (IT 7634).

12:00 Seeing has gotten better - FWHM ~ 0.76/0.71" and clouds are starting to clear out. We are on the 7th cycle

12:23 SX/DX guide star jump.

~12:40 - finished. We completed 8 45deg/135deg cycles

SNR in a single exp ~same in CD 3/ 5 and ranging from 100000 to 173000 due to clouds

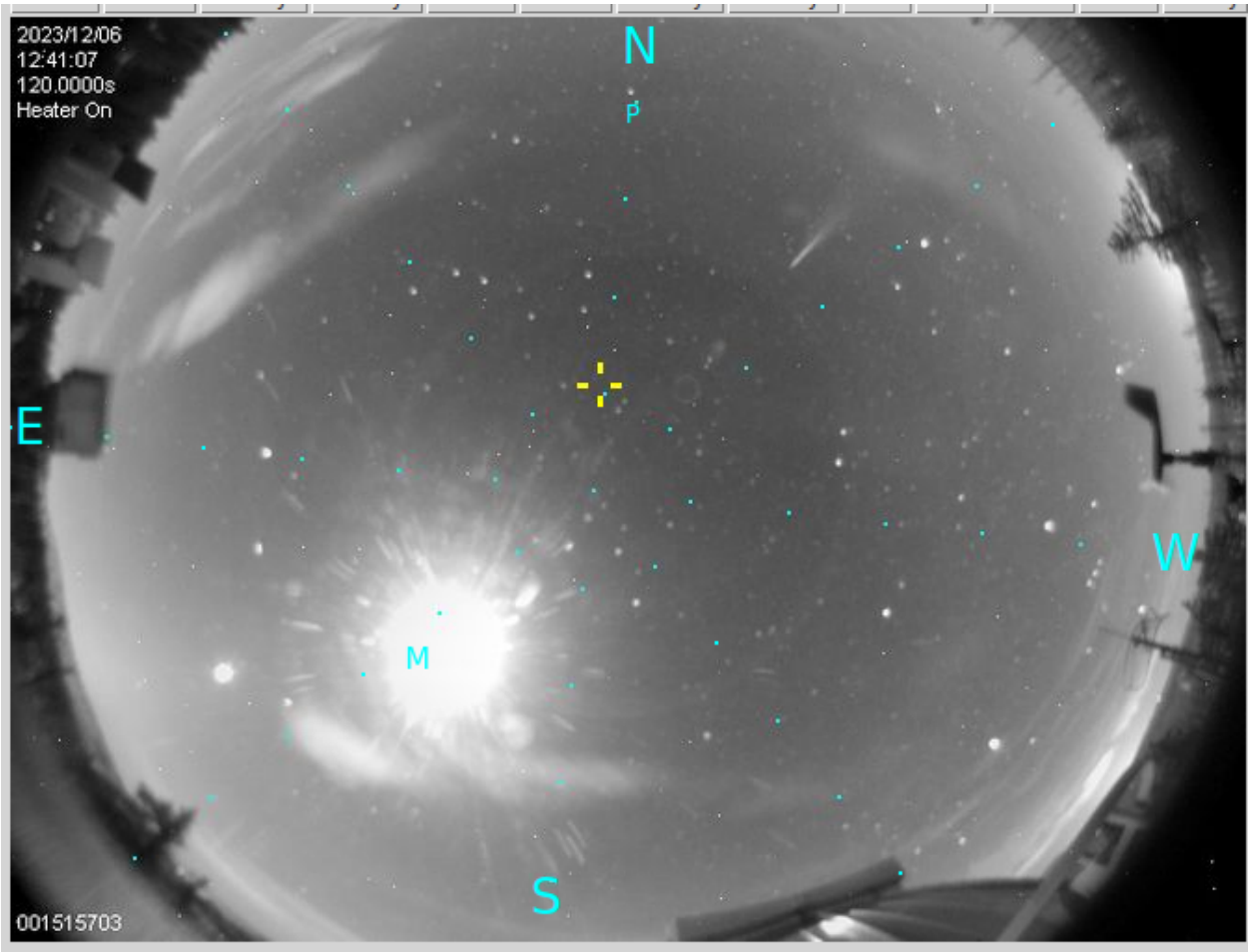
OSU_Pinsonneault/HD90508

12:40 Slewing to the target

12:45 Starting the exposure - the skies have cleared mostly and seeing is ~0.9"

13:11 12-deg twilight
13:39 Taking the last pair of spectra. It is already well into twilight.

From the start —



13:44 Closing up
14:04 Sunrise

Calibrations (PEPSI POL+PFU)

- for the polarimetric observations –done
- for the PFU observations – done