LBT Observing Log for 2023 Dec 6/7(MST)

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

Plan:

PEPSI: OSU_BHBinaries, ND_ChemPec (carbon), OSU_GammaDor
LBC: OSU_monitor

Observed and completed:

Observed PEPSI targets from OSU_GammDor, ND_ChemPec and OSU_BHBin and also 4 targets from OSU_monitor, 1 between 18-deg and 12-deg.

Summary:

A productive night. Seeing was excellent before midnight during the PEPSI observations, but started to worsen just around midnight when we switched to the LBCs to observe OSU_monitor targets. Switched back to PEPSI and observed many targets from the BHBin program, but the wind picked up and forced us to stay away from the SW, so we observed all of the targets we could and then switched back to the LBCs for one more OSU_monitor target and twilight sky flats at Us, B, V and R.

PEPSI log: OSURC_PEPSI_Log20231206.txt
LBC IQ plot:
http://people.lbto.org/~cveillet/Chris/lbcIQ_500nm_Zenith/lbcIQ500z_20231207.png

Issues:

- Telescope:
  - Many pointing corrections needed during the PEPSI observations
- WIth the LBCs:
  - IQ on red was often worse than blue - something we've seen before on occasion (see plot linked above and included at the end).
  - Many LBCR biases had horizontal banding (known issue IT6748). Best ones later in the series of 50.

- TMS-FPIA background service had stopped running sometime. Needed to run FPIA with the keyword bypasstms (not a real issue, the reason this keyword was added)

Overview (times are given in UT):

00:17 Sunset

00:25UT Steve is opening the chamber

01:11 UT 12-deg twilight

OSU_GammDor/KIC 6784155

01:00 UT Slewing to the target
FWHM on the guiders ~ 0.6"
But we are seeing the back-reflected image on DX as double (this is not that uncommon, though usually it resolves into one on its own). Steve is reloading the flat.

01:07UT resending the preset. This time got the wrong star on DX. Steve is nudging it.

We switched from BS1 to BS2, and then we switched from ND0 to ND2, but could not get rid of this double-reflection on DX. The seeing is very good - perhaps that is why we're seeing it persist where it seemed to glom into one before.

01:20UT Starting the exposure.

01:25UT double-image on DX is gone

CDs 3, 5 – SNR 231, 264

OSU_GammDor/KIC 6229502

01:40 Starting the exposure, but no - we lost the star on DX and saw a hotspot jump.
Steve is restarting GCS and I'll resend.

01:45 Started exposure

CDs 3,5 – SNR 238, 284

OSU_GammDor/KIC 10154094

02:06 Slewing
02:08 Starting the exposure

CDs 3, 5 – SNR 201, 225

We were going to slew to ND_ChemPec/TYC 2261-1078-1 but it is close to transiting at 88 deg.

OSU_BHBin/2MASSJ22362877+5238283

02:35 Slewing
02:40 Starting the exposure
Has to check pointing.
02:51 Slewing again

ND_ChemPec/TYC 2261-1078-1

Presetting - pointing check needed.

03:10 Starting this exposure

Some adjustment of the requested time was needed to avoid dead time.

We will do 2 cycles of:
CD1 2000 CD4 2x1000
CD1 2000 CD5 2x1000
CD1 2000 CD6 4x500
and finish up with 1 more on CD1 and CD4 only

03:31 FWHM average ~ 0.38"/0.49" on SX/DX

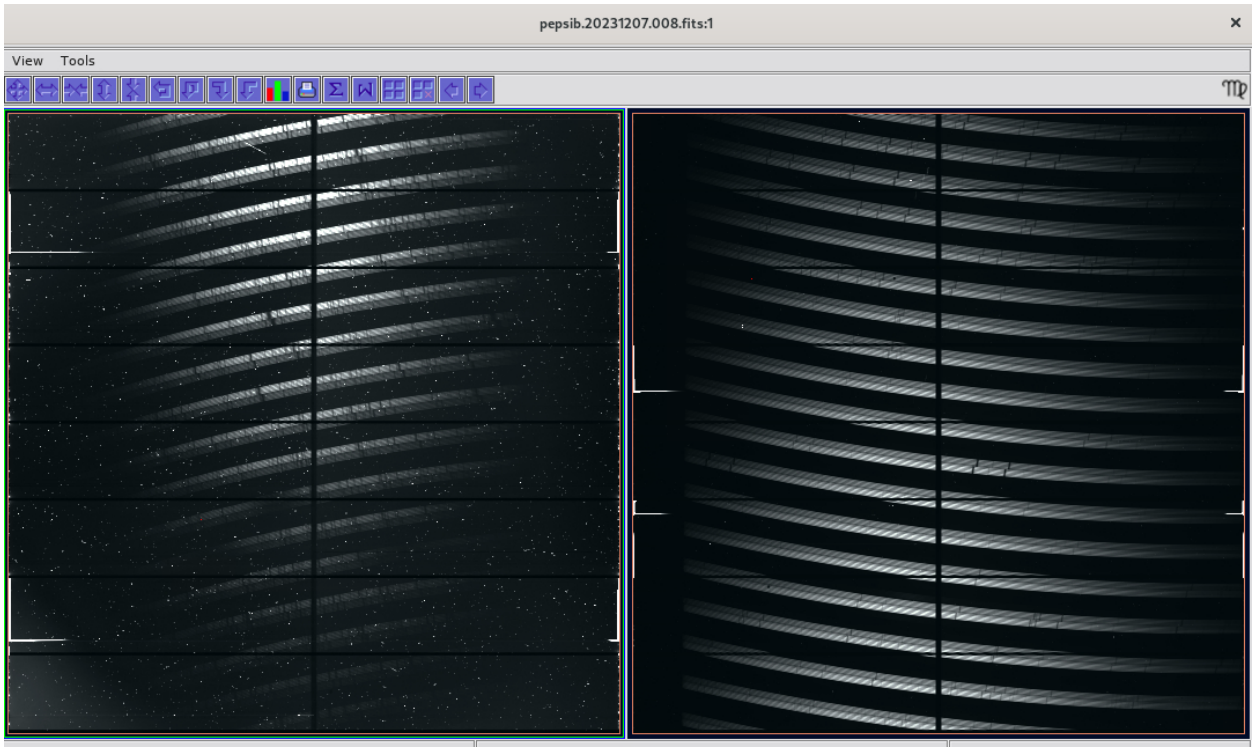
The first CD4 spectrum has SNR 387. Also, there is no broad emission hump seen and the ghost reflections off the other slicers are not seen. However, if I really stretch the CD4 image, I see some emission in sky+obj at the same wavelength as yesterday -
The difference between last night's and tonight's CD4 spectra is that last night used the 300 mic fiber and tonight, the 200 mic fiber.

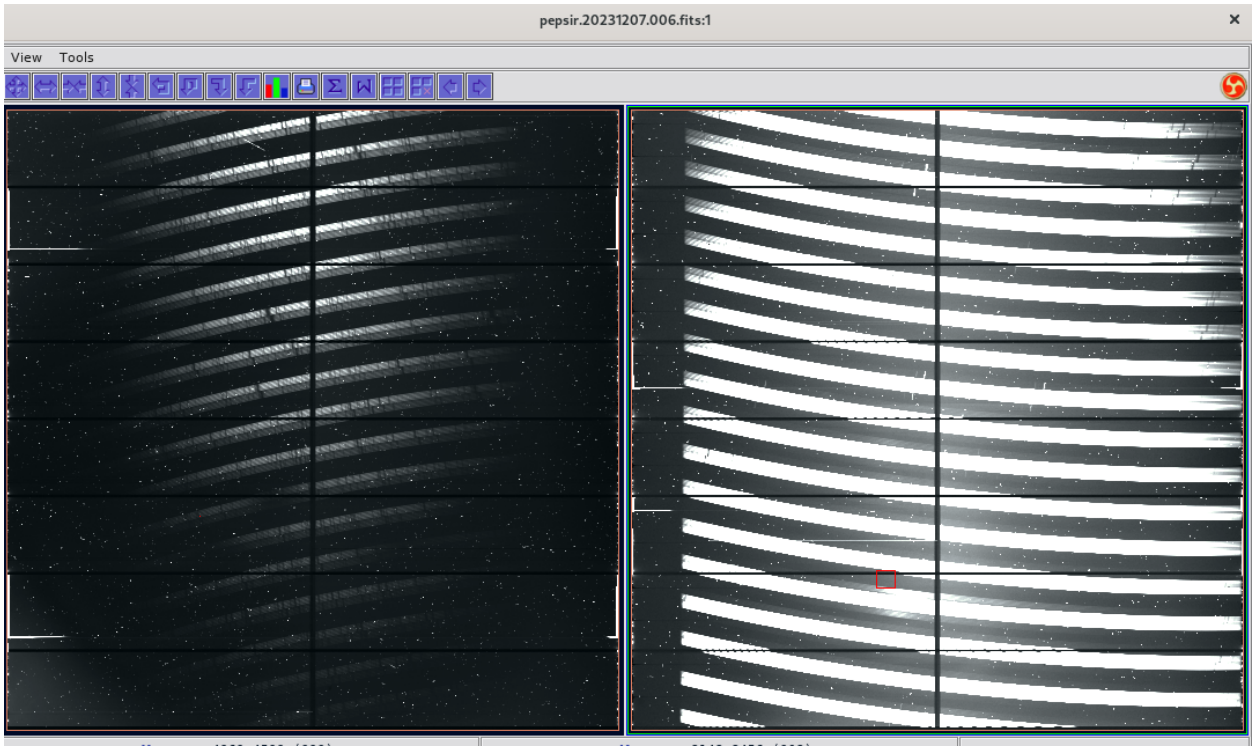
Cycle1:
CD1, 4(#1,#2) — SNR 124, (387,395)
CD1, 5(#1,#2) — SNR 128, (478, 480)
CD1, 6(#1,#2,#3,#4) -– SNR 128, (324, 320, 313, 325)

Cycle2:
CD1, 4(#1,#2) — SNR 126, (377, 395)
CD1, 5(#1,#2) — SNR 109, (494, 476)
CD1, 6(#1,#2) — SNR 100, (314, 301, 306, 302)

In CD1, there is a difference in intensity between SX and DX. It looks like DX is weaker if I've got the flips correct (there was a flip in orientation after the new CCDs were installed during SSD23)

The 1st 2000-sec CD1 and 2nd 1000-sec CD4 exposures: b 8 and r 6 (below - with default stretch and below that - with contrast increased to see the 'emission' in the 4th order from bottom).





04:56 Seeing is still very good - FWHM 0.5/0.55" on SX/DX guiders.

04:57UT Starting the 2nd cycle

06:46 Reconfiguring to LBC

07:08 - Steve sending a sided sync preset to a star near the field to prevent problems (LBC sends "both" vs "side sync preset" and optics hit limit - known issue, IT xxxx)

OSU_monitor/NGC3077

Running dofpia, dohybrid from the term window - IDL wrapper set up for TMS-dofpia switching — TMS is not in use, but this is nice thing to get used to. Note that long-dashes are actually double-dashes.

At first, I got an error. The TMS-dofpia switching script must have crashed:

dohybrid
****
=> Starting DOHYBRID (will block if TMS is on) <=
****

=> running on both sides
% Compiled module: FPIA_START.
% Compiled module: FPIA_SERVICE_REQUEST.
FPIA start failed...
Please report the following message to support
##
SOCKET: Unable to connect to host. Unit: 100
File: dms.mountain.lbto.org.39999
##

So, need to pass dohybrid, dofpia the keyword/option –bypasstms.

dohybrid –bypasstms

Converged, with est seeing 1.16(B) and 1.32(R). Pupils look a bit fuzzy, but we're at high airmass, 1.77:

lbcrangebal:

COPOINTING: B=71819 R=71814
Pointing updates: delta_IE = -7.96", delta_CA = -6.09"
Mirror updates: dX(mm) dY(mm) dRX(") dRY(")
SX: 1.09 0.38 8.21 -23.48
DX: -0.92 -0.32 -6.94 19.81

IQ looks a bit rough on LBCR - 7 pix FWHM. Better on Blue with 5 pix FWHM.
Going to recollimate.

07:28 Started. IQ on Blue ~ 4.9 pix, Red ~ 6 pix.
Christian's IQ plot :
http://people.lbto.org/~cveillet/Chris/lbcIQ_500nm_Zenith/lbcIQ500z_20231207.png

07:45 The OB finished, but the red IQ was worse than the blue. Trying once more to collimate.

07:48 Sending the NGC3077 OB again. DIMM is reporting 1.0-1.1" zen-corrected and LBC guiders 1.3". IQ on Blue ~ 4.5 pix and Red ~ 5.6 pixel

OSU_monitor/NGC2903

08:02 dofpia, –bypasstms
It collimated in one iteration

08:08 Slewing to copointing (AZ axis unwrap)

Radial star offsets from rotator centers: BLUE 4.7" and RED 3.1"

lbcrangebal:

```
---------------------------------------------------------------------
COPOINTING: B=81228 R=81223
Pointing updates: delta_IE = 3.09", delta_CA = -2.43"
  Mirror updates:   dX(mm)   dY(mm)   dRX(")   dRY(")
          SX:   -0.08      -0.24    -5.17    1.77
          DX:     0.05     -0.02    -0.36    -0.97
---------------------------------------------------------------------
```

08:16 Starting the science OB. IQ on Blue ~ 5.8 pix, on Red ~ 5.2 pix

Red IQ started to degrade relative to the Blue IQ near the end.

OSU_monitor/I2574

08:59 dofpia, –bypasstms

copointing

Radial star offsets from rotator centers: BLUE 7.0" and RED 11.1"

lbcrangebal:

```
---------------------------------------------------------------------
COPOINTING: B=90335 R=90331
Pointing updates: delta_IE = 11.28", delta_CA = -8.98"
  Mirror updates:   dX(mm)   dY(mm)   dRX(")   dRY(")
          SX:      0.35     -0.21    -4.49    -7.40
          DX:      0.02     -0.19    -4.13    -0.45
---------------------------------------------------------------------
```

IQ is still worse on red than on blue - 4.7 vs 5.6 pix.

But seeing has gotten worse - now FWHM is ~6.9 pix on both blue and red.

09:18 Reconfiguring to PEPSI-PFU

09:44 Going to the first target

OSU_BHBin/Gaia DR3 1901871691205989 12

09:46 Starting the exposure
CDs 3, 5 – SNR 81,95

OSU_BHBin/Gaia DR3 1959711113800710 40

09:52 Starting
CDs 3, 5 – SNR 66,79

OSU_BHBin/Gaia DR3 2861828836402745 60

09:58 Starting
CDs 3,5 – SNR 71,84

Seeing FWHM ~ 1.30/1.38" — elev 55 deg

OSU_BHBin/Gaia DR3 5030375691209882 88

10:06 Starting
CDs 3,5 – SNR 72,110

OSU_BHBin/Gaia DR3 2692237414140398 08

10:14 Starting
CDs 3,5 – SNR 69,82

OSU_BHBin/Gaia DR3 3104585468895756 928

Long slew - Steve is nudging the pointing
10:22 Starting
CDs 3, 5 – SNR 76,90

10:25 - left, right preset cancelled, but well after the exposure ended
(in a headwind - knocked off source)

We need to stay away from the SW - winds ~ 11-13 m/s

OSU_BHBin/Gaia DR3 5736913402110956928

10:34 - During slew, DX Adsec went into failure state.
10:38 Sending the preset again
10:41 Starting
CDs 3,5 – SNR 100,115

OSU_BHBin/Gaia DR3 10956130043615031O4

10:44 Slewing (long slew)
10:48 Starting
CDs 3,5 – SNR 98,119

OSU_BHBin/Gaia DR3 7992058351093684 48

10:53 Slewing - Pointing check needed
10:57 Starting
CDs 3,5 – SNR 69,88

10:58 Seeing FWHM~ 1.2" on the guiders – 80 deg elevation

OSU_BHBin/Gaia DR3 11498495764949775 36

11:02 Slewing
11:07 Starting - took a while for WFS
CDs 3,5 – SNR 63,86

Seeing 1.5" but elevation 38 deg.

OSU_BHBin/Gaia DR3 8188541078971690 24

11:13 Pointing check needed
11:18 Starting
CDs 3,5 – SNR

Winds are still high - gusts of 18 m/s - from the SW
Cirrus is also coming in from the W.

OSU_BHBin/Gaia DR3 5692513134012211456

Pointing check needed
11:27 Starting
CDs 3,5 – SNR 178,229

OSU_BHBin/Gaia DR3 3869650535947137920

Pointing check needed
11:41 Starting
CDs 3,5 – SNR 67,72

OSU_BHBin/Gaia DR3 9849778079095843 84

11:50 Starting
CDs 3,5 – SNR 116, 130

With the restriction of pointing into the SW or NW, there are almost no more targets.

OSU_BHBin/Gaia DR3 1688851818769141760

Pointing check needed
12:03 Slewing
12:07 Starting
CDs 3,5 – SNR 87, 134

12:11 Starting PEPSI cals while reconfiguring to the LBCs
 * for the previous night's OB
 * for tonight's data - there will be some overlap

12:11 Reconfiguring to the LBCs

The DIMM ran into a limit earlier, soon after we re configured to PEPSI and started the OSU_BHBin program - possibly because we slewed from target to target and it could not keep up.

OSU_monitor/NGC4449

12:35 Slewing to copointing field
Focus/collimation with dohybrid –bypasstms

12:41 18-deg twilight

12:42 copoint

Radial star offsets from rotator centers: BLUE 13.9" and RED 30.7"

lbcrangebal:

COPOINTING: B=124319 R=124314
Pointing updates: delta_IE = -1.50", delta_CA = -10.51"
Mirror updates: dX(mm) dY(mm) dRX(") dRY(")
SX: 1.03 0.43 9.28 -22.09
DX: -0.89 -0.30 -6.53 19.16

12:46 Starting the science
Red IQ ~ 5.5 and Blue is a little worse

First science image - 4.9 pix on blue and 4.6 on red

Uspec 125057 (Uspec) has a jump; 125045 does not (R-Bessel)

12:59 Repeating the OB.

13:11 12-deg twilight

LBC Twilight Sky Flats in

Clouds have mostly cleared out, but we can see a couple of the Geminids shooting over us…not over where we are pointing. The allsky camera movies are available on dms.tucson.lbto.org (VPN).

13:12 Slewing to blank 09+46 for V+R flats, first.

13:24 Starting V+R (a little too early)
* Full sets at PA=0 & PA=180
13:37 Starting B+R
* Full set at PA=180
13:41 Starting Uspec+Y
* Full set at PA=180 but no more… tried to go to PA=0, but it was too bright.

134901 - scrambled image

13:55 Steve is closing up

14:05 Sunrise

LBC Biases

14:06 Telescope parked, chamber dark. Steve is reconfiguring swing arms from LBC to MODS (~6 min).

There were some biases with strong horizontal banding (a chronic issue - seen even when the everything in stationary, IT 6748)

14:13 Swing arms are done moving.

The banding is still present, but ~14:20 the biases are looking more consistently flat.

LBC IQ Plot

http://people.lbto.org/~cveillet/Chris/lbcIQ_500nm_Zenith/lbcIQ500z_20231207.png