

LBT Observing Log: 2025 09 29 UT

Observers: Justin Rupert, Jon Rees
Partner Observer: Peter Garnavich
Telescope Operator: Josh Williams

Plan:

PEPSI to start
UM_58Aql
UM_V1405Cas

OSU_PASTA/Kepler131 1-hour
OSU_PASTA/Kepler-130 1.1-hour
OSU_BHBinaies/2MJ2156+2510 20min - not done

Switch to LBC if seeing < 1.5
OSU_monitor/N6946
OSU_monitor/N672
OSU_monitor/N628
OSU_monitor/N925
OSU_monitor/N2403

Back to PEPSI

OSU_BHBinaries/2MJ0237+0002 0.21 hours
OSU_BHBinaries/2MJ0234-0046 0.24 hours
OSU_BHBinaries/2MJ0241-0051 0.24 hours
OSU_PASTA/HD17674 0.2 hours

Summary:

[Overview \(times are given in UT\):](#)

[UM](#)

[Nova](#)

[58 Aql \(02:05-02:29\)](#)

[V1405 Cas \(02:30-03:20\)](#)

[OSU](#)

[PASTA](#)

[Kepler-131 \(03:21-04:17\)](#)

[Kepler-130 \(04:17-05:16\)](#)

[Monitor](#)

[N6946 \(05:38-07:25\)](#)

[N672 \(07:25-08:23\)](#)

[N628 \(08:23-09:35\)](#)

[N925\(09:35-09:55\)](#)

[N2403 \(09:55-10:35\)](#)

[N925 \(10:35-11:25\)](#)

[BHBinaries](#)

[2MASS J02374515+0002377 \(11:59-12:17\)](#)

PEPSI Log:

<https://drive.google.com/file/d/1qUN08jtchDHUF3dqvT7JD3z9tAG8Xvkc/view?usp=sharing>

Issues:

The LBC plot did not update for tonight.

Weather:

A few clouds to start the night, but they retreated shortly into twilight. The rest of the night was clear and calm.

[Temperature at ground *](#)

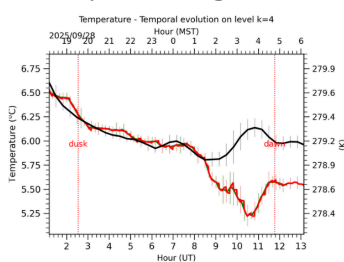


Fig. 4: Absolute temperature temporal evolution between the sunset and the sunrise at [38-62]m.

[Wind Speed at ground *](#)

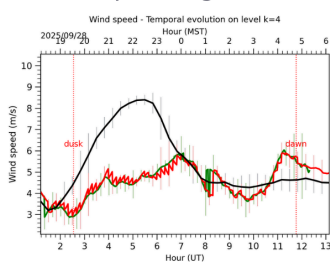


Fig. 5: Wind speed temporal evolution between the sunset and the sunrise at [38-62]m.

[Wind Direction at ground *](#)

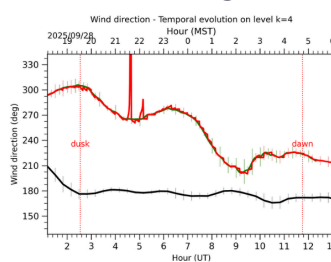
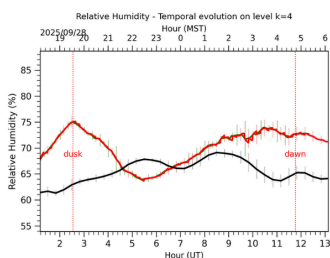
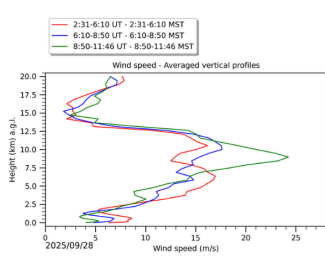


Fig. 6: Wind direction temporal evolution between the sunset and the sunrise at [38-62]m.

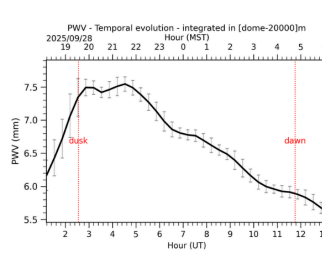
[Relative Humidity at ground *](#)

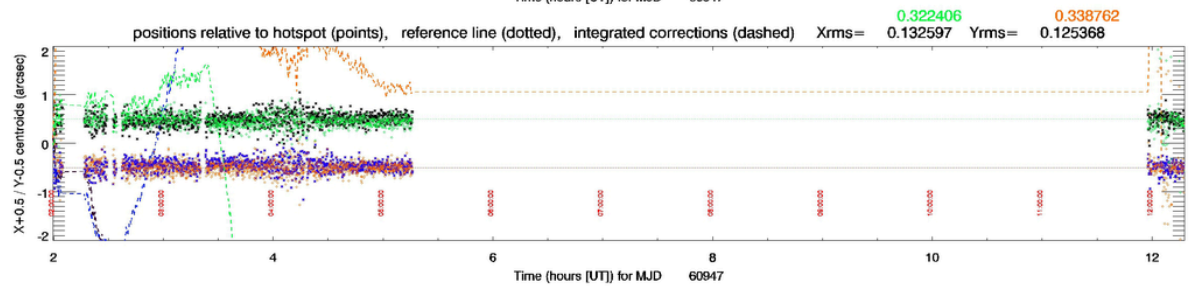
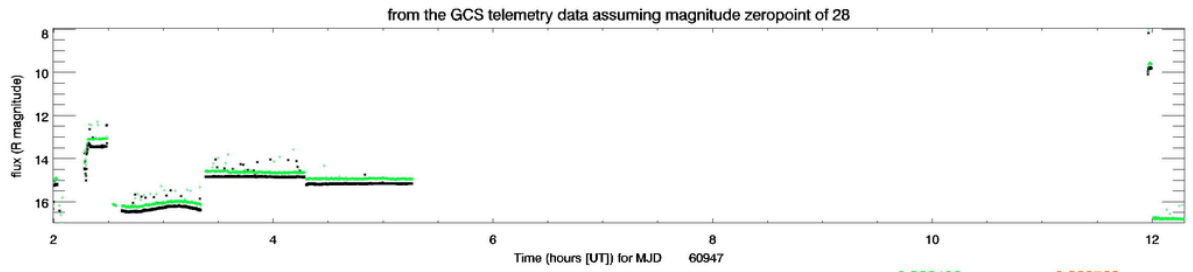
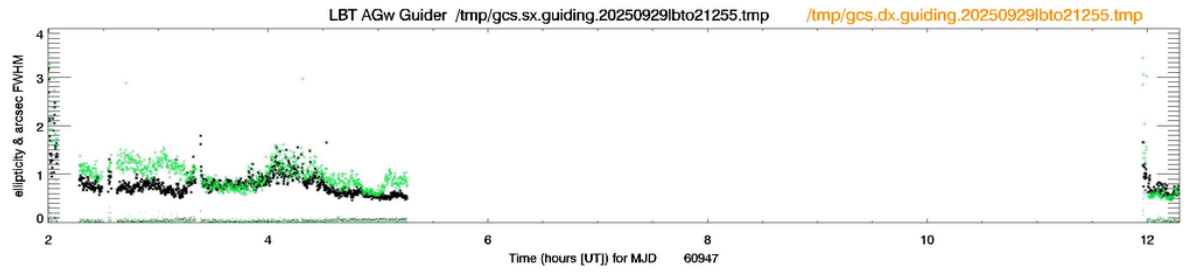
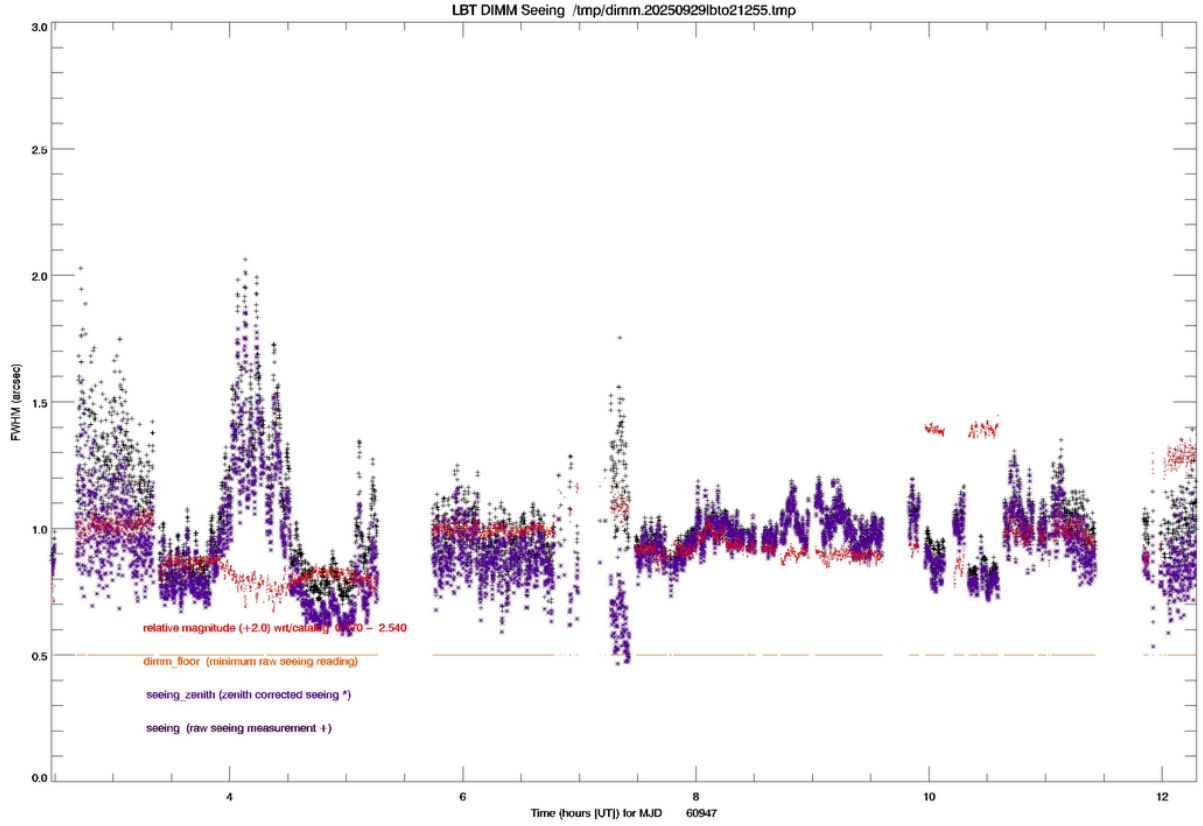


[Wind Speed vertical profiles](#)



[Precipitable Water Vapor](#)





Overview (times are given in UT):

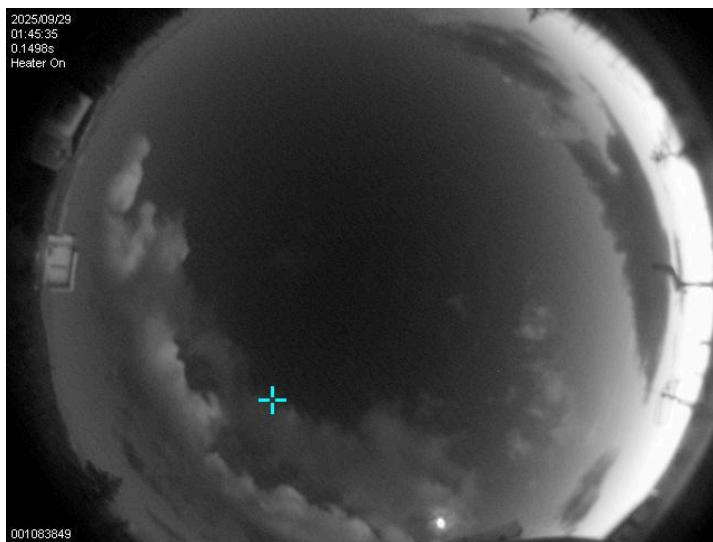
00:45 UT LBCs powered on, LUCI Init all.

01:09 UT Shutters open

01:34 Pointing check.

01:42 UT 70% humidity, some clouds around current area on sky, cyclope monitor ~1" seeing

01:59 Collimation check. Still dealing with some sparse, pesky clouds.



UM

Nova

58 Aql (02:05-02:29)

02:05 Preset. No luck. Still cloudy.

02:16 Resending preset. Hole may be forming where we're trying to point.

02:18 Starting exposure. 1.0" FWHM on guider.

V1405 Cas (02:30-03:20)

02:30 UT Preset sent

02:33 Pointing check.

02:36 Back to target.

02:39 Starting science. Seeing is 0.8" on SX guider, 1.2" on DX guider. 0.81" on Cyclope monitor. Clear skies.

02:59 UT SNR CD2:54 , CD4: 55. The program calls for 125. No clouds, decent seeing (~1") right now

03:21 UT SNR: CD3: 66, CD5:114

OSU

PASTA

Kepler-131 (03:21-04:17)

03:21 Preset.

03:24 Starting science. Seeing is 0.9" on SX guider, 1.0" on DX guider, 0.8" on DIMM. Clear skies.

03:31 UT SNR CD3: 141, CD5:213. Goal is 200 and 250 (this is true for all PASTA targets), respectively. ETC gives 182, 231.

03:42 UT SNR CD2: 141, CD4:217. ETC gives 182, 290.

04:17 SNR CD1: 125, CD6: 427. ETC gives 182, 654.

Kepler-130 (04:17-05:16)

04:17 Preset.

04:18 UT Starting science, Seeing 1.0" SX guider, 1.1" DX guider. 1.0" DIMM. Clear skies.

04:27 UT SNR CD3: 122 , CD5: 146. ETC gives 160, 204.

04:39 UT SNR CD2: 127, CD4: 198. ETC gives 159, 257. Seeing is 0.6" on SX guider, 0.8" on DX guider, 0.7" on DIMM. Clear skies.

05:16 UT SNR CD1: 137, CD6: 388. ETC gives 160, 580. **Reconfig LBCs.**

05:35 Restarting the TMS machine. Took longer than 10 minutes to warm up lasers.

Monitor

N6946 (05:38-07:25)

05:38 Preset to first co-pointing field. Still bringing up the TMS.

05:44 Running dohybrid.

06:00 z22 runaway. Temperature difference between ambient and M1 is ~1.7.

06:03 dohybird - -askme

06:16 Adding +300nm in Z22 on both M1s.

06:19 Adding +1000nm Z11 on both.

06:23 Another +1000nm Z11 on LBCB.

06:24 Running dohybrid - -askme.

| LBC FPIA LOG MONITOR @ LBTO - v4.1 | | | | | | | | | | |
|------------------------------------|---------------------------|-----------|-----------|------------|------------|------------|------------|-------------|--------------------|--------------------------|
| ? | Computed Aberrations (nm) | | | | | | (arcsec) | | blue2025-09-29.Log | |
| | Defoc (Z4) | Ast0 (Z5) | AstV (Z6) | ComaV (Z7) | ComaH (Z8) | Sph1 (Z11) | Sph2 (Z22) | Est. seeing | Est. WIQ | Filename |
| ● | -14404 | --- | --- | --- | --- | --- | --- | 0.91 | 5.68 | lbc.20250929.060020.fits |
| --- | 1050 | 0 | 0 | 0 | 0 | -600 | 0 | --- | --- | dofpia_sph3_adjustment |
| --- | -1050 | 0 | 0 | 0 | 0 | 600 | 0 | --- | --- | dofpia_sph3_adjustment |
| ● | 2044 | 0 | 0 | 169 | -60 | 0 | --- | 0.50 | 0.81 | lbc.20250929.060210.fits |
| ● | 15305 | --- | --- | --- | --- | --- | --- | 0.71 | 6.03 | lbc.20250929.060817.fits |
| --- | 1050 | 0 | 0 | 0 | 0 | -600 | 0 | --- | --- | dofpia_sph3_adjustment |
| --- | -1050 | 0 | 0 | 0 | 0 | 600 | 0 | --- | --- | dofpia_sph3_adjustment |
| ● | -5218 | 0 | 0 | 1061 | -298 | 0 | 0 | 0.50 | 2.12 | lbc.20250929.062543.fits |
| ● | -1147 | 43 | 131 | -883 | 291 | 40 | --- | 0.57 | 0.49 | lbc.20250929.062803.fits |
| ● | -230 | 103 | -16 | -6 | 50 | 73 | --- | 0.66 | 0.42 | lbc.20250929.062958.fits |
| ● | -77 | 70 | -75 | -53 | -1 | 61 | --- | 0.61 | 0.48 | lbc.20250929.063145.fits |
| --- | 547 | 0 | 0 | 0 | 0 | -312 | 0 | --- | --- | dofpia_sph3_adjustment |

| red2025-09-29.Log | | | | | | | | | | |
|-------------------|---------------------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------------|--------------------------|
| ? | Computed Aberrations (nm) | | | | | | (arcsec) | | red2025-09-29.Log | |
| | Defoc (Z4) | Ast0 (Z5) | AstV (Z6) | ComaV (Z7) | ComaH (Z8) | Sph1 (Z11) | Sph2 (Z22) | Est. seeing | Est. WIQ | Filename |
| ● | 11334 | --- | --- | --- | --- | --- | --- | 2.82 | 4.47 | lbc.20250929.055836.fits |
| ● | -10099 | --- | --- | --- | --- | --- | --- | 0.75 | 3.98 | lbc.20250929.060014.fits |
| --- | 875 | 0 | 0 | 0 | 0 | -500 | 0 | --- | --- | dofpia_sph3_adjustment |
| --- | -875 | 0 | 0 | 0 | 0 | 500 | 0 | --- | --- | dofpia_sph3_adjustment |
| ● | 12069 | --- | --- | --- | --- | --- | --- | 0.73 | 4.76 | lbc.20250929.060812.fits |
| --- | 875 | 0 | 0 | 0 | 0 | -500 | 0 | --- | --- | dofpia_sph3_adjustment |
| --- | -875 | 0 | 0 | 0 | 0 | 500 | 0 | --- | --- | dofpia_sph3_adjustment |
| ● | -3138 | 0 | 0 | 386 | -1046 | 0 | 0 | 0.50 | 1.34 | lbc.20250929.062538.fits |
| ● | -328 | -306 | -118 | -318 | 863 | 289 | --- | 0.67 | 0.43 | lbc.20250929.062758.fits |
| ● | -876 | 48 | 136 | -285 | 382 | 99 | --- | 0.53 | 0.49 | lbc.20250929.062952.fits |
| ● | -246 | 33 | -127 | 182 | 84 | 68 | --- | 0.51 | 0.65 | lbc.20250929.063139.fits |
| --- | 444 | 0 | 0 | 0 | 0 | -254 | 0 | --- | --- | dofpia_sph3_adjustment |

06:35 Slewing to co-pointing field.

06:40 lbcrangebal. It's not finding the images in new data, though they are there. Killing IRAF and trying again.

06:45 archive path was input incorrectly. Running lbcrangebal once more.

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-----
COPOINTING: B=63917 R=63912
Pointing updates: delta_IE = 23.99", delta_CA = 10.20"
Mirror updates:  dX(mm)  dY(mm)  dRX(")  dRY(")
                SX:    1.00    0.25    5.27   -21.51
                DX:   -0.95   -0.24   -5.07    20.33
-----

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06:48 Slewing to target.

06:49 Starting science. Seeing is 1.0" on DIMM. Clear skies.

06:58 UT 0.85" FWHM blue(B), 0.7" FWHM red(R).

07:08 UT 0.9" FWHM blue (Uspec), 0.8" FWHM red (R). 0.78" cyclope

07:21 UT 1.1" FWHM blue 0.8" FWHM red. Blue starting to struggle, we'll recollimate after this target

N672 (07:25-08:23)

07:25 UT Slewing to co-pointing field

07:28 UT dofpia

07:33 UT re-sent co-pointing OB before TMS reference taken. D'oh.

| | | | | | | | | | | |
|-----|-------|-----|------|------|-----|------|-----|------|------|--------------------------|
| --- | -1050 | 0 | 0 | 0 | 0 | 600 | 0 | ---- | ---- | dofpia_sph3_adjustment |
| ● | 286 | 24 | 107 | -51 | 81 | -87 | --- | 0.61 | 0.45 | lbc.20250929.073609.fits |
| ● | 7 | 85 | 38 | 20 | 55 | -37 | --- | 0.63 | 0.41 | lbc.20250929.073752.fits |
| --- | 559 | 0 | 0 | 0 | 0 | -319 | 0 | ---- | ---- | dofpia_sph3_adjustment |
| --- | -875 | 0 | 0 | 0 | 0 | 500 | 0 | ---- | ---- | dofpia_sph3_adjustment |
| ● | 147 | 66 | -102 | 228 | -1 | -112 | --- | 0.42 | 0.63 | lbc.20250929.073602.fits |
| ● | 82 | 145 | 185 | -135 | 177 | 1 | --- | 0.48 | 0.58 | lbc.20250929.073748.fits |
| --- | 423 | 0 | 0 | 0 | 0 | -242 | 0 | ---- | ---- | dofpia_sph3_adjustment |

07:39 UT co-pointing

lbcrangebal:

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-----  
COPOINTING: B=74205 R=74159  
Pointing updates: delta_IE = 6.30", delta_CA = -11.57"  
Mirror updates:  dX(mm)  dY(mm)  dRX(")  dRY(")  
SX:  -0.08  -0.15  -3.24  1.74  
DX:   0.19   0.11   2.36  -4.00  
-----
```

07:47 UT Science exposures started. Clear skies.

07:54 UT 0.60" FWHM blue, 0.5" FWHM red, DIMM 0.94", 0.6" Cyclope monitor

08:06 UT Uspec 0.8" FWHM blue, 0.6" FWHM red. DIMM 1.01, 0.78" Cyclope

08:18 UT V 0.8" FWHM blue, 0.65" FWHM red. DIMM 1.03, 0.77" Cyclope.

N628 (08:23-09:35)

08:23 UT preset to co-pointing field

08:27 UT copointing

lbcrangebal:

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-----  
COPOINTING: B=82748 R=82744  
Pointing updates: delta_IE = -2.15", delta_CA = -5.92"  
Mirror updates:  dX(mm)  dY(mm)  dRX(")  dRY(")  
SX:   -0.10   -0.06   -1.26   2.07  
DX:    0.13    0.04    0.94   -2.78  
-----
```

08:31 UT Science exposures started.

08:38 UT 1" blue, elongation 0.8" FWHM red. Looks like we need to recollimate. Killing OB, slewing to collimation field.

08:43 UT dof pia

| | | | | | | | | | | |
|-----|-------|------|------|------|------|------|-----|------|------|--------------------------|
| --- | -1050 | 0 | 0 | 0 | 0 | 600 | 0 | ---- | ---- | dof pia_sph3_adjustment |
| ● | -79 | -124 | 131 | -213 | -338 | -244 | -10 | 0.70 | 0.26 | lbc.20250929.084442.fits |
| ● | 443 | 145 | 58 | 94 | 49 | -165 | -16 | 0.71 | 0.23 | lbc.20250929.084614.fits |
| ● | 319 | 54 | 71 | -59 | -35 | -170 | -19 | 0.68 | 0.19 | lbc.20250929.084741.fits |
| --- | 590 | 0 | 0 | 0 | 0 | -337 | 0 | ---- | ---- | dof pia_sph3_adjustment |
| --- | -875 | 0 | 0 | 0 | 0 | 500 | 0 | ---- | ---- | dof pia_sph3_adjustment |
| ● | 1488 | -108 | -190 | 89 | 234 | -76 | -53 | 0.53 | 0.61 | lbc.20250929.084436.fits |
| ● | 570 | -12 | -177 | -166 | 2 | -208 | -30 | 0.55 | 0.29 | lbc.20250929.084609.fits |
| ● | 233 | -39 | -75 | -7 | -123 | -135 | -11 | 0.50 | 0.16 | lbc.20250929.084736.fits |
| --- | 436 | 0 | 0 | 0 | 0 | -249 | 0 | ---- | ---- | dof pia_sph3_adjustment |

08:51 UT copointing

lbcrangebal:

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-----  
COPOINTING: B=85342 R=85338  
Pointing updates: delta_IE = -3.03", delta_CA = 0.83"  
Mirror updates:  dX(mm)  dY(mm)  dRX(")  dRY(")  
SX:   -0.03   -0.05   -1.02   0.56  
DX:    0.16    0.01    0.28   -3.53  
-----
```

08:58 UT Slewing back to science target

08:59 UT Taking science images

09:05 UT 1.0" FWHM blue, 1.0" FWHM red, 1.0" DIMM

09:24 UT 0.9" FWHM blue, 0.7" FWHM red, 1.0" DIMM. Slight elongation in blue previously, improved in this exposure.

09:30 UT 0.7" FWHM blue, 0.65" FWHM red. No more elongation in blue.

N925(09:35-09:55)

09:35 UT preset to copointing field

09:38 UT dof pia

09:42 UT SX hit collimation limit. Cleared active optics. Restarted fia

09:49 UT SX hit collimation limit again...

| | | | | | | | | | | |
|-----|-------|------|------|------|------|-------|------|------|------|---------------------------|
| --- | -1050 | 0 | 0 | 0 | 0 | 600 | 0 | ---- | ---- | dofpia_sph3_adjustment |
| ● | -5773 | -125 | -500 | 411 | -52 | -1000 | -100 | 0.92 | 2.37 | lbcf.20250929.094327.fits |
| ● | 1185 | 198 | -285 | 227 | -4 | -1000 | -100 | 1.65 | 0.80 | lbcf.20250929.094507.fits |
| ● | -2076 | 239 | -14 | 1395 | 422 | -1000 | -100 | 1.38 | 1.23 | lbcf.20250929.094648.fits |
| ● | -2220 | -411 | 265 | -213 | -168 | -41 | -88 | 0.74 | 0.90 | lbcf.20250929.094834.fits |
| --- | 628 | 0 | 0 | 0 | 0 | -359 | 0 | ---- | ---- | dofpia_sph3_adjustment |
| --- | -875 | 0 | 0 | 0 | 0 | 500 | 0 | ---- | ---- | dofpia_sph3_adjustment |
| ● | 443 | -66 | 151 | 11 | -110 | -150 | 8 | 0.60 | 0.22 | lbcf.20250929.094324.fits |
| ● | 873 | 138 | 83 | 156 | -37 | -356 | -3 | 0.60 | 0.43 | lbcf.20250929.094459.fits |
| ● | -129 | -6 | 78 | -216 | 224 | -186 | 6 | 0.55 | 0.21 | lbcf.20250929.094640.fits |
| ● | -345 | -10 | 102 | 110 | 59 | -86 | -5 | 0.54 | 0.18 | lbcf.20250929.094826.fits |
| --- | 462 | 0 | 0 | 0 | 0 | -264 | 0 | ---- | ---- | dofpia_sph3_adjustment |

N2403 (09:55-10:35)

09:55 UT Moving to N2403 instead, we'll come back to 925 when it's not right at zenith and see if that gives us more play in the mirrors.

10:08 UT 2403 was too low for collimation. Slewed to random field at higher elevation for collimation. OB collimation_test

| | | | | | | | | | | |
|-----|--------|------|------|------|-----|------|-----|------|------|---------------------------|
| --- | -1050 | 0 | 0 | 0 | 0 | 600 | 0 | ---- | ---- | dofpia_sph3_adjustment |
| ● | -10939 | --- | --- | --- | --- | --- | --- | 0.37 | 4.31 | lbcf.20250929.101001.fits |
| ● | -4069 | 184 | -470 | 326 | 92 | --- | --- | 2.01 | 1.62 | lbcf.20250929.101139.fits |
| ● | -636 | 29 | -220 | 453 | -92 | --- | --- | 1.80 | 0.34 | lbcf.20250929.101318.fits |
| ● | -461 | -198 | 324 | 391 | 129 | --- | --- | 1.72 | 0.29 | lbcf.20250929.101457.fits |
| --- | 1050 | 0 | 0 | 0 | 0 | -600 | 0 | ---- | ---- | dofpia_sph3_adjustment |
| --- | -875 | 0 | 0 | 0 | 0 | 500 | 0 | ---- | ---- | dofpia_sph3_adjustment |
| ● | 773 | -104 | 19 | 114 | 106 | -133 | -13 | 0.57 | 0.33 | lbcf.20250929.100958.fits |
| ● | -207 | -89 | 29 | -227 | 1 | -9 | -15 | 0.52 | 0.15 | lbcf.20250929.101133.fits |
| ● | 138 | -82 | -41 | 179 | -58 | -33 | -10 | 0.49 | 0.13 | lbcf.20250929.101312.fits |
| ● | 257 | -42 | -63 | -106 | 30 | -56 | -11 | 0.52 | 0.14 | lbcf.20250929.101448.fits |
| --- | 449 | 0 | 0 | 0 | 0 | -256 | 0 | ---- | ---- | dofpia_sph3_adjustment |

10:16 UT TMS reference taken. Loop started.

10:18 UT Slewing to copointing field.

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-----
COPOINTING: B=102110 R=102106
Pointing updates: delta_IE = -4.19", delta_CA = 10.85"
Mirror updates:   dX(mm)  dY(mm)  dRX(")  dRY(")
                  SX:    -0.24   -0.33   -7.07   5.20
                  DX:     0.28    0.35    7.41   -5.93
-----
```

10:24 UT Slewing to science field

10:26 UT Starting science exposures

10:30 UT 1.6" FWHM blue, 0.85" FWHM red.

10:33 UT 1.5" FWHM blue in Uspec. 0.8" FWHM red. Collimation in blue clearly still a struggle.

N925 (10:35-11:25)

10:35 UT Heading back to N925 now that it's away from zenith. Preset to copointing field

10:38 UT dof pia

| | | | | | | | | | | |
|-----|-------|------|------|------|------|-------|------|------|------|----------------------------|
| --- | -1050 | 0 | 0 | 0 | 0 | 600 | 0 | ---- | ---- | dof pia sph3 adjustment |
| ● | 7884 | --- | --- | --- | --- | --- | --- | 1.60 | 3.11 | lbc b.20250929.104046.fits |
| ● | 2193 | -227 | -18 | -39 | -216 | -1000 | -100 | 1.57 | 1.08 | lbc b.20250929.104255.fits |
| ● | -2568 | -76 | 74 | 184 | -156 | -1000 | -100 | 1.33 | 1.20 | lbc b.20250929.104438.fits |
| ● | -1197 | 54 | 105 | 539 | 55 | -761 | -100 | 0.66 | 0.72 | lbc b.20250929.104623.fits |
| ● | -1167 | 104 | -3 | -12 | 107 | 93 | -100 | 0.77 | 0.47 | lbc b.20250929.104803.fits |
| ● | 402 | 32 | 54 | -27 | -2 | -122 | -88 | 0.69 | 0.19 | lbc b.20250929.104944.fits |
| ● | -156 | -72 | -23 | 26 | 19 | 58 | -45 | 0.59 | 0.11 | lbc b.20250929.105122.fits |
| --- | 533 | 0 | 0 | 0 | 0 | -304 | 0 | ---- | ---- | dof pia sph3 adjustment |
| --- | -875 | 0 | 0 | 0 | 0 | 500 | 0 | ---- | ---- | dof pia sph3 adjustment |
| ● | -92 | 19 | 103 | 133 | 21 | -83 | 7 | 0.60 | 0.12 | lbc r.20250929.104007.fits |
| ● | 13 | 12 | 79 | -87 | 36 | -81 | 9 | 0.51 | 0.11 | lbc r.20250929.104251.fits |
| ● | -31 | -3 | 180 | 190 | -10 | -83 | -12 | 0.51 | 0.14 | lbc r.20250929.104427.fits |
| ● | 333 | -158 | -89 | -182 | 25 | -161 | -13 | 0.52 | 0.21 | lbc r.20250929.104615.fits |
| ● | -246 | -103 | 210 | 180 | -28 | 15 | 0 | 0.55 | 0.16 | lbc r.20250929.104754.fits |
| ● | -75 | 107 | -179 | -50 | -8 | -52 | -6 | 0.49 | 0.11 | lbc r.20250929.104934.fits |
| ● | 248 | 114 | -128 | -147 | -79 | -103 | -12 | 0.45 | 0.17 | lbc r.20250929.105114.fits |
| --- | 409 | 0 | 0 | 0 | 0 | -233 | 0 | ---- | ---- | dof pia sph3 adjustment |

10:54 UT copointing

lbc range bal:

```

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COPOINTING: B=105710 R=105717
Pointing updates: delta_IE = 4.96", delta_CA = -12.63"
Mirror updates:  dX(mm)  dY(mm)  dRX(")  dRY(")
SX:             0.26    0.40    8.67    -5.64
DX:             -0.22   -0.42   -9.07    4.77
-----

```

11:00 UT Slewing to science field

11:01 UT Starting science exposures.

11:11 UT 0.8" FWHM blue, 1.05" red, DIMM 0.95" seeing.

11:21 UT 0.8" FWHM blue, 1" red

11:25 Reconfigure to PEPSI PFU.

11:46 Pointing check.

11:52 Second pointing check.

11:57 Collimation check.

BHBinaries

2MASS J02374515+0002377 (11:59-12:17)

11:59 UT Preset sent

12:02 UT Exposure started

12:06 UT DX star drove off fiber. Nudged it back. There's a bright object nearby.

12:10 UT Starting another exposure, star spent majority of time off fiber

12:12 UT SNR CD3: 51, CD5:63 for first exposures.

12:17 SNR CD3: 51, CD5:64 for second exposures. Closing up.

12:21 Running PEPSI cals.

12:33 UT Running LBC biases.