

Palomar LGSAO Engineering Summary 08/24/07 UT

Afternoon:

- Laser 8.0W, dropping slowly.
- LLT aligned to stimulus laser; BTO alignment remaining.
- AO system GO, but with noticeable vignetting due to OAR.
- Safety systems GO

Night log:

1930 Opening dome for NGS checkout flats.
1945 Closing dome for laser alignment to BTO.
2000 Opening again for AO checkout
SAO 065965: closed-loop Strehl ~70%,
open-TT FWHM = 0.30" (V seeing 0.60")
2028 Estimating primary mirror aberrations
White-light flatmap, TT closed: ph0007 (bkg=ph0008)
2040 Laser power 7.8 W, mode quality much improved. Closing dome
to perform laser alignment to BTO.
2105 BTO save of DEFAULT file not functional. 589 laser
positions:
m1x 2148
m1y -988
m2x 6453
m2y 6102
m3x 7701
m3y 1756
2108 Sending spotters out and preparing to project at zenith.
2125 Projecting laser at zenith. Boresighting good (20" S).
2s background: bkg1187929505.
Optimizing llt_focus:
llt_focus FWHM(pix) Peak
11820 19x13
11850 18x16
11820 19x14
11790 21x14
11820 18x14 60
acq_z
10274 18x14 56
10374 17x15 54
10474 17x14 50
11574 17x15 45
10674 17x16 50
10274 17x13 65
10174 18x13 60
10274 17x13 58
laser_focus
14000 17x13 58
15000 15x13 75
16000 15x13 76
Final FWHM = 2.4"

Final images: acq1187930470, 0492
Laser power 7.4 W, HOWFS counts 100 cts @ 150 Hz.
Disappointing...

2154 Beginning LLT image quality test...
Acquiring Vega... Images nearly saturated at 120mm telephoto focal length.
Acquiring Deneb (V=1.2). Levels better for in-focus images. Very interesting results. Image quality is a very strong function of field position (5" shift from field center causes noticeable aberrations). Best LLT images have FWHM=1.9" with RG610 filter, 2.9" without. Seeing extremely stable throughout experiment (probably 0.5-0.6" in V).

2300 Laser photometry (return vs. polarization).
Optimized BTO polarization:
Laser_pol=114 minimized counts on Q2 = 750 cts
Laser power: Bench=7.7W, LLT focus=5.0W, Bench=7.8W
Acquisition cam images (no filter, all 1187940000+):

bkg	1870, 2184, 2452, 3079
242 (-circ)	2112, 2130 ?
287 (lin)	2326, 2342 57
332 (+circ)	2480, 2490 122
242 (-circ)	2584, 2596 110
287 (lin)	2670, 2684 75
332 (+circ)	2758, 2774 100
242	3027, 3039 120
252	3093, 3151 100
262	3203, 3217 90
272	3271, 3281 86
282	3341, 3355 70
292	3409, 3425 70
302	3487, 3501 80
312	3571, 3585 130
322	3649, 3663 135
332	3739, 3753 120
322	3846, 3854 125
322	3972, 3990, 4006, 4014, 4032

Installed V filter

bkg	4350, 4580
322	4484, 4502, 4516, 4534, 4550

0200 Photometric calibrators (with V filter):
Landolt PG2336+004A (V=11.28)
5863, 5879, 5905, 6080, 6096, 6110
Landolt 115 420 (V=11.16)
6184, 6200, 6214, 6252, 6266, 6278

0215 Starting LOWFS performance test.
0220 Target 1: TYC 2285-1243-1 (V=11.19)
2245 Having trouble with chopper... adjusted chopper delay to 55000 us.
HOWFS: 220 cts @ 100 Hz. LOWFS: 600 cts @ 1000 Hz. co_default4
frame integ

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Palomar Adaptive Optics

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    9-11      1.8s      background
    12-31     1.8s      star.  Strehl ~30%
HOWFS: 150 cts @ 150 Hz.  LOWFS: 600 cts @ 1000 Hz.
    47-66     1.8s      star.  Strehl ~20%
HOWFS: 220 cts @ 100 Hz.  LOWFS: 600 cts @ 1000 Hz.
    67-86     1.8s      star.  Strehl ~20%
co_zero:
    87-86     1.8s      star.  Strehl ~20%
0341 Attempting to take a flatmap on the laser...
0344 Moving to 1235-001489 (V=15)
HOWFS: 160 cts @ 100 Hz.  LOWFS: 120 cts @ 100 Hz.

    127-129   20s      background
    130-139   20s      star.  Strehl ~5%, FWHM=~0.3"
Still cannot explain large flux variations on HOWFS.
0445 Moving to NGS 891 for fun imaging.
0518 Shuttering for FAA compliance.
0520 Calling night.  Laser power 7.3 W.
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