

Caltech Optical Observatories / NASA Jet Propulsion Laboratory  
Palomar Adaptive Optics

Palomar LGSAO Engineering Summary 07/12/06 UT

Daytime results:

1. LLT FSM coordinates: llt\_a + = South, llt\_b + = West
2. Best LLT FSM position: (-12.0, +4.0)
3. Chopper background <2 photocounts/subap. at 100Hz.

Night log:

1950 RD and HP aligning laser to LLT, installing pulnix.  
2030 Opening dome, rebooting AO.  
2030 CS and JH finishing white light source replacement.  
2108 Moving to Altair for LLT boresighting.  
2130 Found the star ~5'W, ~5'E from telescope boresight. Steered it in by tilting LLT.  
2140 Best focus in narrow field mode: 12840. Lowering spider assembly to increase useful focus range.  
2200 Moving to SAO 65890, V3.4 K star. Found it 45"W, 25"S.  
2200 Focus run: star1\_sky  
    ao\_focus\_loop, 11589-50, 50, 3, 'llt', 'star1\_1', 'star1\_sky'. Best focus = 11586.  
2220 Translated secondary N 0.25 turns. FWHM=1.34  
    N 0.25 turns: FWHM = 1.18"  
    N 0.25 turns: FWHM = 1.24", focus = 11595  
    S 0.125 turns, E 0.25 turns: FWHM = 1.32, focus = 11600  
2235 Adjusted 200" focus to 57.35mm from 56.89mm  
2240 W 0.25 turns: FWHM = 1.67". Seeing may be variable.  
2250 E 0.124 turns: Final image quality: star1\_10, FWHM=1.22  
2255 Trouble with AO offloads to 200" focus. Rebooting TCS.  
2300 Checking seeing with PHARO. FWHM=0.50" at BrG. Closed-loop images are ~55% Strehl.  
2115 Checked repeatability of boresighting. Appeared good after ~1hr move to East.  
2320 Checking red laser alignment to LLT. Some realignment needed. New LLT FSM position: (-12.0, 11.0).  
2330 Aligning yellow laser to red in Coude lab.  
2345 Laser incident...  
0005 Laser is fixed. Co-aligned in Coude lab.  
0015 Opening to project laser.  
0035 Projecting laser at zenith. Came in 30" from oasis.  
0040 Manually focusing Acq. Manually focusing LLT.  
0046 Shuttered for a passing helicopter.  
0051 Focus run: laser1\_sky  
    Acq, 5 steps of 150: Best=11920, FWHM=17.4  
    LLT, 5 steps of 50: Best=11300, FWHM=18.6  
    Acq, 5 steps of 300: Best=11950, FWHM=18.6  
0107 Scanning over laser f  
    Position Frame Photometry (5s integ)  
    (Position units are 0.001")  
    0 laser4\_0 16x76  
    2 laser4\_2 19.6x39

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4	laser4_4	14.3x15.5
6	laser4_6	0
0	laser4_0b	17.0x64
-2	laser4_-2	17.0x30
-4	laser4_-4	26x7
-6	laser4_-6	0
-1	laser4_-1	15.7x63
0	laser4_0c	16.0x68
1	laser4_1	15.6x75
2	laser4_2	-

Optimal setting: +0.5

Power: 6.2W

0142 Moving to Landolt 111-775 (V=10.74) for photometric calibration. landolt111775\_1, \_2 dithered (5s integ.)

0154 Back to zenith to adjust laser focus lens.

6000	83
8000	59
10000	40
4000	79
2000	80
0	84

0210 Acquiring LGS on HOWFS.

0218 Taking laser\_off\_100hz  
Taking laser\_detuned\_100hz

0224 Closing UTT loop.

int_gain	llt_a_sig	llt_b_sig	
0.1	.060	.070	
0.2	.057	.055	
0.4	.058	.072	
0.8	.051	.055	
0	.063	.071	not doing much.
1.6	.075	.071	

Not clear whether the UTT loop gains are having any effect.

0245 Starting HOWFS chopper testing.

Identified optimal delay time = 32000

Gate time = 3998

Raleigh

0325 Pause to realign Na and red lasers.

0410 Back on sky, working on HOWFS chopper test.

0435 Tested various background methods.