Palomar LGSAO Engineering Summary 07/13/06 UT

Daytime results:
1. 660nm diode laser image quality at PF: 0.77".

Night log:
2105 FWHM of 660nm is 7.5 pix = 20". Saved saturated image: red_eve3_saturated
2118 With Na filter: FWHM = 8.5 pix = 22.8". Saved red_eve4.
2125 Aligning 589 and 660nm lasers.
2142 Ready to propagate in dome for BTO wavefront quality test.
2200 Measuring Propagating in dome. 2-3 Watts, with occasional 5 W, measured before topmost mirror mounted to LLT
2245 Measuring transmission of BTO: ~62% transmision to just before top fold mirro of LLT

Coude	PF
2.6-4.5	2-3, occasional 5
6.5-7.0	3.0-4.2, 3.7 avg.

2320 Attempting to focus laser. Started far out of focus, several moves of the lens later...
2430 Measured image quality on Na laser at moderate power (~3W?): FWHM = 7.6 pixels = 20.5"
2450 Power: 3.5W coming into PF cage, 2.5W getting to LLT 2ndary
2452 Adjusting focus: Now moved ~1.5cm to negative from start.
0108 Finally found focus at 4000cts.
0115 Bringing Team Prime back to earth, opening dome, sending spotters out.
0122 Moving to a bright star to focus the telescope. Focus=57.14
0130 Taking flatmap.
0136 60s tt-only image: ph0000.fits. FWHM=0.48"
0220 Propagating, power=6.7W
0224 Detune and take sky - laser1_sky.fits
0225 LLT focus loop - laser_focus1, 5 steps
0226 Detune again and take sky - laser1_sky and try focus loop again
Best focus 11320 FWHM=16.2pix (2.6")
0230 Moved LLT focus to 11320
0230 ACQ cam focus loop - laser_focus2, 5 steps
Best focus? - not a large enough range?
0232 Acq cam focus loop - laser_focus3, 5 steps
0235 Beam blocked
0236 Propagating, trying focus loop again
Best focus = 11600, FWHM = 18pix (2.9")
0237 LLT focus loop - laser_focus4
Best focus = 11320, FWHM = 16pix
3.2" 108 peak counts
0240 Tuning laser wavelength

Gauge	Peak Cts
	10.5
	46

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      -20  46
      -10  76
      0    110
      10   95
      20   89
      30   58
      40   36
      Background ~32
      Tuning laser to 5 units.  Peak counts = 109
0247  Saved laser_tuned1, laser_tuned2, then detuned and took -
laser_detuned.  Finally took laser_tuned3
0250 Going to Landolt 112275 V=9.91.  Saved landolt_sky.
0255 Acq cam focus loop - landolt_focus
      Best focus = 14275 FWHM = 11pix (1.62")
0300 Saving landolt_1, then offset and save landolt_2
      FWHM=11.1pix
0303 Save ph0001.fits 20sec integration to get seeing
      FWHM (28,35) -> 32pix = 0.8 in K ( = 1.10" in V).
0308 Moving to target 23: 2724-1419-1
0312 Testing laser propagation.  Worked with no problem.
0320 Acquiring V=10 star, laser with chopper.
      Running WFS at 50Hz.
0340 Closed UTT loop.  Noticed that Raleigh flickering.  Started
     with delay=32000.  Lots of flickering.  ~80 count @ 100 Hz.
0352 Starting full-frame data logging at 1152787843
      Delay=36000, Gate=3998.
      ended at 7965
0355 Chopper off: 8071 to 8134.
0357 Chopper on, UTT off: 8168 to 8240
0358 Chopper on, UTT on: 8266 to 8347
0401 Chopper on, UTT off, delay=32000: 8459 to 8543
0404 Closed DM loop - performance poor.
0410 Reaquiring without chopper.
0425 Acquiring Uranus to test AO performance on extended objects.
0425 Trouble-shooting apparent pupil misalignment.
0438 Found to be just operator error in acquisition.
0440 Locking on Uranus with chopper on, 200 Hz = 200 cts
      1. Weird crescent moon DM pattern is still there.
      2. 30% fluctuations of subap flux clearly seen.
      DM reg. looked OK.
      Offloading focus to tel... 57.37 -> 49.51
      FWHM of triton ~1.0".  Very poor.
0452 Moving to SAO 1464498 to diagnose problems.
0455 Identified possible culprit: Reappearance of new AO build
problem.  Running Tuan's debugging script.
0510 Calling night.
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