

Palomar Adaptive Optics Test Plan

Title	LGS Acquisition and characterization
Date	7/12/06
Lead	A. Bouchez, M. Troy
Time requested	1 hr
Required conditions	Clear enough to project laser.

Purpose

Acquire LGS, focus LLT, determine LGS magnitude and spot size,

Test procedure

1. Setup
 - 1.1. Telescope at zenith, at best NGS focus.
 - 1.2. Acquisition camera filter installed.
 - 1.3. Move LLT mirror to a its default position (determined during LLT alignment)
 - 1.4. Load best available flatmap.
 - 1.5. Focus acquisition camera to 90 km altitude:
move acq_z 11950 (for NGS focus = 14500)
 - 1.6. Focus LLT to 90 km altitude:
bto_control "move llt_focus 11300" (for NGS focus = 11600)
 - 1.7. Check that laser focus is set to optimal position (4000 on 7/12/06):
bto_control "move laser_focus 4000"
 - 1.8. Setup acquisition camera:
 - 1.8.1. Start up IDL program acqview
 - 1.8.2. Set integration time to 2s.
 - 1.8.3. In the correct experiment directory: IDL> ao_plot_vid_image
2. Perform final safety checks and fire laser.
3. Acquire LGS
 - 3.1. If LGS is not in Acq FOV, use ellipticity of dichroic spots (apex points to LGS) and Raleigh gradient (brighter towards LGS) to steer it in:
offset llt_a +X= down; offset llt_b +X= right.
 - 3.2. Move LGS onto HOWFS by clicking on "center LGS".
 - 3.3. Move LGS to clear region of Acq field: offset llt_b + 30
4. Focus on Na layer
 - 4.1. Roughly focus laser spot:
bto_control "move llt_focus ..." in steps of 50
move acq_z ... in steps of 300
 - 4.2. Detune laser, save a 5s background image.
 - 4.3. Focus Acq
IDL> ao_focus_loop, current-600, 300, 5, 'acq', 'save_name',
'sky_name', time=6.0
IDL> ao_read_focus, data,file='save_name'
AO> move acq_z best_focus
 - 4.4. Focus LLT
IDL> ao_focus_loop, current-100, 50, 5, 'llt', 'save_name',

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`sky_name', time=6.0  
IDL> ao_read_focus, data,file='save_name'  
AO> bto_control "move llt_focus XXX"
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- 4.5. Repeat steps 3.2 and 3.3 again if necessary
5. Tune center wavelength
 - 5.1. Save a 5s background image.
 - 5.2. Scan over wavelength, recording peak counts.
 - 5.3. Adjust to peak return.
6. Record photometry
 - 6.1. Record and save a final set of detuned and tuned 5s Acq images for measuring photometry and spot size.
 - 6.2. Image photometric calibrator
 - 6.2.1. Go to photometric standard NGS, Landolt $\sim m_V=11.0$
 - 6.2.2. Move acq_z to NGS focus
 - 6.2.3. Move star to approximate position of LGS
 - 6.2.4. Take two images, with a $\sim 10''$ dither between them

Results and conclusions