Palomar Adaptive Optics Test Plan

Title	LGS Acquisition and characterization
Date	12/1/06
Lead	A. Bouchez,M. Troy
Time requested	1 hr
Required conditions	-

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

Test procedure

1. Setup
   - 1.1. Configure AO to look at sky
   - 1.2. Telescope at zenith, at best NGS focus.
   - 1.3. Acquisition camera filter not installed.
   - 1.4. Move LLT mirror to its default position (determined during LLT alignment) [-11,53]
   - 1.5. Load best available flatmap
   - 1.6. Acq focused at 90 km altitude (NGS focus-2450)
     move acq_z 12300 (for NGS use 14740)
   - 1.7. LLT focused to 90 km altitude (NGS focus - 300).
     bto_control "move llt_focus 11564"
   - 1.8. check/set laser focus to correct value
     bto_control "move laser_focus 9500"
   - 1.9. Setup acquisition camera:
     - 1.9.1. Start up IDL program *acqview*
     - 1.9.2. Set integration time to 2s
     - 1.9.3. In an appropriate experiment directory: IDL> ao_plot_vid_image
2. Perform final safety checks and fire laser
3. Acquire LGS on Acq
   - 3.1. If LGS is not in the 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=left
   - 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. Rough focus laser spot:
     bto_control "offset llt_focus …" in steps of 100
     move acq_z … in steps of 300
   - 4.2. Detune laser, take and save a 5s background image.
   - 4.3. Focus Acq
     - *4.3.1. ao_focus_loop, current-600, 300, 5, 'acq', 'save_name', 'sky_name', time=6.0*
     - *4.3.2. ao_read_focus, data,file='save_name'*
     - *4.3.3. move acq_z best_focus*
   - 4.4. Focus LLT

4.4.1. ao_focus_loop, current-100, 50, 5, 'llt', 'save_name', 'sky_name', time=6.0
4.4.2. ao_read_focus, data,file='save_name'
4.4.3. bto_control "move llt_focus XXX"
4.5. Repeat steps 4.3 and 4.4 again if necessary
5. Tune center wavelength
5.1. This depends….
6. Take photometry
6.1. Install V filter in Acq. camera
6.2. Record and save a final set of detuned and tuned 5s Acq images for measuring photometry and spot size.
6.3. Image photometric calibrator
6.3.1. Go to photometric standard NGS, Landolt ~mV=11.0
6.3.2. Move acq_z to NGS focus
6.3.3. Move star to approximate position of LGS
6.3.4. Take two images, with a ~10" dither between them

Results and conclusions