

Palomar Adaptive Optics Test Plan

Title	LGS Target Acquisition
Version	3.5
Date released	4/25/2007
Lead	A. Bouchez
Time requested	30 min.
Required conditions	N/A

Purpose

Acquire science target, lock all loops and hand over system to observer.

Test procedure

1. Tune up AO system on a nearby bright NGS.
 - 1.1. Slew telescope to a V=7 star near the LGS target.
 - 1.2. Rotate the Cass ring if needed
 - 1.3. Setup AO system for NGS.
 - 1.3.1. Set HOWFS rate to 500 Hz
 - 1.3.2. Set TAO mode to NGS.
 - 1.3.3. load cent_offsets=aocp:/tables/default/co_zero
 - 1.3.4. Move LGS_X to NGS position.
 - 1.3.5. Move WFS_Z to NGS position.
 - 1.3.6. Move ACQ_Z to NGS position.
 - 1.3.7. Verify that focus offload is enabled.
 - 1.3.8. Set Acq to video (installs fold mirror).
 - 1.3.9. Stop chopper if running.
 - 1.4. Acquire star on the HOWFS, framerate 500Hz.
 - 1.5. Take a HOWFS sky (offset telescope 60")
 - 1.6. Close TT loop.
 - 1.7. Align SSMs.
 - 1.7.1. Have observer center the star at the desired location on PHARO in the platescale to be used for science. Mark with crosshairs A.
 - 1.7.2. Switch to 40mas platescale and mark star location with crosshairs B.
 - 1.8. Register DM (coarse and fine).
 - 1.9. Close DM loop.
 - 1.10. Make a new telescope flat map and load.
 - 1.11. Save AO config.
 - 1.12. TX telescope.
2. Move to LGS target and center target on PHARO field.
 - 2.1. Offset to coordinates of LGS target.
 - 2.2. Request spotter permission to propagate.
 - 2.3. Center target on PHARO cross-hairs.
 - 2.4. Project laser.
3. Acquire the LGS.
 - 3.1. Setup AO system for LGS.
 - 3.1.1. Set TAO mode to LGS.
 - 3.1.2. Set HOWFS frame rate to 150 Hz (or previous optimized value).
 - 3.1.3. Set llt_integral gain 1.6 (or previous optimized value).

- 3.1.4. Set dm_proportional_gain 0.02
 - 3.1.5. Set dm_integral_gain 0.15
 - 3.1.6. Leave LGS_X in NGS position.
 - 3.1.7. Move WFS_Z to LGS position (90km or best estimate).
 - 3.1.8. Move ACQ_Z to LGS position (best estimate from focus runs).
 - 3.1.9. Verify LLT FSM positions.
 - 3.1.10. Set Acq to integrate 2s.
 - 3.1.11. Start chopper.
 - 3.2. Project laser.
 - 3.3. Center laser on HOWFS reflective spot.
(Offset llt_a +x moves LGS *up*, llt_b +x moves LGS *left*)
 - 3.4. Record centered position of LLT FSM.
4. Close the DM loop on the laser.
 - 4.1. Move LGS_X to LGS position.
 - 4.2. Check UTT reconstructor. Change if necessary
 - 4.3. Take a HOWFS background (offset llt_a 20").
 - 4.4. "Fix logging" on HO AOMONITOR.
 - 4.5. Close UTT loop.
 - 4.6. Verify HOWFS framerate is correct. If necessary:
 - 4.6.1. Open UTT loop.
 - 4.6.2. Change HOWFS framerate.
 - 4.6.3. Take a new HOWFS background (offset llt_a 20").
 - 4.6.4. Return UTT mirror to center and close UTT loop.
 - 4.7. Close DM loop.
5. Acquire the NGS and close TT loop.
 - 5.1. Setup LOWFS
 - 5.1.1. Set ttm_integral_gain 0.80
 - 5.1.2. Set LOWFS framerate to expected value for NGS.
 - 5.1.3. Move ACQ_Z to NGS position.
 - 5.1.4. Set Acq to integration time appropriate for NGS.
 - 5.2. Identify NGS in Acq field and send LOWFS using ACQVIEW button.
 - 5.3. Take a LOWFS background (offset telescope 60").
 - 5.4. "Fix logging" on LO AOMONITOR.
 - 5.5. If LOWFS residuals are >0.2, zero LOWFS centroids.
 - 5.6. Close TTM loop.
 - 5.7. Verify that LOWFS framerate is correct. If necessary:
 - 5.7.1. Open TTM loop.
 - 5.7.2. Change LOWFS framerate.
 - 5.7.3. Take a new LOWFS background (offset telescope 60").
 - 5.7.4. Return telescope to center and close TTM loop.
6. Close focus loop (pulldown on LGSFOC).
 - 6.1. Close focus loop on LGSFOC tool.
 - 6.2. Wait for focus to converge to <0.5 mm.
7. Acquisition is complete!

Results and conclusions