

Palomar Adaptive Optics Test Plan

Title	LGS Target Acquisition
Version	3.3
Date released	4/3/2007
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Time requested	30 min.
Required conditions	N/A

Purpose

Acquire science target, lock all loops and be ready to perform science at this end of this procedure.

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. Setup AO system for NGS.
 - 1.2.1. Set TAO mode to NGS.
 - 1.2.2. Load co_zero centroid offsets.
 - 1.2.3. Move LGS_Z to NGS position.
 - 1.2.4. Move ACQ_Z to NGS position.
 - 1.2.5. Move WFS_Z to NGS position.
 - 1.2.6. Set Acq to video (installs fold mirror).
 - 1.2.7. Stop chopper if running.
 - 1.3. Acquire star on the HOWFS.
 - 1.4. Close TT loop.
 - 1.5. Register DM (coarse and fine).
 - 1.6. Close DM and check that focus offload is allowed.
 - 1.7. Make a new telescope flat map and load.
 - 1.8. Optional: Record a 30 second PHARO exposure with only TT loop closed to measure seeing.
2. Slew telescope to coordinates of LGS target and center target on PHARO field.
 - 2.1. Center target on HOWFS sweet spot.
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. Set Acq to integrate 2s.
 - 3.1.10. 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)

4. Close the DM loop on the laser.
 - 4.1. Move LGS_X to LGS position.
 - 4.2. Take a HOWFS background (offset llt_a 20")
 - 4.3. Close UTT loop.
 - 4.4. Verify HOWFS framerate is correct. If necessary:
 - 4.4.1. Open UTT loop.
 - 4.4.2. Change HOWFS framerate.
 - 4.4.3. Take a new HOWFS background (offset llt_a 20").
 - 4.4.4. Return UTT mirror to center and close UTT loop.
 - 4.5. Close DM loop.
5. Acquire the NGS and close TT loop.
 - 5.1. Setup LOWFS
 - 5.1.1. Set ttm_integral_gain 0.15
 - 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. If LOWFS residuals are >0.2, zero LOWFS centroids.
 - 5.5. Close TTM loop.
 - 5.6. Verify that LOWFS framerate is correct. If necessary:
 - 5.6.1. Open TTM loop.
 - 5.6.2. Change LOWFS framerate.
 - 5.6.3. Take a new LOWFS background (offset telescope 60").
 - 5.6.4. 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