

Palomar Adaptive Optics Test Plan

Title	Internal Focusing for LGS operations
Date	1/5/2007 V4
Lead	M. Troy
Time requested	1.5 hr
Required conditions	-

Purpose

We outline here the procedure to co-focus the LOWFS, HOWFS and PHARO for night time operation. All work is done with the white light.

Test procedure

1. Setup
 - 1.1. Go to DNGS mode
 - 1.2. lgs_x should be in the LGS position (92000)
 - 1.3. LOWFS
 - 1.3.1. load zero offsets
 - 1.3.2. Set rate to 500Hz
 - 1.4. HOWFS
 - 1.4.1. load zero offsets
 - 1.4.2. Set rate to 200 Hz
 - 1.4.3. Load pixel_gains_lse_sep03
 - 1.4.4. Take HOWFS background
 - 1.5. Acquire white light in HOWFS with power at 35, Lock TT and DM loops
 - 1.6. Make sure LOWFS is off
 - 1.7. Take and load a white light flat map
 - 1.7.1. *IDL> ao_make_dm_flat_map,'filename'*
2. co-focus LOWFS and HOWFS to white light
 - 2.1. Lock in dual mode
 - 2.1.1. Acquire LOWFS using acqview
 - 2.1.1.1. Click ACQ
 - 2.1.1.2. Click on spot when it appears
 - 2.1.1.3. Click "Send LOWFS"
 - 2.1.2. Take LOWFS background
 - 2.1.3. From lgsstools, click "zero cent"
 - 2.1.4. Lock TT on LOWFS
 - 2.1.5. If HO residuals are close, lock DM on HOWFS
 - 2.2. zero LOWFS focus using wfs_z
 - 2.2.1. start, lgsfoc, set the LOWFS zero point to zero, set gain to 0.25
 - 2.2.2. Turn lgsfoc "on"
 - 2.2.3. Note: insure HOWFS residuals show no focus, may need to decrease DM proportional servo loop term.
 - 2.2.4. turn off lgsfoc
 - 2.2.5. note the old and new wfs_z position
3. re-focus white light to zero focus on DM
 - 3.1. Go to NGS mode

- 3.2. close HOWFS loops on white light
- 3.3. Set DM proportional gain to zero
- 3.4. Setup TAO to offload focus to telescope, but prompt user (1mm of secondary motion = 22.9 mm of white_z (or wfs_ motion)
- 3.5. Use the TAO prompts to move the 'white_z' motor to zero the focus on the DM (optional).
- 3.6. Open and close DM loop after moving white_z
- 3.7. Note old and new white_z position
- 3.8. Reset DM proportional gain to 0.02
- 3.9. Make new white light flat map
4. Re-focus acquisition camera
 - 4.1. In acqview, click ACQ
 - 4.2. Set the video camera to integrate at 1Hz, saving 1 frame a second
 - 4.3. Set white light power to 20
 - 4.4. Check to make sure the peak counts are less then ~100. If necessary decrease the white light power
 - 4.5. Shut off white light and take and save a background using ao_plot_vid_image in IDL, call it acq_wl_bkgd
 - 4.6. Turn the white light back on and focus using
 - 4.6.1. ao_focus_loop, 'current acq_z position' -600, 300, 5, 'acq', 'acq_wl_', sky='acq_wl_bkgd', time_to_avg=2
 - 4.6.2. move acq_z to optimal position and note new position
 - 4.7. Save new AO config file called LGS
5. PHARO alignment
 - 5.1. re-focus PHARO
 - 5.1.1. lock HOWFS on zero offsets
 - 5.1.2. focus PHARO to maximize Strehl/minimize FWHM.
 - 5.2. re-tune centroid offsets in HOWFS

Results and conclusions

4/2/07 (v4)

wfs_z: starting position: 17200, ending position: 18172
white_z: starting position: 25750, ending position: 25750
acq_z: starting position: 12700, ending position: 12500

1/5/07 (V3.1)

wfs_z: starting position: 10800, ending position: 10540
white_z: starting position: 29790, ending position: 33256
acq_z: starting position: 14600, ending position: 14600

12/6/06

wfs_z: starting position: 10400, ending position: 10800
white_z: starting position: 29792, ending position 29792
acq_z: starting position: 14600, ending position: 14600
Did tune up on PHARO, no refocus req'd

10/11/2006

wfs_z: starting position:10650 um, ending position: 7260 um

white_z: starting position: 27500 um, ending position: 29792 um
acq_z: starting position: 14600 um, ending position: 14740 um
did re-focus and tune up PHARO

9/7/2006

wfs_z: starting position:10659 um, ending position: 7150 um
white_z: starting position: 27500 um, ending position: 30917 um
saved as 060908a
did not re-focus acq camera, procedure above was not written
did re-focus and tune up PHARO