

Palomar Adaptive Optics Test Plan

Title	Internal Focusing for LGS operations
Date	12/1/2006
Lead	M. Troy
Time requested	2 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. Reflecting spot should be in Laser mode?
 - 1.2. LOWFS
 - 1.2.1. load zero offsets
 - 1.2.2. Set rate to 500Hz
 - 1.3. HOWFS
 - 1.3.1. load zero offsets
 - 1.3.2. Set rate to 200 Hz
 - 1.3.3. Set log interval to 20
 - 1.3.4. Turn WFS on
 - 1.4. Acquire white light in HOWFS with power at 40
 - 1.5. Make sure LOWFS is off
 - 1.6. Take of load a white light flat map
2. co-focus LOWFS and HOWFS to white light
 - 2.1. Lock in dual mode (see procedure XXX)
 - 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. note the old and new wfs_z position
 - 2.2.5. turn off lgsfoc
3. re-focus white light to zero focus on DM (optional)
 - 3.1. close HOWFS loops on white light
 - 3.2. Setup TAO to offload focus to telescope, but prompt user (1mm of secondary motion = 22.9 mm of white_z (or wfs_ motion)
 - 3.3. Use the TAO prompts to move the 'white_z' motor to zero the focus on the DM.
 - 3.4. Note old and new white_z position
 - 3.5. Make new white light flat map
 - 3.5.1. Make DM flat map (ao_make_flat_map,'flat_map_white_light_<date>')
 - 3.5.2. Open TTM and DM loops
4. Re-focus acquisition camera
 - 4.1. move LOWFS out of the way

- 4.2. Set the video camera to run at 1Hz, saving 1 frame a second
- 4.3. Check to make sure the peak counts are less than ~100. If necessary decrease the white light power
- 4.4. Shut off white light and take and save a background using `ao_plot_vid_image` in IDL
- 4.5. Turn the white light back on and focus using
 - 4.5.1. `ao_focus_loop`, 'current acq_z position' -600, 300, 5, 'acq', 'acq_wl_focus', 'sky name from step 4.3', 'time_to_avg=2'
 - 4.5.2. `ao_read_focus`, data, file='acq_wl_focus_focus.dat'
 - 4.5.3. move acq_z to optimal position and note new position
- 4.6. Save new AO config file
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

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

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