May 02, 2006 Palomar LGS IPT Meeting Minutes

A. Bouchez, 5/02/06

1. Analysis of April engineering run data

Jenny provided the following results from PHARO images taken while the HOWFS loop was closed on the LGS:

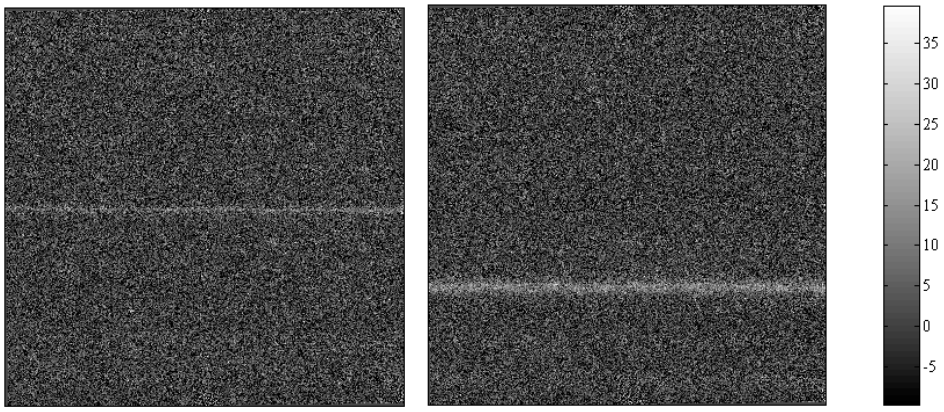

Fig 1: *Left:* J band star trail, HOWFS loop closed on LGS. *Right:* J band star trail, HOWFS loop open.

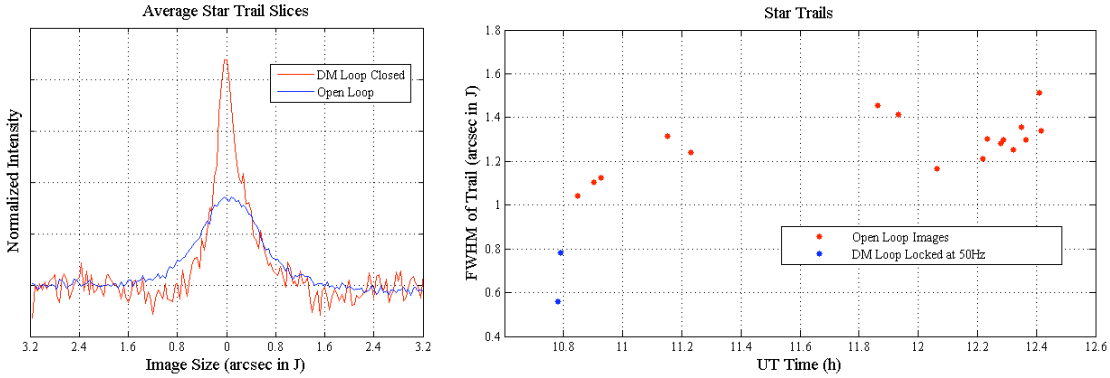

Fig 2: *Left:* Comparison of star trail profiles with HOWFS loop on/off. *Right:* FWHM of star trails versus time.

2. Tasks for the June 12-14 engineering run

1. LLT flexure (HP)
   - Hal has been testing LLT at Palomar, and brought some parts back to campus. Tolerance issue on secondary tilt mechanism will be fixed. Linear stage will be tightened by manufacturer. Primary centering and tilt look OK. Largest deflections are apparently due to torsional deflections of the telescope truss. This will be addressed by stiffening up truss joints.

- There is a possible issue with the boresighting procedure. We may need to iterate boresighting procedure to be accurate. Chris pointed out an early suggestion to place a pulnix camera behind the final fold mirror, replacing it with a dichroic. AB to consider this.

2. More laser photons on the HOWFS
   - Increase laser power to >8W and document trouble-shooting steps. (VV, EK)
     Ed is coming to Palomar 5/18-5/22.
   - Measure and document the laser bandwidth (EK, VV)
     Also 5/18-5/22. Use F-P spectrum analyzer on IR and 589nm beams.
   - Optimize launched polarization (CS)
     Design and install 1/4-wave plate fixture for LLT optical axis. Parts have probably been purchased already – need to track them down. Jenny is checking at Palomar this morning.
     - Check on purchase orders (AB)
     - Chris will need drawings of LLT from Hal.
   - HOWFS optimization for LGS (MT)
     - See section 3 below.
3. BTO control off zenith
   - BTO computer is broken – currently at JPL. Steve is Mr. Fixit.
   - Implement reproducible laser stimulus (AB,CS)
   - Perform open-loop calibration of BTO (AB)
   - Implement self-erecting BTO (CS, JA)
   - Implement safety/alignment stops (mech), with possible webcam feedback (AB).
   - Investigate possible shutter at prime focus (CS)
4. AO software improvements (TT)
5. Aircraft safety systems (AM)
   - Eliminate IRCAM spurious detections. 1-pt calibration may be necessary to elimitate these? Jeff and John H. will check this out. Alan to implement 1-pt calibration.
   - Currently analyzing ASCAM data (2 cases of possible “missed” aircraft)
6. Laser maintenance/optimization/automation (VV)
   a. Install near & far-field cameras (VV)
   b. Automate laser focus adjustment. (VV)
   c. Build new 1.06 laser head (EK, in Chicago)
   d. Agree on LGS automation scheme. Have meeting while Ed is down here in May.

3. HOWFS optimization for LGS

Prioritized possible solutions:

1. CCD frame transfer timing. Requires draining charge from Raleigh region. Talk to SciMeasure about how to implement this.
2. Mechanical choppers: Wheel or shutter. Packaging issue at DAD position.
3. Accept N-1 Raleigh background.
4. Slow laser down while keeping laser power per pulse. (AB to ask Ed)
5. Identify and reduce scattered light along edge of HOWFS.
6. Modify HOWFS platscale.
7. Modify HOWFS field stop.

Decided to pursue the frame transfer timing solution first. Chris will contact SciMeasure in the next couple of days to inquire about feasibility. If multiple charge transfers are not possible, will conside mechanical chopper solution.

Meeting adjourned at 10:05am