July 18, 2006 Palomar LGS IPT Meeting Minutes

Caltech: Bouchez, Cromer, Roberts Palomar: Doyle, Pickles, Thicksten Chicago: Kibblewhite Call-in: Petrie, Troy

1. Announcements

- No word yet on PALM-3000 MRI proposal. We should be hearing from them any day.
- There will be a summer AO BBQ at Antonin's cabin in Sierra Madre on Sunday night, 6pm. Everyone is invited.

2. July LGS engineering run debrief

Priorities for the run

- Test the new 18" LLT mirror
- LGS performance optimization.
- Understand contributors to error budget.
- o Demonstrate improved laser bandwidth, wavelength control & diagnostics.

Summary of an open discussion on what we learned

- New LLT primary seems to be functioning correctly, but collimation and pointing stability around the sky have yet to be demonstrated.
- Transmission of the BTO is a major concern. We could probably investigate this with a 594nm HeNe laser. The final optics, mounted on the LLT, may be the greatest loss.
- We need a beam quality and power characterization bench at the LLT. Q3 may be sufficient for power measurement. Beam quality and power metrics on the laser bench are still necessary.
- We do not understand the ~50% variations in the LGS flux observed with the HOWFS. These could be due to tip-tilt on an overfilled apperture (LLT primary, HOWFS field stop). We may have quad cell data to investigate this.
- The spontaneous loop opening and DM map loading problems is most likely a hardware problem, possibly compounded by fiber communication glitches. A fix, based on that implemented for OCTL, is being implemented.
- Both aircraft safety camera display programs functioned correctly this run, although they stopped drawing circles around detections. The ASCAM appears ready to go live for the next run, but IRCAM is generating too many false positives. Great progress since last run.
- Spotter operations went better than previous during the last run. Spotters are very conservative, with wide variations between spotters.
- The lack of Coude lab temperature stability was a problem. Also need better access to laser. Facility work may be expensive (Bob estimates ~50k for AC, substantially more for new platform). Little Palomar staff availability for facility work until after March '07. Follow-up meeting on this issue schedule for next Monday afternoon.
- The chopper seems to work, but needs to be integrated more fully with AO system.
- We may need to redesign laser focusing lenses, which could be moved to BTO bench, reducing space constraints.

Input from Chris:

Here is laser etalon thermal controller status --

- A box has been assembled that handles four (currently) channels of TEC control, of +/-12V, 6A each
- Two etalon assemblies are ready to test, that are Thorlabs PZT mounts (for dither and possible detune), with TEC and thermistor attached.
- The box responds just fine to serial port control, the provided GUI works fine. John A and Viswa have seen the GUI and may want to comment.
- There should be no problem finishing connections and testing of the mount/controller combination by the next run.
- The current plan is for 10ft of cable between etalon mounts and controller box. The provided GUI runs on a windows machine, can be run by remote desktop like the delay generator GUI.
- Once configured, the controller needs no computer, except for logging and display as desired. Logging has various modes, including text file and spread sheet, with selectable items to log.
- Source code in C of a serial interface is available from the vendor (McShane).

Input from Viswa:

- Please bring up Coude lab remodeling issues if you can.
- Redoing the 2 lens system after the SFG to produce a smaller spot on the secondary and having a more accurate means of alignment seems important. A possible option is to have the lens outside the laser ... may be on the BTO optical bench before the beam splitter cube?
- Things to do to improve BTO transmission/ spot size:
 - Change BS cube
 - Mitch said a new 1" dichroic tip-tilt mirror has been ordered. So we must make sure that it gets installed before the next run.
 - Make provisions to have near and far field cameras at the PFC.
 - Any more diagnostics that we may need? A pulnix that can look at a shear plate that slides in and out of the beam to examine wavefront quality?

3. Discussion of LGSAO operations plan

All who spoke up agreed with the necessity of gradually reducing the level of technical support required from CIT and JPL personnel to operate the LGS system. MT suggested that our current manpower could only support ~10 shared-risk nights in semester 07A, AB estimated that 2-3 CIT/JPL personnel would be needed to support these nights, in addition to a new Palomar laser operator. There also seemed to be a general consensus on phasing out both CIT/JPL technical support for LGS science and spotters by semester 07B. However, both MT and AB remain concerned that the current project budget cannot fund the effort required to make these transitions happen on such a short timescale. Other monetary support needs to be found.

Action items (1 mo. timescale)

- MT & AB to prepare a budget for facilitization of the LGS system by semester 07B.
- AB to coordinate FAA approval process with Keith Wilson at OCTL.

Meeting adjourned at 10:00am.