Keck Next Generation Adaptive Optics
AO Relay Opto-Mechanics Design Review
Charge and Review Process

Don Gavel
October 27, 2009
Revised November 12, 2009

There will be an internal review of the NGAO adaptive optics relay optomechanical system held on November 17, 2009. The purpose of the review is to evaluate the proposed system design and confirm that it will meet the requirements of NGAO as well as be a good starting point for continuation into final design phase.

The review panel consists of three experts from the NGAO team, two from Keck Observatory and one from Caltech Optical Observatories. The review panel is being provided a detailed design document describing the proposed design, and a spreadsheet of the requirements taken from the Contour database with annotations of the design's compliance. Some supplemental material is available on the web page http://www.oir.caltech.edu/twiki_oir/bin/view/Keck/NGAO/OptoMechanicalMinReviewNov09.

Using this material, the panel is asked to evaluate the proposed architecture for the following:

- **Technical feasibility and design completeness**:
  - The optical design should be at a readiness level of Preliminary Design Review
    - Zemax prescription
    - Manufacturing and alignment tolerance analysis
    - Throughput and emissivity analysis
  - The mechanical design should be at a readiness level of Conceptual Design Review
    - Layout of optical design on the Naysmith platform, done in CAD drawings
    - Specifications for table and optical mounts, but not complete drawings of individual mounts.
    - Flexure and alignment tolerance analysis at a rough calculation stage, but no finite element analysis.
- **Satisfies requirements**: A spreadsheet has been provided listing requirements and commentary on how the design is intended to meet them. Note that several of the requirements have not been quantitatively specified yet.
- **Risk**: The reviewers should judge if the design has considered a low-risk approach. However, this is not intended to be a risk assessment review.
- **Cost effectiveness**: The reviewers should judge if the design has proceeded with an eye towards cost-effectiveness. However, this is not intended to be a cost review.

The following item is not completed:

- Atmospheric dispersion corrector

The following areas are *not* considered to be in the scope of this review:

- AO subsystems. Preliminary interfaces to the subsystems LOWFS, HOWFS, acquisition camera, telescope simulator, IFS instrument, and Dual Star Module are provided in this design, but design work on the subsystems themselves is still ongoing as well as work on the interfaces. The ICDs for these interfaces is not a subject of this review.
- Enclosure or environment control
- Operational concepts and procedures
- Integration and test plan

The review will take place on Tuesday, November 17, starting at 1 pm PDT. We will use video conference facilities at the CfAO to connect with participants from CalTech and Keck. The review committee consists of the following people:

- Rich Dekany, Caltech
- Alex Delacroix, Caltech
- Thomas Stalcup, Keck

The presentation team consists of the following people:

- Donald Gavel, UCSC
- Renate Kupke, UCSC
- Chris Lockwood, UCSC

The baseline agenda for the review is as follows (all times are PDT):

1:00 pm: Welcome and introductions
1:05 pm: Presentations
2:30 pm: Response to reviewers' questions
2:50 pm: Break
3:00 pm: Open discussion and questions
4:00 pm: Review committee closed session
4:45 pm: Review committee feedback to team

Reviewers may submit written questions to the design team on areas or issues they would like to see covered during the review. Questions should be directed to Don Gavel, gavel@ucolick.org. Questions received by noon (PDT) Monday, Nov 16 will be addressed with response during the review presentations.

Thanks for helping out and participating in this review!

Don Gavel
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