

Overview of plans for the Palomar AO System Upgrades

Mitchell Troy, Gary Brack, Fang Shi,
Thang Trinh, Tuan Truong, Kent Wallace - JPL
Richard Dekany, Mike Fischer, Viswa Velur - Caltech
Ed Kibblewhite – UoC

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mtroy@jpl.nasa.gov

Outline

- Wavefront processor / WFS upgrade
- Multiple Guide Star Unit
- Sodium LGS

Wavefront Processor/WFS upgrade

- WFS: EEV CCD 39, 64x64 pixels, binned on chip to 32x32, no guard band
- WFP: 1 Pentek 4291 board with 4 TMS320C6701 DSPs
- System Performance
 - 2000Hz with 6.4 e⁻ read noise (200nm wavefront error)
 - 455Hz (and slower) with 3.7 e⁻ read noise
 - Data latency (from start of CCD read to having sent DM commands) $\leq 1/\text{frame rate}$
 - Data Recording: Minimum 400Hz continuous
- Schedule:
 - Currently undergoing testing at JPL
 - Integration at Palomar January-February 2003
 - First light March 2003
 - First science observations: April 2003

Multi-Guide Star Wavefront Sensor

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LGS Experiments at Palomar (Collaboration)

- Caltech
 - provide systems engineering, analysis, theory, telescope infrastructure, including safety systems and BTO
- JPL
 - Provide subsystem engineering, analysis, theory and reconfiguration of the existing adaptive optics system to enable laser guide star use, integration and testing, support of engineering runs at Palomar
- U of Chicago
 - provide sodium laser six months per year for 3 years, laser launch telescope, as well as theory/analysis

System Requirements Document

- 1 System Requirements
 - 1.1 System Context Diagram
 - 1.2 Subsystem Diagram
- 2 Subsystem Functional Requirements
- 3 External System Interface Requirements
- 4 System Performance Requirements
 - 4.1 Error Budget
 - 4.2 Sub-system Performance Requirements
 - 4.3 External System Performance Requirements
- 5 Operational Scenarios
 - 5.1 Science Run Scenarios (calibration, acquisition, nodding, skys, focus control)
 - 5.2 Engineering Run Scenarios (boresight, calibration)

