NGAO Performance Flowdowns

R. Dekany

02 September 2009

Performance Budget Flowdown Process

- Translates high-level performance requirements into subsystems requirements
  - Based upon B2C architecture choices
  - Is iterative
    - Version 1 release this month
      - Version controlled flowdown summary (spreadsheet)
      - Updated Contour Requirements database
      - Will influence on-going design work
    - Version 2 release in February 2010
      - Will document system change orders subsequent to Version 1 release
      - Will document the flowdown for the PDR

Flowdown Products

- Version 1 (Sept 2009)
  - Transmission & Emissivity
    - AO system, Fixed and PnS BTO
  - LGS beacon Spot Size
  - Pupil Registration Framework
  - Go-to Errors
  - Non-sidereal and Long-exposure Tracking Errors
  - Initial Efficiency Budgets
    - Acquisition timeline
  - Rel Astrometry Flowdown
  - High-Contrast Flowdown

Flowdown Products (cont.)

- Version 2 (Feb 2010)
  - TWFS budget
  - Optical Surface Figure Quality
  - Pupil Registration Tolerances
  - Update to HO and TT bandwidth latency to reflect servo design
  - Revisions to Rel Astrometry Flowdown
  - Observing Efficiency Flowdown for Non-Sidereal Long Exposures
  - System Uptime MTBF Framework

Specific Issues

Ref: NGAO_PD_Phase_Flowdown_Reconciliation_v0.6.doc

Reconciliation issues

- Surface Optical Transmission
  - Need uniform coating and dust losses
- System Emissivity
  - Update to enclosure temperature?
- Servo Bandwidth Error
  - Need consistent servo model
  - HC budget vs. WFE budget driver?

Reconciliation issues (cont.)

- Calibration issues
  - Stale reconstructor errors
  - Dynamic zero-point calibration errors
  - Quasi-static WFE driving HC error budget
- HC budget
  - Impact of HOWFS aliasing?

Conclusions

- Initial performance flowdown has identified several consistency and design issues
- After capture into Contour database, further refinement will be rolled out via system change process