Other MROI System Papers:

- 7013-19 (Array Opto-Mechanical Design - Thursday)
- 7013-22/7019-7 (Unit Telescope Design - Tuesday/Software - Thursday)
- 7013-23/126/159 (Delay Line Production - Tuesday/Innovation/Control - Thursday)
- 7013-31 (Science & Commissioning Update - Tuesday)
- 7013-76 (Near-IR Science Combiner - Thursday)
- 7013-127 (Automated Alignment System - Thursday)
- 7013-132 (custom beamsplitter & AR coatings - Thursday)
Key Design Elements

- Pupil plane beam combiner for baseline bootstrapping.
- Custom beamsplitter and AR coatings minimize visibility losses due to intensity mismatch, polarization, and group delay.
- H or Ks-Band (does not share with science combiner).
- Modular design accommodates from 2 to 10 UTs.
- 5 (6 UTs) combination pairs multiplexed onto a single detector.
- 2-way combiner measures complementary outputs simultaneously.
Location In Optical Train

Beam Combining Area
- M10: 15 deg incidence turning mirror
- 13 mm exit beam
- Injection Point For Alignment Sources
- 9.5 cm input beam
- 7.300x Beam Compressor

15 deg incidence dichroics

30 deg incidence turning mirrors

Switchyard optics: dichroics & turning mirrors

Beam Combining Facility
Switchyard

Beam Combiner

Dewar Feed Optics

Auto-Alignment System Components (see paper 7013-127)

Spectrograph

System Architecture
Switchyard: Configurator of the Phase Plane
Array Geometry To Combiner Architecture

Combiner Analysis/Coating Designs: 7013-132
OPD Modulation Strategy

Pathlength Modulators
Modular Design Approach
Dewar Feed Optics
Diffraction Limited Performance at H & K
Algorithm Development

Simulator Diagram:

Tracking Modes:

- Classic Cophasing as well as Coherencing Algorithms
  - Double Fourier Interferometry (Pedretti 2005)
  - Envelope Tracking (Thureau 2003)
  - Sliding Window (Wilson 2005)
- Predictive Algorithm
  - Recursive Least Squares (Morel 2000)
  - More General Bayesian Techniques (Padilla 1995)
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