



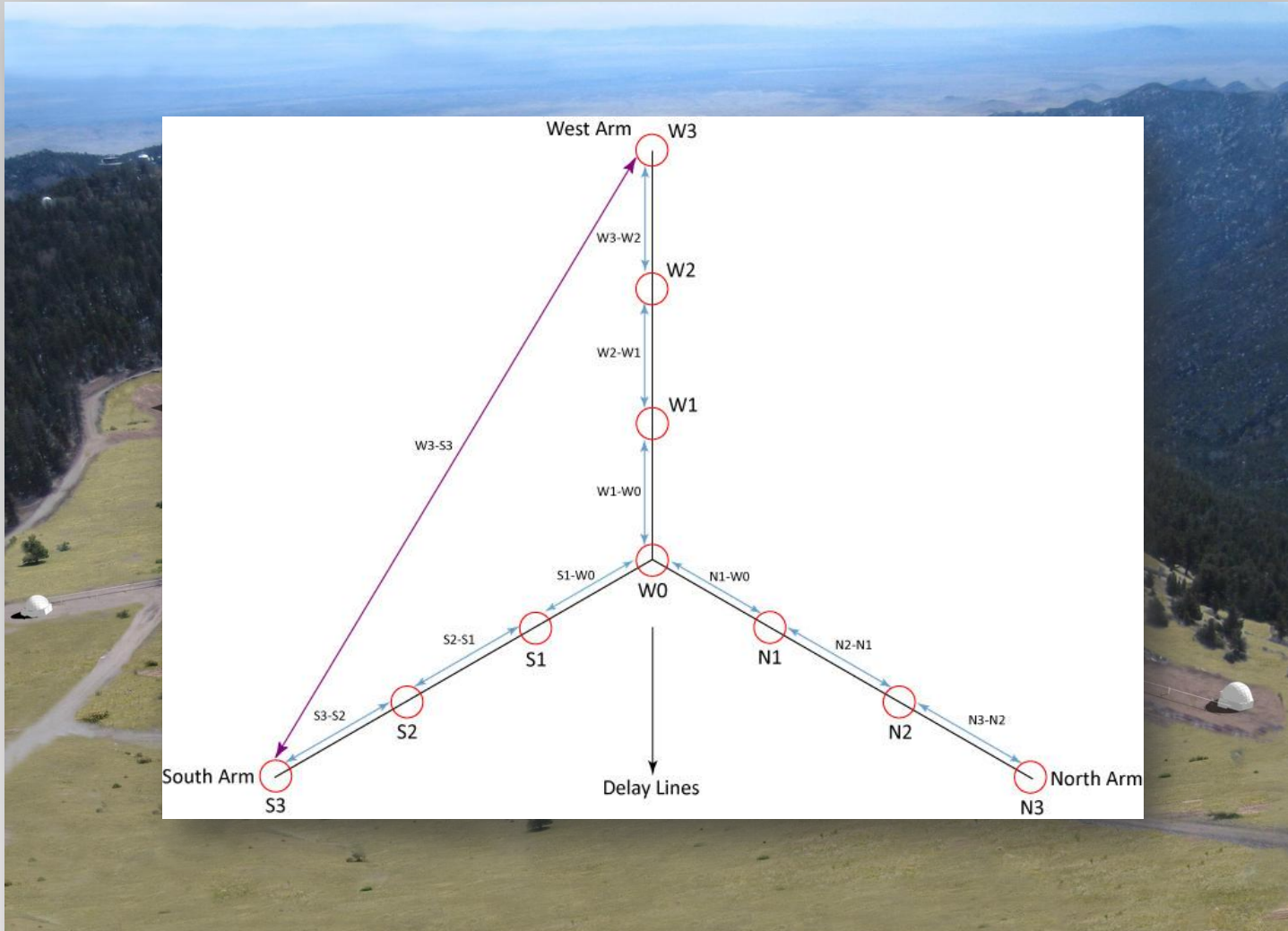
THE MROI FRINGE TRACKER: CLOSING THE LOOP ON ICoNN

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6 July 2012

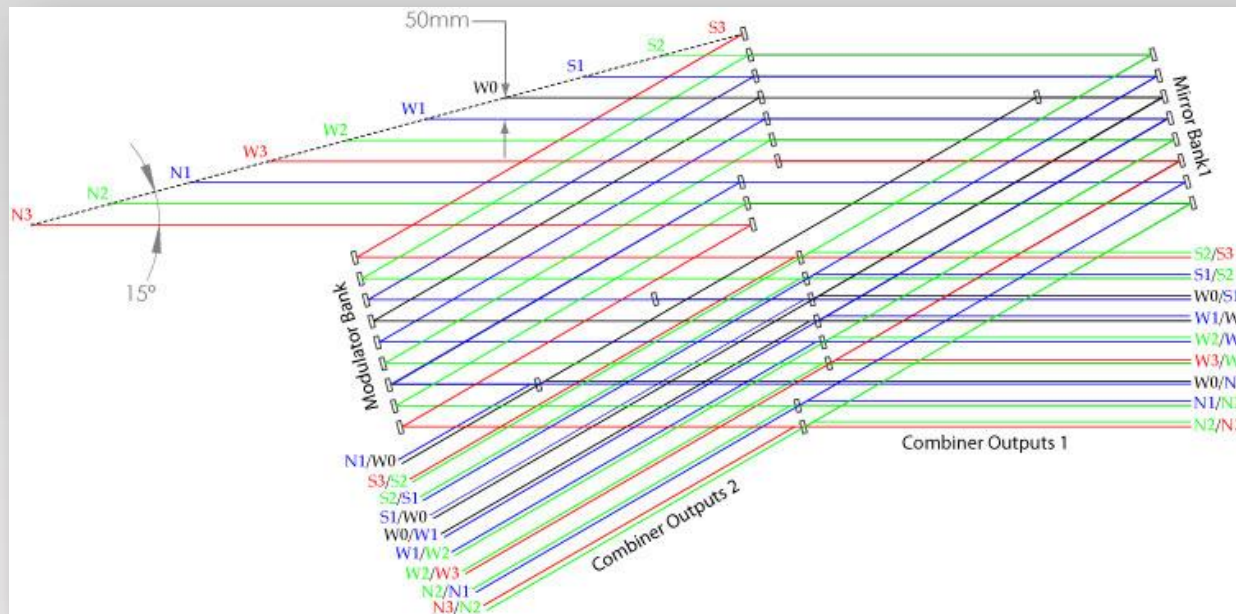
SPIE 8445-57







- Infrared Coherencing Nearest Neighbor tracker
- Dedicated fringe tracker separate from science combiner
- Mechanical and optomechanical design complete
- Minimize internal adjustments
- Final lab integration complete in the fall of 2012



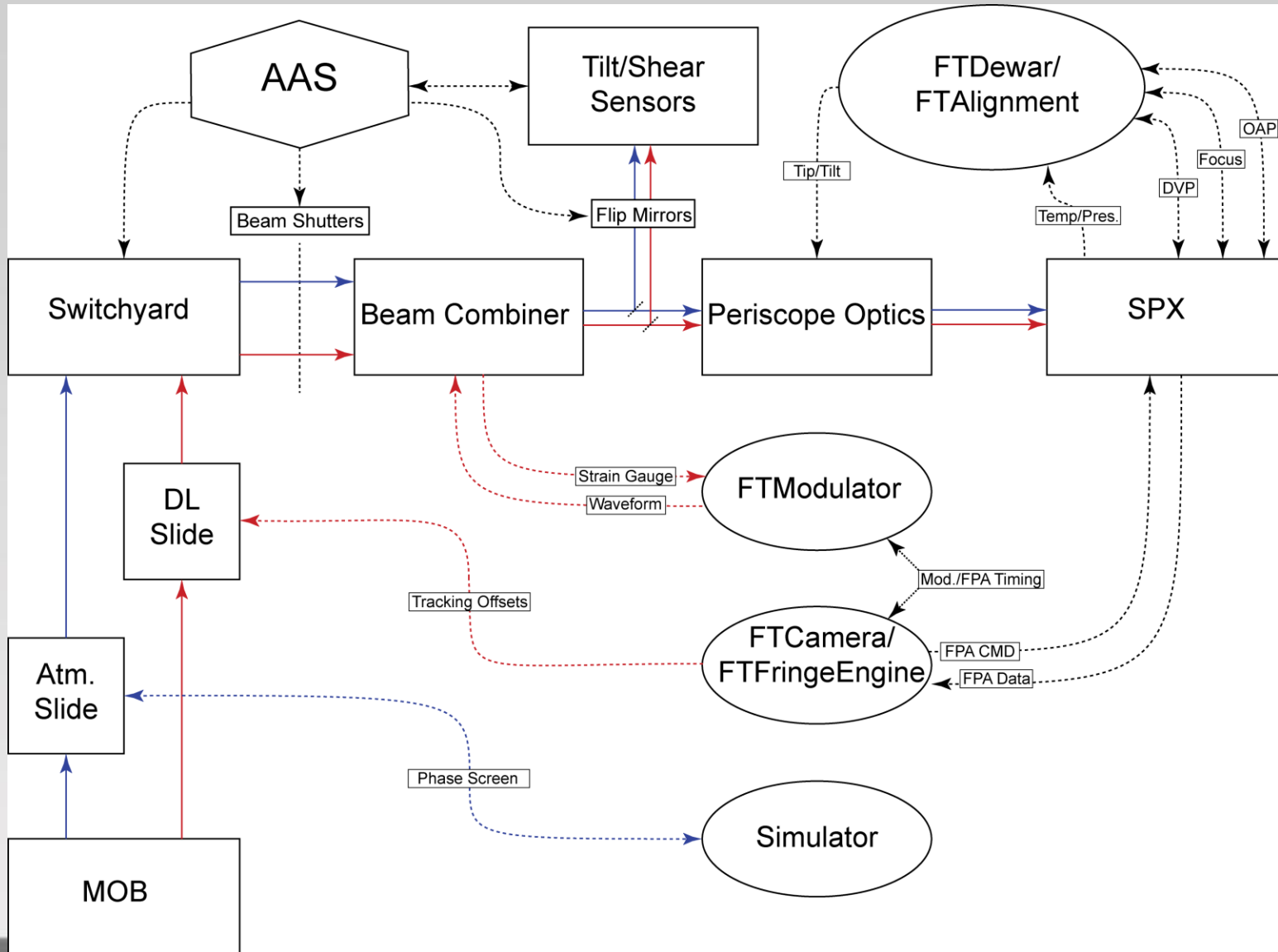


CLOSED-LOOP FRINGE DEMONSTRATION

- Final testing of ICoNN in preparation for observatory installation
- Validate real time closed loop tracking
 - Use dummy atmosphere and mock delay line
 - Requires real time software operation
- Integrate and test Automated Alignment System (AAS) at level of interferometric requirements

- Goal of minimizing site integration time (~PIONIER like)

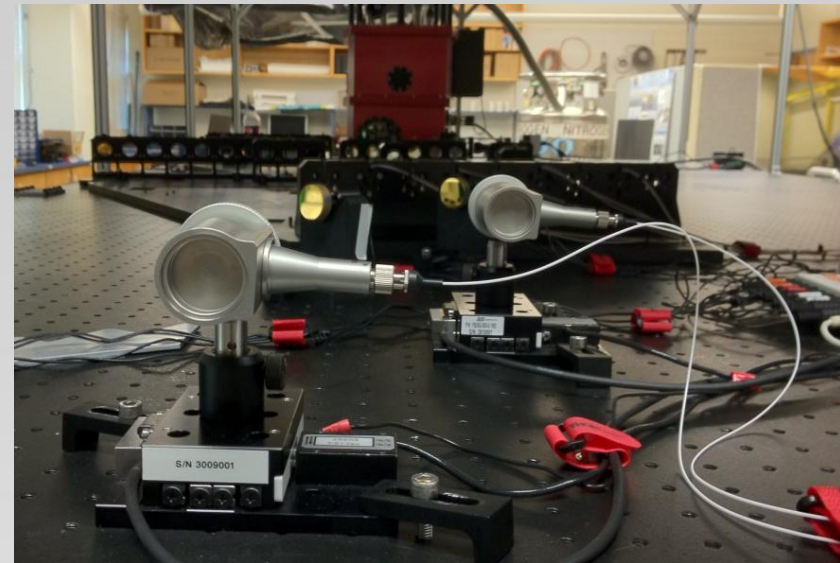
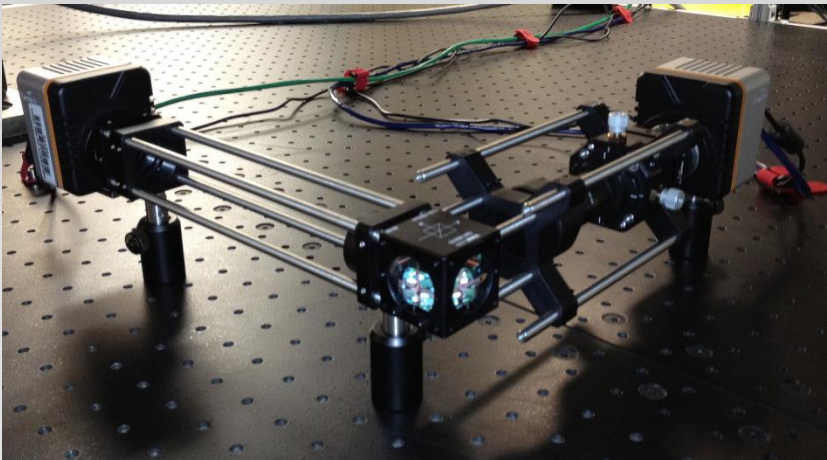
LABORATORY CONFIGURATION





AAS RESPONSIBILITIES

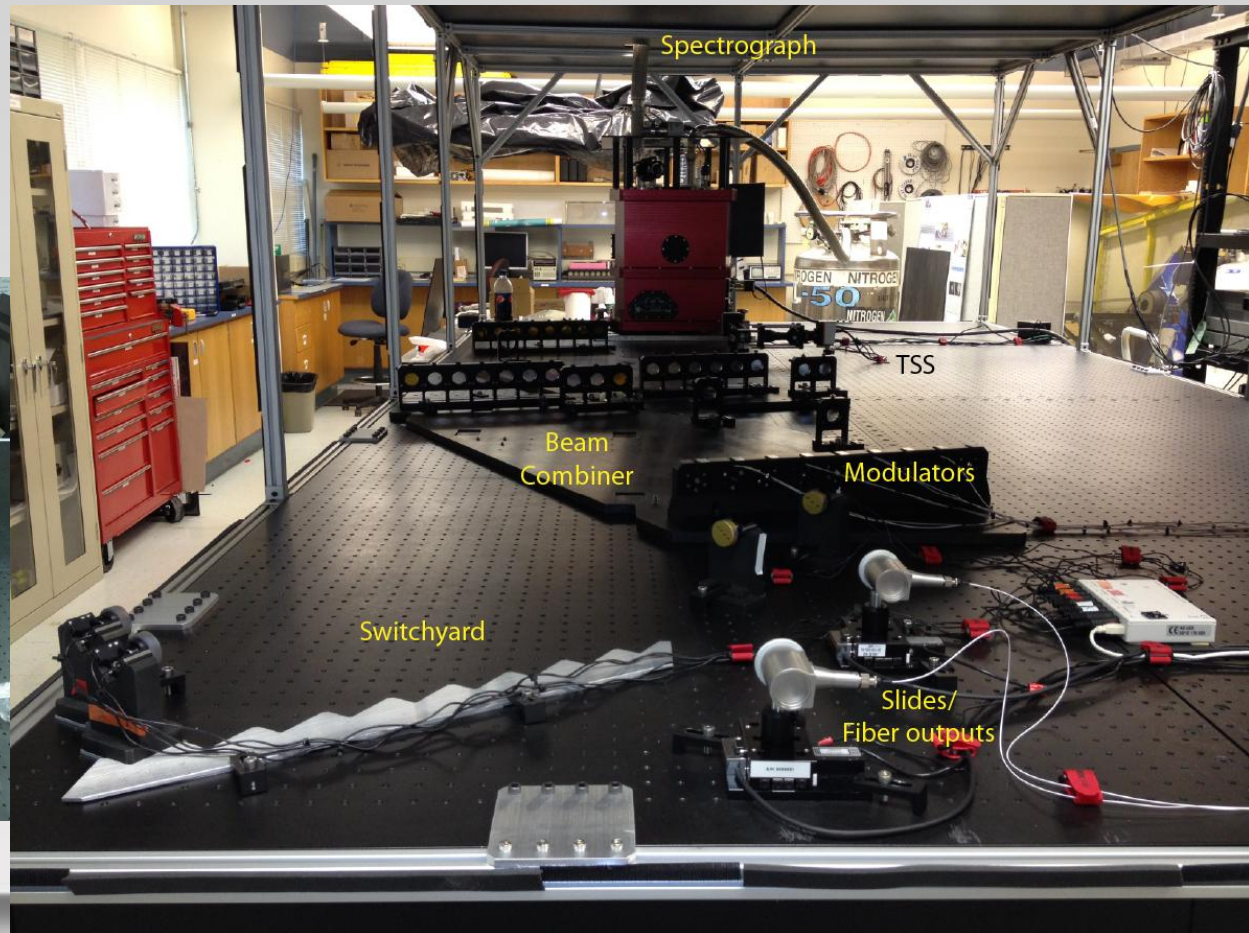
- Provide coherent light source
- Remove tip/tilt and shear
- Perform spectral calibration similar to FTS





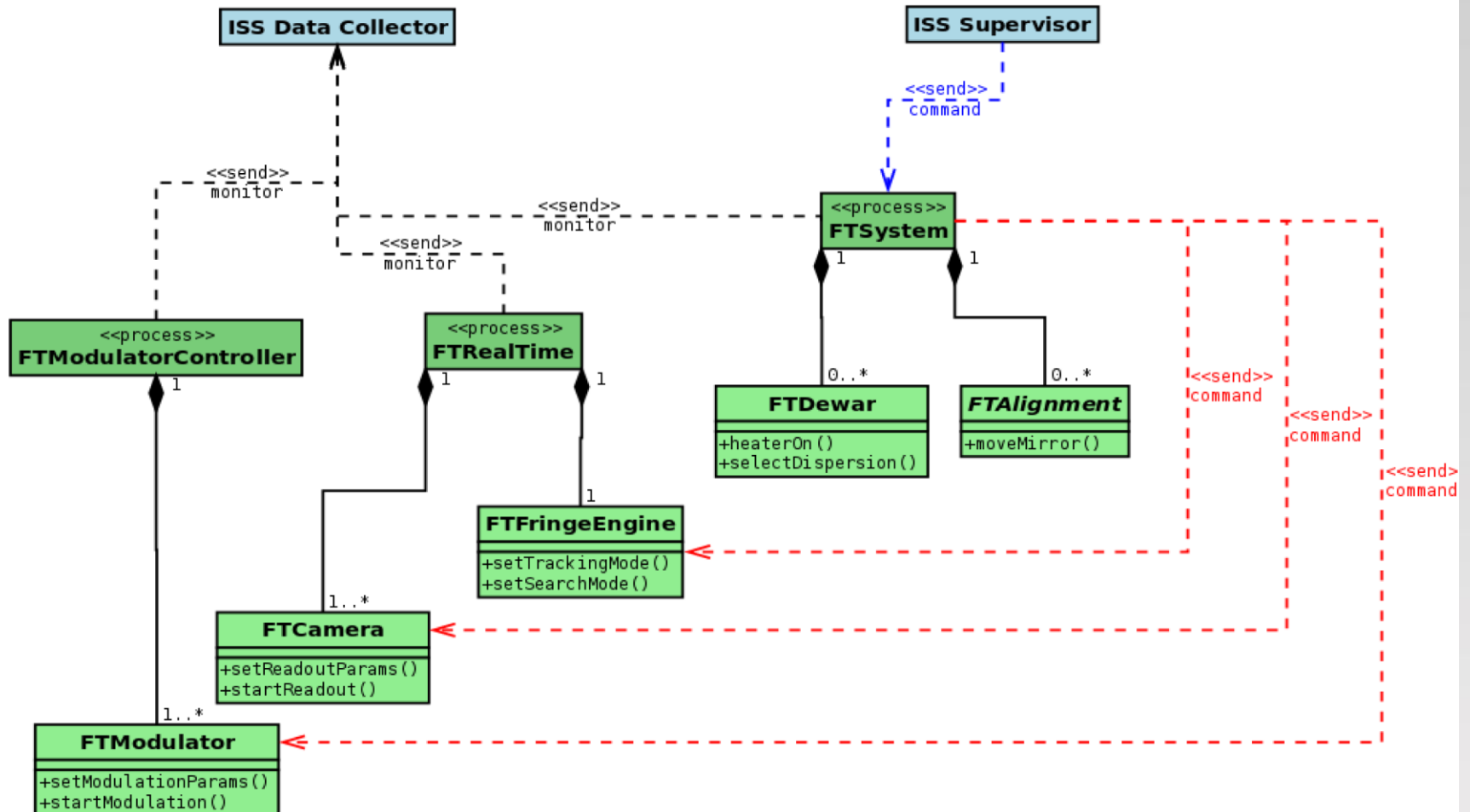
ICoNN SUBASSEMBLY RESPONSIBILITIES

- Modulate and combine light
- Filter and disperse light
- Readout detector
- Close the loop





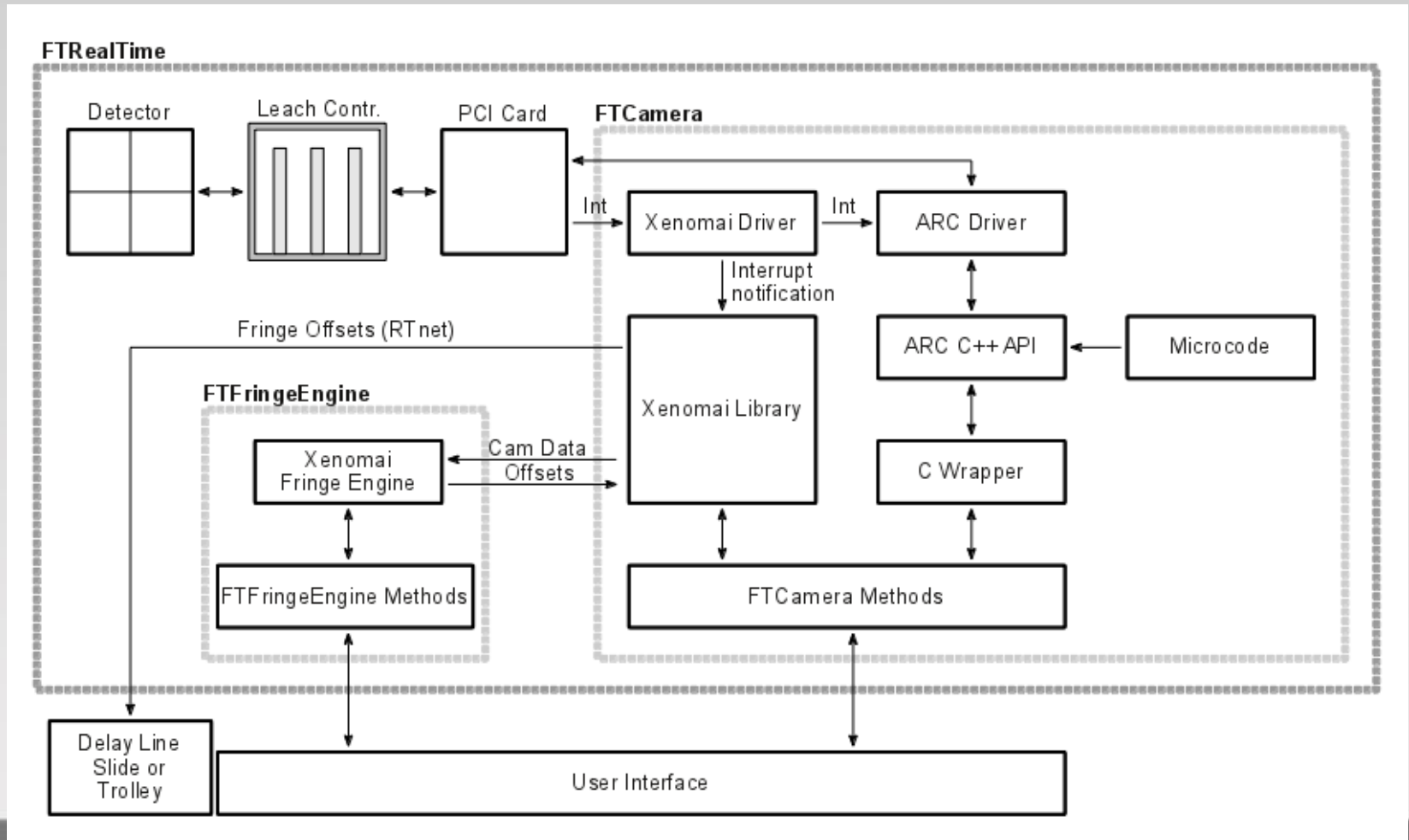
SOFTWARE FRAMEWORK





REAL TIME SOFTWARE

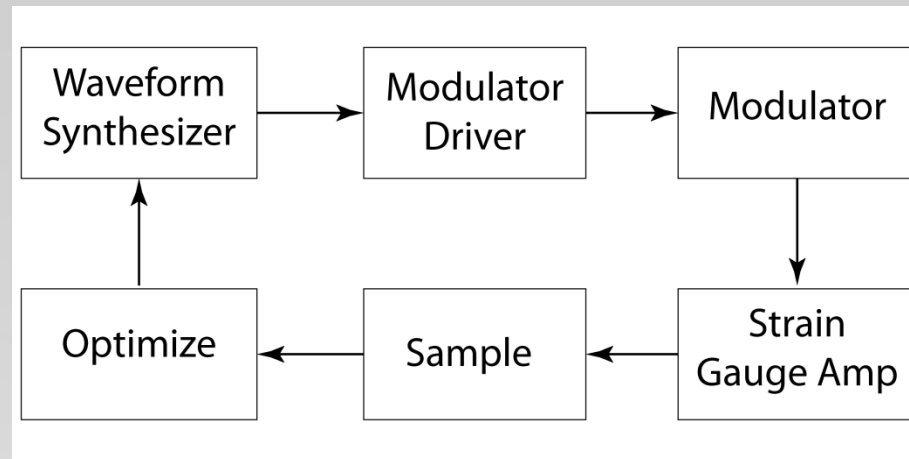
- Must retrofit proprietary software for hard real time operation and communication with the ISS



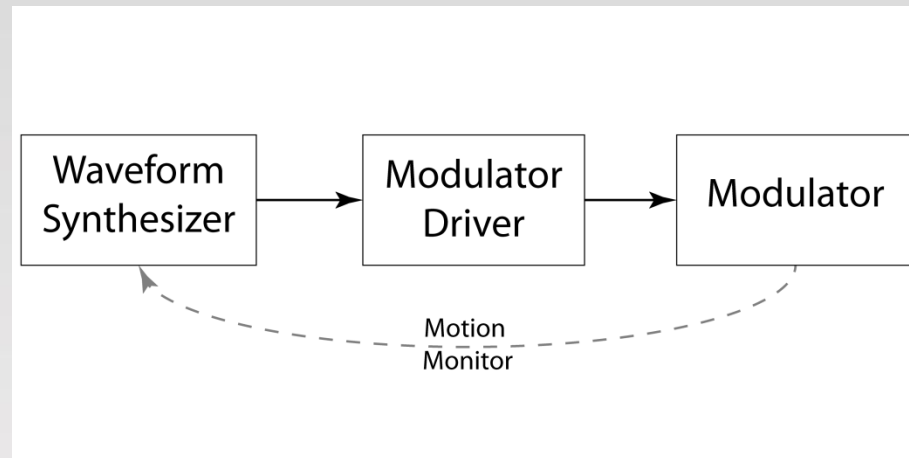


MODULATOR MODES

- Calibration



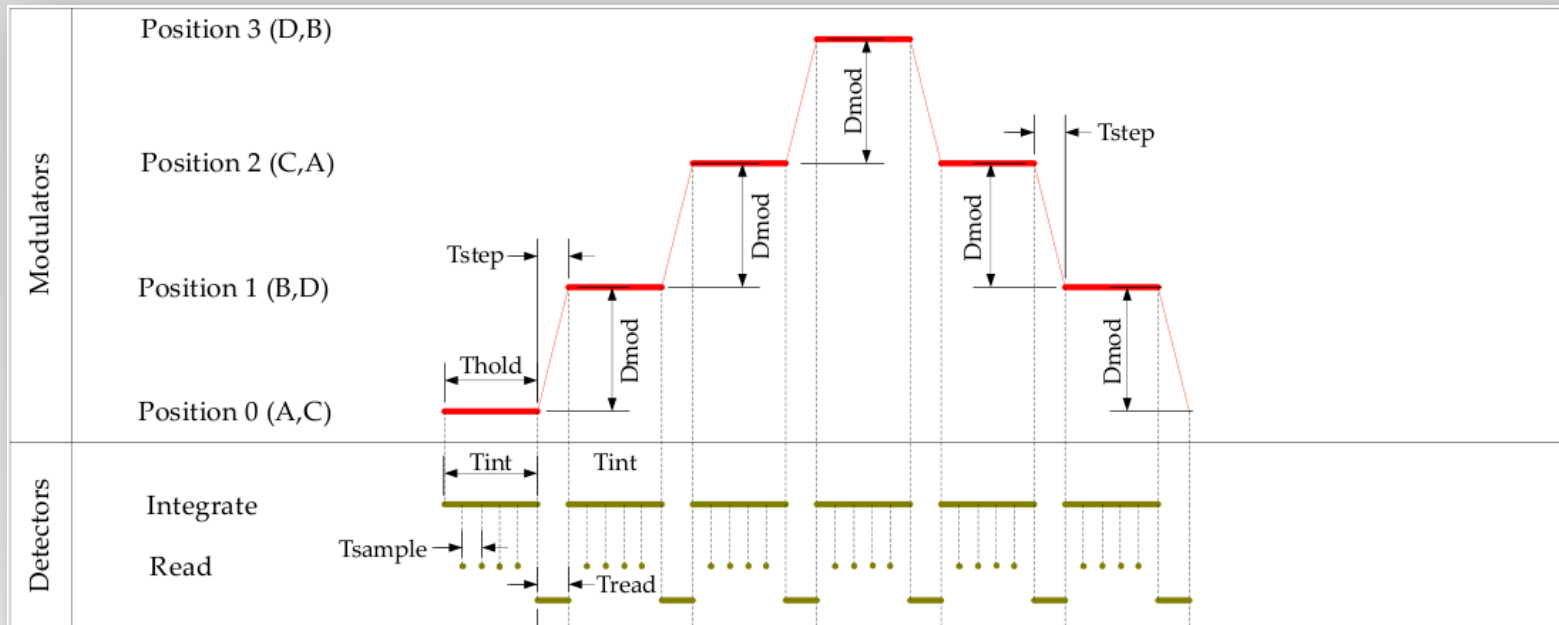
- Operation





MODULATORS

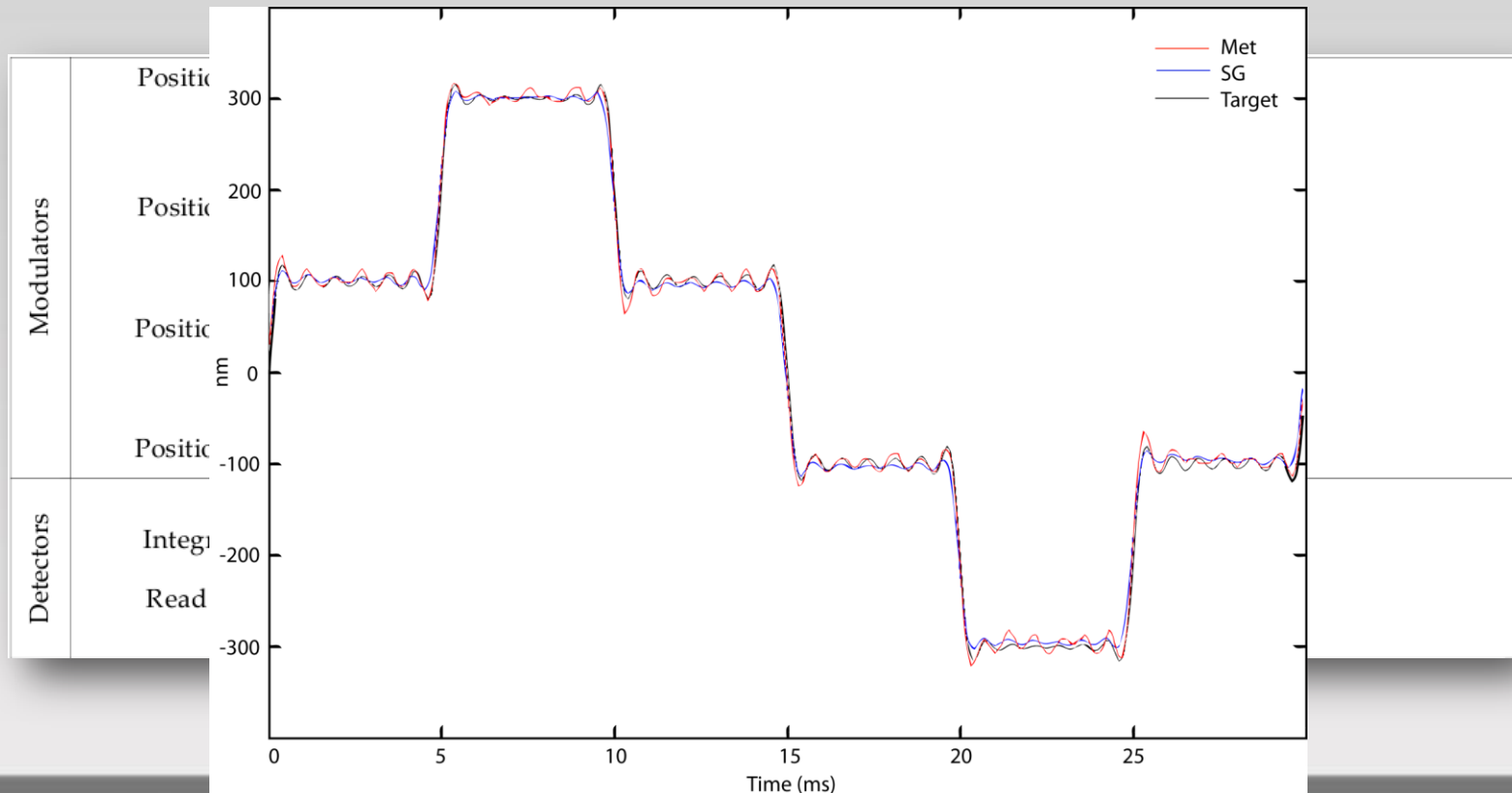
- Improve ABCD measurements over triangular sweep





MODULATORS

- Improve ABCD measurements over triangular sweep
- Less than 19nm RMS from ideal modulation scheme
- 8 hours of open loop testing showed optimization still good





CONCLUSIONS

- Progress
 - Mechanical and optomechanical design complete
 - Final lab integration to be complete in fall 2012
 - Software architecture designed
 - Modulation strategy demonstrated

- Future plans
 - Demonstrate modulation strategy at extreme limits
 - Demonstrate closed-loop fringe tracking
 - Include atmospheric phase plate
 - Expand to multiple baselines



THE END

