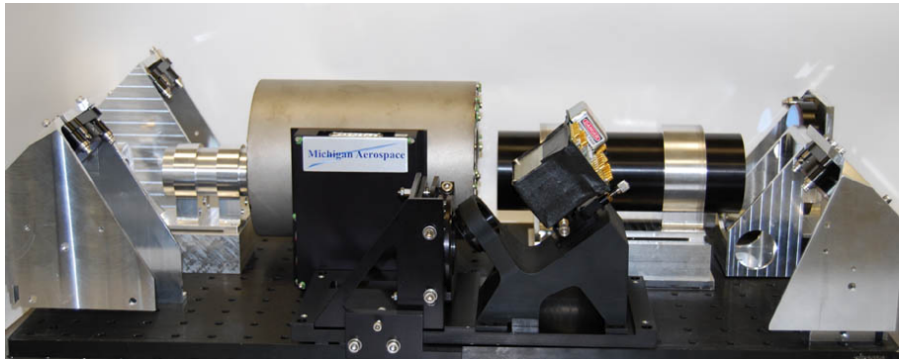
Detector Technology Development for Cloud-Aerosol Transport (CATS) Lidar

PI: Matthew McGill, NASA GSFC

Objective

- Develop and demonstrate a high-efficiency, photon-counting, all-solid-state detection subsystem for use with Fabry-Perot interferometers (FPI)
- Primary application is for use in lidar remote sensing applications, where spectral resolution is required; but can also be used in passive sensing applications
- Reduce cost and complexity of measuring Fabry-Perot interference fringes while simultaneously simplifying optical alignment and increasing detection efficiency
- Demonstrate subsystem performance in a configuration suitable for inclusion in future airborne instruments, with a long-term goal of inclusion in the ACE mission



CATS receiver subsystem, aligned and packaged for integration to high-altitude aircraft.

Accomplishments

- Successfully developed aircraft-ready receiver subsystem and integrated it into the CATS aircraft instrument.
- Developed custom electronics to demonstrate >20 MHz count rate per channel.
- Demonstrated scanning of FPI fringe using novel holographic optical element to measure spectral discrimination.
- Received an Airborne Instrument Technology Transition (AITT) award to integrate and demonstrate CATS from an airborne platform.
- Selected to develop CATS for deployment to the Space Station in 2013.

Co-Is/Partners:
Stan Scott, Shane Wake, NASA GSFC; Sigma Space

TRL_{in} = 3 **TRL_{out} = 4**