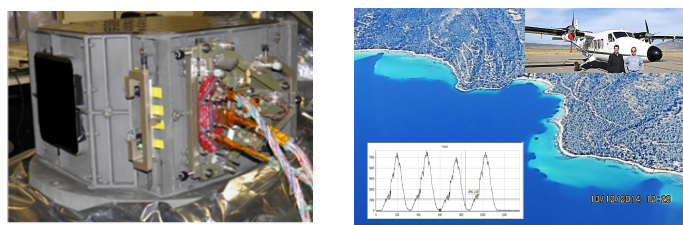
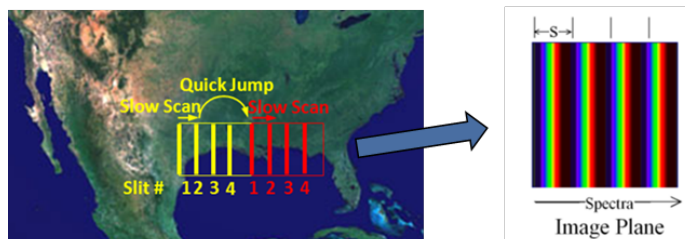


Multi-Slit Optimized Spectrometer (MOS)

PI: Timothy Valle, Ball Aerospace and Technologies Corp.

Objective

- Design and develop a significantly smaller coastal imaging spectrometer that meets GEO-CAPE measurement requirements:
 - MOS for geostationary (GEO) coastal remote sensing and test in an operational environment
 - that can accomplish the ocean color mission with a small package, fast revisit time, and high SNR by producing hyperspectral images at multiple positions simultaneously



Airborne and thermal-vacuum demonstration of independent spectra from 4 slits

Accomplishments

- Developed GEO-CAPE Ocean Science requirements based system that is 3-4X lighter than traditional system
- Validated performance metrics and stability over expected operational temperature range of $20 \pm 6^\circ\text{C}$
 - 4-slit scene multiplexing, 340-890 nm spectral range and sampling, and polarization sensitivity
- Demonstrated <1% out of channel response (slit-to-slit cross talk) for realistic adjacent cloud-ocean radiances
- Developed data driven performance simulator model: radiances to instrument to science products including Monte-Carlo error propagation along the imaging chain.
- Simulated Chlorophyll-a retrievals from MOS perform comparably to MODIS and VIIRS - limited by atmospheric correction
- Demonstrated airborne ocean color scenes of Suisun Bay, Sacramento River, and Lake Tahoe with in-situ validation

Co-Is/Partners: Curtiss Davis, Oregon State University

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