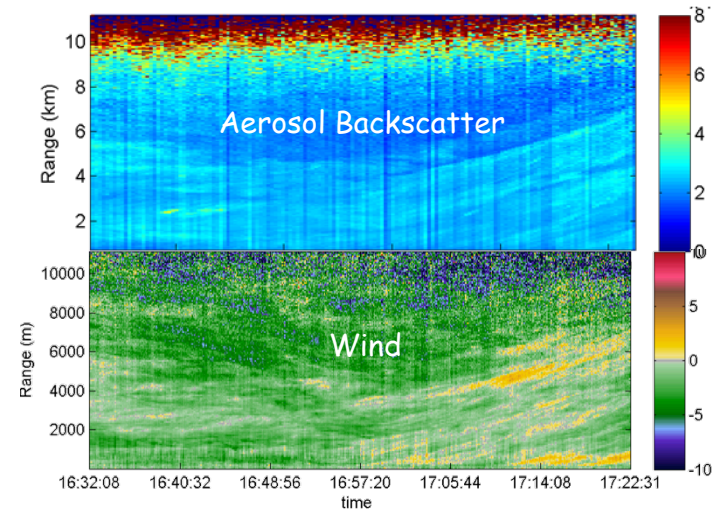


Combined HSRL and Optical Autocovariance Wind Lidar (HOAWL) Demonstration

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Objective

- Demonstrate two wavelength backscatter + extinction + depolarization ($2\beta + 2\alpha + 2\delta$) High Spectral Resolution Lidar (HSRL) and Doppler wind lidar measurements simultaneously at 355 nm and 532 nm using a single multiwavelength interferometric receiver
- Demonstrate system components:
 - High efficiency multi-wavelength optical autocovariance interferometer and integrated $2\beta + 2\alpha + 2\delta$ receiver
 - HOAWL calibration and retrieval algorithms
 - Validated radiometric and integrated HOAWL receiver performance models



Simultaneous wind and HSRL aerosol data with HOAWL

Accomplishments

- Acquired simultaneous HSRL and wind lidar data for ground demonstration of measurement technique
 - Upgraded 2007 OAWL IIP winds instrument for dual wavelength implementation
 - Added depolarization channel
 - Developed and implemented HOAWL $2\beta + 2\alpha + 2\delta$ calibration methodology, retrieval algorithms and data processing
- Developed first dual wavelength Doppler wind lidar system that utilizes a single receiver
 - Enables analysis of 532 nm vs. 355 nm performance differences for 532 nm vs. 355nm wind lidar measurements
- Demonstrated system improvements such as alignment techniques, polarization purity, pulse initiation timing (t_0) correlation improvements

Co-Is/Partners: Sara Tucker, Ball Aerospace; Christian Grund

TRL_{in} = 2

TRL_{out} = 4