

Final Projects for Lidar Class

1. Final project integrates reading, design, and simulation together to show your overall understanding and knowledge of lidar remote sensing.
2. Final project will require a class presentation, followed by a written report.
3. Final project (both presentation and written report) should include, but not limited to, the contents below:
 - Overview of principles, history, & current status
 - Design of a lidar system
 - Simulation of expected lidar signals
 - Sensitivity or error analysis
 - Applications

Selected Topics

***** Differential absorption lidar (DIAL) for troposphere CO₂ - Ryan Neely**

***** Laser altimeter - Steve Mitchell**

- UAS Lidar Bathymeter

***** Aerosol polarization lidar - Matt Hayman**

- please consider in literature search both PMC and PSC or lower atmosphere aerosols as the particle sizes and extinction considerations are quite different, but then concentrate on your PMC research.

***** Direction-detection wind lidar with double-edge filters - Bo Tan**

- please do a thorough job in the literature search, and then concentrate on one particular DDL, e.g., K-DEMOP or Na-DEMOP. The calibration of double-edge filter lidar is a significant issue to consider.

Selected Topics

*** Coherent Doppler lidar - John Smith ?

- please work with NOAA Mike's team to figure out the details of heterodyne detection in optical frequency.

*** Modernization of coherent Doppler lidar - Cody Vaudrin

- Signal processing aspects

*** Cloud lidar - Keith Krause

- 3D Monte-Carlo ray trace code to simulate the lidar return due to multiple scattering. See how far photons penetrate the cloud and also compare lidar returns when the lidar system is above or below the cloud.

*** High-spectral-resolution lidar lidar - Yolanda Roberts ?

- your research with Peter may involve lots of aerosol study. HSRL is a very powerful tool for this. Would you like to consider this, instead of Rayleigh/Mie lidar?

*** Terrestrial lidar scanner - Ben Lowry ?

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Presentation Time Slots

Monday, December 8, 2008 -- 15 minutes each
Ryan Neely, Steve Mitchell, Keith

Wednesday, December 10, 2008 -- 15 minutes each
Matt, Cody, John

Friday, December 12, 2008 -- 15 minutes each
Yolanda Roberts, Ben, Bo Tan

Online FCQ is Due on December 8, 2008

Written Report Due on December 17, 2008