

Using TODWL to support unified parameterization investigations

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WG meeting in Boulder, CO

Outline

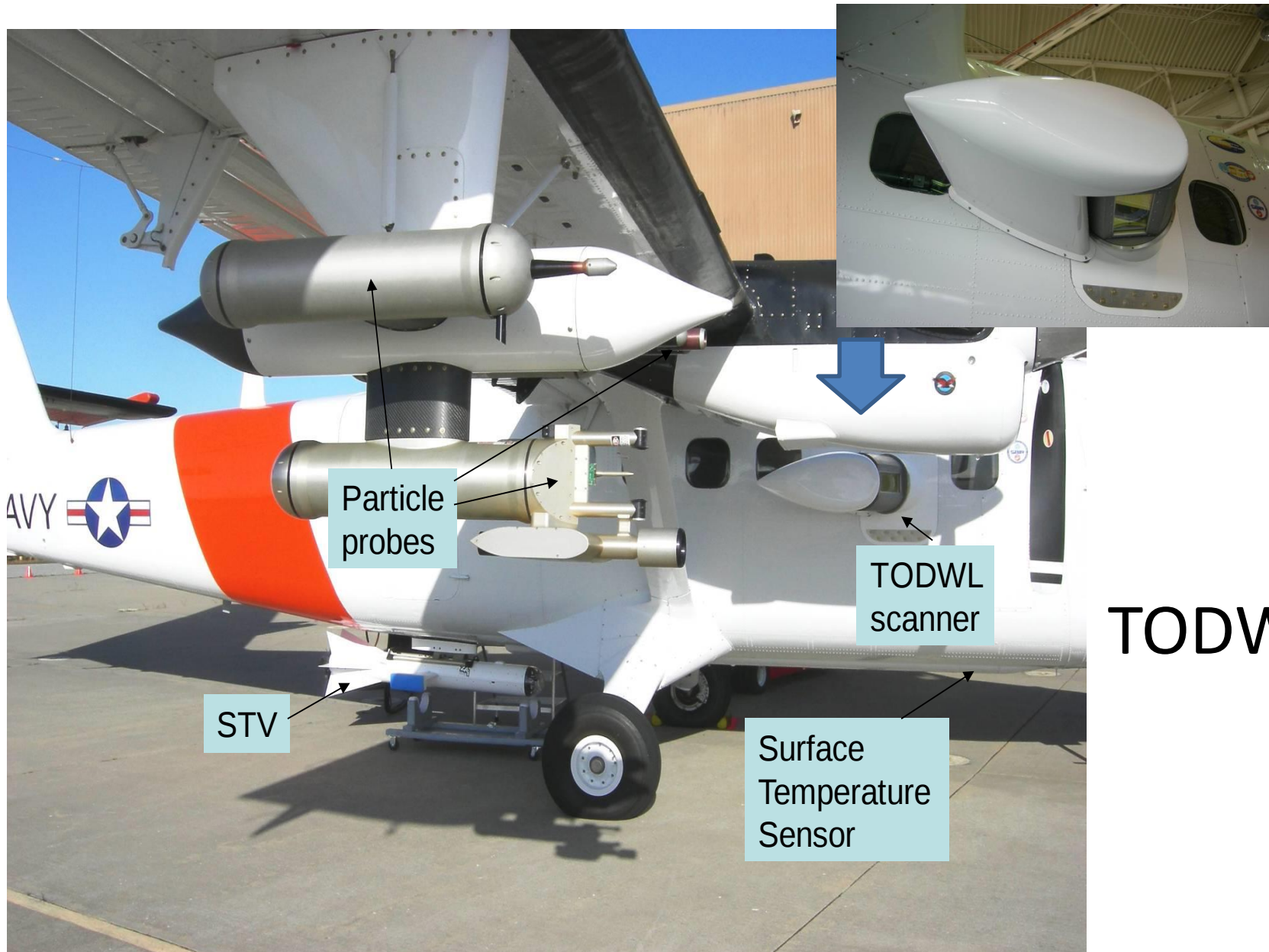
- Science Objectives
- Strategy
- Status of experiments (Marina and Dugway)

Research goal

Contribute to the evaluation and development of the Eddy Diffusivity Mass Flux (EDMF) parameterization by using both existing and new data from the Navy Postgraduate School's Twin Otter Doppler Wind Lidar (TODWL) in an investigation of lower tropospheric dynamics within the interaction zone of complex terrain and the coastal waters, especially in the presence of Organized Large Eddies (OLEs) and Low Level Jets (LLJs).

Additional goals

- Determine the angle between the rolls and the mean wind. Which mean wind?
- Investigate the apparent “integration” effects of the aerosols that persist without correlated velocity structures.



TODWL

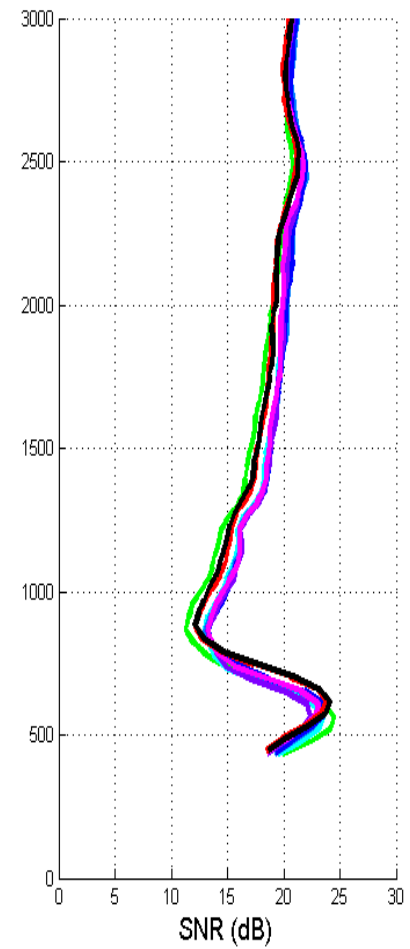
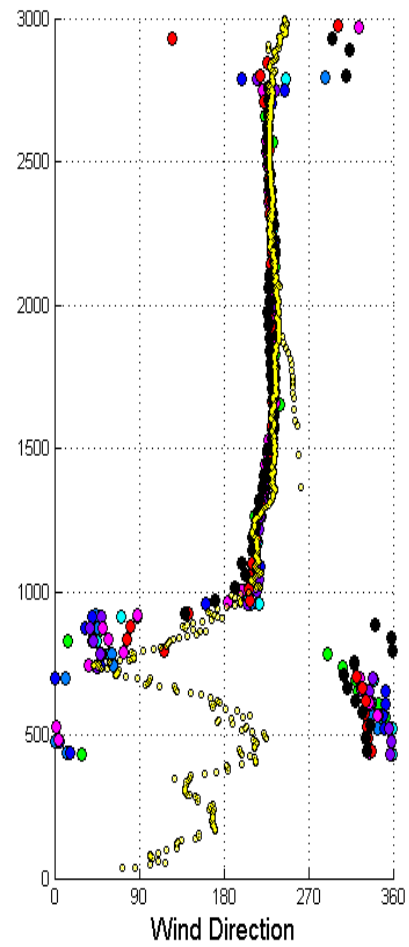
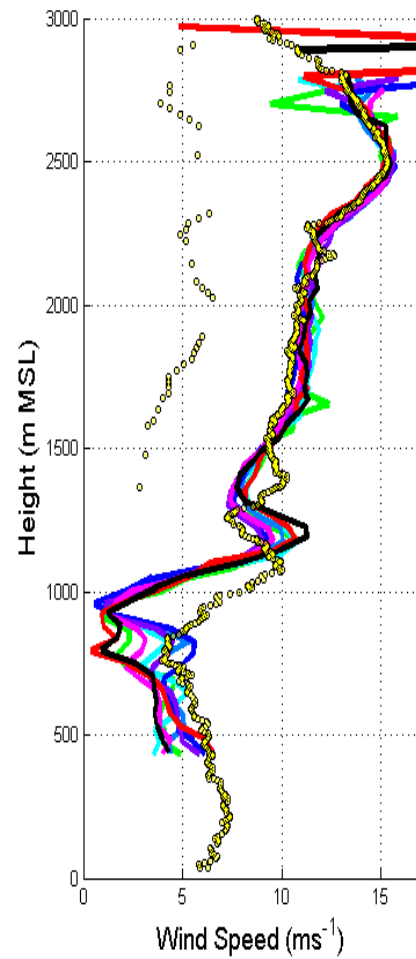


CIRPAS Twin Otter
with
CTV below

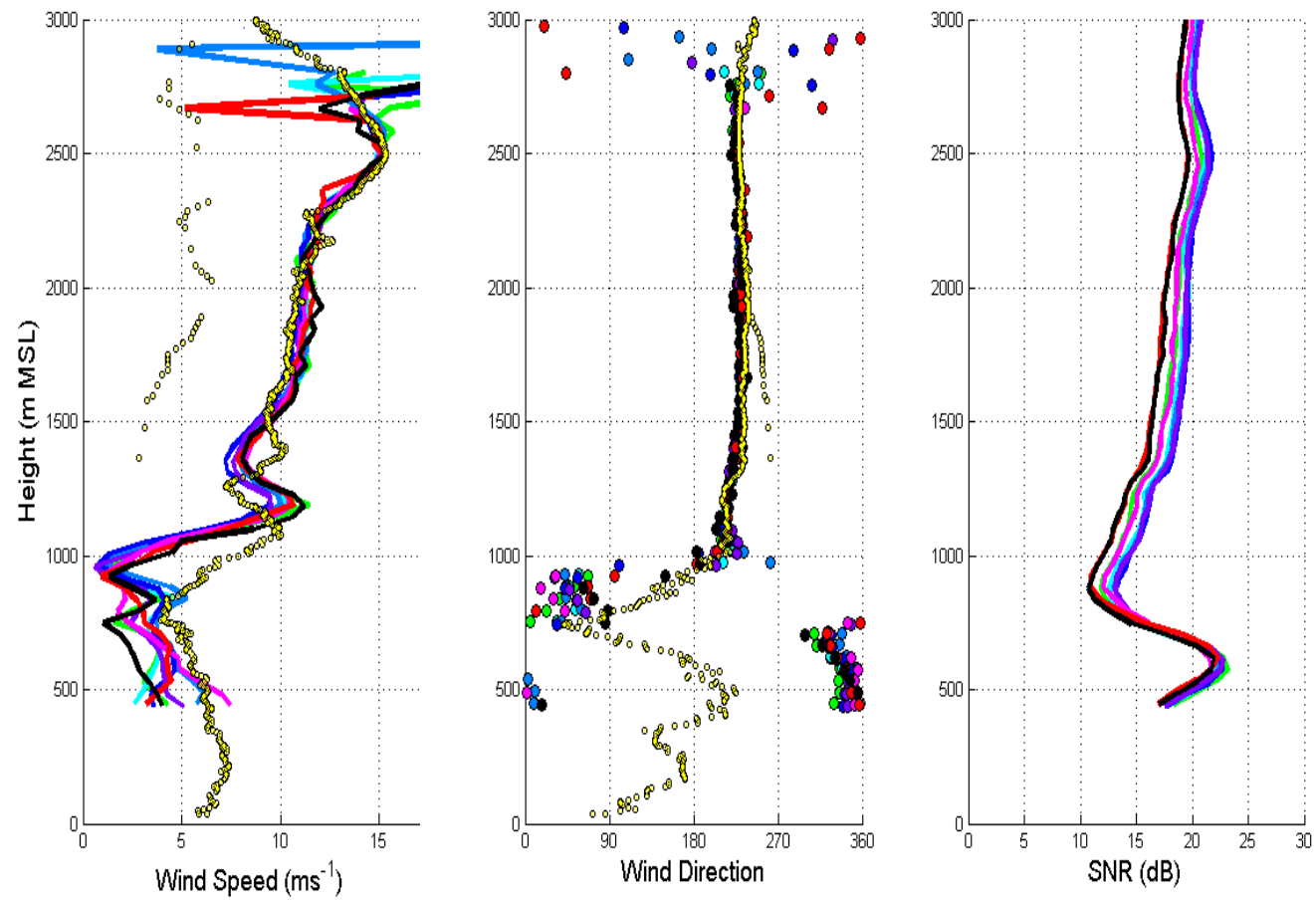
Pallet Wind Observing Lidar Facility (PWOLF)



091712 Lidar Time: 123543 Sonde Time: 115913

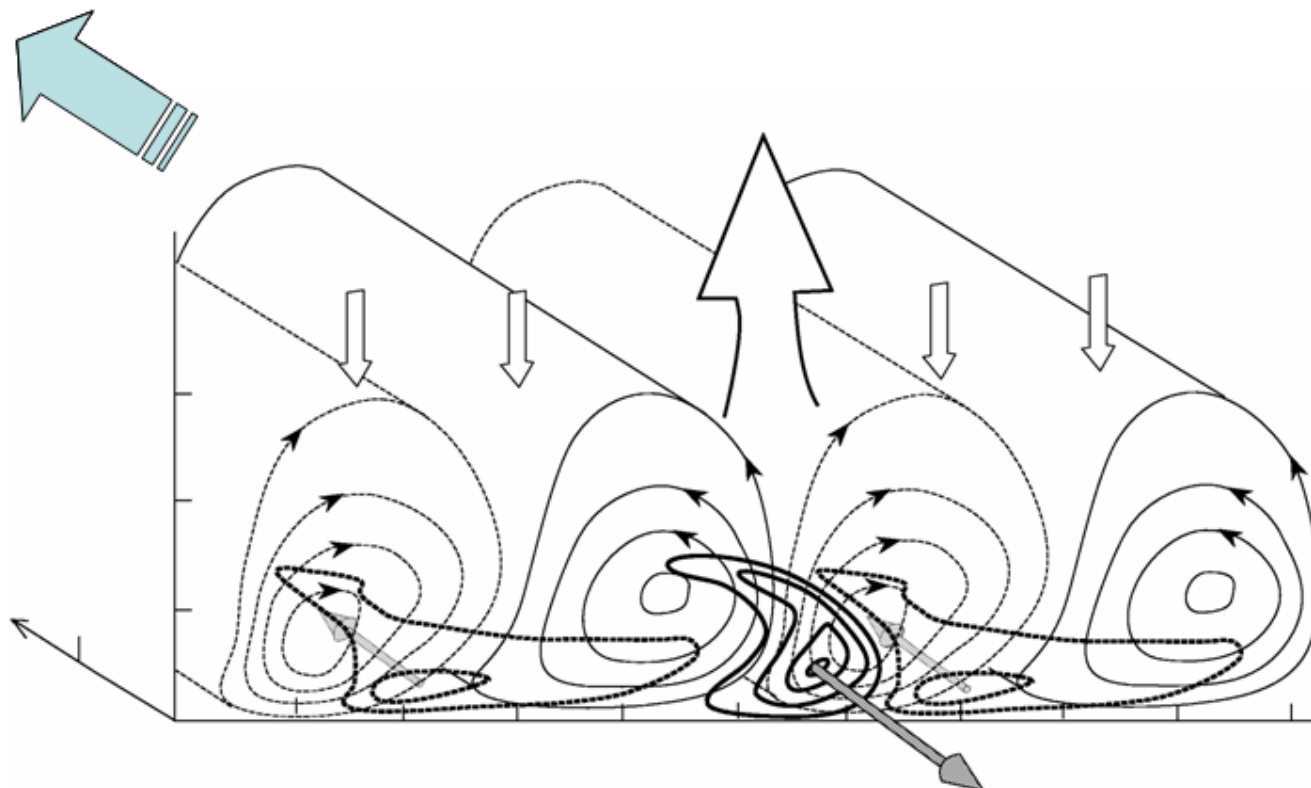


091712 Lidar Time: 124043 Sonde Time: 115913



Coastal studies (land)

- Ridge and valley circulations
- Model validation
- Nocturnal boundary layers
- Low-level-jets (LLJ)
- Organized Large Eddies

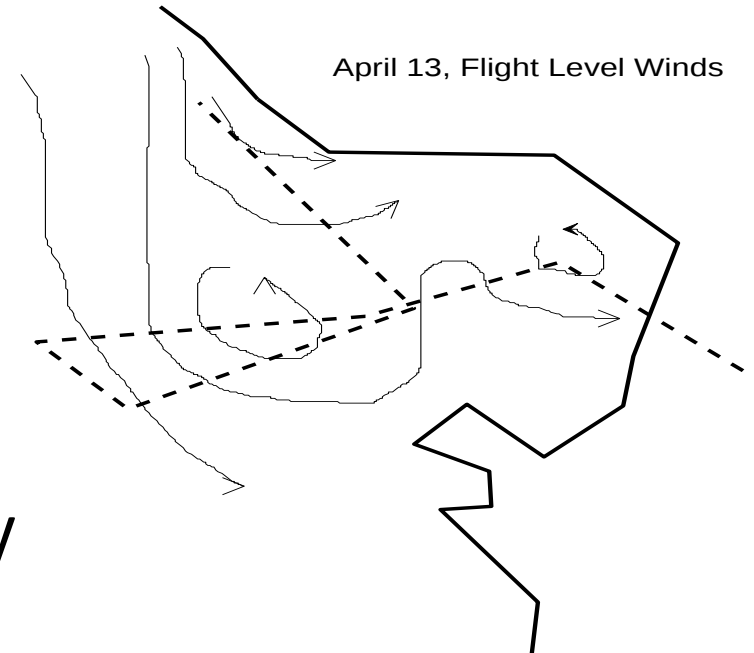
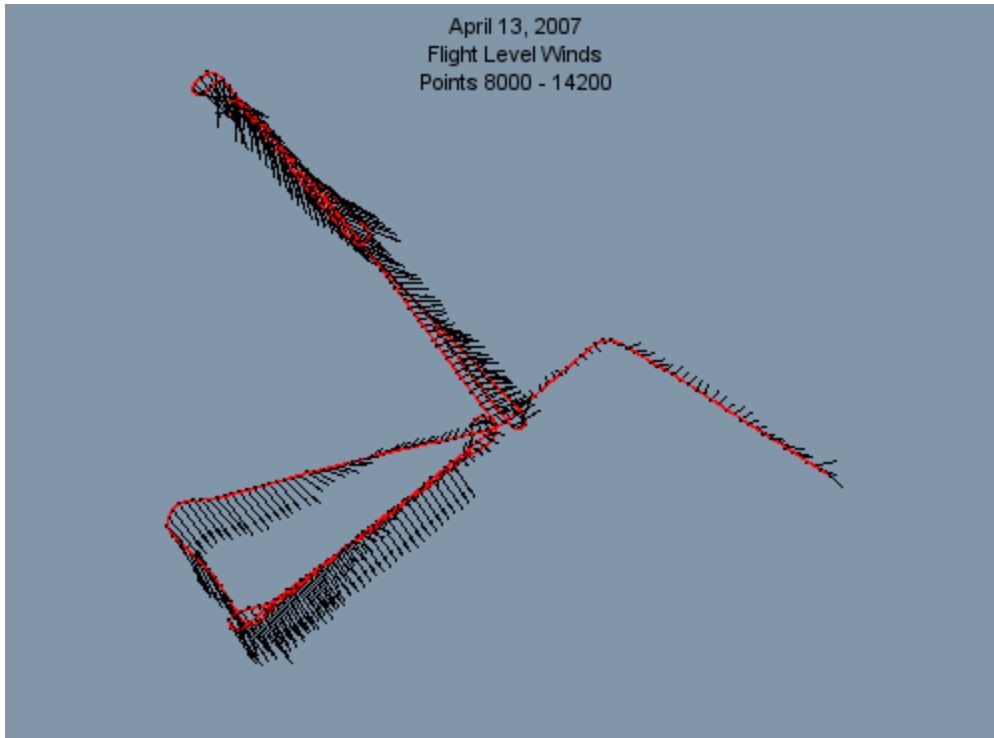


Wavelength: Larger-scale structures ~ 700 to 5000 m
Smaller-scale structures ~ 300 to 700 m

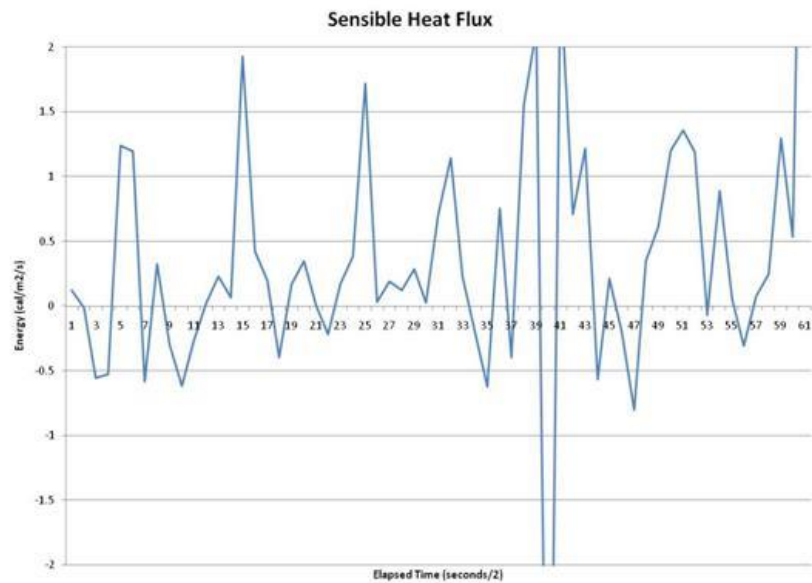
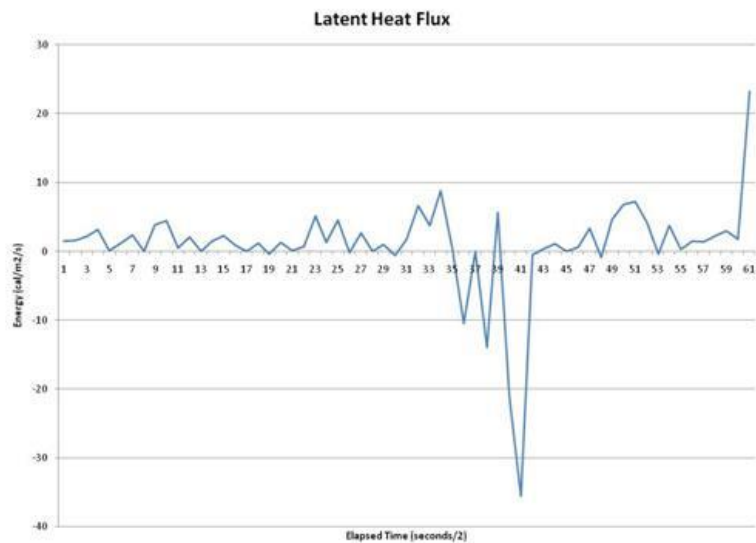
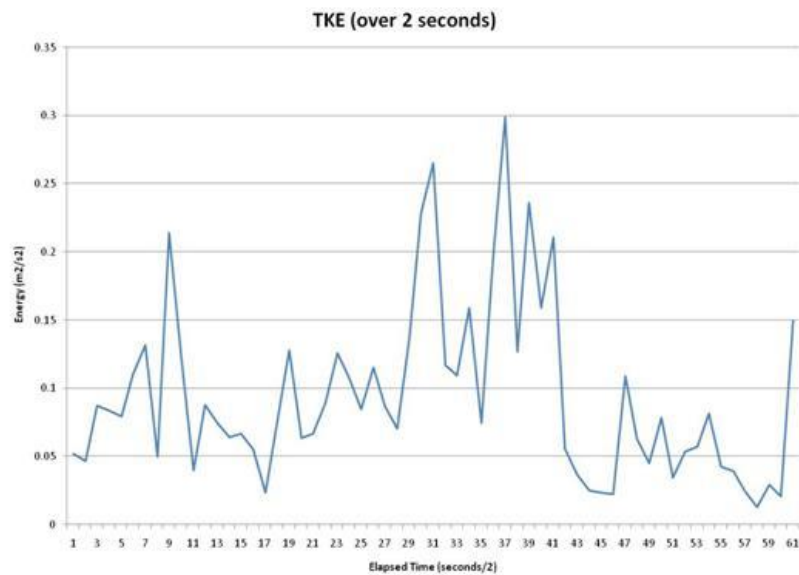
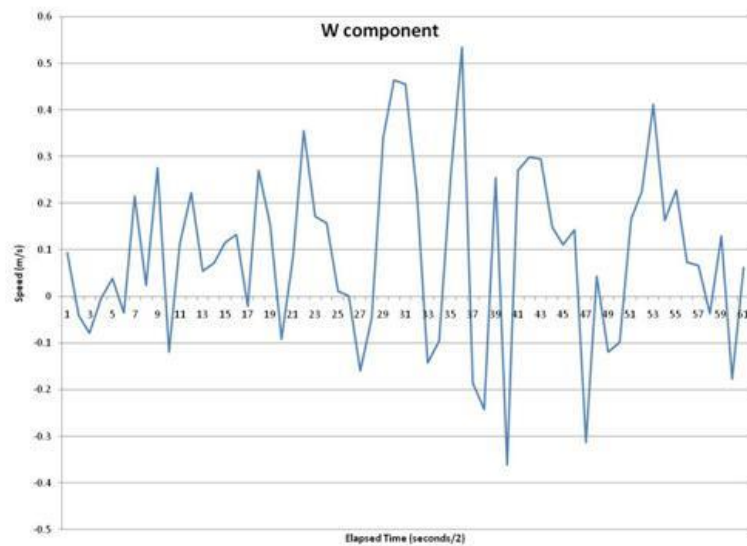
Velocity Perturbations: $\pm 7 \text{ m s}^{-1}$ typical
DOW $\pm$ "10s of" m s^{-1}

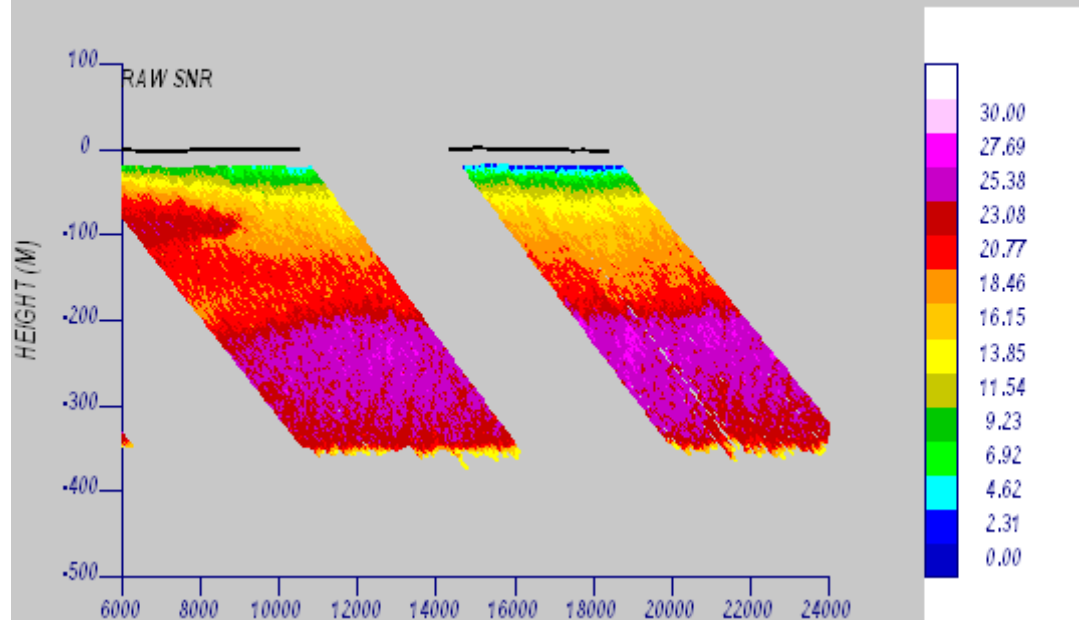
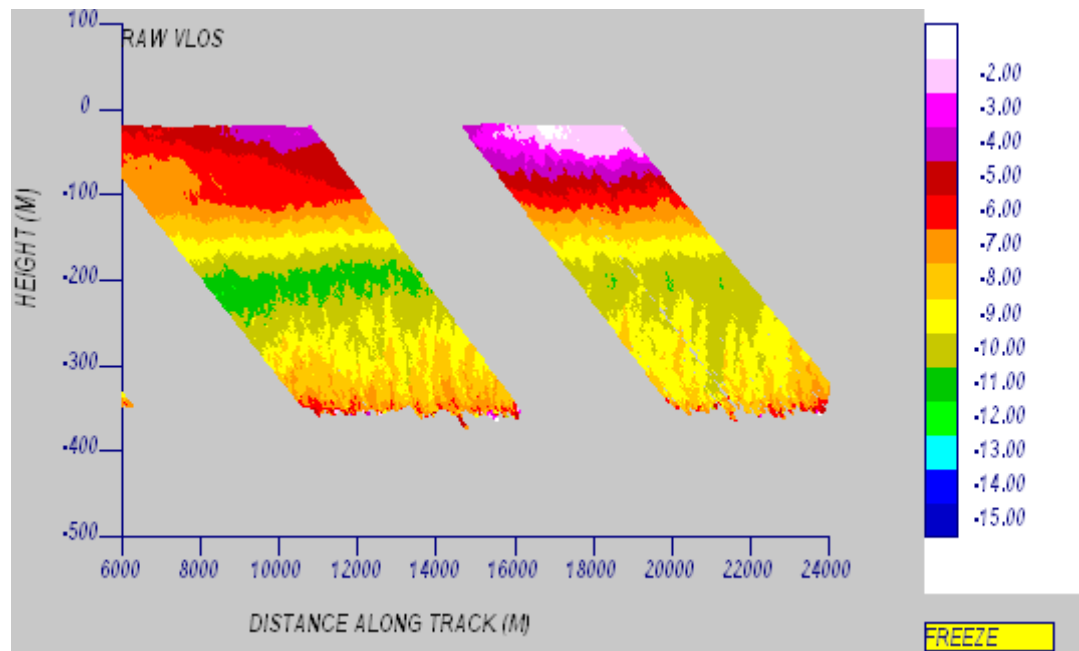
Orientation: Typically along-mean TCBL wind, wide variability

Prevalence: Larger-scale structures ~ unknown, (35% to 70%)
Smaller-scale structures: ***Always Present***

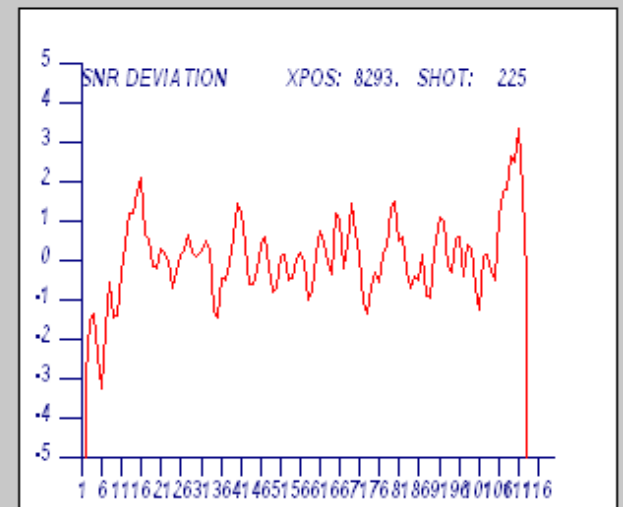
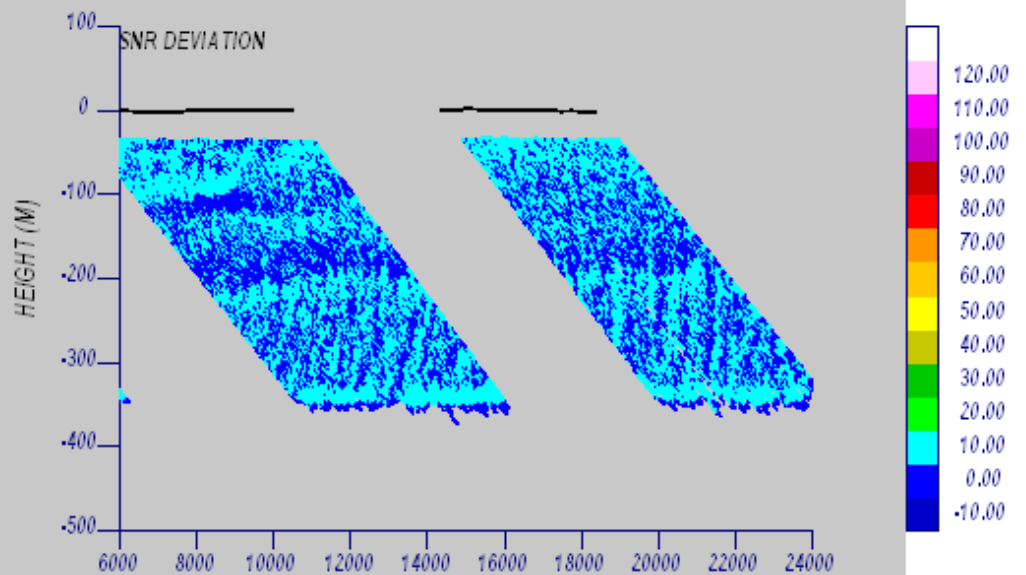
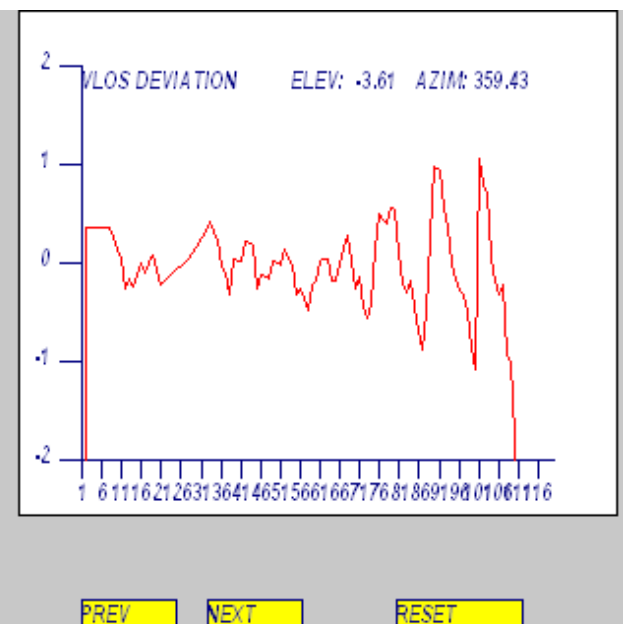
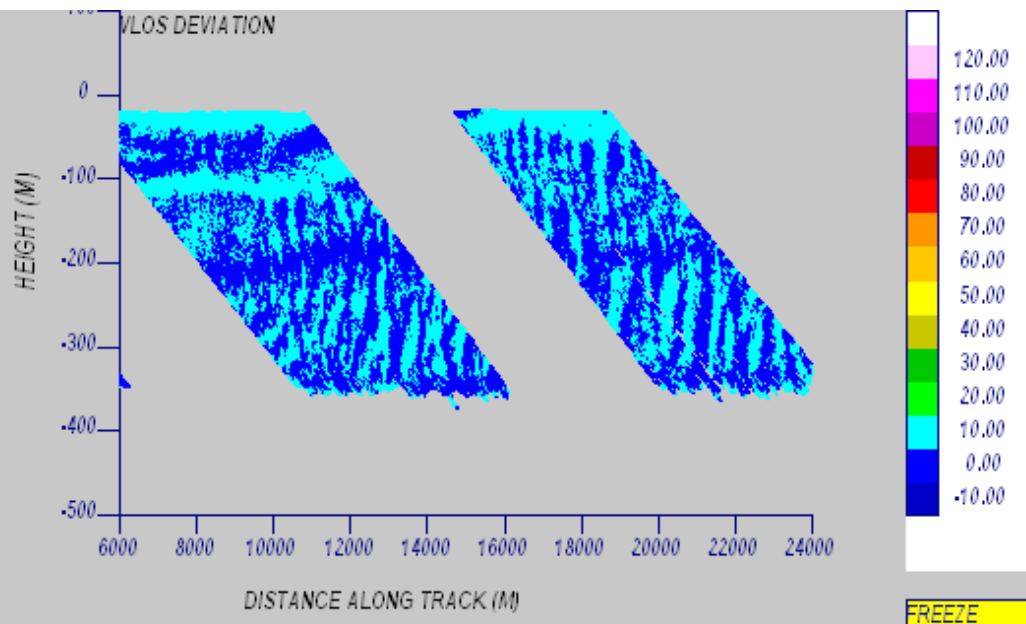


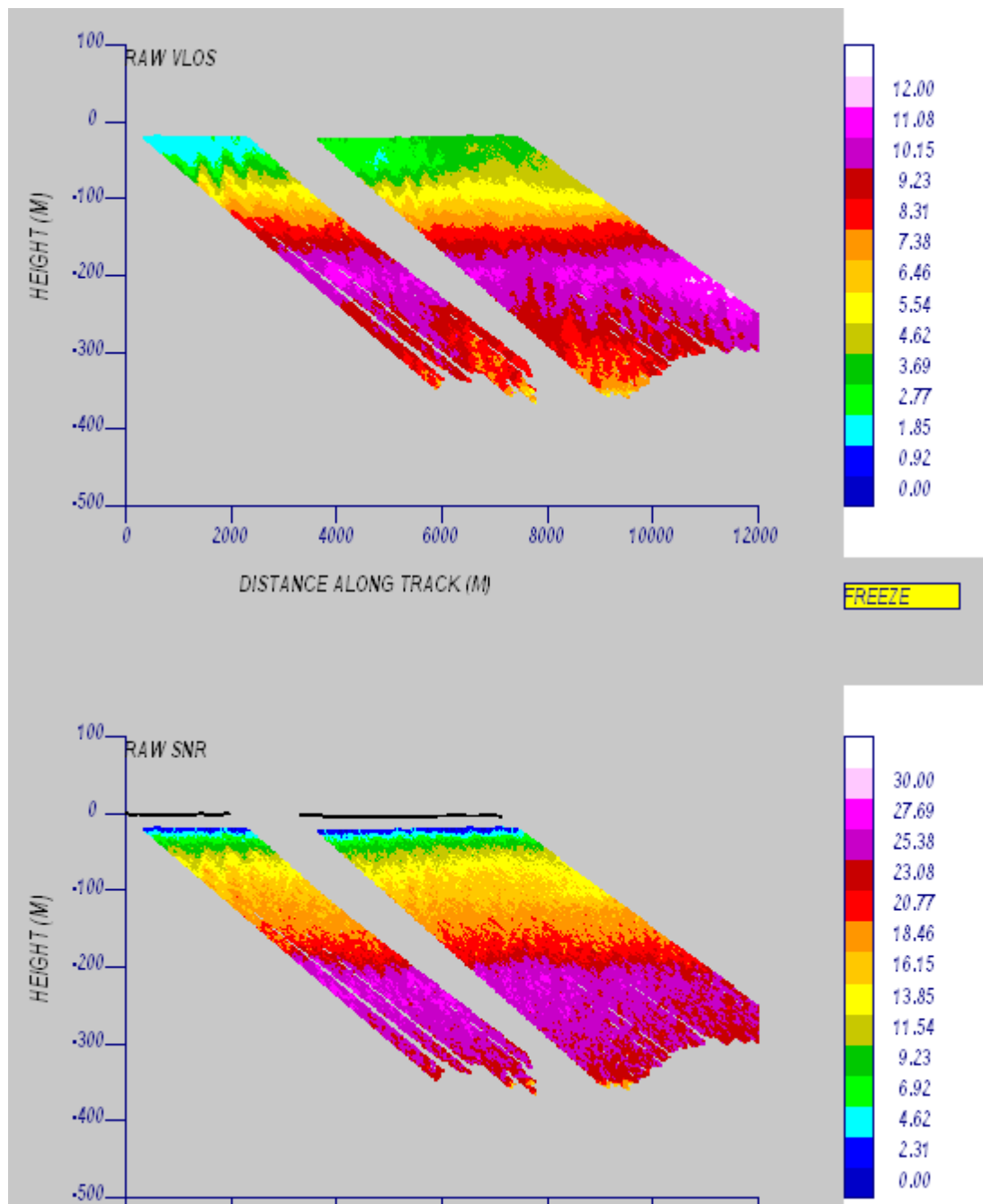
April 13, 2007 flights with CTV



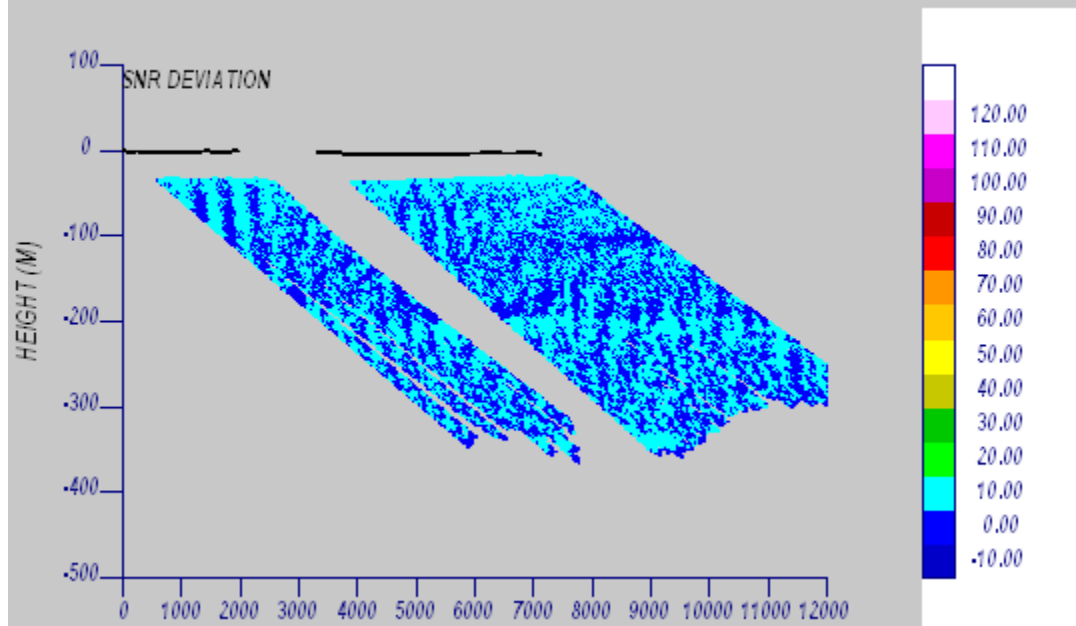
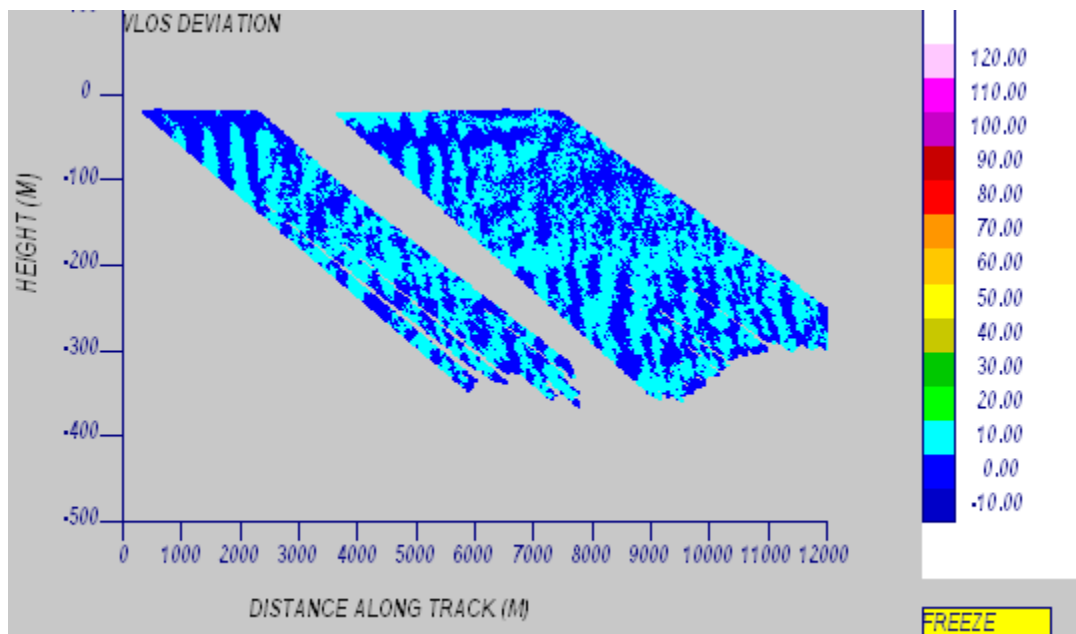


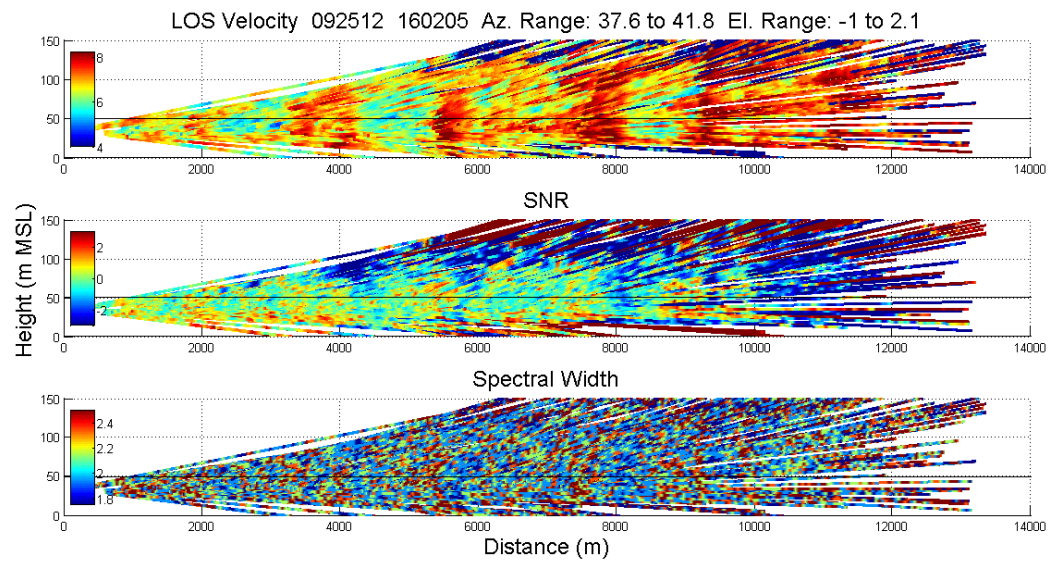
SE





NW





Summary

- One good Salinas Valley mission
- One good off shore aerosol street case.
 - CTV flown at different levels in the MBL
- Final processing data in progress.