

CuPIDO Workshop: Lidar Research at ASU

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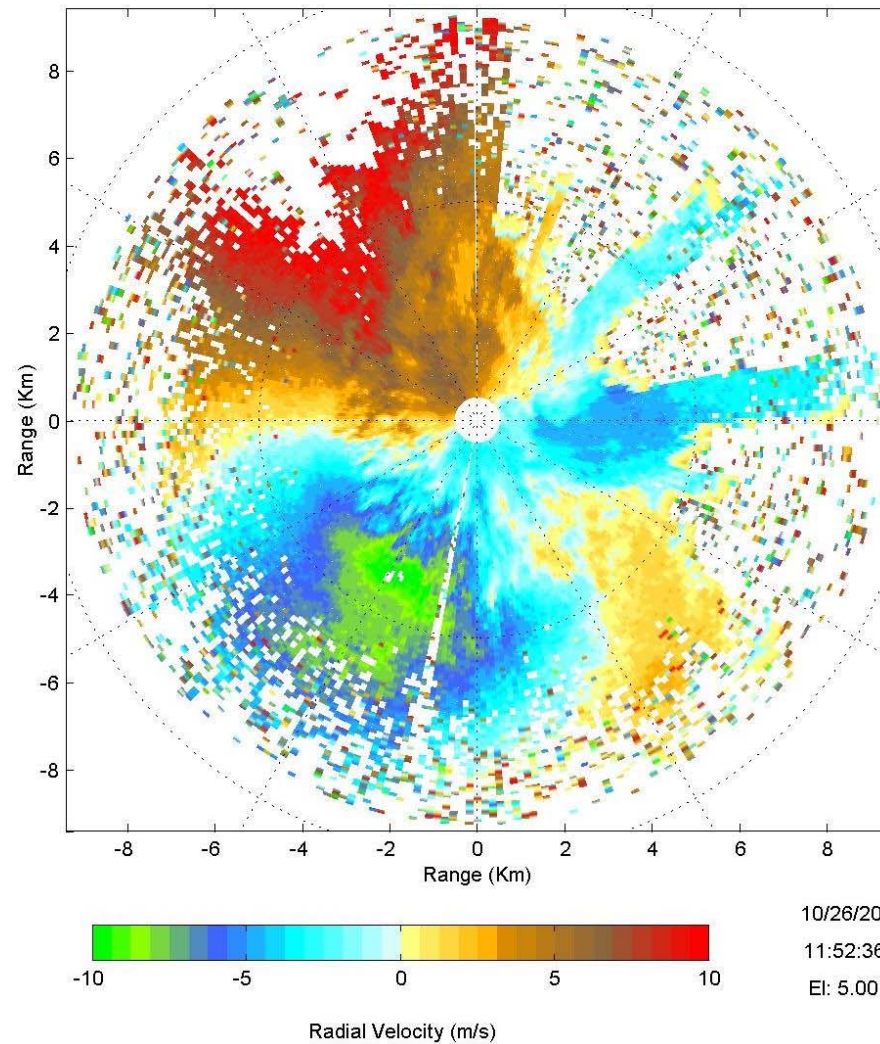


ARIZONA STATE UNIVERSITY

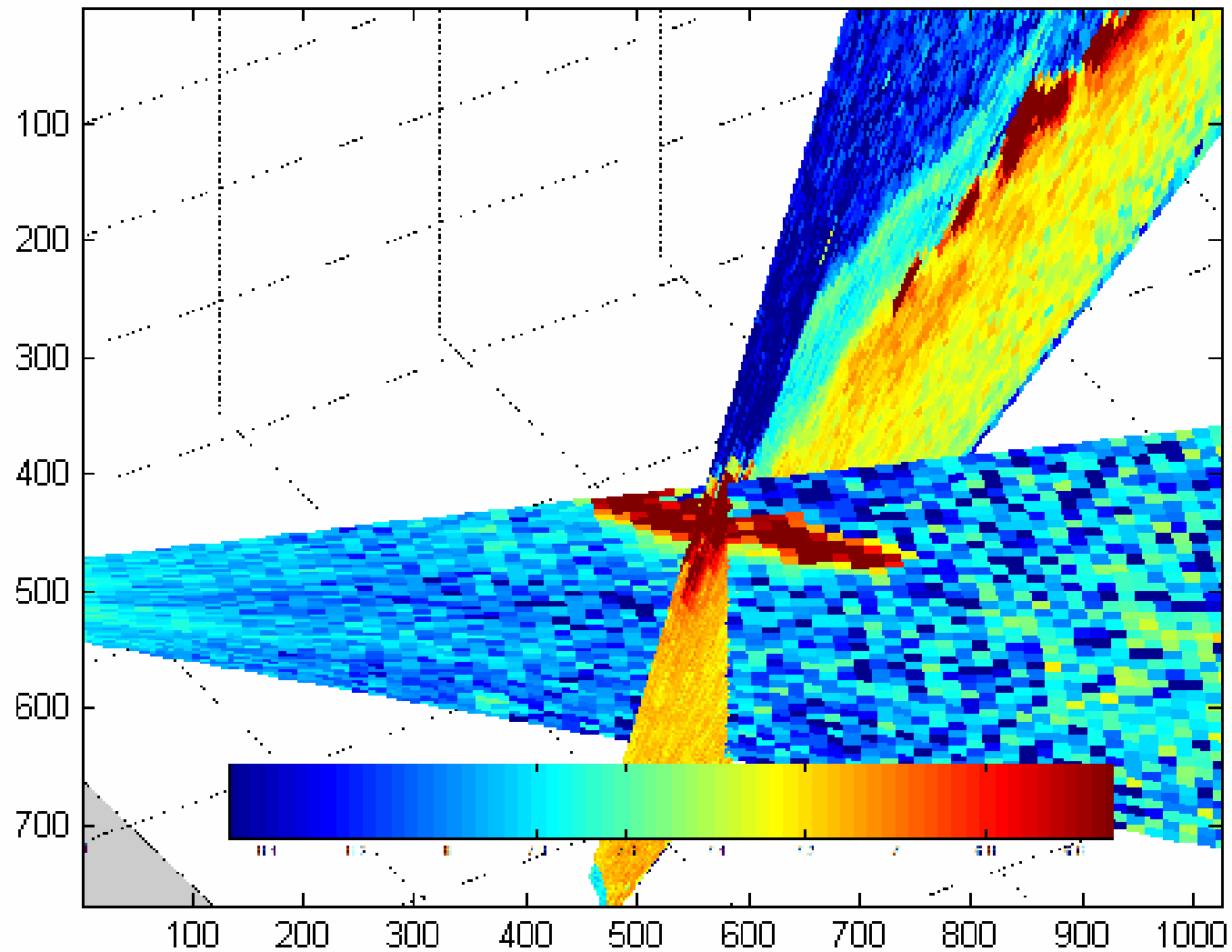
Basics of Lidar

- Coherent Doppler
- 500 PRF
- 6-10 km radial range
- 60m range gates
- Fine azimuthal resolution possible
- Aerosol backscatter and Radial Velocities
- 0.5 m/s velocity accuracy

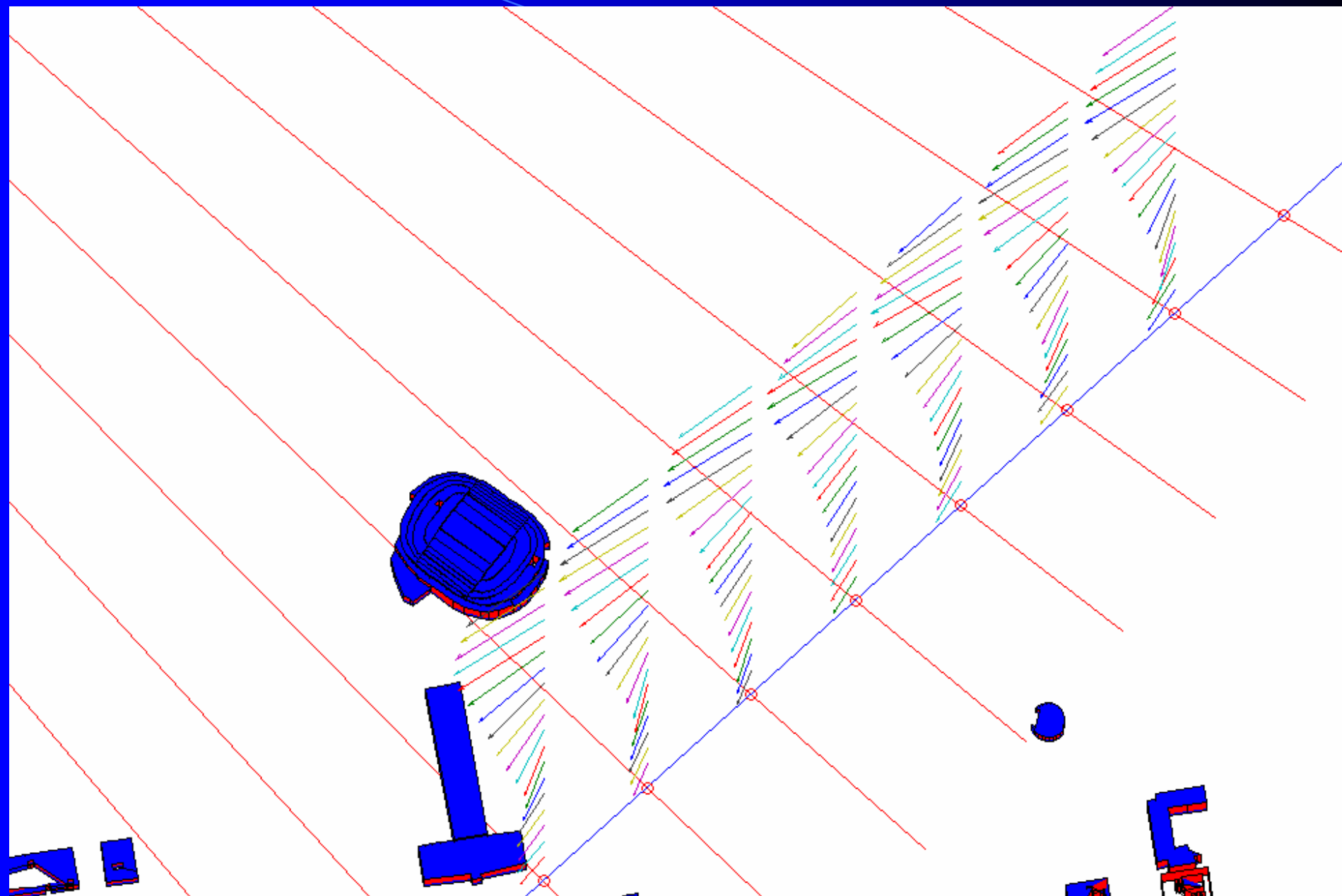
Urban Dispersion Experiment: Salt Lake City (Oct. 2000)



JU2003 Overlapping lidar scans



Retrieval of Velocity Vectors from Overlapping RHI scans



Dispersion Experiments – JU2003

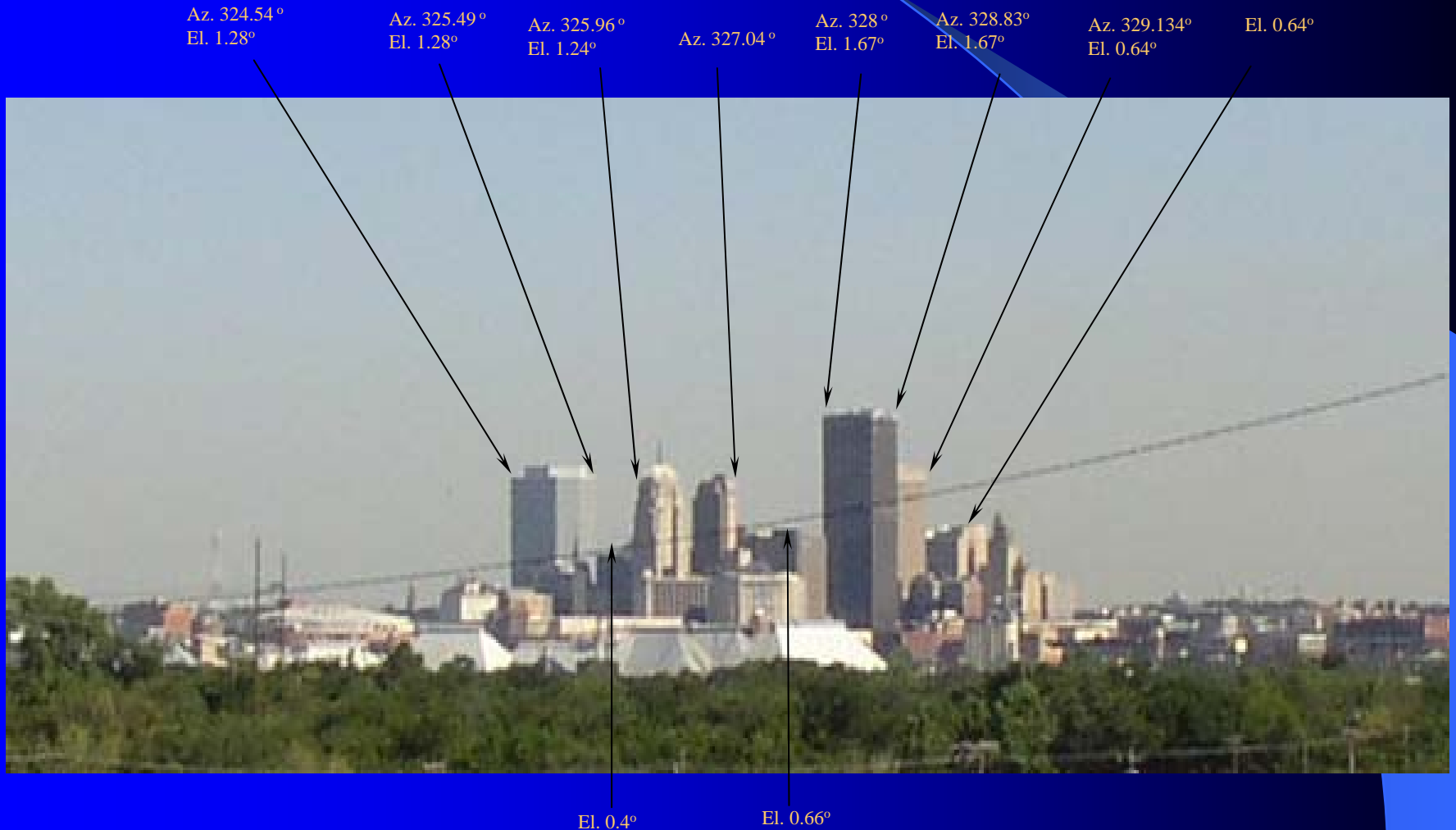
Provide Inflow Conditions

- Experiment Focused on Central Business District
- Determined ASU Location and IOP Scan Patterns

Non-IOP Times Open to Discretionary Scans

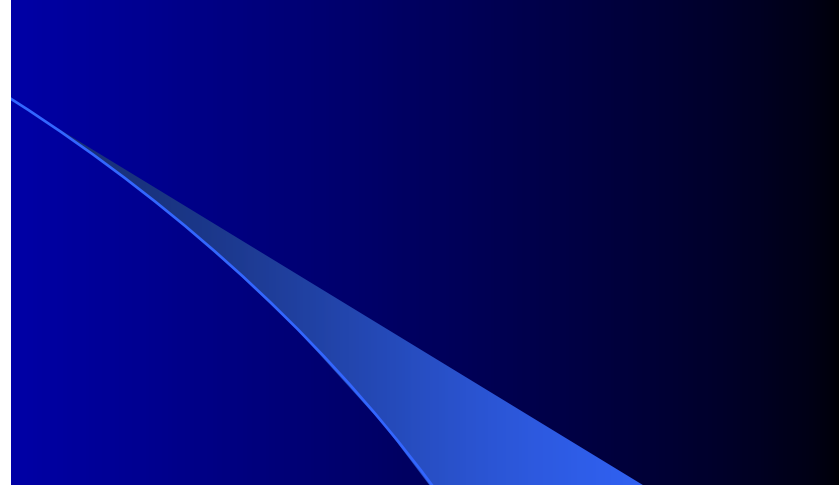
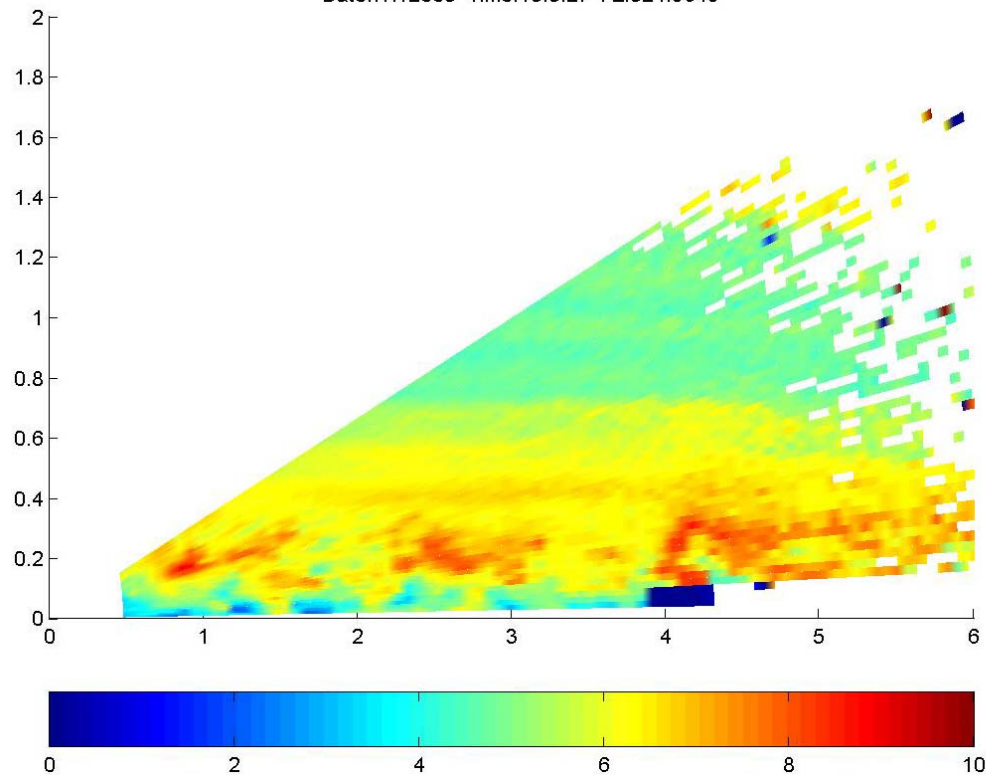


ASU Lidar Perspective

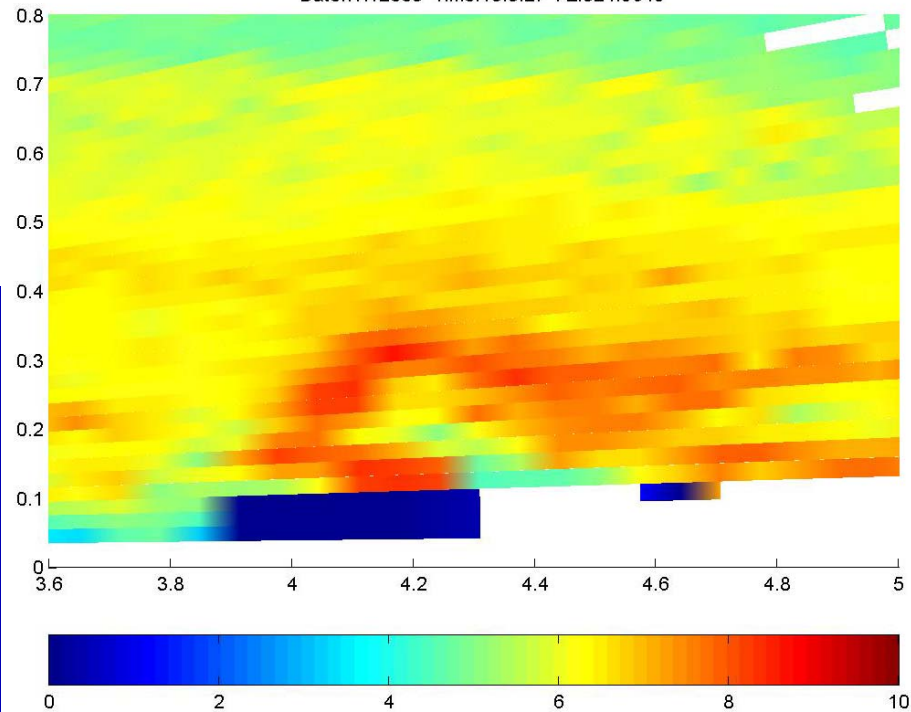


Disturbances in BL Thickness

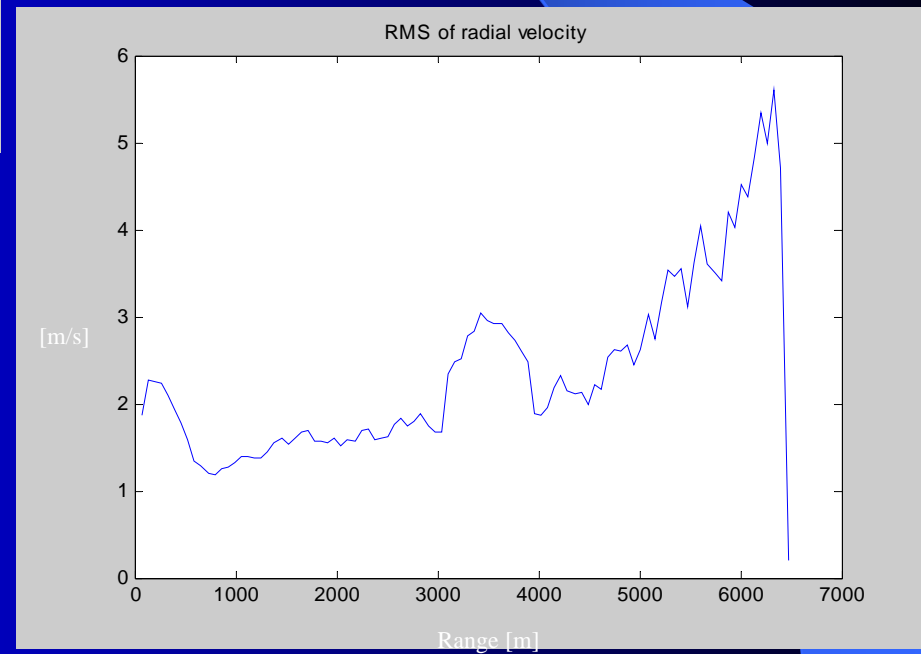
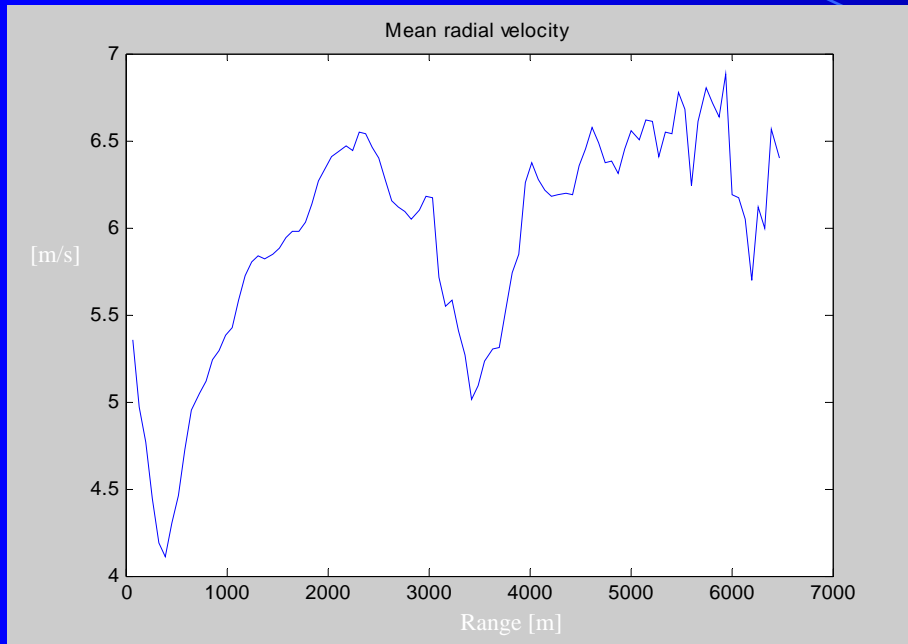
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Date:7/7/2003 Time:13:3:27 Az:324.9649

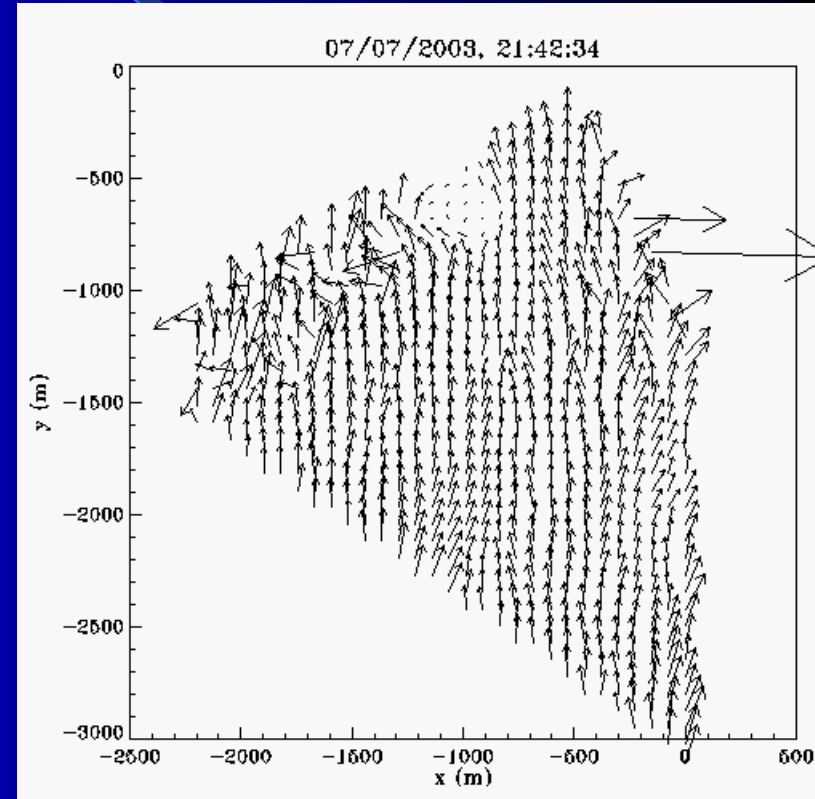


Measured Velocity



Dual Lidar Opportunities

- Data Extraction from Coordinated Scans
 - Intersecting RHI
 - Extract Vectors at Intersections
 - Planar overlapping PPI
 - Dual Doppler Retrieval
 - Plume Tracking
 - ARL Data will soon be available



Tracking plume movement with backscatter fields

ASU Lidar

JU2003

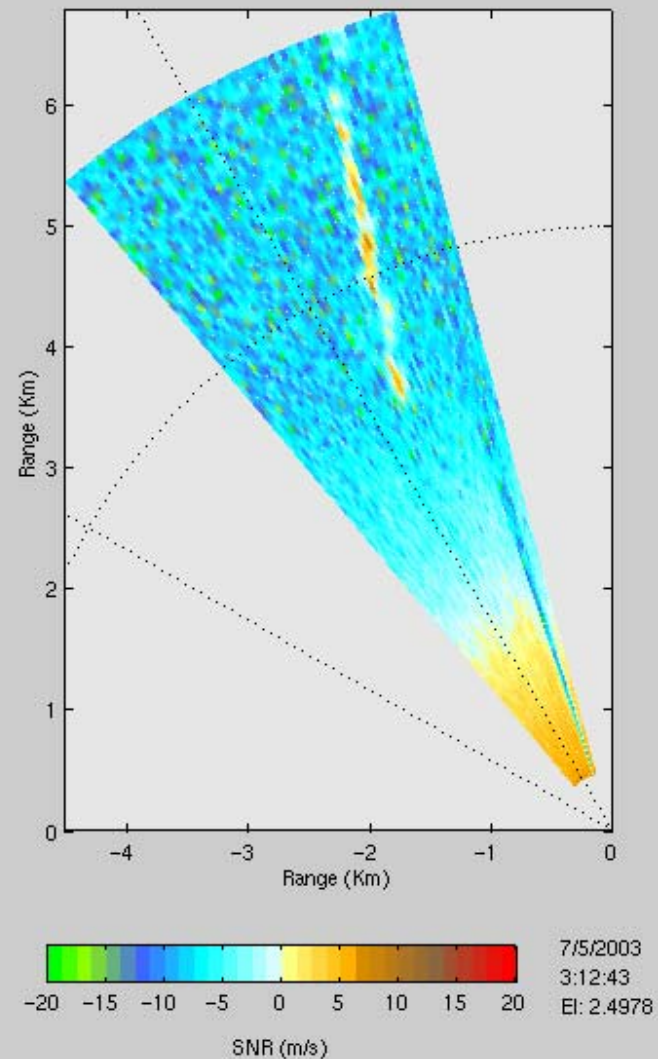
July 8

El: 0.5°

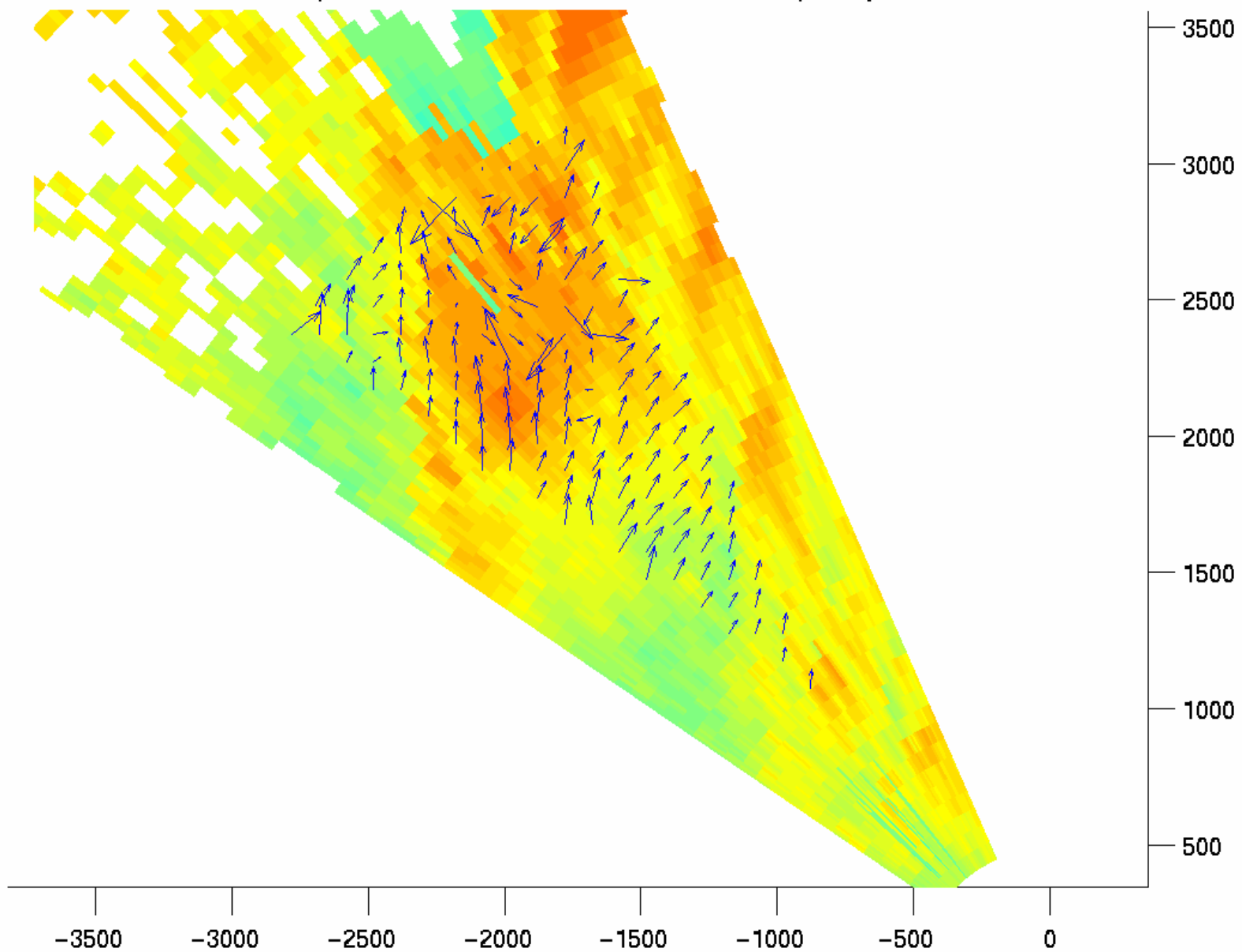
3:45 UTC

10:45 PM

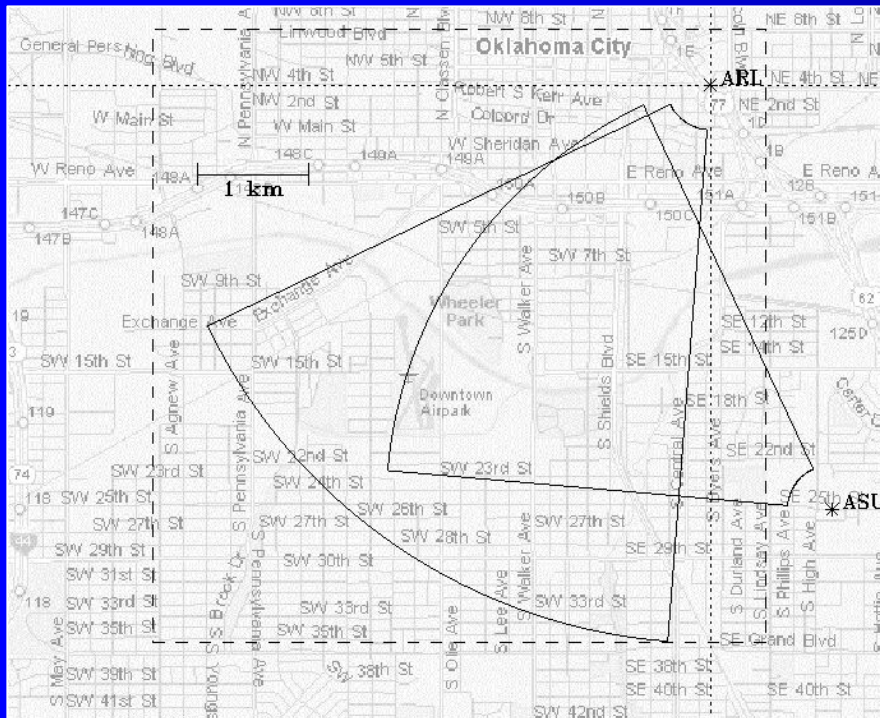
Local



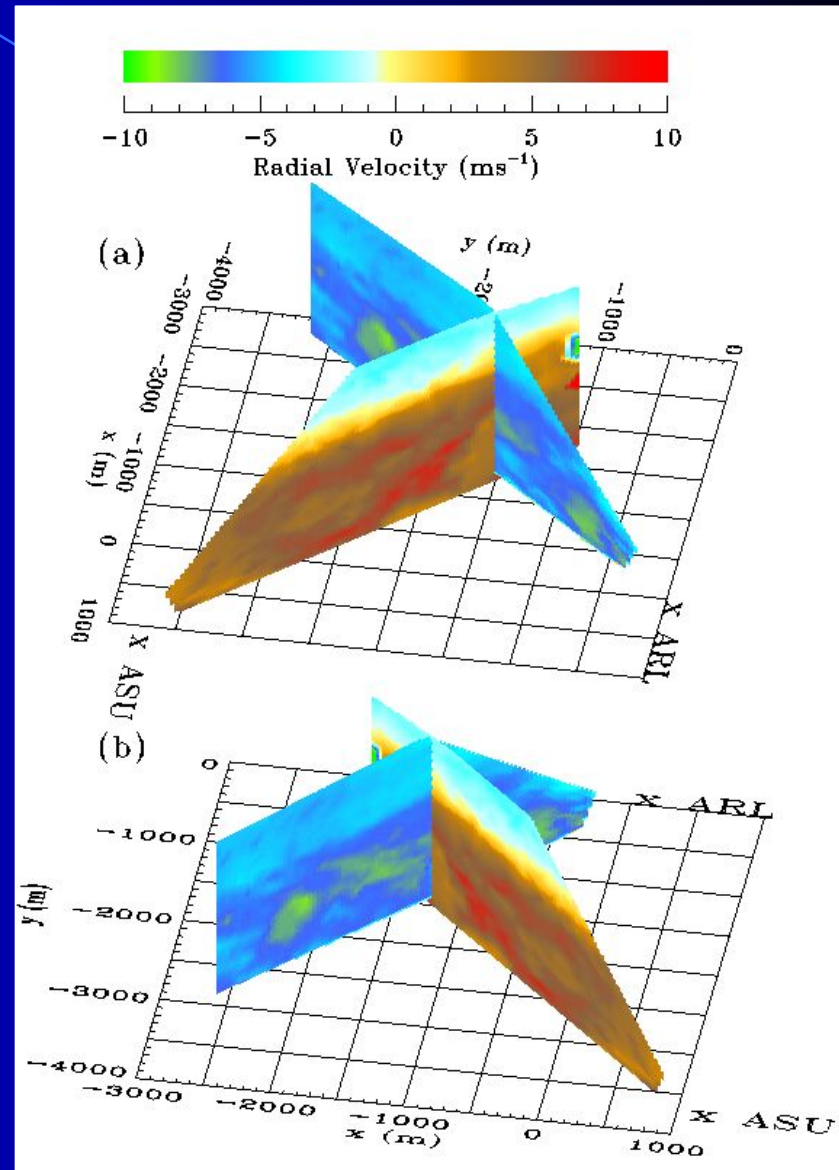
Sweeps 18 to 19, Pattern size = 200, Search Spacing 100



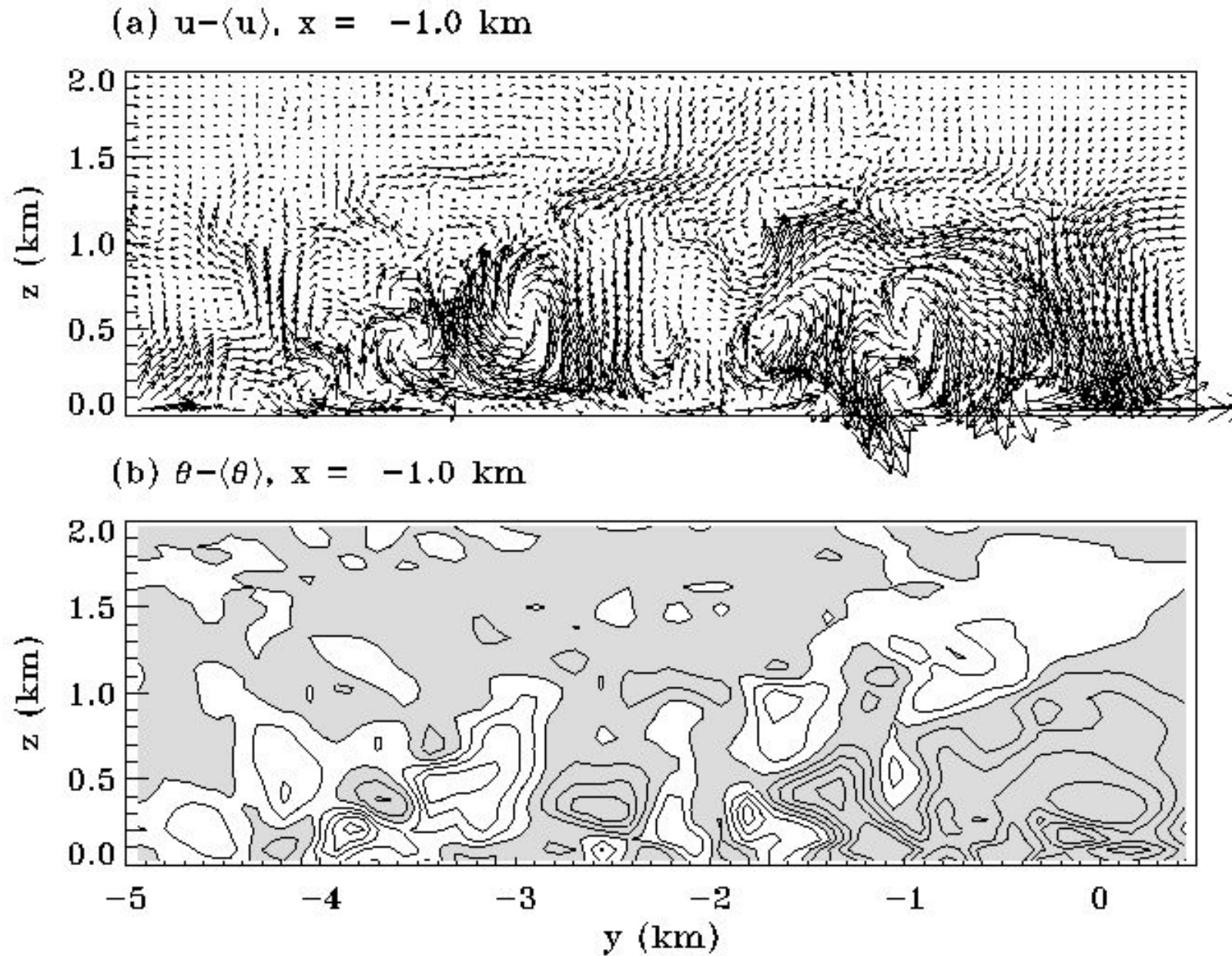
Collaborations with 4DVAR Researchers (Newsom et al 2003)



Data acquired on 11 July, 2003 (1300 CDT). The ARL lidar - RHI raster scans with elevation angles ranging from 0° to 45° at 8°s^{-1} , and azimuth angles ranging from 184.4° to 244.4° in 5° steps. The ASU lidar - a similar scan with azimuth angles ranging from 275° to 335° . Processing for both systems - 66-m range resolution and 100 pulse averaging, implying a 5 Hz beam rate.



Results of 4DVAR from CG/AR -ARL-ASU: from R. Newsom 2003



END