

Observations and Models of Urban Scale Meteorology CCNY Deployments

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****Some data presented here is preliminary and not quality assured**

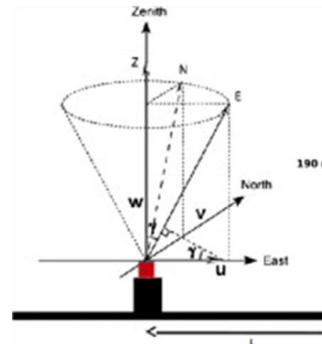
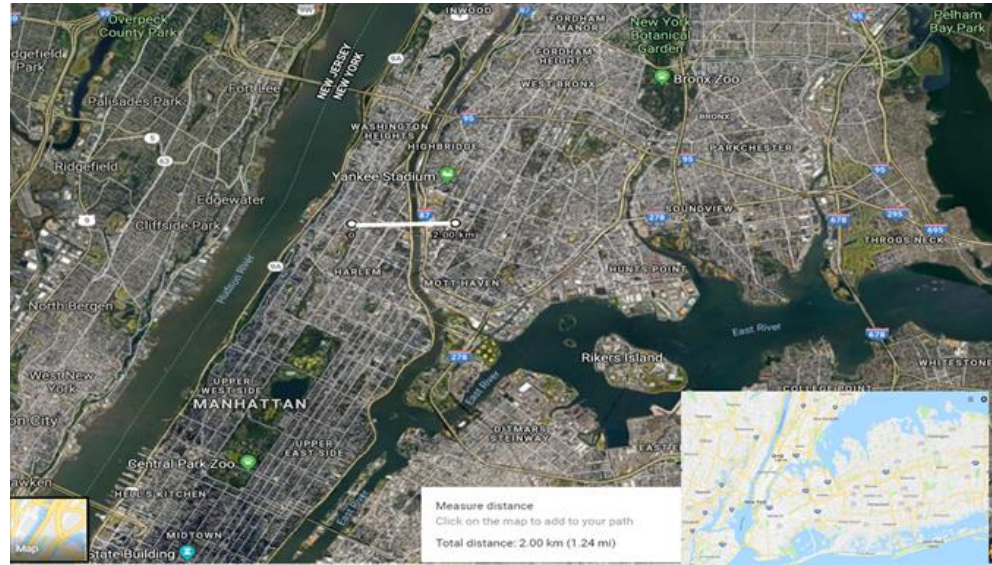
Special Thanks
to Tim Berkoff NASA

Profiling Instruments, location and Scan Strategies

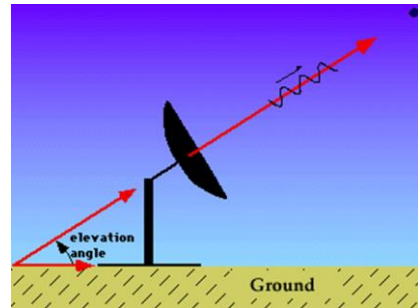
Three Co-operating Doppler Wind Lidars



- 1. Halo Photonics Streamline
- 2. Halo Pro
- 3. Leosphere 200S
(200S moved to CT in mid summer 2018 to co-operate with NASA Ozone Lidar)



Conical Scan:
Profiles mean
wind fields



Range Height Indicator
(RHI) scan:
Lidar is scanned in
Elevation at a fixed
azimuth
(East in this case)

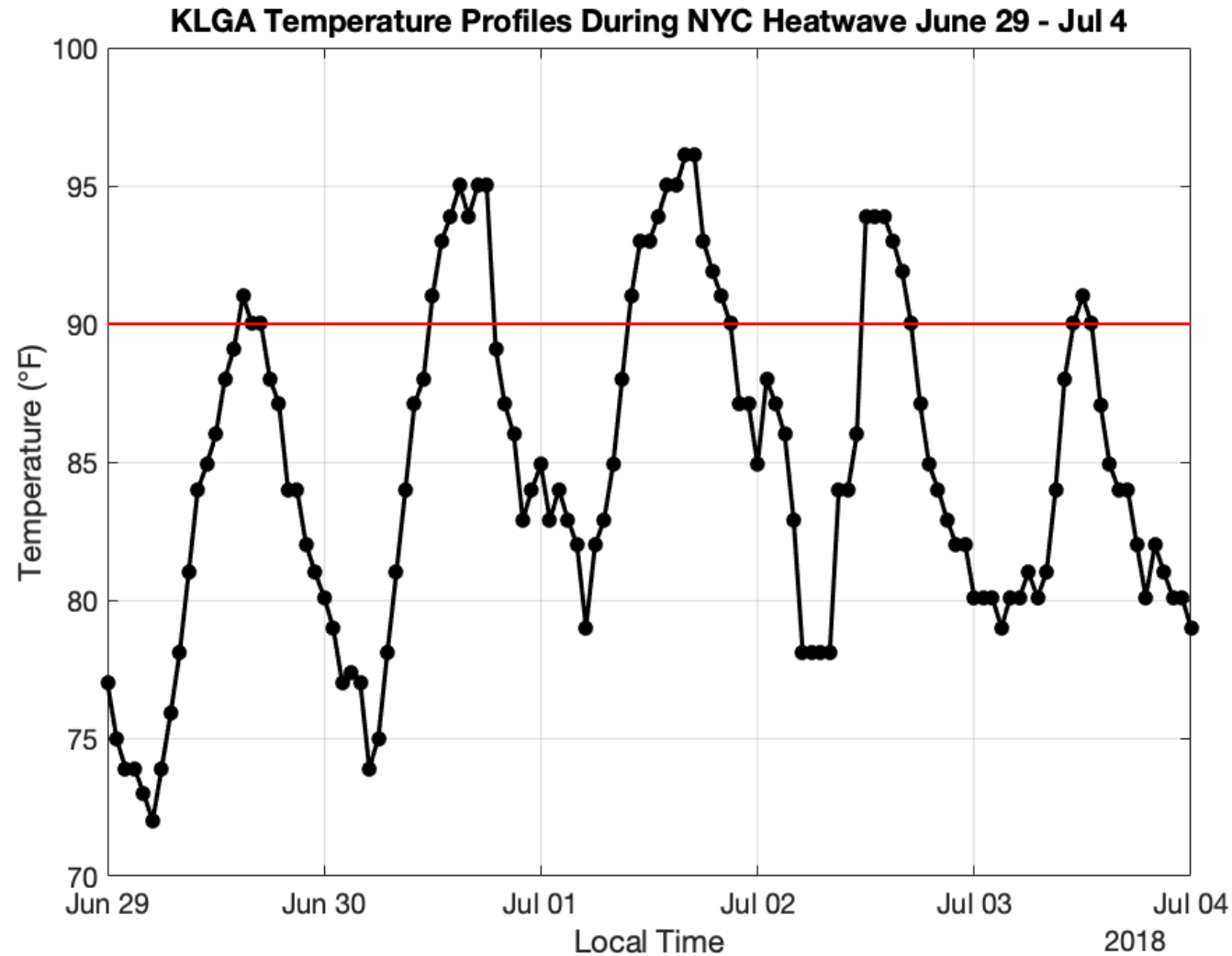
Microwave Radiometer



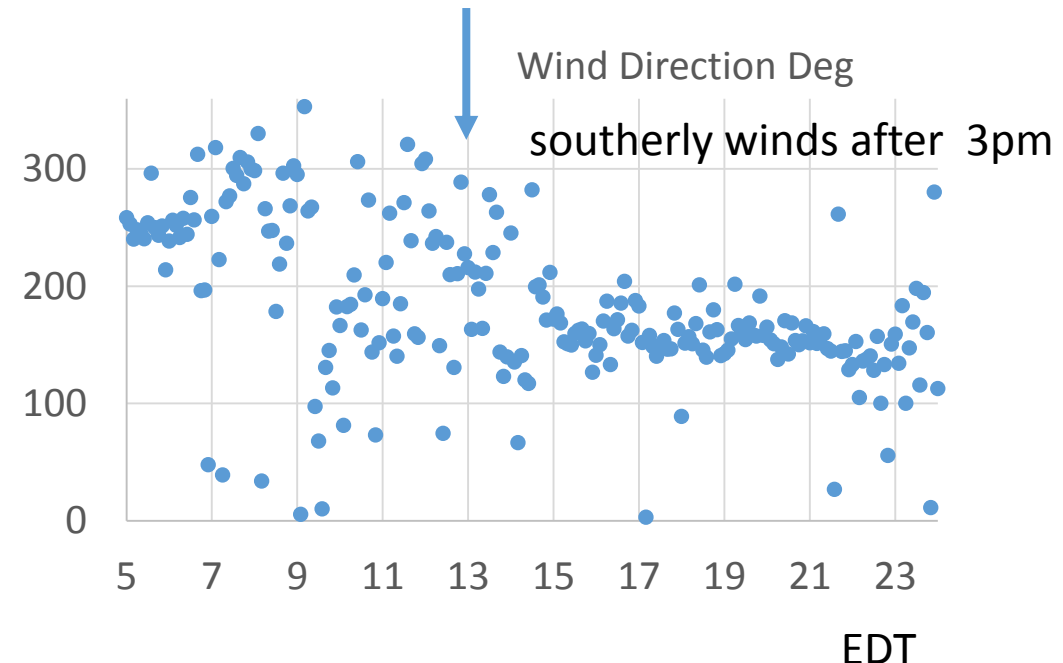
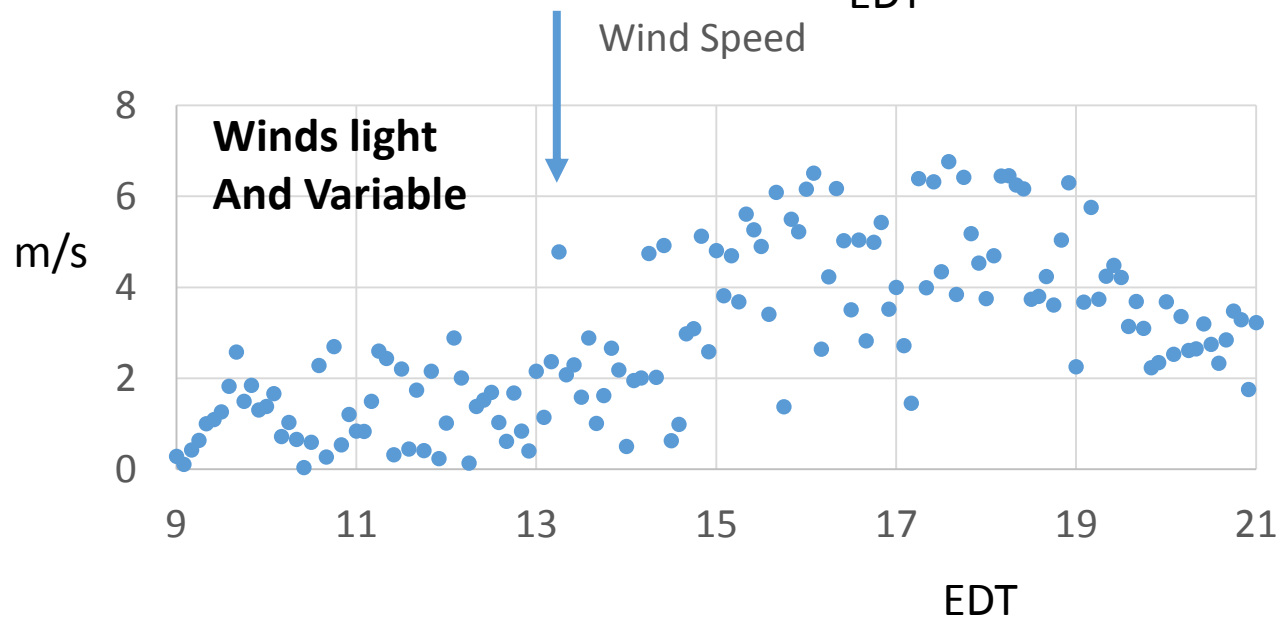
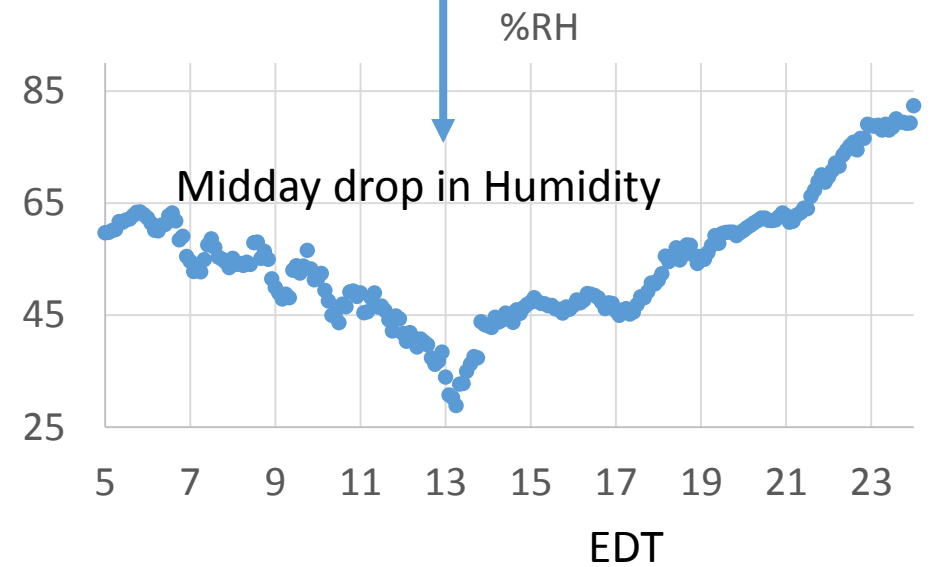
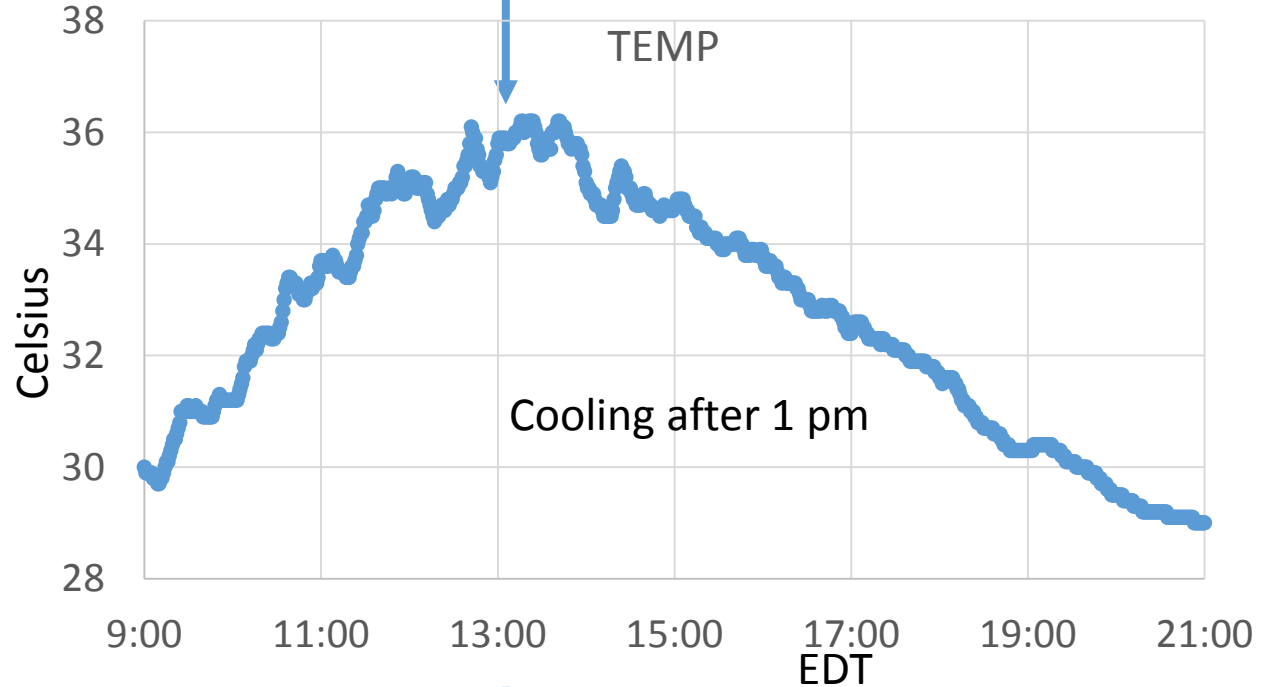
Temperature and humidity
profiling at CCNY

Heat Wave 1: NYC

June 29, 2018 – July 4, 2018

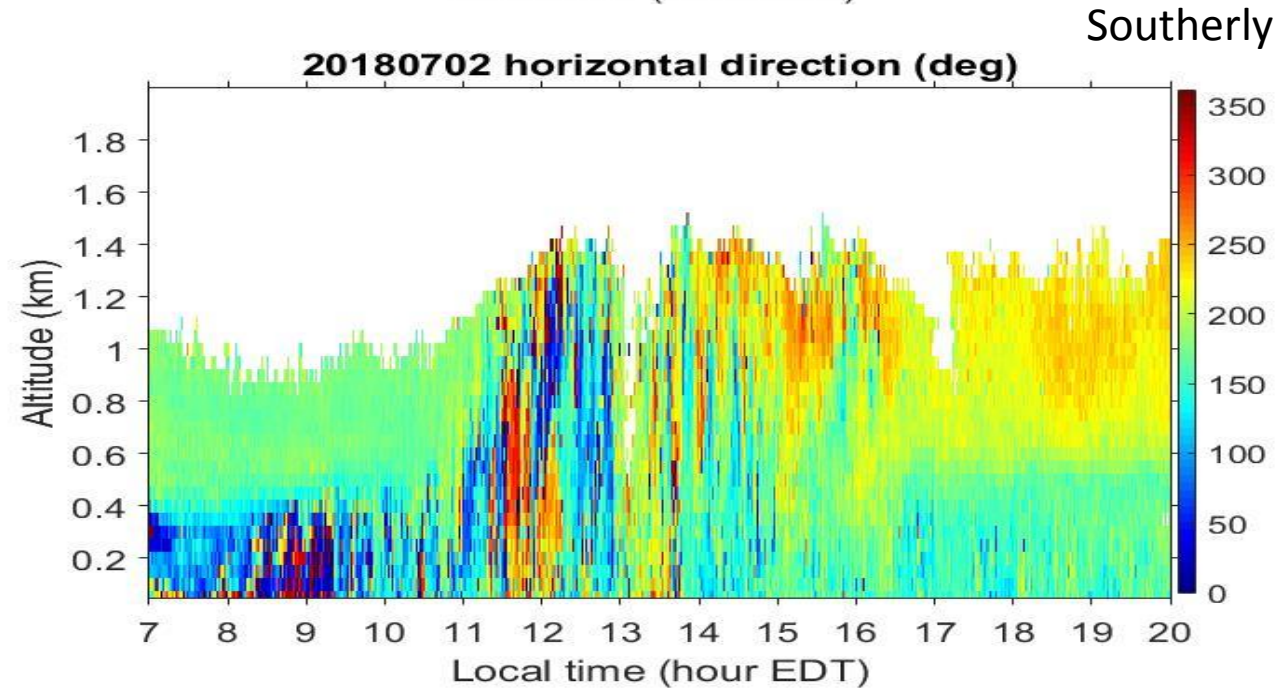
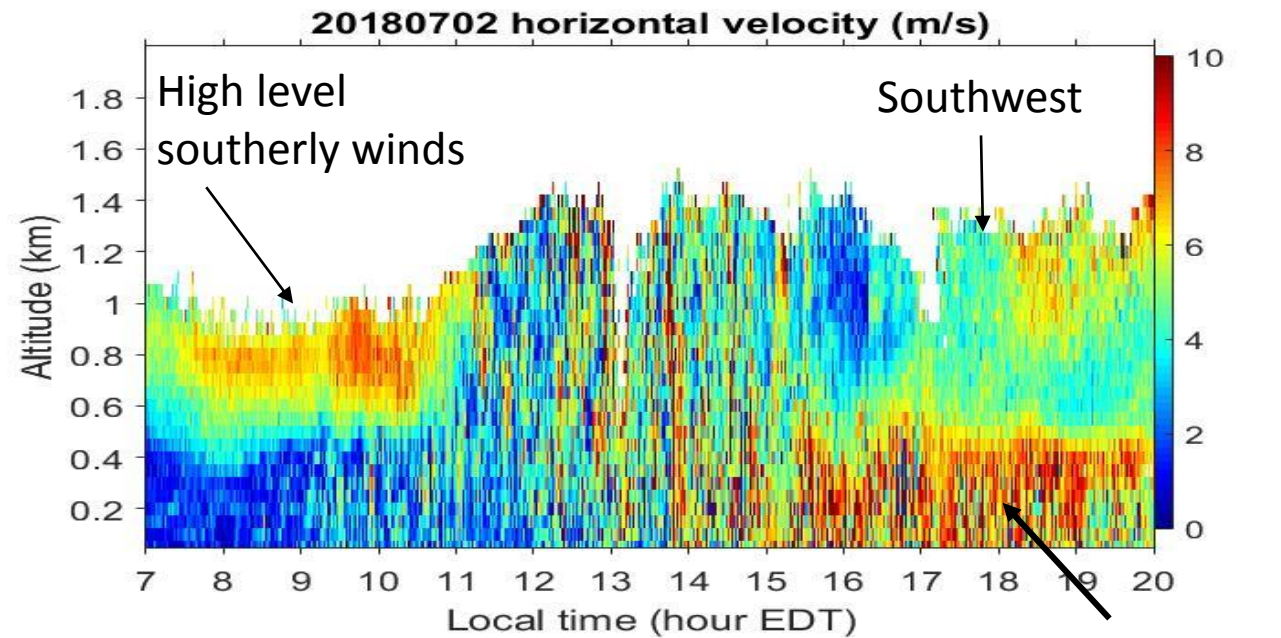
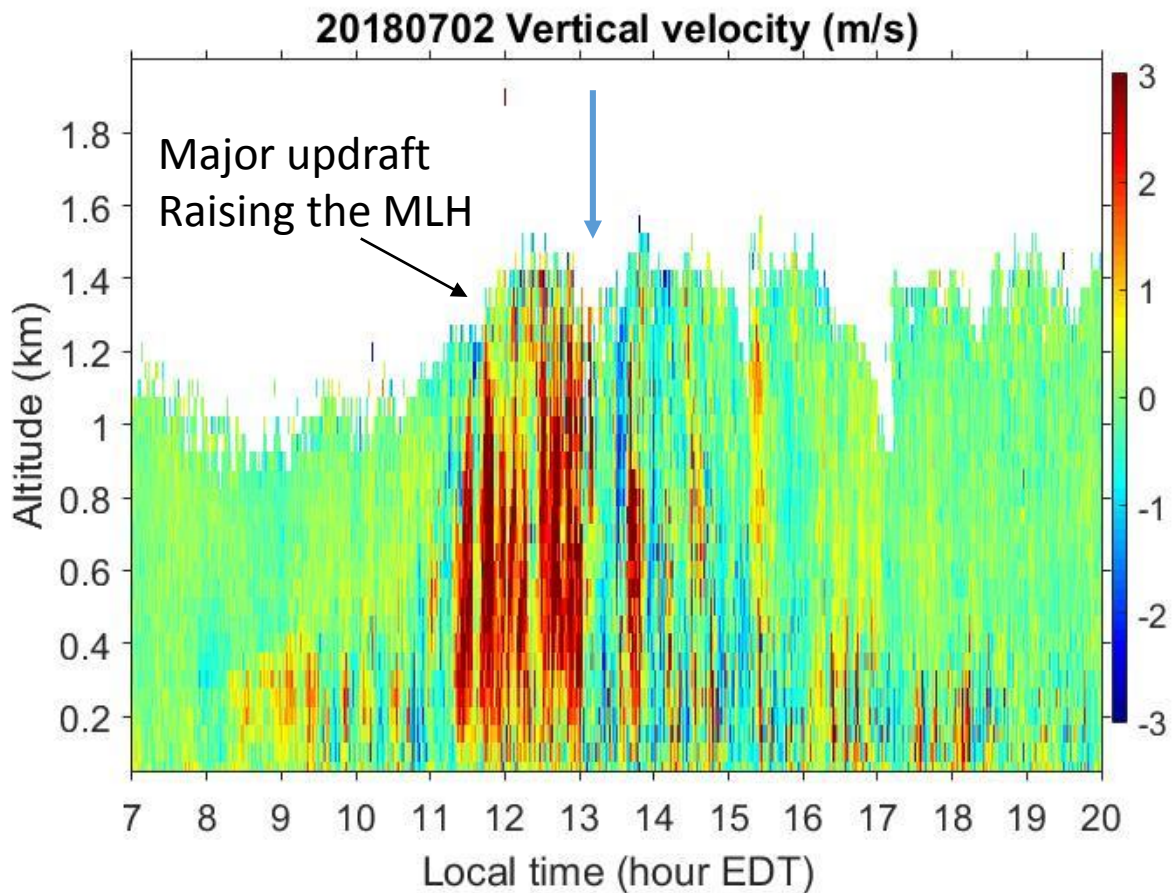


CCNY SURFACE MET CONDITIONS- July 2

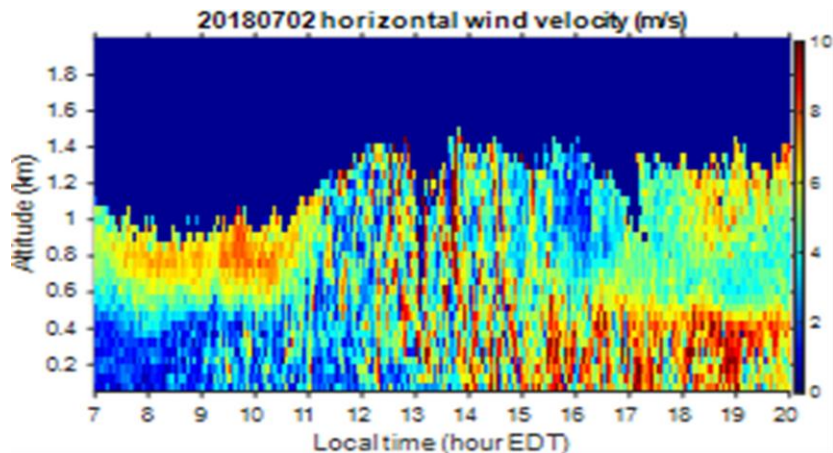


CCNY Profiles- July 2, 2018

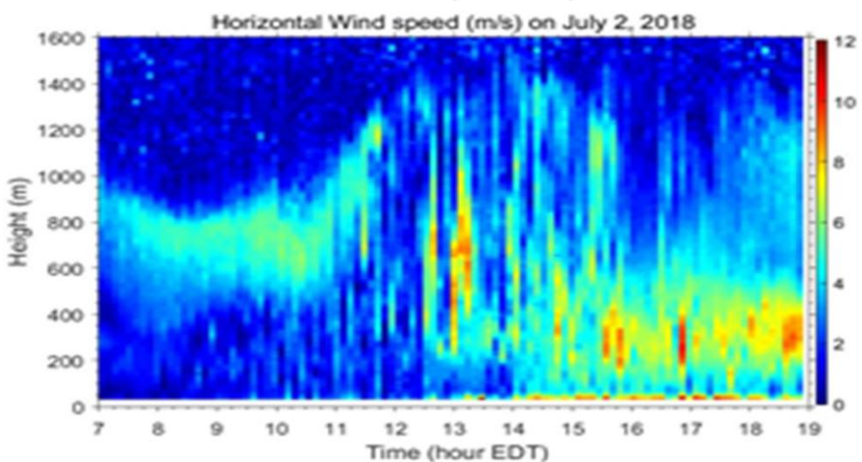
Vertical and Horizontal Winds



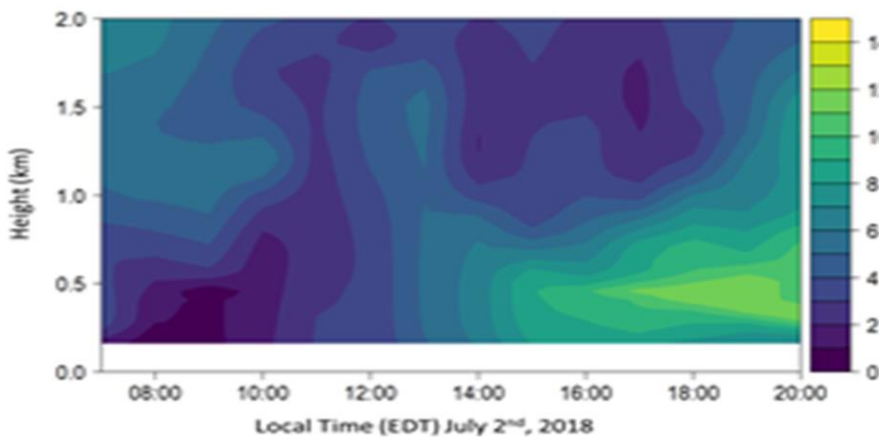
July 2nd Doppler Lidar inter-comparison to uWRF Model



Vaisala 200 S Wind Speed



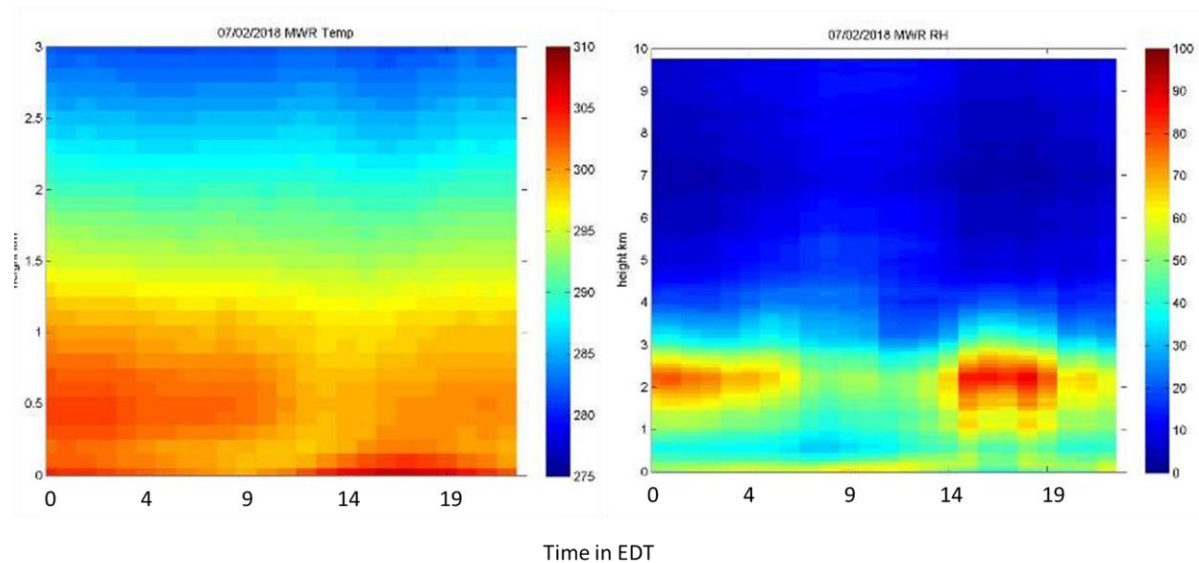
Halo Pro Wind Speed



uWRF Wind Speed Model Output

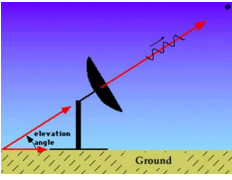
- Significant Low Level Jet
- Reasonable Comparison between Lidars
- uWRF Model captures the Low Level Jet
- Next slide focuses of three specific times to visualize the evolution of turbulent structures
 - 11:30
 - 13:30
 - 13:45

CCNY Microwave Radiometer- July 2nd

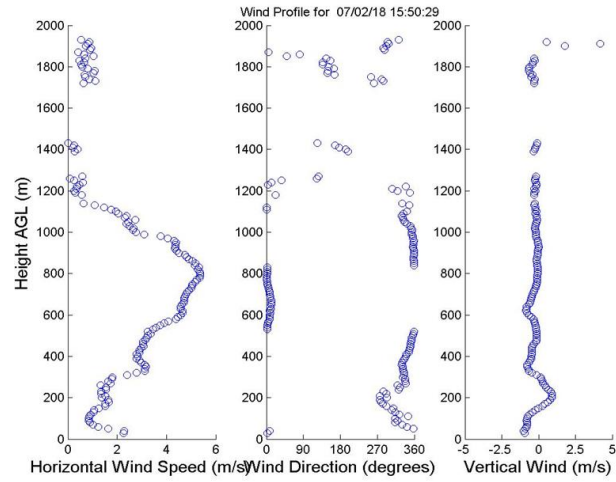


Visualizing the Evolution of Turbulent Structures

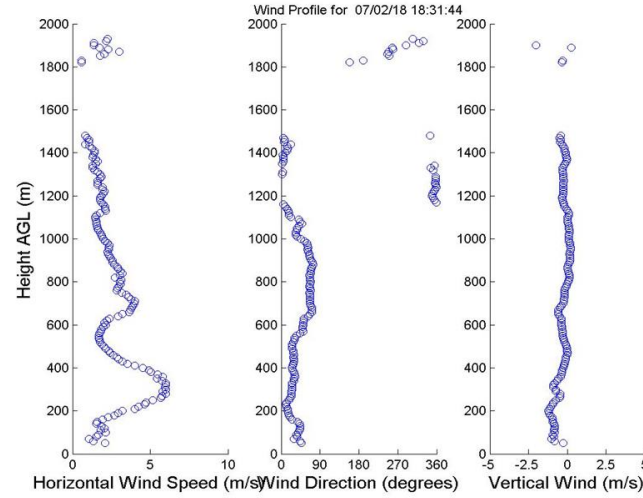
Range Height Indicator (RHI) scan: Lidar is scanned in Elevation at a fixed azimuth (East in this case)



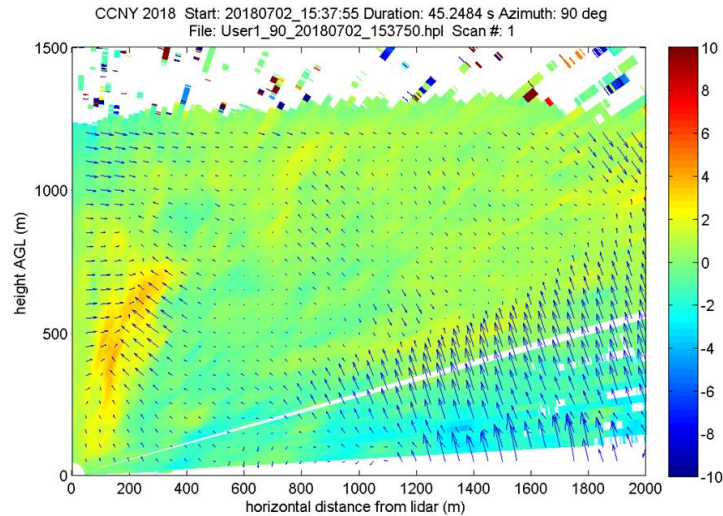
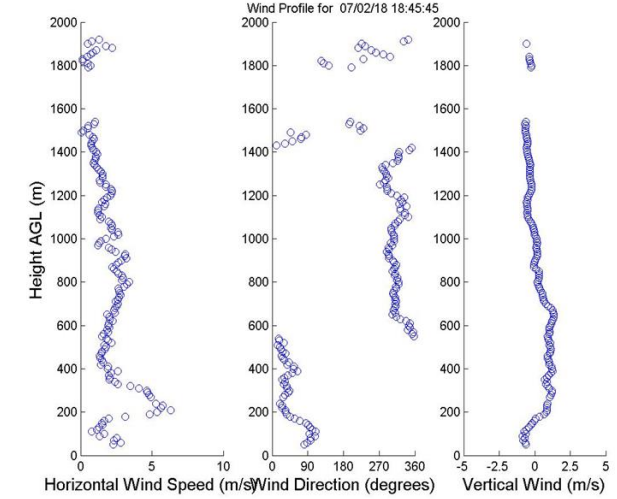
Halo Pro 11:30



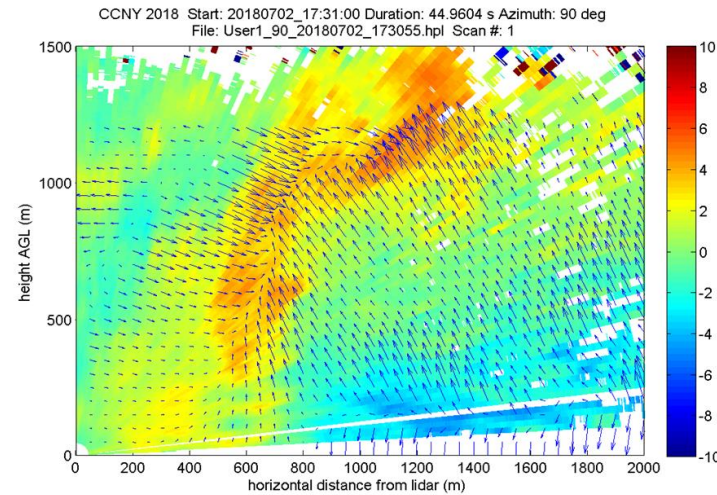
Halo Pro 13:30



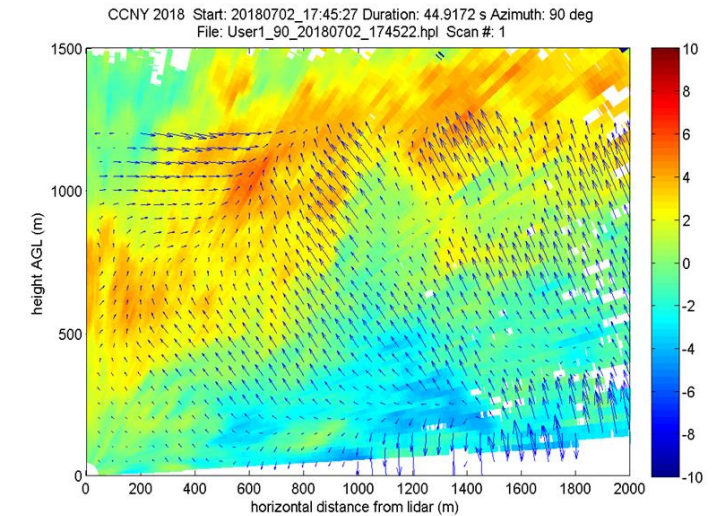
Halo Pro 13:45



Halo Streamline 11:30

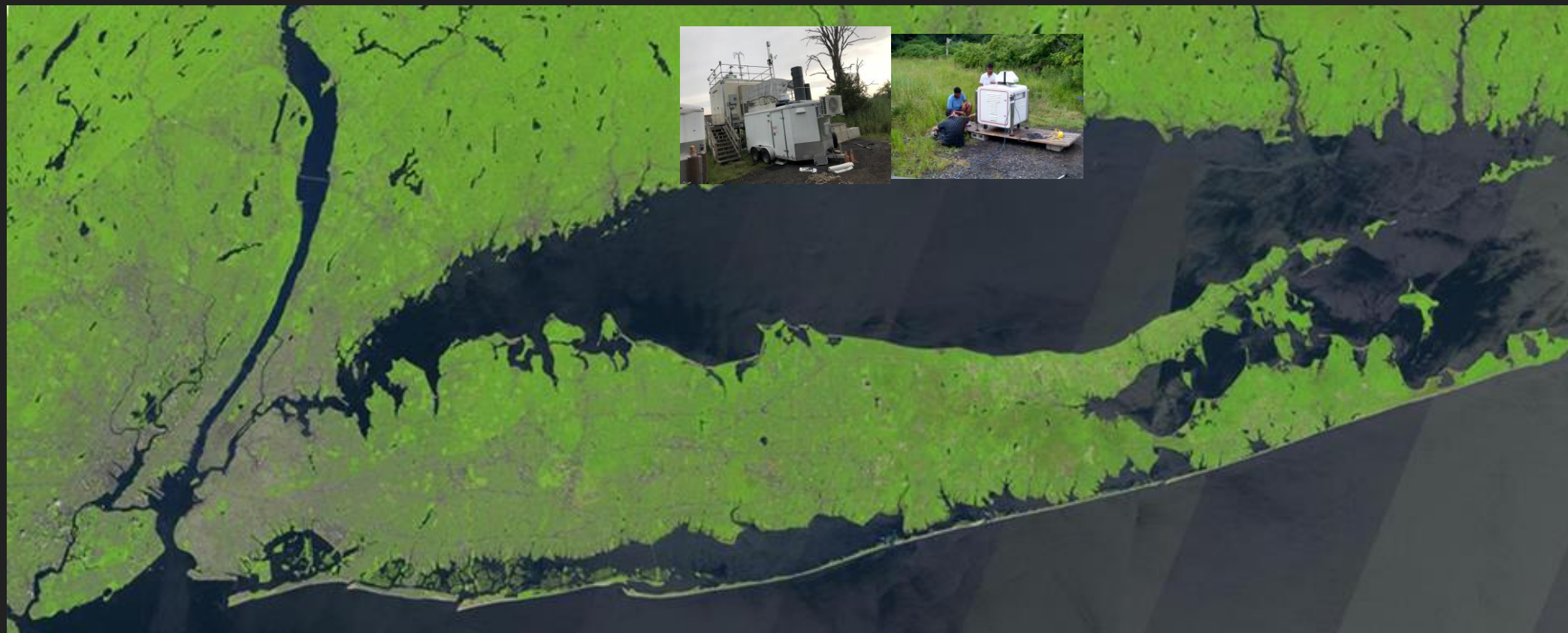


Halo Streamline 13:30

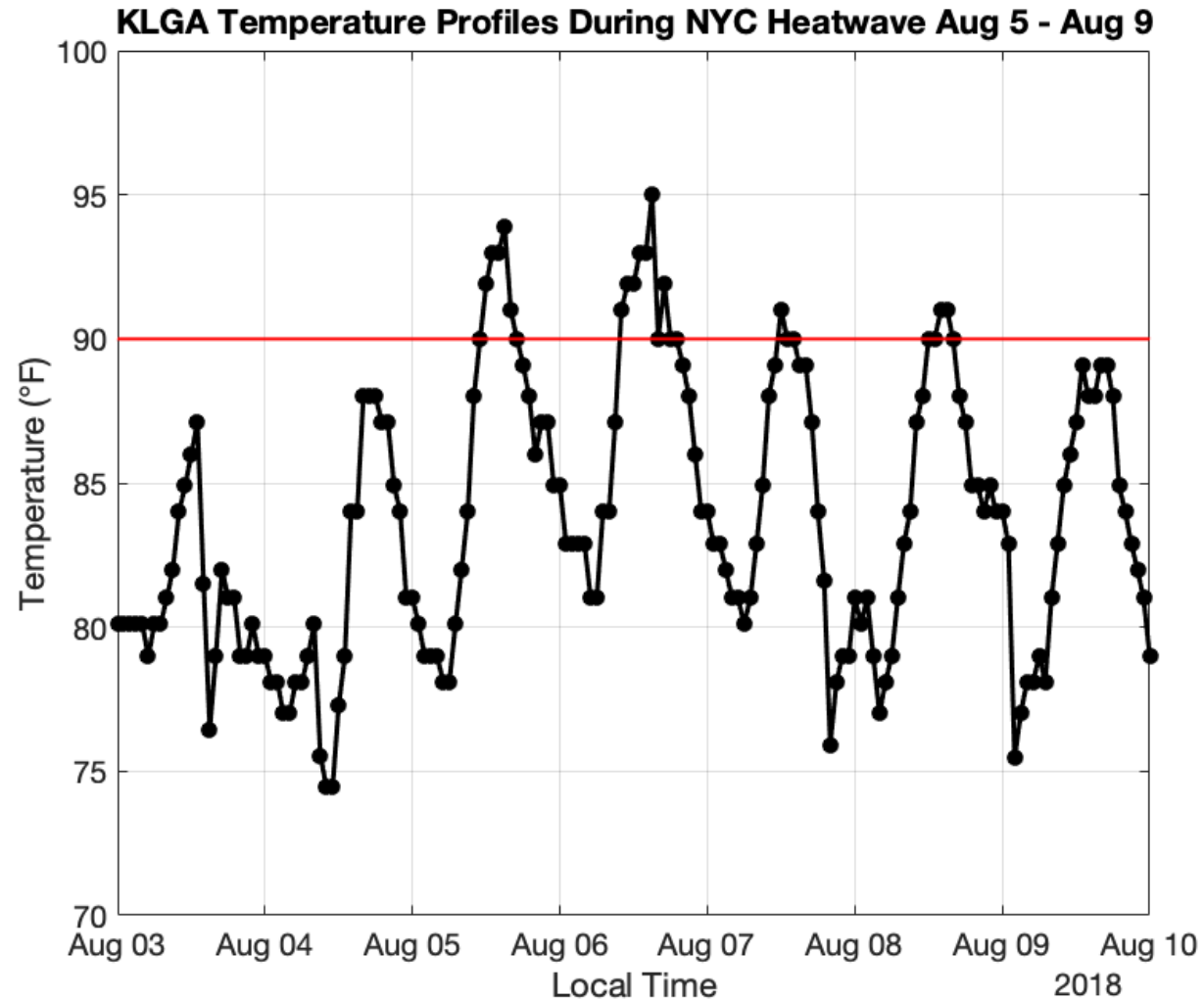


Halo Streamline 13:45

Continuing Summer Campaign 2018
Moved Leosphere Doppler Lidar to CT to Co-operate with NASA Ozone Lidar and Support
Long Island Sound Tropospheric Ozone Study (LISTOS)

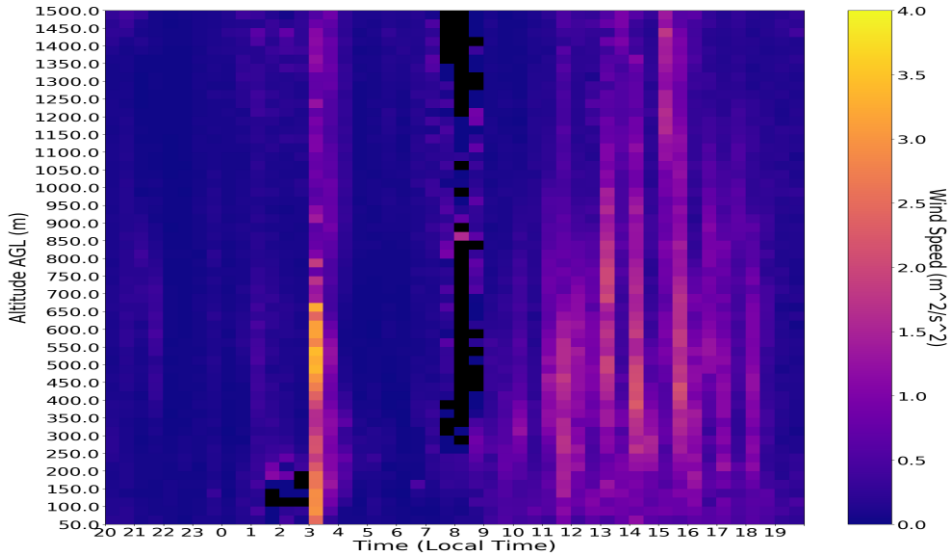


Heat Wave 2: Aug 5, 2018 – Aug 9, 2018

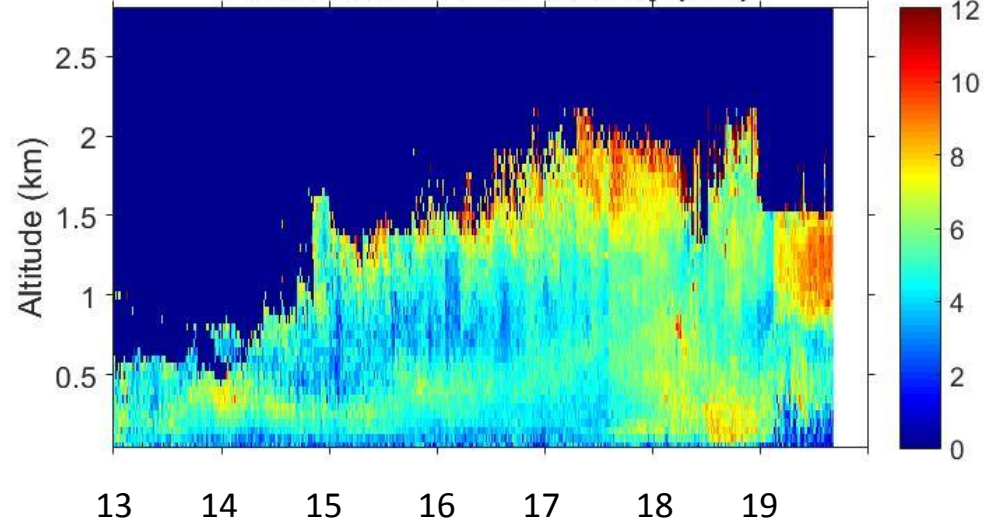


Initial Looks at Co-operating Doppler Lidar with Ozone Lidar

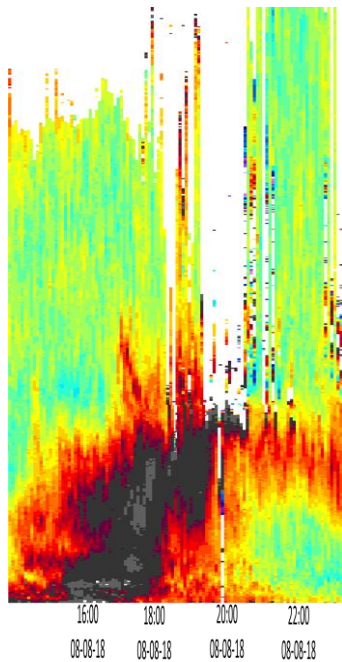
Doppler Lidar Wind Speed Variance



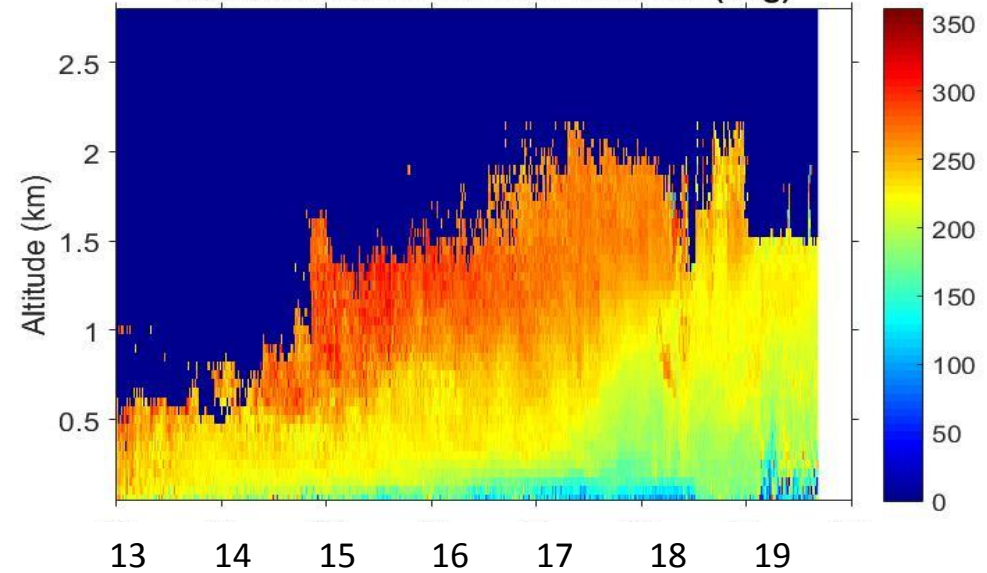
20180808 horizontal velocity (m/s)



Ozone Lidar
Special Thanks
Tim Berkoff



20180808 horizontal wind direction (deg)



Next Steps

- Additional Analysis of Co-operating Doppler Lidars (collaborating with NYS Mesonet in NYC)
- Additional Analysis of Co-operating Doppler Lidar and Ozone Lidar (and Ozone Lidar Design)
- Gearing Up for Better Methods to Share Data/Meta Data/Codes
- Planning for New Deployment of Army Research Lab Doppler Lidar/other equipment
 - NJ Sites are being considered on the west side of the Hudson River
 - Other sites in NJ are being considered to partner with NJ DEP if possible

Acknowledgements

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