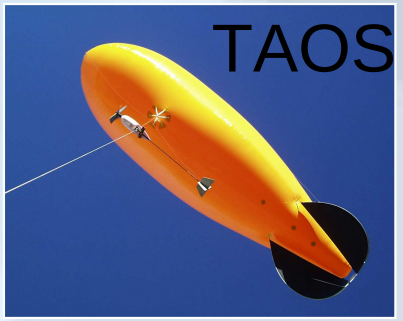
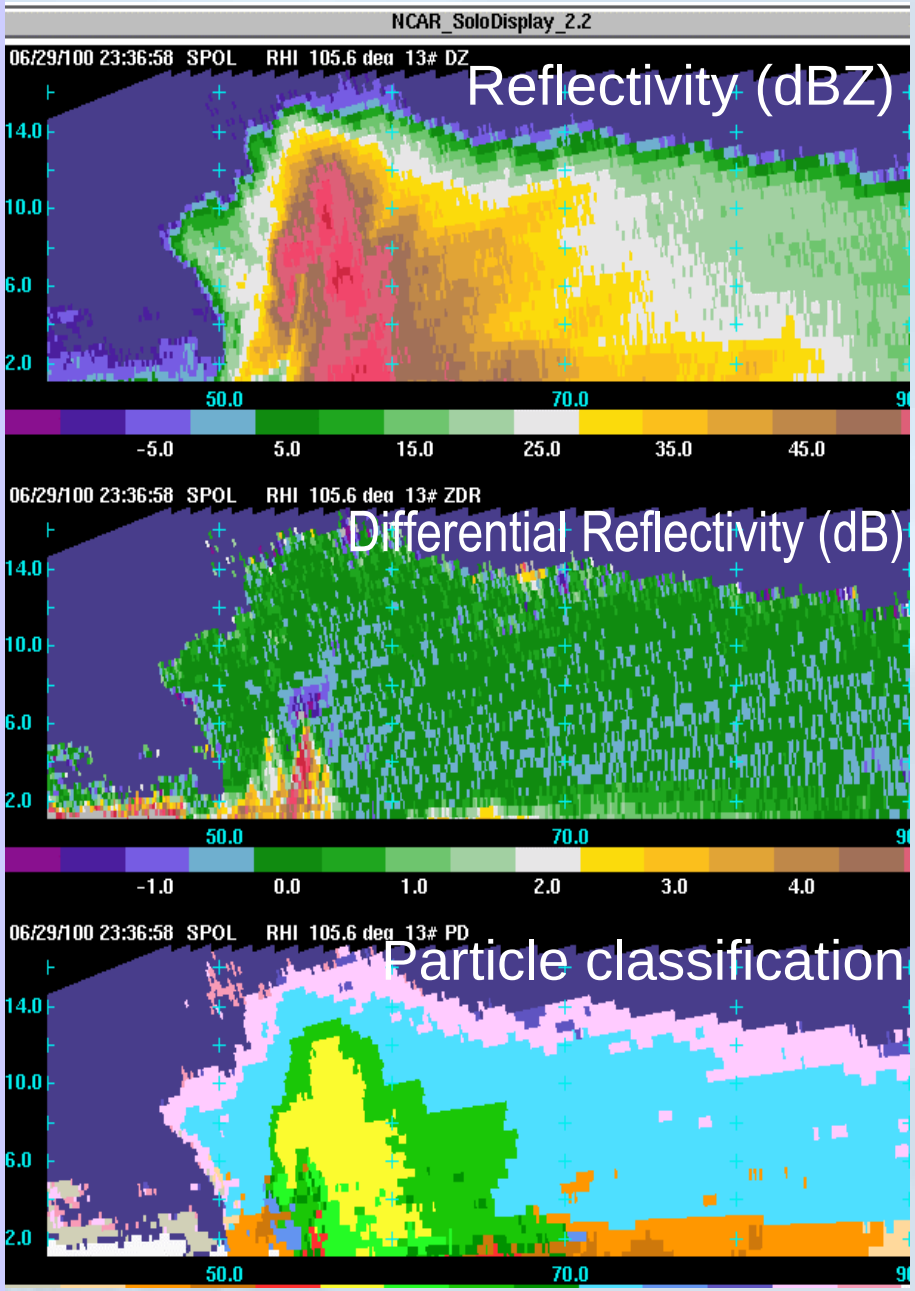
NSF Lower Atmospheric Observing Facilities

NCAR



S-PolKa Radar

- Mass, Latent Heating Rates, Profiles
- Hydrometeor Identification
- Detection of cloud droplets
- Raindrop size distribution
- Effect of Bragg scatter is less at Ka-band
- Improved cloud microphysical retrieval (precipitation type, shape, size and concentration) using both dual-wavelength and dual-polarization observations



Cloud particles
Drizzle
Light rain
Moderate rain
Heavy rain
Hail
Rain/hail mix
Graupel/small hail
Graupel/rain
Dry snow
Wet snow
Oriented ice crystals
Irregular ice crystals
Super cooled liquid droplets
Insects
Birds
Ground clutter

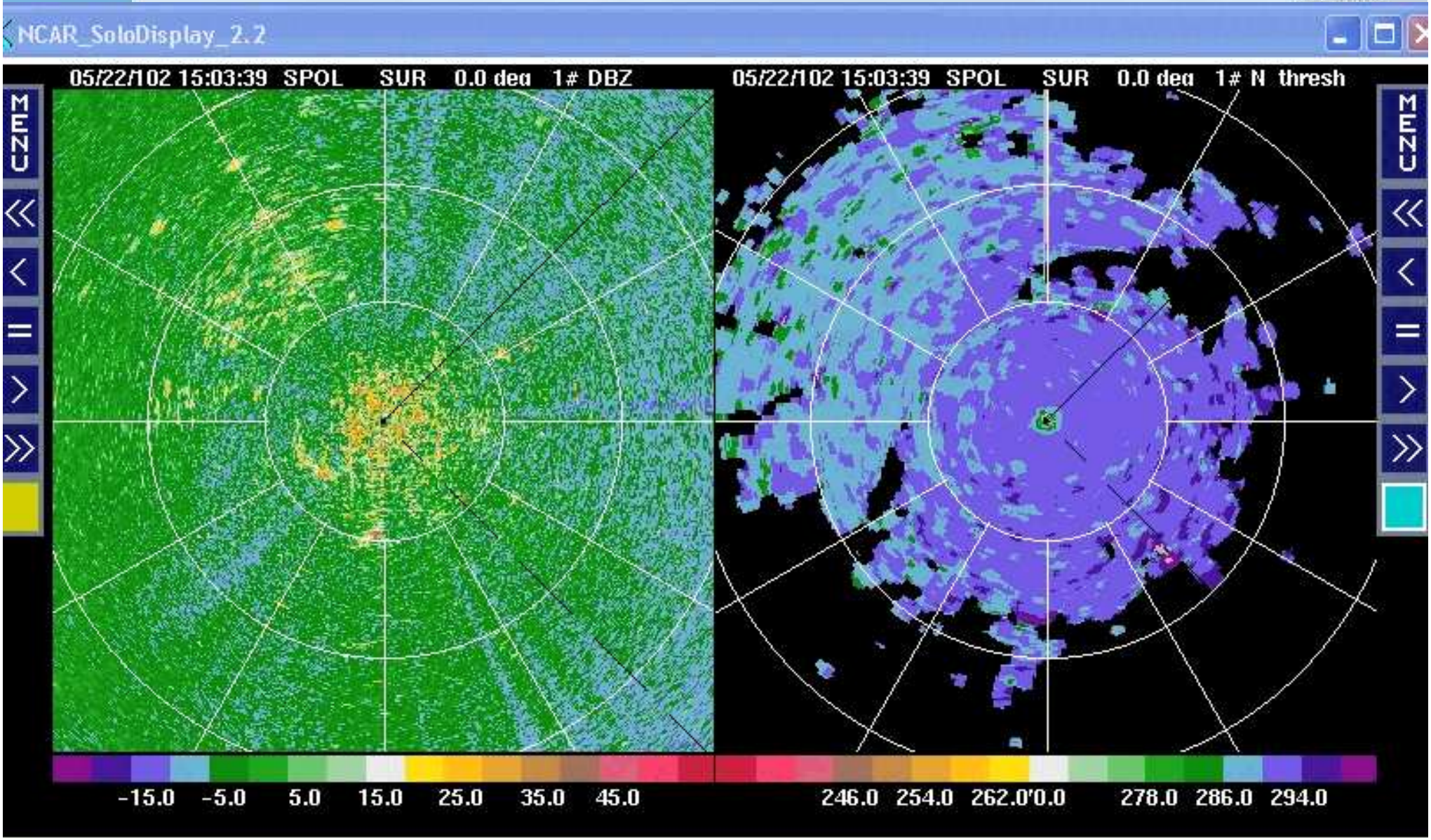
NCAR

Refractivity from S-Pol

REFLECTIVITY

REFRACTIVITY

NCAR

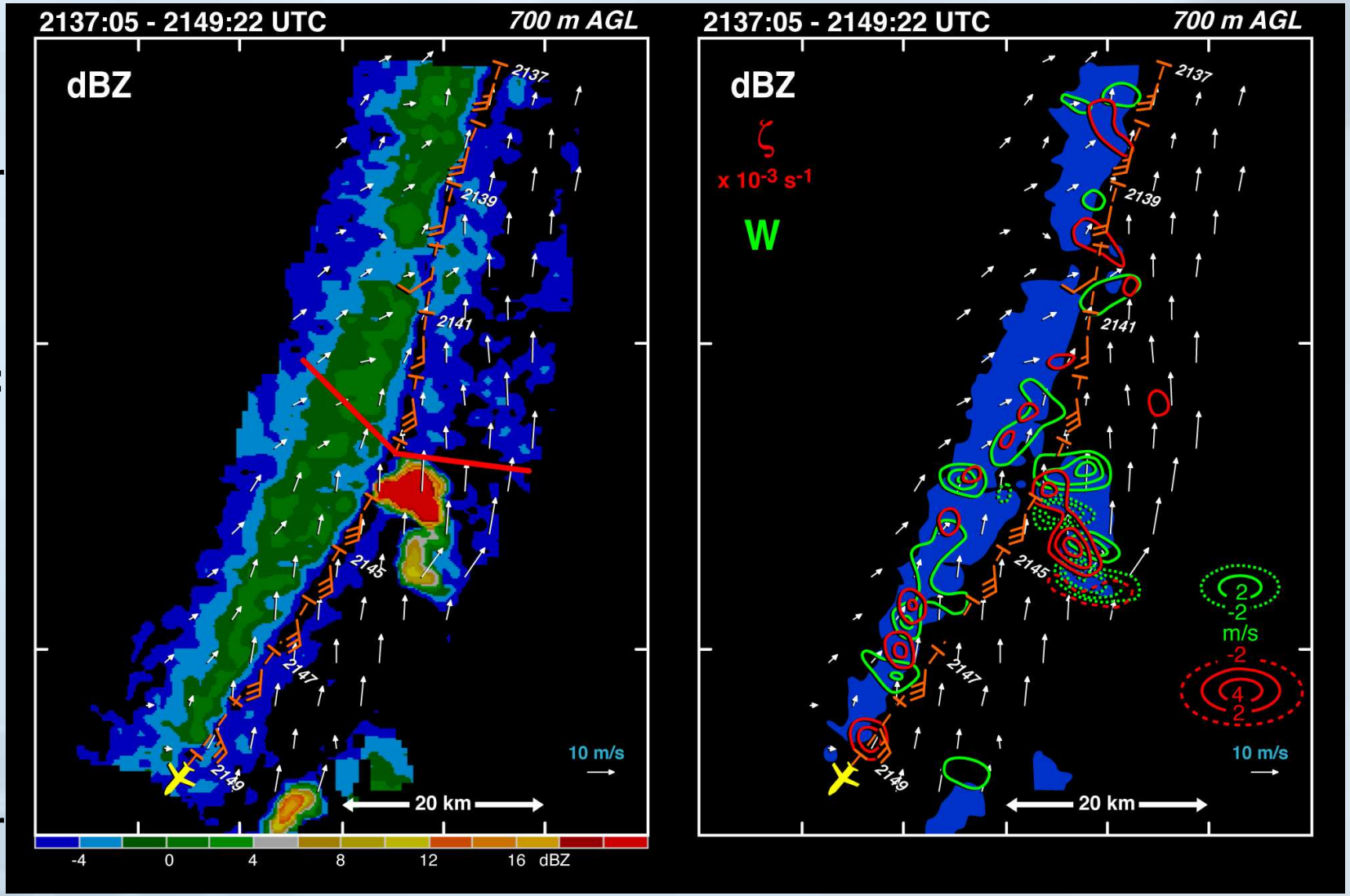


Warm, dry

Cool, moist

ELDORA on P-3

- Dual-beam, scanning, airborne Doppler radar
- Reflectivity and velocity
- Wavelength: 3.2 cm
- 1.8 deg BW
- Typical range: few hundred m to 50-100 km (less when used for clear air observations)

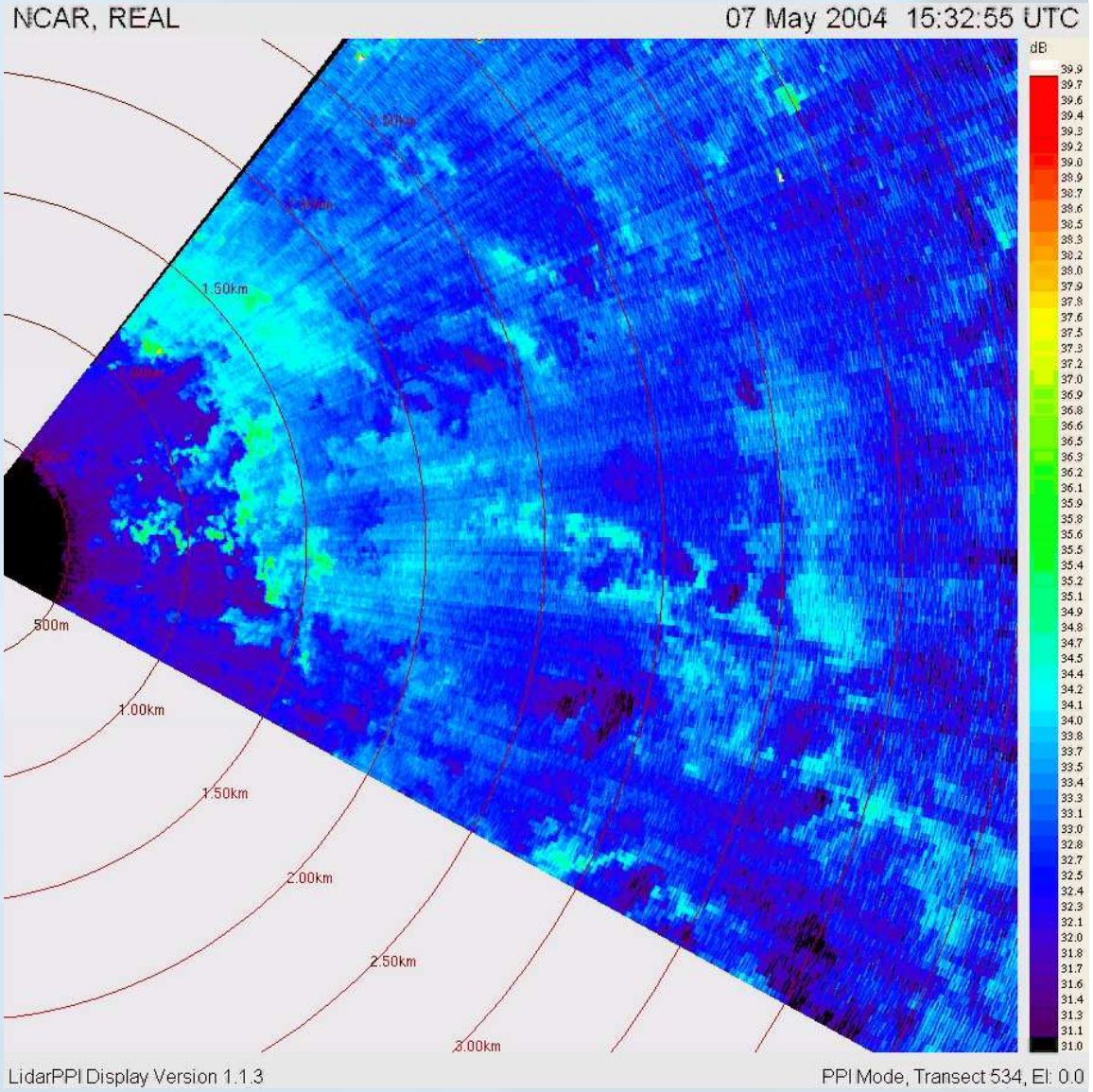


Courtesy Hanne Murphey (UCLA)

Scanning Raman-shifted Eye-safe Aerosol Lidar (REAL)

NCAR

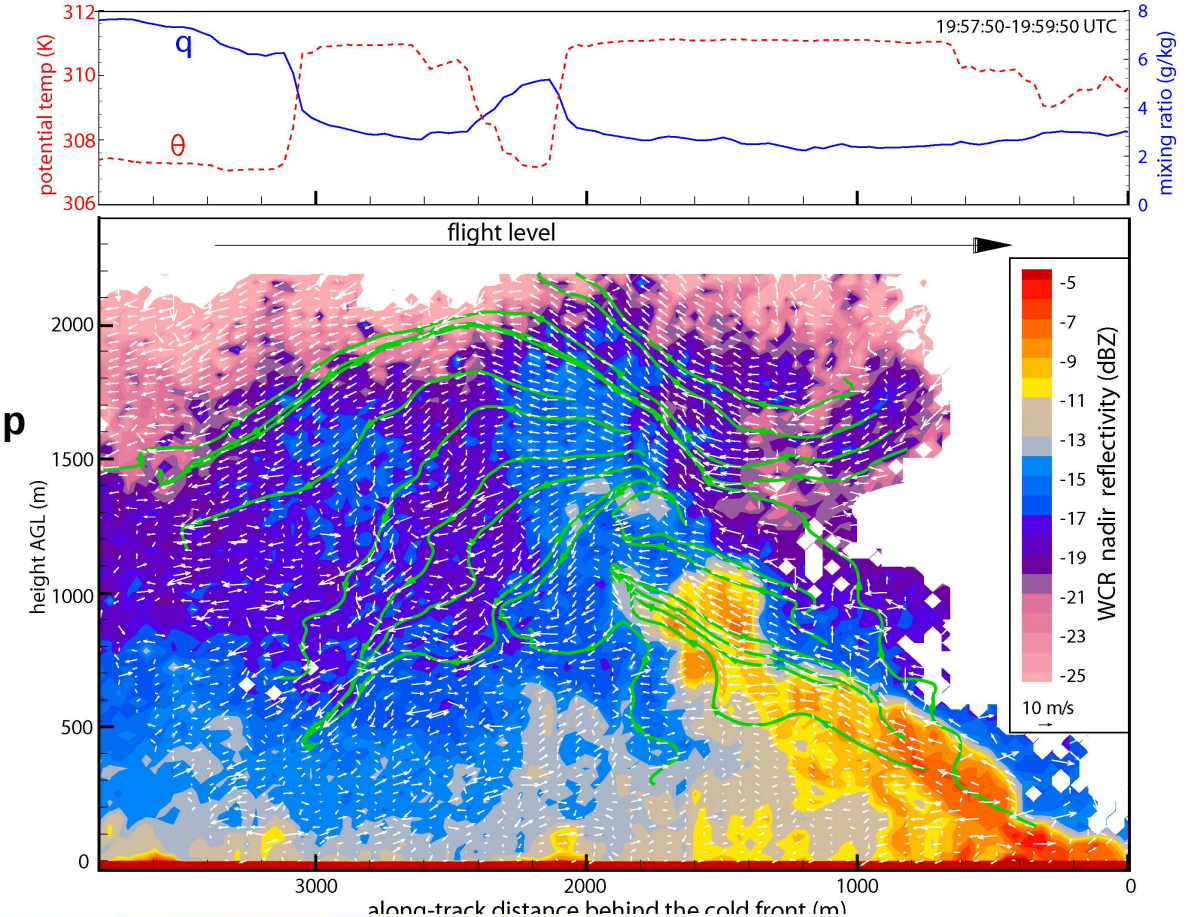
- Aerosol backscatter lidar
- Wavelength: 1.5 microns
- High pulse energy
- Range resolution: 3 m
- Useful range: 500 m to several km
- Rapid scanning
- *Complete eye-safety*
- Retrieve wind field via echo tracking technique
- Future polarization capabilities

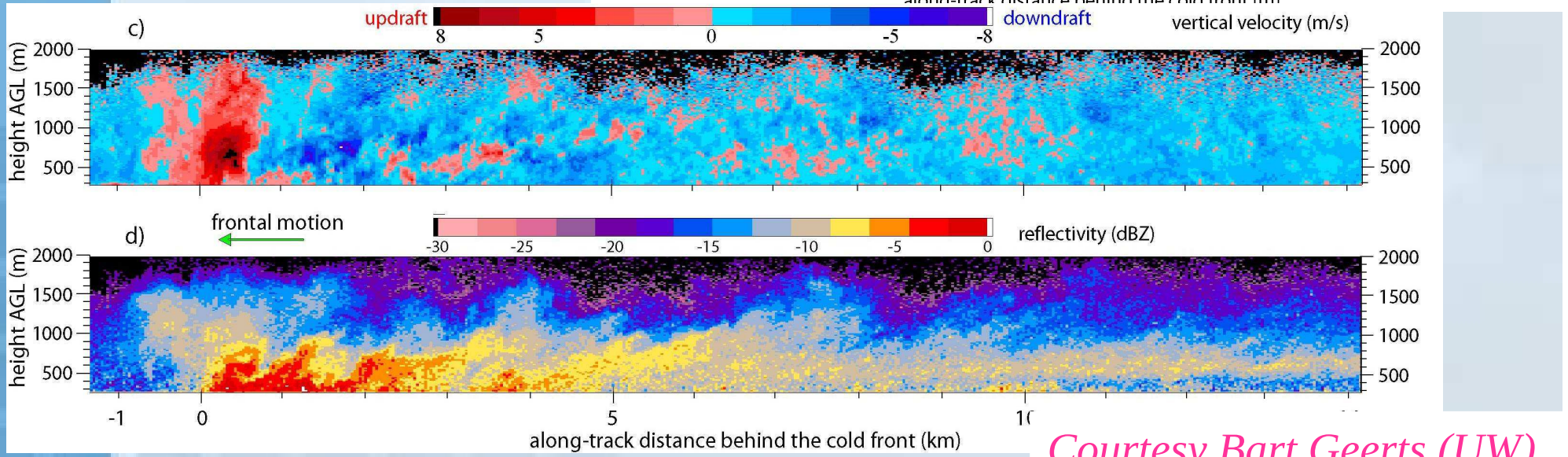


Courtesy Shane Mayor (NCAR)

UWKA & WCR

- http://www-das.uwyo.edu/wcr/
- Fully instrumented (state variables, winds, fluxes, radiation, cloud and precip particle probes, aerosol and chemistry)
- Remote sensing devices:
  - Radiation (NDVI; IR skin temp; hemispheric up & down)
  - dual-frequency microwave radiometers (integrated cloud LWC and vapor)
  - A 94 GHz multiple-antenna polarization Doppler radar, the Wyoming Cloud Radar





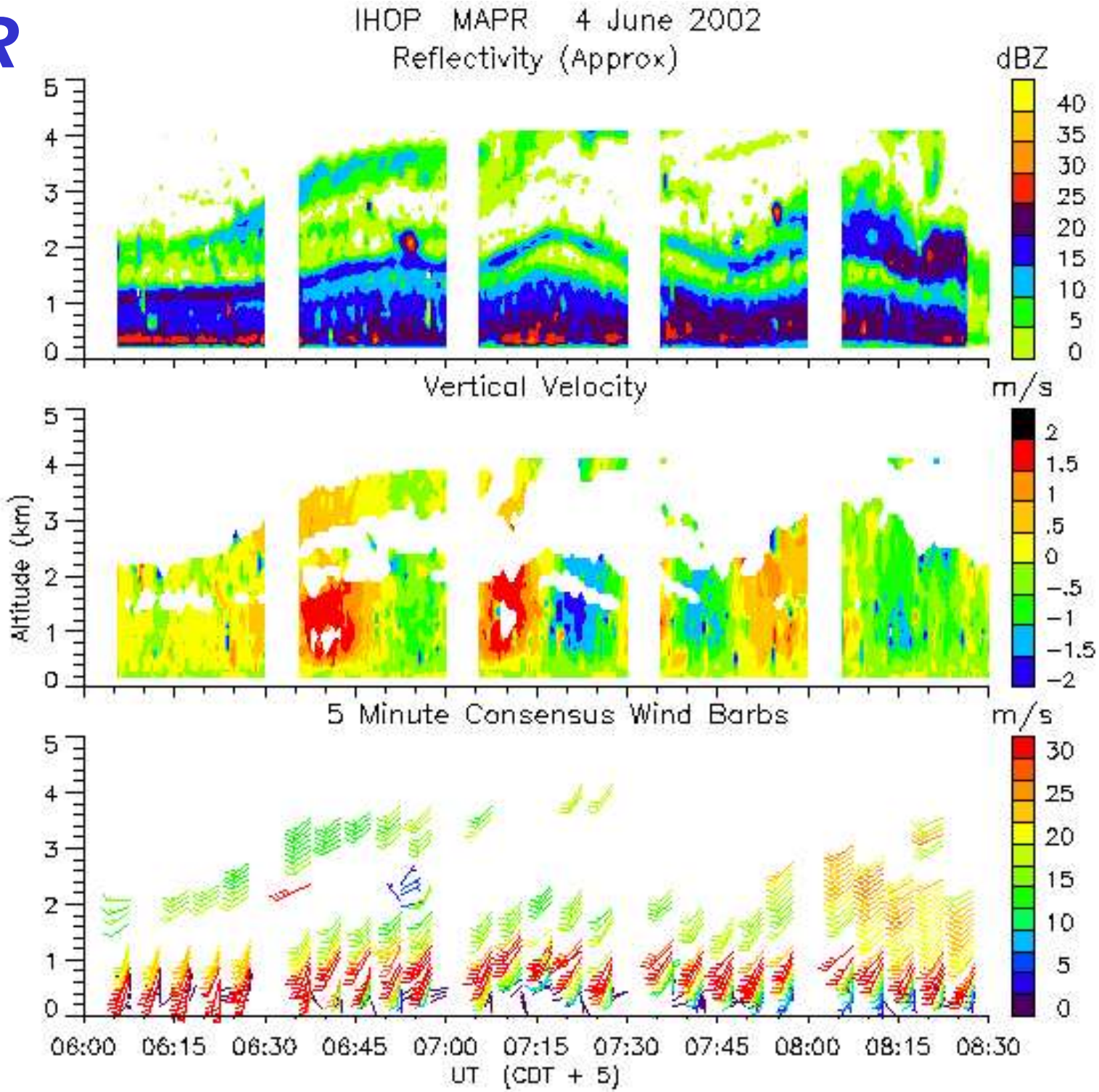
Courtesy Bart Geerts (UW)

HIAPER

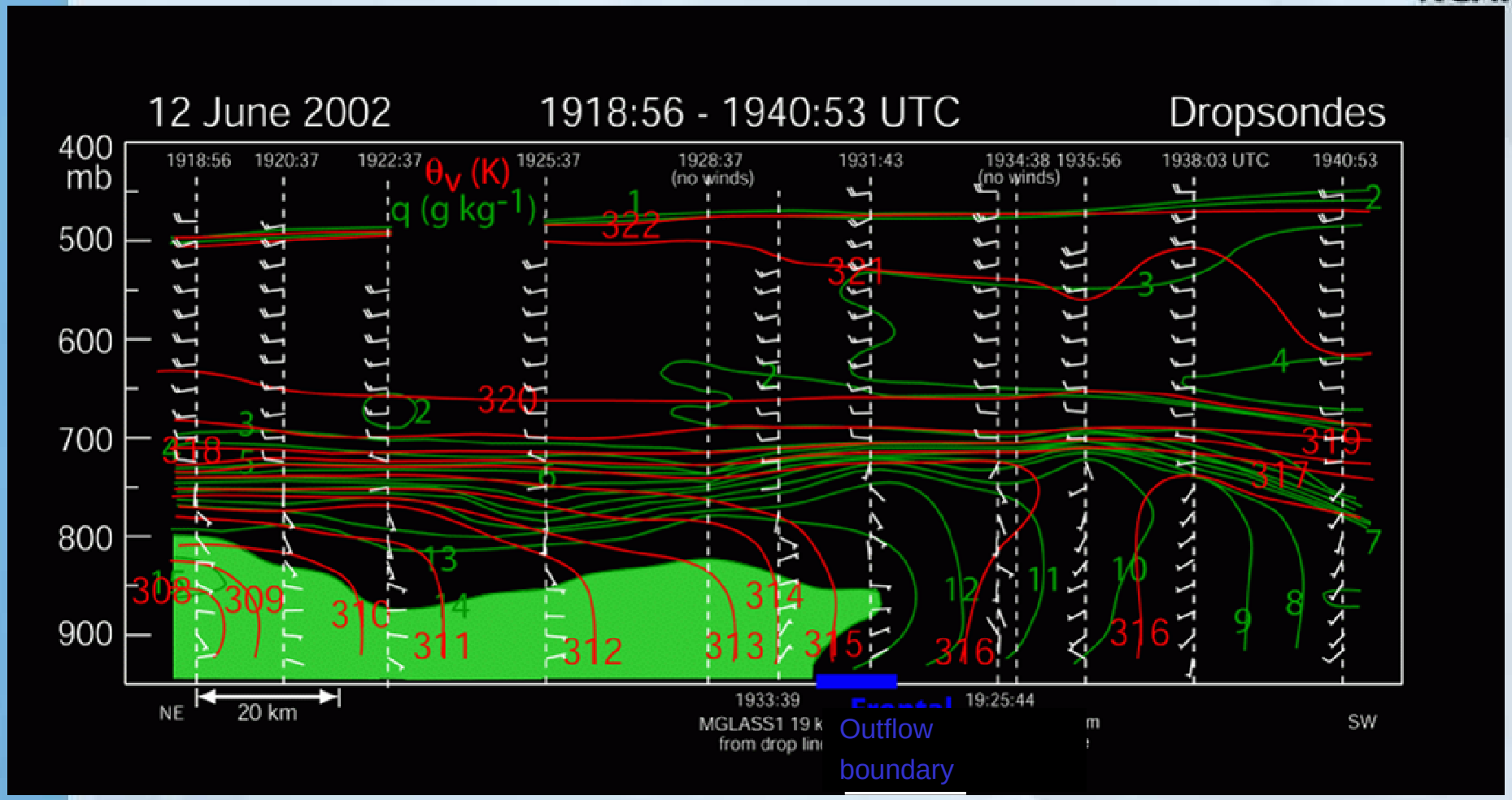
- Gulfstream V (G-V) aircraft
- Max Altitude: 15 km (51,000 ft)
- Max Range: 12,000 km (6000 nm)
- Available for preliminary science missions by Summer, 2005

ISS/MAPR

- Soundings
- Surface station
- Sodar
- RASS
- 915 MHz profiler
- 1-5 min resolution
- Typical res: 100 m (20 m available with special frequency hopping technique)
- Typical range: 300-400 m up to 2-5 km
- 4 kW peak transmitter



GPS Dropsondes



- **Operation by 1 person**
- **Receive and process PTH and wind from 4 sondes simultaneously**
- **Can launch 20 sec apart**

LAOF Request Procedure

- http://www.atd.ucar.edu/requests.html
- COPS Scientific Overview Document due by 15 Dec 05
- Facility requests due by 15 June 2006
- Requests should be accompanied by NSF proposal and COPS SOD
- Reviewed by OFAP in October 2006
- Decision by NSF by November 2006
- No cost if associated with NSF grant; otherwise cost recovery required

Thank you