

NSF C-130 Platform Report



Photo courtesy Carly Calvin, NCAR

NSF C-130 Payload



- **RAF instruments:** Microphysics, Turbulence, Thermodynamics suite, Radiation
- **Special Remote sensing:** Wyoming Cloud Radar (zenith+nadir+slant), Cloud Lidar (zenith), Microwave radiometer (GVR, 183 GHz, zenith)
- **Special Chemistry/aerosols/clouds:** CCN, CVI, Streakers, Giant CCN, Special CN counters (+ultrafine), LDMA, RDMA, Aerosol Mass Spec, volatility, nephelometer, SP2/PSAP, DMS/SO₂, Cloud water collector, CO/O₃, fast FSSP.

C-130 Flights

- Mission types:

(a) 20°S Cross-Sections [5/5 missions total]

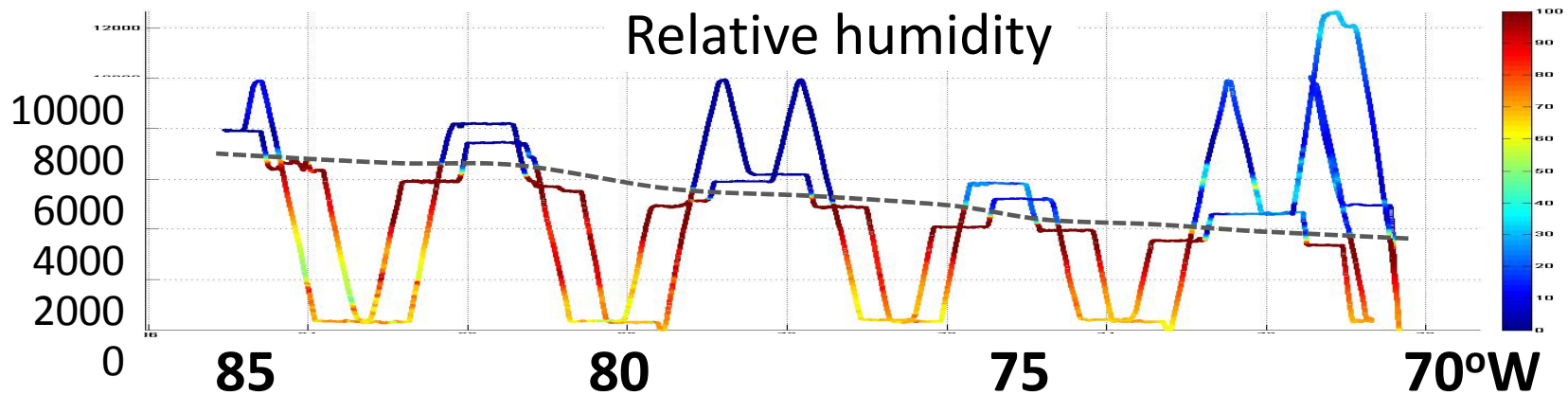
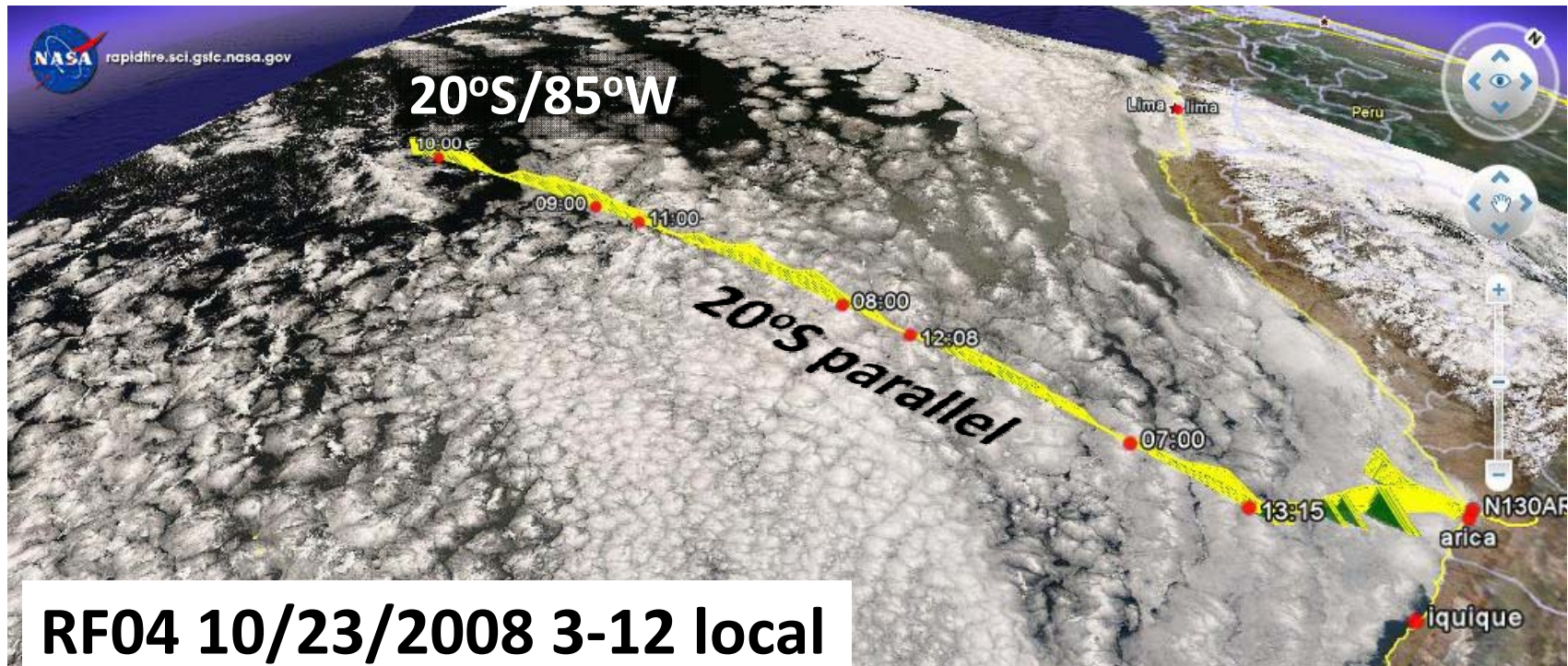
- *characterize structure of MBL, aerosols, clouds along the 20°S parallel from 72-85°W*
- *collaborative (RHB, BAe-146, Do-228, G-1)*

(b) POC Drift missions [4/5 missions]

- *investigate structure of boundary between closed and open cellular stratocumulus*

(c) Polluted Lagrangian [0/2 missions total?]

20°S Missions



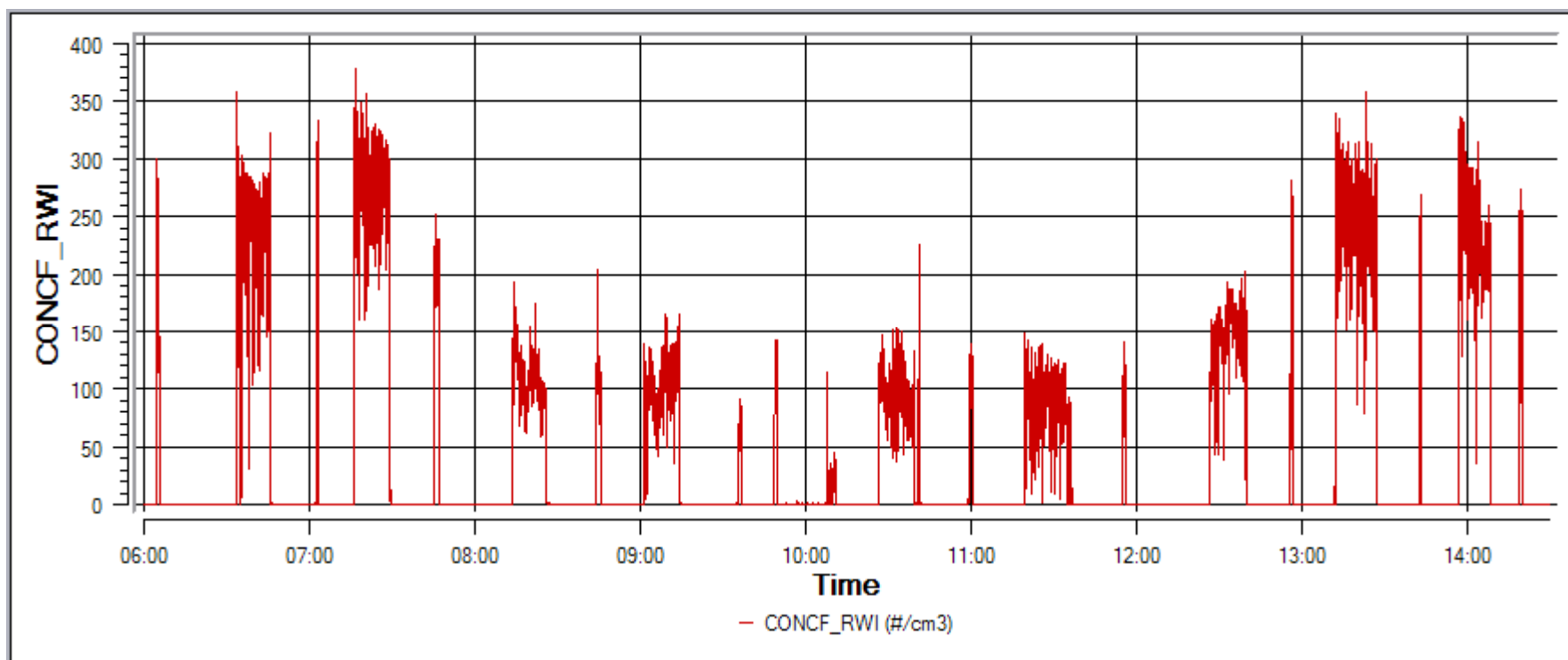
RF03 Cloud droplet number concentration

Transition from Polluted to Clean Clouds and Back

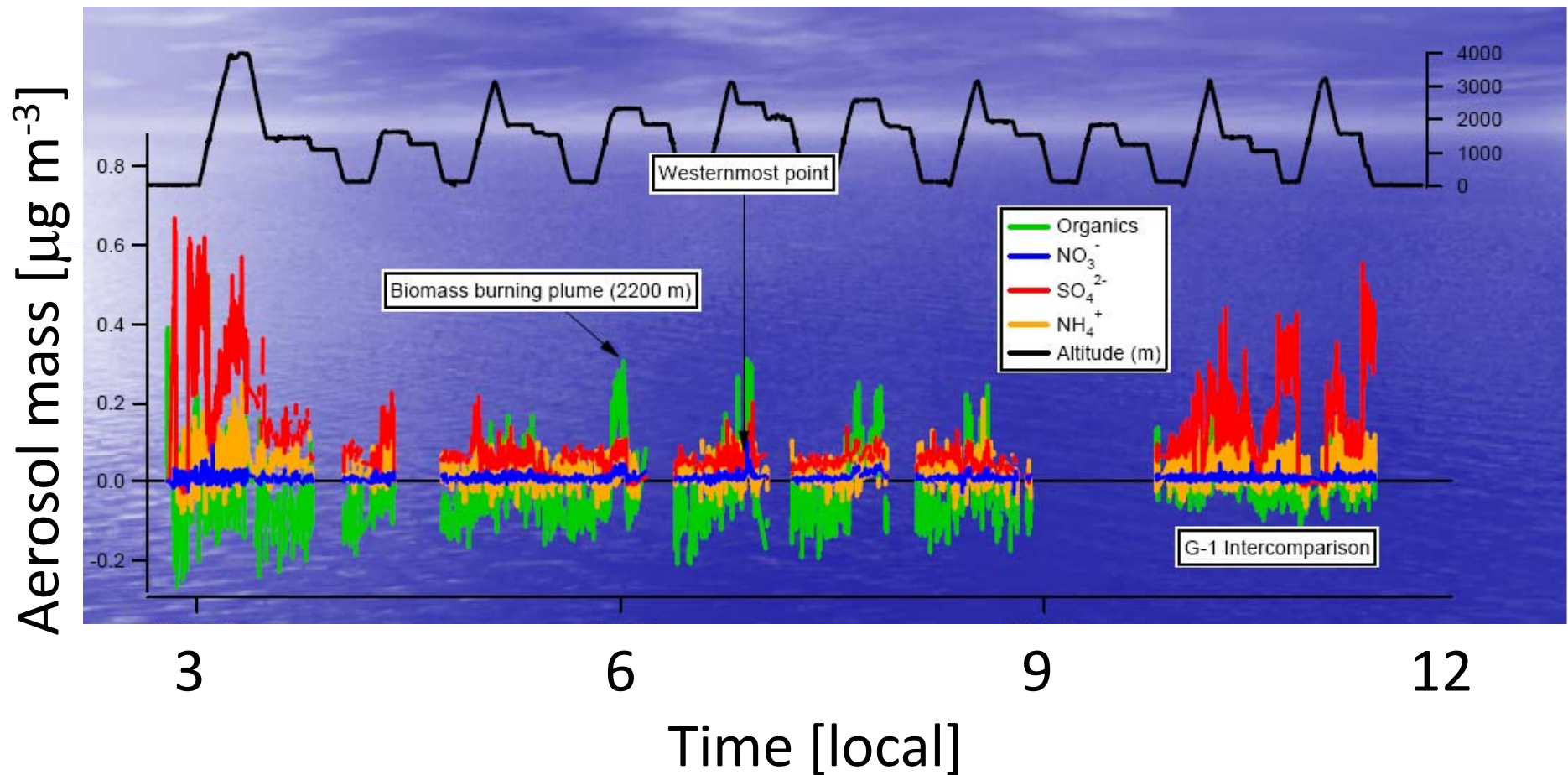
70°W

85°W

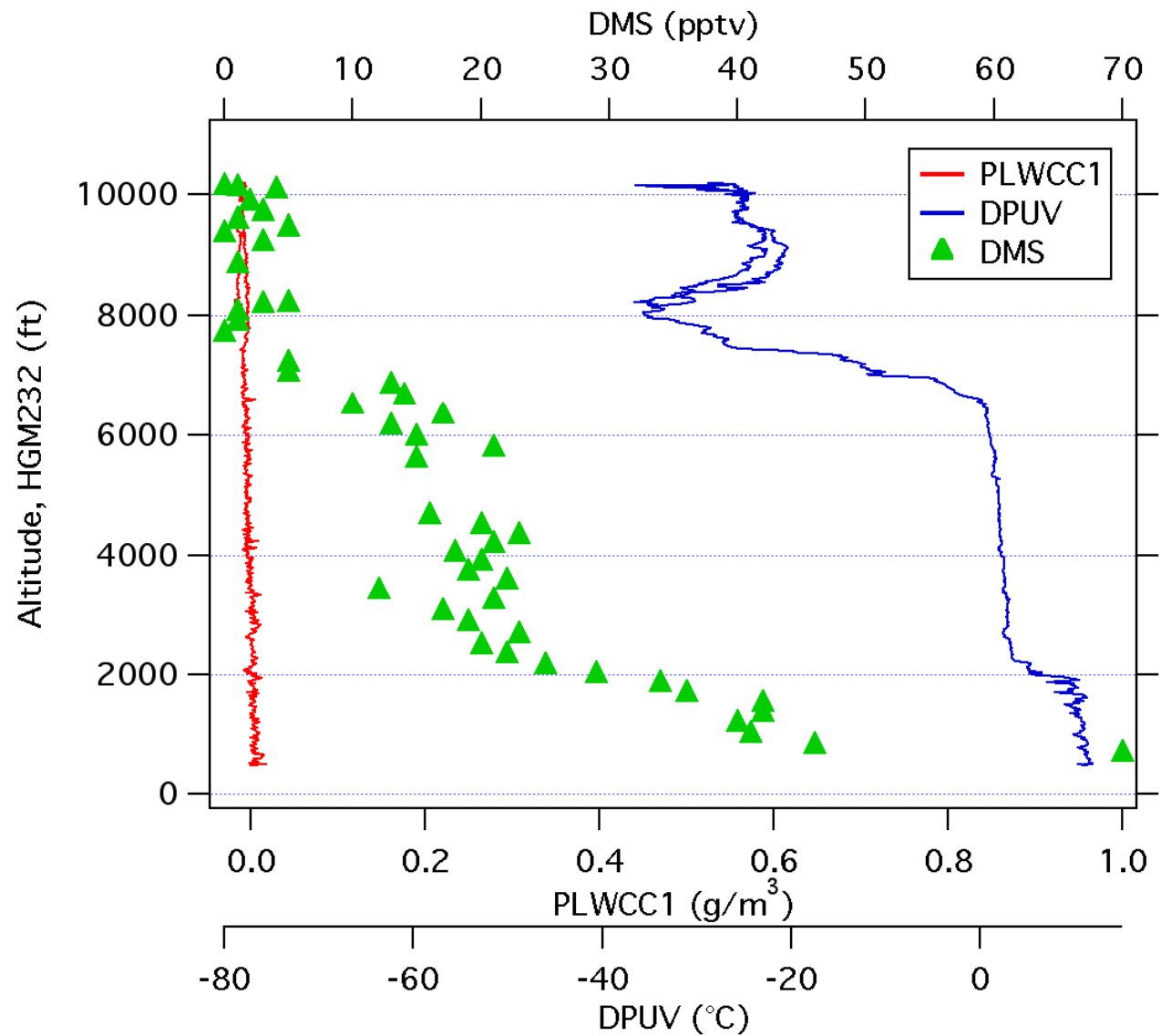
70°W



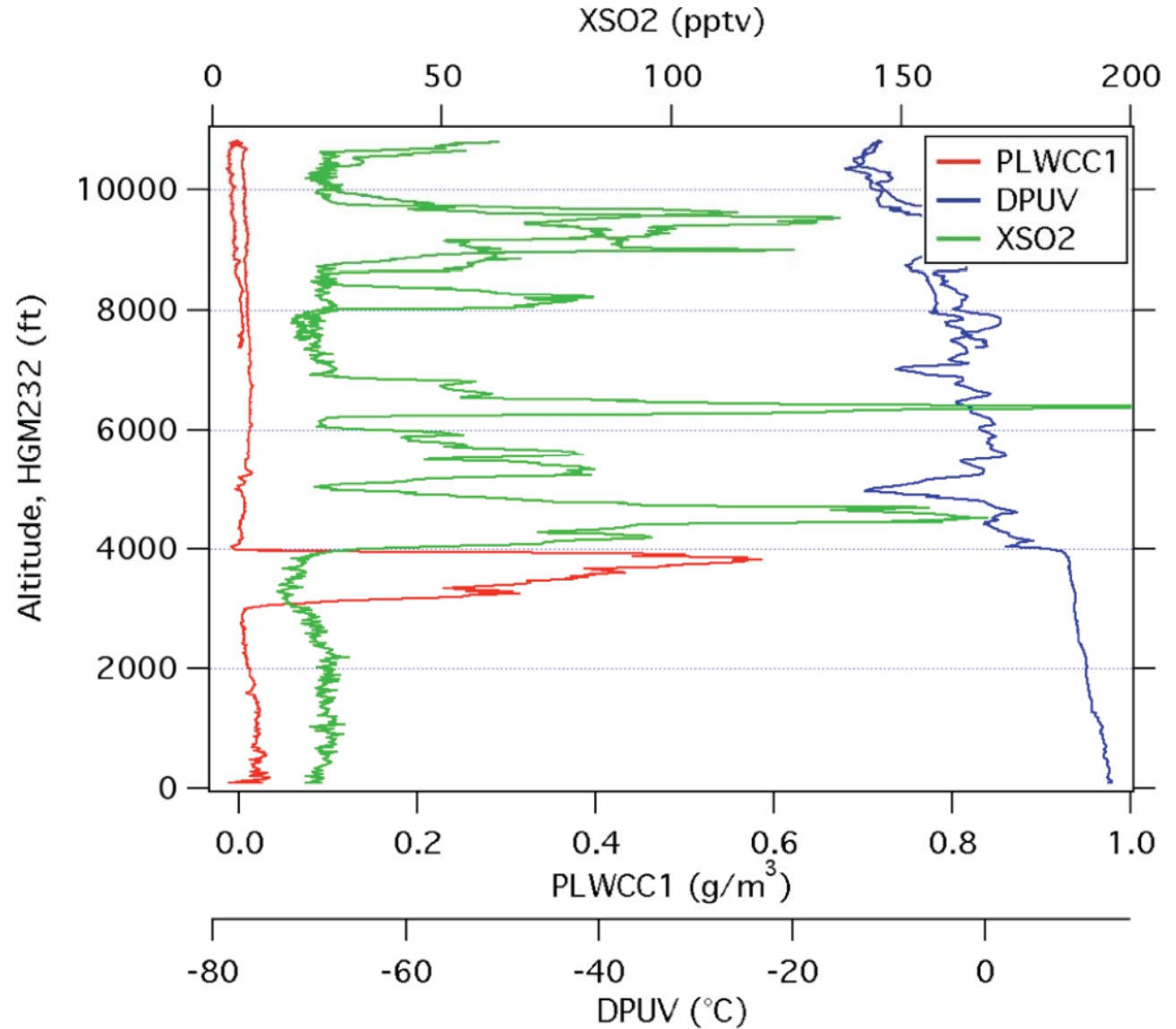
HiGEAR Aerosol Characterization



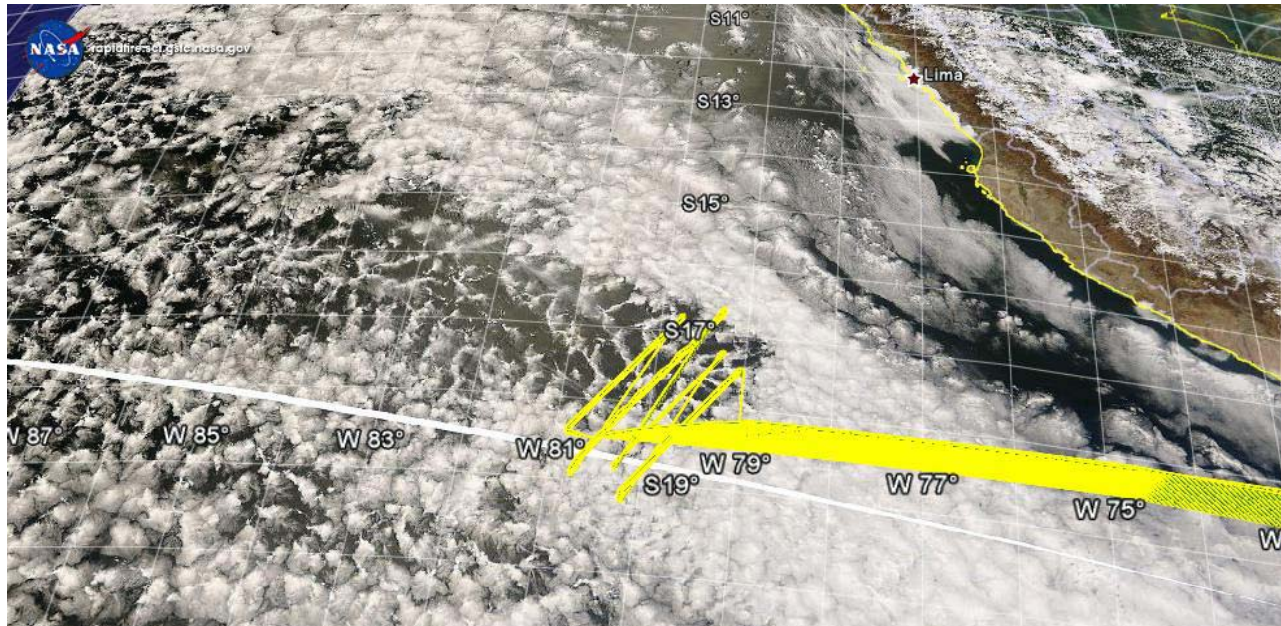
DMS Profiles RF04



SO₂ Profiles RF08 Near Arica



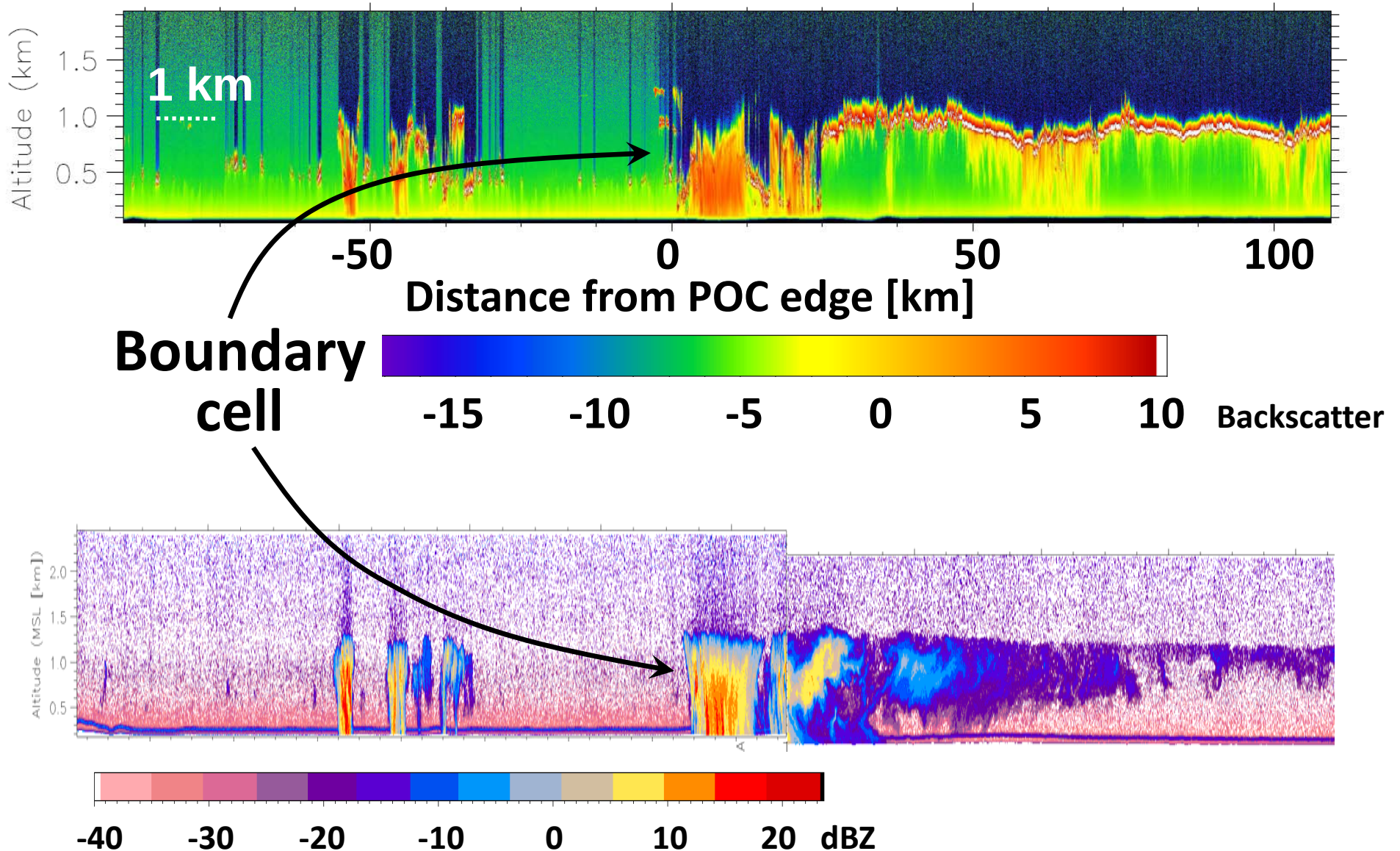
POC-Drift Missions



RF06 10/28/2008 3-12 local (“aPOCalypse” now)

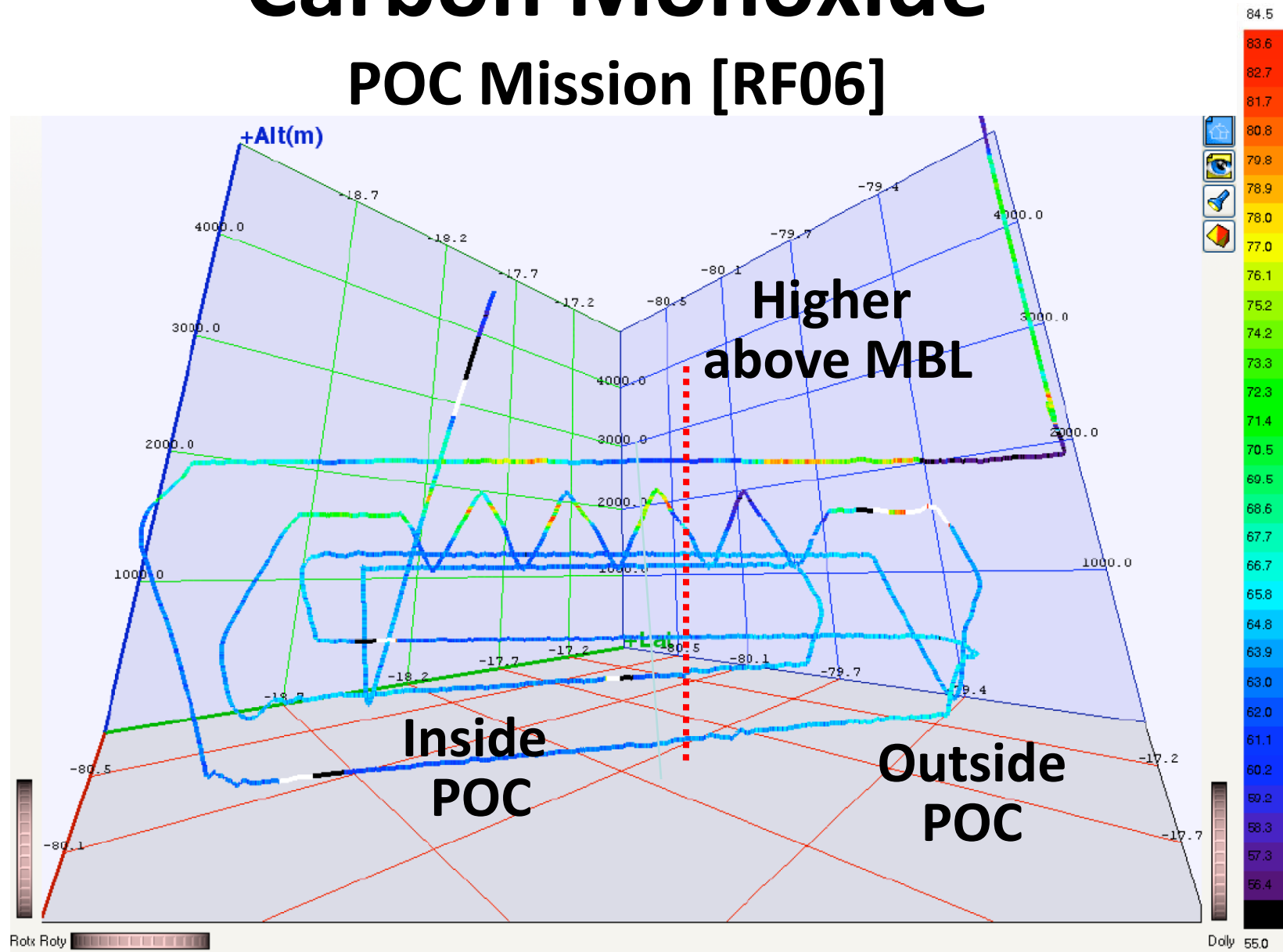
- Lowest CN concentration ever measured
- Remarkable contrasts in micro and macrophysics across POC boundary [aerosols, drizzle, cloud, CO and O₃]

Wyoming cloud lidar (top) and radar (bottom)

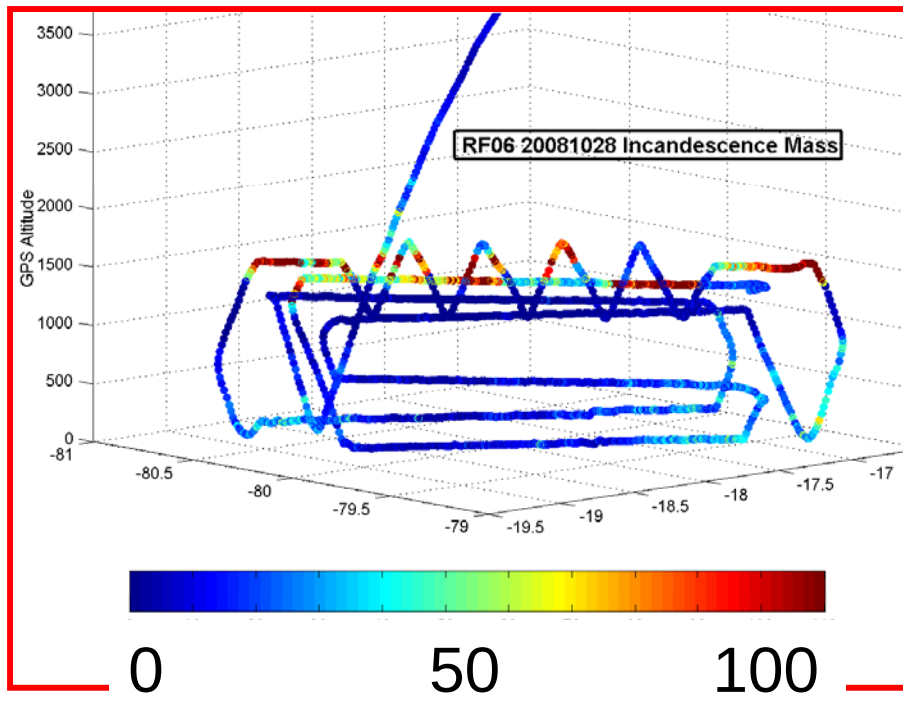


Carbon Monoxide

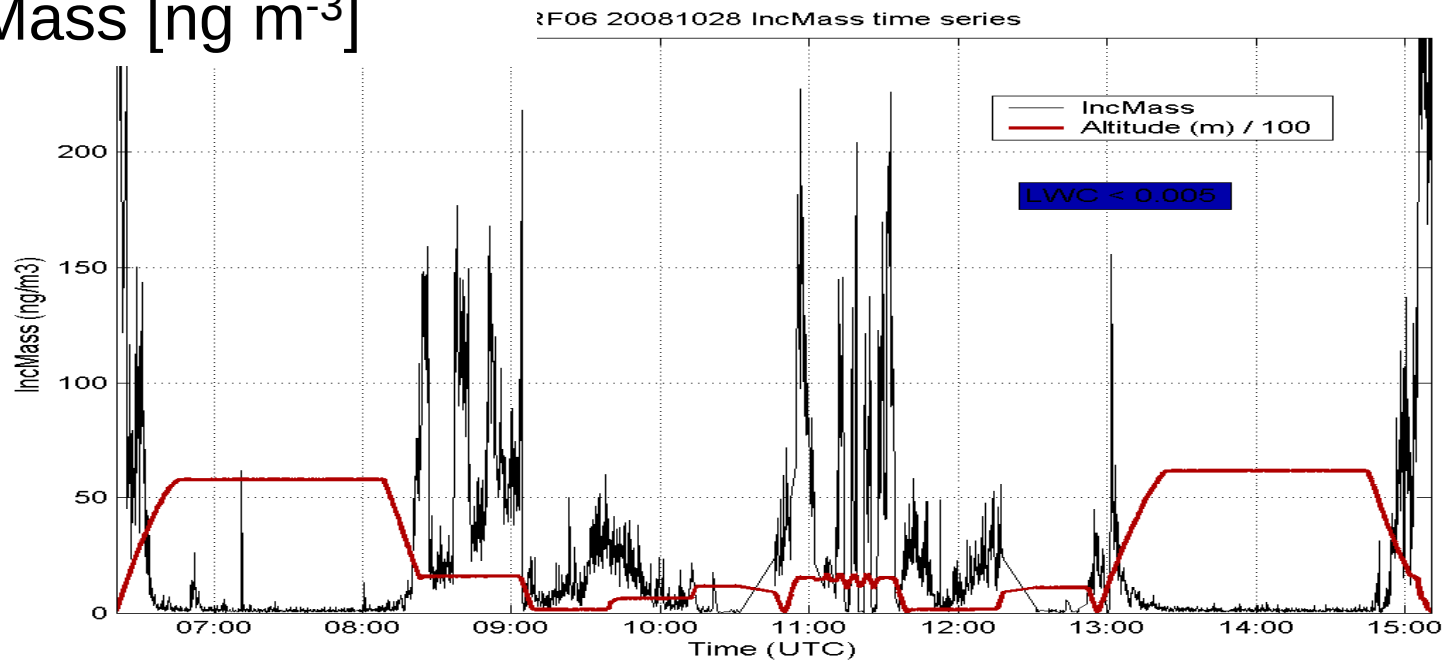
POC Mission [RF06]



SP2 Black Carbon on Flight RF06

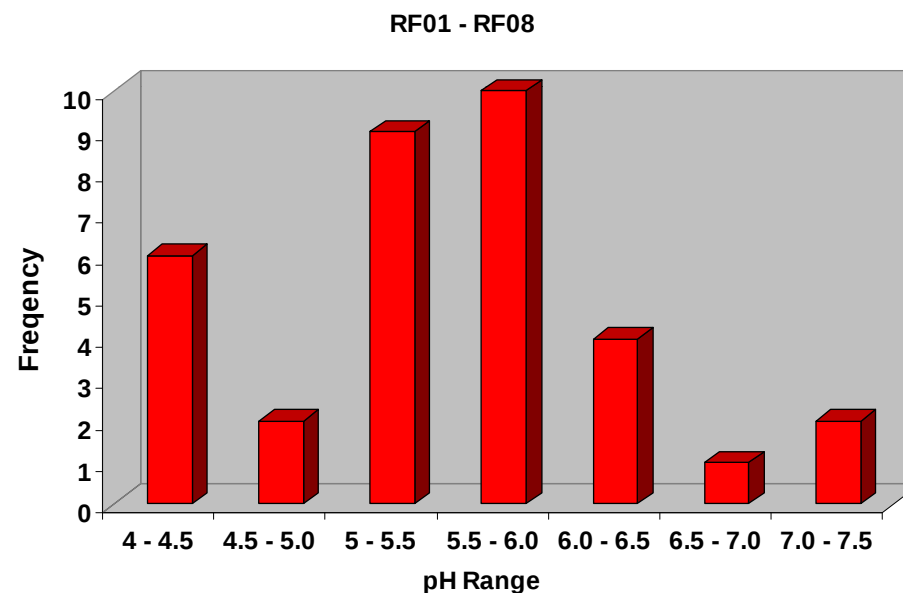
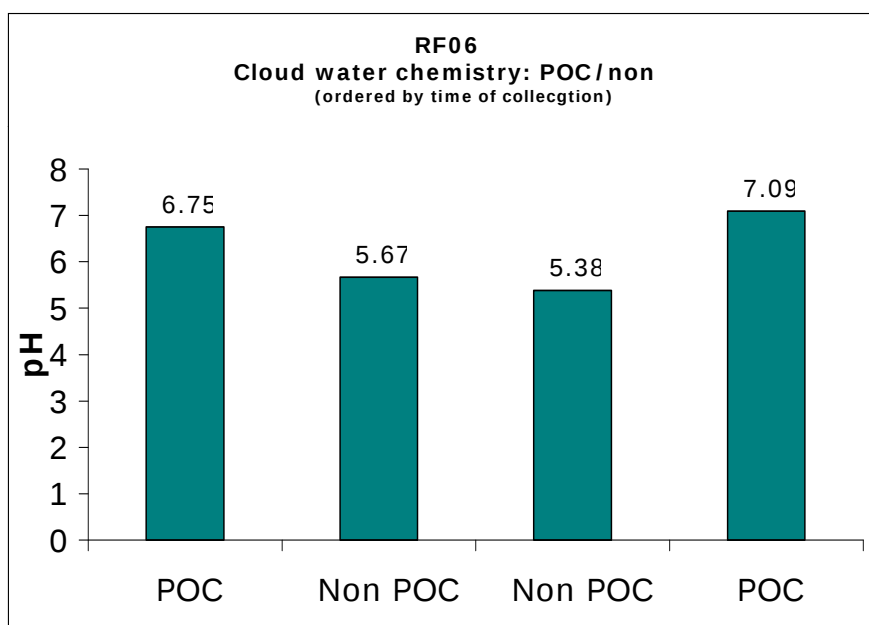


Mass [ng m⁻³]



Cloud water chemistry

CSU/NCAR Cloud Water Collector

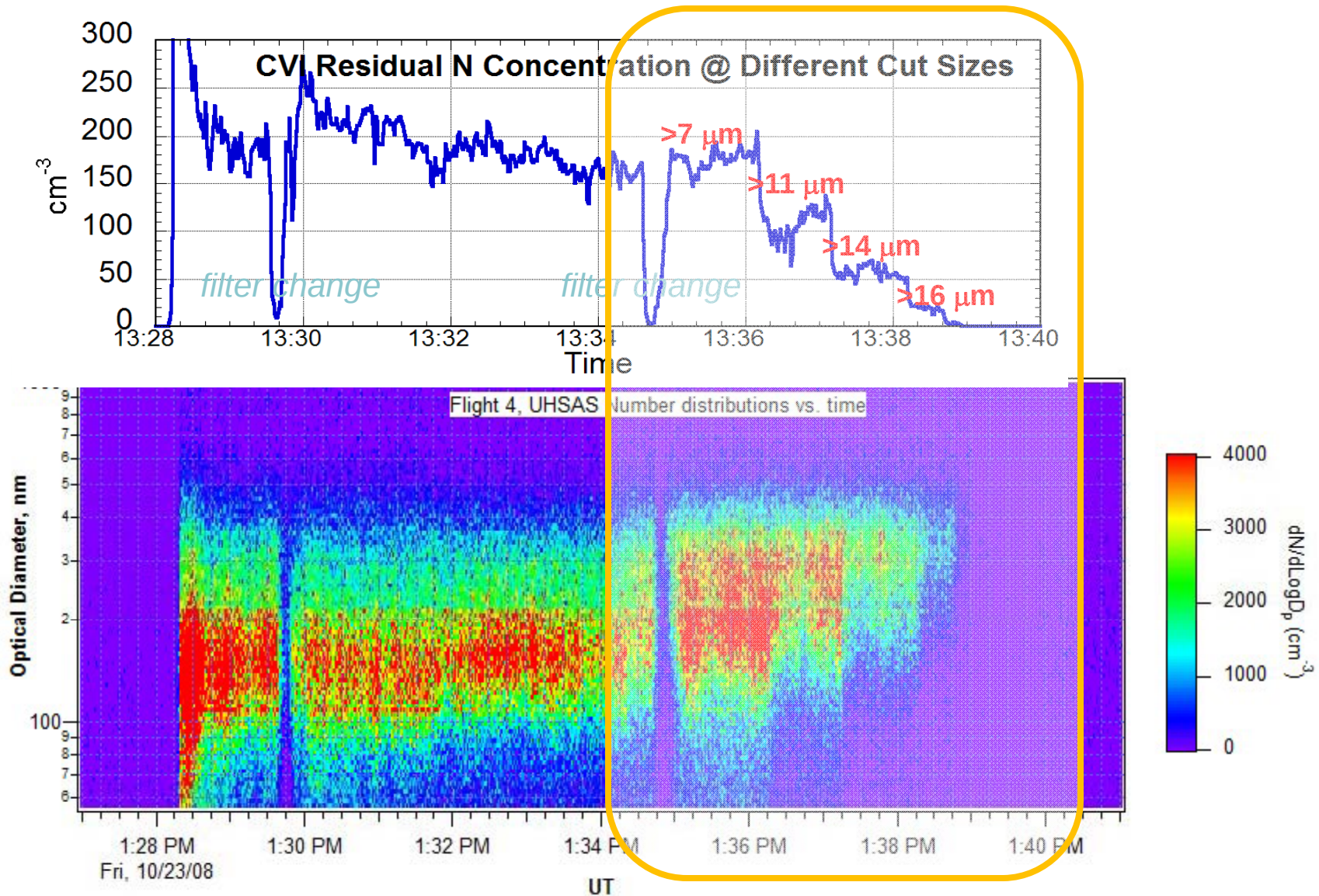


Giant CCN

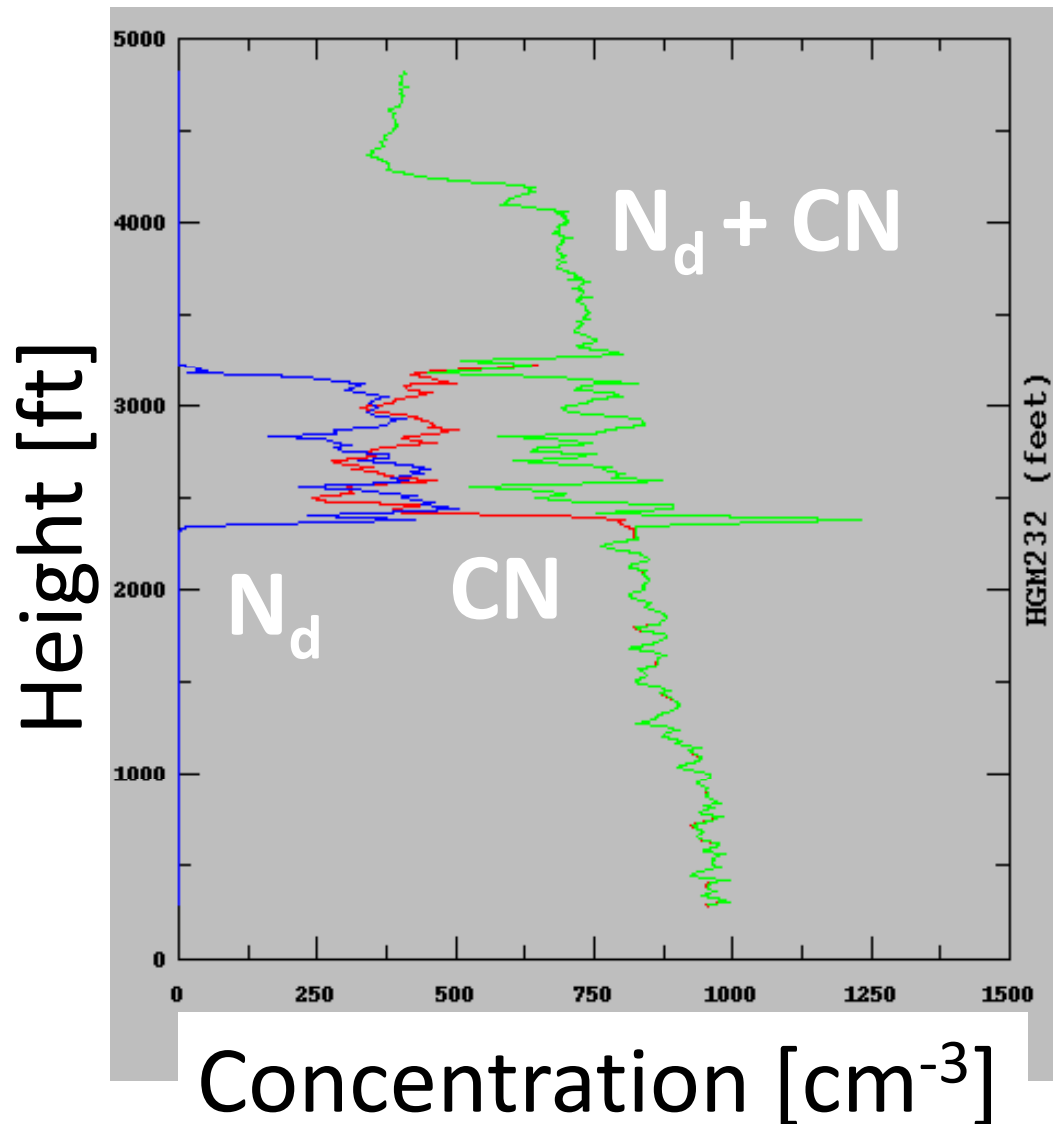


Which Nuclei form Largest Drops?

Important for understanding droplet activation and drizzle formation



Interstitial condensation nuclei



Student C-130 fliers



The Team

- C-130 Ground and Air Crew
- NCAR Research Aviation Facility
- C-130 Pls and Instrument operators
- Mission scientists
- Operations center
- Field catalog support

