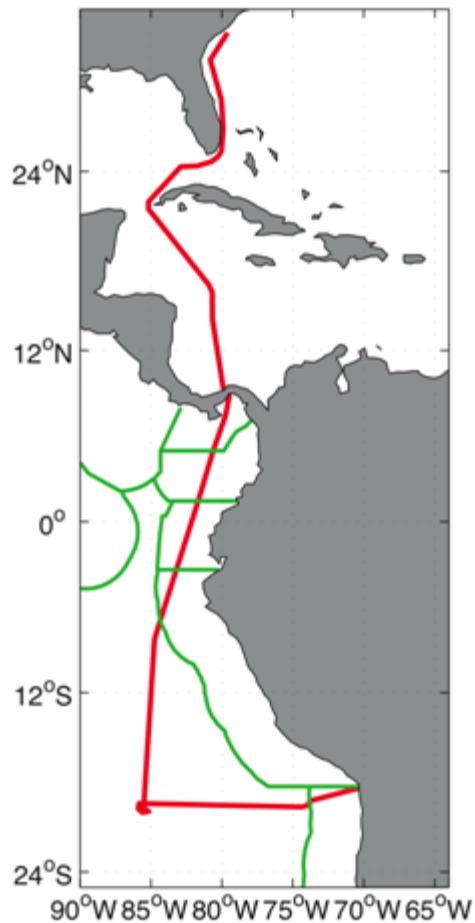


NOAA Ship *Ronald H Brown* *Vocals/Stratus Leg 1 and Leg 2*

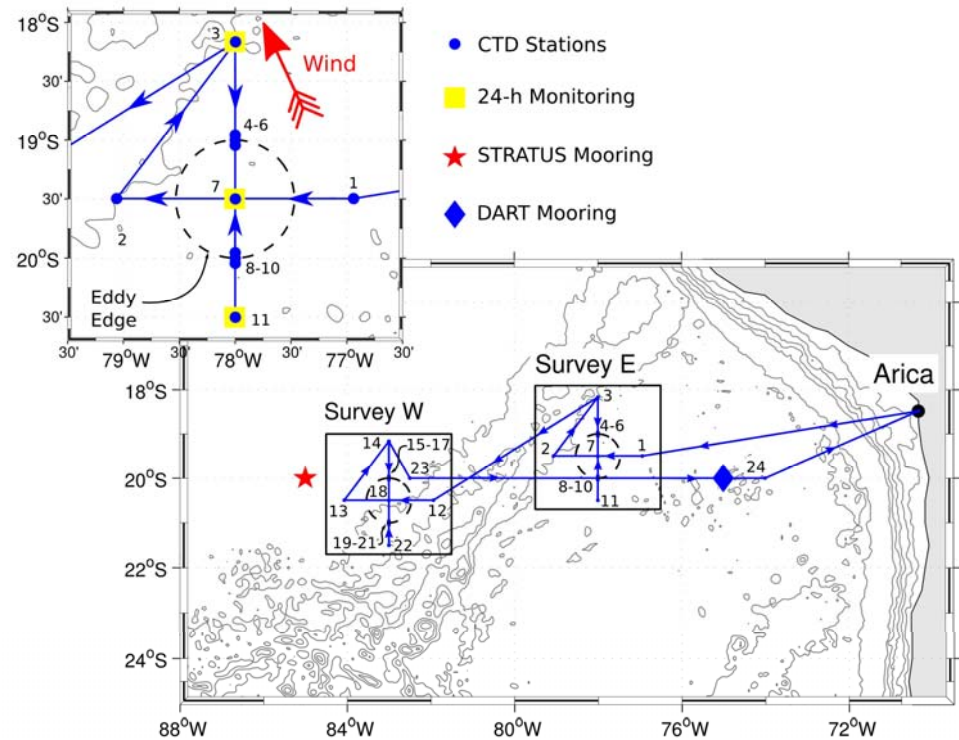


Leg 1: Charleston, SC Oct 6 – Arica Nov 3

Leg 2: Arica Nov 9 – Arica Dec 2



Sampling in Ecuadorian,
Peruvian, international and
Chilean waters.



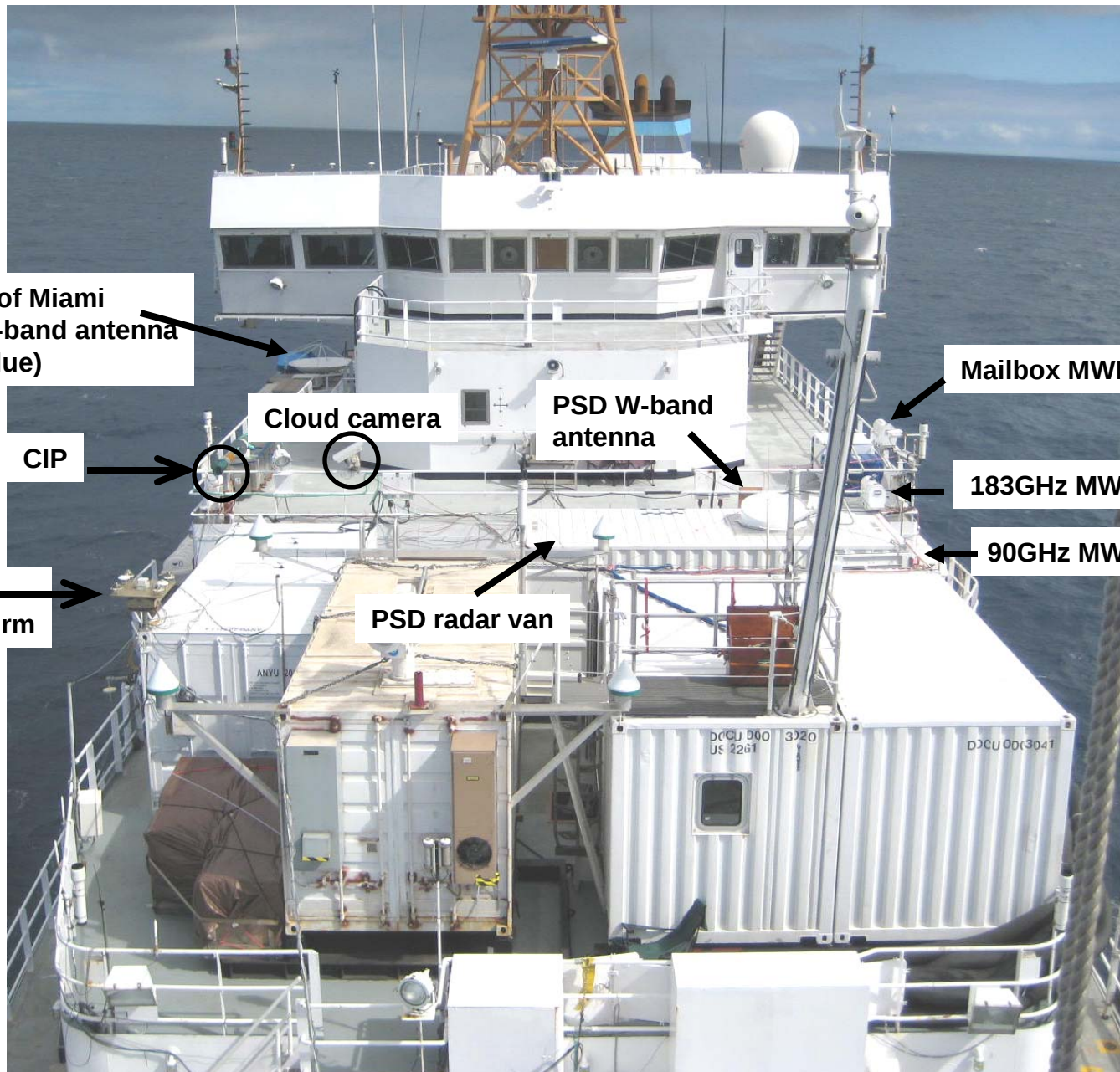
Sampling in international
and Chilean waters.

Leg 1: Charleston, SC Oct 6 – Arica Nov 3

Leg 2: Arica Nov 9 – Arica Dec 2

Participating Institutions

- Woods Hole Oceanographic Institution (WHOI)
- NOAA Earth System Research Laboratory (ESRL)
- Lamont-Doherty Earth Observatory (LDEO)
- Colombian Navy Hydrographic Office, Direccion General Maritima, Centro Control
- Contaminacion del Pacifico, Armada Nacional de Colombia
- Chilean Navy Hydrographic and Oceanographic Office, Servicio Hidrográfico y Oceanográfico de la Armada de Chile (SHOA)
- Ecuadorian Instituto Oceanografico de la Armada (INOCAR)
- Insituto del Mar del Peru (IMARPE)
- University of Miami
- NOAA Pacific Marine Environmental Laboratory (PMEL)
- University of Colorado, CIRES
- North Carolina State University
- University of Hawaii
- University of California, San Diego, Scripps Institution of Oceanography
- Brookdale School
- Bigelow Laboratory for Ocean Science
- UK Meteorological Office
- University of Washington, Department of Atmospheric Sciences (UofW)
- Joint Institute for the Study of the Atmosphere and Ocean, Univeristy of Washington (JISAO)
- Scripps Institution of Oceanography, University of California San Diego (SIO)



U of Miami
W-band antenna
(blue)

Cloud camera

CIP

PSD W-band
antenna

Mailbox MWR

183GHz MWR

90GHz MWR

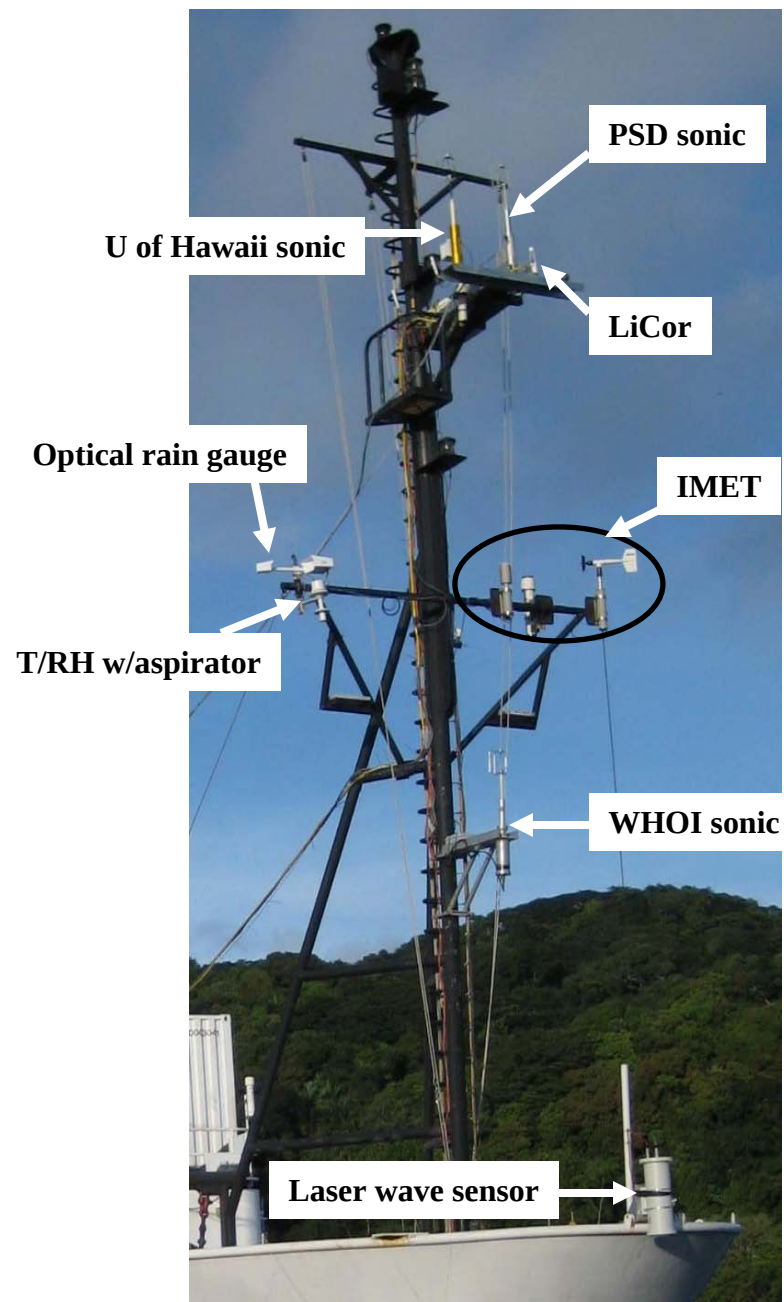
Radiometers
Stabilized platform

PSD radar van

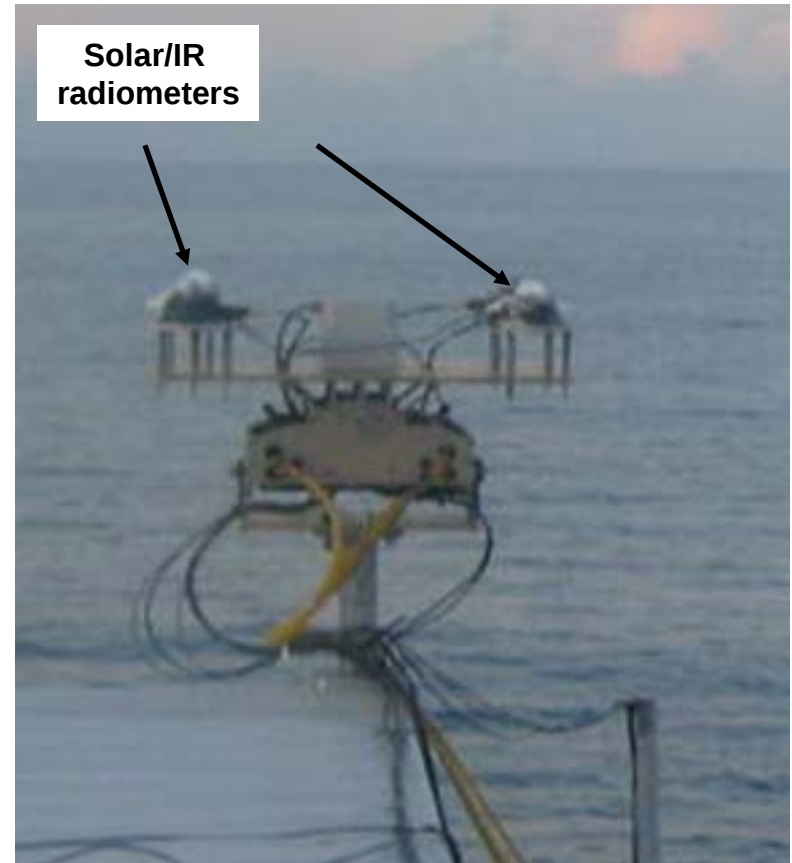
The NOAA/ESRL High Resolution Doppler Lidar

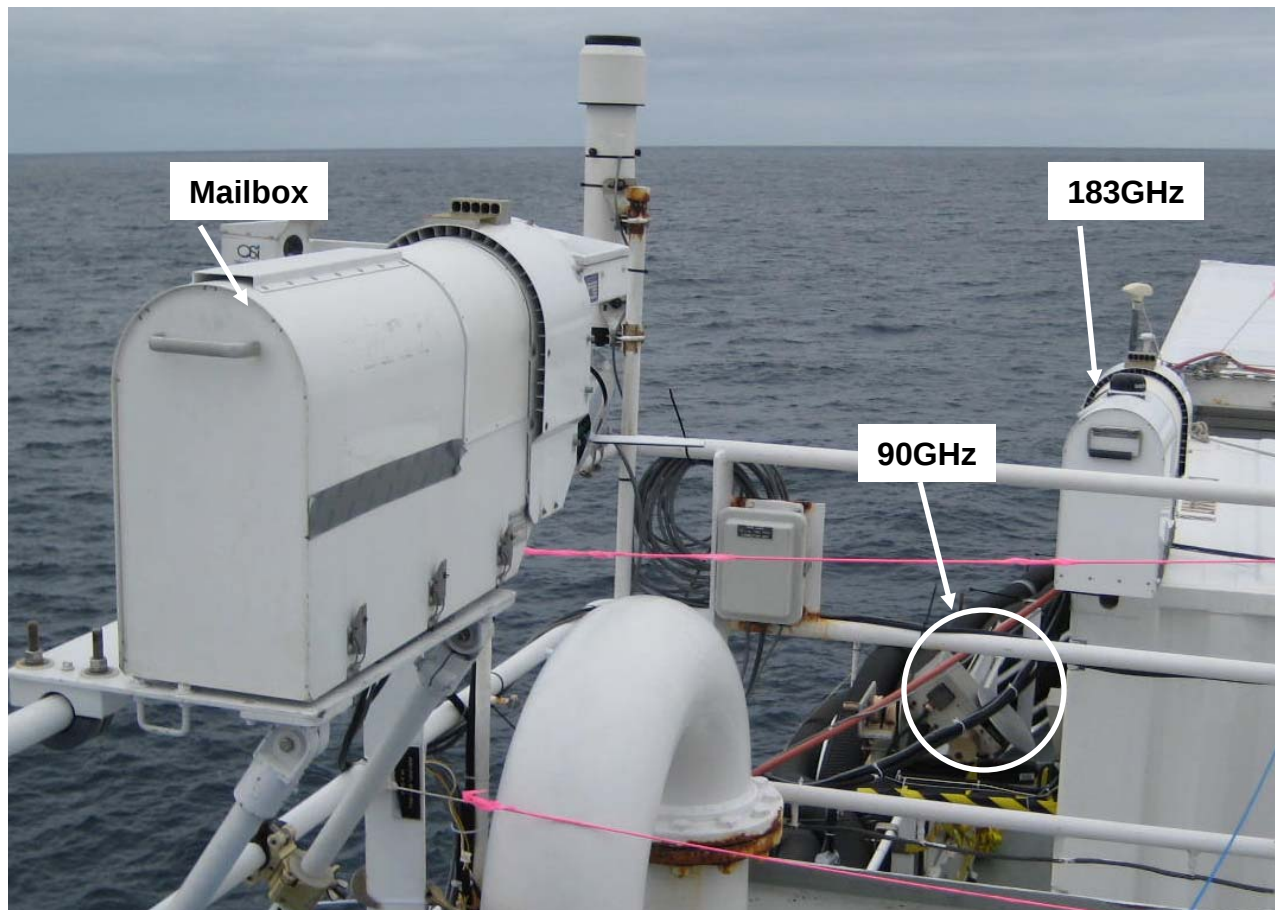
- 30 m / $\frac{1}{2}$ second resolution
 - 2 micron – invisible/eyesafe
 - Motion stabilized scanning
 - 6-7 km typical range
-
- Mounted forward on O2 deck
 - Operates 24/7

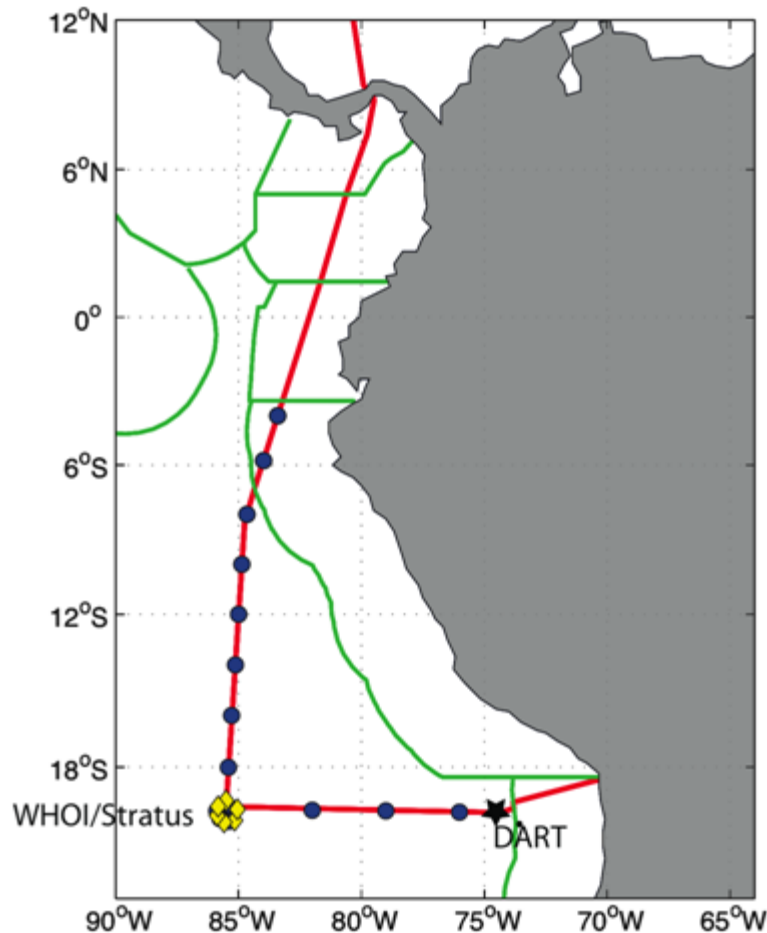




Motion Stabilized Sensors







Blue circles – SST drifters

Yellow diamonds – Profiling floats

Underway from Rodman to Arica with
~2.5 days at WHOI/Stratus mooring
and ~3 days at DART

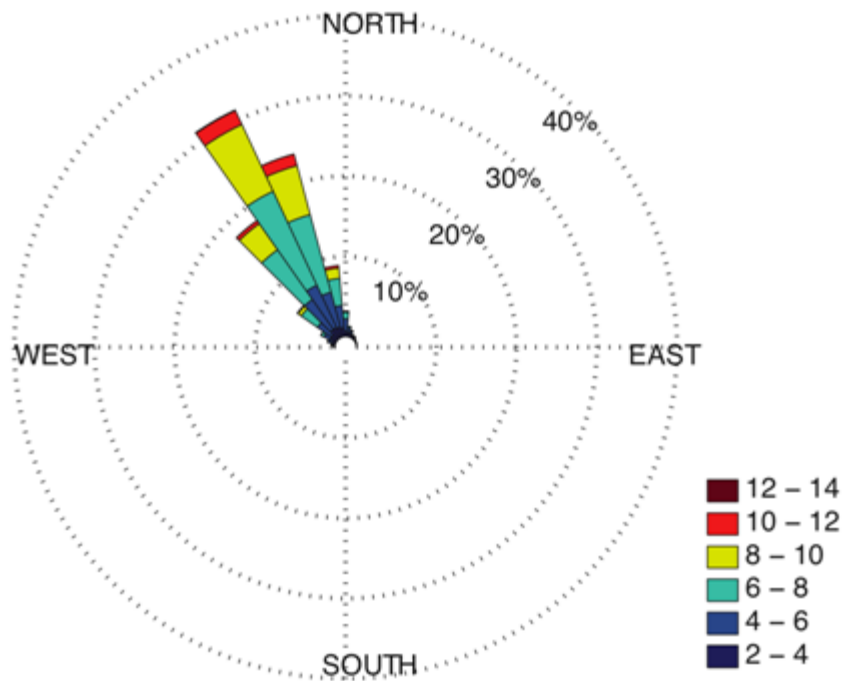
- Air-sea fluxes, bulk meteorology
- Atmospheric profiling
- Cloud properties, photographs
- Aerosol physics, chemistry, optics
- Recover/deploy WHOI mooring
- Recover/deploy DART mooring
- Underway ocean sampling (T,S, vel)
- Radiosondes
- SST drifters
- Profiling ocean floats (T,S, O)
- Phytoplankton sampling
- Seawater DMS, DMSP, chlorophyll
- Underway PCO₂
- Optical absorption spectroscopy
- C, W and X band radars
- CTD profiles, water sampling
- Ocean vertical microstructure profiles



WHOI Stratus buoy: bulk meteorology; ocean temperature, salinity, velocity time series in upper 1500 m.



Chilean Navy Hydrographic and Oceanographic Service (SHOA) DART (tsunami warning) buoy, fitted with WHOI bulk meteorological sensors and ocean T and S sensors in upper 300 m.



WHOI Stratus buoy 2007

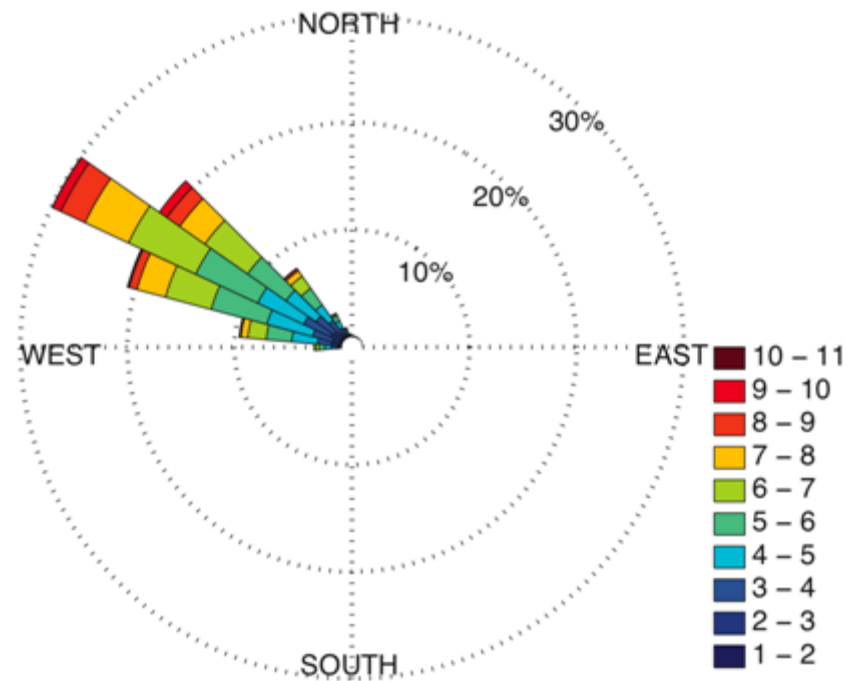
Mean wspd 6.6 m s^{-1}

Mean incoming swr 205.7 W m^{-2}

Mean incoming lwr 371.8 W m^{-2}

Mean sst 20.09° C

Mean at 18.97° C



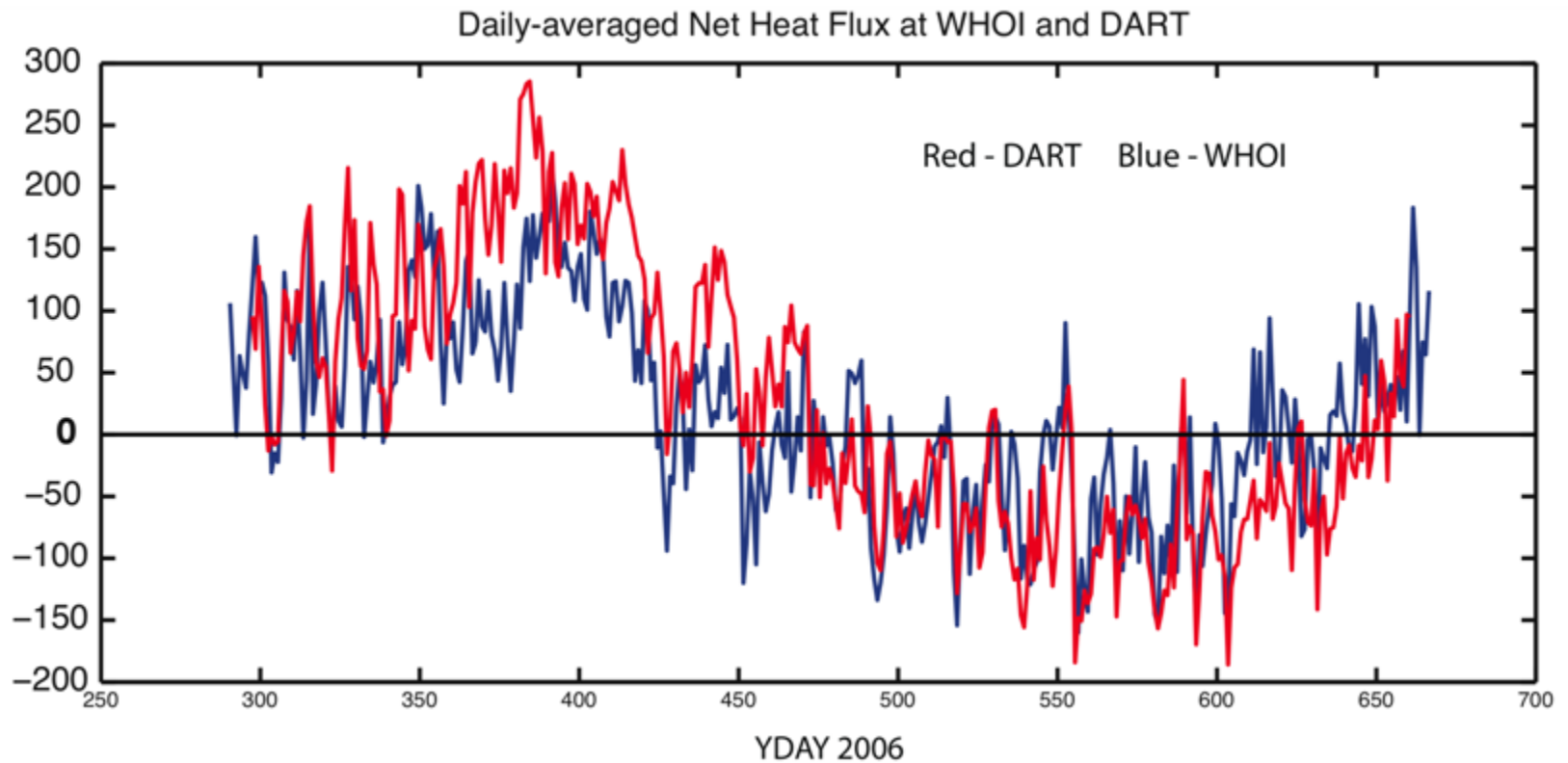
Chilean Navy Hydrographic and
Oceanographic Service (SHOA)

DART buoy 2007

Mean wspd 5.4 m s^{-1}

Mean incoming swr 178.2 W m^{-2}

Mean incoming lwr 378.5 W m^{-2}



WHOI Stratus buoy 2006-2007

Net heat flux	18.1 W m ⁻²
Net swr	194.4 W m ⁻²
Net lwr	-45.0 W m ⁻²
Net sensible	-10.9 W m ⁻²
Net latent	-120.3 W m ⁻²

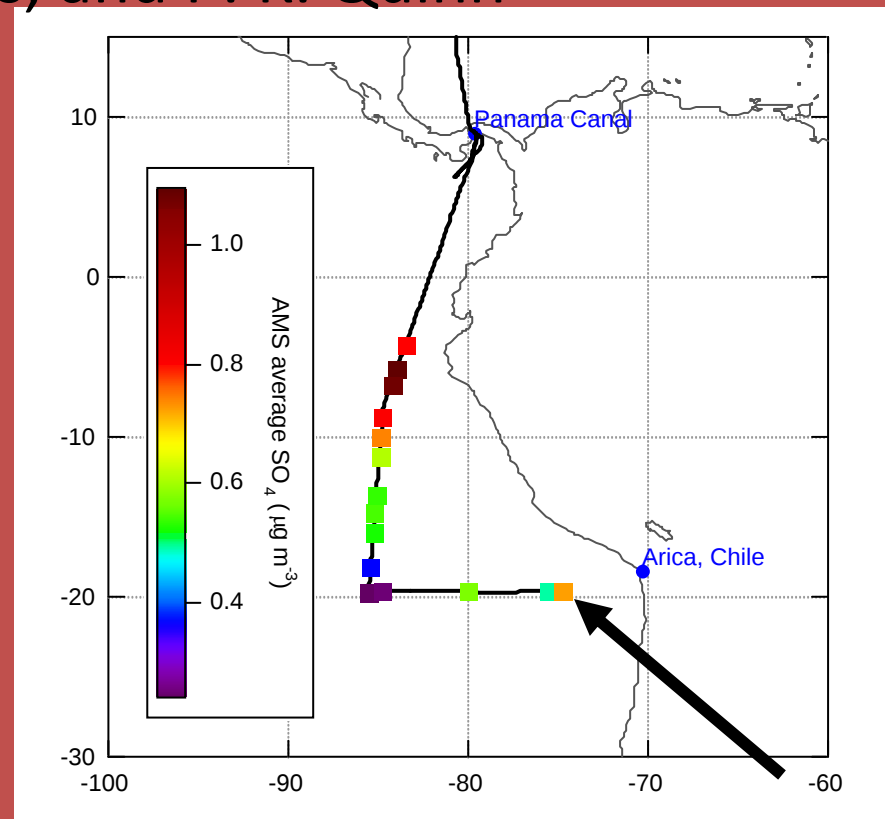
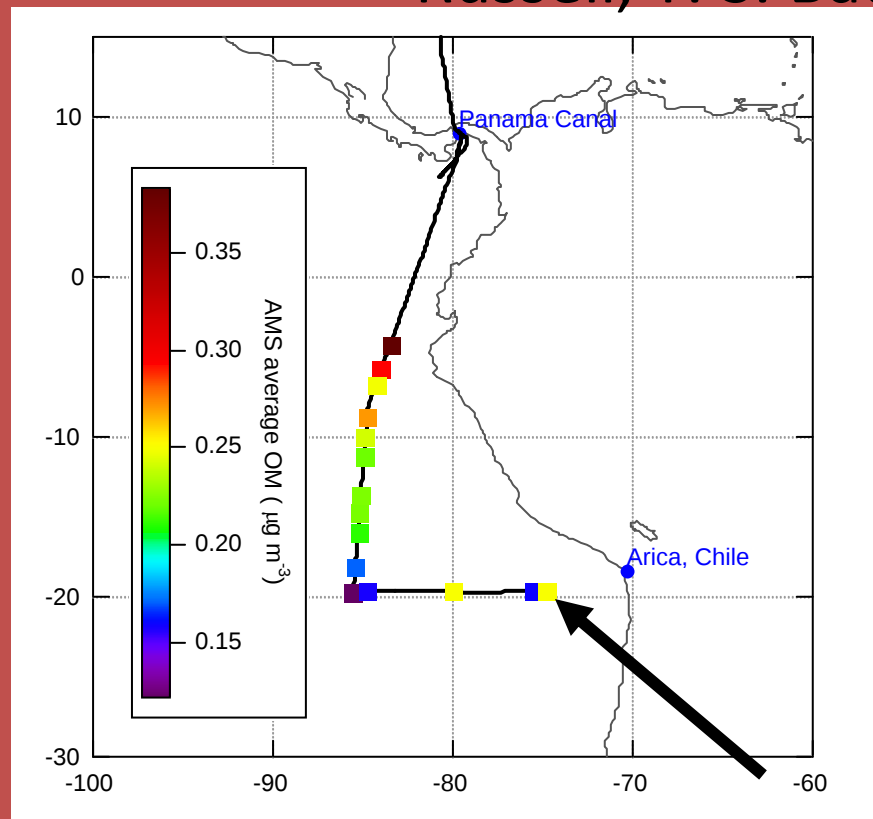
DART buoy 2006-2007

Net heat flux	27.5 W m ⁻²
Net swr	168.4 W m ⁻²
Net lwr	-36.2 W m ⁻²
Net sensible	-10.1 W m ⁻²
Net latent	-94.7 W m ⁻²

Aerosol Mass SO_4 and Organics

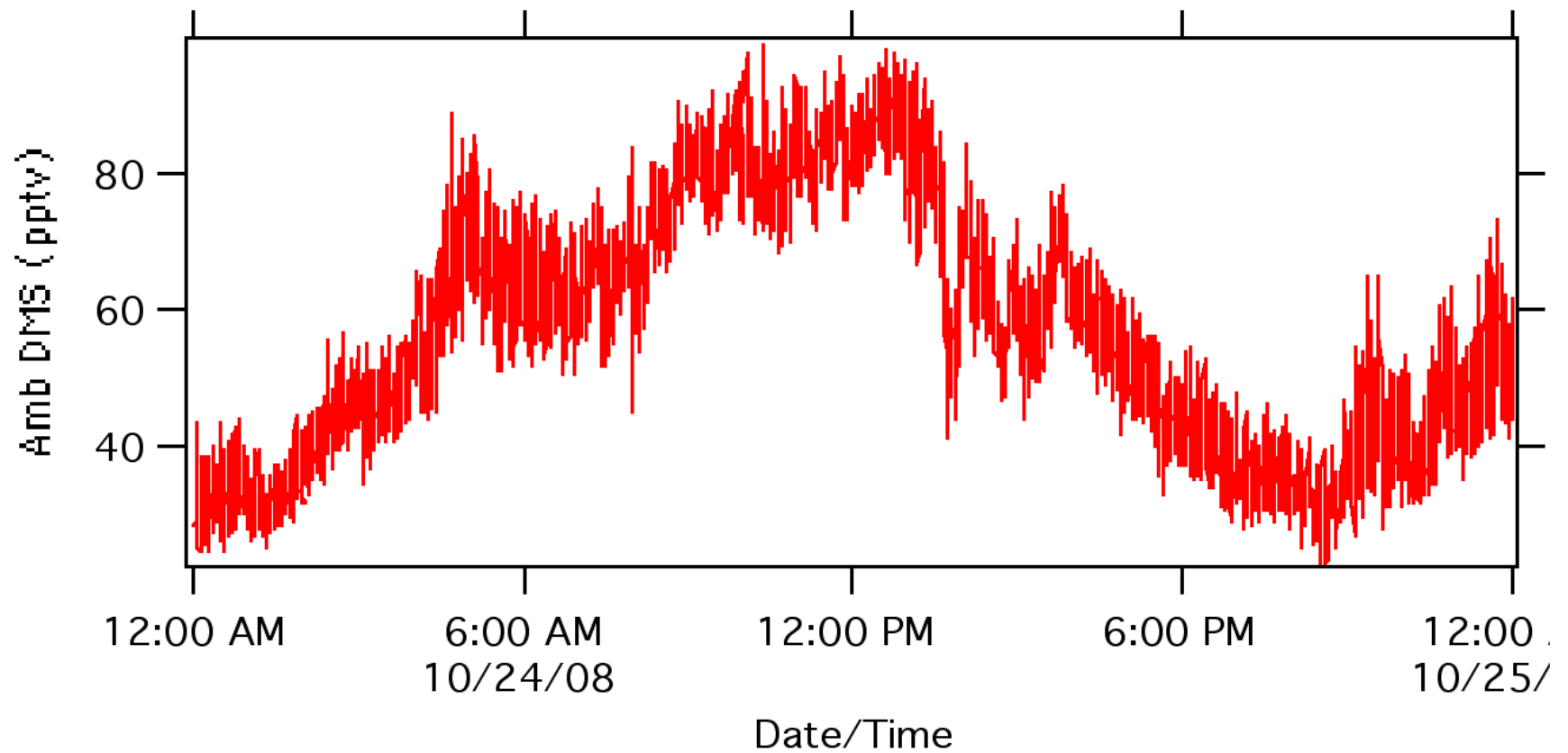
L. N. Hawkins, D. Covert, D. Coffman, C. Hoyle, L. M.

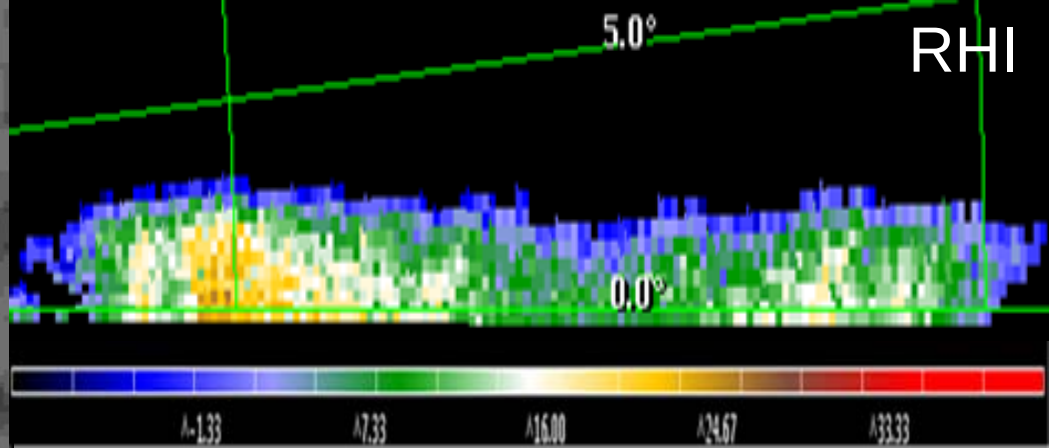
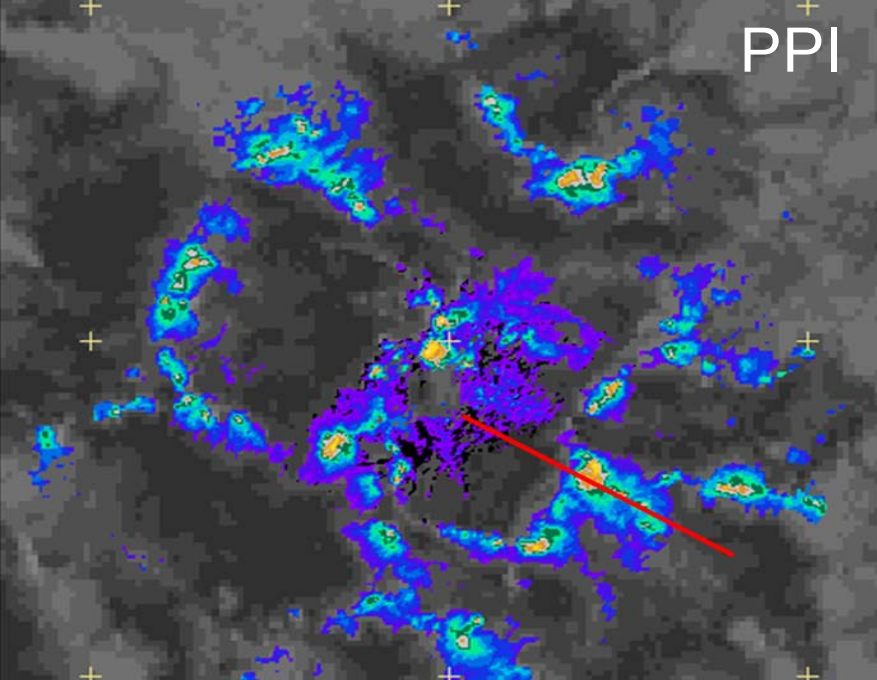
Russell, T. S. Bates, and P. K. Quinn



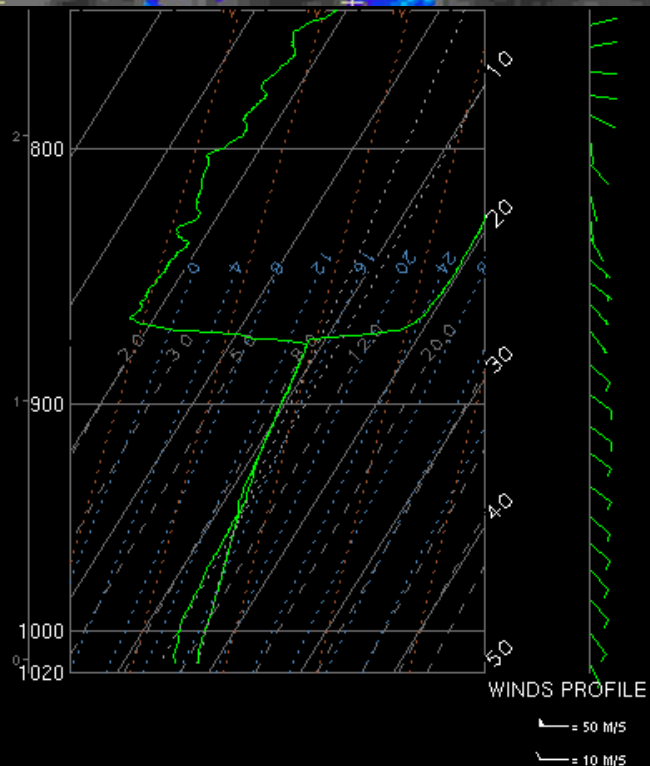
- Near shore samples are roughly double the concentrations of sulfate and organics
- Stronger off-shore winds brought increased mass (marked by arrows) from land sources (e.g. copper smelters and fossil fuel combustion)

Atmospheric DMS
University Hawaii





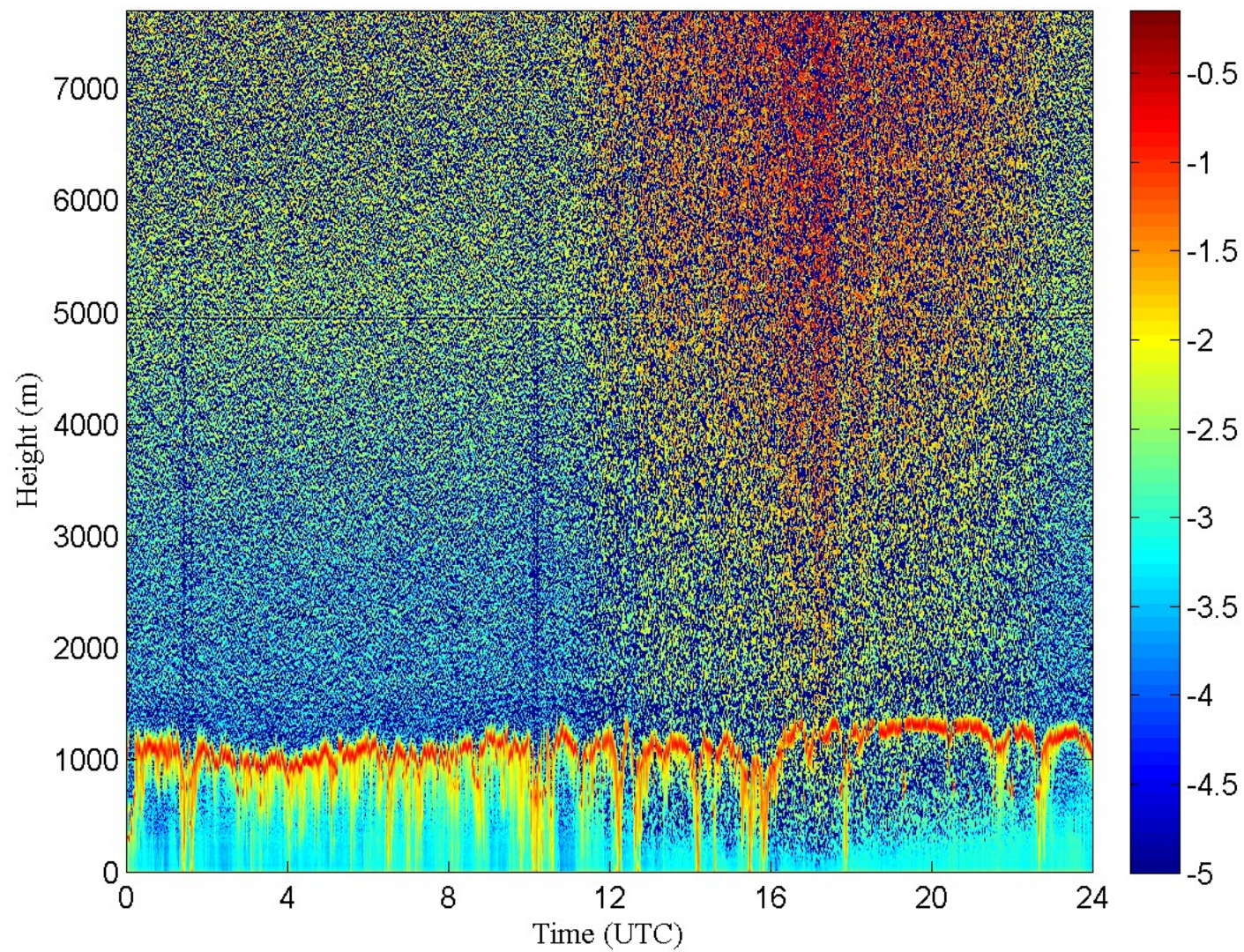
C-Band Radar, Upper Air Sounding,
Cloud photo for
12 UTC on 23 OCT 08



View in direction along RHI

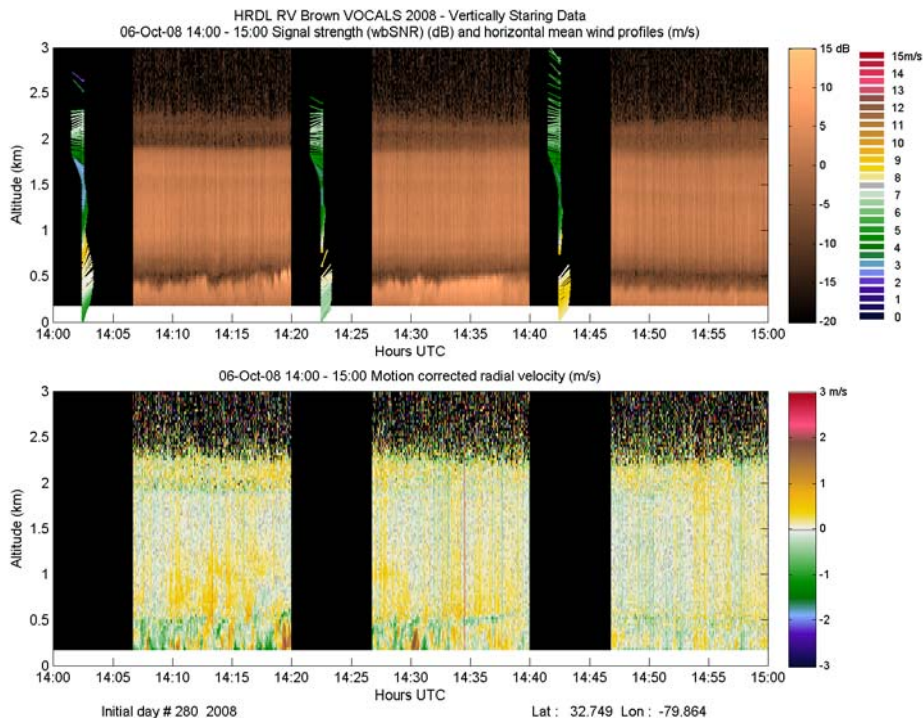


VOCALS□302/10-28-08, Ceilometer Backscatter

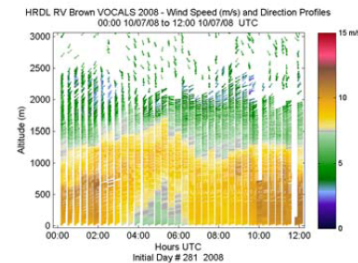


VOCALS HRDL Lidar Data

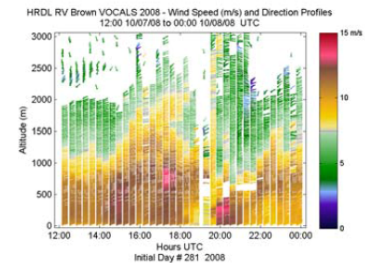
October 7, 2008 - Field Data

[Previous Day](#) [Archive Calendar](#) [Next Day](#)
High Temporal Resolution Vertical data
Click on an image to see the large version

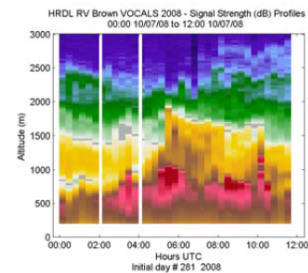
Wind Speed and Direction



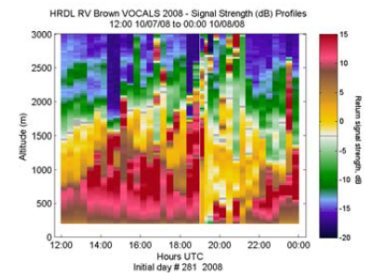
Wind Speed and Direction



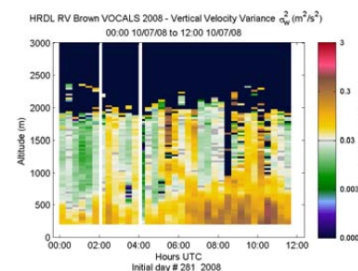
Signal Strength



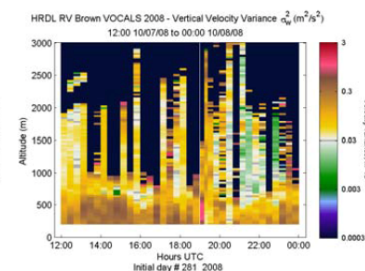
Signal Strength



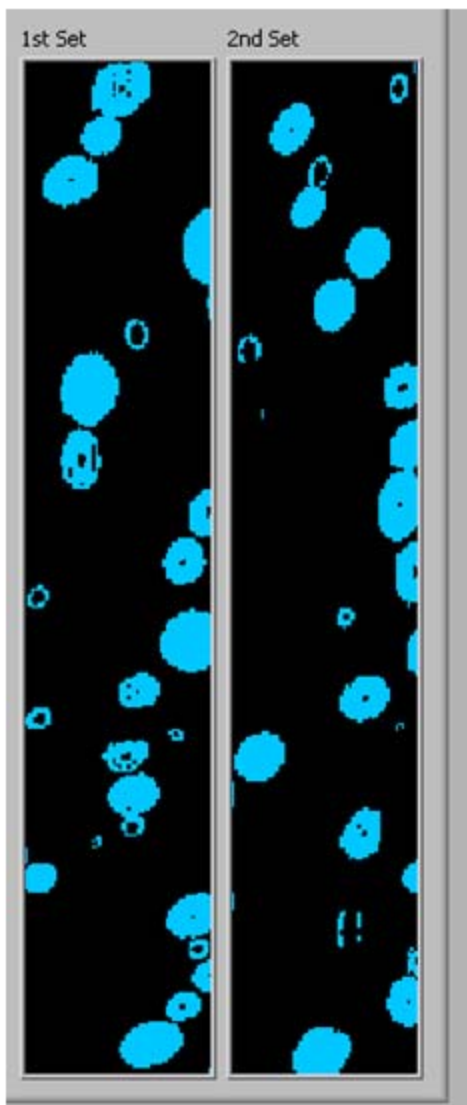
Vertical Velocity Variance



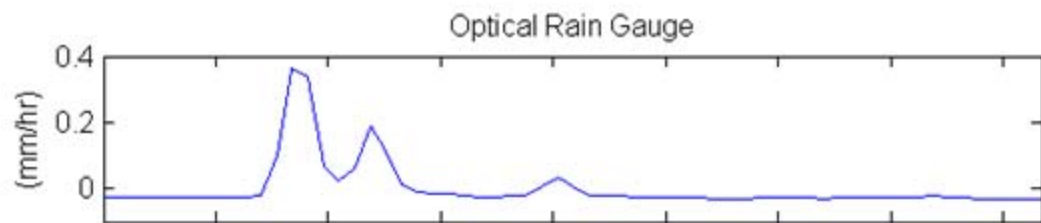
Vertical Velocity Variance


<http://esrl.noaa.gov/csd/lidar/vocals>

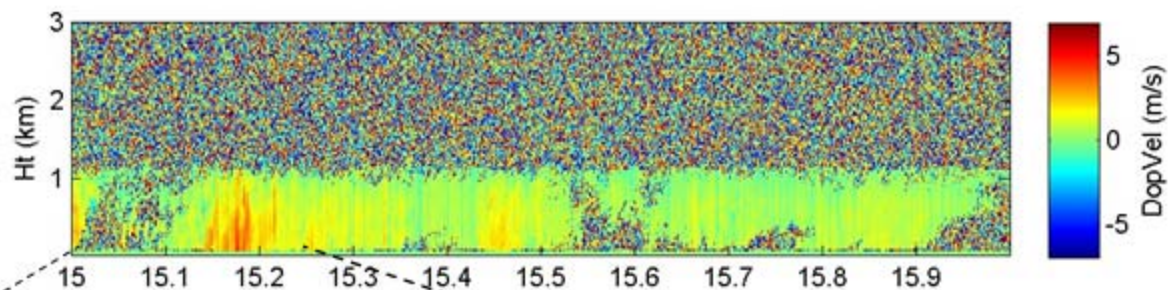
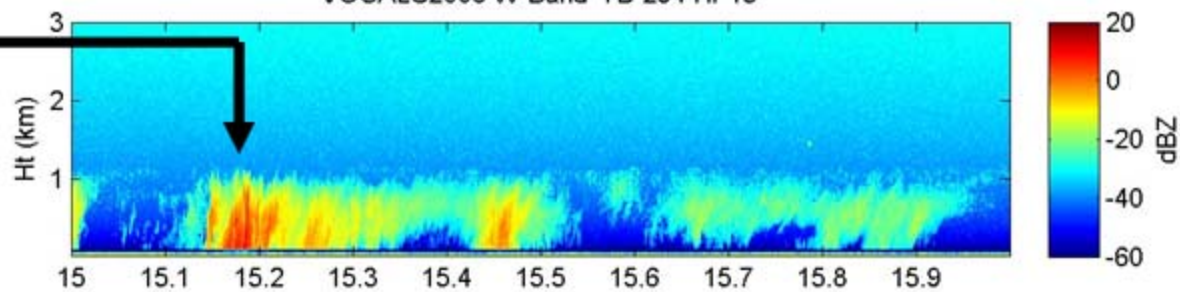
Updated: 20 October 2008



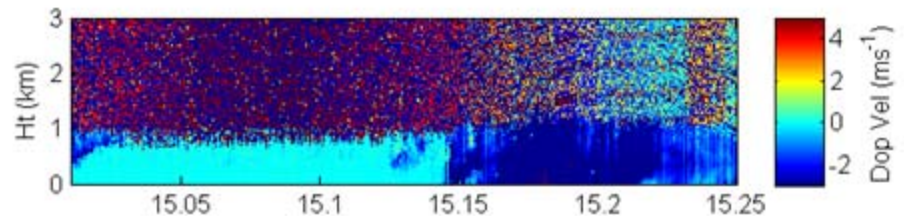
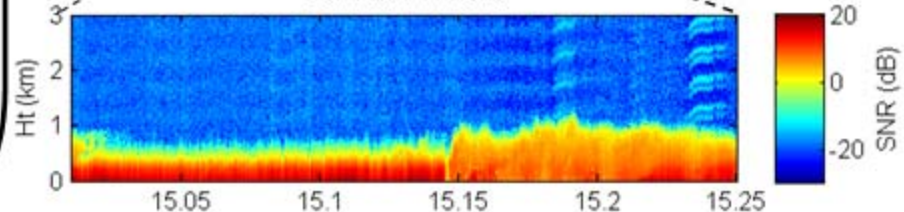
Cloud Imaging Probe
15:11:14 UCT



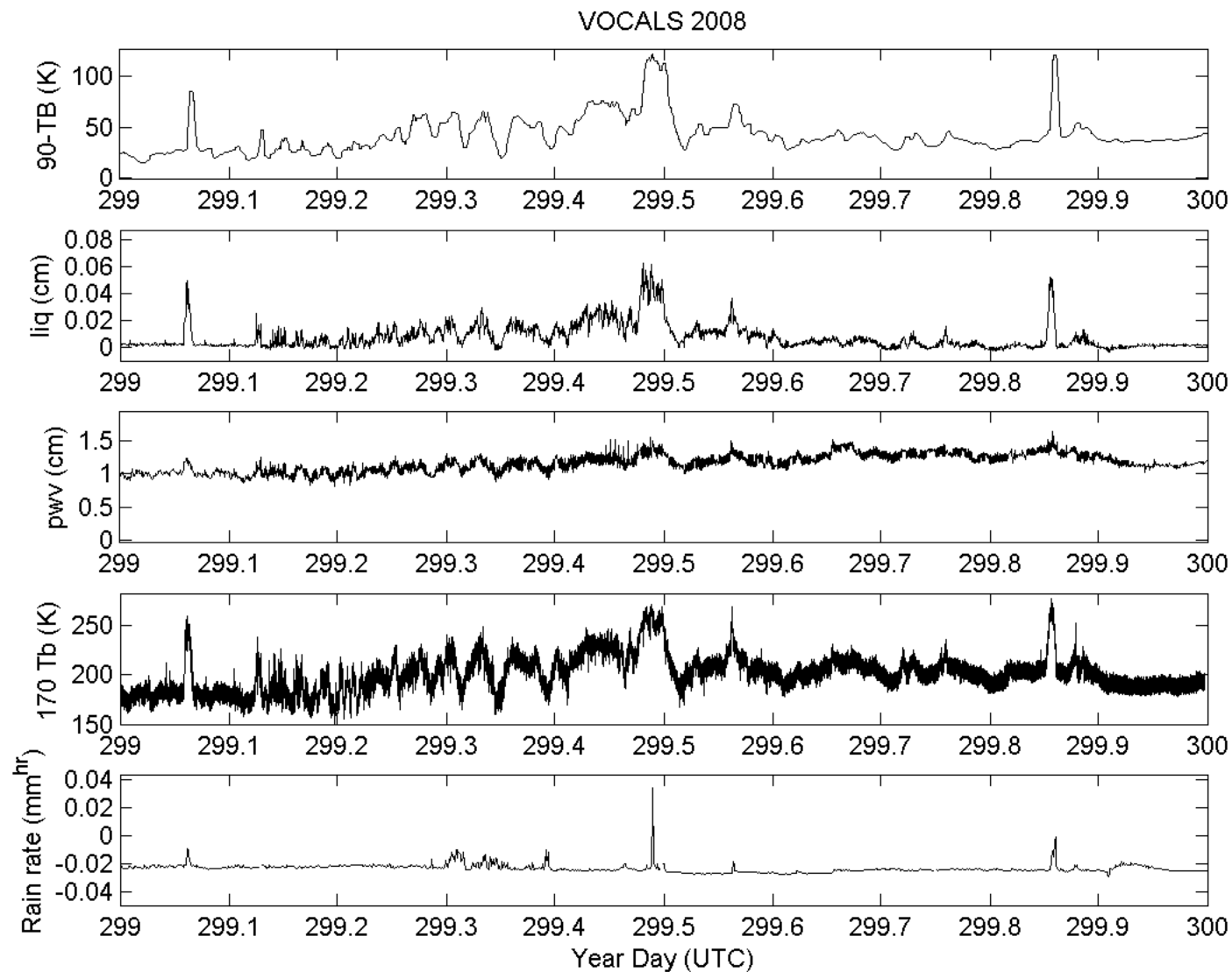
VOCALS2008 W-Band' YD 294 Hr 15



U of Miami W-Band



Microwave



Surface Flux Components

