WINTER DEPLOYMENT

RAF NSF/NCAR C-130 INSTRUMENTATION

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RAF STATE PARAMETERS AND WIND

Temperature, Rosemount heated and fast (25-Hz)
Humidity, cooled mirror dewpoint (slow)
Humidity, VCSEL (25-Hz)

Static pressure, Paroscientific
Differential pressure, Rosemount
Radome attack and sideslip,   Rosemount sensors

Pitch, roll and heading, Honeywell inertial system (IRS)
Ground speed, Honeywell IRS and Novatel/Omnistar dGPS
Latitude and longitude, Honeywell IRS and Novatel/Omnistar dGPS
Accelerations, Honeywell IRS

➔   3-D wind   -   if no icing of radome

RAF AEROSOL PARTICLES

CN counter,   D > 10 nm
UHSAS aerosol spectrometer, 100 channels, 60 nm < D < 1 μm
PCASP aerosol spectrometer, 30 channels, 100 nm < D < 3 μm
FSSP/SPP-300 aerosol spectrometer, 30 channels, 0.3 < D < 20 μm
    300-probe is "end-of-life";   works until it dies, no spares

RAF CLOUD PROBES
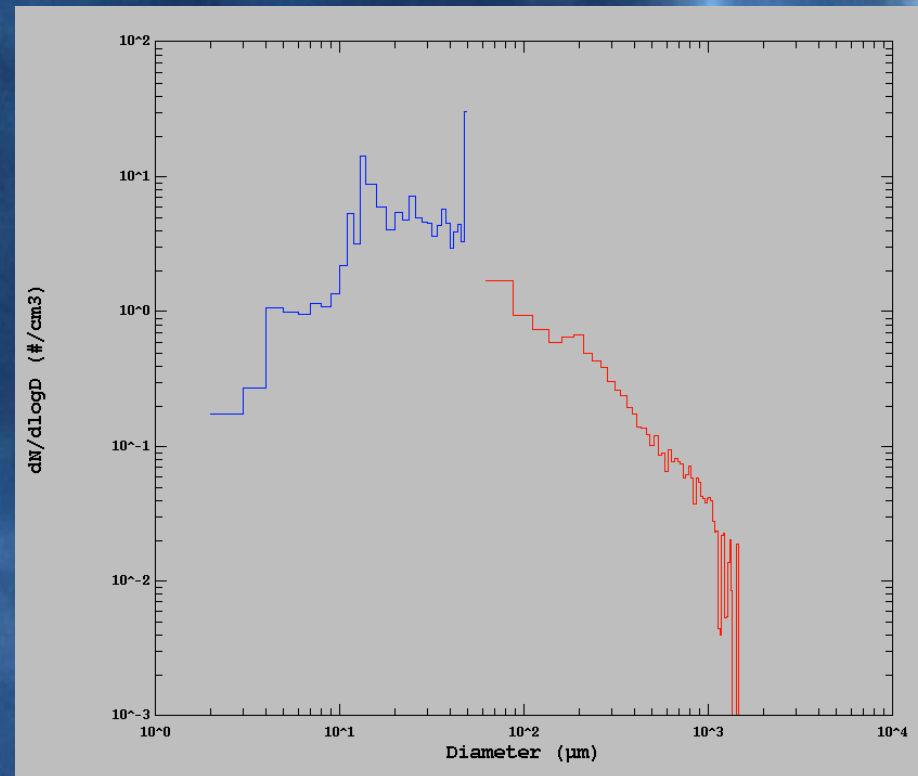
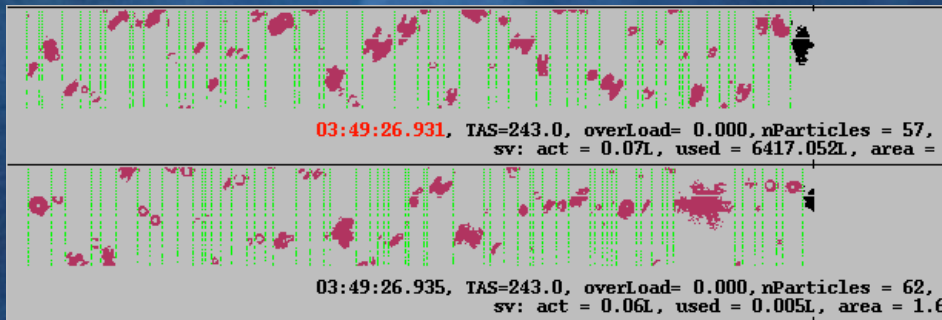RICE Rosemount icing probe, presence of supercooled liquid
King hotwire cloud liquid water content (LWC)   D < 50 μm
CDP, cloud droplet spectrum, 30 bins   2 < D < 47 μm
FSSP, cloud droplet spectrum, 30 bins   2 < D < 47 μm
2D-C, drops and ice particles, 64-diode   50 – 1600+ μm

03:49:26.931, TAS=243.0, overLoad= 0.000, nParticles = 57,
sv: act = 0.07L, used = 6417.052L, area =

03:49:26.935, TAS=243.0, overLoad= 0.000, nParticles = 62,
sv: act = 0.06L, used = 0.005L, area = 1.6

RAF RADIATION SENSORS

Heimann remote surface temperature
Heimann remote cloud base temperature

Digital imagery (forward and down, 1 Hz)

What to expect?

Missed approaches – flaps down will degrade thermodynamics and winds

Flight in clouds – when you do not want it

Icing of some instruments – likely not of HIMIL inlets

Instrument problems – large number of instruments, data systems, satcom, and the law of probabilities

What else to expect?   Field staffing for instruments:

In addition to scientific staff handling specialized instruments, there will be one "overall science" oriented and one "instrument and electronics" capable engineer.

We will mainly look at RAF instrument performance,

Examine / evaluate instrument performance, and

Evaluate the meteorological context of the data

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EOL has a lot of staff with very extensive scientific field observational experience –

I encourage you to use us for planning, evaluation, and to draw us into the subsequent analysis

Data provision in the field

1-Hz netcdf file of most RAF data (state, wind, position, aerosol, cloud, precipitation, trace gases, etc.). Availability: Typically some hours after a flight or next morning

This data is preliminary – do not use it for publication. Use if for quick-look, setting up analysis scripts, etc.

Data provision after the field

Final, quality-controlled data 6 months after completion of deployment
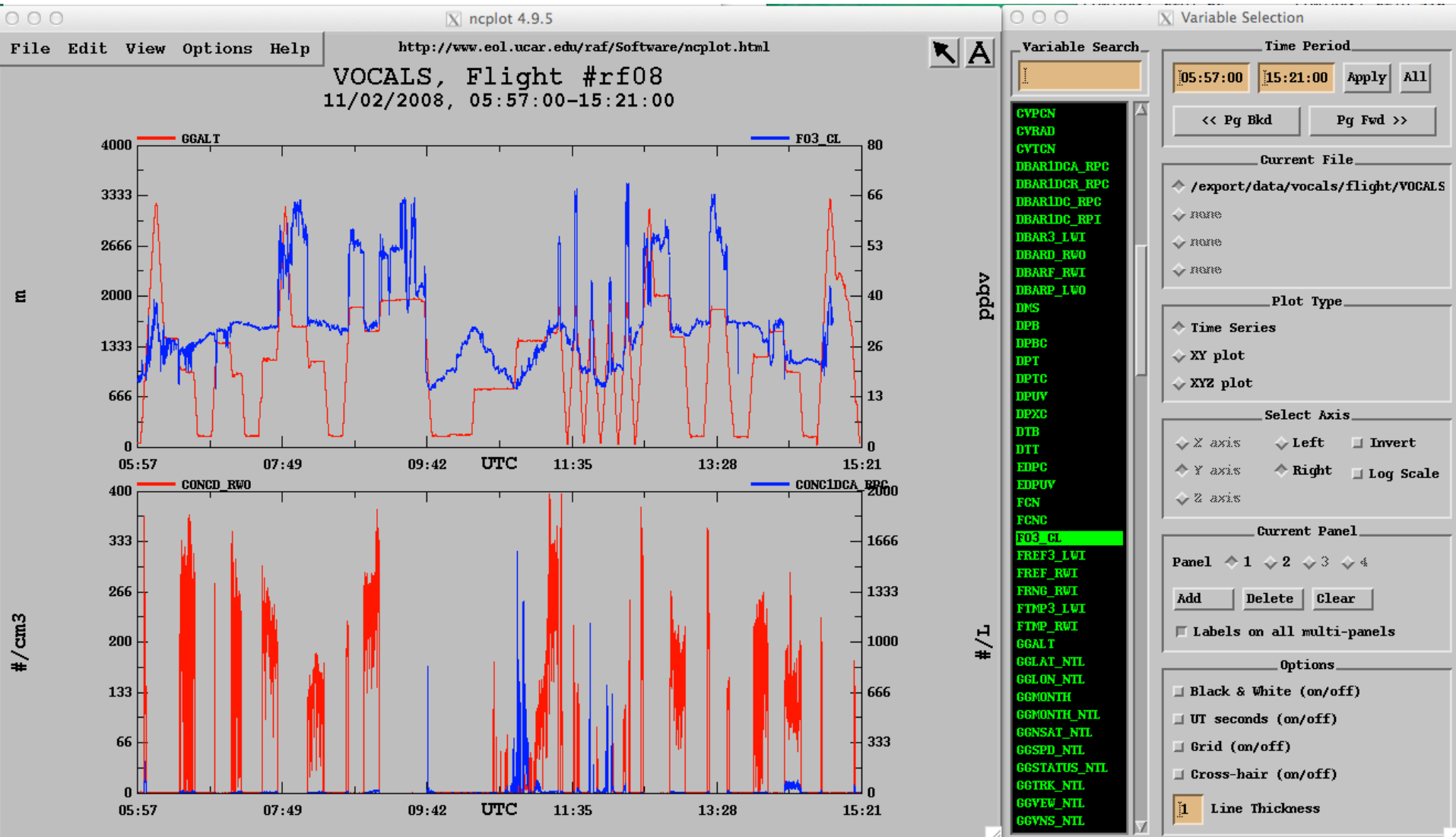
1-Hz is standard rate; 25-Hz winds are possible for eddy-covariance studies

Quicklook of netcdf data on the ground: ncplot, ncpp and xpms2d

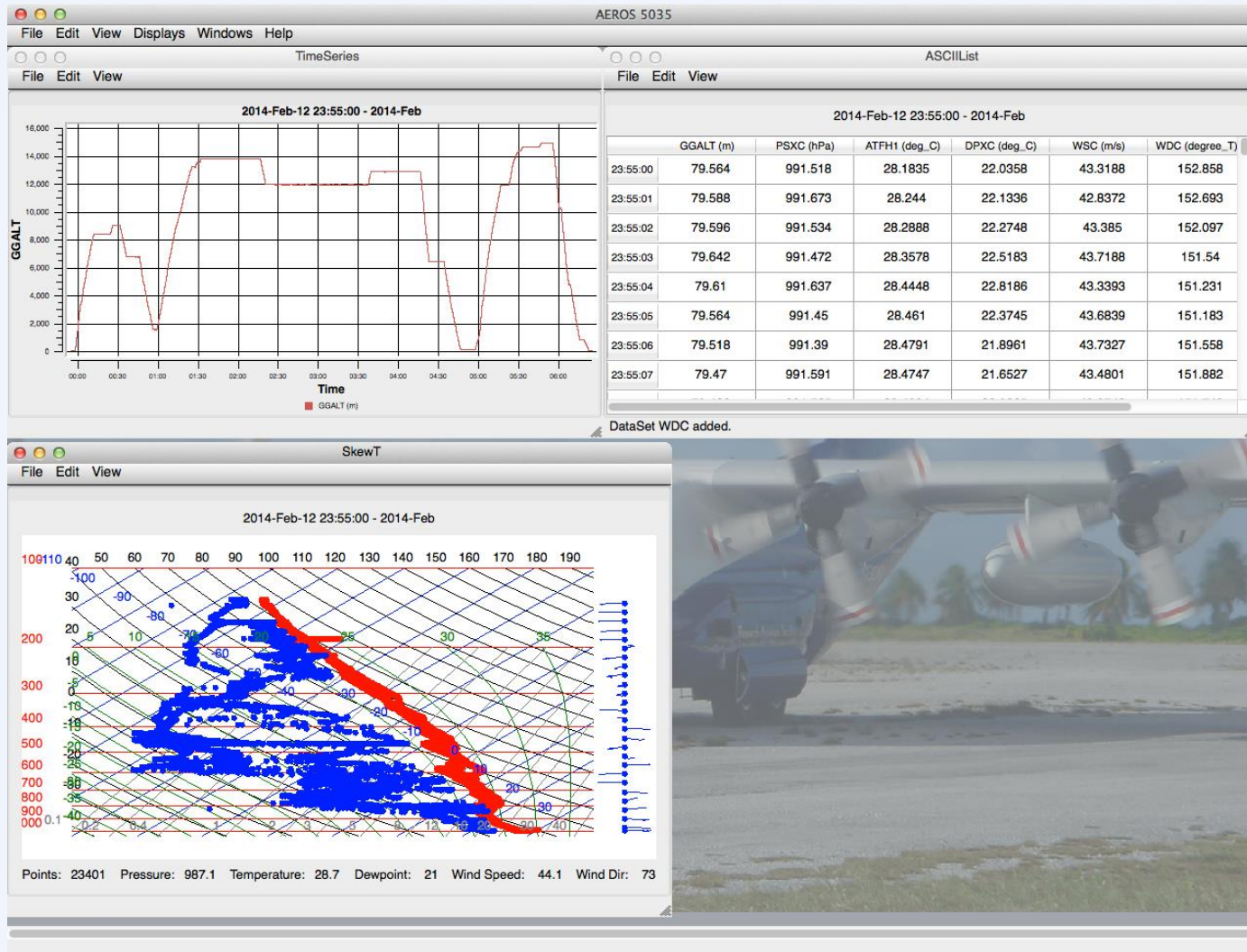Timeseries, lat-lon map, spectral analysis, etc.   Runs on linux and mac

Quicklook of data while flying, while on the ground during flight (limited number of downloaded parameters), and netcdf files post-flight on the ground

aeros

Timeseries, lat-lon map, spectral analysis, etc.   Runs on linux, mac and windows

Let the WINTER begin