DEEPWAVE GV data quality

Jørgen B. Jensen

Thermodynamics
Winds
Position, altitude, etc.
Aerosols
Cloud
Radiation
Data system and other

DEEPWAVE GV data quality:
Thermodynamics

Temperature:	2x Harco heated (slow), 1x Rosemount unheated (fast)
Static pressure:	1x Paroscientific (fuselage), 1x Honeywell (gust pod)
Differential pressure:	1x Rosemount pitot, 1x Honeywell (gust pod)
Dewpoint:	2x Buck Research cooled mirror
	1x VCSEL

Losing track when cold soaked on descent. Now better insulated and heated, so better performance late in flight.

1x VCSEL

Lost signal on one flight (due to icing?) for 10 minutes after takeoff; 5 flights had data loss for a few minutes (changing from high-low range)

DEEPWAVE GV data quality:
Winds

Attack angle: 1x Rosemount (radome), 1x Honeywell (gust pod)
Sideslip angle: 1x Rosemount (radome), 1x Honeywell (gust pod)

Radome sensors affected by icing buildup in tubes shortly after take-off on two flights. Procedures changed.

The radome flow angles remains a difficult sensor system to do routine maintenance on. RAF can blow out the tubes on a pre-flights, but that introduces the possibility of leaks during re-assembly.

Gust pod will be used for wind measurements on the two flights. RAF expects good data for this system in straight and level flight.

Laser velocimetry: LAMS 3D. Notified as experimental, fiber malfunction shortly after arrival in Christchurch.
Very few aerosol particles in SH stratosphere, so not a good operating environment for LAMS.

Vertical wind corr.: Cooper and Friesen work – promising.

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Position and altitude

Inertial systems: 3x Honeywell IRS, 1x Applanix IRS (development)

Applanix mainly had data from the second half (procedure for setup in the absence of complete GISMOS unit; experimental)

GPS: Novatel with Omnistar dGPS real-time corrections
Novatel dGPS (with aircraft)

A number of Omnistar dropouts, particularly when flying due north. Procedures changed; manual change of satellites. Later changed to automatically use the best satellite.

Omnistar vertical altitude accuracy: ~ 0.2 m
Novatel after loosing Omnistar signal: ~ 2.0 – 0.2 m (best during recovery)
Novatel with ground dGPS station: ~ 0.1 - 0.5+ m, worse when being far from ground station

Ground dGPS processing will be done on 11 flights that were affected by more significant Omnistar dropouts.

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Aerosols

Aerosol size distribution: UHSAS

Problems at high altitude in first half, identified to be mostly a pump issue.

CN concentration: TSI 3760a butanol counter

Working on correction for issue with sensor efficiency at low pressures; size dependent.

One flight had lack of butanol.

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Cloud

Supercooled water:	Rosemount icing probe
Cloud droplet size dist.:	CDP
Precipitation size dist.:	Fast 2DC

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Radiation

2D curtain temperature profile: MTP

Two flights has calibration issues, but issues can be resolved with special processing.

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Data system and other

Data system: 6 distributed data modules (DSM) and server

Minor reboot issues (RF08 lost 2 DSMs for 2-3 hours due to faulty network hub)

Satcom: Inmarsat, download data every 5 sec.