HS3 – 2015 Flights on WB-57

HIWRAP L1B Data Format:

HIWRAP data is in HDF5 format and each file is one frequency for a specific time period. The files are generally split into one hour intervals with a small amount of overlap before and after the hour mark.

L1B files contain calibrated reflectivity and Doppler velocity profiles, along with aircraft attitude and other information.

Example file name:

IPHEX\_HIWRAP\_L1B\_2014612-225747-2014612-233003\_HKa\_dist\_v01.h5"

The above file is an IPHEX HIWRAP Ka-band file:

version 01

12 June 2014

22:57:47 to 23:30:03 UTC

FILE\_CONTENTS {

group /

dataset /ExperName IPHEX

dataset /Frequency frequency in GHz

dataset /SWVersion software version number

dataset /Wavelength wavelength in meters

dataset /antElevation 0 degrees for IPHEX

dataset /calconst calibration constant

dataset /calgate gate number of calibration gate

dataset /calpwr\_int integrated calibration power

dataset /creationDate file creation date

dataset /evel aircraft east velocity (m/s)

dataset /gatesp gatespacing (m)

dataset /head aircraft heading

dataset /height aircraft height

dataset /incid incidence angle

dataset /lat aircraft latitude

dataset /lon aircraft longitude

dataset /missing missing data value, usually -999.0

dataset /nbeams number of beams in file

dataset /noise\_db noise level in dB per profile

dataset /nvel aircraft north velocity (m/s)

dataset /pitch aircraft pitch angle

dataset /radarName radar name: HKa or HKu

dataset /rangevec range vector in meters from aircraft

dataset /rng0 profile start range in meters

dataset /roll aircraft roll angle

dataset /rotAngle antenna rotation angle (0 degrees for IPHEX)

dataset /sgate surface gate location in profile

dataset /sigconst sigma 0 constant

dataset /sigma0 sigma0 (dB)

dataset /stitchedPower Blended chirp/pulse power (dB)

dataset /stitchedReflectivity Blended chirp/pulse reflectivity (dBZ)

dataset /stitchedVelocity Blended chirp/pulse a/c corrected

Doppler velocity (m/s)

dataset /surfpwr\_int Integrated surface power (dB)

dataset /surfvel Doppler velocity of surface (m/s)

dataset /timeUTC Profile time in hh.xx

dataset /track aircraft track relative to North

dataset /utcDay Day

dataset /utcHour Hour

dataset /utcMinute Minute

dataset /utcMonth Month

dataset /utcSecond Second

dataset /utcYear Year

dataset /vacft Aircraft motion

dataset /vnyqDual Dual-frequency Nyquist velocity (m/s)

dataset /vnyqHigh Nyquist for High PRF (m/s)

dataset /vnyqLow

dataset /wvel

}

Known issues with the data:

7 April 2015: Version 1

* first cut at Ku and Ka reflectivity calibration using ocean surface return are accurate to 1 or 2 dBZ. These will be revisited in the near term.
* Ku Doppler, prior to late May 2015 had an incorrect phase reset setting in the digital receiver so the values will be much noisier than usual. This was fixed for all the subsequent flights in late May, early June.
* A lose cable on 16, 18, 19, 23, 26, and 28 May 2015 caused an intermittent 2 dB loss in Ku and Ka-band reflectivity sensitivity, and it caused the appearance of incorrect unfolding in the Ka-band Doppler data. This folding was actually due to an incorrect order in the high-low PRF pulses. We are working on fixing this in future versions.

Software:

The files are easily read with MatLab or IDL HDF5 readers. An IDL reader can be found on the <http://har.gsfc.nasa.gov> IPHEX site under “Campaigns”.

For further information, please contact:

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