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:

Gerry Heymsfield 301-614-6369 Gerald.heymsfield@nasa.gov

Vijay Venkatesh 301-614-6341 vijay.subbaramanvenkatesh@nasa.gov