HIWRAP SHOUT 2016 Data Dictionary (Level 1B)

2017-05-19

P = number of Profiles

G = Number of Gates

AircraftVelocityContribution

[1xP] single

Aircraft velocity contribution to data in m/s. This has already been subtracted from the Doppler velocity estimates, and is left as a reference.

AntennaAzimuth

[1xP] double

Antenna Azimuth in degrees.

AntennaAzimuthOffset

[1] double

Offset of antenna azimuth. This has already been subtracted from AntennaAzimuth, and is left as a reference.

AntennaElevation

[1] double

Antenna Elevation off of aircraft nadir in degrees

Average

[1] double

Number of pulses averaged together per profile. Note that profiles overlap.

CPUsec

[1xP] double

Computer (LINUX) time in seconds of each profile

CPUusec

[1xP] double

Computer (Linux) microseconds for each profile

CalibrationConstant\_Ka\_dB

[1] double

Calibration constant (in decibels) applied to Ka-band data. Left as a reference.

CalibrationConstant\_Ku\_dB

[1] double

Calibration constant (in decibels) applied to Ku-band data. Left as a reference.

ChannelMask\_KaMerge:

[GxP] uint

Channel Number used for each profile and gate for the Ka-band merged data. Channels 0,2,4,6 are pulsed. Channels 1,5 are chirped.

ChannelMask\_KuMerge:

[GxP] uint

Channel Number used for each profile and gate for the Ku-band merged data. Channels 0,2,4,6 are pulsed. Channels 1,5 are chirped.

DataAzimuthOffTrack

[1xP] single

The off-track azimuthal position of each profile taking into account aircraft motion.

DataElevationOffNadir

[1xP] single

The off-nadir elevation of each profile taking into account aircraft attitude.

DataLatitudeDelta\_mDegrees

[GxP] int16

The offset in millidegrees of the data Latitude from the aircraft Latitude. Add this to the aircraft Latitude to get the latitude of the data.

DataLongitudeDelta\_mDegrees

[GxP] int16

The offset in millidegrees of the data Latitude from the aircraft Longitude. Add this to the aircraft Longitude to get the Longitude of the data.

DataPositionHeight

[GxP] int16

The height in meters of the data from sea level.

DataPositionX

[GxP] int16

Poisition of the data in aircraft Cartesian coordinates, ‘X’ meters.

DataPositionY

[GxP] int16

Poisition of the data in aircraft Cartesian coordinates, ‘Y’ meters.

DataPositionZ

[GxP] int16

Poisition of the data in aircraft Cartesian coordinates, ‘Z’ meters.

DopplerUnambiguousVelocity\_KaMerge

[1] double

The unambiguous velocity in m/s of the Ka-band Doppler data.

DopplerUnambiguousVelocity\_KuMerge

[1] double

The unambiguous velocity in m/s of the Ku-band Doppler data.

DopplerVelocity\_KaMerge

[GxP] single

Doppler Velocity in m/s of Ka-band radar. Use with Mask\_2Sigma\_KaMerge.

DopplerVelocity\_KuMerge

[GxP] single

Doppler Velocity in m/s of Ku-band radar. Use with Mask\_2Sigma\_KuMerge.

Frequency

[1x8] double

Frequency of radar channels 0-7 in Hz.

L0\_Process\_Date

[1]

Level 0 process data as an integer (‘YYYYMMDD’)

L1B\_Process\_Date

[1]

Process date of this file as an integer (‘YYYYMMDD’)

Mask\_1Sigma\_KaMerge

[GxP]

Ka-band SNR mask for thresholding data. This is the 1-sigma noise threshold. To use this mask, set all reflectivity or Doppler data where the mask is zero to NaN.

Mask\_1Sigma\_KuMerge

[GxP]

Ku-band SNR mask for thresholding data. This is the 1-sigma noise threshold. To use this mask, set all reflectivity or Doppler data where the mask is zero to NaN.

Mask\_2Sigma\_KaMerge

[GxP]

Ka-band SNR mask for thresholding data. This is the 2-sigma noise threshold. To use this mask, set all reflectivity or Doppler data where the mask is zero to NaN.

Mask\_2Sigma\_KuMerge

[GxP]

Ku-band SNR mask for thresholding data. This is the 2-sigma noise threshold. To use this mask, set all reflectivity or Doppler data where the mask is zero to NaN.

DopplerUnambiguousVelocity\_KaMerge

[1] double

Unambiguous Doppler Velocity (folding velocity) of the Ka-band Merged data

DopplerUnambiguousVelocity\_KuMerge

[1] double

Unambiguous Doppler velocity (folding velocity) of the Ku-band Merged data.

NavigationDayIWG1

[1xP] double

Aircraft navigation data

NavigationDriftINSPVA:

[1xP] double

HIWRAP GPS data

NavigationDriftIWG1:

Aircraft navigation data

HIWRAP GPS data

NavigationEastVelocityINSPVA:

[1xP double]

HIWRAP GPS data

NavigationGroundSpeedINSPVA:

[1xP double]

HIWRAP GPS data

NavigationGroundSpeedIWG1:

[1xP double]

Aircraft navigation data

NavigationHeadingINSPVA:

[1xP double]

HIWRAP GPS data

NavigationHeadingIWG1:

[1xP double]

Aircraft navigation data

NavigationHeightINSPVA:

[1xP double]

HIWRAP GPS data

NavigationHeightIWG1:

[1xP double]

Aircraft navigation data

NavigationHoursIWG1:

[1xP double]

Aircraft navigation data

NavigationLatitudeINSPVA:

[1xP double]

HIWRAP GPS data

NavigationLongitudeINSPVA:

[1xP double]

HIWRAP GPS data

NavigationMinutesIWG1:

[1xP double]

Aircraft navigation data

NavigationMonthIWG1:

[1xP double]

Aircraft navigation data

NavigationNorthVelocityINSPVA:

[1xP double]

HIWRAP GPS data

NavigationPitchINSPVA:

[1xP double]

HIWRAP GPS data

NavigationPitchIWG1:

[1xP double]

Aircraft navigation data

NavigationRollINSPVA:

[1xP double]

HIWRAP GPS data

NavigationRollIWG1:

[1xP double]

Aircraft navigation data

NavigationSecondsINSPVA:

[1xP double]

HIWRAP GPS data

NavigationSecondsIWG1:

[1xP double]

Aircraft navigation data

NavigationTrackINSPVA:

[1xP double]

HIWRAP GPS data

NavigationTrackIWG1:

[1xP double]

Aircraft navigation data

NavigationTrueAirSpeedIWG1:

[1xP double]

Aircraft navigation data

NavigationUpVelocityINSPVA:

[1xP double]

HIWRAP GPS data

NavigationVerticalSpeedIWG1:

[1xP double]

Aircraft navigation data

NavigationVerticalWindSpeedIWG1:

[1xP double]

Aircraft navigation data

NavigationWeekINSPVA:

[1xP double]

HIWRAP GPS data

NavigationWindDirectionIWG1:

[1xP double]

Aircraft navigation data

NavigationWindSpeedIWG1:

[1xP double]

Aircraft navigation data

NavigationYearIWG1:

[1xP double]

Aircraft navigation data

OceanGate:

[1xP double]

Gate of each profile associated with sea-level

OceanVelocity\_Ka:

[1xP single]

Measured velocity of sea-level gate for each profile (Ka-band).

OceanVelocity\_Ku:

[1xP single]

Measured velocity of sea-level gate for each profile (Ku-band).

PitchINSPVAOffset:

[1]

Offset of HIWRAP GPS pitch data to HIWRAP coordinates.

RangeMeters:

[Gx1 single]

Range in meters of each gate.

RollINSPVAOffset:

[1]

Offset of HIWRAP GPS roll data to HIWRAP coordinates.

SNR\_KaMerge:

[GxP single]

Signal to noise ratio associated with each data point (Ka-band). Note that this can go negative due to the mean noise subtraction.

SNR\_KuMerge:

[GxP single]

Signal to noise ratio associated with each data point (Ku-band). Note that this can go negative due to the mean noise subtraction.

WaveLengths:

[1x8]

Wavelength in meters of each channel.

Z\_KaMerge:

[GxP single]

Equivalent reflectivity factor (Ze) in linear units at Ka-band. To use, mask with Mask\_2Sigma\_KaMerge, and take 10log10() to convert to dBZe.

Z\_KuMerge:

[GxP single]

Equivalent reflectivity factor (Ze) in linear units at Ku-band. To use, mask with Mask\_2Sigma\_KuMerge, and take 10log10() to convert to dBZe.

sigma0\_Ka:

[1xP single]

Measured normalized radar cross section of the sea-level surface (Ka-band). This will only be valid over the ocean. Attenuation correction has not been applied.

sigma0\_Ku:

[1xP single]

Measured normalized radar cross section of the sea-level surface (Ku-band). This will only be valid over the ocean. Attenuation correction has not been applied.