

Read Me file TARA data - ACCEPT campaign data set.

Introductory information:

TITLE data set:

accept_cesar_tara00_l00_20141107_0633_1304.nc

DESCRIPTION:

The data contain the equivalent reflectivity factors at horizontal polarization (Z_{hh}) and at vertical polarization (Z_{vv}), the mean Doppler velocity at horizontal polarization (V_{hh}), the Doppler spectrum width at horizontal polarization (W_{hh}), the cross-polar equivalent reflectivity factor (Z_{hv}), the differential reflectivity (Z_{dr}) the complex copolar correlation coefficient (ρ) and the Doppler spectrum skewness at horizontal polarization (Skh)

The file also contains the retrieved wind quantities vertical Doppler velocity (vel_z), horizontal Doppler velocity (vel_h), and wind direction (vel_d)

Given are also the height array of the sampling volumes with respect to the ground (height), and the time array of the sample (time), the noise level of the main beam as a function of range [in dBZ] (noise_mb) as well as azimuth and elevation of the radar main beam.

The spectral data can be provided on request contacting the given contact persons

DATA FORMAT:

NetCDF

CONTACT information:

C. Unal (c.m.h.unal@tudelft.nl) or

Prof. Dr. H. Russchenberg (H.W.J.Russchenberg@tudelft.nl)

Methodological information:

METHODE of data COLLECTION:

Measurements are collected by the Transportable Atmospheric Radar (TARA) during the Analysis of the Composition of Clouds with Extended Polarization Techniques campaign (ACCEPT) at the CESAR observatory (Cabauw Experimental Site for Atmospheric Research), Cabauw, The Netherlands in October and November 2014.

INSTRUMENT SPECIFICATIONS:

Type : FM-CW

Central frequency : 3.298 GHz ; S-band

Transmitted power : 100 W ; Automatic decrease by step of 10~dB in case of receiver saturation

Signal generation

Sweep time : 0.5 ms

No. of range bins : 512

Range resolution : 30 m ; Height resolution = 21.2 m

Time resolution : 2.56 s

Polarimetry

Polarisation : VV HV HH ; Main beam only
 Measurement cycle : VV HV HH OB1 OB2 ; Main beam + 2 offset beams
 Doppler
 No. Doppler bins : 512
 Doppler resolution : 0.036 m/s
 Max. unambiguous vel. : 9.1 m/s
 Max. vel. main beam : 45.5 m/s ; After spectral polarimetric dealiasing
 (see Unal 2004)
 Max. vel. offset beams : 45.5 m/s ; After spectral dealiasing
 Antennas
 Beam width : 2.1 deg
 Gain : 38.8 dB
 Near field : 200 m
 Beams Elevation Azimuth (North = 0 deg)
 Main beam : 45 deg 246.5 deg
 Offset beam 1 : 60 deg 246.5 deg
 Offset beam 2 : 43.1 deg 267.3 deg
 Clutter suppression
 Hardware : Antennas ; Low side lobes
 Processing : Doppler spectrum ; Spectral polarimetry (main beam)

No further quality checks performed after the data processing

Used SOFTWARE:

- Polawind_re_V8_light.m written by C. Unal (c.m.h.unal@tudelft.nl)
- Create_netcdf_files_from_tara_v_accept_final.m written by Dr. Lukas Pfitzenmaier
l.pfitzenmaier@uni-koeln.de)

Data specific information:

variables:

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double time(dim_time) ;
    time:units = "seconds since 1970-01-01 00:00:00" ;
    time:long_name = "none" ;
    time:missing_value = "NaN" ;
double height(dim_height) ;
    height:units = "m" ;
    height:long_name = "height above ground" ;
    height:missing_value = "NaN" ;
double latitude(dim_value) ;
    latitude:units = "degrees_north" ;
    latitude:long_name = "Latitude of instrument location" ;
    latitude:missing_value = "NaN" ;
double longitude(dim_value) ;
    longitude:units = "degrees_east" ;
    longitude:long_name = "Longitude of the instrument location" ;
    longitude:missing_value = "NaN" ;

double azimuth(dim_value) ;
  
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azimuth:units = "deg" ;
azimuth:long_name = "Fixed azimuth of TARA main beam; related to the
                    North" ;
azimuth:missing_value = "NaN" ;
double elevation(dim_value) ;
elevation:units = "deg" ;
elevation:long_name = "Fixed elevation of TARA main beam" ;
elevation:missing_value = "NaN" ;
double Z_hh(dim_time, dim_height) ;
Z_hh:units = "dBZ" ;
Z_hh:long_name = "Horizontal polarized reflectivity factor" ;
Z_hh:missing_value = "NaN" ;
double Z_vv(dim_time, dim_height) ;
Z_vv:units = "dBZ" ;
Z_vv:long_name = "Vertical polarized reflectivity factor" ;
Z_vv:missing_value = "NaN" ;
double V_hh(dim_time, dim_height) ;
V_hh:units = "m/s" ;
V_hh:long_name = "Mean Doppler velocity - along the line of sight" ;
V_hh:missing_value = "NaN" ;
double W_hh(dim_time, dim_height) ;
W_hh:units = "m/s" ;
W_hh:long_name = "Doppler spectrum width" ;
W_hh:missing_value = "NaN" ;
double Z_hv(dim_time, dim_height) ;
Z_hv:units = "dBZ" ;
Z_hv:long_name = "Cross-polar reflectivity" ;
Z_hv:missing_value = "NaN" ;
double Z_dr(dim_time, dim_height) ;
Z_dr:units = "dB" ;
Z_dr:long_name = "Differential reflectivity" ;
Z_dr:missing_value = "NaN" ;
double Rho(dim_time, dim_height) ;
Rho:units = "no unit" ;
Rho:long_name = "Complex copolar correlation coefficient" ;
Rho:missing_value = "NaN" ;
double Skh(dim_time, dim_height) ;
Skh:units = "no unit" ;
Skh:long_name = "Doppler spectrum skewness" ;
Skh:missing_value = "NaN" ;
double vel_z(dim_time, dim_height) ;
vel_z:units = "m/s" ;
vel_z:long_name = "Vertical Doppler velocity component retrieved by TARA;
                    product based on information of all 3 beams" ;
vel_z:missing_value = "NaN" ;

double vel_h(dim_time, dim_height) ;

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vel_h:units = "m/s" ;
vel_h:long_name = "Horizontal Doppler velocity component retrieved by
                    TARA; product based on information of all 3 beams" ;
vel_h:missing_value = "NaN" ;
double vel_d(dim_time, dim_height) ;
vel_d:units = "degrees_related_to_the_North" ;
vel_d:long_name = "Wind direction retrieved by TARA; product based on
                    information of all 3 beams" ;
vel_d:missing_value = "NaN" ;
double noise_mb(dim_height) ;
noise_mb:units = "dBZ" ;
noise_mb:long_name = "Noise level of TARA main beam; range dependent" ;
noise_mb:missing_value = "NaN"
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