COARE 3.5 model outputs for HiWinGS 2013 – version 1

05/20/2014 – Ludovic Bariteau

This document is the Readme for *HiWinGS_2013_1minC35outputs*, *HiWinGS_2013_10minC35outputs* and *HiWinGS_2013_hrC35outputs*. All versions are available in a Matlab format or in text files and refer to 1min, 10 min and hourly averages. These files simply contain the raw outputs of the COARE 3.5 algorithm available at ftp://ftp1.esrl.noaa.gov/users/cfairall/bulkalg/cor3_5/ .

In this first version, please note the following:

- the wind speed relative to water was used to compute the fluxes
- wave height and wave slope were set to NaN as it was not yet available.
- The sea temperature from the ship (5m deep) was preferred to compute fluxes as the PSD sea snake was flying out of the sea during high winds thus reflecting most likely a mean temperature of the top few cm of the ocean and lowest cm of the air. The cool-skin affect is removed in the coare35vn algorithm and therefore fluxes have been computed based on Tsea measurements that have been corrected for cool skin. Warm layer effects are null for this experiment (strong mixing) and was therefore not included in the computations.
- Fluxes are defined as negative downward and positive upwards.
- Reference height was setup to 10m in the algorithm

The files can be directly acquired with MATLAB. For instance to read the 1min text file from your local directory, use:

```
A =importdata('your_local_directory\HiWinGS_2013_1minC35outputs.txt')
A=A.data;
```

The files contain 40 variables which are as follow:

```
yday=A(:,1);% Decimal yearday (UTC)
usr =A(:,2);%friction velocity that includes gustiness (m/s)
tau =A(:,3);%wind stress (N/m^2)
hsb =A(:,4);%sensible heat flux into ocean (W/m^2)
hlb =A(:,5);%latent heat flux into ocean (W/m^2)
hbb =A(:,6);%buoyany flux into ocean (W/m^2)
hsbb =A(:,7);%"sonic" buoyancy flux measured directly by sonic anemometer
hlWebb=A(:,8);%Webb correction for latent heat flux, add this to directly
measured eddy covariance latent heat flux using water vapor mass
concentration sensors.
tsr =A(:,9);%temperature scaling parameter (K)
qsr =A(:,10);%specific humidity scaling parameter (g/Kg)
zot =A(:,11);%thermal roughness length (m)
zoq =A(:,12);%moisture roughness length (m)
Cd =A(:,13);%wind stress transfer (drag) coefficient at height zu=16.29m
Ch =A(:,14);%sensible heat transfer coefficient (Stanton number) at height
zt=15m
Ce =A(:,15);%latent heat transfer coefficient (Dalton number) at height
zq=15m
L =A(:,16);%Obukhov length scale (m)
```

```
zet =A(:,17);%Monin-Obukhov stability parameter zu/L
dter =A(:,18);%cool-skin temperature depression (degC)
dqer =A(:,19);%cool-skin humidity depression (g/g)
tkt =A(:,20);%cool-skin thickness (m)
Urf =A(:,21);%wind speed at reference height (m/s)
Trf =A(:,22);%temperature at reference height (C)
Qrf =A(:,23);%specific humidity at reference height (g/kg)
RHrf =A(:,24);%relative humidity at reference height (%)
UrfN =A(:,25);%neutral value of wind speed at reference height (m/s)
Rnl =A(:,26);%Upwelling IR radiation computed by COARE (W/m^2)
Le =A(:,27);%latent heat of vaporization (J/kg)
rhoa =A(:,28);%density of air (kg/m3)
UN =A(:,29);%neutral value of wind speed at zu (m/s)
U10 =A(:,30);%wind speed adjusted to 10 m (m/s)
U10N =A(:,31);%neutral value of wind speed at 10m (m/s)
Cdn_10 =A(:,32);%neutral value of drag coefficient at 10m
Chn_10 =A(:,33);%neutral value of Stanton number at 10m
Cen_10 =A(:,34);%neutral value of Dalton number at 10m
RF=A(:,35); %Sensible heat flux from rain (W/m^2)
Qs=A(:,36);%Specific humidity at surface (g/g)
Evap=A(:,37);%Evaporation rate (mm/hr)
T10=A(:,38);%Temperature adjusted to 10 m (C)
Q10=A(:,39);%Specific humidity adjusted to 10 m (g/kg)
RH10=A(:,40);%Relative humidity adjusted to 10 m (%)
```