

Preliminary bulk fluxes the AMMA 2008 Readme for flux summary files

The data file 'flux_5hf_AMMA08.txt' and 'flux_30hf_AMMA08.txt' contain computations of bulk meteorological variables and fluxes derived from the PSD system based on preliminary analysis done during the AMMA 2008 cruise. The 5hf refers to 5-min averages and the 30hf to 30-min averages. Most quantities given are subject to future modification based on accounting for other sources of data and revised calibrations. No direct turbulent flux calculations are included in this present data.

The file is 32 columns, not labeled so they can be directly acquired with a MATLAB 'load' statement.

```
x=load('your_local_directory\ flux_5hf_ AMMA08.txt');%read file with 5-min  
average data; set your local directory
```

The columns are as follows:

```
jdy=x(:,1);%julian day at beginning of time average  
U=x(:,2);%true wind,PSD sonic (m/s) (18.5 m)  
dir=x(:,3);%true wind direction, PSD sonic (deg)  
tsnk=x(:,4);%sea snake temperature,PSD, 0.05 m depth (C)  
tsg=x(:,5);%tsg water temperature, 5 m depth, (C)  
sal=x(:,6);%tsg salinity (psu)  
ta=x(:,7);%air temperature, PSD (C) (z=15 m)  
qse=x(:,8);%sea surface specific humidity,from snake (g/kg)  
qa=x(:,9);%air specific humidity, PSD (g/kg) (z=15 m)  
psp=x(:,10);%downward solar flux, PSD units (W/m^2)  
rl=x(:,11);%downward IR flux, PSD units (W/m^2)  
org1=x(:,12);%rainrate, PSD STI optical rain gauge, uncorrected (mm/hr)  
ushp=x(:,13);%ship speed, SCS gps (m/s)  
head=x(:,14);%ship heading, , SCS laser ring gyro (deg)  
urel=x(:,15);%relative wind speed, PSD (m/s)  
reldir=x(:,16);%relative wind direction (from),clockwise rel ship's bow, PSD  
sonic (deg)  
lat=x(:,17);%latitude, deg (SCS pcode)  
lon=x(:,18);%longitude, deg (SCS pcode)  
zts=x(:,19);%depth for bulk flux Ts reference, =0.05 when snake is used  
sig_u=x(:,20);%std dev of ship speed, m/s (>.2 indicates maneuver)  
taub=x(:,21);%bulk wind stress along mean wind, N/m^2  
hsb=x(:,22);%bulk sensible heat flux, W/m^2  
hlb=x(:,23);%bulk latent heat flux, W/m^2 (includes Webb et al. correction)  
hrain=x(:,24);%rain heat flux, as per Gosnell et al 1995, W/m^2  
ta_im=x(:,25);% IMET air temp, C (z=15 m)  
qa_im=x(:,26);;% IMET air specific humidity, g/kg (z=15 m)  
s_ship=x(:,27);% IMET true wind speed, m/s (z=15 m)  
dir_ship=x(:,28);% IMET true wind direction, deg (z=15 m)  
psp_ship=x(:,29);%IMET solar flux, W/m^2  
pir_ship=x(:,30);%IMET IR flux, W/m^2  
barpress=x(:,31);%atmospheric pressure, PSD (mb)  
RH=x(:,32);%Relative Humidity, PSD (%)
```

The data in this file comes from three sources: The PSD sonic anemometer (acquired at 10 Hz), the ships SCS system (acquired at 0.5 Hz), and the PSD mean measurement systems (sampled at

10 sec and averaged to 1 min). The sonic is 5 channels of data; the SCS file is 17 channels, and the PSD mean system is 77 channels. A series of programs are run that read these data files, decode them, and write daily text files at 1 min time resolution. A second set of programs reads the daily 1-min text files, time matches the three data sources, averages them to 5 or 30 minutes, computes fluxes, and writes new daily flux files. The 5 and 30-min daily flux files have been combined into the following files *flux_5hf_AMMA08.txt* and *flux_30hf_AMMA08.txt*.

Further experimental details are as follows:

True wind speed is computed from the sonic anemometer using the ship's GPS system; thus, it is interpreted as the speed relative to the fixed earth. Some modest flow distortion corrections have been used in an attempt to reduce the transitions when stopping for stations.

Air sea fluxes were computed using the COARE bulk algorithm version 3.0.