README for PYTHON COARE3.5

The COARE model followed from the international TOGA-COARE field program which took place in the western Pacific warm pool over 4 months from November 1992 to February1993. The algorithm is intended to provide estimates of momentum, sensible heat, and latent heat fluxes using inputs of bull atmospheric variables (wind speed, SST, air temperature, air humidity). The algorithm contains subroutines to deal with near-surface gradients of temperature in the ocean. Version 2.5 was published in 1996 and a major update, version 3.0 was published in 2003. This update was based on new observations at higher wind speeds (10 to 20 m/s). Version 3.5 was released in 2013 following the publication of Edson et al. 2013, which made adjustments to the wind speed dependence of the Charnock parameter based on a large data base of direct covariance stress observations (principally from a buoy). This led to an increase in stress for wind speeds greater than about 18 m/s. The roughness Reynolds number formulation of the scalar roughness length was tuned slightly to give the same values of Ch and Ce as version 3.0. The diurnal warm layer model was structured as a separate routine instead of embedded in a driver program. COARE 3.5 was based on Edson’s buoy data (Edson et al. 2013) and was compared to a large data base (a total of 16,000 hours of observations) combining observations from NOAA, WHOI, and U. Miami (Fairall et al. 2011).

The PYTHON program given here is for version 3.5. There is a new matlab set, version 3.6. This new version is restructured slightly and the main advance is improved wave parameterizations and treatment of wave breaking for the gas transfer aspects (COAREG). The windspeed only representation is the same as 3.5.

More details are found in coare3.6\_readme\_1.docx

The python code runs the same data set used to exercise the matlab code.

*Execute '%run coare35vn.py' from the iPython command line for test run with*

*'test\_35\_data.txt' input data file. Edit line 554 to indicate path to test data file*

This will output a file of results that you can compare to the test\_35\_output\_py\_082020.txt provided. The file contains a time series of flux variables, etc.

usr tau hsb hlb hlwebb tsr qsr zot zoq Cd Ch Ce L zet dter dqer tkt RF Cdn\_10 Chn\_10 Cen\_10

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Fairall, C.W., E.F. Bradley, J.S. Godfrey, G.A. Wick, J.B. Edson, and G.S. Young, 1996a: The cool skin and the warm layer in bulk flux calculations. J. Geophys. Res. 101, 1295-1308.

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