Description of Processing Products for CASPER-W

BWB, 2/20/2018

Matlab Scripts

motcorr

All matlab codes to run the raw motion correction and 10-min averaging are archived in the `Sally_Ride/matlab/motcorr_flux` folder. Motion correction and initial 10-min averaging are done with the `run_motcorr_flux_CASPER_2017.m` script. Path strings on lines 37 and 68 should be edited to conform with the directory on your computer. Other paths defined in the script are OS-independent. This script will reset the matlab path and add the motcorr directory to ensure only functions in this folder are visible to the motcorr code.

Running the motcorr script regenerates the 10-Hz corrected wind and motion output files, the 'da' files of 10-minute output variables, and the 'sp' files of 10-min frequency-binned spectra and cospectra. The motcorr script does not perform corrections except for a small adjustment to the ship SST and ship barometric pressure, as defined on lines 109-110. It may take a hour or so to run to completion for the entire project.

da_red (data reduction)

The `Sally_Ride/matlab/da_red_analysis` folder contains all scripts necessary to run the filtering and hourly averaging routines which generate final output at 10-min and hourly time bases and a saves variety of diagnostic and descriptive plots in .fig and .png formats.

Data filtering limits can be adjusted on lines 57-76. These values are used at several points during the processing to define selection criteria for plots and output processing.

The `CASPER_2017_fixit_da1.m` subroutine does adjustments and filters out bad values from the various raw 10-min variables. You can edit this code to modify the filtering, but the routine itself is called by the da_red script.

Updated COARE bulk model output is computed from the filtered, adjusted bulk met data at 10-min and hourly timescales. Additional filtering is applied to the hourly averages of observed sensible and latent heat based on difference with the bulk result. You can edit this on lines 1393 -1413.

Output Files

motcorr

Raw motion correction and 10-min averaging produces the following files:

1. `/CASPER_2017/Sally_Ride/flux/Processed/motion_decorr/` : a folder of 10 Hz platform motion files at the location of each sonic, including euler angles, uvw platform velocities (m/s), and uvw displacements (m).
2. `/CASPER_2017/Sally_Ride/flux/Processed/uvwStream_decorr_v3` : a folder of 10-Hz motion-corrected uvw wind speeds and sonic temperature for each anemometer.
3. `/CASPER_2017/Sally_Ride/flux/Processed/da_decorr_v3` : a folder of 10-min output variable files for each day. These files are concatenated to produce a single 'da' output file, `CASPER_2017_da_v3_decorr.txt`. See `_README_CASPER_2017_flux_hr_file_format.txt` for a description of data columns.
4. `/CASPER_2017/Sally_Ride/flux/Processed/sp_decorr_v3` : a folder of 10-min spectral data files for each day. These files are concatenated to produce a single 'da' output file, `CASPER_2017_sp_v3_decorr.txt`. See the `specreader_CASPER_2017.m` script for an example of how to read and plot from this file.
5. `/CASPER_2017/Sally_Ride/flux/Processed_Images/Daily_decorr_v3` : a folder of daily plots for various bulk met and derived variables in .png and .fig formats.
6. `/CASPER_2017/Sally_Ride/flux/Processed_Images/SpectraPlots_decorr_v3` : a folder of hourly mean spectra and cospectra plots for the three sonics.
7. `/CASPER_2017/Sally_Ride/flux/Processed_Images/WindPlots_decorr_v3` : a folder of wind and motion data plots for the three sonics.

da_red

The data reduction script produces the following files:

1. `CASPER_2017_flux_10_v3_decorr.txt` (and .mat version): 10-min final output, filtered to remove bad values but not for conditions such as relative wind direction or ship speed and motion variance. See `_README_CASPER_2017_flux_10_file_format.txt` for a description of data columns.
2. `CASPER_2017_hr_v3_decorr.txt` (and .mat version): hourly final output, filtered to remove bad values and unfavorable experimental conditions such as relative wind direction or ship speed/motion. See `_README_CASPER_2017_flux_hr_file_format.txt` for a description of data columns.

I included a very large number of parameters in the 10-min and hourly output files, so these should contain almost everything you could want.