

Terrain-induced Rotors Experiment Mar/Apr 2007

Hot-film anemometry

Outdoor, three-dimensional, in-situ calibrated hot-film anemometry system (OTIHS)

REFERENCE: Poulos, G. S., S. Semmer, J. Militzer and G. Maclean, 2006: A novel method for the study of near-surface turbulence using 3-d hot-film anemometry. American Meteorological Society, 17th Symposium on Boundary Layers and Turbulence, San Diego, CA, May.

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Deployment details (see also the reference above):

Deployed for EOP-2, 3, 4 and 5 (which occurred between 30 Mar – 30 Apr) at the ISFF 'Central' site: on a 5 m tower adjacent to a 30 m tower.

3 systems at 1.4 m, 2.0 m and 3.0 m above ground above brush of 0.8m average height.

Each OTIHS was embedded within a Campbell CSAT3 sonic anemometer operated at 60Hz providing u, v, w, and Tc (here in 1 second averages per below).

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Data files are written in ASCII files at 1 second intervals for the EOPs.

Filename format: hf\_YYYYMMDD\_1m.txt, \_2m.txt, \_3m.txt.

Time: UTC

Interval: 1 second statistics, centered on the middle of the second, as indicated by the seconds fields in the timetags: 0.5, 1.5, etc.

Variances are weighted by N, rather than statisticians norm of N-1

Missing data value: 1.e37

NOTE: Records with all missing values are discarded, so there are missing time periods within the files

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Sonic wind data u,v,w are in rotated into Cartesian coordinates but they have not been corrected for sonic tilt.

Variable names are standard and

- Pdir is the orientation of the OTIHS probe relative to 270 degrees (0.0 being 270 and negative values being south of 270 by that amount)
- tc is the virtual temperature computed from the speed of sound
- diag is a sonic anemometer diagnostic value, where 0 means a good measurement. Sonic wind data with a diag value > 0 should be regarded as a flawed measurement.
- hotfilm voltages are the raw values from the three films labeled va, vb, vc.

- see HYPERLINK "http://www.eol.ucar.edu/rtf/projects/TREX/isff" <http://www.eol.ucar.edu/rtf/projects/TREX/isff> for more information