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Comparison of the fast response instruments at C14 and K34 sites in the Amazon rain forest.

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Abstract

Wavelet and Fourier analysis was performed to study and compare the spectral characteristics, the fluxes of the wind velocity (u,v,w components), temperature and humidity concentrations using two different instruments and on two different towers in the Amazon rain forest at Manaus in 2000. The comparison was made of the spectra and fluxes estimated from the Gill (Solent A1012R) and Campbell sonic anemometers, H₂O measurements of the LiCor and Krypton instruments for the days, 216 to 248 at the C14 site (02°35'21''S , 60°06'53'' W) and for days 252 to 267 at site K34(02°36'33''S , 60°12'34'' W). The sampling frequency for Gill is 10.42 Hz while for the Campbell it is 16Hz. In the first stage of the analysis no attempt has been made to reduce to a common sampling frequency. Since the sampling frequencies are not the same the data sets were aligned using the minimum of the temperature. After adjusting for calibrations it was found that there is good agreement in only the w component and the w spectra in both the instruments at both the sites. The temperature measured by the Campbell instrument is always higher and the fluctuations smaller than those measured by Gill. The actual differences vary with the time of the day. There are also differences between the water vapour measurements. The Krypton appears to be much more sensitive to small changes in humidity compared to LiCor. At the K34 site, at low wind speeds, there are significant differences in u and v between the Gill and Campbell. We are now examining the differences between the two sites and the instruments after reducing to a common sampling frequency of 2Hz.

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