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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "Cospectral analysis of high frequency signal loss in eddy covariance measurements" *by* A. Wolf and E. A. Laca

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The paper by Wolf and Laca show some surprising and counterintuitive results.The analysis of the high frequency loss shows for flux measurements over short grass canopy with ideal fetch conditions the largest correction for the heat flux (in the order of 15%) and clearly smaller correction for trace gas fluxes.

Path length averaging and sensor separation are causing systematic damping. The sensor separation only affects the trace gas fluxes, while for the heat flux only the path length averaging has to be considered. Therefore it must be expected that the heat flux is affected to a lesser degree by high frequency damping than the trace gas fluxes.

The data used are based on a recording with a logger at 10 Hz. As a first treatment a

dealiasing is performed with a recursive filter. Whether such a step is necessary: will depend on how exactly the 10 Hz sampling works. This step could be unnecessary in case the 10 Hz readings are averages over the 20 or 50 Hz resolution that the sonic anemometer and the Licor – 7500 instruments are capable to deliver.

The mathematical framework used to adjust the spectra by a transfer function is debatable. E.g. equations 2 – 4 are erroneous; the filter constant t has the unit second. Seconds cannot be equal square root of seconds!

Figure 2 shows an archetype of an observed f-weighted cospectrum. It shows a ratio around 2 of the value at the Nyquist frequency and the maximum. This ratio is very low. We measure at our grassland site ratios above 50 over all stability ranges for the heat flux. The low ratio shown in figure 2 might points to a problem in the recording of the raw data (especially the temperature data) or a mathematical error in the post processing of the data.

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