

Interactive comment on “Low-cost eddy covariance: a case study of evapotranspiration overagroforestry in Germany” by Christian Markwitz and Lukas Siebicke

Anonymous Referee #3

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General comments

This manuscript presents a test of a low-cost hygrometer manufactured by Bosch GmbH being used for eddy-covariance measurements. The sonic anemometer is the same as for regular eddy-covariance system being deployed. Another difference between the low-cost system and the regular system is the data acquisition, which is realized by a Raspberry Pi instead of a Campbell CR6 data logger. The regular EC system has a Licor LI7200 for measuring water vapor and CO₂ fluctuations. I doubt that the data acquisition causes significant differences in the collected data since both systems are recording digitally. So, the main question of this study is, whether the

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precision and the spectral response characteristics of the Bosch hygrometer are sufficient for eddy covariance applications. The results of evapotranspiration show a good agreement, if adequate spectral corrections are applied, which leads the authors to the main conclusion that this low-cost system is an alternative when a larger number of measurement units is required for a certain application. I generally agree with this assessment; however, I suggest that a more extensive evaluation of the spectral response characteristics of the Bosch sensor based on the collected field data should be presented, e.g. the system's cut-off frequency based on in-situ assessment method of Ibrom et al. (2007) and the transfer function of the Moncrieff et al. method. This would perhaps also better explain why the one method gave different results than the other.

Minor comments

Abstract: I find the abstract too long, I am not sure though, if this journal has any limits in that respect. E.g. the introductory sentences could be shortened. Nevertheless, I would suggest to mention the main results, perhaps even including information about the RMSE.

P2, L10-21: It is not clear how this is relevant for the topic of this paper. Perhaps omit these sentences, although they are correct.

L9, L7: How were the clocks of the two systems synchronized and how good was this synchronization. It needs to be better than 0.05 s.

P10, L17: Since you analyzed the spectra already, I suggest that you also empirically determine and present the cut-off frequency of the Bosch sensor, also in order to verify the response time provided in the specifications.

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