

Answers to Referees (Comments from the Referees are in black, answers in blue)

Referee 1

General comments

A thorough software comparison is an important exercise for a new software package in order to characterize its performance and capabilities. EddyPro has become probably the widely used eddy covariance software and it has been tested against other software.

Therefore it makes sense to use this software as an inter-comparison partner for the new software package Eddy UH, which is introduced in this manuscript. Perhaps it could have been even more interesting to compare include also other software in this exercise, but this point is not critical. As pointed out by the authors, the outcome of any flux calculation, however, does not only depend on the software package itself but also on the settings applied in a specific software, i.e. the order and selection of single processing steps and correction algorithms. Some details about the implementation of different processing options can only really be understood by the developer of a specific software. Therefore, I would like to encourage the authors to include Gerardo Fratini, the developer of EddyPro, in this study. I believe the interpretation of the differences between both software could benefit from his experience a lot. Regarding the title, I am not sure if the second part of it “for a wide range of instrumentation and ecosystems” is really supported by the presented results, given the fact that only two different data sets were investigated. Nevertheless, this study is timely and at least in part original. For example, the inclusion of methane fluxes in such a software comparison is novel and therefore increases the value of this study. Up to now, not much was known about the uncertainty of methane fluxes due to the post-processing algorithms.

Furthermore, this study not only presents a software inter-comparison, but also a sensor inter-comparison between different gas analysers, including the relatively new LI7200. In addition, investigating the effect of the use of different software on the cumulative fluxes is novel and interesting for a larger readership. The paper is generally well written, clearly structured and the figures are clear and informative. Therefore, in summary I recommend that this manuscript can be accepted with minor revisions.

We thank the reviewer for the comments. Following also the other reviewer's comments, we have change the title of the paper to make it more consistent with the aim of this study. The new title is “**Quantifying the uncertainty of eddy covariance fluxes due to the use of different software packages and combinations of processing steps for a wide range of instrumentation in two contrasting ecosystems**”. We have been in contact with Gerardo Fratini, and we had some discussion related to this study. We have now added him in the Acknowledgments.

P13 L8: It is therefore rather a unit conversion and not a correction.

I would still called it “WPL correction”, like it is indicated in the original paper (Webb et al, 1981).

P13, L24: Could it not also be possible that the problem lies not in the spectra but in the transfer function, which might not be appropriate for this set-up when the displacement is mostly vertical rather than horizontal, so that the theoretical method is overcorrecting?

The sensor separation correction implemented in EddyPro is based on Horst and Lenschow (2009) study, who theoretically derived a formula (Eq.13) for calculating directly the spectral attenuation (given the sensor separation). Such formula was derived assuming the analytical form of Horst (1997) for the cospectral model. Moreover, it was derived for horizontal sensor separation, and then proposed also for describing the vertical separation. While we recognize

that in Siikaneva wetland site the site specific cospectral model (and stability dependence of the cospectral peak normalized frequency) differs from those used in this correction (which are instead close to atmospheric surface layer parameterizations), we also think that a more detailed analysis on the limitation of the Horst and Lenschow's correction for our dataset is outside the scope of this study.