

Interactive comment on “Flux correction for closed-path laser spectrometers without internal water vapor measurements” by R. V. Hiller et al.

Anonymous Referee #3

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It is certainly interesting to assess whether it is possible to use an external H₂O measurement for correcting spectroscopic closed-path CH₄ measurements when H₂O is not available from the spectrometer for eddy-covariance applications. To do this, the (spectral) effects of sensor separation, dampening due to the tubing filters and instrument design, plus the specific tube delay effects for H₂O and cross-sensitivity should be determined. This does not require any modification of WPL theory, but only additional corrections and transfer functions. It is purely coincidental that two non-linear effects, i.e. cross-sensitivity and dampening effects, can compensate each other. Therefore, both should be treated separately and not merged into one correction.

If the goal of this ms is to find a way to make the FMA usable for eddy covariance this reviewer would disagree with the authors that the proposed approach is more elegant

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(p.353, l.22) than drying the sample. If the goal is to make FGGA's without H₂O correction (early serial numbers) usable for eddy covariance the relevance of this ms is not very general.

The authors failed to explain why the second H₂O/CO₂ instrument should be placed at some distance (p.354, l.7), in this case 5 m lateral and 0.95 m vertical. The vertical separation causes unnecessary problems for comparing the spectral response of both systems. The lateral separation limits the comparability in the time domain.

The character of this experiment is rather a case study and that should be represented in the title, the abstract and throughout the text of the ms. A more suitable title could be "Can open-path H₂O measurements be used for correcting closed-path spectrometer without internal H₂O measurements?" Parts of the conclusion are in line with this already (p. 371, l. 8-10).

Although the topic and the points raised in the discussion about instrument interference and usability of instruments for eddy-covariance applications are insightful and valuable, I recommend rejecting this ms.

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 351, 2012.

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