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Interpretability of negative latent heat fluxes from Eddy Covariance measurements during dry conditions	
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Response to Report from Editor

We've received comments from two reviewers, both experts in this field. Both are supportive and recommend the manuscript for publication after minor revisions. After reading myself, I agree with the two reviewers that the paper is well written and interesting.

Thank you very much for this kind assessment of our work.

Some brief comments on the reviewer's points: While I can see Reviewer 1's point, I agree with the authors' response that it is good to keep the wetter site in Germany in the analysis to show the contrast with the drier site. I also agree with the second reviewer that some more motivation and discussion of explaining the mismatch between EC and lysimeter is interesting rather than explaining the lysimeter patterns.

I also have some additional comments below to consider. Ultimately, we invite the authors to implement their revisions.

1) The condition for SVA discussed in lines 230-240 might need some more discussion. Specifically, if the soil temperature (Ts) is below the dew point, wouldn't this be conditions for dew formation on the soil surface/pores? Therefore, SVA in the soil occurs below the dew point? Dew should form when the air temperature (or the bare soil surface Ts in this case) drops below the dew point. If I am misunderstanding, please provide some more detail on this point.

Thank you very much for spotting this error! The partitioning equations for dew and SVA at the end of Page 9 (230) was wrong. It should be
*"$Tdew_{0.1m}$ **>** T_s" for dew*
*"$Tdew_{0.1m}$ **<** T_s" for SVA*
(Ts stands for surface temperature in our manuscript) which is in line with the definition that you refer to in this comment.

2) l and g are not defined in the caption in Fig. 1

Thank you, we added the following explanation into the caption of Figure 1:

*The representations (a and b) illustrate that at constant atmospheric rH of 60 % at a temperature of 20 °C, the vapor flux direction and phase change **(l and g for liquid and gas)** within the soil are opposite for different soil water potentials.*

3) Consider showing a time series to demonstrate SVA with the lysimeter and EC. Currently, while detailed, Fig. 3 and 4 are quite dense and potentially difficult for some readers to see the SVA process. It looks like Reviewer 2 requested something like this.

We have indeed added an additional figure to the appendix (Figure D1) showing the course of diel measurements from EC and lysimeters, as suggested by reviewer 2, and decided to add surface temperature and dew point temperature to show that the surface is too hot for dew formation during this period.

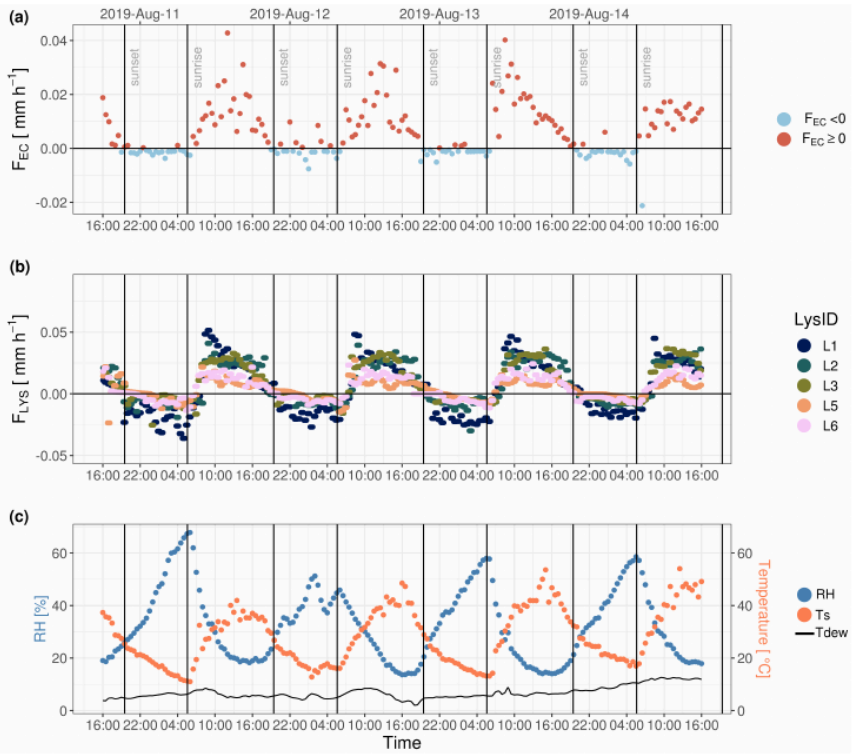

Figure D1. Diurnal measurements of water fluxes from (a) eddy-covariance (F_{EC}) and (b) the five lysimeters (L1, L2, L3, L5, and L6) from 11.08.2019 18:00 h until 15.08.2019 18:00 at ES-LMa*. Panel (c) illustrates the course of relative humidity (RH) at 2 m height above the soil surface together with surface (T_s) and dewpoint temperature (T_{dew}). Black vertical lines illustrate sunset and sunrise (determined by the geographic coordinates of the field site).

4) An error propagation analysis was mentioned around line 442. Please consider showing this analysis in the supplemental materials given the value it adds.

Thank you for this suggestion. We have added a figure to the Appendix section (Figure J1) showing the relative proportion of the error-propagated random error compared to the total sum of negative LE fluxes, which reinforces the argument we make around line 442.

Appendix J: Proportion of random error on $F_{IN,EC}$

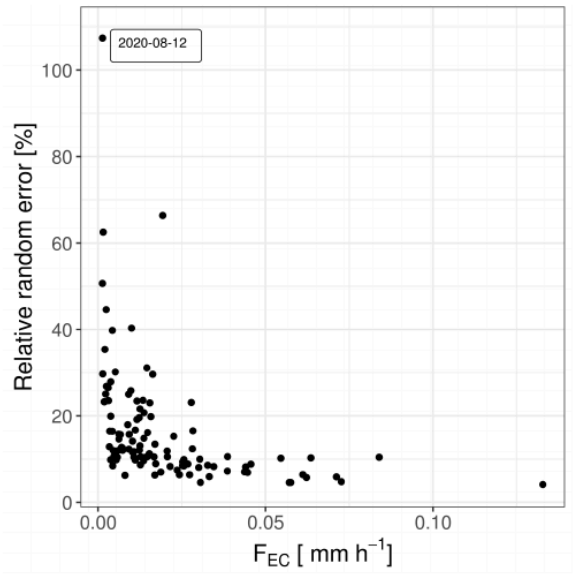

Figure J1. The relative random error shown on the y-axis is the proportion of the random error from the total inward flux measurements $F_{IN,EC}$ of the EC for each nights. The half hourly $F_{IN,EC}$ measurements per night were summed. The random error per night was determined by propagating the random error of the half houly measurements using standard deviations.

-Andrew Feldman

Thank you very much for contributing and helping us to improve this manuscript.

Sinikka Paulus