

Dear Reviewer,

thank you very much for your comments to improve our manuscript.

Please see below for a detailed reply to your comments:

- TITLE: Also if it could be quite “appealing”, it can result misleading; so I suggest rephrasing for example “Effects of different climatic conditions on soil water storage patterns”
 - We changed the title according to your suggestion
- ABSTRACT: “This year and reflects the direct impact of changing climate on soil water budget parameters.” Unclear as it seems related to the effects of global warming and not to the comparison between two different conditions, please remove or rephrase
 - We changed “changing climate” to “different climatic conditions”, so the phrase does not refer to global warming, as you suggested.
- L46: “The SWS is the residual between in-flux and out-flux components of the soil water balance;” it could be trivial or incorrect (as also bottom drainage can occur, I suggest removing)
 - We removed the sentence as you suggested
- L117: I suppose that the meaning of the sentence could result unclear after the track change mode
 - The long sentence is rather confusing, especially with “track changes mode” turned on. Thus, we split the sentence into two sentences, so our message would become more evident: “Thus, the dominant frequencies of a time series can be derived with WA for each moment in time. In contrast, Fourier analysis calculates only the dominant frequency across the entire time series (Torrence and Compo, 1998).“ (ll. 104-106)
- L92-155: the paragraphs are hard to read as they anticipate the paragraph §2.3 where many concepts are introduced. It is a general comment as I know that, at this stage, restructuring the sections could be hard
 - Thank you for the comment. We understand that the section about Wavelet analysis and its application is rather extensive and that some parts are better placed in the method section 2.3. However, since this section describes concepts and not distinct methodological facts that are needed to reproduce our research, we would prefer leaving the section as it is. One could argue that some concepts like PWC and MWC could be removed since they are not applied and thus directly relevant to the paper. On the other hand, we were asked to include such a section during an earlier review stage.
- L205: the time span (2014-2021) is too short to identify robust variations in thermometric and rainfall regimes; so it could be better to report how, during the observed period, these were the variations or considering longer time span to estimate actual differences in climatology
 - You are right: the study period is too short to report robust variations in temperature and rainfall. That is why we included the longterm climatic differences (1991-2022) (Figure 1, new manuscript), that also support the short term differences we see in the data. Reasons for that might be the more maritime climate in Selhausen compared to Dedelow. We emphasized this in the text by adding: “Thus, within these eight years, the lysimeters from

Dedelow were exposed to wetter and warmer weather conditions caused by the more oceanic climate in Selhausen as compared the more continental one in Dedelow. Also, considering the two sites with the different climatic conditions, the weather was characterized by extreme rainfall events (2017), relatively wet (2017, 2021) and dry (2018) periods within the observation period. Compared with the longer-term periods, these extremes seem to be exceptional.” (ll. 190-196)

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- Figure 1: If I have correctly understood the meaning of the values in the graphs, that related to Dedelow should be corrected (now they report the same values)
 - We corrected the wrong numbers in the graph of Dedelow and checked the manuscript again. The numbers in the text were correct.
- L232: how do you compute potential evapotranspiration?
 - While checking our metadata for the calculation of the ETP in Dedelow and Selhausen, we realized that in Selhausen the grass reference evapotranspiration (ET₀) was calculated (according to Penman-Monteith) and in Dedelow the potential evapotranspiration according to Wendling et al. (1991). Since these are different types of evapotranspiration that should not be confused. The difference in ETP or ET₀ between our two sites was only used to characterise the gradient in climate between Dedelow and Selhausen and is not important for the interpretation of our results we decided to remove this value from the manuscript.
- Table 1: are information about soil hydraulic properties available? E.g. soil-water characteristic curves or hydraulic conductivity values?
 - Yes, there are data on soil hydraulic properties available. They are published in Herbrich & Gerke (2017) and Rieckh et al. (2012) as well in supplementary table S8 of Groh et al. (2022). We added the reference that soil hydraulic properties can be found in these publications (header of Table 1)
- L580: typo for “actual”
 - We corrected the typo.

Literature:

- Groh, J., Diamantopoulos, E., Duan, X., Ewert, F., Heinlein, F., Herbst, M., Holbak, M., Kamali, B., Kersebaum, K.-C., Kuhnert, M., Nendel, C., Priesack, E., Steidl, J., Sommer, M., Pütz, T., Vanderborght, J., Vereecken, H., Wallor, E., Weber, T. K. D., Wegehenkel, M., Weihermüller, L., and Gerke, H. H.: Same soil, different climate: Crop model intercomparison on translocated lysimeters, *Vadose Zone Journal*, 21, 303, doi:10.1002/vzj2.20202, 2022.
- Herbrich, M. and Gerke, H. H.: Scales of Water Retention Dynamics Observed in Eroded Luvisols from an Arable Postglacial Soil Landscape, *Vadose Zone Journal*, 16, 1–17, doi:10.2136/vzj2017.01.0003, 2017.
- Rieckh, H., Gerke, H. H., & Sommer, M. (2012). Hydraulic properties of characteristic horizons depending on relief position and structure in a hummocky glacial soil landscape. *Soil and Tillage Research*, 125, 123–131.
<https://doi.org/10.1016/j.still.2012.07.004>
- Wendling, U., Schellin, H.G., and Thomä, M.: Bereitstellung von täglichen Informationen zum Wasserhaushalt des Bodens für die Zwecke der agrarmeteorologischen Beratung, *Z. Meteorol.*, 41, 468–475, 1991.