

Dear Thomas Pütz,

we are very thankful for your generally positive judgement of our manuscript and for the specific comments, which helped us to strengthen the paper.

Please find below all replies to the comments as inserted blue text.

Kind regards,

Andre Peters, Thomas Nehls and Gerd Wessolek

General comments

Filter procedures for lysimeter data are necessary tools to process the data records. The AWAT filter can be used as a useful / timesaving tool for data preparation. In my understanding, a filter must find only improper, incorrect, or faulty data in order to correct these errors in the next step. Within very narrow limits, an evaluation of the data is necessary to classify their sense and correctness. However, an interpretation of the data is strictly to avoid.

Yes and no. We agree that a data filter should primarily help to eliminate faulty data and noise. Yet, if we want to use the final data we must interpret them. This is always a delicate step since it requires expert knowledge. We hope that we showed in the paper that omitting the suggested interpolation schemes and keep the mere step interpolation can lead to a “wrong” data interpretation. This is of particular importance if data shall be used for modeling in high temporal resolution. Since both reviewers, you and Johann Fank, have raised this issue we added now the sentence “As stated above, the step interpolation scheme directly reflects the resolution of the measurement system and is therefore the final part of a mere data evaluation process. Using the suggested two interpolation schemes is the first step towards data interpretation.” (section 2.3.2).

Specific comments

In your introduction: beside P and ET you should mention the importance of the seepage water because of the importance for the water balance.

We agree that seepage water is an important part of the water balance. However, this Note deals exclusively with the filtering and interpretation of data for P and ET, which can be directly derived from lysimeter measurements including seepage. Seepage water depends directly on the imposed lower boundary of the lysimeter and might thus not be representative for the place where the lysimeter is located. Since this discussion is beyond the scope, we would like to omit it here. Furthermore, in terms of discussing noise and filtering of noise, seepage is of smaller interest since the noise is much more reduced due to the transport process of water within the lysimeter.

P2 L 4-5: here I miss also the seepage water or drainage!!

See reply above

P 5 L 18 “a time with no fluxes was compared”. - It is hard to believe that there is no flux (= no ET) in July?

This is right. We changed it to “...low fluxes...”.

You did not discuss or reflect to any data noise induced by wind events. Are you sure to have no wind effects? For further filter tests, a combination of different, changing scenarios would be desirable, e.g. a mixed scenario of rain – ET – rain?

This note is not meant as a test of the AWAT filtering scheme. It is intended as an extension towards data interpretation. Strong wind does only mean that the value for delta is high so that the step and therefore the vertical distance of two consecutive anchor points is large. The wind effects are discussed and handled in the original paper (Peters et al., 2014).

Why no synthetic data were used, because for this case very specific data mistakes can be inserted? While real lysimeter data always an interpretation must be carried out to define the true values.

This Note deals with data after calculation of the anchor points, i.e. after all noise and errors are assumed to be eliminated. For the schemes, which are introduced here, it makes no difference whether real data or synthetic data is used. The use of synthetic data is interesting and might be used in future studies to test the filter throughout. However, as already discussed by Peters et al., (2014) artificially composed data might not comprise the same complex system and noise behavior as in reality.

Technical corrections

I will list only errors that have not been criticized by the former reviewer.

P 8 L 23: What is a simple heuristic selection criterion?

The heuristic selection criterion is introduced in section 2.3.2. What it does is given in the second part of the sentence to which the reviewer refers.

P 11 Fig 1: the legend of the x-axis and date below are showing different years 2012 / 2014 than in the description?

We are thankful for this hint and apologize for the fault. All data was recorded in 2014. This is now corrected.

P 13 Fig 3: this figure is not a really good graphic to compare results, my suggestion: compare it as differences. P 14 Fig 4: see above!

The aim of Fig 3 and 4 is to show that the step interpolation scheme leads to predicted ET, which (i) depend on the chosen time interval for the output and (ii) are either very high or zero and that the suggested interpolation schemes solve this specific problem. This is best done by the figures as they are.