

Interactive comment on “Technical note on long-term probe misalignment and proposed quality control using the heat pulse method for transpiration estimations” by E. K. Larsen et al.

Anonymous Referee #1

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General comments:

The manuscript entitled, Technical note on long-term probe misalignment and proposed quality control using the heat pulse method for transpiration estimations, addresses an important technical issue with regards to probe misalignment. It is suitable as a technical note within HESS and it delivers a concrete way of dealing with probe misalignment. More specifically, it provides a concrete statistical filtration method to ensure the consistency of measurements. The work provides a substantial contribution to scientific progress within the sap flow community. The methods are valid, yet more clarification is needed with regards to the sampling design and a more elaborate

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analyses are needed on the individual specific effects. Although the results and conclusions are presented clearly, there is a need within the manuscript to elaborate on the implications of the results and potential other issues present with the methods that is applied.

The main issue I see with regards to the manuscript is that the authors could spend more attention on the variability of misalignment issues between installed trees and present in a clear way how they defines zero flow conditions. Additionally, the implications of the correction could be more concretely quantified by showing time-series of daily water use, with and without the proposed correction. Finally, within the discussion there is space for further elaborating on the other issues related to the installment of these type of sensors. Clearly circumferential variability, wounding and other biases should be further investigated in the future.

Specific comments:

Line 44-46: Please provide sources describing each of the method. Now readers cannot read related literature to explain the method.

Line 56-59: See also: Steppe et al. 2010 A comparison of sap flux density using thermal dissipation, heat pulse velocity. This is a relevant study which addresses the offset of sap flow methods from gravimetric measurements.

Figure 1: It would be good if there would be a zoom in panel where you can see more detail on the patterns. The current point cloud does not give the reader a full idea on the diurnal quality of the data. Line 220: Please help the reader to understand what RSD is. I went back to the methods to check, yet this part of the text should be understandable on its own.

Line 237-238: It would be good to understand when and why there is a limited amount of periods with zero-flow conditions. Additionally, it is not clear how these periods where exactly defined. It would help to include an appendix figures which details these periods

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and the underlying environmental conditions. Additionally, now the displacement is provided for one tree and the average of all trees and sensors. Yet, it would be good to see whether there are difference between the sensors themselves. Would the authors be able to provide the change presented in Figure 2 for each sensor?

Line 263-265: It would be interesting to see temporally what the difference are in daily water use (L d⁻¹). This will clarify if the offset due to misalignment is progressively getting worse or whether, in these species, the impact is not that bad. Additionally, when presenting these numbers it is critical that the standard deviation is also provided for these estimates.

Line 296-299: Indeed, there could be a reduction in the amplitude due to wounding effects or other changes within the stem. Did the authors analyse whether they would see a reduction in the amplitude over time? It would be important to make this test as the data is available.

Line 316-318: This is indeed a valid point, yet I would propose that the authors would elaborate on the fact that reinstalling sensors along the stem will introduce change due to circumferential variability in the stem. This could be critical when generating continuous series of sap flow over the long term. Also, do the authors think these results found on conifers are universal for all types of species? I would have expected a short discussion to clarify to the reader why these findings could be of general value to the application of the method.

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