

Author reply to technical correction of „Form and function in hydrology: In situ imaging and characterization of flow-relevant structures from point to hillslope scale” by C. Jackisch et al.

We deeply thank the editor Ross Woods and the reviewers for their efforts they invested in improving our manuscript.

The requested technical corrections have been addressed as follows:

P2L6–8: Relevance Wittgensteins Tractatus for this manuscript

Although the topic of form and function relation is deeply rooted in science-philosophical essays we understand that a direct citation raised concerns about how we refer to Wittgensteins findings alone. Despite the large body of literature on structure, scaling, organization and functional similarity, the topic of how we can infer on structure from function and vice versa appears to have ample room for debate and research.

As the sentence P2L6–8 is an introduction to the following clarification of what we understand about the terms in our manuscript and since the citation was rather generic, we decided that the citation is not necessary and dropped it.

P7L8: “... to activate all potential flow paths ...”

We agree that more and longer irrigation could have activated even more pathways. The absolute statement has been altered by replacing “all” by “the”.

P14L4–10, Fig. 4: figure is still misleading. The Ksat data in Fig. 4 clearly suggest that the variance decreases with depths. Fig. 13 in the appendix reveals a different results that supports the actual text.

In Fig. 4 Ksat vs. depth the visual interpretation is hindered by the difference in the number of data points in low and greater depth. To make this easier we added box plots to each depth level. As Fig. 4 comprises all laboratory measurements based on ring samples and Fig. 13 refers to in-situ measurements, we do not agree that exchanging the plots would help to understand the manuscript better. In the text the references to the figures are correct.

P20, Fig. 9: Uncertainty by the selection of t_{fix}

As can be depicted from equation 1 the selection of t_{fix} (time of fixation) scales the velocity linearly. This was the reason for not adding more content to the graph. As such this is not really an error margin which could be added but rather a conceptual assumption of the method. To take up the suggestion and to clarify on that we added box plots for four different t_{fix} estimates to the plot.

P29L10–11: absolute statement that form and function cannot be approached separately

We agree that the statement should not be so absolute and that it needs further clarification. As such we modified the sentence to:

Our findings show that form and function in hydrological systems operate in conjugated pairs. This implies that it is very difficult to observe them separately and that their projections are inherently non-unique and scale dependent.