Hydrology and Earth System Sciences Discussions

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1
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Comment on hess-2021-293

B. des Tombe (Referee)

Referee comment on "Combining passive- and active-DTS measurements to locate and quantify groundwater discharge into streams" by Nataline Simon et al., Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2021-293-RC1, 2021

I recommend this manuscript to be published after making several major changes. First of all, I would like to congratulate the researchers on their great work. Estimating seepage rates is incredibly hard and this work helps others in their estimation. I recommend several changes that, from my point of view, would help readers/others. These comments target mainly the assumptions/boundary conditions/initial conditions of each of the applied models, and projecting the uncertainty of those assumptions on to the estimate of the seepage rates. Thus, how to go from a complex 3D world to a highly simplified 1D model. The uncertainty of the estimates is discussed at the end (..2 cm offset of the fiber introduces an error in the seepage estimate of 50%..) to a (very) limited extent. It is currently presented as an afterthought and I would like to see this as a significant part of the body of the manuscript. The uncertainty of the estimated seepage rates is an important part of the discussion and allows for better comparison of the different methods. I expect the uncertainty of the estimates to be so large that I wonder if estimating flow is even possible with the presented methods, and it would rather be identifying locations where the river is gaining. Maybe the manuscript is better of estimating locations where the river is gaining, it would be a very valuable contribution to the field. The comments in the two attached documents may be formulated a bit short, but these are intended constructive comments to help you to improve your article. Kind regards, Bas des Tombe.

Please also note the supplement to this comment:
https://hess.copernicus.org/preprints/hess-2021-293/hess-2021-293-RC1-supplement.pdf