

Interactive comment on “Estimating the degree of preferential flow to drainage in an agricultural clay till field for a 10-year period” by David Nagy et al.

Anonymous Referee #2

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Dear Authors,

I have read your joint manuscripts “Estimating the degree of preferential flow to drainage in an agricultural clay till field for a 10-year period” and “Effect of preferential transport and coherent denitrification on leaching of nitrate to drainage”. I think the topic of your studies and the outcome might be interesting to the HESS community. The manuscripts show an impressive attempt to model the water flow and nutrient dynamics in the well-studied clay fields of the PLAP Studies in Denmark, using a very large database.

In these articles I feel lost in the abundance of data and parameters and goodness of fit measures, which obscures the message you want to convey. It also seems that you have used determined a rather large amount of sensitive parameters and subsequently

used many different parameters to calibrate on and different model performance criteria. In the end it would be nice to see a bit more discussion about the model concept and what can be learned from this study and the field data on preferential flow.

I think the articles both would benefit strongly by improving the structure. Additionally, in many sentences I have proposed changes, as they were either grammatically incorrect, or way too long and complicated or not precise. You can find all these proposed changes in the added annotated pdf.

Last but not least I think you should reconsider your wish to put these articles forward for the special issue on “Water, isotope and solute fluxes in the soil–plant–atmosphere interface: investigations from the canopy to the root zone“. In that special issue the focus is on the use of isotopes to better understand the soil-plant-atmosphere processes. I do not see how this study fits in there.

So, to conclude, I think the paper as it is needs a major revision, including rethinking the way the model was parameterised and what can be learnt from this model. That should be followed by a new round with reviews. I would like to wish the authors good luck in their work on improving the article. It is an impressive amount of data and an interesting model, I think it is definitely worthwhile putting some more effort into this.

Please also note the supplement to this comment:

<https://www.hydrol-earth-syst-sci-discuss.net/hess-2019-665/hess-2019-665-RC2-supplement.pdf>

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2019-665>, 2020.

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Discussion paper

