Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2019-17-RC2, 2019

Hydrology and Earth System Sciences
Discussions
Open Access
EGU

Interactive comment on "Efficient estimation of effective hydraulic properties of stratal undulating surface layer using time-lapse multi-channel GPR" *by* X. Pan et al.

Anonymous Referee #2

Received and published: 1 June 2019

This is an interesting paper. Hydraulic properties of the surface layer was estimated using time-lapse multi-channel GPR at plot scale. I recommend its publication after a moderate revision. The following comments may be helpful for improving the manuscript. 1. The term 'effective hydraulic properties' is used in the paper. What's the difference of effective hydraulic properties and hydraulic properties? 2. Page 5 Line15 : For the bottom boundary, a Dirichlet boundary condition is applied with a fixed water pressure of -0.4 m. Page 9 Line12 : The lower Dirichlet boundary is constantly set to the position of the water table inferred from drilling (-1.7 m). Please explain the bottom boundary. Is 'a fixed water pressure of -0.4 m' a good assumption? How will this assumption affect results? 3. Page 14 Line19 : Particularly, the structural information

Printer-friendly version

Discussion paper

resulting from the slope-induced lateral water redistribution is essential to the proposed approach. Page 16 Line15 : Application of the demonstrated approach mainly relies on the slope gradient of the undulating structure and the lateral water redistribution. A 2D model is used here to simulate lateral water redistribution. If a 3D model is applied here, the simulated lateral water redistribution may be more or less different. How do you consider this? 4. Page 9 Line6 : For the hydraulic model of the transect, the geometry (16.82 m x 1.3 m) is discretized with a resolution of 0.10 m x 0.05 m (Fig. 3b). Page 13 Line4 : Three two-layer architectures (S1, S2, and S3 in Fig. 6) are employed with a domain of 6.28 m x 2 m and are discretized 5 with a resolution of 0.04 m x 0.02 m. Two different models are used instead of one, please explain.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2019-17, 2019.

Printer-friendly version

Discussion paper