

Hydrol. Earth Syst. Sci. Discuss., referee comment RC2
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Comment on hess-2022-193

Anonymous Referee #2

Referee comment on "Modelling of water infiltration into water-repellent soils with a pore-scale Darcian flow model" by Claude Hammecker et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-193-RC2>, 2022

The manuscript is very important to understand the hydrological process of soil water movement. But, a lot of incorrect grammar and irregular writing make the manuscript difficult to be understood. For example, commas in some sentences appear at unexpected places and some sentences are incorrect in tense, incomplete or lengthy.

What are the characteristics of water repellent soil? What is the difference of infiltration process for water repellent soil and non-water repellent soil? What are the main factors affecting the two processes? The manuscript lacks description or understanding of these basic problems.

Why do the author employ the capillary model and the pearl necklace model to describe the influence of the contact angle on water repellence? Both models generalize soil particles as spheres, but in fact, soil particles are irregular thin slices. Can such distorted generalization better describe the relationship between soil particles?

There is no infiltration experimental data in the manuscript. How to verify the improved models?

According to a1 of A/A0 from the Pearl necklace in Table 1, Should the contents between lines 195 and 200 belong to Section 3.1.2.

Line 206 "This result is one of the novelty of this study", What is the novelty? and please clearly illustrate is the contribution of the novelty to describe the infiltration into water repellent soils?

Equation (17) may be wrong. According to the formulas $\bar{\mu}_1$ and $\bar{\mu}_2$, it should be written

as $h_a = 2\sqrt{R^2 - r_a^2} - R$? But according to Figure 1, Equation (17) seems to be correct.