

## Review of the manuscript hessd-12-12089-2015

“Macropore flow at the field scale: predictive performance of empirical models and X-ray CT analyzed macropore characteristics”  
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### 1 General comments

The manuscript is the report of an experimental study on undisturbed soil samples. The results show the importance of quantification of macroporosity to determine the water flow parameters. In order to characterize macroporosity, X-ray CT scanning is applied.

The manuscript describes an interesting data set, and shows that macropore effects cannot be neglected at fine scale; in other words, pedotransfer functions and phenomenological models are not yet sufficiently developed to predict the real hydraulic properties of soils, because they do not properly account for macropore characteristics. This is evident from figure 3, which renders the rest of the paper less interesting and relevant.

Sorry, but my opinion is that the paper is not suited for publication on HESS. In fact, the data set is very interesting, but data processing and interpretation are performed with standard tools and do not have any innovative content.

However, the paper is well written and organised, but for few problems that are listed in the technical comments below.

### 2 Specific comments

1. The term “connected macroporosity” – as defined at page 12096, line 29 to page 12097, line 2 – is used to describe a connected volume of macropores which extends from one side to the opposite end of the sample. In the scientific literature, this is often referred to as percolating cluster or percolating connected volume, borrowing the definitions and notation of percolation theory. Since a lot of connectivity indicators have been defined in the scientific literature, I think that the use of “percolating macropores” should be preferred.
2. Page 12101, lines 23 to 25. I think that the statement “The density-corrected...biopores.” is not supported by the data.
3. I think that it would be great if the authors stored the measurement results in a public data repository, making them open to the whole scientific community, so that other researchers can profit from their excellent experimental work to improve phenomenological models and to perform further analyses that could permit to extract more information from this data set.

### 3 Technical comments

1. Page 12092, line 21. Erase “-0.5”.
2. Page 12093, line 28. Rephrase the sentence “However...yet”.

3. Page 12095, line 3. Replace “1.69 ha” with “1.69-hectars-wide”.
4. Page 12095, line 5. Geological Survey of Denmark and Greenland (1999) is not listed in the references.
5. Page 12095, line 13. Replace “ID”, possibly with “diameter”.
6. Page 12096, line 7. Substitute “Jassonge” with “Jassogne”.
7. Page 12101, line 9. Please rephrase “both models”, by explicitly writing which models are used to compute data for Figure 3.
8. Page 12101, line 23. Substitute “und” with “and”.
9. Page 12111, lines 17 to 19. The citation to this paper is missing in the text.