

Interactive comment on “Examining the effect of pore size distribution and shape on flow through unsaturated peat using 3-D computed tomography” by F. Rezanezhad et al.

Anonymous Referee #3

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I have some rather mixed feelings concerning this paper that make it a little difficult to make a decision regarding publication. The positive aspects of the paper are the novelty. X-ray CT as a tool is very well suited to such a study yet this is the first of this kind that I have come across. Whilst there has been much research on soil structure using CT, peat has been largely ignored so this is important work. Further the scanning of samples at different matric potentials is also novel and is much appreciated. Overall the authors have undertaken the work with a great deal of skill and precision and are to be congratulated for that. However, the major disappointment in the work is that effectively it has been undertaken on just one sample. This is divided up into three

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samples but then only one sample is focused on. This is a real shame in my opinion and as a result I feel uncomfortable supporting publication because of this. Whilst I appreciate the difficulties with cost and access to CT facilities I have never come across another similar paper that only examined one sample. Effectively it downgrades all the conclusions. As such I will leave this decision to the editor. My own feeling is that the quality of the work would just sway me to air on the positive side. Some more minor issues are covered below.

- The style of writing is often excessively wordy and many of the more basic aspects of soil physics and CT measurement are covered in far too much detail. The paper could be quite heavily edited and would read better.
- To what extent is the data you present 2D or 3D. Please make this clear. Suggest you remove 3D from the title
- P3842 L15 why not express BD in g cm^3 as is the norm?
- P3842 samples were removed from the pressure plates for scanning, hence were not under pressure during scanning. Did this have any impact? What was the scan length?
- P3842 L42 Too much detail of established methodology here.
- P3845 L1 - did you try to segment the solid material from the water manually? What were the HU for these materials? Did they overlap?
- P3847 - given the importance of the single continuous pore you dont include any images of this? This is precisely the benefit of CT!
- Do Table 3 and Figure 3 show the same data? if so please just use one or the other.
- P3851 L24-26. Going back to my comment above, how can you make a statement such as this on the basis of analysing just 1 sample?