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Hydrology and Earth System Sciences Discussions

Interactive comment on "Polymer tensiometers with ceramic cones: performance in drying soils and comparison with water-filled tensiometers and time domain reflectometry" *by* M. J. van der Ploeg et al.

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We thank the referee for the effort put in our paper. We made the reply based on the points raised by the reviewer. As point 1 and 2 are general comments that were later addressed more specifically, we start with point 3.

3. The reviewer did not mention in what way s/he perceived our observations to be incorrect. The lack of explanation does not allow us to make fruitful modifications. The

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thorough comments by Dr. Tarantino did not reveal any indication about the alleged incorrectness of our observations, and we therefore left the text unchanged. In our literature review we have incorporated the accessible papers written in English mentioned by the reviewer. Two of the papers the reviewer refers to are in Portuguese, another constitutes gray literature, and one required a considerable expense to be acquired.

4. Agus and Schanz (2005) mention Fredlund and Rahjardjo (1993), but make a distinction between measurement of the matric potential and total potential with the filter paper method. According to these authors the filter paper method can measure matric potential between 0 and -1.5 MPa and total potential between -3 and -100 MPa. In the text we do not mention the matric potential range of -0.09 to -0.5 MPa to be the measurement range of the filter paper, we mention methods that can be used between -0.09 and -0.5 MPa of which the filter paper method is one.

5. Mahler and Diene is in Portuguese, unfortunately. Other literature pertaining to narrow-chamber water-fillled tensiometers suggests that operating these sensors for prolonged times (weeks, months) is not feasible.

6. The soil in the evaporation container of Fig. 3a had a sand fraction of 97.6 %. From retention curves of sand it is known that small reductions of the matric potential cause wet sandy soils to lose large quantities of water. Then, the soils (now much drier) can experience large further reductions of the matric potential without losing much additional water. The result is shown in Fig 3a. The matric potential gradually decreases, but this is not visible on the scale shown in Figure 3a. See also point 13.

7. In principle they should. In reality this is often not the case. We do not know the reason why our water-filled tensiometers cavitated earlier.

8. The volume change we allude to here is entirely caused by deformation of the pressure membrane of the pressure transducer, cavitation therefore did not occur. Note that cavitation requires a pressure inside the chamber that is lower than the ambient

HESSD

6, C2861–C2863, 2009

pressure. The operational principle of the POT is to avoid this condition.

9. The table was already in days, but 4B should be 1A. We corrected this.

10. We thank the reviewer for the suggestion and have included the reference in the paper.

11. We have included the paper in the references.

12. These references are mentioned in Table 2.

13. We are not sure what is unclear for the referee in Figure 4 (Figure 5 in the revised manuscript), but have assumed that it had to deal with point 6. We have included an extra figure with a scale from 0.5 to -0.5 MPa as suggested by Dr. Tarantino.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 4349, 2009.