Hydrol. Earth Syst. Sci. Discuss., 7, C26–C27, 2010
www.hydrol-earth-syst-sci-discuss.net/7/C26/2010/

Hydrology and Earth System Sciences Discussions

Interactive comment on "A quality assessment of spatial TDR soil moisture measurements in homogenous and heterogeneous media with laboratory experiments" *by* T. Graeff et al.

Anonymous Referee #2

Received and published: 12 February 2010

By using a recently developed fast TDR-inversion algorithm for soil moisture, this paper estimated soil moisture profiles from the measurement of three rods TDR probes. An extensive discussion about the influences of rod geometric deformation (convergent and divergent rods) on the simulated soil moisture profiles were conducted, the discussions about the influences of coated and uncoated probes on the TDR reflectograms, soil structures (homogeneous and heterogeneous media) on the soil moisture retrieval were also presented. The spatial moisture distribution in nature soil obtained in this paper is a valuably information for many other research fields. The estimated profiles in loamy soil are in good agreement with the TDR measurements. However, there are still several aspects need to be improved as listed in the specific comments. Therefore,

I suggest publish this paper in HESS after a revision.

Specific comments 1. How to make this algorithm more applicable or more robust? For example, how to reduce the field measurements by THETA probes? How to simplify and elaborate the eq. (10) under different soil texture conditions, not in specific soil condition? How to obtain eq. (11) at diverse soil conditions? By this way, we can enlarge the applicable domain of this algorithm.

2. CA in eq. (12) can be used to specify the rods deformation geometry, are the characteristics described by the amplitude coefficient dependent on the soil structure (homogeneous or heterogeneous media)?

3. There are several character misprints, e. g., Fig. 9c (page 19, line 15) should be Fig. 9b; "shows that the measurements slightly underestimate. . .. . ." (Page 19, line 16-17) may be "shows that the inverted value or the inversion slightly underestimates. . .. . ."

4. The probes deformation will lead to systematic bias in inverted soil moisture profiles (under- and overestimate), then when the amplitude coefficient CA is negative value (the absolute value is not very big, it means that the rod may be parallel or slightly divergent), how to determine the accuracy of inverted moisture profiles?

5. The conclusion of a study should be more concise, please make a careful revision.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 269, 2010.