Conjunctive Use of Tension Infiltrometry and TDR for Inverse Estimation of Soil Hydraulic Properties. (S01-schwartz153647-Poster)

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Abstract:

Infiltration from a tension disc infiltrometer can be used conjointly with measurements of soil water content using time domain reflectometry (TDR) to improve estimates of field hydraulic parameters. However, TDR probes must be inserted at the soil surface and outside the disc perimeter to minimize soil disturbance. Sensor placement only partially within the wetted zone complicates the interpretation of measured water contents. We investigated the sensitivity of TDR probe placement on inverse parameter estimation and the correspondence between measured and predicted soil water contents. Infiltration experiments were completed for 0.58 m diameter cylinders repacked with silt loam and loamy fine sand soils. A 0.2 m diameter disc infiltrometer was placed on the surface of the repacked soil columns to measure cumulative infiltration. Six TDR probes were inserted diagonally into the soil to measure transient water contents during infiltration. Inverse optimization of hydraulic parameters was completed using cumulative infiltration, water retention, and TDR data. Spatially averaged soil water contents modeled using optimized parameters are compared with water contents measured by TDR.

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