



Water content profile retrieval by TDR measurements within lysimeters

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Water content retrieval by TDR measurements is a technique intensively studied during the last years. Even there exists clear indications that the procedure should work, the theoretical models do not describe the measurements system completely. Nevertheless, this measurement technique is attractive for various applications in environmental sciences. It would be possible, for example, to measure with one single vertical installed TDR probe the water content profile within a lysimeter. The installation of several vertical TDR probes would allow to get a deeper insight into the flow regime of the lysimeter under observation.

We will present the state-of-the-art with respect of TDR measurement technique. The measurement setup and key features in the retrieval algorithm are discussed briefly and an outlook of the potential of this measurement technique is given. We will present then first results from two experiments where we studied the dynamic of the infiltration of water pulses through a small and large lysimeter, respectively. The small lysimeter is a sand column of 1.4 m height and 0.45 m in diameter equipped with one vertical TDR probe of 1m length. The large lysimeter has an extension of 7x7x0.8 m and is equipped with four vertical TDR probes of 0.8m length. Both lysimeter were filled with different type of sand. First result indicates that the relative change of the water content profile can be extracted from the measured TDR traces.