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GPR monitoring for non-uniform infiltration through a high permeable gravel layer in the test sand box

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Recently capillary barriers have been known as a method to protect subsurface regions against infiltration from soil surface. It has essentially non-uniform structure of permeability or soil physical property. To identify the function of the capillary barrier, the site-characterization technique for non-uniform soil moisture distribution and infiltration process is needed. We built a sand box in which a thin high-permeable gravel layer was embedded and conducted a infiltration test, including non-uniform flow of soil water induced by capillary barrier effects. We monitored this process by various types of GPR measurements, including time-lapsed soundings with multi-frequency antenna and transmission measurements like one using cross-borehole radar. Finally we will discuss the applicability of GPR for monitoring the phenomena around the capillary barrier of soil.
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