

## Monitoring of Shear-wave velocity in the vadose zone.

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Shear wave velocity is geophysical parameter related to stiffness. This is useful indicator to assess the stability of ground. We observed change of shear wave velocity due to the water infiltrated into a vadose zone. An experiment of time-lapse S-wave tomography was conducted at PWRI tsukuba site. First, we monitored artificial water infiltration process. We dug a small trench on a crown of 2 m high model levee. Then, we poured fresh water into a trench under constant water level. A survey line was set across the center of trench. As a result, the extension of decrease in shear wave velocity was clearly imaged as time passes. Next, we measured just after rain and compared shear wave structure between before and after rain. As a result, an area of decrease in shear wave velocity distributed in shallow ground. Two types of result showed that decrease of stiffness in ground due to the water infiltrated into a vadose zone and shear wave velocity of unsaturated soil was a parameter depended on volumetric water content of a soil. Monitoring of shear wave velocity enables us to extract a weak zone due to rainfall. In addition, this method is expected to assess the stability of levee and road embankment during rainfall.

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