

## Monitoring of the rain-induced landslide process with use of self-potential method

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In order to mitigate the rain-induced landslide disasters, monitoring and forecasting of the landslides are important. In this study, self-potential approach is applied to develop an early warning system for rain-induced landslides. At the first step, laboratory experiments under the precipitation control and sandbox experiments have been conducted. The results show, (1) the SP variation associated with infiltration and saturation and (2) the transient changes of self-potential variation a few tens minutes before the main slide. We try to explain the sources of these self-potential phenomena qualitatively and quantitatively. The obtained results are as follows;

(1) The SP variations are found to be controlled by hydraulic head with use of the electro-kinetic coupling coefficient  $C'$  which connects the pore pressure (hydraulic head) and self-potential in the assumption of saturation.

(2) The remarkable step-like and rectangular transient signals can be seen only in self-potential changes. These changes are detected only below the upper boundary of the slipped body and the detected electric field is generated. It is found that the transient signals occurred with constant increasing of the soil displacement when images from digital video cameras in the case of indoor landslide experiments have been analyzed.

The details will be presented in our presentation.

**Keywords:** landslide, self-potential, monitoring and forecasting, pore pressure, the electro-kinetic coupling coefficient, soil displacement