

The sandbox experiments to understand Self-Potential changes associated with water flow

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Landslides are one of the most severe natural disasters in the world and there are two types; rainfall induced landslides and landslides triggered by an earthquake. In this research, basic study on early warning system for landslides will be performed to understand rainfall-induced landslide process by hydrological and electromagnetic changes. The final goal of the research is to develop a simple methodology for landslide monitoring/forecasting using self potential method. Conventional methods for monitoring landslides are based on geotechnical and hydrological approaches measuring pore pressures and displacements on the surface. In these methods, boreholes are required in general which may disturb the subsurface water system. Making boreholes is costly and it is not so practical for field applications. On the other hand, self potential measurement using two electrodes is easy to set up and run continuously.

In this study, the sandbox experiment has been conducted to understand the relation between water flow and self potential using a network of electrodes set in the tank. For the sandbox system, it is possible to control the water table and easily to drain water from the tank and infiltrate water into the tank. Controlling water flow in the tank, we conducted repeatedly experiments. In consequence, we could get the relation between the magnitude of water flow and self potential. The details will be given in our presentation.