



Early warning of landslides based on landslide indoor experiments

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An experiment to induce a fluidized landslide by artificial rainfall has been conducted on an indoor slope. The experimental slope is 10 m long, 1 m wide, and the slope gradients are 10 degree for the lower and 32 degree for the upper slope. As for self-potential measurements, electrodes (Pb-PbCl₂), pasted the bentonite to reduce a contact resistivity, have been installed with intersensor distance of one meter in a depth of 20 cm and 50 cm and the reference electrode has been installed in the depth of 50 cm at the top of the slope. For pore pressure measurements, gauge meters have been set up in a depth 10 cm, 40 cm and 65 cm and the air pressure meter was installed in a depth 40 cm with one meter spacing. Here, electrodes and pore pressure meters were installed alternately. The electrodes and gauge meters have been connected to the 16 bit AD converter (National Instrument SCXI-1120) and fed to the data acquisition PC. The sampling rate is 100 Hz. Soil displacement has been recorded by CCD video cameras with motion of markers. The total amount of water flowed out from the slope has also been measured.

A landslide initiated 65440 s (1h49m40s) after the start of sprinkling at a precipitation intensity of 80 mm/h. During this experiment, pore pressure, self-potential, and soil displacement have been measured. The results suggest the relationship among motion of subsurface water, soil displacement, and electrical potential differences. Self-potential method seems to have capability for early warning system for landslides.