

# **Experimental Study on the Electro-Kinetic Effect ; Self-potential approach to monitor groundwater condition under the slope for rainfall-induced landslide forecast**

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Statistical significance and probability of the precursory phenomena of ULF electromagnetic anomalies preceding large earthquakes have been reported in recent years. In addition, the electrokinetic effect is considered to be strong as one of the most promising generation mechanisms based on the waveform analysis. In this study, in order to perform experimental and theoretical investigation on the fundamental properties of the signals originated by the electrokinetic effects from the ground, we studied rainfall-induced landslide as an example. Of course monitoring the groundwater condition under the slope and estimation of the occurrence time of the main collapse are essential to mitigate landslide risks. In this sense, we investigate self-potential (SP) method using the flume tests, the sandbox experiments, and numerical simulations. We found the SP changes are controlled by the electro-kinetic effects. There is a linear correlation between the variation of self-potential and the hydraulic head; that is called a coupling coefficient. The value of this coefficient depends on the soil property. The knowledge of electro-kinetic effect based on the landslide studies can apply to provide an earthquake preparation processes if we could understand how the electric field occurs. We would like to present the similarity of the signals between the flume test and the observed ULF anomalies before crustal activities at station. Also we would like to propose a model for the SP signal in the sandbox experiment.

## Suggested references

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