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Multi parametric study of the “Vence” landslide, at different time and spatial scales (Alpes-Maritimes, France).

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The understanding of landslide behaviour requires to characterise and quantify the triggered parameters in relation to kinematics. Because of strong annual variations of triggered factors, the knowledge of temporal evolution is important. In general, most of experiments that are carried out only consider the geological mass at a given state. The triggered factor presents temporal variations that are not easy to quantify. Our purpose is to obtain a temporal imagery of the water behaviour (the main triggered factor on the studied site) and to quantify the correlation between the hydrogeological state and the landslide kinematics. The experimental step is based over a multi-parametric study of the Vence landslide at different spatial and time scales. This landslide affects a ten meter thick sandy-clay mass overlying a fractured calcareous substratum.

Firstly, we study the entire landslide without time consideration. A geophysical study (4 electrical tomographies) is correlated to geotechnical data (inclinometers, cored surveys). These first results allow for defining the sliding surface geometry, but also to calibrate the resistivity values obtained by electrical tomography.

On the basis of this information, we carry out temporal follow-up experiments of resistivity in order to understand fluid circulation inside the landslide. This experiment consists in a controlled water injection, to follow its evolution in the geological mass. We show that the whole injected water volume concentrates at the interface between the sandy-clay formation and the calcareous substratum, thus highlighting a strong permeability contrast in the solid mass.

An observation on a longer period (a few months) and at the landslide scale requires

to correlate several data. The experimental setup is based on:

- a water level survey,
- an autonomous acquisition system in order to collect daily geophysical data,
- a topographic survey of movements.