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Time-lapse inversion of daily ERT data from eight weeks Super Sauze landslide monitoring

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The Electrical Resistivity Tomography (ERT) can be used to monitor the variation of the water content and water flow in landslides. Understanding the spatial and temporal changes of the water content and the preferential flow paths is of great interest, because hydrology is an important triggering factor for landslide dynamic processes.

The research presented here is part of a larger field experiment conducted at the Super-Sauze landslide, which objective is the characterization of the existing relationship between small fracture processes and slope movement, fissure development and pore pressure build-up.

In this study, ERT measurements arranged in a Wenner configuration were carried out at the clay-rich Super-Sauze landslide (South French Alps) over a period of eight weeks in order to identify temporal and spatial variations in water content. The investigated area exhibits the highest landslide dynamics at the site, with average displacements greater than 0.01 m/day. One of the studied profiles is 100 m in length and has electrode spacings of 1m, whereas the other two are both 12.5 m in length and have electrode separations of 0.25m.

To analyse the collected electrical resistivity data, a time-lapse inversion was implemented. Heavy rainfall events occurred in the monitored period can be clearly observed in the presented results.