Geophysical Research Abstracts
Vol. 19, EGU2017-14490, 2017
EGU General Assembly 2017

Catalogs of micro-seismicity recorded at the Pechgraben landslide (Upper Austria)

Floriane Provost (1), Clément Hibert (1), Naomi Vouillamoz (2), Jean-Philippe Malet (1), David Ottowitz (3), and Birgit Jochum (3)

(1) Institut de Physique du Globe de Strasbourg - CNRS UMR 7516, University of Strasbourg/EOST, 5 rue Descartes, F-67084 Strasbourg, France , (2) Institute of Geophysics, University of Stuttgart, Azenbergstraße 16, DE-70174 Stuttgart, Germany, (3) Geological Survey of Austria, Department of Geophysics, Neulinggasse 38, 1030 Vienna, Austria

The microseismicity activity of soft-rock landslides (i.e. developed in clays and clay-shales) present various types of seismic event associated with the slope deformation. They are assumed to be linked to the slip at the interface with the bedrock or at the boundaries of the landslide, to material failures, to fissure openings or to fluid transfers within the medium. It is currently necessary to document the microseismicity generated by soft-rock landslides on a larger amount of instrumented slopes in order to validate the current seismic typology and understand the source mechanisms in relation with the deformation.
Previous studies have shown the interest of the Pechgraben (Upper Austria) clay-shale landslide for such documentation. This landslide was reactivated in summer 2013 after heavy rainfalls and is characterized by a shallow bedrock (<10m) and varying displacement rates in space and time (from mm.day-1 to cm.day-1). A short pilot seismic campaign (<9 days) was carried out in 2015 and micro-earthquakes as well as episodic tremor-like signals were recorded. A new passive seismic campaign was conducted during one month in November-December 2016. Two broadband three-component seismometers were installed facing each other on the two stable borders of the slope with one tripartite seismic array deployed in the center, on top of the most active area of the landslide. The deformation pattern of the slope was monitored remotely with a ground-based InSAR at a high frequency (10 min).
This study aims to present the variety of seismic sources generated by the landslide, using supervised machine learning algorithms for event detection and classification, and to correlate the resulting micro-seismic catalog with the changes in time of the slope deformation.