Geophysical Research Abstracts
Vol. 19, EGU2017-8678, 2017
EGU General Assembly 2017

Ambient seismic noise monitoring of the Super-Sauze landslide from a very dense temporary seismic array

Toufik Chtouki (1), Jerome Vergne (1), Floriane Provost (1), Jean-Philippe Malet (1), Arnaud Burtin (2), and Clément Hibert (1)

(1) Institut de Physique du Globe de Strasbourg, CNRS UMR7516, University of Strasbourg/EOST, Strasbourg, France (jerome.vergne@unistra.fr), (2) Institut de Physique du Globe de Paris, Paris, France

The Super-Sauze landslide is located on the southern part of the Barcelonnette Basin (French Alps) and has developed in a soft clay-shale environment. It is one of the four sites continuously monitored through a wide variety of geophysical and hydro-geological techniques in the framework of the OMIV French national landslide observatory.
From early June to mid-July 2016, a temporary dense seismic array has been installed in the most active part of the landslide and at its surroundings. 50 different sites with an average inter-station distance of ∼50m have been instrumented with 150 miniaturized and autonomous seismic stations (Zland nodes), allowing a continuous record of the seismic signal at frequencies higher than 0.2Hz over an almost regular grid. Concurrently, a Ground-Based InSAR device allowed for a precise and continuous monitoring of the surface deformation. Overall, this experiment is intended to better characterize the spatio-temporal evolution of the deformation processes related to various type of forcing.
We analyze the continuous records of ambient seismic noise recorded by the dense array. Using power spectral densities, we characterize the various types of natural and anthropogenic seismic sources, including the effect of water turbulence and bedload transport in the small nearby torrents.
We also compute the correlation of the ambient diffuse seismic noise in various frequency bands for the 2448 station pairs to recover the empirical Green functions between them. The temporal evolution of the coda part of these noise correlation functions allows monitoring and localizing shear wave velocity variations in the sliding mass. Here we present some preliminary results of this analysis and compare the seismic variations to meteorological data and surface deformation.