Geophysical Research Abstracts, Vol. 8, 05221, 2006
SRef-ID: 1607-7962/gra/EGU06-A-05221

An experience of seismic monitoring for understanding muddy landslides: the case of Super-Sauze (South French Alps)

D. Amitrano, (1), S. Gaffet (2), J-P Malet (3), O. Maquaire (4)

(1) LIRIGM-LGIT, Université Joseph Fourrier, Grenoble, France, (david.amitrano@ujf-grenoble.fr) (2) Geosciences Azur, Valbonne, France, (3) UCEL, University of Utrecht, Netherlands, (4) LETG-GEOPHEN, Université de Caen, France.

The macroscopic deformation of rocks, for scales ranging from that of laboratory sample (cm) to that of the rock massive and earth crust, is associated to local irreversible processes (cracks/faults propagation and shearing). These fast movements involve acoustic wave's propagation, which can be observed by remote sensing. Thus, the seismic monitoring during the strain progression can help to a better understanding of rock behaviour and can lead to the determination of failure precursors. Despite of this strong comprehensive potential, this observational tool has not been often used for the study of gravitational instability.

Here we present seismic monitoring data's concerning a muddy landslide, located in the Southern French Alps.

These results show that recordable seismicity exists in the frequency range of 0.01 Hz to 10 Hz, associated with the rock material deformation. The acceleration of landslide deformation, triggered by rainfall, appears to be well correlated with seismic activity. The origin of the seismicity is attributed to the shearing of moving mass in the bedrock. The spectral analysis of the seismic wave reveals that the best correlation is obtained in the range 0.1-10 Hz.

These results show the strong potential of the seismic monitoring for reaching a better knowledge of the mechanisms of rock masses deformation and of gravitational instabilities. The determination of operational failure precursors basing on the seismic monitoring is not yet reached but is a major target of this research.