Geophysical Research Abstracts, Vol. 9, 06969, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-06969

Analyzing the kinematical behaviour of slow-moving landslides in the varved clays of the Trièves Plateau (France).

Th.W.J van Asch (1), J.-P. Malet (2), T.A. Bogaard (1), D. Jongmans (3)

(1) Faculty of Geosciences, Utrecht University, Utrecht, Netherlands, (2) CNRS UMR 6554, University of Caen Basse-Normandie, France, (3) CNRS UMR 5559, University Joseph Fourier, Grenoble, France. (t.vanasch@geo.uu.nl / Phone: +31-30-253-2778)

Slow-moving landslides show complex mechanical and fluid interactions. They show among others: non linear intrinsic viscosity of the shear zone, strength regain by consolidation, undrained loading effects leading to local de- and accelerations and the generation of excess pore pressure. The parameterization of hydrological and geomechanical factors by field and laboratory tests to describe the movement patterns of these landslides is difficult. It is a challenge to model the accurate reproduction of the de- and acceleration of these landslides and particularly, to forecast catastrophic surges.

The in-depth displacements (inclinometer data) and ground water variations of some landslides observed in the varved clays region of the Trièves Plateau (France) were collected to analyze and model the movement behaviour. The inclinometer profiles show major deformation at the bottom of the landslide bodies which indicates a viscous shear zone with a more or less rigid body on top. Different concepts are developed and tested on observed displacement data to solve the excess driving force of the moving bodies including the interaction between different compartments of the landslide and the effect on the velocity distribution. Also the non-linearity of the intrinsic viscosity of the shear band is calibrated and validated on measured displacement data. Analyzes have been carried out on anomalies in the kinematic behaviour of these landslides. Thresholds for catastrophic movements are proposed.