Geophysical Research Abstracts
Vol. 13, EGU2011-8471, 2011
EGU General Assembly 2011
© Author(s) 2011

Sensitivity analysis of rock avalanche's run-out simulation in Trafoi (South Tyrol, Italy)

Jean Pascal Iannacone (1), Alessandro Corsini (1), Byron Quan Luna (2), and Francesco Ronchetti (1)

(1) Earth Sciences Department, University of Modena and Reggio Emilia, Modena, Italy (jeanpascal.iannacone@gmail.com/Fax +39 059 2055887), (2) Faculty of Geoinformation Science and Earth Observation (ITC), University of Twente, Twente, The Netherlands

In the last years several numerical codes for landslides run-out evaluation have been proposed by different authors. The determination of realistic parameters is the most crucial issue in run-out modelling. Back analysis of past events in the same area is the best way to tackle the problem. However, this is not possible when trying to deal with first trigger events that might be of interest for hazard zoning. Whereas typical parameters are quite widely available in literature for debris flows, they are not for rock avalanches. In these operative conditions, sensitivity analysis is a possible approach to assess the relative spatial probability of an area to be involved in the run-out of the rock avalanche.

This paper deals with sensitivity analysis with reference to the run-out simulation code MassMov2D applied to the Trafoi rock slide (South Tyrol, Italy). MassMov2D is a script implemented in the PCRaster language developed by Beguería et al. (2009) The Trafoi landslide is an active deep-seated rock slide whose morphometric and geological characteristics are very similar to the Val Pola landslide. The Val Pola landslide is located only a few km west of Trafoi and evolved in a catastrophic rock avalanche in 1982. Since GPS monitoring from 2007 to date has shown that portions of the Trafoi rock slide move at cm/year rate, and given the fact that the Trafoi village is located at the base of the rockslide slope, run-out analysis is relevant for risk scenarios assessment.

Results have shown that the choice of values for internal friction angle, basal friction angle, and Chezy parameter afflicts the model outputs significantly. Nonetheless, they have also pointed out that the variations due to different parameters set is not that relevant in terms of the risk assessment, since the village is reached by the run-out for most of combinations of parameters and volume of failure material. Based on such evidence, a continuous monitoring system should be necessary in order to provide an early warning.