



ANALYSIS OF CAPILLARY BARRIER EFFECTS IN THE ACTIVATION OF DEBRIS AVALANCHES IN PYROCLASTIC COVER

V. Simeone, D. Mancarella

Politecnico di Bari, Facoltà

On May 1998 many landslides involving pyroclastic covers laying on the slope of Pizzo D'Alvano relief hit the towns of Bracigliano, Quindici, San Felice a Cancellò, Sarno. They were triggered by a prolonged rainfall event but certainly not extraordinary in terms of return time. The aim of the investigations carried out within this work, by means of in situ and lab testing, and by means of numerical simulations, is to point out some aspects related to triggering mechanisms of the debris flows that appear relevant to the authors. In particular attention is paid to retention phenomena of filtering waters due to the build up of capillary barriers in the interface between fine and coarser pyroclastic layers, causing suction head to drop down to triggering of the above mentioned landslide event. The study has brought into prominence how the formation of a capillary barrier is possible in the pyroclastic covers of the Pizzo D'Alvano relief due to the peculiar stratigraphic configuration and inherent hydraulic properties of this soil.

In case of a long rainfall event characterized by a low intensity, water accumulation in the upper layer is facilitated until eventually saturation is reached. The slow hydration of surficial deposits leads to a loss of the stabilizing contribution provided by the suction tension thus reducing mechanical strength till destabilization of the pyroclastic masses.

The presence of a capillary barrier at the interface between differently grain-sized soil layers can be considered as a one of the mechanism responsible of triggering slope instabilities in pyroclastic covers.