



## **Automatic and continuous landslide monitoring: the Rotolon Web-based platform**

Simone Frigerio, Luca Schenato, Matteo Mantovani, Giulia Bossi, Gianluca Marcato, Marco Cavalli, and Alessandro Pasuto

CNR-IRPI, Research Institute for Geo-Hydrological Protection, Italian National Research Council - Padova (Italy)  
simone.frigerio@irpi.cnr.it

Mount Rotolon (Eastern Italian Alps) is affected by a complex landslide that, since 1985, is threatening the nearby village of Recoaro Terme. The first written proof of a landslide occurrence dated back to 1798. After the last re-activation on November 2010 (637 mm of intense rainfall recorded in the 12 days prior the event), a mass of approximately 320.000 m<sup>3</sup> detached from the south flank of Mount Rotolon and evolved into a fast debris flow that ran for about 3 km along the stream bed.

A real-time monitoring system was required to detect early indication of rapid movements, potentially saving lives and property. A web-based platform for automatic and continuous monitoring was designed as a first step in the implementation of an early-warning system. Measurements collected by the automated geotechnical and topographic instrumentation, deployed over the landslide body, are gathered in a central box station. After the calibration process, they are transmitted by web services on a local server, where graphs, maps, reports and alert announcement are automatically generated and updated. All the processed information are available by web browser with different access rights. The web environment provides the following advantages: 1) data is collected from different data sources and matched on a single server-side frame 2) a remote user-interface allows regular technical maintenance and direct access to the instruments 3) data management system is synchronized and automatically tested 4) a graphical user interface on browser provides a user-friendly tool for decision-makers to interact with a system continuously updated. On this site two monitoring systems are actually on course: 1) GB-InSAR radar interferometer (University of Florence - Department of Earth Science) and 2) Automated Total Station (ATS) combined with extensometers network in a Web-based solution (CNR-IRPI Padova). This work deals with details on methodology, services and techniques adopted for the second monitoring solution. The activity directly interfaces with local Civil Protection agency, Regional Geological Service and local authorities with integrated roles and aims.