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## **LANDMON a new integrated system for the management of landslide monitoring networks**

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In the last decades, technological evolution has strongly increased the number of instruments, which can be used to monitor landslide phenomena. Robotized Total Stations, GB-InSAR and GPS are only few examples of the systems, which can be used for the control of the topographic changes due to the landslide activity. These monitoring systems are often organized in a complex network, aimed at controlling the most important physical parameters influencing the evolution of landslide activity. The level of complexity of the monitoring network increases with the number of monitoring systems and this could generate a paradox: the source of data are so numerous and difficult to interpret that a full understanding of the phenomenon could be hampered. The Geohazard Monitoring Group (GMG) of CNR IRPI has a long experience in landslide monitoring and has developed series of applications aimed to the landslide monitoring network management. The new developed system is called LANDMON (LANDslide MONitoring Network) and it is able to acquire, store, process and publish monitoring data from the landslide. LANDMON is currently active in many landslide sites distributed in several areas in Italy and Europe. LANDMON is based on several applications, also developed by GMG, like ADVICE (ADVanced displaCement monitoring system for Early warning [1]) and 3DA (three-dimensional Displacement Analysis [2]). These applications are aimed respectively to collect and process monitoring dataset, manage early warning application based on pre-defined thresholds, and to publish three dimensional displacement maps in near real time. Moreover, LANDMON integrates several new features, such as WebGIS application, modelling using inverse velocity method, and management of webcam monitoring system, meteorological parameters and borehole inclinometric data. The use of LANDMON is part of a more articulated communication strategy, which focuses on dissemination of the landslide monitoring result in order to produce a user-friendly communication system [3]. This system can be used in particular during emergencies to share the information with the involved population and to support decision makers.

*References:*

[1] Allasia P., Manconi A., Giordan D., Baldo M., Lollino G. (2013) ADVICE: A New Approach for Near-Real-Time Monitoring of Surface Displacements in Landslide Hazard Scenarios. *Sensors* 13(7), 8285-8302

[2] Manconi A., Allasia P., Giordan D., Baldo M., Lollino G., Corazza A., Albanese V. (2013) Landslide 3D surface deformation model obtained via RTS measurements. In: Margottini, C., Canuti, P., Sassa, K. (eds.), C. Margottini et al. (eds.), *Landslide Science and Practice*, Springer-Verlag Berlin Heidelberg, Vol. 2, 431-436

[3] Giordan D., Manconi A., Allasia P., Bertolo D. (2015) Brief Communication: On the rapid and efficient monitoring results dissemination in landslide emergency scenarios: the Mont de La Saxe case study. *Nat. Hazards Earth Syst. Sci.* 15, 2009–2017

