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# Using PS-InSAR data in landslide hazard management: the case of Veneto Region (NE Italy)

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The Project Persistent Scatterers Interferometry, performed by the Italian Ministry of Environment and Territory of the Sea (METS) in the framework of the Extraordinary Plan of Environmental Remote Sensing, has made available a high quantity of data useful for local Authorities (Regions, Provinces, and Municipalities) in the management of the main geological hazards, such as landslides, subsidence, and sinkholes. The main output of the Project consists of ground displacements and velocities measured at target points over the entire Italian territory by using PS-InSAR processing technique applied to SAR data acquired by satellites ESA (European Space Agency) ERS-1 and ERS-2 (Earth Resources Satellite) and ENVISAT (Environmental Satellite) in the period 1992-2010. Description and results of the Project are available for public browsing at the geoportal of the METS (http://www.pcn.minambiente.it).

On the basis of PS-InSAR data, several studies have been recently performed for the identification and characterization of landslides both at small and large scale. These studies led to a more precise delimitation of instable areas and to a better evaluation of the state of activity of mass movements. But, as now well known, interferometry techniques can't be applied to the whole territory due to geometric distortions in SAR data acquisition and to ground conditions.

In this work we analyze the potentiality of PS-InSAR data from the Project Persistent Scatterers Interferometry in landslide hazard management of the Veneto Region, located in the north-eastern part of Italy. A synthetic description on the main features of landslides affecting the Region is reported, then the percentage of instabilities where PS-InSAR data can be used, is calculated. At the scale of the entire Region we suggest to follow the method proposed in the scientific literature to evaluate the state of activity of landslides on the basis of the measured velocities at the ground surface, while at local scale (single Municipality) we propose to analyze more in depth displacements time series to better evaluate the occurrence of landslides characterized by high frequency of reactivation and to identify the relationships with rainfall considered as triggering factor.

Results from our study will help in identifying the actual possibility to use PS-InSAR data in landslide characterization and monitoring. Starting from these results an update of current landslide inventories and a planning to monitor the evolution of instabilities is possible. To these purposes, in the next future we are going to process high resolution SAR data acquired by Cosmo SKY Med satellites characterized also by a high revisit period, and to implement new systems for a near real time monitoring.