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(Article begins on next page)



Differential SAR interferometric analysis of Alpine landslide in the framework of Eurorisk-Preview project

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Prevention, Information and Early Warning, pre-operational services to support the management of risks (PREVIEW), is an integrated project within the Sixth Framework Programme of the European Commission. A European team was set up under the European Global Monitoring for Environment and Security (GMES) initiative, in order to make the best views of the most advanced research and technologies outcomes in the field of Earth Observation for the improvement of risk management. The objective of the Preview project is the development of a prototype system to support end-user (e.g. National Civil Protections) decision during crisis management as well as in the prevention phase. In the field of landslides, Preview includes remote sensing data processing for developing and applying innovative diagnostic techniques and advanced monitoring system: in particular the service 1 of the Landslides Platform addresses the monitoring of deep-seated slow-moving landslides over large areas, by application of interferometric techniques. In fact, a well know technique able to measure slow terrain movements is spaceborne differential synthetic aperture radar (SAR) interferometry even if the extraction of the displacement information is a complex task, especially in mountainous areas. The advanced processing technique developed by Telespazio group jointly exploits spatial and temporal properties of the data, in order to improve the density and the accuracy of the measurements. The integration of SAR interferometry with GIS, traditional geotechnical data and in situ tests is analysed, in order to assess the contribution of satellite remote sensing information in support to the needs of end users both at national and local level. Preliminary results are reported in the test site of Valfurva, east of Bormio in the Italian Alps, where significant rock-slides and deep-seated slope gravitational deformations were recognised. SAR images from ERS and ENVISAT satellites, with temporal range from 1995 to 2006,

have been used. The end users involved in this test area are at the moment the Italian Civil Protection Department, the Civil Protection of Regione Lombardia and ARPA Lombardia.