MORFEO project: use of remote sensing technology for mapping, monitoring and forecasting landslides

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MORFEO, an Italian acronym for Monitoring Landslide Risk exploiting Earth Observation Technology, is a 3-year research and development project of the Italian Space Agency, carried out in the framework of the Italian national earth observation programme. The project primary contract is Carlo Gavazzi Space, a leading enterprise in space technology and remote sensing applications in Italy. The project research team is composed by seven research institutes of the Italian National Research Council, and six university departments. The team has consolidated experience in landslide detection and mapping, landslide hazard assessment and risk evaluation, remote sensing technology (e.g., laser, optical, radar, GPS) for landslide detection, mapping and monitoring. MORFEO aims at the design, development and demonstration of a prototype system that exploits multiple satellite technologies to support the Italian national civil protection offices to manage landslide risk in Italy. Research activities conducted within the MORFEO project consist chiefly in testing, evaluating and improving EO technologies to increase the current capabilities to detect, map, monitor and forecast landslides in Italy. More precisely, the activities include: (i) detection and mapping landslides exploiting medium-resolution to very-high resolution satellite optical images, (ii) landslide monitoring, through the integration of ground based and satellite technologies, including GPS and DInSAR, (iii) landslide susceptibility, hazard and risk modelling using information obtained processing optical and radar data, (iv) vulnerability and damage assessment, exploiting optical and radar sensors, and (v) landslides forecasting, using thresholds, models and remote sensing data. We provide examples of some of the preliminary results obtained in the MOFEO project.