



Multi - band Persistent Scatterer Interferometry data integration for landslide analysis

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We present a methodology to perform a geomorphological assessment of ground movements over wide areas, by improving Persistent Scatterer Interferometry (PSI) analysis for landslide studies. The procedure relies on the integrated use of multi-band EO data acquired by different satellite sensors in different time intervals, to provide a detailed investigation of ground displacements. The methodology, throughout the cross-comparison and integration of PS data in different microwave bands (ALOS in L-band, ERS1/2 and ENVISAT in C-band, COSMOSKY-MED in X-band), is applied on the Tramontana Range in the northwestern part of Mallorca island (Spain), extensively affected by mass movements across time, especially during the last years. We increase the confidence degree of the available interferometric data and we homogenize all PS targets by implementing and classifying them through common criteria. Therefore, PSI results are combined with geo-thematic data and pre-existing landslide inventories of the study area, in order to improve the landslide database, providing additional information on the detected ground displacements. The results of this methodology are used to elaborate landslide activity maps, permitting to jointly exploit heterogeneous PS data for analyzing landslides at regional scale. Moreover, from a geomorphological perspective, the proposed approach exploits the implemented PS data to achieve a reliable spatial analysis of movement rates, whatever referred to certain landslide phenomena or to other natural processes, in order to perform ground motion activity maps within a wide area.