



DInSAR and PSI methods for the recognition of landslides: an experience in the Romanian Subcarpathians

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Landslide is one of the common natural hazards in Romania, especially in the Curvature area of the Romanian Subcarpathians. In this region, landslides cause considerable damages to critical infrastructures, build-up environment and cultivated areas. Most of the slopes are affected by translational and rotational landslide types.

The objective of this work is to locate and inventory landslides in the Buzau County, and possibly to characterize their dynamics. As the vegetation is abundant in the study area, series of L-band ALOS/PALSAR images are processed using advanced multi-temporal differential SAR interferometry (DInSAR & PSI). To analyze the DInSAR results, an object-oriented segmentation method is proposed to identify possible landslide candidates in the interferograms; to analyze the PSI results, a statistical method is used to identify PS characterized by the same evolution pattern in the time series.

Both techniques have proved to be able to detect unrecognised active landslides in the area, and allowed to complete existing geomorphological inventories. Around 700 new areas of landslides were detected after the analysis of the DInSAR results by an expert. However it represents 30% the zones that were detected in total. The false results remained difficult to isolate without a manual assessment.

That means that applying SAR interferometry is not a sufficient tool to build exhausting inventories, and depending on the characteristics of the images (frame/track, baseline), the characteristics of the terrain (landcover, slope gradient, geomorphology) and the characteristics of the landslide (size, displacement rate), only a certain percentage (roughly less than 50%) of the already known landslides are detected with InSAR. Moreover, because of the large variety of landcover (urban, forest, cultivated areas, bare soils) and slope morphology in the study area, DInSAR and PSI techniques provide different results depending on local conditions.