



Detection of mass movements in Alpine Slovenia using Permanent Scatter InSAR data

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Using relatively new method called Permanent Scatter (PS) InSAR technique mass movements in the area that spreads over 700 km² and lies in the NW part of Slovenia were assessed. The research area forms the eastern flank of the Alpine arch and is tectonically still active. For the analytical purposes 57 images of descending orbit from satellites ERS 1 and ERS 2 were used. The time span of the acquired images was from April 1992 to December 2000. The average signal reflector (PS) density for the area was 23 per km², which is a relatively good result considering that the area is in the mountain region and that is sparsely inhabited. Altogether 16304 permanent scatters were detected and for each of them the average movement in the line of sight was determined in relation to measurements at reference point, which is located in the Alpine foreland. For 10 % of them (1646 PS) with the coherence above 0.74, time series of movements were derived. Analyses are in progress to define the applicability of the method for the slope mass movement detection and to define the tectonic activity of the region for what the method is very useful, as already proven elsewhere by other researchers. The drawback of the measurements is that only displacements up to 28 mm between two consecutive acquisitions (35 days) can be detected, hence only relatively slow slope movements can be detected and observed. Nevertheless, the measurements showed that some areas of slope instability can be monitored, especially wider and slower ones. Triggering factors can be divided in two categories, rainfall and seismic activity. The results also show constant uplift of Alps and they indicate that the uplift is of higher magnitude than it was considered until now. The relative uplift in relation to the reference point in town Tolmin ranges from 1.25 mm up to more than 2 mm per year.