



## **Recent activity of an old landslide in the Flemish Ardennes (Belgium)**

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The hilly region of the Flemish Ardennes, in W Belgium, is known to be a place prone to landsliding. In this particular study, we focused on the Hekkebrugstraat landslide, the best-documented mass movement in this area. This landslide, which covers an area of 9 ha, extends in subhorizontal Eocene sediments composed of alternating clays and clayey sands on which a perched water table can develop. Due to anthropogenic interventions and after a very wet winter, this rotational earth slide was strongly reactivated in early February of 1995 and damaged several houses. Field investigations revealed that several reactivations occurred until 2000 within the slide and 2003 at the main scarp. Topographical changes which have occurred since 1995 have been studied. Aerial digital stereophotogrammetry was applied to extract the ground surface before and one year (spring 1996) after the main reactivation. Two 2 m-resolution DTMs were interpolated with a final accuracy of 50 cm. The subtraction of these DTMs from each other allowed us to measure vertical motion of 1 m or higher at the pixel scale. The detected movements are typical of a rotational slide and fit very well the field observations. At the head of the landslide a zone of depletion with vertical movement up to -7 m was detected, whereas the zone of accumulation was uplifted by up to 4 m. Horizontal displacements were also identified. In one year, the main scarp retreated up to 15 m, and displacements of several meters were observed at walls within the landslide. Vertical ground displacements after 1996 were measured using a third, LIDAR-based DEM. This 2 m-resolution DEM was acquired in 2002 with a vertical accuracy of 30 cm. The subtraction of the topographies revealed the compaction of the zone of accumulation after the reactivation. The post-1996 reactivations of the

main scarp were also detected.