



Terrestrial laser scanning data post processing for monitoring landslides

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Landslides are very complex processes of natural hazards and have been investigated in various ways. In the framework of the EU-Alpine Space Interreg III B project Clim-ChAlp, terrestrial laser scanning (TLS) is evaluated, in comparison to other monitoring techniques, for its application in landslide monitoring. It has previously been shown that under certain circumstances TLS can be a powerful tool to monitor landslides, but some limitations do exist. Some crucial steps in landslide monitoring are, amongst others: 1) the registration process 2) filtering of the point cloud data 3) data interpolation.

The research question is to discover to what extent these post processing methods can be improved for the application of TLS for landslide monitoring. The goal is to improve the data quality to achieve more reliable conclusions concerning the movement patterns.

Because a high degree of accuracy is the primary requirement for this application, the RIEGL LMS-Z420i was chosen as the experimental device. The accuracy of the distance measurement is given by the manufacturer of the device to be up to 10 mm, the beam width 0.25 mRad, and the range 1000 m. Combination with a calibrated and oriented high resolution digital camera created a hybrid sensor system, which is necessary to determine slope-parallel movements.

The results of measurements taken at test sites in Vorarlberg, Austria are presented and the outcome of different post processing methods for analysing data to investigate

the movement processes is discussed.