



The application of terrestrial laser scanning for landslide monitoring

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Landslides are very complex natural hazard processes 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. The purpose of this research project is to compare data of the TLS measurements with traditionally gained data from total stations about the mass movement processes. The research question is to discover to what extent the application of TLS is relevant, while still acquiring process able 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. The combination with a calibrated and oriented high resolution digital camera created a hybrid sensor system. Two different test sites were chosen for measurement. One test site represents a “fast” mass movement (movement rates of ~ 15 cm and more within the test period), the other one a “slow” mass movement (movement rates of ~5 cm within the test period). The results of the measurements taken at test sites in Vorarlberg, Austria are presented and the methodologies of analysing the data to investigate the movement processes are discussed.