Geophysical Research Abstracts,
Vol. 11, EGU2009-3557-2, 2009
EGU General Assembly 2009

Integrating Airborne and Terrestrial Laser Scanning data to monitor active landsliding

B. Székely (1,2), G. Molnár (1,2), A. Roncat (1), H. Lehner (1), Th. Gaisecker (3), and P. Drexel (4)

(1) Institute of Photogrammetry and Remote Sensing, Vienna University of Technology, Vienna, Austria (balazs.szekely@ipf.tuwien.ac.at), (2) Dept. of Geophysics and Space Science, Eötvös University Budapest, Hungary, (3) Riegl Laser Measurement Systems GmbH, Horn, Austria, (4) Landesvermessungsamt Vorarlberg, Feldkirch, Austria

Active slope processes often endanger various built-up objects and, as a consequence, sometimes human lives as well. Data acquision on the status and evolution of such slopes, especially those that had already affected by landsliding, therefore is a primary target for engineering geomorphic research.
The method of laser scanning provides an appropriate data collection technique with the requested accuracy. Data from repeated Airborne Laser Scanning (ALS) campaigns are suitable to be analysed for the slow, incipient movements of the slope. The problem of this surveying technique is that repetition time is strongly dependent on the financial resources of the monitoring project, and often the requested recurrence of flight campaigns cannot be achieved.
A possible solution to densify the data acquisition in time is the application of Terrestrial Laser Scanning (TLS) and intergration of its data with ALS data sets. TLS has the advantage of flexibility and shorter observation distances compared to ALS.
This technique needs special considerations and tedious processing since the geometric setting of the data acquision considerably differ in TLS and ALS. Furthermore, obstacles in the landscape may partly hamper the data acqusition which rarely the case in ALS.
Our case study area is a several-decade-long active landsliding in Doren (Federal State Vorarlberg, Austria) that as it develops, it is about to endangers houses of the locality. The site is especially suitable for the project, because multi-temporal data sets (from ALS flight campaigns in 2003, 2006 and 2007, respectively) of this area are available.
The data integration is carried out in the form of production of point clouds (sensed from various points of the valley sides) and we compared the results with the results of the previous ALS campaigns. With the planned repetition of the TLS measurements new and detailed insights can be achieved concerning the evolution of the incipient and on-going slow motions.
This project has been supported by the Austrian Academy of Sciences (ÖAW) within the framework of scheme Ġeophysics of the Earth´s crust, Riegl GmbH generously provided a full-waveform terrestrial laser scanning device.