



Project GeoWSN: High precision but low-cost GNSS landslide monitoring in Austria

Daniel Koch, Michael Brandstätter, and Norbert Kührtreiber
Institute of Navigation, Graz University of Technology, Austria

At present, GNSS monitoring of landslides is an accepted and approved method to detect movements of slopes at risk in the sub-centimetre level. However, high-precision geodetic GNSS-receivers are expensive, therefore this monitoring method is not widely applied. Recently low-cost GNSS-receivers are conquering the geodetic market and are well suited for a cost effective and yet precise GNSS-monitoring.

During the project GeoWSN, which was funded by the Austrian Research Promotion Agency (FFG), an applicable low-cost monitoring system was developed at Graz University of Technology. The system is based on a so-called Wireless Sensor Network (WSN) consisting of low-cost GNSS-receivers, temperature and humidity sensors and inertial measurement units. Additionally energy-harvesting technologies and power-saving algorithms provide that the system is energy- autarkic.

For real-time applications, a communication link between the sensor nodes is implemented. The relative positioning method RTK (Real Time Kinematic) is applied to reach the highest possible accuracy. The GeoWSN sensor nodes enable the detection of possible movements in the real-time processed positions of the sensor nodes. To ensure a real-time evaluation and interpretation of the data, the current status of the slope can be acquired by a local warning centre. Therefore, affected people can be warned within a short latency. Several test-scenarios have shown the acceptance of the system at the warning centre of Styria, Austria. This contribution should give an overview of the main idea of a low-cost warning system and results of the project GeoWSN.