

# GPS Software Development for Monitoring of Landslides

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## ABSTRACT

Natural disasters caused by landslides are frequent phenomena in alpine regions. For the investigation of landslide motions a GPS-based continuous monitoring system has been developed. The goal of the related research project is to discover possible precursors of mass movements.

We present the development of the GPS software GRAZIA which is designed to monitor and visualize slow deformations online. We describe the sequence of data processing steps with the main focus on special algorithms for obtaining high accuracy results: (a) normal point computation of double differenced phase data, (b) covariance model of the phase data, and (c) tropospheric bias model.

We have surveyed the Gradenbach landslide (Austria) several times during the past three years, using the GPS monitoring system. Data obtained from this project is used to demonstrate the excellent performance of the software GRAZIA. We show that the implemented correction models achieve, with respect to standard methods, a significant improvement of accuracy, reliability and time resolution of the deformations.

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