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RHETICUS: Insightful Geo-Analytics for Detecting Ground Instabilities and Monitoring Critical Infrastructures

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Abstract

Rheticus® is an automatic cloud-based geoinformation service platform, designed to deliver fresh and accurate data and information for monitoring the evolution of the Earth's surface. The platform, provides information by means of graphic indicators, dynamic diagrams and pre-set reports. The provided information allow users to immediately perform assessment operations over areas of interest.

Rheticus® Displacement represents a revolutionary model concept (through subscription) in monitoring critical infrastructure with the use of SAR data and the persistent scatter technique (PS), designed for users with high expectations in the value of information and its user friendliness provision.

More specifically, Rheticus® Displacement provides accurate information to monitor over time, through Multi-Temporal SAR Interferometry (MTInSAR) analysis, movements occurring across landslide features or structural weaknesses that could affect buildings or infrastructures. Using European Copernicus Sentinel-1 (S1) open data images and MTInSAR techniques, the service is complementary to traditional survey methods, providing a long-term solution to slope instability and geohazards monitoring.

The service update is guaranteed through the use of satellite images, mapping data and environmental information available online as open data. The service is updated with the availability of fresh incoming data, and the refresh rate can range from monthly to daily frequency depending on the service characteristics.

Rheticus® Displacement is a turnkey vertical web service for the continuous monitoring via satellite of instability phenomena affecting transportation infrastructures (roadways, railways, including bridges and tunnels) and/or their nearby areas, caused by structural defeats or ground displacements such as landslides or subsidence phenomena.

In this presentation, we focus on the great challenge of land and infrastructure monitoring as the key activity to ensure people's safety, environmental protection and the safeguarding of assets at all stages of the life cycle of infrastructures, from design to production, management and maintenance.