

## **High Spatio-Temporal Resolution Multisensors InSAR time series used for anthropogenic and natural ground deformation monitoring: cases studies of volcanic deformation in DR Congo and mining subsidence in the Greater Region**

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Modern Synthetic Aperture Radar (SAR) satellites and satellite constellations are capable of acquiring data at very high temporal resolution allowing detection of ground deformation signals with a minimal delay.

Advanced interferometric SAR (InSAR) processing techniques, such as Small Baseline Subset (SBAS) and Multidimensional Small Baseline Subset (MSBAS) are capable of producing time series of ground deformation with a very high sub-centimeter precision. Additionally MSBAS allows combination of various InSAR data into a single set of vertical and horizontal deformation time series further improving their temporal resolution and precision. Developed methodologies are ready for operational near real time monitoring of natural and anthropogenic hazards, including landslides, volcanoes, earthquakes and tectonic motion and ground subsidence caused by mining and groundwater extraction.

Here we present two case studies where an InSAR time series analysis was able to map ground deformation with superior resolution and precision, including mining subsidence in the Greater Luxembourg region and volcanic deformation in the Virunga Volcanic Province.

Often, InSAR is the best cost-efficient solution with no restrictions on spatial coverage, weather condition, security and timing. It is anticipated that the use of SAR data for mapping hazards will increase in the future as data access improves.