

Ground-based SAR system for monitoring deformation and infrastructure



Category: Sensors & Measuring Techniques

Reference: TDO0092

Broker Company Name: TNO

Broker Name: Len van der Wal

Telephone: +31 (0)88 866 65 26

Email: len.vanderwal@tno.nl

Abstract:

A Dutch company has developed a novel ground-based solution for monitoring unstable natural elements and critical manmade structures with Synthetic Aperture Radar (SAR). It is a non-invasive remote sensing tool for continuous deformation monitoring covering large areas. The sensor is compact and easy to install and can operate even under harsh working conditions.

Description:

Structural movements or terrain sliding information are affecting construction and geotechnical engineers' tasks more and more and ultimately also decision maker's choices. Continuous monitoring of a critical environment is often needed, for instance when supervising dams, towers, landslides, glaciers and unstable slopes in open pit mines.

Ground-based SAR is the answer to the increasing market demand for commercial radar able to reach a broader range of final customers. Ground-based SAR is a non-invasive remote sensing instrument for continuous deformation monitoring of large areas. Thanks to its unique design, the sensor is compact, easy-to-install and can operate even in harsh working conditions (cold/hot temperatures, rain, fog, dust, smoke, ash).

The ground-based SAR sensors can be modified according to the customer's requirement: the sensor is available in standard, interferometric or polarimetric setup and different kinds of antenna can be purchased on request.

Innovations and advantages of the offer:

Data acquisition can be performed in less than 5 seconds, overcoming the limitation of similar commercial systems on the market, i.e. the low temporal coherence due to local atmospheric variations.

A high spatial resolution (0.5 to 0.75 m in range, 4.5 mrad in cross-range) and a sub-millimeter deformation accuracy of the observed scenario is possible even from a few kilometers distance without the need for an in-situ operator.

The system can be used both in SAR and RAR mode, which makes this sensor a very convenient and versatile solution for deformation monitoring applications.

Application:

- Open pit mines
- Construction companies
- Geohazard institutes
- Land managements
- Public administrations

Space Heritage:

The FastGB SAR system inherits the Synthetic Aperture Radar technology developed by ESA and the Technical University in Delft. ESA developed the synthetic aperture radar (SAR) technology for its satellites and MetaSensing transferred the knowledge first to its airborne radars and successively to its ground based sensors, such as the FastGB SAR.

Broker Comments:

The FastGB SAR is a compact and cost-effective sensor capable of real-time acquisition with sub-millimetre accuracy. The acquisition is performed in less than 5 seconds, an order of magnitude faster than any other radar sensor in the deformation monitoring market. This is critical in fast changing environments and also the key to very high accuracy. The FASTGB SAR operates day-night even under harsh working conditions and from a few kilometres distance, not requiring the presence of an in-situ operator.