

Atlas InSAR

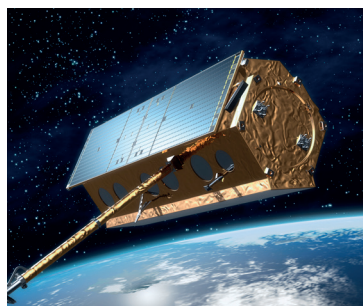
Monitoring ground motion and infrastructure stability from space

YOUR CHALLENGES

- **Map, monitor** and **predict movements** of your infrastructure at risk
- Acquire **accurate information** about past, present and future **ground and infrastructure behaviour**
- Measure **ground stability** with minimal on-site intervention



OUR SOLUTION



Atlas InSAR is Sixense's Interferometric Synthetic Aperture Radar (InSAR) solution to measure ground deformation and structure stability from space with millimetric precision. Utilising radar satellite images and advanced data processing, Atlas InSAR provides millions of measurement points in areas of interest, either for construction risk management or maintenance activities.

Through all project stages – design, construction or operation – satellite monitoring can provide both a comprehensive understanding of terrain behaviour over large areas as well as high resolution detailed analysis of single structures.

THE BENEFITS

- **Coverage of large areas:** monitoring over remote and very extensive areas including inaccessible or dangerous zones
- **Retrospective studies:** historical ground motion analysis from 1992 using archived satellite images
- **Non-invasive system:** a remote solution without requirements for site interventions and free of maintenance
- **Cost-effective solution,** permitting optimisation (and potential reduction) of ground-based monitoring systems
- **Combined with topographic data,** Atlas InSAR offers a robust and integrated monitoring solution



Sixense's

• 20 years of experience in instrumentation & monitoring.

• In-depth knowledge of measurements, civil engineering and geotechnics.

• The worldwide specialists in accurate and reliable measurements.

• Ability to offer optimised solutions combining the latest and most reliable technologies.

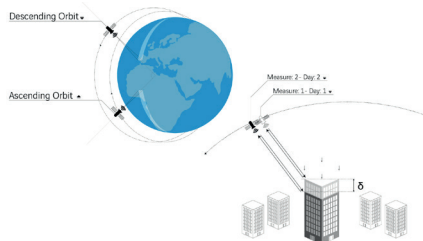
CONTACT US

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OPERATING PRINCIPLES



Radar interferometry is a Satellite remote sensing technique which is capable of measuring millimetric motion of terrain over wide areas.

Interferometric synthetic aperture radar (InSAR) involves the use of two or more synthetic aperture radar (SAR) images of the same area at different points in time to model changes in landscape topography and associated deformation patterns.

A SAR sensor transmits electromagnetic waves to the ground and collects its back-scattering signal. The solution can operate day and night in all-weather conditions.

When several measurements are compared the difference indicates ground deformation over time.

For any ground point, satellite time series enables the analysis of movements every few days during the monitoring period.

SPECIFICATIONS

- **Millimetric precision:** up to 1 mm/year and 2-3 mm precision on single measurement points
- **High density of measurement points:** typically more than 20,000 / sq. km in urban areas
- **High measurement frequency:** 3, 6 or 12 day intervals between acquisitions depending on satellite used
- **Quality processing chain** compatible with all satellites

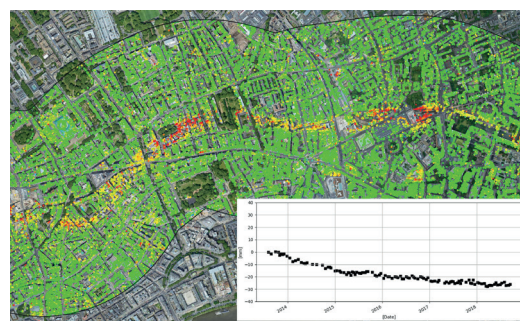
APPLICATIONS

All projects and assets which require geotechnical and structural risk management on large scale:

- **Transportation infrastructure:**
Tunnels, Railways, Motorways, Bridges, etc.
- **Hydraulic infrastructure:**
Dams, dykes, docks, canals, etc.
- **Buildings and historic monuments**
- **Mines and quarries**
- **Landslides**

ASSOCIATED TOOLS AND SERVICES

- **Historical studies:** retrospective detection of deformation
- **Monitoring:** Regular and flexible monitoring of ground and infrastructure movement during all project phases
- **On-demand monitoring:** update frequency adjusted to magnitude of motion and project needs
- **Advanced web platform:** simple user interface for a quick and easy interpretation of millions of measurement points
- **A unique competence** combining InSAR data and other ground based monitoring solutions



REFERENCES

EOLE La Défense, Paris, France
EOLE Tunnel Porte Maillot, Paris, France
Thames Tideway Tunnel, London, UK

Westconnex Stage 2, Sydney, Australia
Suburban Rail Loop, Melbourne, Australia
Crossrail, London, UK

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