

# **Introducing Geo–Sensing as the integration of Geodetic and Geotechnical deformation monitoring techniques to contribute on deformation modelling.**

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## **SUMMARY**

The value of a monitoring system is to provide reliable data on timely manner that will contribute to model deformations to support the authorities in their responsibility of preserving people's safety, engineering structures and the environment. Today by using high-precision sensors in automatic mode to control the daily behavior of points located on bridges, dams, buildings, landslides or subsidence area's it is possible to be warned early in advance of motions and deflections diverging from a normal state that could announce potential failures and to face the causes or at least to take actions that will mitigate the impact on the population. Monitoring systems using geodetic instrumentations will most of the time produce a feedback on possible movements from geometric point of view (position domain) and operate from outside while geotechnical sensors will be inside structures or below the ground level. The integration of the measurements from both sensors at the processing level will allow mutual checks and will definitively improve the parameters of the deformation model that is the basis of risk management. The necessary conditions to fulfill such innovative approach are time synchronization and collocation (offset's) which means to create a geometric relationships between the sensors in a common time frame. The contribution of a such new approach can also be seen in the reduction of sensors and the cost of the infrastructure (communication, power supply, maintenance, etc.) The Geo-Sensing is therefore a new approach that goes beyond the simple integration of sensors and even their collocation. Often underlined as a multi-disciplinary approach, the outcome of monitoring projects must be much more effective. Examples of Hydro Power Plants, Bridges and Tunnels projects will illustrate that paper.