

# GeoGuard: an innovative service to monitor the displacements of structures and ground, based on cost-effective GNSS sensors

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Forum topics	<input type="checkbox"/> Energy in 21st Century	<input type="checkbox"/> Cultural Heritage in Digital World
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	<input type="checkbox"/> Construction 4.0	<input type="checkbox"/> BIM Lifecycle, Facility & Asset Management

**Abstract:** (250 to 500 words: for each heading use the bullet points or narrative - the submission including graphics should not exceed one page)

Problems - Issues / Challenges-Needs	Precise and timely measurements of displacements for structure health monitoring and natural hazard monitoring and prediction are highly valuable data for engineers, infrastructure and civil protection managers. Aging and ground motion affect the health of structures such as bridges, dams, pipelines. GNSS technology allows for continuous and precise monitoring of structures and ground movements, but it is not widely adopted due to the high cost of the instrumentation based on geodetic-class GNSS products.
Solutions - Methods / Results - Findings	The GeoGuard monitoring service provides continuous monitoring with millimeter-level accuracy for daily/hourly solutions, by using cost-effective GNSS hardware. The whole system is designed, developed, produced and operated by GReD and Softeco. The GeoGuard weather-resistant units are deployed, operated and maintained by Softeco. GNSS data sensed by the GeoGuard units are continuously processed by means of positioning software and station network management software developed by GReD. Customers visualize the results by connecting to an online portal, showing the measured displacement data for each station.
Novelty - Value / Relevance to ...	The recent introduction on the market of cost-effective GNSS equipment allow to reduce the hardware cost by a factor of ten. Unlike traditional GNSS hardware vendors, GeoGuard provides an end-to-end service that includes all the activities and tools needed to effectively provide a continuous monitoring of the movements and deformations undergone by structures and/or the ground. As an additional service, GeoGuard can also provide time series of atmospheric water vapor estimated along the zenith direction from each GNSS antenna, which can be used to improve the forecast of local convective rain events, which in turn could trigger movements of the ground.
Forum statement	GeoGuard: an innovative service for the continuous monitoring of displacements of structures and ground by means of cost-effective GNSS sensors

**Keywords:** (up to 5 keywords)

Monitoring; GNSS; structures; landslides; sensors

**Graphics:** (please use the gray area below for *representative graphics* or *graphical summary*: select the gray area below and paste your graphics)

