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Integrated geomatic techniques for monitoring, study and control of a landslide in an urban area

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For the monitoring of a landslide interesting a wide area of the Assisi town (Umbria, central Italy) has been set up an integrated system based on geomatic techniques (GNSS, leveling). The landslide has a slow rate of movement and the damages to building and infrastructures are evidenced on a long term for an accumulation effect. Even if generally there is no immediate danger for the population, many buildings including public services have been seriously damaged during the years and have been consequently set out of service partially or totally. Moreover, possible breaks of infrastructures like water or gas pipelines involve a certain grade of hazard.
Drainage and consolidation works are under execution along the landslide body, aiming to reduce the slope movement rate, preventing or at least mitigating further damages.
The surface deformation monitoring system set up by the Perugia University (together with the Italian Research Council in the initial stage) operates since 1995. After more than 15 years of activity the landslide phenomenon has been deeply investigated and the relevant outputs (time series and the field of movements) are useful for a verification of the effectiveness of the interventions under work and the design of further actions.
The report presents the design concepts of the monitoring system, its evolution in time following the technologic improvement, and an analysis of the results.