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ABSTRACTS

Possibilities for buildings monitoring, using terrestrial radar interferometry

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Abstract

This paper describes the possibility of using a new technology - terrestrial radar interferometry - in order to determine more precisely the deformations and vibrations of building structures. Our attention was directed toward to estimate the horizontal displacements of tall buildings, especially in the upper part, and the vertical displacement of the superstructure of bridges under traffic.

The technology of terrestrial radar interferometry can be used to determine deformations with accuracy up to 0.01 mm in real time, capturing the oscillations of investigated objects with frequency bandwidth up to 200 Hz.

Deformation of several points on the object at different heights can be determined simultaneously, if it is a high building or at different distances (from the point of observation) if it is deck of a bridge, all of them from the distance and without destructive intervention on the monitored object.

The IBIS-FS radar interferometry system, produced by IDS GeoRadar, was used for measurement in the case of practical examples from this article.

We will briefly outline the measurement principle of this instrument and the criteria underlying the geometry setting for the optimal choice of the observation point.

The article presents several experiments of dynamic analysis of the displacements of characteristic points of constructions of the type mentioned above.