

Monitoring of slow ground deformation by satellite differential radar-interferometry. A reference case study.

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Abstract

Differential radar-interferometry satellite (D-InSAR) technique has been applied to a test site near Vauvert (France) to detect and monitor ground deformation. This site corresponds to the location of an industrial exploitation of underground salt using the solution mining technique. A subsidence phenomenon has been observed by ground based measurements. Despite unfavorable conditions for D-InSAR because of the vegetal cover, we show that, after dedicated filtering process, remote sensing radar observations provide valuable information which improves substantially our knowledge on the phenomenon. In particular, our study shows that the geometry of the subsidence bowl is different than what was previously thought using ground based techniques only. The size of the subsidence bowl (8 km) is larger than expected. This information will be useful for further modeling of the deformation and for a better implementation of the ground measurement networks. It also shows that radar interferometry can be used for the long term monitoring of such sites and for the anticipation of environmental issues.