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SAR Interferometry for monitoring land subsidence: Application to areas of underground earth resources mapping

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Abstract

Numerous studies carried out within the framework of natural hazards research programs have enabled to test the contribution of SAR remote sensing. The assessment of the interferometry possibilities with the first European Remote Sensing Satellite has been done for sites already known for their instability, involving landslides and subsidence.

Differential interferograms were generated using ERS RAW data recorded either during a 35 days or a 3-days cycle and combined with a DEM covering an underground coal mining in the south of France. The time series of results show good correlations (1) between the geographic location of fringes and the exploitation schedule of the coal deposit that has been mined on the dates the images were taken and (2) between the fringe patterns and the intensity of the local subsidence measured along the benchmark network. Therefore those results provide a good way for mapping evolutive surface deformations in a semi-industrial area and for testing the quality of theoretical models of subsidence.

Keywords:

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