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Comparison between GPS measurements and interferometry to control mining subsidence in the Catalan basin

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The purpose of the study is to apply SAR interferometry for the mining activity in the Catalan basin and compare the outcomes with high precision Global Position System (GPS) data, with the idea to verify the suitability of the system to control mining subsidence in a zone where potash is exploited by means of a room and pillar method in a depth between 500-1000 meters below the surface. The satellite images used are obtained by the Sentinel-1 and then processed by software, developed by the Polytechnic University of Catalonia, called SUBSIDENCE-GUI, which was created to control mining subsidence. On the other hand, UTM coordinates of 200 control points measured between 2014-2016 by GPS are gathered to compare the outcomes of the software. The procedure used is as follows: processing the images upward and downward separately. Subsequently, either the linear deformation velocity or the nonlinear is estimated, obtaining the overall deformation. The comparison between SAR and GPS results has been done in the three spatial directions, having the SAR technology a divergence in the control points within the accuracy of the GPS in all the directions.

Biography

Lluís Sanmiquel has completed his PhD from Polytechnic University of Catalonia (UPC). He is the Director of ICL Chair in Sustainable Mining, agreement between the UPC and the ICL mining company. He has published more than 15 papers in reputed journals and has carried out several projects and studies related to mining safety, surveying and GIS applied in mining.

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