Subsidence monitoring of an Iranian oil field inferred from SAR interferometry

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Abstract  Land subsidence is one of the most hazardous phenomena because its gradual occurrence due to compaction of natural deposits is so excessive. Human activities like hydrocarbon fluid withdrawal can also cause local subsidence and damage industrial structures. Traditional ground surveying can detect the change amount, but the limitations of benchmarks and operational costs necessitate application of modern techniques for change detection. Nowadays, SAR Interferometry (InSAR), an improved geodetic tool, is used for recording reservoir surface changes surveillance at the centimetre scale. The main purpose of this research is to study one of the hydrocarbon extraction sites in Iran which has noticeable subsidence, to determine its main cause. The observed deformation is highly compatible with the production data. This result indicates that the use of InSAR under normal conditions opens up wide applications in both research and industrial contexts.

Key words land subsidence; fluid withdrawal; production rate; InSAR