

SAR interferometry and its application to land subsidence monitoring in Xi'an, China

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Land subsidence, especially in city areas, is an environmental problem that should pay much attention to. Chinese Xi'an, a city located in the central-southern Guanzhong Downfaulted Basin, has occurred land subsidence in some areas within the city. This is mainly controlled by ground fracturing, as well as excessive extraction of underground water. All these influence the loose rocks with huge thickness and with good permeability, which in turn initiate land subsidence with the speed of a few centimeters per year.

SAR interferometry is a fast monitoring method using SAR imagery to study slight change of topography with its high ground resolution, which reaches to centimeter levels. This paper systematically study land subsidence of Xi'an from 1996 to 1998, utilizing ERS SAR data from a tandem pair combining with ground visiting.

Random interference in the SAR data is obviously due to the booming of the city, which accompanies with the construction of large number of buildings. Especially when the time interval of the used data within 1-2 years, the random interference will be much more serious, which will affect the interpretation results. This paper also discusses methods for denoising.