Monitoring land subsidence process in the urban area of Ho Chi Minh city, Vietnam using multi-temporal SAR Interferometry

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Land subsidence has become the most common hazard in urban area that could led to cracking buildings and infrastructures, extending the flooding area or even change the river path. Despite deriving precise information, conventional subsidence monitoring techniques are considered as costly, man-power consuming and lack of comprehensive information. Recently, SAR Interferometry (InSAR) has become a widely used geodetic technique for monitoring the deformation of the Earth's surface, especially methods based on the use of a multi-temporal dataset. In this study, we use a stack of 18 SAR images acquired from L-band PALSAR sensor onboard the ALOS satellite to derive the subsidence information of Ho Chi Minh city, Vietnam over the period of December 2006 to December 2010. The Stanford Method for Persistent Scatterers (StaMPS) Multi-Temporal Interferometry (MTI) approach is chosen to take advantages of both the persistent scatterers and the distributed scatterers, which could be used as monitoring points to measure the subsidence process. Assume the subsidence in this area mostly corresponds to vertical components, we found subsidence patterns along Saigon river and in the South of the city. Maximum subsidence rate reaches up to -66 mm/year in vertical direction. Finally, InSAR derived result and previous levelling data are taken into comparison to find the correlation between the two results.