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STUDY CASE OF LAND DISPLACEMENT MONITORING SERVICE BASED ON INTERFEROMETRIC SAR

Abstract

Human activities such as oil and gas extraction, ground water extraction, infrastructure load, construction, etc. cause severe land subsidence in urban environment. Especially, the rapid increases in population and industrialization in major cities are threatening human life. This phenomena is being recognized as new security threat. Therefore governments and commercial companies are also trying to implement a large scale consistent monitoring method for their administration. Several interferometric synthetic aperture radar(InSAR) techniques such as PSInSAR, DSInSAR, ComSAR, and SBAS were introduced for land displacement monitoring, however its complicated methodological framework and validation process make end users misunderstand the capability of InSAR technique. This paper shows case studies using InSAR technique by comparing up-to-date techniques and the pros and cons of each technique. Major purpose of this paper is to share the end users' feedback from practical use case and propose an effective approach in terms of actual service. Also, this paper discusses on the ripple effects and concerns of InSAR based land displacement technique in social way. Case studies from metro construction in Seoul, Korea, oil extraction site in Tengiz oil field, Kazakhstan, groundwater extraction in Lahore, Pakistan, and mining activities in Uzbekistan shall be discussed mainly. With those examples this paper concludes with the limitation of InSAR technique in terms of current monitoring scheme and the constraints of current small SAR satellites when it comes to process land displacement.