

Volume Data Images Optimalization in Permanent Scatterer Interferometric Synthetic Aperture Radar (PS-InSAR) Technique for Land Subsidence Estimation

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Abstract: Since the introduction of the persistent scatterer technique (PS-InSAR) in the early 1999, the applicability of radar interferometry has increased considerably. In this research, PS-InSAR technique is proposed to retrieve the volume change of long-term continuously land deformation. This technique is used to analyze subsidence in Bandung City, West Java-Indonesia by assessing 19 ALOS PALSAR images (Japanese L band spaceborne) during the periods of July 2007-February 2011. In this research, data volume images are optimized by reducing set data images with iterative PS-InSAR processing. This PS-InSAR processing chain based on a rigid quality assessment of the estimated parameter like minimum coherence (0.9) and PS density point (200), in order to get an optimum quality of light PS-InSAR (LPS-InSAR) concept technique. Moreover, a strict quality validation of PS-InSAR with other geodetic techniques such as DInSAR and GPS method. The result of validation has result such as $1,4 \pm 1,4$ cm/year (PS InSAR-DInSAR) and $1,6 \pm 0,7$ cm/year (PS-InSAR-GPS). For land subsidence velocity in Bandung City has result between $0,6 \pm 0,4$ cm/year and $2,1 \pm 1,2$ cm/year. This research shows a capability of data volume optimalization in PS-InSAR technique as basic concept of LPS-InSAR processing.

Keyword: DInSAR, Geodetic, GPS, Land Subsidence, PS InSAR.