DIFFERENTIAL INTERFEROMETRY SAR TECHNIQUE FOR DETECTING SURFACE DISPLACEMENT IN HILLY AREAS

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Abstract – This paper described the results using data from ALOS satellite for the purpose of detecting surface displacement in hilly areas of Semarang City using the two-pass differential interferometry synthetic aperture radar (DInSAR) technique. The data analyzed in this study is four ALOS PALSAR pairs from 2007-2008. 90-m SRTM DEM was used as an external elevation model. The results focus on hilly areas where slope hazard is potential happened. It has shown the displacement with 1 – 6cm/year but there are many noises on the results. To minimize the noise, the threshold has been limited 0.2 – 0.5 as a consequence, the possibility is areas where showed displacement could be diminished. Besides, the different angle of Line of Sight (LOS), orbit direction and the selection of pair data can influence the results either. To validate the area that is shown the displacement, we use map of potential landslide areas from The Agency of Tackling Disaster in Semarang Region because surface displacement in hilly areas is one of indications for landslide hazard. Based on results of SAR processing, the validation shows that there are 15 spot areas that indicate potential landslide hazards.

Keywords: surface displacement, insar, hilly areas, potential landslide