

MW 5.4 POHANG EARTHQUAKE ON 15 NOVEMBER 2017 OBSERVED BY SENTINEL-1A/B SAR INTERFEROMETRY

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ABSTRACT ... Co-seismic surface displacement caused by an Mw 5.4 earthquake occurred in the city of Pohang, South Korea, was mapped by interferometric SAR (InSAR) images obtained from Sentinel-1A/B satellites. The SAR sensors onboard Sentinel-1A/B operate in C-band (5.3 GHz) with 12-day repeat cycle. The interferometric image pairs were acquired in IW (interferometric wide-swath) mode, one in ascending and the other in descending mode. The data were all processed by a SNAP program distributed freely from European Space Agency (ESA). Coherence was maintained in this heavily vegetated/cultivated area because 1) the rice paddy has been harvested and the leaves of deciduous trees and bushes have been fallen in this late autumn, 2) the vegetation density of the mountains near the epicenter is very sparse due to recent wild fires, and 3) the temporal and spatial baselines of the image pair are very short. The observed displacement spans approximately 7 km in NW direction and 5 km in NE direction with a maximum displacement of 4 cm in the radar line of sight direction. The surface displacement map was interpreted together with a focal mechanism of the main shocks and the distribution of aftershocks. Three dimensional surface displacement map was calculated from the static slip distribution model by using both ascending and descending interferogram, which is in good agreement with the InSAR, seismic, and field data.

KEY WORDS: Pohang, Earthquake, InSAR, Sentinel-1, Slip

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