Coseismic deformation of the 2018 Lombok earthquake, Indonesia, revealed through InSAR measurements

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Interferometric Synthetic Aperture Radar (InSAR) is a space-based technique allowing to derive images of ground surface deformation. This method is based on repeated acquisitions by a Radar system onboard a satellite. We use Advanced Land Observing Satellite-2 (ALOS-2)/Phased Array-type L-band Synthetic Aperture Radar-2 (PALSAR-2) InSAR data sets from ascending stripmap mode and descending ScanSAR data. Meanwhile, we also use JAXA’ s AW3D DEM to correct for the topographic phase. These datasets allow us to more completely detect the deformation signal around the epicentral region caused by three Mw > 6 shallow earthquakes occurred in Lombok island, Indonesia. These events are of almost dominant thrust mechanism using GCMT solutions. The results show that the maximum amplitude of the line of sight (LOS) displacements are covering the mainshock of 35 cm in ascending and 30 cm in descending observations which is close to the epicenter of the earthquake. Both of which indicate that the surface was approaching toward the satellite. Because of ALOS-2 interferogram images are affected by ionospheric disturbances; therefore, we also perform ionospheric correction using split spectrum method (SSM), and the result shows that no signal of the ionosphere is detected there so that we can ignore the effect of the ionosphere. Meanwhile, to find slip distribution around the epicentral area, we plan to generate a fault source model using triangular dislocation element in an elastic halfspace.

Keywords: The 2018 Lombok earthquake , Coseismic deformation, InSAR

