

Crustal deformation related with the 2006 volcanic activity of Iwo-jima detected from PALSAR/InSAR

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Continuous subsidence had been observed at GPS station of Iwo-jima since 2003, but it turned to uplift from August of 2006. Furthermore an increase of seismic activity was also observed. To investigate crustal deformation in such Iwo-jima, urgent observations by ALOS/PALSAR were done based on a verification experiment for disaster mitigation. In this presentation, we introduce results obtained from interferometric analyses of these SAR data.

In this analysis, we used PALSAR data observed on 16 Jun. 2006, 1 Aug. 2006, 1 Nov. 2006, and 1 Feb. 2007 from ascending orbits. From the interferometric pair of June 16 and August 1, 2006; this period was before turning to uplift from subsidence, a remarkable crustal deformation was not obtained. From the interferometric pair of June 16 and Nov. 1, 2006, crustal deformation that the distance from the satellite to the earth surface (slant range) had extended was detected. It is consistent with subsidence pattern that has been continuously progressing. Around the southeast coast, crustal deformation pattern shortening a slant-range was obtained. It is corresponding to uplift or horizontal displacement toward the west. Since such crustal deformation pattern has not been observed when volcanic activity is calm, this may be related with an increase of volcanic activity. From the interferometric pair of 1 Nov. 2006 and 1 Feb. 2007, crustal deformation that a slant-range in central area relative to the south end had shortened more than 20 cm was detected. In December of 2006, further activation of uplift and seismic activity was observed, and this deformation pattern may be related with such volcanic activity.

We also analyzed PALSAR data observed on November 11 and December 27, 2006 from ascending orbits. From this interferometric pair, characteristic fringe pattern that extends from north to south appeared in the west coast area of Iwo-jima. This pattern shows that a slant-range of central area relative to the west coast area was shortened more than 10 cm. This deformation concentrates in a width of 1-2km, and a fringe step appeared along the Asodai Fault. Such step-like deformation may have been caused by a fault dislocation induced by inflation source located in a relatively deep area.