

Ground deformation associated with the volcanic activity of Kuchierabujima volcano revealed by InSAR

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Kuchierabujima volcano located to the south of Kyushu Island, southwest Japan is an active island volcano. The volcano has repeated magmato-phreatic or phreatic eruptions at a summit crater of Shindake or at a fissure on the east of the crater since 1841, before which no historic eruptions have been recorded. Although no eruptions have occurred after 1980, the increase of volcanic earthquake activities has been repeatedly observed. The hypocenters were located at a depth shallower than 500 m beneath the west and the southwest rim of Shindake crater (Iguchi et al, 2002). The GPS surveys (Iguchi et al., 2002) and the airborne survey of magnetic intensity (Utsugi et al., 2002) detected an anomalous region at a depth of about 1 km on the east of Shindake crater, interpreted as a shallow hydrothermal reservoir. Since 2004, the continuous GPS observation is made at four stations in this volcano, and the deformation indicating the inflation of summit region was observed at the observation site near the summit crater during the periods from January to June, 2005 and from September, 2006 to January, 2007, respectively (Saito and Iguchi, 2007). The ground deformation was accompanied by the increasing activity of volcanic earthquakes.

In this paper, ALOS/PALSAR image pairs are analyzed in order to detect the ground deformation of Kuchierabujima volcano associated with the inflation event observed during the period from September, 2006 to January, 2007. The resultant interferograms show a few centimeters of LOS distance decrease in the area near the summit crater, being consistent with the results of the GPS observations. The interferograms are in harmony with the simulated images in which the pressure source inferred from GPS survey data is assumed.

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