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Surface deformation of Kuchinoerabujima volcano revealed by PS-InSAR time-series analysis

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Kuchinoerabujima volcano is an active volcanic island located on the volcanic front of the Ryukyu island arc. Recent eruptive activities of Kuchinoerabujima volcano occurred at two active craters of Shindake and Furudake. Eruption was not observed for more than 30 years, however, seismic swarms were accompanied with radial outward pattern from the summit crater during January-June 2005, September 2006-January 2007, and September 2008-January 2009 (e.g., Saito and Iguchi, 2007). Ground displacements near the summit area of Shindake were also detected by interferometric SAR (InSAR) analysis using ALOS/PALSAR data (Yamamoto, 2009).

We report the result of an InSAR time-series analysis applied on data acquired over Kuchierabujima volcano. Persistent scatterer SAR interferometry (PS-InSAR) analysis using the StaMPS algorithm (Hooper et al., 2007) is applied to ALOS/PALSAR data. Both ascending and descending orbits, PS-InSAR analysis identified enough numbers of coherent pixels. The obtained line-of-sight (LOS) displacements showed rather complicated pattern compared with previous results. The obtained deformation near the summit area of Shindake was consistent with results of conventional InSAR and GPS. Also, it suggests another deformation source, which are not clearly accounted for previously.

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Keywords: PS-InSAR, time-series analysis, Kuchinoerabujima volcano, ground deformation, ALOS/PALSAR