

STT057-05

Room:105

Time:May 24 11:45-12:00

Ground deformation in and around Sakurajima volcano revealed by ALOS/PALSAR data

Keigo Yamamoto^{1*}

¹DPRI, Kyoto university

Sakurajima volcano is an andesitic stratovolcano located in southern Kyushu, Japan. The current eruptive activity at the summit crater began in 1955. While the activity has been gradually decayed after the 1990s, the eruptive activity at the Showa crater on the eastern slope of the volcano started in June 2006 and this activity has increased in recent years. Repeated precise leveling surveys have been conducted in and around Sakurajima volcano since 1957 (Yoshikawa, 1961; Eto et al., 1997). The results indicated that the ground subsidence around the northern and the central parts of Sakurajima continued due to the pressure decrease at the magma reservoirs associated with the intense eruptive activity since 1973. It was found that the ground around the northern part of Sakurajima was turned to the uplift when the eruptive activity was gradually decayed after the 1990s (Eto et al., 1997). The recent precise leveling surveys were conducted in October - December 2007 (Yamamoto et al, 2008), in November 2009 and in April 2010 (Yamamoto et al., 2010) and in November 2010. The obtained survey data indicated that the ground uplifts around the northern part of Sakurajima continued during the period from 1996 to 2010.

The recent InSAR technique allows us to detect nearly continuous deformation image which covers the whole target area. We analyzed the ALOS/PALSAR image pairs, in order to detect the ground deformation associated with the volcanic activity of Sakurajima volcano. In this paper, the results of the InSAR analysis by using the ALOS/PALSAR data are shown to discuss the recent ground deformation of this volcano.

A few centimeters of LOS distance decrease are detected at the northern part of Sakurajima in the resultant interferograms during the period from 2007 to 2010. The quasi-upward components calculated by the 2.5-D deformation analysis (Fujiwara et al., 2000) are consistent with the ground uplifts measured by the leveling surveys conducted in Oct.-Dec., 2007, Nov., 2009 and Apr., 2010. From the analysis according to Mogi's model by using the InSAR results, the inflation source is located beneath the northern flank of the volcano. The resultant interferograms also show a few centimeters of LOS distance increase at the eastern and the southern parts of Sakurajima, which may be related to the ground subsidence around the areas of relatively new lava flows.

Acknowledgements: We thank JAXA SIGMA-SAR software to generate our interferograms (M. Shimada, 1999). PALSAR level 1.0 data are shared among PIXEL (PALSAR Interferometry Consortium to Study our Evolving Land surface), and provided from JAXA under a cooperative research contract with ERI, Univ, Tokyo. The ownership of PALSAR data belongs to METI (Ministry of Economy, Trade and Industry) and JAXA. This study was supported by the Earthquake Research Institute cooperative research program.

Keywords: Sakurajima volcano, ground deformation, InSAR