[JJ] Evening Poster | S (Solid Earth Sciences) | S-VC Volcanology

[S-VC41]Active Volcanism

convener:Yuta Maeda(Nagoya University), Takahiro Miwa(National research institute for earth science and disaster prevention), Yosuke Aoki(東京大学地震研究所, 共同), Takeshi Nishimura(Department of Geophysics, Graduate School of Science, Tohoku University)
Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
This session discusses various aspects of active volcanisms including, but not limited to, recent and historical eruptions, various phenomena associated with the volcanic activities, underground structures of the volcanoes, and developments of new instruments based on geophysical, geochemical, geological, and multidiscipline approaches. We also welcome studies on understanding and predicting the transitions of the eruptive activities from observational, theoretical, and experimental approaches.

[SVC41-P37]Long period pulses preceding the explosive eruption of Aso Volcano in October, 2016 part2

*Kyoji Tani[1], Takahiro Ohkura[2], Mare Yamamoto[4], Keiko Kuge[3] (1.Kyoto University, 2.Aso Volcanological Laboratory, Graduate School of Science, Kyoto University, 3.Department of Geophysics, Graduate School of Science, Kyoto University, 4.Research Center for Prediction of Earthquakes and Volcanic Eruptions, Graduate School of Science, Tohoku University)
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At 01:46 on October 8, 2016, an explosive eruption occurred at the Nakadake first crater of Aso Volcano. The type is considered as a phreatomagmatic eruption(JMA,2016).

Two seismic pulses called long period pulses(LPPs) were observed 6 and 2 minutes before the eruption, which we hereinafter call LPP1 and LPP2, respectively.

In this work, by mainly analyzing the broadband seismograms, we examined the source mechanism of the LPPs, which can provide information on the preparatory process of the explosive eruption.

We used broadband seismic data at eight stations around the Nakadake first crater. The distances from the crater range between 0.3 and 2.3km. We also used tilt data at a station.

By using the particle motions recorded at the seismic stations, we estimated the sources of the two LPPs to be located about 100m from the LPP source determined by Kawakatsu et al. (2000). Within the error ranges, the source regions are considered to be the same. Compared with the location of the crack-like conduit beneath the crater (Yamamoto et al.,1999), the LPP sources are located in or close to the crack.

In the Fourier spectra from the two LPPs, we observed some peaks corresponding to the crack resonance.

The spatial variation in ovserved LPP amplitude is very similar to that of long period tremor(LPT) which was shown by Yamamoto et al. (1999). Thus, a resonance of the crack-like conduit is likely to cause the LPPs in a similar manner to LPT. Moreover, Legrand et al. (2000) showed that the moment tensors of LPT and LPPs are similar.

At the times of LPP1 and LPP2, static tilt changes were also observed at Hondo, which is located 800m southwest of the crater). The changes associated with LPP1 and LPP2 were 0.012μrad upward to the N15°W direction and 0.026μrad upward to N49°W direction, respectively. The directions are not toward the crater. The tilt changes can not be explained solely by a spherical pressure source beneath the crater. For an open crack of Yamamoto et al. (1999) beneath the crater, the displacements calculated on the formulation of Okada et al. (1992), indicate that the tilt at Hondo is to the W10°S direction, which does not agree with the observations. However, we found that the observations appear to be explained by summing the tilt changes predicted from the open crack and spherical source. Both may have occured.