

The sixth round of the repetitive seismic experiment in Sakurajima Volcano, Japan. The experiment 2014.

TSUTSUI, Tomoki^{1*}; IGUCHI, Masato²; NAKAMICHI, Haruhisa²; TAMEGURI, Takeshi²; IKEDA, Keiji³; OSHIMA, Hiromitsu⁴; YAMAMOTO, Mare⁵; NOGAMI, Kenji⁶; OHMINATO, Takao⁷; KOYAMA, Takao⁷; MAEDA, Yuta⁸; OHKURA, Takahiro²; SHIMIZU, Hiroshi⁹; YAKIWARA, Hiroshi¹⁰; KOBAYASHI, Reiji¹⁰; MAEKAWA, Tokumitsu⁴; HIRAHARA, Satoshi⁵; WATANABE, Atsushi⁷; HORIKAWA, Shinichiro⁸; MATSUHIRO, Kenjiro⁸; YOSHIKAWA, Shin²; SONODA, Tadaomi²; SEKI, Kenjiro²; HIRANO, Shuichiro¹⁰; HIRAMATSU, Hideyuki³; TORIYAMA, Naofumi³; KONO, Taisuke³

¹Akita University, ²Kyoto University, ³Japan Meteorological Agency, ⁴Hokkaido University, ⁵Tohoku University, ⁶Tokyo Institute of Technology, ⁷University of Tokyo, ⁸Nagoya University, ⁹Kyushu University, ¹⁰Kagoshima University

The sixth round of the repetitive seismic reflection experiment is presented, whose purpose is detection of structural evolution associated with underground magma movement in Sakurajima Volcano.

Seismic experiments have been performed every December since 2009 with same field design in the same geometry in the northern part of Sakurajima. Two major lines are routinely included in these experiments and comprised with 14 shot points and 225 stations every year. Total stations vary depends on state of the year. Uniform instruments, LS-8200SD by Hakusan Industry and Vertical motion 4.5Hz sensor, and 20kg size chemical explosions are used. 263 stations were deployed in this round, 2014.

In addition to the routine style observation, another type charge, slurry explosive, was tested and accelerations were measured for all shots. These experiment and observations were performed at the shot point KOME, S07. Four accelerationmeter were deployed ranging 10 to 70m. The nearest station was the force-balancing type triaxial accelerometer, model TSA-100 by Metrozet, which installed at c.a. 10m from the shot holes. Other three station were the verdumping type triaxial accelerometer, model JEP-6A3 by Akashi Mitsutoyo, which wereinstalled at 30m and at adjacent of routine stations. Accelerogram were recorded by the recorders, SC-ADL1000 or SC-ADH10KP, at each station. In order to compare seismograms along the lines, 20kg of slurry explosives were detonated at 15m from the dymanait shot.

The detonation for the sixth round experiment was done on the night 4th December 2014, and that for an additional line was the afternoon of 3rd December. 98.5% of all stations were completed schedule and seimograms upto 17Gbytes were obtained through the experiment. Data suggest that reflectivity under northeast part of Sakurajima have recovered as the same level as an average during 2009 to 2011.

On the slurry shot, 80% of peak acceleration was obserbed in near field and its waveform differs less significantly than that by dynamite. Because RMS amplitudes were the same in the routine stations with those from dynamite, it is possible to use slurry explosives sustainably as alternative of dynamite in our experiment.

This study was supported by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan, under its Earthquake and Volcano Hazards Observation and Research Program, also supported by Japan meteorological Agency and DPRI, Kyoto University. The instruments for routine experiment are provided by Earthquake Research Institute, University of Tokyo. The sensors and recorders were provided by Prof. Tomotaka Iwata, Kyoto University and SCIMOLEX co. The field operation was supported by Kagoshima Meteorological office, JMA.

Keywords: Sakurajima Volcano, Repetitive seismic experiment, Reflection seismology, Structure evolution, Volcanic structure, Magma