**Japan Geoscience Union Meeting 2011**
(May 22-27 2011 at Makuhari, Chiba, Japan)
**©2011. Japan Geoscience Union. All Rights Reserved.**

SVC050-P14 Room:Convention Hall Time:May 23 16:15-18:45

# Crustal structure of Sakurajima Volcano and Aira Caldera from receiver function analysis

Takahiro Ohkura[1*], Yuki Abe[1], Takuo Shibutani[2], Masato Iguchi[2], Kazuro Hirahara[1], Takeshi Tameguri[2], Tadaomi Sonoda[2]

[1]Graduate school of Science, Kyoto Univ., [2]DPRI,Kyoto Univ.

SSakurajima volcano, located at the southern rim of the Aira caldera approximately 20 km in diameter, is well known to be one of the most active volcanoes in Japan. As a result of precise leveling surveys and GPS observation from 1995 to 2010, in the caldera, it was found that an inflation source is located at depths of about 10 km beneath the Aira caldera and the volume of the source increased by 0.1 kmˆ3 in the period. Although this source is considered to be a magma chamber, the total volume of the chamber is unknown. Therefore, in order to determine the crustal structure of the Aira caldera and to estimate a total amount of magma accumulated beneath the caldera, we investigated seismic velocity structure of Sakurajima volcano and Aira caldera by a receiver function (RF) analysis.

A RF is calculated by deconvolving vertical component of a waveform of a teleseismic P-wave from its horizontal component. We used more than 3000 waveforms from 500 teleseismic events (epicentral distance: 30-90 deg, magnitude greater than 5.5) to estimate RFs, observed at Hi-net , J-array and seismic stations established by Sakurajima Volcanological Observatory, DPRI, Kyoto University. We extracted vertical and radial components of a teleseismic P-wave between 35 seconds before and 90 seconds after the onset, and vertical components of noise for 125 seconds before the onset. We cut off frequency content higher than 0.56 Hz with a Gaussian high-cut filter and applied an extended-time multitaper (Shibutani et al., 2008) to compute RFs.

Then, we constructed images with RFs migrated to the depth domain with a velocity model JMA2001 and projected on a cross section along WNW-ESE direction. Beneath the caldera, two phases with positive polarity were observed, corresponding to discontinuity with upward decreasing seismic velocity, at depths of 20km and 40km. This suggest the existence of a low velocity layer beneath the caldera like in the Aso caldera ( Abe et al. 2010 JVGR).

In order to get the detailed seismic velocity structure beneath the Aira caldera, we used a genetic algorithm (GA) inversion for the obtained RFs. For the GA inversion, we stacked RFs for each station according to back-azimuth. As a result of inversion, a low velocity layer (VS =2.8 km/s, 15-20 km in depth) was found in the north western part of the caldera. However, no low velocity layer could be found at the eastern rim of the caldera.

We thank the National Research Institute for Earth Science and Disaster Prevention, Kagoshima University, Kyushu University, and the Japan Meteorological Agency for seismic waveform data.