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# Seismic Observation in Aso caldera

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Aso caldera is located in the area with a large amount of crustal strain rate in the Kyushu district. Horizontal crustal strain in Kyushu district derived from continuos GPS measurements (GEONET) shows E-W contraction with amount of $5 * 10^{-6}$ from Jan. 1999 to Jan 2008 in and around Aso caldera.
Sudo et al. (2006) and Ohkura et al. (2009) detected a deflation source at a depth of about 6 km below the central cones of the volcano based on leveling survey data. The seismic velocity structure shallower than 10 km beneath Aso Caldera has been estimated with seismic tomography by Sudo and Kong (2001), and they detected a low velocity spherical zone at about the same region as the deflation source. Therefore, it is possible that the low seismic velocity sphere is a magma chamber.
Geographical Survey Institute (2004), as a result of GPS measurements in and around Aso caldera, suggested that a sill-like dilatation source is located beneath Aso Caldera at a depth of 15.5 km and its dilatation caused crustal deformation in the middle of 2003. Ohkura and Oikawa (2008) observed ground deformation in Aso Caldera with GPS stations established by AVL Kyoto Univ., and revealed that the sill-like source has been compressing since 2004. Deflation at both of the sources account for E-W contraction with amount of $5 * 10^{-6}$(Ohkura and Oikawa,2008).
Beneath the sill-like source, deep low frequency earthquakes are located, suggesting fluid movements at the depth. Abe et al.(2009) estimated RFs with teleseismic waves observed in the central part of the Kyushu district, southwest Japan, and projected depth domain receiver functions (RFs) on two sections across Aso Caldera. S-wave velocity structure beneath Aso caldera was inferred from time domain RFs with a genetic algorithm (GA) inversion.
They detected a large low S-wave velocity region in the middle portion of the crust beneath the western part of Aso Caldera. This low Vs region exists almost at the same depth as a sill like deformation source and hypocenters of DLFEs.
However, they exist beneath the eastern region of Aso Caldera, out of the analyzed area in Abe et al. (2009).
Therefore, we have started seismic observation in the eastern part of Aso caldera.
We installed five stations in the eastern part of Aso caldera in July, 2009. All stations are equipped with a 3-component seismometer with a natural period of 1 second (Sercel L-4C-3D) and a newly developed data logger ( Kinkei System EDR-X7000). Ground motion data are stored in CF card continuously with a 18 bit of resolution and a sampling rate of 250Hz.
These five stations are distributed surroundings the area where a sill like deformation source and hypocenters of DLFEs are located so that rays from teleseismic events path through the middle portions of crust in the area.
Using the data at these stations, we can infer the velocity structure beneath the eastern part of Aso caldera with a GA inversion for RFs with teleseismic waves and detect the distribution of fluid beneath the eastern part of Aso caldera. These results would contribute a better understanding of a relation between volume change of volcanic fluid and strain accumulation process at active faults around the volcano.

Keywords: Aso Volcano, Caldera, crustal structure, receiver function