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

[S-VC41]Active Volcanism

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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-P01]The Estimation of the Deformation Sources Beneath Meakandake and Oakandake Volcanoes in Hokkaido, Japan -Trial of Finite Element Method-

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Keywords:Meakandake, Oakandake, crustal deformation, GNSS, ALOS-2, FEM

Meakandake volcano is located in Hokkaido and one of active volcanoes where Japan Meteorological Agency (JMA) observes its volcanic activities continuously. The data of continuous GNSS stations and ALOS-2 indicated the inflation of Meakandake volcano and its eastern area ranging from October 2016 to May 2017. The local inflation atop Oakandake volcano was also detected by ALOS-2 data that suggests the source depth can be shallow.

The small-scale inflation of Meakandake volcano and its eastern area has still been observed since May 2017, thus understanding the volcanic activity beneath the volcano is important for disaster mitigation. The possible shallow source of Oakandake volcano and its activity can be concerns of nearby communities. However, since continuous GNSS observation is not carried on Oakandake volcano, it is difficult to monitor the deformation every day. Therefore, we believe the estimation of the source will help to understand the volcanic activity of Oakandake volcano.

In this study, we estimated the deformation sources of Meakandake and Oakandake volcanoes by analyzing the data of continuous GNSS observations and ALOS-2 spanning from October 2016 to May 2017. Firstly, we assumed the opening of sill for the inflation source of Meakandake volcano and its eastern area and calculated best-fit parameters of the model using MCMC method. On the other hand, analytical models that require a deep source to calculate displacements cannot be good models in terms of a shallow source. Thus we adopted finite element method to estimate a shallow source beneath Oakandake volcano using a software “GSIFEM” that we have been developing since 2016. GSIFEM makes a mesh of a target area including a model to be assumed and calculates the displacements at each site. Finally, we estimated the deformation sources were located in the eastern area of Meakandake volcano and beneath Oakandake volcano, respectively.
We report the results of the estimations and the outline of GSIFEM.