

## Feasibility study on active monitoring of volcanic activity by using artificial source

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Quantitative monitoring of magma transport process is essentially important for the prediction of volcanic eruptions. We aim for the implementation of the active monitoring to detect the volcanic activity within the volcanic body. The advantage of using active sources, such as ACORSS, is that the source function is known in advance with much more accuracy than natural seismic source. Since we can know accurate source function, the transfer functions between the source and the receivers are easily obtained by deconvolution process. To monitor the temporal change of structure, we need to know the change in the transfer function. The problem is how well we can interpret the change in transfer functions as a change in the structure. In this study, we assumed to put an artificial source and some seismometers around the volcanic vent on the surface of volcano. We check the sensitivity of structure change on the transfer functions by means of numerical simulation.

We calculate the change of transfer function in the frequency range of 1 to 10 Hz with finite different method when the magma elevates in the volcanic vent at the center of the computational domain. We put 16 seismometers around a volcanic vent and calculate the sensitivity of structure changes in the vent. We verified whether the change in the volcanic vent could be identified using inversion of the change in the transfer functions. As a result, although some errors were observed, it is possible to detect the change in the vent by using our method. The inversion for using lower frequency (1 to 5Hz) can better reconstruct the structure change than higher frequency probably because of the limitation of the linear inversion scheme we used.