

Attempt of detection of volcano-geomagnetic changes using repeated aeromagnetic observation (2)

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It is widely recognized that the magnetic field observation is effective as the method to monitor the activity of the volcano. By observing the volcano-magnetic change (geomagnetic field change associated with the volcanic activity due to thermal demagnetization), subsurface thermal condition can be presumed.

However, to observe such a field change, geomagnetic observation site have to be installed just near the active area of volcano. So, the spatial distribution of observation sites becomes very limited one.

Recently, aeromagnetic survey is attracting attention as a method for obtaining a detailed spatial distribution of volcano-magnetic change. Aeromagnetic survey has high spatial resolution. But their temporal resolution is typically low because of the spatial aliasing problem. To detect the geomagnetic change using the repeated aeromagnetic data, we have to pay attention to the way of extracting the true field change.

For this purpose, we proposed a new mode of analysis (Utsugi, 2008). This method is based on the equivalent anomaly method (Nakatuska et al., 2006). This method is originally used to obtain upward or downward continuation of geomagnetic anomaly obtained by aeromagnetic survey. We applied this method to extract temporally changes. In our method, we introduce two types of equivalent anomalies. One is to express the geomagnetic anomalies produced by the crustal magnetized rock. The other is to express the temporal changes. Using all data obtained by two or more times aeromagnetic survey, we calculate these equivalent anomalies simultaneously. Using this method, the effect of spatial alias produced by the difference of flight track of each survey will be reduced.

In this study, we will introduces the result of applying this method to some data which obtained by repeated aeromagnetic survey.