The Preliminary Study on Electrical Conductivity under Tatun Volcanoes by Using Fluxgate Magnetic Data

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Abstract

There is still volcano activities exist under Tatun volcanoes, which is in the vicinity of Taipei, a densely populated area. Due to the potential hazard that could happen at the area, monitoring of the volcano activity and the exploration of the underground structure is an important subject to the area. In Taiwan, the studies that used geomagnetic data to explore the magnetic susceptibility structure are all done by using total filed geomagnetic data. In this study, we used 3-components magnetic data and through the magnetic transfer function, we obtained the relationship between the vertical component (Z) and horizontal components (X, Y). And we used the relationship to calculate the distribution of Parkinson vectors at three stations in different depth.

In this study, we used the data recorded by the magnetometer that we installed in May 2014 and the magnetometer at Tatun volcano observatory to calculate the distribution of Parkinson vectors at three different stations. After combining the separated results together, we were able to detect the location of high conductivity area. In the result of 6 km deep, the Parkinson vectors focused area is located beneath Hsiaoyoukeng area; at the depth of 7 km, the Parkinson vectors are focus beneath the east part of ZHU station; The result of 8 km deep shows that the location of high conductivity area is located beneath Tayiokeng area; In the result of 9 and 10 km deep, there are both one obvious focused area exists in the center of the study area. Compare ours and the one whcih have been done by the others, the results are similar and we speculate that the high conductivity area is related to the hydrothermal activity under Tatun volcanoes.

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