

地球統計学的手法に基づく, VLF-MT による表層比抵抗の
分布特性の把握～台湾北部・大屯火山群を例に

小森省吾^{*1}、鍵山恒臣^{*2}、Benjamin Fong Chao^{*3}

(*1 産業技術総合研究所, *2 京都大学, *3 中央研究院(台湾))

Geostatistical approach to obtain features of surface resistivity distribution using VLF-MT beneath
Tatun Volcano Group, northern Taiwan

Shogo Komori^{*1}, Tsuneomi Kagiya^{*2}, Benjamin Fong Chao^{*3}

(*1 GSI, AIST, *2 Kyoto Univ., *3 Academia Sinica(Taiwan))

Abstract

VLF-MT is one of electromagnetic methods to reveal a resistivity feature beneath the earth surface. It uses an electromagnetic wave with a singular frequency such as 22.1 KHz, showing the feature of shallow subsurface. Its high simplicity of use enables a huge numbers of horizontally-extensive measurements at low cost. However, it is quite often that there are many missing data points, mainly due to inaccessibility and high-level noises. Consequently, a sparse distribution of surface resistivity is obtained, which might lead to lesser resolution for an extraction of spatial features beneath survey areas. “Geostatistics” is possibly a good tool to solve the above problem. It was theoretically developed by Krige (1951) to evaluate a quality of mines. To date, it has been widely used for explorations of oils and geothermal/groundwater resources, by applying to data such as temperature, crack density, porosity, permeability, and chemical composition. Because this method is mathematically based on “statistics”, it enables a fair inference with regard to a spatial property of the obtained data. The present study examined a feasibility of the Geostatistics for ~ 300 resistivity data of VLF-MT obtained in Tatun Volcano Group, northern Taiwan (e.g., Komori et al., 2014). The numerical code “GSLIB” (Deutsch and Journel, 1998) was used for our geostatic works. The data were first processed to make experimental semivariograms, and the obtained variograms were used for an inference of values of the nugget, sill, and ranges, on the basis of the criteria put by Kitanidis (1997). In the presentation, we showed preliminary products obtained by the above processes.

References

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