

Modeling of Radial Dikes by Topographical Analysis using GIS for Quaternary Volcanoes

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One of the technical issues related to volcanic and igneous activities is the sophistication of technology for grasping the range of influence of magma. To address this issue, it is important to accumulate survey cases, especially when the dike develops over a radius of 15 km from the center of the Quaternary volcano, but it lies beneath the existing volcanic body. It is practically difficult to grasp the distribution of the conduits and the dikes derived from them. Therefore, the purpose of this study was to develop a method for estimating the distribution range of dikes distributed under the Quaternary volcanic body based on topographical data such as digital elevation models. In this study, we used digital maps and GIS software to target six volcanoes, such as stratovolcanoes and calderas. The parameters were measured, and modeling of the three-dimensional distribution range of radial dikes was examined from each parameter for each altitude. As a result, the transition of the center of gravity position for each altitude suggests the transition of the center of activity in the process of forming the volcanic body to some extent, and it is possible to extract not only the activity of the central crater but also the activity of lateral volcanoes. This suggests the possibility of quantitative evaluation of the transition and stability of the conduit even in volcanoes whose activity history is not clear by applying this method.

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