低高度磁気データから推定した十勝岳の3次元磁化構造

High resolution three-dimensional magnetization mapping in Tokachidake Volcano using low altitude airborne magnetic survey data

*岩田 光義[1]、茂木 透[1]、大熊 茂雄[2]、中塚 正[2]
*mitsuyoshi iwata[1], Toru Mogi[1], Shigeo Okuma[2], Tadashi Nakatsuka[2]

1.北海道大学　大学院　理学研究院　附属地震火山研究観測センター、2.独立行政法人産業技術総合研究所　地質情報研究部門
1.Institue of Seismology and Volcanology, Faculty of Science, Hokkaido University, 2.Gological Survey of Japan, AIST

Tokachidake Volcano, central Hokkaido erupted in 1926, 1962 and 1988-1989 from the central part, in the 20th century. In recent years, the volcano is getting active at the 62-2 crater and the Taisho crater. A low altitude airborne magnetic survey was conducted in 2014 mainly over the active area of the volcano by the Ministry of Land, Infrastructure, Transport and Tourism to manage land slide risk in the volcano. We have re-analyzed the aeromagnetic data to delineate three-dimensional magnetic structure of the volcano.

The survey was flown at an altitude of 60 m above ground by a helicopter with a Cesium magnetometer in the towed-bird 30m below the helicopter. The low altitude survey enables us to delineate the detailed magnetic structure. We calculated magnetic anomaly distribution on a smooth surface assuming equivalent anomalies below the observation surface. Then the 3D magnetic imaging method (Nakatsuka and Okuma, 2014) was applied to the magnetic anomalies to reveal the three-dimensional magnetic structure. In this analysis, the magnetic structure with a thickness of 3,000 m was assumed as the initial model. As a result, magnetization highs were seen beneath the Ground crater and other craters around the summit of Tokachidake (62-2 crater, Ground crater, Nokogiridake crater, Suribachi crater and Kitamuki crater). This implies that magmatic activity occurred in the past at these craters. These magma should have already solidified and acquired strong magnetization. Relative magnetization lows were seen directly under the 62-2 crater and beneath the Ansei crater. This implies that these areas are still hot since the magma activity continues.

As described above, the distribution of magnetization can help us to better understand the subsurface structure of Tokachidake Volcano. However, its intensity seems to be more or less low overall compared to previous rock magnetic studies (i.e. Uesawa, 2008). This disagreement might be improved by more appropriate assumptions especially about the thickness of the magnetic model. This point should be further studied in detail.

Acknowledgement

We would like to thank the Asahikawa Development and Construction Department, Ministry of Land, Infrastructure, Transport and Tourism for providing the airborne magnetic survey data of Tokachidake Volcano.

キーワード：十勝岳、磁気異常、空中磁気探査
Keywords: Tokachidake, magnetic anomaly, aeromagnetic survey

