Field verification about the volcanic craters found by analyzed using LIDAR and RRIM in the Hachimantai area

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1. Introduction

In the Sengan geothermal area, between Iwate and Akita prefecture, four active volcanoes are located which are Iwate, Akita-komagatake, Akita-yakeyama and Hachimantai Volcano. The investigation of the Hachimantai Volcano, as an active one, has been started after recent study (Wachi et al. 2002). In that study, it was clarified that the craters of the Pond Hachiman and Pond Gama around the gentle peak of the Hachimantai Volcano were formed by the volcanic activity about 6,000yBP, in comparison to the Kikai-Akahoya tephra.

2. Analysis using LIDAR and RRIM

The Hachimantai area was well-known as a major landslide area in Japan. Since it has been occurred phreatic eruption related to landslide similar to the Sumikawa Landslide in the past, it is necessary to understand more detail its topography. Except for well-known some large craters, small explosive craters might be existed near the trail in deep bush.

In order to solve their problems at the Hachimantai area, we surveyed detail topography using LIDAR (LIght Detection And Ranging) with 1m-grid-DEM without tree effects. The DEM data was translated into RRIM (Red Relief Image Map; Patent pending) to examine the microtopography. RRIM revealed the fact as follows, 1) over nine small craters between Mikaeri Pass and Pond Gama and Pond Megane, 2) possible craters about seven or eight at eastern side of Gozaisyo Hot Spring nearby ex-Matsuo Mine (Chiba et al, 2004).

3. Field survey

We carried out in the two areas about topographical and geological field survey after snow melted. In the peak of the Hachimantai Volcano, elliptical craters without water in-flow and flow out were confirmed at the four points. We found thirteen craters. On the other hand, in the Gozaisyo area, we found sixteen craters, including some indistinct ones. We concluded that these craters could be categorized as volcanic ones by topographical characteristics, although eruptive sediments could not found. In the Gozaisyo craters, temperature zones, spring including hydrogen sulfide gas and limonite forming were observed.

4. Summary

RRIM using LIDAR altimetry data in the Hachimantai area led discovery of these new craters. It could be confirmed the high possibility that were not only landslide-forming but also volcanic craters. It is important to study the crater forming age and eruptives in the future.

This paper is a part of the report from investigation of the history at the Hachimantai Volcano, Iwate Office of River and National Highway, Tohoku Regional Bureau, Ministry of Land, Infrastructure and Transport.

Reference

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