Eruption age determination of the latest lava flows at Yokodake Volcano, Japan, using paleomagnetic methods

*Hiroya Nitta[1], Takeshi Saito[2]

1. Graduate School of Science and Technology, Shinshu University, 2. Institute of Science, Academic Assembly School of Science and Technology, Shinshu University

Yokodake volcano, which consist of the nine lava flows (Y1-Y9) and accompanied pyroclastic materials, is only active volcano belonging to northern Yatsugatake volcanoes in central Japan. Eruption ages of Y1-Y8 lava were not determined. Although the latest eruption of Y9 lava had been estimated using ^{14}C dating (Okuno, 1995; Okuno and Kobayashi, 2010), room exists for improvement in precision of the age determination. In this study, we carried out eruption age determination of the Y8 and Y9 lava flows using paleomagnetic methods.
Thirty-two and sixty paleomagnetic samples were collected from Y8 and Y9 lava flow, respectively. We determined the components of remanent magnetization from PThD experiments. Paleointensities were estimated by using IZZI method (Yu and Tauxe, 2005).
As a result, mean direction of magnetic components obtained from Y8 and Y9 lava, is Dec=4.5˚, Inc=50.7˚ (α95=4.1˚) and Dec=4.7˚, Inc=51.8˚ (α95=2.2˚), respectively. Paleointensity of Y8 and Y9 lava is estimated to be 48.4±2.1 μT and 52.4±4.3 μT, respectively. Palaeomagnetic age was estimated by comparing our results with paleosecular variations of the geomagnetic field (Hayashida et al., 2007; Hatakeyama et al., in prep.). Paleomagnetic age of Y8 and Y9 lava is estimated to be ca 3.5 ka, and ca 0.6 and 2.4 ka, respectively. As for Y9 lava, these two ages are consistent with ^{14}C age of previous studies. Although lava morphology and vegetation on the lava suggests younger eruption age, further study using alternative dating will be needed to determine the eruption age of Y9 lava.
In addition, we measured declination in situ with sun compass. Calculated declinations are quite different with declination of the IGRF-12 or Geospatial Information Authority of Japan. It is reconfirmed that measurement of declination using sun compass is quite important for paleomagnetic sampling with magnetic compass, if NRM intensity is very high.

Keywords: Yokodake, Latest lava, paleomagnetical age estimate

