

Searching a paleomagnetic record of the Laschamp excursion in the Hikageyama lava of the Sanbe volcano

Hiroto Nishiyama^{1*}, Akira Hayashida², Yoshihiro Sawada³, Tohru Danhara⁴, Shigenori Kawano⁵

¹Sci. Environ. Math. Model., Grad. Sci.&Engi., Doshisha Univ., ²Dept. Environ. Sys. Sci., Doshisha Univ., ³Shimane University, ⁴Kyoto Fission Track Ltd., ⁵Shimane Nature Museum of Mt.Sanbe

The Laschamp excursion is one of the best-known geomagnetic excursions in the late Brunhes chron, which was first recognized in lavas from the French Massif Central. According to recent radiometric dating of the lava flows and stratigraphic correlations of the Atlantic sediments with the Greenland ice cores, the Laschamp excursion is dated at about 41 ka and assigned with the interstadial 10. Among widespread tephra deposits in Southwest Japan, the Sanbe-Ikeda (SI) volcanic ash layer is dated at 43 to 46 ka. It is expected therefore that the Laschamp excursion is recorded in volcanic rocks or sedimentary sequences overlying the SI tephra.

We made paleomagnetic study of the Hikageyama dacite, which is overlying the Ikeda Pumice Deposit, the source of the SI tephra deposit. We collected oriented samples at 9 sites and measured natural remanent magnetization (NRM) on a spinner magnetometer. Stepwise alternating field (AF) demagnetization revealed that NRM of most samples are essentially composed of a single component, while some samples showed highly stable remanence which cannot be demagnetized at peak AF of 100 mT. We also obtained a fission-track date of zircon crystals at 36+/-7 ka.

Among the 9 sites, 4 sites in the eastern part of the Hikageyama yielded consistent site mean directions characterized by shallow inclinations and easterly deflection. These site means exceed a common range of paleosecular variation, providing virtual geomagnetic poles (VGP) at around 50 N and 100 W. It can be assumed therefore that the Hikageyama dacite recorded anomalous geomagnetic field at the time of the Laschamp excursion.

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