R004-01
Zoom meeting A ：11/4　AM1　(9:00-10:30)
09:00-09:15

富士山における紀元前 1000 年から西暦 1100 年にかけての地磁気永年変化曲線

#馬場　章[1)],渋谷　秀敏[2)]
[1)]富士山研,[2)]熊大・先端科学・地球環境

Paleomagnetic secular variation curve from BCE 1000 to CE 1100 at Fuji volcano, Japan

#Akira Baba[1)], Hidetoshi Shibuya[2)]
[1)]MFRI,Yamanashi Perf.,[2)]Dep't Earth & Env., Kumamoto Univ.

As the paleomagnetic directions and intensities have changed incessantly, it can be and has been utilized for a dating tool. The paleomagnetic secular variation (PSV) records in Japan has been revealed by archaeomagnetic studies of old kilns and hearths (e.g. Hirooka,1977) and paleomagnetic studies of sediment cores (e.g. Ali et al.,1999). However, the archaeomagnetic results are restricted to the last 1600 years in Japan, and PSV records from sediment cores are inconsistent. So, we have carried out the paleomagnetic direction measurements of the volcanic products on Fuji volcano to present the PSV curve extending back to the pre-historic ages, up to BCE 1000. The PSV curve is drawn as a sequence of direction, minimizing the sum of fitness and roughness and the ratio of them is determined by Akaike's bayesian information criterion (ABIC).
Fuji volcano is one of the largest active volcanos in Japan, having erupted mostly basalt in chemistry. Takada et al., (2016) has been revised the geological map of Fuji volcano, and categorized the rock-stratigraphic units into 185, which were erupted during BCE 17000 to CE 1707. For the last 3500 years (Subashiri-d and -c stages), they added a significant amount of ^{14}C dates and utilizing stratigraphic relation with Iz-Kt (CE 838) and Kg (1210-1187 cal BCE) tephra layers (Yamamoto et al., 2005 ; Kobayashi et al., 2007 ; Tani et al.,2013), and established the stratigraphy on the age duration. Those developments enable us collecting paleomagnetic direction data in a sufficient frequency.
The samples were collected from 42 units of lava flows, pyroclastic flows and pyroclastic cones of mostly known eruption ages. We selected carefully several sites from each volcanic product and corrected 6 to 20 samples using an engine powered core picker. Samples were oriented by a sun compass to eliminate the influence of local magnetic anomalies. Magnetization of the samples are measured using a spinner magnetometer with alternating field demagnetization (AFD) and thermal demagnetization (ThD). Our criterion for the site mean direction is a95 less than 5.0 degrees, which gives less than 2.1 degrees of a95 for unit mean.
The dataset enable us to draw the PSV curve between BCE 1000 and CE 1100 at Fuji volcano. It is interesting that there seems to be a stagnant point in PSV at around ca.BCE 1000, whose direction is similar to a known stagnant point in PSV at around CE 800. A phase shift is observed from clockwise circularity (BCD 1000 to CE 600) to counterclockwise circularity (CE 700 to CE 1100), looping around the stagnant point in PSV at around CE 650. Comparing the PSV curve with those from the Korean archaeological sites (e.g. Sung and Hirooka,2000), there shows some disagreements in the age assignments before CE 400. It is necessary to reconsider smoothing and/or fitting parameters of ABIC, and the age of volcanic products (Takada et al., 2016). The PSV curve revealed here is a good tool for the correlating the ages in various discipline in the East Asia.