

# Brunhes-Matuyama polarity reversal recorded in lava flows on Tahiti Island: Paleointensities

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In order to reveal the morphology of reversals, it is essential to restoring behaviors of the geomagnetic field vector. For this purpose, lava successions are considered as an appropriate record since they can provide continuous data set of absolute paleointensities and paleodirections. In this study, we investigate the Brunhes-Matuyama (B-M) polarity reversal recorded in 21 lavas on the northern side of Punaruu Valley, Tahiti Island. From the lavas on the southern side of the valley, Chauvin et al. (1990) found the B-M reversal and the older geomagnetic events, however they reported only three paleointensities for the period of the B-M reversal.

Samples were collected from fresh basalts by portable engine drill or hand-sampling. We performed the thermomagnetic analyses and hysteresis measurements with a vibrating sample magnetometer. Thermomagnetic curves of the samples are classified into three types concerning Curie point ( $T_c$ ): (a)  $\sim 550$  C, (b)  $\sim 550$  and  $\sim 150$ - $200$  C, and (c)  $\sim 150$ - $200$  C. In the Day plot, the data fall in the PSD area, close to the SD area.

The samples were subjected to low temperature demagnetization (LTD) and alternating field (AF) demagnetization, and thermal demagnetization. The preliminary report of remanence directions have been given by Kurata et al. (2003 Joint Meeting) and we have increased the numbers of samples measured. Relatively older lavas in this study show a stable component with a 95% confidence limit of 2-6 degree. For younger lavas, several samples show significant amount of secondary components. In those cases, demagnetization procedure of AF with LTD was more effective than thermal demagnetization and we adopted a high coercivity or blocking-temperature component as a primary one. To date sixteen mean paleomagnetic directions have been determined. The older lavas (unit Nos.1-12) show reversed directions, which would appear to correspond to the Matuyama Chron. The younger lavas (Nos.13-21) indicate a polarity sequence of reverse, intermediate, normal and reverse. The second reversed polarity is recorded in the youngest lava of No.21, suggesting another reversal to the Brunhes normal polarity after this polarity sequence.

The LTD-DHT Shaw method was applied to the samples from these lavas. We have chosen this method mainly because, LTD and AF demagnetization can effectively remove the secondary components. Also, because the samples are altered due to laboratory heating, the standard Thellier method cannot be applied. Seventy-six specimens have been subjected to the LTD-DHT Shaw method. Thirty-two specimens passed the selection criteria .

The preliminary results of paleointensities are following. Nine of the older lavas (Nos. 1-12) gave a paleointensity of 6-32 micro T, showing a successive increase and a subsequent rapid decrease. Since all the these lavas have the reversed primary component, the intensity variation (the increase and decrease) is considered as a characteristic of the geomagnetic field just prior to the beginning of the directional reversal. In terms of the intensity decrease, this result is consistent with the previous studies. However, we observe a clear relationship of the intensity with the directional deviations from the GAD one. For the younger lavas, No.18 lava gave a paleointensity of 5 micro T. We will discuss more detailed features of the geomagnetic field during the B-M reversal.