Abusolute Paleointensities of about 30Ma from Ethiopian flood basalts

*Yutaka Yoshimura[1], Naoto Ishikawa[1], Yuhji Yamamoto[2], Hyeon-seon Ahn[3], Tesfaye Kidane[4], Yo-ichiro Otofuji[5]

1.Kyoto University, 2.Center for Advanced Marine Core Research , Kochi Univ., 3.Research Institute of Natural Science, Gyeongsang National University, 4.2Department of Earth Science, Faculty of Science, Addis Ababa University, 5.Kobe University

The Ethiopian traps, distributed in Ethiopia and Yemen, are flood basalts erupted about 30Ma related to the activity of the Afar hot plume, and form about 2000-m-thick sequence of lava flows at the Ethiopia plateau. Rochette et al. (1998) performed paleomagnetic and geochronological studies on samples from 42 lave flows in Lima-Limo and Wegel Tena section at the Ethiopia Plateau. Based on obtained $^{40}Ar/^{39}Ar$ ages of 28-30Ma, they corresponded paleomagnetic polarity changes obtained from the lave sequence to Chron C11r-C11n.2n-C11n.1r in Geomagnetic Polarity Time Scale (GPTS) of Huestis and Acton (1997), and argued that the period of the Ethiopian trap volcanism is about 1Myr or less. In order to reveal detailed geomagnetic variations at about 30 Ma recorded in the Ethiopian traps, we have been performing paleomagnetic analyses on samples collected from 94 lava flows in Lima-Limo sections. In addition to the polarity changes reported by Rochette et al. (1998), we found polarity changes with short intervals and some directional variations like geomagnetic excursion (Ahn,2015). We have been also estimating paleointensities from the samples by using the double heating technique of the Shaw method with low temperature demagnetization (LTD-DHT Show method: Yamamoto et al., 2003). Paleointensity data between 6.3 and 29.1μT are obtained form 11 specimens of 10 flows. A mean of specimens providing higher latitude of Virtual Geomagnetic Pole (VGP) above 45° is 17.6μT, and the value of one specimen with lower VGP latitude is 6.3μT. The mean intensity is lower than the present geomagnetic intensity at Ethiopia (35μT). It is implied that the geomagnetic intensity at about 30Ma is lower than the present, which may be compatible with that a mean VADM between 0.3 and 300Ma is about 60% of that between 0 and 0.3 Ma (Plenier et al., 2003). A weaker intensity of the sample with lower VGP latitude might have represented a temporal feature in geomagnetic excursion or polarity change.

Keywords: Ethiopian trap, geomagnetic polarity change, absolute paleointensity

