Variation of geomagnetic field intensity at about 30 Ma recorded in the Ethiopian flood basalt

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We conducted a paleointensity study on samples from lava sequences of the Ethiopian flood basalt in order to clarify geomagnetic field variation at about 30 Ma. We obtained 24 absolute paleointensities by using the double heating technique of the Shaw method combined with low-temperature demagnetization, and 45 relative paleointensities estimated from intensity ratios of natural remanent magnetization to anhysteretic remanent one (NRM/ARM). Based on highly positive correlation of NRM/ARM with absolute paleointensity data, we calculated paleointensity values of samples that did not yielded absolute paleointensities. Finally, we determined paleointensities for 46 specimens from 45 flows of the lava sequences.
An overall mean of the paleointensity data is 13.2±10.9 μT and an averaged virtual dipole moment (VDM) is 2.7±2.3 10^{22} Am^2, indicating a weak intensity at about 30 Ma in the past 10 million years. Among seven polarity zones recorded in the lave sequences, a normal polarity one shows very low intensity (4.5± 2.7 μT) with smaller variation of intensity, and the VDM variation shows a tendency that the VDM was weaker in normal polarity zones than reverse polarity ones. In a period when polarity changes occurred in short intervals, a larger variation of VDM is observed, and higher values of VDM are detected from samples with large co-latitude of VGP from a mean paleomagnetic pole of the lava sequences.

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