

Paleointensity study on basaltic rocks from Baengnyeong Island, Korea

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We report new absolute paleointensity (API) data from basaltic rocks probably aged ~ 4-5 Ma in Baengnyeong Island, Korea, together with paleodirectional and rock magnetic results. Paleodirectional analysis obtained an overall mean direction of $D = 347.3$ and $I = 38.3$ ($a_{95} = 4.9$, $k = 113.4$) corresponding to a virtual geomagnetic pole at 342.1E and 70.2N. Comprehensive rock magnetic analyses identified Ti-poor titanomagnetite with, in part, multi-domain (MD) particles as a main carrier of remanent magnetization. The Tsunakawa-Shaw (TS) method yielded 12 qualified API estimates with a high success rate, efficiently removing possible MD influences, and resulted in a mean value of 13.1 uT with good precision (1.7 uT, standard deviation). The Thellier method of the IZZI protocol with pTRM checks, coupled with the use of a bootstrap approach instead of the "conventional best-fitting" in API determination, gave 6.6-19.7 uT as a 95% confidence interval of its mean API estimate, which supports the reliability of our TS-derived API mean estimate; but it is not considered in the final mean value because of the relatively large uncertainty. The virtual dipole moment corresponding to the TS-derived API mean, $2.9 (+/- 0.4) \times 10^{22} \text{ Am}^2$, is somewhat lower than the expectations of the past few Myr averages. Combined with a global API database, our new data implies a larger dispersion in the dipole moment during the early Pliocene than previously inferred.