流理構造の発達する厚い流紋岩溶岩の自然残留磁化方向

Direction of natural remanent magnetization of rhyolite lava with clearly marked flow structure

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Volcanic rocks have long been recognized as good recorders of the geomagnetic field corresponding to the time of their formation. Rhyolite lava is a common volcanic rock in continental regions and can also be considered to be a useful source of paleomagnetic data. However, only few studies have focused on paleosecular variation, magnetostratigraphy or plate reconstruction analysis using the remanent magnetization of rhyolite lavas. Being highly viscous, rhyolite lavas often show heterogeneous texture, unlike andesitic and basaltic lavas. Flow structure, one of the characteristics of rhyolite lava, may offer a clue about the changes in the direction of remanent magnetization in rhyolite lava during the development of the structure: heterogeneous texture in rocks may cause the deflection of the remanent magnetization to a direction different from the original one. The disagreement between the observed paleomagnetic direction of rhyolite lava and the expected one may be a function of the development of the flow structure.
In this study, we examined a thick rhyolite lava flow with clearly marked flow structure to assess its ability to records a consistent paleomagnetic direction, using material penetrated by two drill cores.
Progressive thermal demagnetization isolated two natural remanent magnetization components. The remanence was almost unblocked at around 580 degrees C during thermal demagnetization and is inferred to be carried by magnetite. A high-temperature component from each of the two cores yields inclinations that differ from each other. The low-temperature component had those that agreed with each other, and were also consistent with the direction expected from a geocentric axial dipole field. The modification of direction of the high-temperature component may be explained by post-magnetization acquisition tilting. In the case of silicic lava, the low-temperature component may retain directions parallel to the ambient field direction at the time of lava emplacement.

キーワード：流紋岩溶岩、残留磁化、ドリルコア
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