

On the cause of annual variation in the geomagnetic total intensity data in volcanic area

Maroka Neki [1], Hisashi Utada [2], # Tsuneomi Kagiya [3]

[1] Earthquake Research Institute, Univ. of Tokyo, [2] ERI, Univ. of Tokyo, [3] Earthquake Research Institute, University of Tokyo

Local geomagnetic data often contains an annual variation. We applied a hypothesis that a thermally induced magnetization change of near surface rocks causes this variation. We tested this hypothesis by using two data sets from different magnetized volcanoes. We measured magnetization and its temperature dependence of rock samples from the two volcanoes in the range 0-40 degrees C. We also obtained a total intensity anomaly map around magnetometer sites in each volcano. We found that the observed annual variation in the total intensity can be quantitatively explained by an annual variation in the equivalent source due to temperature change. This result indicates that correction of this effect is necessary in order to extract a real volcano-magnetic signal.