

Paleomagnetic Study of Four Geomagnetic Records of the last 15,000 years: Insights From Hawaiian Lavas, Ecuadorian Archaeomagnetic Artefacts and Soft Sediments From the Baltic Sea

*Emilio Herrero-Bervera¹

1. University of Hawaii at Manoa

Paleomagnetic data are the unique source of observations to understand the geomagnetic variations and hence the geodynamo processes involved in field generation. During the last three decades, great interest has been concentrated on the investigation of the Secular Variation (SV) of the Earth's magnetic field in different parts of the world. Several reference SV curves have been constructed at the local and/or the regional level mainly based on the paleomagnetic data from lava flows, soft sediments and archaeological artifacts. Such reference curves are particularly important for improving our knowledge about the non-dipole variations of the geomagnetic field, the geodynamo processes and the particular characteristics of the field behavior. Based on these secular variation records, particular interest has been recently concentrated on the short-term variations of the direction and intensity of the Earth's magnetic field evidenced from local SV curves. Recent archaeomagnetic and geomagnetic observations from studies in western Europe, the eastern Mediterranean, South America and Hawaii indicate that periodic changes of ~500 to 1000 years in the secular variation of the geomagnetic field over the last 1000 to 15000 years have been truncated by sudden so-called "archaeomagnetic jerks," which apparently have taken place at irregular intervals of time. Here, we present results of 15000 years of PSV investigations derived from Hawaiian lavas and from two widely separated archaeological sites in Ecuador spanning ~3000 years of PSV, from Valdivia coastal Ecuador spanning ~6000 years of PSV, and two sites from IODP Expedition 347 Sites M0059 and M0060 in the Baltic Sea that cover ~9000 years and 510-15145 years of PSV. We will show correlations of all these PSV results with the regional and global geomagnetic field models.

Keywords: Paleosecular Variation, Hawaiian Lavas, Ecuadorian archaeomagnetic artefacts