

Paleomagnetic study of an historical lava flow from the Llaima Volcano, Chile

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The understanding of the paleosecular variations (PSV) of the geomagnetic field in South America is still biased by the scarcity of data. Especially, the recent geomagnetic PSV is characterized by the large growth of the South Atlantic Magnetic Anomaly (SAMA) during the last three centuries, first documented by the geomagnetic model *gufm1* (Jackson et al., 2000). A large amount of data is required to understand the time and geographic distribution of this primary feature, and the Andean Pleistocene and Holocene volcanoes are an excellent recorder of instant local changes in SV. Here we present a preliminary study from 18 paleomagnetic samples collected during 2015 on what it was supposed to be the 1750 or the 1957-58 AD lava flow on the Llaima Volcano (38.692° S; 71.729° W), one of the most active centres of the Chilean Andes, in the Southern Volcanic Zone. A detailed paleomagnetic study was performed in order to recover the Declination and Inclination of the geomagnetic field, obtain the paleointensity and define the magnetic mineralogy. AF demagnetization until 1 T yielded an average vector at Dec/Inc 2.3°/-33.1° with α_{95} of 2.4°. This direction is carried by titanomagnetite grains with 40-45% ulvospinel as revealed by thermomagnetic curves. Paleointensity estimates were obtained following the IZZI-Thellier protocol. Seven specimens from 5 samples provided reliable results (success rate of 35%), giving an average paleointensity for these specimens of $30.88 \pm 2.39 \mu\text{T}$. The full magnetic vector obtained here was compared to archeomagnetic reference curves and the IGRF suggest that the lava flow is has the age of 1957-58 AD.