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New paleomagnetic data from the Djhavakheti Highland volcanic region (Lesser Caucasus): The Plio-Pleistocene Dashbashi sequence.

Elisa María Sánchez-Moreno (1), Manuel Calvo-Rathert (2), Avto Gogichaishvili (3), Goga T. Vashakidze (4), and Vladimir A. Lebedev (5)

(1) Departamento de Física, Universidad de Burgos, Burgos, España (emsanchez@ubu.es), (2) Departamento de Física, Universidad de Burgos, Burgos, España (mcalvo@ubu.es), (3) Instituto de Geofísica Unidad Michoacán, Universidad Nacional Autónoma de México, Morelia, México (avto.gogichai@gmail.com), (4) Alexandre Janelidze Institute of Geology, Ivane Javakhishvili Tbilisi State University, Tbilisi, Georgia (goga.vashakidze@gmail.com), (5) Institute of Geology of Ore Deposits, Petrography, Mineralogy and Geochemistry, Russian Academy of Sciences, Moscow, Russia

The Djhavakheti Highland volcanic region in the central sector of the Lesser Caucasus (South Georgia) is one of the largest neo-volcanic areas of the Caucasus. It displays an eruptive activity that provides long and continuous sequences of basaltic lava flows whose mineralogy is capable to record in a reliable way the direction and intensity of the Earth's magnetic field at the time of its cooling. Paleomagnetic and paleointensity data in this area, despite their interest, are scarce in comparison to the rest of the Alpine-Himalayan Belt. Therefore this study contributes to complete the knowledge of the magnetic field record in this region.
Recently, a new sequence named Dashbashi was sampled in the volcanic Djhavakheti Highland region. The sequence consists of 16 basaltic lava flows divided into three sections of different ages which are separated by erosion surfaces. The first section (flows DB01 to DB06) has an approximate age of 3.25 $\pm$ 0.25 M.a., the second (flows DB07 to DB14), an estimated age of 2.45 $\pm$ 0.25 M.a. and lavas DB15 and DB16 yield a similar or lower age.
Rock-magnetic experiments were performed to determine the carriers of remanent magnetisation, their thermal stability and grain size. These experiments included the measurement of thermomagnetic curves, hysteresis parameters and isothermal remanent magnetisation (IRM) acquisition curves. All experiments were performed at the UBU paleomagnetic laboratory with a Variable Field Translation Balance (VFTB). Three types of behavior have been differentiated: i) Type H: Reversible behaviour and a single ferromagnetic phase with high Curie temperature (Tc) close to 580°. This phase corresponds to magnetite/ Ti-poor titanomagnetite. ii) Type H*: Single high temperature ferromagnetic phase and more irreversible behaviour that distinguishes them Type H. iii) Type M: Two ferromagnetic phases, the high Tc present in all samples, and another medium Tc (≈400-500°C) titanomagnetite/titanomaghemite with lower titanium content.
Paleomagnetic measurements were also carried out at the UBU paleomagnetic laboratory with a 2G cryogenic magnetometer and included both thermal and alternating field (AF) demagnetization. A characteristic remanent magnetization (ChRM) could be determined in all studied flows. After analyzing the paleomagnetic directions obtained for the 16 lava flows of the Dashbashi sequence, it could be observed that the polarities determined for each of them show an inverse-intermediate latitude, which could correspond to an unstable directional behavior.
With the purpose of analyzing the behaviour of secular variation in the studied section, and confirm its unstable character, the scatter of paleosecular variation (PSV) of the virtual geomagnetic poles VGPs was calculated, obtaining a very low dispersion value.