



## **Anisotropy of Magnetic Susceptibility Analysis of The Rusca-Tihu Volcanoclastic Formation (East Carpathians, Romania): Flow Source Recognition**

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In the eastern Carpathian–Pannonian region during the last 15 Ma, westward-dipping subduction in a land-locked basin caused collision of a lithospheric block from the west with the southeastern border of the European plate. After the main collisional events at 11 Ma, volcanism took place in the East Carpathians forming the Călimani – Gurghiu – Harghita volcanic chain. This volcanic chain consists of calc-alkaline products that occurred along the easternmost margin of the rigid Transylvanian block, in the front of European Platform and it marks the end of the post-collisional subduction-related magmatism along the front of the European convergent plate margin. We present the first magnetic fabric and paleomagnetic study of pyroclastic deposits of the Rusca-Tihu volcano, one of the main volcanic structures from the Calimani Mountains. After a large debris avalanche event around 8 Ma, the proximal facies is represented by lava flows, pyroclastic flows and fall deposits and block-and-ash flow deposits. We have sampled 6 sites in poorly lithified pyroclastic deposits, lithic blocks of andesites from 2 sites and a lava flow interbedded in the pyroclastic deposits. The aims of study were the determination of the flow directions of pyroclastic flows and the estimation of the temperature of emplacement of block-and-ash flow deposits. The anisotropy of magnetic susceptibility (AMS) was measured using a MFK1A kappabridge and a 3D Rotator. The analysis of the natural remanent magnetizations by means of alternating field and thermal demagnetizations was used to determine the magnetic polarity and to estimate the emplacement temperature. Rockmagnetic experiments (field and temperature dependence of the magnetic susceptibility, hysteresis properties) have shown that Ti-poor and medium titanomagnetite as main ferromagnetic minerals. Good paleomagnetic results were obtained from the lava flow and andesitic blocks from the pyroclastic deposits, but in the samples from the poorly welded pyroclastic flows we did not obtained good demagnetization results. Taking into account these results and the ferromagnetic mineralogy, we estimate that the emplacement temperature is at most sites below 500°C. The magnetic polarity of the lava flow is reversed in agreement with other results from the Rusca-Tihu volcano. Based on the AMS measurements we have identified successfully the flow directions in fine pyroclastic deposits and interbedded lava flow, which are in agreement with the suppose position of the Rusca-Tihu stratovolcano. The variability of AMS data indicates a possible topographic control on inferred flow directions.