



## **Geomagnetic field paleointensity results of Dmitrievskaya Sloboda-II settlement burnt material (Vladimir region, Murom town, Russia)**

Olga Pilipenko (1), Inga Nachasova (1), and Olga Zelentsova (2)

(1) Schmidt Institute of Physics of the Earth RAS, Moscow, Russian Federation (pilipenko@ifz.ru), (2) Institute of Archeology RAS, Moscow, Russian Federation (olgazelentsova2010@yandex.ru)

Archeomagnetic research make it possible to obtain data about the intensity of the geomagnetic field in recent millennia as a result of studying the thermomagnetization of burnt material of archaeological monuments. This makes it possible to obtain quantitative information about the intensity of the ancient geomagnetic field, which can not be obtained by investigation other types of magnetization. This work is devoted to the archeomagnetic study of samples of the ceramics of Dmitrievskaya Sloboda-II settlement in order to obtain data of the geomagnetic field intensity. Settlement Dmitrievskaya Sloboda- II is located in the Murom district of Vladimir region on the northern periphery of Murom town ( $\sim 55^{\circ}\text{N}$ ,  $\sim 42^{\circ}\text{E}$ ). The archeological monument belongs to Pozdnyakov culture and dates from the middle of the second millennium B.C. For the dating of the monument, a series of radiocarbon dates were obtained for soil, coal and ceramics. The definitions made for coal have a calibrated age of  $\sim 1750$ -1500 years B.C. The dates obtained for ceramics are more variable. The most probable interval of the calibrated age of dates for ceramics is  $\sim 2050$ -1750 B.C. These dates correspond to the time of the transition from the middle bronze to the late one and are related to the early stage of the formation of the Pozdnyakov culture. During the investigation the 14 fragments of ceramic of Pozdnyakov culture were studied. Examination of a composition of a ferromagnetic fraction present in the demonstration collection, consisting of 7 samples, were carried out by powder X-ray diffraction method. X-ray phase analysis of the magnetic fraction showed the presence of magnetite which was single-phase oxidized up to maghemite and hematite. The thermomagnetic analysis shows that curves of the saturation magnetic moment from the temperature of the first and second heating have a bend in the temperature interval of  $\sim 580$ -600°C. The thermomagnetic analysis suggests that the main carriers of magnetization in the samples are magnetite and/or maghemite. To obtain the values of ancient geomagnetic field intensity, experiment was carried out using the modified Telier method. The pTRM check-points at temperatures of 300, 400 and 500°C were created on all fragments of ceramics. Also, repeat magnetic field-free heaters at temperatures of 150, 250, 350, 450 and 550°C, so called pTRM tail-check, were created on all samples of the collection to test changes in the composition of magnetic carriers at blocking temperatures above the TRM creation temperature. As a result of the study, the data of the geomagnetic field intensity recorded in eleven fragments of ceramics from the archaeological site Dmitrievskaya Sloboda - II were obtained. The geomagnetic field intensity varied within  $\sim 40$ -75  $\mu\text{T}$  with an average value of about 55  $\mu\text{T}$  in the middle of the 2-nd millennium B.C. This work was supported by RFBR, project № 16-05-00378 and by the Government of the Russian Federation (project no.14.Z50.31.0017).