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Geomagnetic paleointensity at ~1.75 Ga of Paleoproterozoic volcanic rocks from the Ukrainian Shield

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New determinations of paleointensity have been obtained for igneous rocks of the Ukrainian Shield — from the Korsun-Novomirgorod pluton (1735–1760 Ma, Ingul Domain) and from the Korosten pluton (1750–1760 Ma, North-Western Domain). Sample selection, palaeomagnetic studies and rock age determination were carried out by Ukrainian geophysicists [1]. Determination of paleointensity and accompanying studies of rock properties were carried out in GO “Borok” IPE RAS. To obtain reliable determinations of paleointensity, the magnetic and thermomagnetic properties of the samples were studied and X-ray diffraction studies were carried out. This revealed that the carriers of the characteristic component of natural remanent magnetization are single-domain and small pseudo-domain magnetite grains. Two methods were used to determine paleointensity: the Tellier-Coe procedure with the pTRM-checks procedure and the Wilson method. Paleointensity determinations were obtained for five sites and met quality criteria. The obtained paleointensity and virtual dipole moment (VDM) values are extremely low, in the range of (3.6–9.76) μT and (0.92–2.43)×10^{22} Am^2, respectively. Analysis of the data available in the paleointensity database (WDB) suggests that geodynamo operation during the Proterozoic era may have been characterized by alternating periods of strong and weak magnetic dipole regimes. However, the validity of this conclusion depends entirely on the reliability of the data reported in literature and presented in WDB. This work was supported by the State program GO “Borok” IPE RAS number FMWU-2022-0026.

[1] V. G. Bakhmutov, O. V. Mytrokhyn, I. B. Poliachenko and S. I. Cherkes, New palaeomagnetic data for Palaeoproterozoic AMCG complexes of the Ukrainian Shield, Geofizicheskiy Zhurnal. 45, 4 (2023) 3.