



Paleomagnetism of the Franz Josef Land basalts

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Here we present a result of paleomagnetic study from the Late Mesozoic basalts exposed on the different islands of the Franz Josef Land Archipelago (FJL). The field work was conducted during 2010, 2011, 2015 field seasons. Paleomagnetic study was focused on more than 40 magmatic objects (mainly lava flows and several sills, dykes etc) that crop out on Hooker Island, Jackson Island, Heiss Island, Ziegler Island, Hall Island, Wilczek Land, Alexandra Land and Zemlya Georga. The samples were subjected to a detailed step-wise thermal demagnetization in temperatures up to 600° C or alternating field demagnetization with maximum field up to 140 mT. Natural remanent magnetization (NRM) was measured with a 2G cryogenic magnetometers or a JR-6A spin-magnetometer housed in a non-magnetic rooms at the Institute of Petroleum Geology and Geophysics SB RAS and Novosibirsk State University. The main NRM carriers in the FJL samples are titanomagnetites with varying Ti-content. Magnetic remanence was unblocked in temperatures of 350-400°C. Some samples are characterized by unblocking temperatures of 560°C. All the virtual geomagnetic poles (VGPs) form a large, highly scattered "cloud" with a centre in the region of 140-120 Ma on the European apparent polar wander path (APWP). It is difficult to single out individual VGP groups by age, linking them to available Ar/Ar datings. We can consider the calculated average for all VGPs poles as paleomagnetic, corresponding to the boundary of ~ 130 Ma - the time of the main and possibly the only stage of magmatic activity at the FJL. The paleomagnetic pole is located at $Plat=69.6^\circ$, $Plon=178.6^\circ$; a corresponding statistical characteristic of pole: $N=45$, $K=22.4$, $S=17.2^\circ$, $A95=4.6^\circ$, $PaleoLat=63.5^\circ$. Statistic from 45 VGPs and a wide age range provide reliable averaging of secular geomagnetic variations. The magnitude of the angular dispersion of the paleomagnetic pole of 17.2° that practically coincides with the value predicted for paleolatitude 63.5° by the value $S \approx 19^\circ$ and is limited by the limit $10^\circ < S < 20^\circ$, which is also an indicator of the correct averaging of the secular variation. The coordinates for the calculated paleomagnetic pole taking into account confidence ovals do not differ from the corresponding path segment of the APWP of Europe. This means that at least since the Early Cretaceous, structures of the FJL (as part of the Svalbard plate) had a position that was close to the current position relatively to the Arctic margin of Europe and have not undergone significant shifts or rotations.

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