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Paleomagnetism of Jurassic-Cretaceous basalts from the Franz Josef Land Archipelago: tectonic implications

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New paleomagnetic data were obtained from a total of 158 oriented samples collected from the Jurassic magmatic complexes exposed on the Franz Joseph Land Archipelago (FJL). The field work was conducted during 2011 field season. Present study was focused on the tholeiitic basaltic lava flows that crop out on the Hooker Island. The samples were subjected to a detailed step-wise thermal demagnetization in temperatures up to 600 deg C or alternating field demagnetization with maximum filed up to 140 mT. Natural remanent magnetization (NRM) was measured with a 2G cryogenic magnetometer or a JR-6A spin-magnetometer housed in a magnetically shielded room at the Institute of Petroleum Geology and Geophysics, Siberian Branch of Russian Academy of Sciences. The main NRM carriers in the FJL samples are titanomagnetites with varying Ti-content. Magnetic remanence was unblocked in temperatures of 350-400 deg C. Some samples are characterized by unblocking temperatures of 560 deg C. The new paleomagnetic data were combined with those previously obtained from the early Cretaceous volcanics exposed on the FJL. A new mean paleomagnetic direction for the Jurassic rocks was calculated as D=78.3 deg, I=74.7 deg, a95=3.1 deg, k=194.3, N=13. A corresponding paleomagnetic pole is now located at Plat=62.1 deg; Plon=136.5 deg, A95=5.5 deg, K=63.6. New results suggest that the JFL occupied a significantly different position from that of the present day. However, in early Cretaceous the JFL was already located close to its present day position. We propose a rifting event between the North Barentz terrane (FJL and possibly Svalbard) and the counterpart of European tectonic domain. The rifting occurred during Early-Middle Jurassic. This event was accompanied by a significant shift of the FJL to the north-east for approximately 500 km. New results are in good agreement with a hypothesis that the FJL was passing over the Icelandic-Siberian hot spot during the Jurassic-Cretaceous time. Paleolatitudes for the Hooker Island correspond to its present latitude and the paleolatitude of the Siberian trapps. The reported results are preliminary and cannot lead to any ultimate interpretation. Further investigations are needed. This and future studies are supported by the Russian Foundation for Basic Research grant 13-05-00177 and Russian Science Foundation grant 14-37-00030.