AGU 100 ADVANCING EARTH AND SPACE SCIENCE
CHAPMAN CONFERENCE
Selfoss, Iceland • 13–18 October 2019

Conference: Large-scale Volcanism in the Arctic: The Role of the Mantle and Tectonics
Session: Large-Scale Volcanism and the Connection to Mantle Dynamics III Posters

Board 16: Paleomagnetism and Geochronology of Flood Basalts from the Franz Josef Land Archipelago

Abstract

At present, views on the evolution of magmatism in the Franz Josef Land (FJL) archipelago are reduced to two points of view – either the short-term one-stage formation of a large igneous province at the beginning of the Cretaceous, or the effect of a long-lived hot spot from the Early Jurassic to and including the Early Cretaceous with several brief pulses of magmatic activation. Our paleomagnetic studies indicate a total prevalence of products of an exclusively Early Cretaceous episode of magmatism. The calculated virtual geomagnetic poles form a single “cloudy” distribution with its center shifted towards the Early Cretaceous paleomagnetic poles of Siberia. Analysis shows that the main reason for the significant variation of the poles is the high latitude position of the FJL and the secular variations of the geomagnetic field, and not the difference in the age of magmatism. The coincidence of the mean paleomagnetic pole of the FJL traps with the Early Cretaceous (145–125 Ma) apparent polar wander path interval of Siberia, rather than Eastern Europe, confirms the hypothesis of Mesozoic strike-slip activity inside the Eurasian continent. Isotopic-geochemical studies of FJL basalts, which are presumably different in age, indicate a single intraplate source of melts during the formation of the FJL traps. Our new $^{40}Ar/^{39}Ar$ data support one Early Cretaceous episode of magmatic activation. The exceptional predominance of normal polarity indicates that the peak of magmatism occurred at the end of the Barremian (chron M1) – Aptian, i.e. corresponds to the beginning of the Cretaceous superchron (C34n) about 125 Ma. The obtained estimates of the geological age and paleolatitudinal position (N 63°) of the FJL traps allow us to consider this area of plume magmatism as part of the High Arctic Large Igneous Province and to link its formation with the evolution of the modern Icelandic hot spot.

This work was supported by the RSF (project no. 19-17-00091), the RFBR (project nos. 18-35-00273, 18-05-70035), and the Ministry of Education and Science of the Russian Federation (project nos. 5.2324.2017/4.6 and 5.4786.2017/6.7).

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