

Paleomagnetism and geochronology of the Devonian dykes, Kola Peninsula

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Abstract: During last four years, we studied more than 100 dolerite and alkaline dykes, which are widely spread on the Kola Peninsula and belong to the Devonian magmatic province. Within the scope of our researches some of these dykes have been dated and their precise isotopic ages (Ar/Ar, Sm-Nd, Rb-Sr) lie in the range of 390-360 Ma (Veselovskiy et al., 2013). The age of other sampled dykes can be considered as Devonian due to similarity of their paleomagnetic, geochemical and petrological characteristics to the dated ones. Paleomagnetic directions have been obtained from more than 80 dykes. Almost all dykes yielded (a) a low-temperature component that is aligned along the present-day field and is likely of viscous origin; (b) a well defined dual-polarity intermediate-temperature component with steep eastward directions that accounts for a main part of the NRM and often decays to the origin on orthogonal plots; and (c) a dual-polarity high-temperature component with shallow inclinations and ENE declinations of presumed primary origin. The presence of the primary high-temperature component makes us possible to calculate preliminary Baltica's paleomagnetic pole for the Middle-Late Devonian. In view of the obtained microprobe data we believe that intermediate component is a result of unknown hydrothermal process, which age can be estimated from the comparison of corresponding paleomagnetic pole with the Baltica's APWP as Jurassic. We believe that both mentioned episodes of endogenous activity within the large stable craton were connected with plume-lithospheric interaction in the Devonian and Jurassic. In this presentation we use the obtained paleomagnetic, petrological and geochronological data to determine the paleogeography of Baltica in the Devonian and Jurassic times and to find its position within the global paleotectonic and geodynamic reconstructions.

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Keywords: Devonian, paleomagnetism, rock-magnetism, Ar/Ar geochronology, dykes

References :

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