Geophysical Research Abstracts
Vol. 18, EGU2016-8631, 2016
EGU General Assembly 2016

New paleomagnetic data from 1.80-1.75 Ga mafic intrusions of Fennoscandia and Sarmatia: implications for the late Paleoproterozoic paleogeography of Baltica and Laurentia

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A series of recently dated 1.78-1.75 Ga lamprophyre and shoshonite intrusions are exposed north of Ladoga Lake in southern Karelia (Fennoscandia). We carried out a paleomagnetic study of these intrusions and an additional study of the coeval gabbro-dolerite Ropruchey sill near the Onega Lake. All studied rocks carry a stable primary remanence supported by positive contact tests. We also studied 14 mafic dykes and 1 mafic sill from Ukrainian shield (Sarmatia). Most of these intrusions have been dated or re-dated recently by U-Pb (baddeleyite) method at 1.80-1.75 Ga. Ukrainian dykes also carry a consistent stable bipolar remanence. Two positive contact tests suggest that this remanence is primary. A comparison of new and previously published paleomagnetic data shows a significant difference between Fennoscandian and Sarmatian 1.80-1.75 Ga paleopoles. This implies that the final assemble of Baltica by docking of Volgo-Sarmatia and Fennoscandia occurred after 1.75 Ga. Consequently these two parts of Baltica should be considered as independent blocks in pre-1.75 Ga paleogeographic reconstructions. Using late Paleoproterozoic paleomagnetic data from Laurentia together with geological constraints we have built a new kinematic paleogeographic model for Laurentia and Baltica in the Statherian.