



## **Long duration and multiphase plume basic magmatism with Pt-Pd and Cu-Ni ores for the Paleoproterozoic Baltic Shield**

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Volcano-plutonic, dyke and terrigenous sediment formations of the Paleoproterozoic in the Eastern, Achaean part, of the Baltic Shield are interpreted as intracratonic and plume related. These formations are characteristic of long-lived rift systems in a unique period of plate assembly following the Archean. The geodynamic regime over this period changed to a global plate-tectonic regime. Layered pyroxenite-norite-gabbro-anorthosite intrusives of the Paleoproterozoic time with Pt-Pd and Cu-Ni industrial deposits compose two belts or two wedges of the vast Fennoscandian plume – Kola and Fenno-Karelian. Based on U-Pb and Sm-Nd data, basic magmatism in these belts was active during long time interval from 2530 Ma to 2400 Ma.

In the framework of large scale and geology-geochronology, the well studied Fedorovo-Pansky intrusion is established as having an early pyroxenite barren magmatic phase with an age from 2530 Ma to 2510 Ma. The main gabbro-norite phase originated from 2500 Ma to 2485 Ma, the pegmatoid vein phase was produced at 2470 Ma and late anorthosite phase was 2450 Ma. The Main phase composes magma-related Cu-Ni and Pt-Pd mineralization of the bottom part of the intrusion. Two last phases are characterized by magmatic and fluid- hydrothermal Pt-Pd mineralization of the two ore horizons (Lower and Upper reefs). Homogeneity and a long functioning single deep magmatic reservoir of the EM-1 type with enriched by LILEs is defined by negative E Nd (T) from -1.1 to -2.4 and I Sr from 0.703 to 0.704, and high  $^3\text{He}$  values.

This magmatic province is a part of a single Canadian-Fennoscandian Paleoproterozoic

zoic superplume (Heaman, 1997, Vogel et.al., Ernst, 2001, 2005).

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