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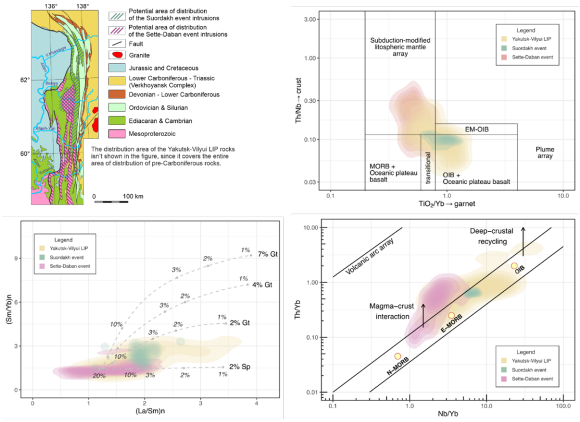
Geochemical variations in the composition of LIPs of the south-east of the Siberian platform

ALEKSANDR D. SAVELEV[1,2], **ANNA A. PAZUKHINA**[1], HAFIDA EL BILALI[3] AND RICHARD E. ERNST[3]

[1]St. Petersburg State University
[2]Russian Geological Research Institute (VSEGEI)
[3]Carleton University

Presenting Author: aapazukhina@gmail.com



The southeastern margin of the Siberian Craton is commonly known as a passive margin with well-recognized early Neoproterozoic (ca. 1000–950 Ma, Sette-Daban LIP) and Middle-Late Devonian rifting events (380-360 Ma, Yakutsk-Vilyui LIP) associated with mafic magmatism, normal faulting, and deposition of clastic rocks and evaporites [1]. Ordovician sills were later discovered in this area and are now identified as the Suordakh complex (490–480 Ma), although most of the Ordovician and Silurian is reported as a period of tectonic quiescence, with deposition of thick units of carbonates with numerous reef-like build-ups [1].

Geochemical composition of mafic rocks from all magmatic events corresponds to tholeiite basalts, although the rocks of the Suordakh complex partially fall into the area of picrobasalts. Samples from mafic intrusions of the Sette-Daban and Yakutsk-Vilyui LIPs fall into the area of trachybasalts and alkaline basalts.

Most diagrams (Fig. 1) show that composition of mafic intrusions of the Suordakh complex corresponds to within-plate basalts. The rocks of Sette-Daban and Yakutsk-Vilyui LIPs vary in composition from OIB to MORB, which is typical for rift systems. However, rocks of the Yakutsk-Vilyui LIP, which were formed later, overlap with fields related to other mafic intrusion complexes (Fig. 1).

Such variation in chemical composition may be related to variations in the initial compositions of magmas as well as by the degree of contamination with various rocks of the basement and sedimentary cover of the platform.

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[3] Kiselev et al. (2014) Russ. Geol. Geophys., 55 (2), 144–152; https://doi.org/10.1016/j.rgg.2014.01.003

[4] Pearce et al. (2021) Lithos 392–393, 106068. https://doi.org/10.1016/j.lithos.2021.106068