



Anisotropy of magnetic susceptibility of the large dolerite sills of the Angara-Taseeva depression (the Siberian Traps LIP) and the magma flow reconstructions

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The Siberian Traps Large Igneous Province is considered to be the classic example of the continental LIP magmatism. Within the Angara-Taseeva depression (the southern part of the Siberian platform) the products of the Permian-Triassic magmatic activity represent huge dolerite sills intruding the Paleozoic sediments. The extension of the discrete intrusive bodies, their age and order of emplacement remain uncertain. Previously we performed the detailed paleomagnetic investigation revealing the essential magmatic events.

Here we present the results of the detailed study of the anisotropy of magnetic susceptibility in the sills of the Angara-Taseeva depression. In 50% of the studied sites we found so-called “normal” magnetic fabric when the minimal axis of the AMS ellipsoid (K3) is normal to the contact (subvertical in sills) and the two other axes are shallow. In this case we interpreted the orientation of the maximal axis (K1) as the magma flow direction. 25% of the studied locations demonstrated the “inverse” magnetic fabric when K1 is normal to the contact. The other sites showed intermediate, diagonal or dispersed type of the AMS ellipsoid axis.

In the inner part of the depression the normal magnetic fabric is predominant, and, in general, K1 axes of the AMS ellipsoid converge to the center. This fact confirms the suggestion that the magma feeder zone for the intrusions was located in the central part of the Angara-Taseeva depression. In addition, the pattern of K1 axis allows revealing the local centers of intruding, corresponding to the Padunskiy and Tulunskiy sills. In the periphery of the depression, on the contrary, the inverse magnetic fabric is the most common (in the Tolstomysovskiy sill chiefly). This study was funded by RFBR (projects № 16-35-60114) and the Ministry of Education and Science RF (project № 14.Z50.31.0017).