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Paleomagnetism and Anisotropy of Magnetic Susceptibility in the Late Quaternary Lava Flows from the Tolmachev Dol area (the Southern Kamchatka)

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Paleomagnetic investigation of the Quaternary volcanic rocks of Kamchatka is important due to several reasons. First, the existing global models of the geomagnetic field are still insufficiently reliable because the data are non-uniformly distributed across the Earth's surface (e.g. [1,2]. For instance, only scarce reliable information about secular variations of geomagnetic field is available for northwestern Pacific, and data for some regions are absent altogether. Given that, the new detailed paleomagnetic information on basaltic lava flows from Kamchatka can be an important contribution to the global models, in particular, for determining the nondipole components of the geomagnetic field. Also, these data can be applied for the regional correlation of volcanic events.

Another vital problem is a reconstruction of the dynamics of the eruptive processes. In Kamchatka, recent volcanic activity is related to large stratovolcanoes, monogenetic cones and domes, and fields of areal volcanism. For the latter, the reconstruction of local volcanic centers and distribution directions of lava flows is important in the context of the volcanic dangers estimation.

Within this study, we analyzed 13 paleomagnetic sites from basaltic lava flows of the Tolmachev Dol area (the Southern Kamchatka). This district is a well-known field of the areal volcanic activity in the Southern Kamchatka with the age of 25-3 Ka [3]. At this moment, 11 site-mean paleomagnetic directions, satisfying the modern methodical and instrumental standards of paleomagnetic studies, were calculated. For 3 sites, we obtained anomalous directions with low inclinations, which can correspond to the geomagnetic excursion. Future perspectives are to obtain the reliable ages from the OSL-dating and to perform the paleointensity experiments.

Furthermore, we measured anisotropy of magnetic susceptibility in the studied lava flows. The majority of sites demonstrate the low degree of anisotropy, typical of the basaltic flows ($P<1.05$). Based on the magnetic lineation, the patterns of lava transport were reconstructed. Preliminary results point out the eruptions from the multiple volcanic centers.

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